

Odonatological Abstract Service

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1997

9593. Bernard, R. (1997): An extremely late record of *Sympetrum fonscolombi* (Sel.) in Poland (Anisoptera: Libellulidae). *Notulae odonatologicae* 4(10): 159-160. (in English) [Record of a male caught on 29-X-1996, near Poznań, Poland] Address: Bernard, R., Dept of General Zoology, Adam Mickiewicz University, Umultowska 89, PL-61-702 Poznań, Poland; E-mail: Bernard@amu.edu.pl

9594. Burkart, W. (1997): Neue Reproduktionsnachweise der Frühen Heidelibelle (*Sympetrum fonscolombi* SELYS 1840) (Odonata: Libellulidae) in Niedersachsen. *Beiträge zur Naturkunde Niedersachsens* 50: 48. (in German) [Teneral of *S. fonscolombii* were recorded in Rotenburg, Niedersachsen, Germany on 8-IX-1996] Address: Burkart, W., Am Emel 7, 27412 Wilstedt, Germany. E-mail: weguburkart@gmx.de

9595. Dijkstra, K.-D. (1997): New records of *Libellula fulva* (Müll.) for Portugal (Anisoptera: Libellulidae). *Notulae odonatologicae* 4(10): 160. (in English) [Two records of the regional very rare *L. fulva* are documented and briefly discussed.] Address: Dijkstra, K.D., Netherlands Centre for Biodiversity Naturalis, P.O. Box 9517, NL-2300 RA, Leiden, The Netherlands. E-mail: dijkstra@nrm.nl

9596. Gatter, W. (1997): *Birds of Liberia*. Aula-Verlag, Wiesbaden. ISBN 3-89104-615-4: 320 pp. (in English) [The book includes a colour picture of the Little Bee-eater *Merops pusillus* with an anisopteran prey.] Address: AULA-Verlag, Industriepark 3, 56291 Wiebelsheim, Germany

9597. Habdijia, I.; Radanovic, I.; Primc-Habdijia, B. (1997): Longitudinal distribution of predatory benthic macroinvertebrates in a karstic river. *Archiv für Hydrobiologie* 139(4): 527-546. (in English) ["The longitudinal distribution of predatory macroinvertebrates and their diversity were investigated on boulder, cobble and gravel substrates along the River Kupa, a karstic river in the NW Dinarid area (Croatia). Depending on substrate type and river section, the predator biomass constituted 6.9 % to 20.2 % of the total macro-invertebrate biomass. In the headwater streams more than 80 % of predator biomass was represented by rhyacophilid, perlid and perlodid larvae. In the upper river section Hirudinea species, rhyacophilids and the dipteran larva,

Atherix ibis, constituted approximately equal percentages of total predators. In the lower river section Hirudinea species, Odonata larvae, tanipod and ceratopogonid larvae were the most dominant predators. Along the river gradient the increase of predator biomass corresponded with the increase of scraper, collector-gatherer and filterer biomass. The Shannon index of diversity showed that the diversity of predators increased from the source area to the downstream reaches. A significant and positive association was found between diversity of predators and diversity of collector-gatherers. This positive relationship between predators and collector-gatherers may be interpreted as the diversity response of predators to the diversity of prey." (Authors) The species list includes *Platycnemis* sp., *Corduliidae*, 'non det.', *Gomphus vulgatissimus*, and *Onychogomphus* sp.] Address: Habdijia, I., Department of Zoology, Faculty of Science, University of Zagreb, Rooseveltov trg 6, 10000 Zagreb, Croatia

9598. Holuša, O. (1997): The occurrence of dragonfly *Aeshna subarctica* Walker, 1908 (Odonata: Aeshnidae) in the Hrubý Jeseník Mts. (Czech Republic). *Čas. Slez. Muz. Opava (A)*. 46: 287-288. (in Czech, with English summary) [5 males, 1 female and 2 exuviae of *A. subarctica* were collected by the author on 8-IX-1997 at the peaty lake Malé mechové jezírko on the moorland of Rejvíz (745 in a.s.l., Hrubý Jeseník Mts., north-western Silesia in Czech Republic). Oviposition took place in the growth of *Eriophorum* sp. in the margin of the lake. *A. subarctica* frequently was observed to hunt for tandems of *Sympetrum* species.] Address: Holuša, O., Muzeum Beskyd, Přírodovědné oddělení, Zámecké náměstí 1264, CZ-738 01 Frýdek-Místek

9599. Holuša, O. (1997): Scarce chaser (*Libellula fulva*), a rare species in the Czech Republic and Slovak Republic. *Ochrana Přírody* 52(8): 240-241. (in Czech, with English summary) [*L. fulva* was found on a pond near the village Brzotin, Slovakia. The regional records of this species are documented. The list of Odonata from the same locality includes further 9 Odonata species e.g. *Erythromma viridulum*, *Anax parthenope*, and *Crocothemis erythraea*.] Address: Holuša, O., Muzeum Beskyd, Přírodovědné oddělení, Zámecké náměstí 1264, CZ-738 01 Frýdek-Místek

9600. Parr, A. (1997): The 1996 Red-veined Darter *Sympetrum fonscolombi* (Selys) influx into Britain. *Atropos* 2: 44-46. (in English) [The influx is given in de-

tails presenting phenological diagram of observation dates and a map with localities of observation.] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK

9601. Raab, R.; Chwala, E. (1997): Rote Liste ausgewählter Tiergruppen Niederösterreichs - Libellen (Insecta: Odonata), 1. Fass. 1995. Hrsg.: Amt der Niederösterreichischen Landesregierung, Abteilung Naturschutz, Wien. ISBN 3-901542-07-8: 91 pp. (in German) [Red list of the endangered Odonata of the federal state 'Niederösterreich' (NÖ), Austria. The publication also includes notes on dragonflies as bioindicators, the history of dragonfly research in NÖ, altitudinal distribution of Odonata in NÖ, a checklist of the species, data on the regional distribution, habitats, risk assessment, action plan, regional papers on Odonata, and in most cases colour pictures and distribution maps of the species.] Address: Amt der NÖ Landesregierung, Abteilung Naturschutz, Landhausplatz 1; Haus 16, A-3109 St. Pölten, Austria

9602. Zimmermann, P. (1997): Die Naturschutzgebiete im Landkreis Calw (Nordschwarzwald) - Beitrag zur Herpeto-, Heuschrecken- und Libellenfauna. Veröffentlichungen für Naturschutz und Landschaftspflege in Baden-Württemberg 71/72: 327-377. (in German) [27 Odonata species are represented in the 25 studied nature conservation areas within the boundaries of Landkreis Calw, Baden-Württemberg, Germany.] Address: Zimmermann, P., Regierungspräsidium Karlsruhe, Referat Naturschutz und Landschaftspflege, 76247 Karlsruhe, Germany. E-mail: peter.zimmermann@rpk.bwl.de

9603. Zimmermann, W. (1997): Die Arktische Smaragdlibelle (*Somatochlora arctica*) erstmalig in Thüringen nachgewiesen. Landschaftspflege und Naturschutz in Thüringen 34(1): 24-25. (in German) [First record of *S. arctica* in Thüringen, Germany, 11-VI-1997, NSG Saukopfmoor.] Address: Zimmermann, W., Thomas-Müntzer-Str. 5, D-99423 Weimar, Germany

1998

9604. Brinkmann, R. (1998): Berücksichtigung faunistisch-tierökologischer Belange in der Landschaftsplanung. Informationsdienst Naturschutz Niedersachsen 4/98: 58-127. (in German) [The potential of Odonata for landscape planning purposes is commented on pages 102-103.] Address: Niedersächsisches Landesamt für Ökologie, Abt. Naturschutz, Postfach 101062, D-31110 Hildesheim, Germany. E-mail: poststelle@hi.nloe.land.ni.dbp.de

9605. Dahmen, D.; Dahmen, E.-G.; Gellert, G. (1998): Einfluß extremer Schwermetallbelastungen auf die Zusammensetzung der Makrobenthoszönose eines Mittelgebirgsbaches in einem ehemaligen Erzabbaugebiet des Raumes Overath (Bergisches Land). Decheniana 151: 173-182. (in German, with English summary) ["The effects on benthic invertebrates of the extremely with heavy metals contaminated creek Grünewaldbach (Nordrhein-Westfalen, Germany), impacted by wastes from past mining activities, were studied in 1995. As reference served a low impacted creek (Hellenthalbach), situated at a distance of 1.3 km. Both creeks are tributaries of the river Sülz. The organisms were exposed to high levels of Cd (up to 0.13 mg/L), Zn (up to

133 mg/L) and Ni (up to 2.18 mg/l) and lower concentrations of Pb and Cu. This led to a high elevated whole-body heavy metals bioaccumulation. The grazing species showed the highest and the carnivorous species the lowest concentrations. Severely influenced by heavy metals was the composition of the benthic community in the Grünewaldbach. Triclad, gammarids, mayflies, dragonflies and water beetles were absent. The most widespread organism was the caddisfly *Plectrocnemia conspersa*." (Authors) Larvae of *Cordulegaster boltonii* occurred in the low impacted creek Hellenthalbach; the mean (n=20) of heavy metals in dried bodymass in mg/kg is as follows: Cd: 5.6 (s=3.7), Pb: 28.1 (s=11), Cr: 1.9 (s=0.2), Cu: 43.3 (s=9.9), Ni: 4.9 (s=1.9), Zn: 193 (s=16).] Address: Dahmen, D., Burbacherstr. 263, 53129 Bonn, Germany

9606. Dudley, R. (1998): Atmospheric oxygen, giant Paleozoic insects and the evolution of aerial locomotor performance. *The Journal of Experimental Biology* 201: 1043-1050. (in English) ["Uniformitarian approaches to the evolution of terrestrial locomotor physiology and animal flight performance have generally presupposed the constancy of atmospheric composition. Recent geophysical data as well as theoretical models suggest that, to the contrary, both oxygen and carbon dioxide concentrations have changed dramatically during defining periods of metazoan evolution. Hyperoxia in the late Paleozoic atmosphere may have physiologically enhanced the initial evolution of tetrapod locomotor energetics; a concurrently hyperdense atmosphere would have augmented aerodynamic force production in early flying insects (including Protodonata). Multiple historical origins of vertebrate flight also correlate temporally with geological periods of increased oxygen concentration and atmospheric density. Arthropod as well as amphibian gigantism appear to have been facilitated by a hyperoxic Carboniferous atmosphere and were subsequently eliminated by a late Permian transition to hypoxia. For extant organisms, the transient, chronic and ontogenetic effects of exposure to hyperoxic gas mixtures are poorly understood relative to contemporary understanding of the physiology of oxygen deprivation. Experimentally, the biomechanical and physiological effects of hyperoxia on animal flight performance can be decoupled through the use of gas mixtures that vary in density and oxygen concentration. Such manipulations permit both paleophysiological simulation of ancestral locomotor performance and an analysis of maximal flight capacity in extant forms." (Author)] Address: Dudley, R., Dept of Zoology, University of Texas, Austin, TX 78712, USA. E-mail: rdudley@utxvms.cc.utexas.edu

9607. Finck, P. (1998): Der Einfluß von Probenahmezeitpunkt und -häufigkeit auf die Erfassung der Makroinvertebraten in Mittelgebirgsbächen. *Lauterbornia* 34: 245-254. (in German, with English summary) [The influence of sample timing and frequency on the recording of the macroinvertebrates in mountain brooks was studied by recording macroinvertebrates at two sites in the Eifel mountains in Northrhine-Westfalen, Germany. Additionally the dominance structures of the biocoenosis indicating different habitat requirements were analysed. Recommendations are given for a minimum standard to guarantee the relevance and validity of the results for physical planning: not less than 4 samples obligatory in March, May, June, and September. *Calopteryx virgo* and *C. splendens* are recorded for the studied brooks Ahbach and Klausenbach.] Address: Finck,

P., Bundesamt für Naturschutz, Abt. Biotopschutz und Landschaftsökologie, Konstantinstr. 110, 53179 Bonn, Germany

9608. Jödicke, R. (1998): Extraordinary flight dates of *Ceriagrion tenellum* (De Vill.) in NW Germany (Zygoptera: Coenagrionidae). *Notulae odonatologicae* 5(2): 20-21. (in English) [The paper compiles data on phenology of the species, in most cases from the Federal State Niedersachsen, Germany.] Address: Jödicke, R., Am Liebfrauenbusch 3, D-26655 Westerstede, Germany. E-mail: reinhard.joedicke@ewetel.net

9609. Kossenko, S.M.; Fry, C.H. (1998): Competition and coexistence of the European bee-eater *Merops apiaster* and the Blue-cheeked bee-eater *Merops persicus* in Asia. *Ibis* 140(1): 3-13. (in English) ["Studies were conducted over a 10-year period on the supposedly similar European Bee-eater *Merops apiaster* and Blue-cheeked Bee-eater *M. persicus* breeding in mixed and separate colonies in four Asiatic countries (Turkmenistan, Uzbekistan, Tajikistan). In spring, *M. persicus* arrived a few days later and laid up to 2 weeks later than *M. apiaster*. Spatial distributions of the two species were positively associated. They were sympatric and syntopic: more than half of the local breeding ranges overlapped, and many birds bred within sight and sound of the congener. Intraspecific conflict was frequent, but in mixed colonies interspecific conflict was rare. Most *M. apiaster* nest burrows were dug into cliffs and most *M. persicus* ones into level ground, but dense mixed colonies occurred only in cliffs. Burrow architecture differed specifically. Diets were qualitatively similar at insect family level but different at the species level, partly because of local variation in availability and partly because of distinct preferences of *M. apiaster* for small beetles, ants and termites and of *M. persicus* for large dragonflies and cicadas. *Merops persicus* was less specialized than *M. apiaster* and had an airborne insect prey spectrum nearly twice as broad. Diets were more alike where the two birds foraged together than where they foraged separately. There was a high incidence of egg and nestling loss by predation and starvation. We speculate that each species may prove to breed more successfully in mixed than in monospecific colonies. We propose that the two bee-eaters do not compete for nest sites but may compete for food and coexist unaggressively by trading off food competition against improved breeding success in mixed colonies." (Authors)] Address: Fry, C.H., University of Aberdeen, Department of Zoology, Tillydrone Avenue, Aberdeen AB9 2TN, UK

9610. Niedringhaus, R.; Zander, B. (1998): Die Kleingewässer der Ostfriesischen Inseln. Zustandsanalyse und ökologische Bewertung anhand der Flora/Vegetation und der Wirbellosenfauna. Schriftenreihe Nationalpark Niedersächsisches Wattenmeer 3: 270 pp. (in German) [This is a detailed and extensively documented study of the Mollusca, Odonata, Coleoptera and Heteroptera of the pools in the Lower-saxony watten sea Islands. Odonata (37 species) are dealt with in chapter 6.12 and on several other places in the book.] Address: Bezirksregierung Weser-Ems, Nationalparkverwaltung, Virchowstr. 1, 26382 Wilhelmshaven, Germany

1999

9611. Kuhn, J. (1999): Zwischen Hochwasser und Austrocknung – die Gefleckte Heidelibelle. *Magazin*

Lebensräume 3: 29. (in German) [Baden-Württemberg, Germany; brief note on factors determining population dynamic of *Sympetrum flaveolum*. The species is a habitat specialist of fluctuating water levels in the littoral of lakes and ponds.] Address: Kuhn, J., Marktstr. 26, 89143 Blaubeuren, Germany

2000

9612. Dudley, R. (2000): The biomechanics of insect flight: form, function, evolution. Princeton Univ. Press, Princeton, N.J. ISBN-13: 978-0691044309: 476 pp. (in English) ["Here, Robert Dudley presents the first comprehensive explanation of how insects fly. The author relates the biomechanics of flight to insect ecology and evolution in a major new work of synthesis. The book begins with an overview of insect flight biomechanics. Dudley explains insect morphology, wing motions, aerodynamics, flight energetics, and flight metabolism within a modern phylogenetic setting. Drawing on biomechanical principles, he describes and evaluates flight behaviour and the limits to flight performance. The author then takes the next step by developing evolutionary explanations of insect flight. He analyzes the origins of flight in insects, the roles of natural and sexual selection in determining how insects fly, and the relationship between flight and insect size, pollination, predation, dispersal, and migration. Dudley ranges widely—from basic aerodynamics to muscle physiology and swarming behaviour—but his focus is the explanation of functional design from evolutionary and ecological perspectives." (Publisher) This is a comprehensive and definitive summary of the state of the art in the biomechanics of insect flight - including Odonata - through the late 1990's.] Address: Dudley, R., Dept of Zoology, Univ. of Texas, Austin, TX 78712, USA. E-mail: rdudley@utxvms.cc.utexas.edu

9613. Kotenko, T.I. (2000): The European pond turtle (*Emys orbicularis*) in the Steppe Zone of the Ukraine. *Stapfia* 69: 87-106. (in English) ["*E. orbicularis* is widely distributed in the Steppe Zone of the Ukraine and most abundant in the deltas of big rivers. Data are presented on distribution, habitats, abundance, seasonal and daily activity, migrations, reproduction, diet, enemies and parasites, collected between 1974 and 1999. ... The diet included many species of invertebrates and a few vertebrates. Gastropoda, Dytiscidae (Coleoptera), Hemiptera and larvae of Diptera and Odonata were the dominant components." (Author)] Address: Kotenko, Tatiana, Schmalhausen Institute of Zoology, National Academy of Science, Khmelnytsky Str. 15, 252030 Kiev, Ukraine. E-mail: Kotenko@iz.freenet.kiev.ua

9614. Kourie, J.I.; Shorthouse, A.A. (2000): Properties of cytotoxic peptide-formed ion channels. *Am. J. Physiol. Cell. Physiol.* 278: C1063-C1087. (in English) ["Cytotoxic peptides are relatively small cationic molecules such as those found 1) in venoms, e.g., melittin in bee, scorpion toxins in scorpion, pilosulin 1 in jumper ant, and lycotoxin I and II in wolf spider; 2) in skin secretions (e.g., magainin I and II from *Xenopus laevis*, dermaseptin from frog, antimicrobials from carp) and cells of the immune system (e.g., insect, scorpion, and mammalian defensins and cryptidins); 3) as autocytotoxicity peptides, e.g., amylin cytotoxic to pancreatic b-cells, prion peptide fragment 106–126 [PrP-(106–126)], and amyloid b-protein (AbP) cytotoxic to neurons; and 4) as designed synthetic peptides based on the sequences and

properties of naturally occurring cytotoxic peptides. The small cytotoxic peptides are composed of β -sheets, e.g., mammalian defensins, AbP, amylin, and PrP-(106–126), whereas the larger cytotoxic peptides have several domains composed of both α -helices and β -sheets stabilized by cysteine bonds, e.g., scorpion toxins, scorpion, and insect defensins. Electrophysiological and molecular biology techniques indicate that these structures modify cell membranes via 1) interaction with intrinsic ion transport proteins and/or 2) formation of ion channels. These two nonexclusive mechanisms of action lead to changes in second messenger systems that further augment the abnormal electrical activity and distortion of the signal transduction causing cell death. Alignment of the sequence of the scorpion defensin with the sequences of insect defensins (20). The defensins were characterized from species belonging to three insect orders: Diptera (a), Coleoptera (b), and Odonata (c). The scorpion defensin is closely related to the *Aeschna* defensin (c). Dashes indicate gaps to optimize the alignment. Identical amino acids are boxed. Boxes in bold represent the identical residues between *Aeschna* and scorpion residues." (Authors)] Address: Kourie, J.I., Membrane Transport Group, Department of Chemistry, The Faculties, The Australian National University, Canberra City, Australian Capital Territory, 0200 Australia

9615. Nachtigall, W.; Kesel, A.B. (2000): Biologisch komponentierte Materialien und Systeme Schwerpunkt Biomimetische Materialien. *magazin forschung* 1/2000, Saarbrücken: 49-56. (in German) [The membrane of the wing of *Orthetrum cancellatum* is used to demonstrate the mechanical characterisation of biological materials, serving as a basis for the biomimetical development of new (industrial) materials.] Address: Kesel, Antonia, Department of Zoology, Technical Biology and Bionics, University of Saarland, 66041 Saarbrücken, Germany. E-mail: a.kesel@rz.uni-sb.de

9616. Palot, M.J.; Soniya, V.P. (2000): Odonata of Keoladeo National Park, Bharathpur, Rajasthan, India. *Zoos' Print Journal* 15(8): 317-320. (in English) [Sixteen odonate species are briefly documented from the Keoladeo National Park which is situated in the Indo-Gangetic flood plains in the Bharathpur District of Rajasthan, India.] Address: Soniya, Y.P., Zool. Survey of India, Freshwater Biological Station, 1-1-300/B Ashok Nagar, Hyderabad, Andhra Pradesh 500020, India

9617. Sankey, J. (2000): Key to adult damselflies of the Ottawa District. *Trail & Landscape* 34(1): 17-27. (in English) ["This article includes diagrams of damselfly body and wing anatomy and many detailed drawings of the features that allow one to distinguish among local species. Adapted from larger keys, especially The Odonata of Canada, and with illustrations prepared for Manuel d'identification des libellules du Québec." (Author)] Address: not stated

2001

9618. Bechly, G. (ed.) (2001): Die faszinierende Evolution der Insekten. *Stuttgarter Beiträge zur Naturkunde - Serie C (Wissen für alle)* 49: 94 pp. (in German) [The Book includes several well written brief introductions to different aspects of insect evolution and contains many references to Odonata.] Address: Bechly, G., Staatliches Museum für Naturkunde, Abt. Paläontologie, Rosen-

stein 1, D-70191 Stuttgart, Germany. E-mail bechly@gmx.de

9619. Berezina, N.A. (2001): Influence of ambient pH on freshwater invertebrates under experimental conditions. *Russian Journal of Ecology* 32(5): 343-351. (in English) ["In experimental mesocosms differing in water pH, the communities of macroinvertebrates demonstrated marked differences in their species composition and the quantitative ratios between the main groups of members (oligochaetes, chironomids, mollusks, etc.). The highest species diversity was recorded at pH 4.09–8.65. It proved to decrease at pH below 4 and above 9. In experiments on determining tolerance to water pH, seven groups of invertebrates differing in their adaptive potential were distinguished among 40 species found en masse in the freshwater zoobenthos and zooperiphyton of the Upper Volga basin." (Author) *Epithea bimaculata* and *Libellula depressa* were used in laboratory experiments. In these species, pH-tolerance ranges from 4.5–9.0. Translated from *Ekologiya*, No. 5, 2001, pp. 372–381.] Address: Berezina, N.A., Papanin Institute of the Biology of Inland Waters, Russian Academy of Sciences, Borok, Nekouzskii raion, Yaroslavl oblast, 152742 Russia

9620. Keiler, J.-A.; Kovac, D. (2001): Travertininsekten. *Natur und Museum, Frankfurt* 131(6): 195-197. (in German) ["Includes a brief description of a Thuringian travertine rock, with an odonate larva incrustation (age 130.000-110.000 B.C.)."] Address: Keiler, J.-A., c/o Senckenberg. Naturf. Gesellschaft, Senckenberganlage 25, D-60325 Frankfurt/Main, Germany

9621. Kordges, T. (2001): Kalksteinbrüche in Wuppertal-Dornap: Eingriffsflächen mit Refugialfunktionen für gefährdete Tier- und Pflanzenarten. *Umweltschutz in Wuppertal*: 33-52. (in German) [The paper includes some general information on the dragonfly fauna of quarries and their habitat requirements.] Address: Kordges, T., Oekoplan, Husmannshoferstr. 10, 45143 Essen, Germany. E-mail: thomas.kordges@oekopla-essen.de

2002

9622. Kadoorie Farm and Botanic Garden (2002): Report of Rapid Biodiversity Assessment at Heweishan Forest Farm, Southwest Guangdong, 4 to 5 May 1998. *South China Forest Biodiversity Survey Report Series (Online Simplified Version)* 6. KFBG, Hong Kong SAR: II + 15 pp. (in English) ["Sixteen species of dragonfly were encountered over the two-day period. The most frequently encountered was the ubiquitous *Pantala flavescens*. Unfortunately, apart from a species of Gomphinae awaiting identification, the most interesting dragonflies observed were two species of *Macromia* which could not be collected or identified in the field. The remaining thirteen species are all also known from Hong Kong, where (with the exception of the rare *Paragomphus capricornis*) they are all abundant to fairly common (K.D.P. Wilson, 1997). *P. capricornis* has not previously been recorded from Chinese territory outside of Hong Kong (K.D.P. Wilson, 1997), and is therefore a new provincial record." (K. D.P. Wilson)] Address: Kadoorie Farm and Botanic Garden Corporation, Lam Kam Road, Tai Po, N.T., Hong Kong SAR

9623. Kunkel, A.; Werner, W. (2002): Vergessen Sie Archaeopteryx! *aviso* 1/2002: 16-22. (in German) [The

papers reports on fraudulent falsification of fossils including an example of a dragonfly mounted on plates from the Lower Cretaceous of the Brazilian Santana-formation.] Address: not stated

9624. Malkmus, R. (2002): Die Libellen des Spessarts. Nachrichten des Naturwissenschaftlichen Museums der Stadt Aschaffenburg 106: 3-55. (in German, with English summary) ["Between 1990 and 1996 the dragonflies of the mountain range Spessart in Central Germany - an area of 3922 qkm, within the borderlines of the river Main, Sinn and Kinzig - were mapped. 47 species could be pointed out, 38 of them in established reproductive populations. Significant is the appearance of *Gomphus vulgatissimus*, *Cordulegaster bidentata*, *Somatochlora arctica*, and *Crocothemis erythraea*; rare guests - some of them presumably reproducing - are the species *Aeshna affinis*, *Anaciaeschna isocetes*, *Brachytron pratense*, *Libellula fulva*, *Orthetrum brunneum*, *Sympetrum pedemontanum*, and *Leucorrhinia pectoralis*." (Author)] Address: Malkmus, R., Schulstr. 4, 98759 Wiesthal, Germany

9625. Rizali, A.; Buczori, D.; Triwidodo, H. (2002): Insect diversity at the forest margin-rice field interface: Indicator for a healthy ecosystem. Hayati 9(2): 41-48. (in English) ["This research was conducted in Gunung Halimun National Park, West Java. The influence of forest habitat toward insect diversity in rice field was shown. Samplings of insect species were done using pitfall trap, farmcop, malaise trap, and light trap. Altogether, there were 14 352 individual insects collected, which consist of 16 orders, 110 families, and 435 species. Based on analysis of their functional role, the insect complexes consist of 37.2% herbivores, 21.4% predators, 12.2% parasitoids, 6.2% detritivores, and 23.0% transient species. Our data further suggested that Chironomidae are dominating species on the rice field. Some of the transient species could potentially be used as indicator for healthy ecosystem. These are the Ephemeroptera, Trichoptera, Carabidae and Formicidae in rice field. Ephemeroptera and Trichoptera are bioindicators for water habitat whereas Carabidae and Formicidae for soil habitat." (Authors) Odonata are only represented by "Coenagrionidae".] Address: Rizali, A., Yayasan Peduli Konservasi Alam, Jalan Sirnasari II No. 12A, Sindangbarang, Bogor 16117, Indonesia. E-mail: kpkai@indo.net.id

2003

9626. Kadoorie Farm and Botanic Garden (2003): Report of a Rapid Biodiversity Assessment at Guan-yinshan Nature Reserve, Central Guangdong, China, August 2000. South China Forest Biodiversity Survey Report Series (Online Simplified Version) 30. KFBG, Hong Kong SAR: II + 19 pp. (in English) [29 species were recorded during the three-day survey. One of these (*Vestalis* sp.) remains unidentified. The presence of four calopterygids and two Macromia species indicates that streams in the study area were of high water quality. (G.T. Reels, K.D.P. Wilson)] Address: Kadoorie Farm and Botanic Garden Corporation, Lam Kam Road, Tai Po, N.T., Hong Kong SAR

9627. Mühle, R.-U. (2003): Tierleben: ein zoologischer Überblick zur Unteren Havelniederung. Brandenburgische Umwelt Berichte 13: 82-97. (in German) [Brandenburg, Germany. 17 Odonata species are briefly cha-

acterised with reference to ecology and habitats.] Address: Mühle, R.-U., Ökologische Station Gülpe, Universität Potsdam, 15715 Gülpe, Germany. E-mail: muehle@rz.uni-potsdam.de

9628. Strnadova, M.; Borstelmann, G. (2003): "Fliegende Edelsteine". Die Libellenwelt der Schlatts im Landkreis Diepholz. Stiftung Naturschutz Diepholz: 22 pp. (in German) [The paper focuses on the app. 40 Odonata species in the Landkreis Diepholz. Niedersachsen, Germany-region, and gives a brief introduction in biology, ecology and aesthetics of Odonata.] Address: <http://www.stiftung-naturschutz-diepholz.de/img/download/libelle.pdf>

2004

9629. Biologische Station Westliches Ruhrgebiet (2004): Grundlagenarbeiten (Kartierungen, Bestandsaufnahmen) und Konzeptentwicklung. Jahresberichte der Biologischen Station Westliches Ruhrgebiet 2003: 17-48. (in German) [Nordrhein-Westfalen, Germany; Legally protected sites were studied for their fauna and flora. Twenty eight Odonata species are included in the study. Regionally interesting species are briefly presented.] Address: Biologische Station Westliches Ruhrgebiet, Ripshorster Str. 306, 46117 Oberhausen, Germany. E-mail: info@bswr.de

9630. Fenoglio, S.; Bo, T.; Gallina, G.; Cucco, M. (2004): Vertical distribution in the water column of drifting stream macroinvertebrates. Journal of freshwater ecology 19(3): 485-492. (in English) ["We examined the macroinvertebrate composition and drift density in a Mediterranean lotic system, the Erro River (northwestern Italy). Drift density and composition were sampled for one year at three levels of the water column; temperature and flow velocity were also measured. We found that drift density was generally highest near the bottom. We also noticed that various taxa tended to drift at preferential levels of the water column, with 41.4 % of taxa mainly at the bottom level and 31.0% mainly at the top. Drift density decreased with increasing water temperature. Both taxa richness and macroinvertebrate abundance in the drift were positively associated with natural riverbed richness and abundance." (Authors) The list of taxa includes *Onychogomphus* sp.] Address: Fenoglio, S., University of Eastern Piedmont, Di.S.A.V., Via Cavour 84, 15100 Alessandria, Italy. E-mail: tenoglio@unipmn.it

9631. Windte, J.; Pfingsten, K.C. (2004): On 2D motion parameters for flapping wing propulsion. First European micro air vehicle conference and flight competition. Braunschweig, Germany, July 13 & 14, 2004: (in English) ["The paper discusses how to obtain favourable 2D motion parameters for a flapping wing propulsion system. To find parameter sets with a high propulsion efficiency, two different approaches are considered: A biomimic approach is undertaken, where the motion parameters of a dragonfly are derived from slow motion Im material of a dragonfly in search flight condition with a flight speed of $U_1 = 1m/s$ and a Reynoldsnumber based on chord length of $Re = 800$. These are used to perform a Navier-Stokes-simulation of two moving airfoils representing the flow conditions at a position of $2=3$ of the wingspan. Then, a generic approach is undertaken, in which simple motion forms are analysed systematically to achieve a basic understanding of the

generation of thrust. For this investigation the flight conditions of a dragonfly in fast forward flight at $U1 = 10m/s$ are studied. Both approaches result in a set of motion parameters which yield a good efficiency. They demonstrate two different ways to obtain essential knowledge for a potential propulsion system for micro air vehicles." (Authors)] Address: Windte, J., Institute of Fluid Mechanics, Technical University Braunschweig, Germany. E-mail: J.Windte@tu-bs.de

2005

9632. Albrecht, C.; Dworschak, U.; Esser, T.; Klein, H.; Weglau, J. (2005): Tiere und Pflanzen in der Rekultivierung. 40 Jahre Freilandforschung im Rheinischen Braunkohlerevier. Kapitel 4.1.10 Libellen (Odonata). Acta Biologica Benrodis Supplementband 10: 176-183. (in German) [A total of 42 odonate species was recorded in the brown coal mining region west of Köln, Nordrhein-Westfalen, Germany. Most of the data result from expertises from the late 1990th and early 2000th.] Address: Albrecht, C., Forschungsstelle Rekultivierung, Hackhausen 86, 41363 Jüchen. dr.albrecht@kbff.de

9633. Aletsee, M. (2005): Schutz und Renaturierung der "Palsen" als Grundlage für den Erhalt der Moorvegetation und gefährdeter Libellenarten im deutsch-belgischen Hohen Venn. Telma 35: 93-109. (in German, with English summary) ["The Hohe Venn contains a large number of so called palsen (mired relicts of palsa). Different types of oligotrophic and acidic mires have developed in the palsen. These mires often show a characteristic, radial ecological gradient. Simplified this gradient starts with a Sphagnum fallax-fazies, continues with an ombrotrophic stage of vegetation and ends in a central fen. Not influenced by humans these palsen are unique relict of a natural landscape with a large number of endangered species. They are very important especially as reproduction habitat for Odonata. On account of intensive drainage up to the middle of the 20th century a lot of palsen were influenced and some were destroyed. This paper points out the potential of renaturation of drained palsen by investigating the vegetation and by classifying the Odonata habitats by means of TWINSPAN-algorithm. In conclusion you can still find a reduced flora in restored palsen, but also an expansion of the typical, remained vegetation (Sphagnum fallax, Eriophorum angustifolium, Vaccinium oxycoccus). The marginal zone shows in both, flora and Odonata fauna, in one part more euryoecious species (Juncus effusus, Glyceria fluitans, Aeshna cyanea) and in the other part typical species of acid-dystrophic water (Carex echinata, C. canescens, Sphagnum fallax, Aeshna juncea, Leucorrhinia dubia, Coenagrion hastulatum, Sympetrum danae). On the other hand you can find highly specialized Odonata species like Aeshna subarctica and Somatochlora arctica as well as elements of the vegetation like Andromeda polifolia and Rhychospora alba only in not by human influenced palsen." (Author)] Address: Aletsee, M., Obersteinstr. 38, 52223 Stolberg, Germany. E-mail: aletsee@rwth-aachen.de

9634. Biologische Station Westliches Ruhrgebiet (2005): Grundlagenarbeiten (Kartierungen, Bestandsaufnahmen) und Konzeptentwicklung. Jahresberichte der Biologischen Station Westliches Ruhrgebiet 2004: 17-82. (in German) [Nordrhein-Westfalen, Germany; Legally protected sites were studied for their fauna and flora. Thirty three Odonata species are included in the

study. Regionally interesting species are briefly presented.] Address: Biologische Station Westliches Ruhrgebiet, Ripshorster Str. 306, 46117 Oberhausen, Germany. E-mail: info@bswr.de

9635. Darwall, W.; Smith, K.; Lowe, T.; Vié, J.-C. (2005): The status and distribution of freshwater biodiversity in eastern Africa. IUCN SSC Freshwater Biodiversity Assessment Programme. IUCN, Gland, Switzerland and Cambridge, UK. Occasional Paper of the IUCN Species Survival Commission No. 31: viii + 36 pp. (in English) ["Biodiversity within inland water ecosystems in Eastern Africa is both highly diverse and of great regional importance to livelihoods and economies. However, development activities are not always compatible with the conservation of this diversity and it is poorly represented in the development planning process. One of the main reasons for inadequate representation of biodiversity is cited as a lack of readily available information on the status and distribution of inland water taxa. In a response to this need for information, the IUCN/SSC Freshwater Biodiversity Assessment Programme conducted a regional assessment of over 1,600 taxa of freshwater fishes, molluscs, odonates and crabs from Burundi, Kenya, Malawi, Rwanda, Tanzania and Uganda. In the process of the study, which is based on the collation and analysis of existing information, regional experts from five of these countries were trained in biodiversity assessment methods and, where appropriate, in field assessment and taxonomy. Distribution ranges have been mapped for the majority of species so providing an important tool for application to the conservation and development planning process. The full dataset is to be made freely available through the internet and through distribution on CD-ROM. Levels of regional endemism are notably high with 82% of fish and 74% of molluscs restricted to the region. Species diversity is also high and the major centres of diversity are the African Great Lakes of Malawi/Nyassa/Niassa, Tanganyika and Victoria, and in the Eastern Arc Mountain Range (for Odonata). Major threats are identified as loss and degradation of habitat, in particular from sedimentation due to deforestation and eutrophication, and the introduction of alien species. The centres of threatened species are the African Great Lakes and a number of East Coast river drainages. A major concern for the future is the potential impact of water resource developments such as for improved water supply, irrigation and provision of hydroelectric power. A gaps analysis found that inland waters are poorly protected within the existing Protected Areas network which is largely focused on terrestrial ecosystems. Forest Reserves were, however, observed to provide effective protection of watersheds at the headwaters of some river systems; it is recommended that their legal status be raised to provide a greater incentive for their effective management and for increasing the potential for attracting funds. Finally, it is most important that the data from this study are made available to the relevant decision makers and stakeholders in a format that can be easily understood and readily integrated within the decision making process. With this in mind a second major project has been initiated to extend the work to the rest of Africa and to develop a series of "Best Practice Guidelines" for the integration of biodiversity information within the development process." (Authors)] Address: IUCN Publications Services Unit, 219c Huntingdon Road, Cambridge CB3 0DL, UK. E-mail: books@iucn.org

9636. Durdin, C. (2005): Recent wildlife highlights on Fenland nature reserves. Fenland Newsletter 3: 3. (in English) ["Small red-eyed damselfly *Erythromma viridulum* was recorded for the first time at the Ouse Washes in 2004. Seven males and a breeding pair were using the important ditch habitats on the reserve. This species is a recent colonist in Britain (first records 1999) and its spread from the continent is being linked to climate change." (Author)] Address: E-mail: chris.durdin@rspb.org.uk

9637. Gillett, M.; Gillet, C. (2005): Insects & other arthropodes. In: Peter Hellyer and Simon Aspinnall (Eds): The Emirates. A natural history. Trident Press Limited. The Environment Agency, Abu Dhabi, Dolphin Energy Limited. ISBN: 1-900724-74-X: 169-196. (in English) [Verbatim: "Although the early stages of dragonflies are totally dependent on fresh water, adult specimens can be found in a variety of habitats, including offshore islands and inland sand dunes. Indeed, for a desert country, the UAE has a remarkable and beautiful dragonfly fauna, reviewed most recently by Giles (1998), with some additions by Feulner (1999). Five species of damselflies (suborder Zygoptera) and 17 of dragonflies (suborder Anisoptera) are known from the Emirates with a further small number of species recognised from neighbouring areas of Oman and, therefore, also likely to be found in the UAE. After the Lepidoptera, the Odonata, including both damselflies and dragonflies proper, is probably the next most colourful insect group in the Emirates. Damselflies migrate at night, but during daytime they are usually not found far from water, as in the wadis of the Hajar Mountains. Particularly colourful damselflies include the endemic powder-blue damselfly *Arabicnemis caerulea* and the bright orange-red *Ceragrion glabrum*. Blues and red also predominate in the colours of the dragonflies. A striking example is the large and iridescent blue male of the emperor dragonfly *Anax imperator*, common wherever there is water for it to patrol. Equally large, the female is more dully coloured. The males of several species have red-dish-marked wings and bodies, such as the purple-blushed, gully and orange darter dragonflies (*Trithemis annulata*, *T. arteriosa* and *T. kirbyi*, respectively). The young stages of all species of Odonata are spent in fresh water. Eggs may be simply dispersed at random over water or the female may insert single eggs into slits cut into the stems of aquatic plants. After hatching, the nymphs may spend several years growing and developing in the water, before climbing out and giving rise to the mature winged insect in a final spectacular moult. Both young and adults are carnivorous. The adults of dragonflies are very fast and manoeuvrable predators that attack even large insects on the wing. After the adults hatch out, they often migrate vast distances to find feeding areas and new bodies of water for reproduction to begin anew."] Address: Gillett, M., Dept Biochemistry, FMHS, UAE University, P.O. Box 17666, AL Ain, U.A.E. E-mail: M.gillet@uaeu.ac.ae

9638. Gröning, E.; Brauckmann, C. (2005): Neue Rekonstruktions-Zeichnungen von ausgewählten paläozoischen Gliederfüßern (Fluginsekten, Spinnentiere und Arthropodea). Virgo - Mitteilungsblatt des entomologischen Vereins Mecklenburg-Vorpommern 8: 21-25. (in German) [Five species are presented including *Namurotypus sippeli* Brauckmann & Zessin, 1989.] Address: Gröning, Elke, Institut für Geologie und Paläontologie, Technische Universität Clausthal, Leibnizstr. 10,

D-38678 Clausthal-Zellerfeld, Germany. E-mail: groening@geologie.tu-clausthal.de

9639. Lange, L. (2005): Ausgewählte Libellenfunde im Kreis Parchim aus den Jahren 2001-2003. Virgo - Mitteilungsblatt des entomologischen Vereins Mecklenburg-Vorpommern 8: 2-3. (in German) [30 Odonata species from various localities in the district Parchim (Mecklenburg-Vorpommern, Germany) are briefly documented.] Address: Lange, L., Deichreihe 21, 25599 Wewelsfleth, Germany

9640. Liess, M.; von der Ohe, P.C. (2005): Analyzing effects of pesticides on invertebrate communities in streams. Environmental Toxicology & Chemistry 24(4): 954-965. (in English) ["The aim of this investigation was to find patterns in aquatic invertebrate community composition that are related to the effects of pesticides. Investigations were carried out in 20 central European streams. To reduce the site-specific variation of community descriptors due to environmental factors other than pesticides, species were classified and grouped according to their vulnerability to pesticides. They were classified as species at risk (SPEAR) and species not at risk (SPEnotAR). Ecological traits used to define these groups were sensitivity to toxicants, generation time, migration ability, and presence of aquatic stages during time of maximum pesticide application. Results showed that measured pesticide concentrations of 1 : 10 of the acute 48-h median lethal concentration (LC50) of *Daphnia magna* led to a short- and long-term reduction of abundance and number of SPEAR and a corresponding increase in SPEnotAR. Concentrations of 1 : 100 of the acute 48-h LC50 of *D. magna* correlated with a long-term change of community composition. However, number and abundance of SPEAR in disturbed stream sections are increased greatly when undisturbed stream sections are present in upstream reaches. This positive influence compensated for the negative effect of high concentrations of pesticides through recolonization. The results emphasize the importance of considering ecological traits and recolonization processes on the landscape level for ecotoxicological risk assessment." (Authors) Nine Odonata families and *Platycnemis pennipes*, *Aeshna cyanea* and *Cordulegaster boltonii* are classified as invertebrate at risk of being affected by pesticides.] Address: Liess, M., UFZ—Centre for Environmental Research, Permoserstr. 15, D-04318 Leipzig, Germany. E-mail: matthias.liess@ufz.de

9641. Minniti, M. (2005): Biotopi di Odonata Anisoptera nel Lazio e nella Toscana. Atti Mus. Stor. nat. Maremma 21: 3-13. (in Italian, with English summary) [Records of Anisoptera from seven localities in Lazio (n = 10) and four in Toscana (n = 13 taxa) are outlined. Most interesting is a record of *Lindenia tetraphylla* from Lago dell'Accesa, Toscana.] Address: Minniti, M., Via del Giordano 19, 00144 Roma, Italy

9642. Packauskas, R.J. (2005): Hudsonian Emerald Dragonfly (*Somatochlora hudsonica*): A technical conservation assessment. Prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project: 38 pp. (in English) ["*S. hudsonica* appears to be an uncommon species, both from the standpoint of its encounters with human beings as well as the number of specimens found in collections. Very little historical information or primary literature exists for this dragonfly, and it has never been studied in depth. Although the species is reported to be widely distributed across

Canada (Dunkle 2000), the only records of its occurrence in the continental United States place it at seven locales in Colorado, possibly three in Wyoming, and one in Montana. Most records are over 30 years old, and little or no documented collecting has been done at these sites since the originals. The paucity of records for this species, which may be due to a lack of collecting in areas where the species may occur, makes it suspect as a species of special concern. At this time, however, there is limited scientific evidence that either alleviates or warrants concern for its viability. The Hudsonian emerald dragonfly is considered a sensitive species in the Rocky Mountain Region of the USDA Forest Service. Primary Threats: As with other dragonflies, the main threat to the viability of this species would be the degradation of its aquatic habitat. Trees are an important component of areas surrounding the aquatic habitats of the Hudsonian emerald dragonfly since they provide areas for prey foraging by adults as well as shade that maintains lower water temperatures. Trees may also serve as mating areas. The loss of trees can occur through timber harvest, fuel reduction, or wildfires. Grazing by livestock may decrease perching or emergence vegetation for this species as well as degrade the aquatic habitat by increasing sedimentation. Sedimentation may also occur as a result of road construction or clear cutting. Tree harvest, grazing, and road construction can also help to produce nutrient runoff, increasing nutrient loads to the aquatic habitat, thus producing eutrophication. Use of pesticides, like piscicides and herbicides, can also serve to decrease population densities of the Hudsonian emerald dragonfly as well as populations of prey species when these chemicals enter the aquatic environment. Primary Conservation Elements, Management Implications and Considerations: Since this species is known from only a few limited areas, those areas and nearby aquatic habitats should be protected from management practices that would adversely affect them until more information on this species is forthcoming. Since the largest proportion (possibly 80 percent or more) of this species' life cycle is spent as larvae in the water, these aquatic stages are the most important to preserve in order to produce reproducing populations. Land management practices done in or around the areas currently inhabited by this species must be done thoughtfully to have as little impact on the aquatic habitats as possible. Adaptive land management methodologies, such as adjusting livestock grazing regimes in riparian or wetland areas, creating alternative livestock watering sources, and leaving timber harvest and fuel reduction buffers around known aquatic habitats for this species may be warranted. The main conservation focus should be to keep the known aquatic habitats (given in this paper) in mind when proposing management of any kind in these areas." (Author) The full paper is available at: <http://www.fs.fed.us/r2/projects/scp/assessments/hudsonianemeralddragonfly.pdf> Address: Packauskas, R.J., Dept. Biol. Sc., Fort Hays State Univ., 600 Park Str., Hays, Kansas 67601, USA

9643. Schachtner, J.; Schmidt, M.; Homberg, U. (2005): Organization and evolutionary trends of primary olfactory brain centers in Tetraconata (Crustacea + Hexapoda). *Arthropod Structure & Development* 34: 257-299. (in English) ["The olfactory lobes of crustaceans and the antennal lobes of insects are the primary olfactory brain centers in Tetraconata. Recent publications considered the apparent lack of olfactory centers in se-

veral crustacean and insect taxa and structural differences in the organization of olfactory and antennal lobes as evidence for an independent origin of both brain areas. In depth comparison of species within and across tetraconate taxa, however, rather demonstrates that many characters of the organization of tetraconate olfactory centers are shared even among distantly related clades, but have been modified in various taxon-specific ways. From the available data and from comparison with the situation in chilopods, a closely related mandibulate outgroup, we conclude that an olfactory lobe organized into spheroidal glomeruli is a plesiomorphic character of the tetraconate brain. Shared features between decapod crustaceans and neopteran insects are cholinergic uniglomerular afferent neurons, a single large serotonin-immunoreactive neuron, multiglomerular GABAergic local interneurons, and projection neurons of similar morphology. Taxonspecific apomorphies include loss of olfactory sensilla and olfactory lobes in palaeopteran insects, certain branchiopod, maxillopod, and isopod crustaceans, profound changes in glomerular architecture in decapod crustaceans, and decomposition of glomerular boundaries in orthopteroid insects. In holometabolous insects, olfactory afferent projections from mouthpart sensilla are integrated into the antennal lobe and an increased tendency of contralateral connections is observed in lepidopterans and dipterans. Sexual dimorphism of antennal lobes, prominent in several neopteran insects, has most likely occurred convergently, and is not observed in malacostracan crustaceans." (Authors) In Fig. 5, the agglomerular area in the brain receiving sensory input from the antennae of *Hemicordulia tau* is shown; this area is innervated by AST-A-ir fibers originating partly from cell bodies in a medial cell group.] Address: Homberg, U., FB Biologie, Tierphysiologie, Universität Marburg, D-35032 Marburg, Germany. E-mail: homberg@staff.uni-marburg.de

9644. Schiess, H. (2005): Schmetterlinge und Libellen in der Schwantenuau. Franz Kälin AG. Einsiedeln. ISBN 3-9523062-0-7: 135 pp. (in German) [Einsiedeln, Kanton Schwyz, Switzerland; 20 Odonata species are illustrated and briefly introduced.] Address: Druckerei Franz Kälin AG, Kornhausstr. 22, CH-8840 Einsiedeln, Switzerland

9645. Terzani, F.; Marconi, A.; Carletti, B. (2005): Odonati raccolti dal 1971 al 1986 e depositati nel Museo Zoologico dell'Università di Firenze (Odonata). *Atti Mus. Stor. Nat. Maremma* 21: 39-48. (in Italian, with English summary) [A collection of 109 odonate specimens from Somaliland has been studied. It resulted in a list of 29 species. New additions for Somaliland are *Hemistigma albipuncta*, *Orthetrum guineense*, and *Trithemis pluvialis*. An updated list of the dragonflies of Somaliland is provided.] Address: Terzani, F., Museo Zoologico "La Specola" dell'Università di Firenze, Via Romana, 17, I-50125 Firenze, Italy. E-mail: tterza@tin.it

9646. Zessin, W. (2005): Bilder aus der Geschichte des Schweriner Zoos (15). *Ursus, Schwerin* 11(1): 81-84. (in German) [The paper includes photographs of participants of the 16th International Symposium of Odonatology, held on 28-VII-2004 in Schwerin, Germany.] Address: Zessin, W., Lange Str. 9, D-19230 Jasnitz, Germany. E-mail: zessin@zoo-schwerin.de

9647. Aletsee, M. (2006): Libellen - rasante Flieger über den Gewässern. In: Heiko Schumacher, Frauke Severit (Red.): Tiere und Pflanzen im Nationalpark Eifel. Ein Begleiter durch Wald, Wasser und Wildnis. Verlagsgruppe Bachem. ISBN: 3761620055: 319 pp. (in German) [General view on the Odonata fauna (n=20 species) of the Nationalpark Eifel, situated in Nordrhein-Westfalen, Germany.] Address: Aletsee, M., Obersteinstr. 38, 52223 Stolberg, Germany. E-mail: aletsee@rwth-aachen.de

9648. Benstead, P. (2006): Casual observations of Odonata recorded in Cambodia in 2005 and 2006. *Malangpo* 21: 218-220. (in English) ["The Odonate fauna of Cambodia is poorly known, the list for the country presented in Tsuda (2000) is incomplete and many widespread Indochinese species are missing. This short note hopes to fill some of these gaps. The author recently made two three-day visits to Cambodia and spent some time identifying Odonata. The trips took place in March 2005 and March 2006 and cumulatively 27 species of Odonata were recorded. Visual observations were in most cases backed up by photographic records. No specimens were taken." (Author)] Address: Benstead, P., The Old Stables, Church Street, Reepham, Norwich. NR10 4JW, UK. E-mail: phil.benst01@tesco.net

9649. Biologische Station Westliches Ruhrgebiet (2006): Grundlagenarbeiten (Kartierungen, Bestandsaufnahmen) und Konzeptentwicklung. Jahresberichte der Biologischen Station Westliches Ruhrgebiet 2005: 19-85. (in German) [Nordrhein-Westfalen, Germany; Legally protected sites were studied for their fauna and flora. Twenty four Odonata species are included in the study. Regionally interesting species are briefly presented.] Address: Biologische Station Westliches Ruhrgebiet, Ripshorster Str. 306, 46117 Oberhausen, Germany. E-mail: info@bswr.de

9650. Buchwald, R.; Manzi, A.; Hunger, H. (2006): Habitatwahl von *Lestes dryas* und *Sympetrum flaveolum* in mittelitalienischen Karst-Hochebenen. In: Buchwald, R. (Hrsg.) (2006): Habitatwahl, Fortpflanzungsverhalten und Schutz mitteleuropäischer Libellen (Odonata). Ergebnisse der 23. Jahrestagung der Gesellschaft deutschsprachiger Odonatologen (GdO), 19.-21.3. 2004, Oldenburg. ISBN: 3-89995-278-2. 128 pp: 15-26. (in English, with German and Italian summaries) ["In numerous, both permanent and ephemeral (summer-dry) standing waters of karst plateaus of Central Italy, we studied the effect of various factors regarding their structure, hydrology, and vegetation on abundance, frequency, and reproduction of the odonate species *L. dryas* and *S. flaveolum*. Both species occur in a wide variety of waters and habitat types - however, with significant differences in frequency and abundance. The imagoes prefer waters with shallow shores which are covered by (brownish- or yellowish-) green vegetation dominated by the growth forms "rushes" (or similar) and "sedges". The vegetation height exceeds (30-) 35 cm (*L. dryas*) respectively 20 cm (*S. flaveolum*) along the edges and (30-) 35 cm (*L. dryas*) respectively (25-) 30 cm (*S. flaveolum*) in the central depressions. Compared to vegetation aspect and -colour and vegetation height in the central depressions, other parameters (e.g., area size, water level at the time of oviposition, density and cover of the vegetation, soil colour) play a subdominant

or no role at all for the colonisation by the studied species. These results are congruent with those from other regions of Europe to the greatest possible extent. From our findings, we derive a habitat selection hypothesis for the two species. This hypothesis should be tested by carrying out experiments designed to study the importance of each parameter individually." (Authors)] Address: Buchwald, R., Universität Oldenburg, Institut für Biologie und Umweltwissenschaften (IBU), 26111 Oldenburg, Germany. E-mail: rainer.buchwald@uni-oldenburg.de

9651. Ewers, M.; Buchwald, R. (2006): *Orthetrum coerulescens* zwischen Weser und Ems - Bestandssituation, Ökologie und Schutzmöglichkeiten. In: Buchwald, R. (Hrsg.) (2006): Habitatwahl, Fortpflanzungsverhalten und Schutz mitteleuropäischer Libellen (Odonata). Ergebnisse der 23. Jahrestagung der Gesellschaft deutschsprachiger Odonatologen (GdO), 19.-21.3. 2004, Oldenburg. ISBN: 3-89995-278-2. 128 pp: 84-91. (in German, with English summary) ["Actually only two populations of *O. coerulescens* are known in the Region Weser-Ems (western Lower Saxony, Germany). In the Börstel Forest (Lkr. Osnabrück) the species reproduces in a ditch, a spring brook and some ponds in a heath bog with *Erica tetralix*] the breeding habitats are characterized by flowing, summer-warm, acid water with low content of bases. In the Meerkanal (Lkr. Oldenburg), an outflow of a natural lake, a big population was detected in 1997 and intensively studied in 1999 and 2002. In a section of 900 meters up to 118 territorial males were counted showing a maximum abundance between 13.00 and 14.30 o'clock. The maximum density of males was observed in sections with little or no shade, medium velocity of flow, rich floating vegetation (e.g. *Potamogeton alpinus*), and adjacent extensive meadows/pastures or heaths. Despite the different structure of their water bodies and their vegetation, the two habitats have some characteristics in common, above all high water temperatures in winter and summer, open and flowing water courses, a small or medium cover of helophytes and hydrophytes and an extensive use of the surrounding landscape. In order to improve the situation of *O. coerulescens* in the study region it is proposed to keep open the breeding waters and to (re)create appropriate flowing waters near the two actual populations." (Authors)] Address: Buchwald, R., Universität Oldenburg, Institut für Biologie und Umweltwissenschaften (IBU), 26111 Oldenburg, Germany. E-mail: rainer.buchwald@uni-oldenburg.de

9652. Gärtner, E.; Karsch, U.; Prys Witt, K.-P.; Scherzer, H. (2006): Libellenfauna im NSG Helstorfer Moor (Hannoversche Moorgeest) - Lebensraum der Zwerglibelle (*Nehalennia speciosa*). In: Buchwald, R. (Hrsg.) (2006): Habitatwahl, Fortpflanzungsverhalten und Schutz mitteleuropäischer Libellen (Odonata). Ergebnisse der 23. Jahrestagung der Gesellschaft deutschsprachiger Odonatologen (GdO), 19.-21.3. 2004, Oldenburg. ISBN: 3-89995-278-2. 128 pp: 106-113. (in German, with English summary) ["The Helstorfer Moor, a small bog north of Hannover (Lower Saxony, Germany), has been exploited by peat cutting over some centuries. In a two-year-inventarisation 35 dragonfly species (Odonata) were found, among these many rare typical species of peat bogs (sensu Eb. SCHMIDT). After one single male had been discovered by Prys Witt, in 2003 a large population of the Graceful Dragonfly (*Nehalennia speciosa*) was found in the Helstorfer Moor,

situated in a distance of about 20 km from another population near Hannover. The imagoes of this species predominantly occur in the northern part of the bog, where the peat waters are hydrologically influenced by flowing water and/or adjacent springs. In the small larval ponds the Small Water-Hose (*Utricularia minor*) is the characteristic plant species. The peat water is strongly or weakly acid, the conductivity is below 100 μ S. The imagoes of *Nehalennia* were found in sections dominated by the Whistle Grass (*Molinia caerulea*), in part mixed with sparse stands of trees (*Pinus silvestris*, *Betula pubescens*). The habitat is part of a Nature Reserve of 410 hectares, well protected against external detrimental influences." (Authors)] Address: Gärtner, E., Drosselgasse 14, 31139 Hildesheim, Germany

9653. Geißler-Strobel, S.; Trautner, J.; Jooß, R.; Hermann, G.; Kaule, G. (2006): Informationssystem Zielartenkonzept Baden-Württemberg. Ein Planungswerkzeug zur Berücksichtigung tierökologischer Belange kommunalen Praxis. *Naturschutz und Landschaftsplanung* 38(12): 361-369. (in German, with English summary) ["Information System Target Species Concept in Baden-Württemberg- Tool to consider faunistic concerns in local planning practice This System is a web-based planning tool for designing zoological conservation and development concepts for target species. Intended to start in December 2006, it will be available within the web-space of the governmental 'Authority of Environment. Measurements and Nature Conservation' (www.lubw.baden-wuerttemberg.de). Target groups for the tool are local and regional authorities and their departments for planning, environmental protection and forestry as well as zoologists commissioned to produce expert reports. The planning tool has been developed to improve consideration of the essential aims of the Target Species Concept in municipal landscape planning. The tool assesses expert knowledge on the distribution and ecology of about 330 selected animal target species, applying the approach of assigning special conservation responsibilities for target species to local communities. The planning methodology derived from this knowledge supports the first steps of a planning process towards species and habitat oriented measures but it does not replace zoological investigations. In combination with the planning tool a two step approach to design community-based conservation concepts for target species has been developed and already tested to some extent. The first step allows to evaluate planning priorities and the relevance of many types of measures for the local area without extensive field work. This preliminary evaluation is based on the tool output, an overview inspection by qualified zoologists, and the analysis of existing faunistic data. The results of the first step can be used as a rough framework for action, particularly for the development of local landscape plans and of qualified "eco-accounts". The second step aims to specify the preliminary results more precisely e.g. concerning selected parts of a local community. This step generally requires additional field data. Partial results can be integrated as separate modules." (Authors) The paper refers to *Coenagrion mercuriale* and *Orthetrum coerulescens*.] Address: Geißler-Strobl, Sabine, Jahnstr. 15, 72070 Tübingen, Germany. E-Mail geissler-strobel@t-online.de

9654. Hall, L.W.; Killen, W.D.; Anderson, R.D. (2006): Characterization of benthic communities and physical habitat in the Stanislaus, Tuolumne, and Merced Rivers,

California. *Environmental Monitoring and Assessment* 115: 223-264. (in English) ["The primary goal of this study was to characterize physical habitat and benthic communities (macroinvertebrates, including Odonata) in the Stanislaus, Tuolumne and Merced Rivers in California's San Joaquin Valley in 2003. These rivers have been listed as impaired water bodies (303 (d) list) by the State of California due to the presence of organophosphate (OP) insecticides chlorpyrifos and diazinon, Group A pesticides (i.e., organochlorine pesticides), mercury, or unknown toxicity. Based on 10 instream and riparian physical habitat metrics, total physical habitat scores in the Stanislaus River ranged from 124 to 188 (maximum possible total score is 200). The highest total habitat score was reported at the upstream site. Tuolumne River physical habitat scores ranged from 86 to 167. Various Tuolumne River physical habitat metrics, including total habitat score, increased from downstream to upstream in this river. Merced River physical habitat scores ranged from 121 to 170 with a significant increase in various physical habitat metrics, including total habitat score, reported from downstream to upstream. Channel flow (an instream metric) and bank stability (a riparian metric) were the most important physical habitat metrics influencing the various benthic metrics for all three rivers. Abundance measures of benthic macroinvertebrates (5,100 to 5,400 individuals) were similar among the three rivers in the San Joaquin watershed. Benthic communities in all three rivers were generally dominated by: (1) Baetidae species (mayflies) which are a component of EPT taxa generally considered sensitive to environmental degradation; (2) Chironomidae (midges) which can be either tolerant or sensitive to environmental stressors depending on the species; (3) Ephemerellidae (mayflies) which are considered sensitive to pollution stress; and (4) Naididae (aquatic worms) which are generally considered tolerant to environmental stressors. The presence of 117 taxa in the Stanislaus River, 114 taxa in the Tuolumne River and 96 taxa in the Merced River implies that the benthic communities in these streams are fairly diverse but without a clear definition of benthic community expectations it is unknown if these water bodies are actually impaired." (Authors)] Address: Hall, L.W., Agricultural Experiment Station, Wye Research and Education Center, University of Maryland, Queenstown, MD, USA

9655. Joger, U. (2006): In Memoriam Peter Lenk (26 March 1964 – 23 November 2005). *Salamandra* 42(4): 193-196. (in English) [Obituary for a regionally known German resp. Bavarian odonatologist.] Address: Joger, U., Staatliches Naturhistorisches Museum, Pockelsstr. 10, 38106 Braunschweig, Germany, E-Mail: ulrich.joger@snhm.niedersachsen.de.

9656. Khaleghizadeh, A.; Sehhatibet, M.E. (2006): Contribution of the knowledge of the diet of Iranian birds. *Ekologia* 15: 145-150. (in English, with Russian summary) [The diet of the Black Frankolin (*Francolinus francolinus*) also includes Odonata.] Address: Khaleghizadeh, A., Ornithology Laboratory, Agricultural Zoology Research Department, Iranian Research Institute for Plant Protection, PO Box 1454, Tehran 19395, Iran. E-mail: akhaleghi/adeh@yahoo.com

9657. LeRoy Poff, N.; Olden, J.D.; Vieira, N.K.M.; Finn, D.S.; Simmons, M.P.; Kondratieff, B.C. (2006): Functional trait niches of North American lotic insects: traits-based ecological applications in light of phylogenetic relationships. *J. N. Am. Benthol. Soc.* 25(4): 730-

755. (in English) ["The use of species traits to characterize the functional composition of benthic invertebrate communities has become well established in the ecological literature. This approach holds much potential for predicting changes of both species and species assemblages along environmental gradients in terms of traits that are sensitive to local environmental conditions. Further, in the burgeoning field of biomonitoring, a functional approach provides a predictive basis for understanding community-level responses along gradients of environmental alteration caused by humans. Despite much progress in recent years, the full potential of the functional traits-based approach is currently limited by several factors, both conceptual and methodological. Most notably, we lack adequate understanding of how individual traits are intercorrelated and how this lack of independence among traits reflects phylogenetic (evolutionary) constraint. A better understanding is needed if we are to make the transition from a largely univariate approach that considers single-trait responses along single environmental gradients to a multivariate one that more realistically accounts for the responses of many traits across multiple environmental gradients characteristic of most human-dominated landscapes. Our primary objective in this paper is to explore the issue of inter-trait correlations for lotic insects and to identify opportunities and challenges for advancing the theory and application of traits-based approaches in stream community ecology. We created a new database on species-trait composition of North American lotic insects. Using published accounts and expert opinion, we collected information on 20 species traits (in 59 trait states) that fell into 4 broad categories: life-history, morphological, mobility, and ecological. First, we demonstrate the importance of considering how the linkage of specific trait states within a taxon is critical to developing a more-robust traits-based community ecology. Second, we examine the statistical correlations among traits and trait states for the 311 taxa to identify trait syndromes and specify which traits provide unique (uncorrelated) information that can be used to guide trait selection in ecological studies. Third, we examine the evolutionary associations among traits by mapping trait states onto a phylogenetic tree derived from morphological and molecular analyses and classifications from the literature. We examine the evolutionary lability of individual traits by assessing the extent to which they are unconstrained by phylogenetic relationships across the taxa. By focusing on the lability of traits within lotic genera of Ephemeroptera, Plecoptera, and Trichoptera, taxa often used as water quality indicators, we show how a traits-based approach can allow a priori expectations of the differential response of these taxa to specific environmental gradients. We conclude with some ideas about how specific trait linkages, statistical correlations among traits, and evolutionary lability of traits can be used in combination with a mechanistic understanding of trait response along environmental gradients to select robust traits useful for a more predictive community ecology. We indicate how these new insights can direct the research in statistical modeling that is necessary to achieve the full potential of models that can predict how multiple traits will respond along multiple environmental gradients." (Authors) Odonata taxa are treated at the genus level.] Address: LeRoy Poff, N., Department of Biology and Graduate Degree Program in Ecology, Colorado State University, Fort Collins, Colorado 80523 USA. E-mail: poff@lamar.colostate.edu

9658. Luck, J. (2006): Dragonflies and damselflies – Sussex 2006. *Adastra* 2006: 19-20. (in English) [Records of the locals *Erythromma viridulum*, *Lestes dryas* and the immigrants *Anax parthenope*, *Aeshna affinis*, and *Sympetrum fonscolombii* are briefly reported. In regard to the Sussex Rare Species Inventory, *Platycnemis pennipes*, *Brachytron pratense*, and *Sympetrum sanguineum* were removed for the encouraging reason that they had become more common. The report includes a brief report on current research on the distribution of *Libellula fulva*, and the announcement of a lecture held by Dave Chelmick.] Address: Luck, J., 4 Mill View, Ringmer, East Sussex BN8 5EP, UK. Email: johnluck@gotadsl.co.uk

9659. Malkmus, R. (2006): Zur Verbreitung von Amphibien, Reptilien und Libellen in den Ostalpen (4. Nachtrag). *Nachrichten des naturwissenschaftlichen Museum der Stadt Aschaffenburg* 108: 55-67. (in German, with English summary) [Odonate records (including *Aeshna caerulea*, *Somatochlora alpestris*, *S. arctica*) from Überschalljoch, Karwendel, Hirzkarsee, Dachstein, and Schladminger Tauern, Austria are briefly documented.] Address: Malkmus, R., Schulstr. 4, 98759 Wiesthal, Germany

9660. Malkmus, R. (2006): Herbstbeobachtungen an Libellen in Ost-Portugal. *Nachrichten des naturwissenschaftlichen Museum der Stadt Aschaffenburg* 108: 25-31. (in German, with English summary) ["During a journey to the eastern parts of Portugal in November 2004 six species of Odonata were recorded. In the mid of this month 3 species (*Lestes viridis*, *Aeshna mixta*, *Sympetrum striolatum*) were observed at oviposition. Several new distribution data could be located for *Aeshna cyanea* and *Aeshna mixta*." (Author)] Address: Malkmus, R., Schulstr. 4, 98759 Wiesthal, Germany

9661. Martens, A. (2006): Paarungssysteme bei Libellen - aktueller Kenntnisstand und offene Fragen. In: Buchwald, R. (Hrsg.) (2006): *Habitatwahl, Fortpflanzungsverhalten und Schutz mitteleuropäischer Libellen (Odonata)*. Ergebnisse der 23. Jahrestagung der Gesellschaft deutschsprachiger Odonatologen (GdO), 19.-21.3. 2004, Oldenburg. ISBN: 3-89995-278-2. 128 pp: 30-32. (in German, with English summary) ["A brief review is given on new findings on sperm competition and related aspects in dragonflies since 1999." (Author)] Address: Martens, A., Pädagogische Hochschule Karlsruhe, Postfach 111062, D-76060 Karlsruhe, Germany. E-mail: andreas.martens@ph-karlsruhe.de

9662. Michalsky, J. (2006): Dragons & Damsels. *Paradise Magazine - in flight with Air Niugini* 203(6): 46-50. (in English) [The author reports on his fascination of Papua New Guinean dragonflies, gives some general information on biology and ecology of Odonata, and outlines some facts on rare or specialised species inhabiting the country.] Address: not stated

9663. Monteiro, B.R. (2006): Distribuicao dos lepidopteros o donatas da Reserve Natural da Serra da Malcata. *Depto Biol., Univ. Avciro*: 121 pp.. (in Portuguese) [Portugal; the paper includes distribution maps of 22 odonate species (including e.g. *Macromia splendens*, *Oxygastra curtisii*, *Pyrrhosoma nymphula*, *Coenagrion caerulescens*) in the Reserve.] Address: not stated

9664. Ngai, J.T.; Srivastava, D.S. (2006): Predators accelerate nutrient cycling in a bromeliad ecosystem. *Science* 314: 963. (in English) ["The availability of nutri-

ents in ecosystems is determined by resource supply and recycling rates and affects important ecosystem properties (1–3). The relative roles of abiotic supply and food web configuration in determining resource-processing rates remain contentious and poorly understood. Under anthropogenic pressure, ecosystems are predicted to lose predators disproportionately, affecting ecosystem processes (4). Current ecological theory predicts that predator loss will affect nutrient cycling by changing prey abundance (density-mediated effects, as in a trophic cascade) (5) or prey foraging efficiency (trait-mediated effects) (6). These changes can further affect nutrient cycling by altering the species composition or size structure of the prey community. In this study, we examined the effects of predators on nutrient cycling by using the detritus-based insect community in bromeliads. We demonstrate that predation can have counterintuitive effects on nutrient cycling. Leaves of tank-forming bromeliads (e.g., *Vriesea* and *Guzmania* genera) are tightly interlocking, forming wells that collect water and leaf litter and provide habitat for aquatic insect larvae. The detritus not only supports the insect community but also provides a source of nutrients for the bromeliad. A natural gradient also exists in predation where the major predator, a damselfly larva (*Mecistogaster modesta*), becomes more abundant as the plant grows. Although it has been hypothesized that aquatic insects increase nutrient flux to the bromeliad, this relationship has never been documented. First, we ran fertilization experiments to determine whether nitrogen (N) or phosphorus (P) limit the productivity of the plant and insect components of this ecosystem. (7). Both tissue nutrient ratios and fertilization experiments showed that N, rather than P, primarily limits productivity of bromeliads and can limit insect productivity [Supporting Online Material (SOM) text and tables S1 and S2], so we focused on the effects of trophic structure on N cycling. Leaf detritus enriched in ^{15}N was used to trace the movement of N through the food web in bromeliads containing either no insects, detritivores only, or detritivores and predators. The presence of detritivores alone did not affect the amount of N entering bromeliads from the enriched detritus (Fig. 1A). However, in the presence of both detritivores and predators, there was a significant enrichment in ^{15}N in bromeliad leaves compared with plants containing detritivores alone, indicating that the presence of predators increased the flow of N from litter to bromeliads. This is surprising given that previous studies, consistent with the predictions of density or trait-mediated effects, have shown that predators decrease litter decomposition by reducing detritivore abundance (8) or by decreasing the foraging rate (9) of detritivorous arthropods. We hypothesize that the detritivorous insects, which pupate relatively rapidly, constitute a loss of litter-derived N for bromeliads when they emerge. A survey indicated that detritivorous insects generally have higher N:P ratios than those found in typical litter (Fig. 1B), suggesting that, as leaf litter is consumed, the insects will preferentially retain N in their body tissues and release P. Predation by longer-lived damselfly larvae converts the mobile pool of N contained in detritivores into fecal pellets that can be decomposed by microbes or leached to release N in a form available to the bromeliad. Thus, insects facilitate nutrient uptake by the plant, but only if both predators and detritivores are present. These results emphasize the importance of the temporal and spatial scales of dispersal for nutrient flux. The emergence of adult insects means that, although detritivores increase re-

source flux over larval time scales by releasing nutrients from litter, these insects act as a nutrient sink for bromeliads over their entire life span. The faster emergence rate of detritivores compared with that of predators allows predation to reduce the loss of N from the bromeliad. Although we use insects in bromeliads to examine biotic effects on nutrient cycling, our results can give insights into other systems where mobility differs between trophic levels. Some trophic interactions, for instance, involve migratory and nonmigratory species or species that undergo ontogenetic niche shifts. This mechanism may also apply if the prey species has a very different range size than its predator. Given the increased extinction risk of higher trophic levels, understanding the mechanisms whereby predators drive important ecosystem processes is critical in predicting anthropogenic impacts on natural systems." (Authors)] Address: Ngai, Jacqueline, Department of Zoology, University of British Columbia, 6270 University Boulevard, Vancouver, British Columbia V6T 1Z4, Canada. E-mail: ngai@zoology.ubc.ca

9665. Röske, W. (2006): Artenschutz mit Tradition: Coenagrion mercuriale in Baden-Württemberg. In: Buchwald, R. (Hrsg.) (2006): Habitatwahl, Fortpflanzungsverhalten und Schutz mitteleuropäischer Libellen (Odonata). Ergebnisse der 23. Jahrestagung der Gesellschaft deutschsprachiger Odonatologen (GdO), 19.-21.3. 2004, Oldenburg. ISBN: 3-89995-278-2. 128 pp: 54-58. (in German, with English summary) ["Since the early 1990s, a continuous species protection project for *C. mercuriale* has been carried out in the administrative region of Freiburg (federal state of Baden-Württemberg, south-western Germany). The main topics of this project are public relations work, the organisation of concrete measures, and the monitoring of the populations. The primary objectives of the programme are described, and information on funding, on the type of management actions taken, and on the population development of *C. mercuriale* is given." (Author)] Address: Röske, W., Hofmatte 22, 79232 March, Germany. E-mail: Wolfgang.Roeske@ifo-freiburg.de

9666. Sauer, H. (2006): Rudolf Malkmus zum 65. Geburtstag. Zeitschrift für Feldherpetologie 13: 1-12. (in German) [R. Malkmus, Aschaffenburg, Bayern, Germany is a profiled herpetologist who also has published several odonatological papers.] Address: Sauer, H., Berliner Straße 65, D-63619 Bad Orb, Germany

9667. Schiel, F.-J. (2006): Bilanz des Artenschutzprojekts *Leucorrhinia pectoralis* in Baden-Württemberg. In: Buchwald, R. (Hrsg.) (2006): Habitatwahl, Fortpflanzungsverhalten und Schutz mitteleuropäischer Libellen (Odonata). Ergebnisse der 23. Jahrestagung der Gesellschaft deutschsprachiger Odonatologen (GdO), 19.-21.3. 2004, Oldenburg. ISBN: 3-89995-278-2. 128 pp: 46-51. (in German, with English summary) ["*L. pectoralis* is a very rare species in the German federal state Baden-Württemberg. Stable, autonomous populations which do not depend on steady immigration of individuals from other populations exist exclusively in the southeastern region „Oberschwäbisches Hügel- und Moorland". As the species is listed in the Annexes II and IV of the European habitats directive, the populations of *L. pectoralis* in SW-Germany have been the subject of increased attention since 1997: Between 1997 and 2000, intensive investigations and management measures were financed by a LIFE-Nature-Project called "Endangered Dragonfly Species in SW-Germany". Dur-

ing the years 2001 through 2003, these actions were continued as projects financed by the "Bezirksstelle für Naturschutz und Landschaftspflege" Tübingen. The purpose of this paper is to evaluate the protection actions that have been taken during the last seven years. Since 1997, 67 management measures were undertaken in 14 different mire areas. The most urgent type of management action was the removal of dense vegetation from inhabited peat bogs (In 11 mires), followed by cutting trees and shrubs along the shorelines (in 8 mires), electrofishing (in 2 mires), and mowing of dense reed vegetation (*Phragmites australis*), removal of eutrophicated soil and extensification of grassland utilization in the surrounding of 1 reproduction site, respectively. Only in three mires the management measures showed no success so far, two of which are situated in a distance of many kilometres from the margin of the populated area and therefore more or less isolated. At all sites in which small populations were still present when the implementation of management measures started, the number of individuals of *L. pectoralis* increased on account of the actions taken. Whereas, in 1997, the species was recorded in only 20 peat waters located in 9 mires, it reproduced in 40 peat waters of 12 mires in 2003. These findings show that the balance of the species protection project *L. pectoralis* is positive. Nevertheless, further management actions will remain absolutely necessary in order to guarantee the long-term survival of the species in Baden-Württemberg. It is recommended to employ Wildermuth's rotation model, which has been successfully tested over many years in Switzerland." (Author) Address: Schiel, F.-J., Inst. Naturschutz und Landschaftsanalyse, Turenenweg 9, D-77880 Sasbach, Germany. E-mail: Franz-Josef.Schiel@INULA.de

9668. Schmidt, E. (2006): Zur Odonatenfauna von Freizeit-Angelteichen im Westmünsterland. In: Buchwald, R. (Hrsg.) (2006): Habitatwahl, Fortpflanzungsverhalten und Schutz mitteleuropäischer Libellen (Odonata). Ergebnisse der 23. Jahrestagung der Gesellschaft deutschsprachiger Odonatologen (GdO), 19.-21.3. 2004, Oldenburg. ISBN: 3-89995-278-2. 128 pp: 92-102. (in German, with English summary) ["The dragonfly fauna of some fishing ponds is recorded. These ponds have a regulated water feeding by a nearby rivulet, they remain filled with water throughout the year, there is no feeding of the fishes (like carps), which all are large enough for being taken by angle (no spawn), and a replacement for the output by fishing. The number of dragonfly species is rather high, but nearly no species are endangered, and most species have only small abundances. Only *Platycnemis pennipes* and *Gomphus pulchellus* in the region are favoured at these fishing ponds. Nevertheless these ponds enrich the dragonfly fauna in Westfalian lowlands, which are poor in natural stagnant water bodies." (Author)] Address: Schmidt, E., Coesfelder Str. 230, D-48249 Dülmen, Germany

9669. Sohni, V.; Finch, O.-D. (2006): Bedeutung eines renaturierten Hochmoor-Restes bei Oldenburg (Oldb.) für die Libellenfauna. In: Buchwald, R. (Hrsg.) (2006): Habitatwahl, Fortpflanzungsverhalten und Schutz mitteleuropäischer Libellen (Odonata). Ergebnisse der 23. Jahrestagung der Gesellschaft deutschsprachiger Odonatologen (GdO), 19.-21.3. 2004, Oldenburg. ISBN: 3-89995-278-2. 128 pp: 104. (in German) ["We examined the odonate assemblages of 11 water systems situated

within a protected remnant peat bog in the north-eastern part of Cloppenburg district, Lower Saxony, Germany in summer 2001. A total of 30 species was recorded, representing half of the species known to occur between the rivers Ems and Weser. 13 species (45%) are listed in the Red Data Books of either Germany and/or Lower Saxony. Two species, *Ceriatrigon tenellum* and *Aeshna subarctica*, are listed as endangered, with the former being confirmed to reproduce within the study site. Species richness at the water systems ranged from 5 to 18 species per system. Besides high densities of eurytopic species like *Lestes sponsa* and *Pyrrosoma nymphula*, we found some stenotopic species confined to acidic bogs occurring in lower numbers. The number of bog specialists found in our study area is in concordance with the situation of other bogs in early stages of regeneration. Regeneration of the investigated bog was initiated by measures in 1988. Subsequent measures like the sealing of drainages increased the ratio of bog specialists vs. generalist species in the study area. The occurrence of *Ceriatrigon tenellum* and *Aeshna subarctica* justifies taking measures in the future." (Authors) The results have been published in detail in Dosera 2004: 119-135.] Address: Finch, O.-D., Universität Oldenburg, Terrestrische Ökologie, 26111 Oldenburg, Germany. E-mail: Oliver.d.finch@uni-oldenburg.de

9670. Velasco, J.; Millán, A.; Hernández, J.; Gutiérrez, C.; Abellán, P.; Sánchez, D.; Ruiz, M. (2006): Response of biotic communities to salinity changes in a Mediterranean hypersaline stream. *Saline Systems* 2(1): 15 pp. (in English) ["This study investigates the relationship between salinity and biotic communities (primary producers and macroinvertebrates) in Rambla Salada, a Mediterranean hypersaline stream in SE Spain. Since the 1980's, the mean salinity of the stream has fallen from about 100 g L⁻¹ to 35.5 g L⁻¹, due to intensive irrigated agriculture in the watershed. Furthermore, large dilutions occur occasionally when the water irrigation channel suffers cracks. [...] Salinity was the first factor determining community composition and structure in Rambla Salada stream followed by the type of habitat." (Authors) *Anax* sp. is the single odonate taxon mentioned in table 4.] Address: Velasco, Josefa, Department of Ecology and Hydrology, University of Murcia, 30100 Murcia, Spain E-mail: jvelasco@um.es

9671. Vershinin V.L.; Ivanova N.L. (2006): Peculiar features of the trophic relations of an introduced species *Rana ridibunda* (Pallas, 1771) depending on habitat conditions. *Volga Ecological Journal* 2006(2/3): 119-123. (in Russian, with English summary) [Russia; Odonata are preyed by the frog *R. ridibunda*.] Address: Vershinin, V.L., Institute of Plant and Animal Ecology, UB RAS Russia, 620144 Ekaterinburg, 8 Marta, 202, Russia

9672. Wildermuth, H (2006): Sequenzielle Mehrfachpaarung beim gleichen Vierfleckpaar (Libellula quadrimaculata) - Zufall oder Gesetzmäßigkeit?. In: Buchwald, R. (Hrsg.) (2006): Habitatwahl, Fortpflanzungsverhalten und Schutz mitteleuropäischer Libellen (Odonata). Ergebnisse der 23. Jahrestagung der Gesellschaft deutschsprachiger Odonatologen (GdO), 19.-21.3. 2004, Oldenburg. ISBN: 3-89995-278-2. 128 pp: 33-34. (in German, with English summary) ["Repetitive mating sequences of up to six times between the same male and female of the Four-spotted Chaser were recorded, interrupted by oviposition, rest, or attempted de-

parture of the female. These repeated matings were recorded several times and are, therefore, believed to occur regularly if the pair is not disturbed by rival males, which often happened. The phenomenon is discussed with respect to individual fitness and sperm competition." (Author)] Address: Wildermuth, H., Haltbergstr. 43, 8630 Rütli, Switzerland. E-mail: hansruedi@wildermuth.ch

9673. Wildermuth, H. (2006): *Nehalennia speciosa* in der Schweiz ausgestorben - und in Europa? In: Buchwald, R. (Hrsg.) (2006): *Habitatwahl, Fortpflanzungsverhalten und Schutz mitteleuropäischer Libellen (Odonata)*. Ergebnisse der 23. Jahrestagung der Gesellschaft deutschsprachiger Odonatologen (GdO), 19.-21.3. 2004, Oldenburg. ISBN: 3-89995-278-2. 128 pp: 63-64. ["*N. speciosa* was recorded in Switzerland from 1867 until 1990. Intensified search for the species during the subsequent years remained unsuccessful. The 17 localities where it was recorded partially in rather high numbers until the early seventies of the last century concentrated on a small area in the eastern Swiss Plateau. It is believed that *N. speciosa* became extinct because of desiccation of its formerly already damaged habitats during a long lasting dry period in 1976, combined with changes in the vegetation due to slow eutrophication. In view of strong regressive tendencies of the species in whole Europe the future of the species in the western Palearctic region depends largely on the conservation of the last large populations in southern Bavaria, Poland, Belorussia and perhaps also Russia." (Author)] Address: Wildermuth, H., Haltbergstr. 43, 8630 Rütli, Switzerland. E-mail: hansruedi@wildermuth.ch

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9674. Caspari, S.; Bettinger, A. (2007): Konzept: Die Saarländische Naturschutzstrategie. Modul: Regionale Biodiversitätsstrategie (Arten, für deren Erhalt unsere Region / das Saarland besondere Verantwortung trägt). Landesamt für Umwelt- und Arbeitsschutz (LUA), Zentrum für Biodokumentation des Saarlandes (ZfB), Am Bergwerk 10, D-66578 Landsweiler-Reden. <http://www.saarland.de/dokumente/themanaturschutz/Biodiv110707.pdf>: 42 pp. (in German) [*Cordulegaster bidentata* is the only odonate species that the Federal State Saarland should be responsible for its protection within the borders of Germany. This is due to the fact that significant parts of the German populations are restricted to this region.] Address: Caspari, S.; Bettinger, A., Landesamt für Umwelt- und Arbeitsschutz (LUA), Zentrum für Biodokumentation des Saarlandes (ZfB), Am Bergwerk 10, D-66578 Landsweiler-Reden, Germany. E-mail: SCaspari@biodokumentation.saarland.de

9675. Chang, C.H.; Ting, K.; Chen, K.T. (2007): Microstructure and nanomechanical properties of the wing membrane of dragonfly. *Advanced Materials Research* 79-82: 1325-1328. (in English) ["The flight mechanics of dragonflies including hovering and taking off backwards, flight sideways and vertical directions has been attentions in Bionics. The dragonfly wing consists of the networks of various veins and membranes to make the structural properties complicated. In the past investigations, surface characteristics of dragonfly wing were measured by nanoindentation test. Thus the aim of this study will comprehensively concern the nanomechanical properties of veins, membrane and pterostigma of the wing of the dragonfly with nanoindentation. In the

mean time, the modulus and hardness of the wing of the dragonfly's composites including lengthwise vein, transverse vein, membrane and pterostigma are measured. The value of modulus of lengthwise vein is greater than the other structures. The value of modulus of transverse vein is the smallest due to its soft behavior. Its hardness is also smaller than others." (Authors)] Address: Chang Ching-Hsin, National Chung Hsing University, 250, Kuo Kuang Rd., Taichung 402. Taiwan. E-mail: chang.chhs@gmail.com

9676. Chuzakova, T.A.; Poljakova, N.V. (2007): Macrozoobenthos of some Samarskaya Luka waters. *Samarskaya Luka* 16(3) (21): 538-546. (in Russian, with English summary) [The macrozoobenthic fauna of 6 streams and 2 ponds of the National Park Samarskaya Luka was investigated. The list of 72 taxa includes *Cordulegaster boltonii* and *Erythromma najas*.] Address: Chuzakova, T.A., St. Petersburg State University, Biological Faculty, Department of Ichthyology and Hydrobiology, St. Petersburg

9677. De Marmels, J. (2007): Reportes de Odonata nuevos para Venezuela. *Entomotropica* 22(1) (issued in 2010): 45-47. (in Spanish, with English summary) ["Four species are added to the Venezuelan checklist: *Neoneura rufithorax* Selys, 1886 (Zygoptera: Protoneuridae); *Phyllocycla pegasus* (Selys, 1869) (Anisoptera: Gomphidae); *Aeschnosoma elegans* Selys, 1871 (Anisoptera: Corduliidae) and *Brechmorhoga flavopunctata* (Martin, 1897) (Anisoptera: Libellulidae). Five are deleted from that list: *Euthore hyalina* (Selys, 1853) (Zygoptera: Polythoridae); *Heteragrion macilentum* Hagen in Selys (Zygoptera: Megapodagrionidae), 1862; *Anomalophlebia nitida* Belle, 1995 (Anisoptera: Gomphidae); *Phyllocycla diphylla* (Selys, 1854) (Anisoptera: Gomphidae) and *Macrothemis declivata* Calvert, 1909 (Anisoptera: Libellulidae)." (Author)] Address: De Marmels, J., Museo del Instituto de Zoología Agrícola "Francisco Fernández Yépez" (MIZA), Facultad de Agronomía, Univ. Central de Venezuela, Apartado 4579, Maracay 2101-A, Venezuela. E-mail: demarmjc@gmail.com

9678. Gassmann, D. (2007): Die Ligula der Kleinlibellen im Rasterelektronenmikroskop - Morphologische Strukturen und evolutionsbiologische Bedeutung. *Mikrokosmos* 96(3): 183-187. (in German) [Detailed description of morphology and function of the ligula in Zygoptera with special emphasis on *Coeliccia membranipes*, *Torrenticnemis filicornis*, *Idiocnemis obliterata*, *I. strumidens*, and *Thaumatagrion funereum*. The phylogenetic importance of differences in the structure of the ligula is outlined.] Address: Gassmann, D., Institute of Evolutionary and Ecological Sciences, Leiden University, c/o National Museum of Natural History, P.O. Box 9517, 2300 RA Leiden, The Netherlands. E-mail: gassmann@naturalis.nnm.nl

9679. Gondat, L.; Arluziaga, I. (2007): Zarauzko (Euskal Herria) erreketako makroinvertebratu faunaren ezagutzari zenbait ekarpen. *Heteropterus - Revista de Entomología* 7(1): 111-121. (in Euskarian, with Spanish and English summaries) ["Contribution to the knowledge of benthic macroinvertebrate fauna from Zarautz streams (The Basque Country)." The checklist includes *Calopteryx virgo*, *Chalcolestes viridis*, *Boyeria irene*, and *Cordulegaster boltonii*.] Address: Gondat, L., EHU/UPV Donostiako Irakasleen Eskola; Matematika-ren eta Zicntzia Esperimentalen Didaktika Saila, Oñati plaza 3; 20009 Donostia, Spain

- 9680.** Kalniņš, M.; Medne, M. (2007): The spatial allocation of dragonflies (Odonata) communities in raised bogs of Latvia. Book of abstracts: Daugavpils University Institute of Systematic Biology. 4th International Conference "Research and Conservation of Biological Diversity in Baltic region". Daugavpils, 25 - 27 April, 2007. Daugavpils University Academic Press "Saule": 50. (in English) [Verbatim: "The communities of different dragonfly species and their spatial allocation have been poorly studied in Latvia. Research in dragonflies 'communities' spatial allocations in bogs were undertaken in Sudas bog, (Cesis district), Taures bog (Valka district) and Lielais Kemeru tirelis bog (Tukums and Riga districts) in 2005 - 2006. Individual researches were taken also in other bogs of Latvia. Research surveys included quantitative adult registration along 100 m long patches inspection. Sloughs registration in several habitats or groups of species has been done additionally. Different characteristic bog habitats were selected as patches for examination: large water pools complexes in open bog areas, lakes in the bogs inclusive lakes with woody coasts, lake with woody coasts located at the edge of bog, the watercourse at edge of bog, beavers over flooded watercourse in the dif of bog, complexes of water pools with woody edges and water pools in the middle of the wood. 26 dragonfly species were examined during current research: 20 species in Sudas bog, 6 species in Taures and 13 species in Lielais Kemeru tirelis bog. Major diversity of species has been registered near the watercourses with rich vegetation (14 species) and in large complexes of water pools (10 species). Lower diversity has been confirmed in bog lakes situated on open areas (7 species) and in open patches of the bog without water pools (3-4 species). *Sympetrum danae* has been registered in all examined patches of Sudas bog, *Libellula quadrimaculata*, *Lestes sponsa* and *Enallagma cyathigerum* – in 80 % of examined patches of Sudas bog. Meanwhile, *Anax imperator* was found only in water pools, but *Pyrrhosoma nymphula* – along watercourses with grassy coasts. Due to sloughs research also *Aeshna subarctica* was registered but during adult registration this species was found only in Taures bog."] Address: Kalniņš, M., Nature Protection Board, Eksporta iela 5, Riga, LV-1010, Latvia. E-mail: martins.kalnins@dap.gov.lv
- 9681.** Kiel, E.-F. (2007): Erhaltungszustand der FFH-Arten in Nordrhein-Westfalen. Ergebnisse des FFH-Berichtes 2001 bis 2006. Natur in NRW 2/2007: 12-17. (in German) [Documentation of the present conservation status of *Coenagrion mercuriale*, *C. ornatum*, *Stylurus flavipes*, and *Leucorrhinia pectoralis* in Nordrhein-Westfalen, Germany.] Address: Kiel, E.-F., LANUV, Fachbereich 24, Leibnitzstr. 10, 45659 Recklinghausen, Germany. E-mail: ernst-friedrich.kiel@lanuv.nrw.de
- 9682.** Krüner, U. (2007): Der Südliche Blaufeiler, *Orthetrum brunneum* (Fonscolombe, 1837), am Entwässerungsgraben der Halde Emil Mayerisch, Kreis Düren (NRW). Entomologie heute 19: 51-57. (in German, with English summary) ["The drainage ditch at the hard coal dump Emil Mayerisch is colonized by *O. brunneum* since 15 years. The larval growth was studied in 1993. Due to the optimal environmental conditions a part of the population emerged one year after oviposition while another part needed two years. Phenological data of exuviae and imagoes from 1992 to 2006 show a flying time from June to August. Until now the population of *O. brunneum* could be preserved by regular removing of mud and aquatic plants." (Author)] Address: Krüner, Ulrike, Gelderner Str. 39, 41189 Mönchengladbach, Germany. E-mail: kruener@t-online.de
- 9683.** Machida, K.; Oikawa, T. (2007): Structure analyses of the wings of *Anotogaster sieboldii* and *Hybris subjacens*. Key Engineering Materials 345-346: 1237-1240. (in English) ["The wings of a dragonfly have many complicated structures. The configuration of the costal vein of the wings of a dragonfly is different from them of other insects. So, we paid attention to the configuration of the costal vein of the wings in this study. In order to know the functions and structures of the wings of a dragonfly, several 3-D models of the wing of *Anotogaster sieboldii* were created, and calculated with the 3-D finite element method. In addition, we created a 3-D model of the wing of *Hybris subjacens* which has the configuration of original wing, and compared the models of *Anotogaster sieboldii* and *Hybris subjacens*. As a result, it was clarified that the arch configuration of the costal vein controls the bending and the torsion of the wings." (Authors)] Address: Kenji Machida, K., Tokyo University of Science, 2641 Yamazaki, Noda-shi, Chiba, 278-8510, Japan. E-mail: mac@rs.noda.tus.ac.jp
- 9684.** Maibach, A.; Flöss, I. (2007): 19. Symposium der Schweizerischen LibellenkundlerInnen. Nouvelles. Centre Suisse de la Cartographie de la Faune 32: 33-36. (in German or French) [Abstracts of the following lectures are presented: René Hoess: Neuere und ältere Funde von *Coenagrion scitulum* in der Schweiz; Gilles Carrón & Olivier Schær: *Leucorrhinia albifrons*, *Gomphus vulgatissimus* et *Coenagrion mercuriale* à Genève; Moritz Frei & Daniel Kury: Erfassung von Libellen - ein Methodenvergleich; Frank Hampel: Beobachtungen eines Anfängers am Gattikerweiher und anderswo; Sandrine Angélibert, N. Indermuehle, D. Luchier, B. Oertli, J. Perfetta: Les Odonates adultes: quelle place dans la biodiversité aquatique du Canton de Genève?; David Leclerc: Mise en place d'une liste d'espèces de libellules prioritaires pour le bassin genevois («Liste rouge» régionale); Hansruedi Wildermuth: Erfolgreiche Förderung einer Population von *Orthetrum coerulescens* durch technische Naturschutzmassnahmen; Nicola Indermuehle, B. Oertli, A. Maibach, O. Schær & S. Lezat: L'échantillonnage des Odonates adultes: inventaire exhaustif et/ou «rapid assessment method»? Résultats préliminaires; Sandrine Angélibert, N. Indermuehle, D. Luchier, B. Oertli, J. Perfetta: Les Odonates adultes: quelle place dans la biodiversité aquatique du Canton de Genève?; Traute Fliedner: Biotopzerstörung durch Viehtritt nicht nur auf Alpweiden, sondern auch in Naturschutzgebieten; Gerhard Vonwil: Flutmulden – wenig bekannte Libellenrefugien] Address: Centre Suisse de Cartographie de la Faune (CSCF), Passage Maximilien de Meuron 6, 2000 Neuchâtel, Switzerland
- 9685.** Ott, J. (2007): Hat die Klimaänderung eine Auswirkung auf das Netz Natura 2000? - erste Ergebnisse aus Untersuchungen an Libellenzönosen dystropher Gewässer im Biosphärenreservat Pfälzerwald. Naturschutz und Biologische Vielfalt 46: 65-90. (in German) ["Dragonflies are suitable indicators for the quality of aquatic environments and for environmental changes. Dragonflies recently have been used as monitoring organisms to demonstrate the effects of climatic change, e.g. via the range expansion of southern species to the north or via the shifts within community composition. First results from a study in the transboundary biosphere reserve "Pfälzerwald-Vosges du Nord" are pre-

sented. The dragonfly fauna and the environmental conditions of the so called "Wooge", mainly dystrophic lakes (Natura 2000-code 3160), were monitored and compared with previous investigations. Most of these waters are part of the national Natura 2000 network. As a consequence of the effects of climatic changes and also synergistic effects (e.g. ground water extraction, drying/freezing out, lacking maintenance, increasing fragmentation) the aquatic systems have changed dramatically in the last couple of years. Water levels have dropped between one and two meters, reaching extreme situation in July 2006, where some waters even dried out completely. As a consequence, the dragonfly fauna also has changed: many of the stenoeccious and endangered moorland species, which are characteristic for the dystrophic waters, have disappeared from most of the waters (e.g. *S. arctica*, *A. juncea*, *L. dubia*, *C. hastulatum*). These species now are nearly extinct in the German part of the biosphere reserve. At the same time, these lakes have been colonised by generalists and widely distributed species, which are now dominating the waters and dragonfly communities (e.g. *O. cancellatum*, *L. depressa*, *G. pulchellus* - also *A. Imperator*) indicating the strong disturbance. Some of the waters even have dried out completely and, thus, totally lost their value for the aquatic fauna. In addition, species typical for astatic waters and thermophilic species like *Lestes virens*, *L. barbarus* and *Ischnura pumilio* are rapidly invading the area, indicating a change in the biological communities as well. If summer droughts and synergistic effects continue at current rates — and the scenarios show an ongoing impact in the region - and if no immediate management and mitigation measurements are undertaken, the remaining waters will lose their importance for the Natura 2000 network shortly and devalue this concept completely." (Author) Address: Ott, J., Friedhofstr. 28, D-67705 Trippstadt, Germany. E-mail: L.U.P.O.GmbH@t-online.de

9686. Santos, J.A. (2007): Libelulas e libelinhas. *Madressilva* 7: 6-7-9, 11. (in Portuguese) [This is an illustrated, brief general description of odonate biology, with a key to the families occurring in Algarve, Portugal. References to some regional species are made family wise.] Address: Santos, J.A., Associa cao Almargem, Alto di S. Domingos 14, PT-8100-756 Louie, Portugal

9687. Smith, A.J.; Bode, R.W.; Kleppel, G.S. (2007): A nutrient biotic index (NBI) for use with benthic macroinvertebrate communities. *Ecological Indicators* 7(2): 371-386. (in English) ["Aquatic macroinvertebrates have been among the principal biological communities used for freshwater monitoring and assessment for several decades, but macroinvertebrate biomonitoring has not incorporated nutrient measures into assessment strategies. Two nutrient biotic indices were developed for benthic macroinvertebrate communities, one for total phosphorus (NBI-P), and one for nitrate (NBI-N). Weighted averaging was used to assess the distributions of 164 macroinvertebrate taxa across TP and NO₃- gradients and to establish nutrient optima and subsequent nutrient tolerance values. Both the NBI-P and NBI-N were correlated with increasing mean TP and NO₃- values ($r = 0.68$ and $r = 0.57$, respectively, $p < 0.0001$). A three-tiered scale of eutrophication for TP and NO₃- (oligotrophic: ≤ 0.0175 mg/l TP, ≤ 0.24 mg/l NO₃-, mesotrophic: > 0.0175 to ≤ 0.065 mg/l TP, > 0.24 to ≤ 0.98 mg/l NO₃-, eutrophic: > 0.065 mg/l TP, > 0.98 mg/l NO₃-) was also established through cluster analysis of

invertebrate communities using Bray-Curtis (quantitative) similarity. Significant differences ($p < 0.0001$) were detected between median NBI-P and NBI-N scores among the three trophic states. Therefore, the nutrient biotic indices (NBIs) appear to accurately reflect changes in stream trophic state. Multimetric water quality assessments were also used to identify thresholds of impairment among the three trophic states. Hodges-Lehman estimation indicated that the greatest change in assessment results occurred between the mesotrophic and eutrophic states. The eutrophic state also represented the highest percentage of overall impairment. Therefore, the suggested threshold for nutrient impairment is the boundary between mesotrophic and eutrophic (0.065 mg/l TP and 0.98 mg/l NO₃-). The corresponding NBI-P score (6.1) and NBI-N score (6.0) for this threshold incorporate predictive capabilities into the NBIs. The NBI and index score thresholds of impairment will provide monitoring programs with a robust measure of stream nutrient status and serve as a useful tool in enforcing regional nutrient criteria." (Authors) The index includes "Ophiogomphus sp. and undetermined Gomphidae".] Address: Smith, A.J., New York State Department of Environmental Conservation, Stream Biomonitoring Unit, Albany, NY 12233-3502, USA. E-mail: ajsmith@gw.dec.state.ny.us

9688. Staudacher, K.; Füreder, L. (2007): Habitat complexity and invertebrates in selected Alpine springs (Schütt, Carinthia, Austria). *Internat. Rev. Hydrobiol.* 92(4-5): 465-479. (in English) ["The invertebrate fauna from eight selected springs of the landslide area of Schütt (Carinthia, Austria) with contrasting environmental factors was investigated. The role of habitat structure on the community composition was studied with a particular focus on the spring-dwelling animals colonizing the aquatic and the adjacent aquatic-terrestrial transition zones. The crenocoenosis was predominantly composed of Chironomidae, Plecoptera, Trichoptera, Mollusca and Ostracoda and the number of spring-specialists was high. Habitat complexity, variable microhabitat composition and the concomitance of lotic and lentic areas in the eucrenal zone furthered a high species diversity and abundance. Even the aquatic-terrestrial transition zone was inhabited by high numbers of crenobionts and crenophiles. Moreover, the connectivity of aquatic and terrestrial habitats positively affected the structural and functional organisation of invertebrate assemblages in the spring biotopes." (Authors) The list of taxa includes *Cordulegaster bidentata* and *Aeshna cf. caerulea*.] Address: Staudacher, Karin, River Ecology and Invertebrate Biology, Institute of Ecology, University of Innsbruck, Technikerstr. 25, A-6020 Innsbruck, Austria. E-mail: karin.staudacher@student.uibk.ac.at

9689. Xiao, K.; Bai, K.; Wang, W.s.; Song, F. (2007): Experimental study on the microstructure and nanomechanical properties of the wing membrane of dragonfly. *Acta Mechanica Sinica* 23(3): 281-285. (in English) ["Detailed investigations on the microstructure and the mechanical properties of the wing membrane of the dragonfly are carried out. It is found that in the direction of the thickness the membrane was divided into three layers rather than a single entity as traditionally considered, and on the surfaces the membrane displays a random distribution rough microstructure that is composed of numerous nanometer scale columns coated by the cuticle wax secreted. The characteristics of the surface structure are measured and described. The

mechanical properties of the membranes taken separately from the wings of live and dead dragonflies are investigated by the nanoindentation technique. The Young's moduli obtained here are approximately two times greater than the previous result, and the reasons that yield the difference are discussed." (Authors)] Address: Song, F., Slate Key Laboratory of Nonlinear Mechanics (LNM), Institute of Mechanics, Chinese Academy of Sciences, Beijing 100080, China. E-mail: songf@lnm.imech.ac.cn

2008

9690. Bechly, G. (2008): Additions to the fossil dragonfly fauna from the Lower Cretaceous Crato Formation of Brazil (Insecta: Odonata). *Palaeodiversity* 3, Supplement: 11-77. (in English, with German summary) ["Several interesting new discoveries of fossil odonates from the Lower Cretaceous Crato Formation of NE Brazil are presented. Two new taxa of damselflies (*Euarchistigma peterknobli* n. sp. and *Santanagrion longipes* n. gen., n. sp.) are described, and a new specimen of *Euarchistigma marialuiseae* with preserved colour pattern, distinct from the type species, is featured. Among the dragonflies totally three new families (*Megaphlebiidae* n. fam., *Magnathemidae* n. fam., and *Cratopetaliidae* n. fam.), nine new genera, and ten new species (*Paracordulagomphus aberrans* n. gen., n. sp.; *Paracordulagomphus divergens* n. gen., n. sp.; *Pauciphlebia novaolindense* n. gen., n. sp.; *Cratogomphus erraticus* n. gen., n. sp.; *Cratohagenius erichweberi* n. gen., n. sp.; *Megaphlebia rayandressi* n. gen., n. sp.; *Magnathemis marcusthorhalli* n. gen., n. sp.; and *Cratopetalia whiteheadi* n. gen., n. sp.) are described. A further putative new dragonfly genus and species is discussed and featured, but not formally described because of the poor preservation of the single available specimen. The original descriptions of *Euarchistigma marialuiseae*, *Cratostenophlebia schwickerti*, *Eotanypteryx paradoxa*, *Paramesuropetala gigantea*, *Cordulagomphus hanneloreae* and *Cordulagomphus winkelhoferi* are emended with new data and supplemented with drawings and photos. The newly discovered counter plate of the holotype of *Cratopetala petruleviciusi* is featured. Some errors concerning collection numbers and depositions of fossil odonates in Martill et al. (2007) are corrected and new collection numbers are updated for the Senckenberg museum collection." (Author)] Address: Bechly, G., Staatliches Museum für Naturkunde, Abt. Paläontologie, Rosenstein 1, D-70191 Stuttgart, Germany. E-mail: bechly@gmx.de

9691. Beckmann, H.; Berlin, A.; Blumrich, B.; Eitner, M.; Gottschalk, H.-J.; Grawe, D.; Thiele, V.; Wolf, F.; Zilch, M.; (2008): Entomofaunistische Untersuchungen im Bereich des Baggersees bei Alt Gaarz (NSG „Seen- und Bruchlandschaft südlich Alt Gaarz, Landkreis Müritzer, Mecklenburg-Vorpommern). *Archiv der Freunde der Naturgeschichte in Mecklenburg* XLVII: 5-26. (in German) [Germany; the list of Odonata totals to 21 species, and includes the regional rare *Onychogomphus forcipatus*.] Address: Thiele, V., Ahornring 10, 19292 Möllen, Germany. E-mail: mv.thiele@t-online.de

9692. De Vlinderstichting (2008): Monitoring Dragonflies in Europe. Programme & Abstracts of International Symposium, Wageningen, 13-14 June 2008. De Vlinderstichting, Wageningen: 26 pp. (in English) [Oral presentations: Groenendijk, D., V. Mensing & C. Plate: Ten

years dragonfly monitoring in the Netherlands: results and lessons for the future; - Ott, J.: What can monitoring studies of dragonflies tell us? From single waters to landscapes, from short term to long term projects; - Grönhagen, N & K.-J. Conze: How to detect trends in heterogeneous data accurately? The example of the preparation of the new red list of dragonflies in Northrhine-Westphalia; — Oertli, B.: The local species richness: a metric for a long term monitoring; - Torralba-Burrial, A. & F.J. Ocharan: Monitoring dragonfly species as river ecological status bioindicators; - Van Strien, A.: Detecting trends in dragonfly data: difficulties & opportunities; - Bell, S.: People count too: volunteers and biodiversity monitoring in Europe; - De Knijf, G.: The dragonfly inventory project in Flanders (Belgium): thirty years of collecting data. Are there any trends detectable?; - Dyatlova, E.S.: Dragonflies of the proposed National Park "Nizhnednestrevsky": monitoring and conservation; — Thompson, D.J.: Monitoring *Coenagrion mercuriale*: the UK experience; - Termaat, T, J. Bouwman & C. Plate: Monitoring threatened species in the Netherlands; - Luque, P. & M. Lockwood: The Catalan Dragonfly Monitoring Scheme; - Kalkmam, V.: Progress report on the atlas and red list of European dragonflies; - Van Swaay, C.: Lessons from the Butterfly Monitoring Network in Europe; - Poster presentations: Azpilueeta Amerin, M. & A. Cordero Rivera: Monitoring *Oxygastra curtisii* and *Macromia splendens*: their habitat and life cycle; - Oertli, B. & P. Nicolet: The European Pond Conservation Network (EPCN); - Sanchez Guillen, R.A. & A. Cordero Rivera: Relative frequency of *Ischnura elegans* and *I. graellsii* (Odonata: Coenagrionidae) in the Galician coast; — Termaat, T, VI Kalknum & J.H. Bouwman: Trends in ranges of dragonflies in the Netherlands: does climate change play a role?; - Termaat, T, V Mensing, D. Groenendijk & J. Bouwman: Dragonfly protection in the Netherlands: a stepwise approach.] Address: Vlinderstichting, Postbus 506, NL-6700 AM Wageningen, The Netherlands

9693. Geraeds, R.P.G. (2008): Larven van de Gewone bronlibel in de Rode Beek (Nationaal Park De Meinweg). *natuurhistorisch maandblad* 97(6): 129-132. (in Dutch, with English summary) ["The Meinweg nature reserve hosts the largest population of *Cordulegaster boltonii* in the Netherlands. The species is known to breed in three brooks in the reserve, the Bosbeek, Nartheciumbeekje and Venbeek brooks. The Rode Beek brook, also situated in this nature reserve, was never considered as a breeding water for this species. In October 2007, the Rode Beek brook was surveyed (with a net) to establish the presence of larvae of *C. boltonii*. The survey yielded 23 larvae in the stretch from the Dutch-German border, where the brook enters the Netherlands, to the Gitstapper water mill. The species was not found downstream of this mill, where the brook has been canalised and runs through open farmland, making it an unsuitable habitat for this species. The survey showed, however, that the brook does function as a breeding water for *C. boltonii* at the Meinweg reserve. The larvae we caught ranged in age from 1 to 4 or 5 years, proving that the Rode Beek brook actually hosts a population of *C. boltonii*." (Author)] Address: Geraeds, R.P.G., Bergstraat 70, 6131 AW Sittard, The Netherlands

9694. Golovatyuk, L.V.; Zinchenko, T.D.; Shitikov, V.K. (2008): An indicative assessment of macrozoobenthos organisms in flowing waters. *Inland Water Biology* 1(3):

260-273. (in English) [*Calopteryx splendens*, *Coenagrion puella*, *Erythromma najas*, *Gomphus vulgatissimus*, *Ischnura elegans*, *Libellula quadrimaculata*, *Platycnemis pennipes*, *Stylurus flavipes*, *Sympetrum flaveolum*, and *Sympetma fusca* were used as indicators for saprobic conditions in rivers of the middle and lower Volga River, Russia. Original Russian Text © L.V. Golovatyuk, T.D. Zinchenko, V.K. Shitikov, 2008, published in *Biologiya Vnutrennikh Vod*, No. 3, 2008, pp. 66–79.] Address: Zinchenko, T.D., Institute of the Ecology of the Volga River Basin, Russian Academy of Sciences, ul. Komzina 10, Tolyatti, 445003, Russia. E-mail: tdz@mail333.com

9695. Haller, R.; Nössing, T.; Werth, F.; Festi, A. (2008): *Libellen (Odonata) am Schlern (Südtirol, Italien)*. *Gredleriana* 8: 287-300. (in German, with English summary) [In 2006 and 2007, 19 odonate species were recorded in the Schlern massif, South Tyrol, Italy. *Cordulegaster bidentata* (regionally threatened with extinction), *Sympetrum fonscolombii*, and *Crocothemis erythraea* are noteworthy. The rest of species are regionally common.] Address: Haller, R., St. Peterweg 83, 39018 Terlan, Italy. E-mail: reinhold.haller@brennercom.net

9696. Hocking, D.J.; Semlitsch, R.D. (2008): Effects of experimental clearcut logging on gray treefrog (*Hyla versicolor*) tadpole performance. *Journal of Herpetology* 42: 689-698. (in English) ["Clearcutting detrimentally affects the populations of many amphibian species. However, Gray Treefrogs (*Hyla versicolor*) have shown a preference for breeding sites located in clearcuts near forested habitat. To test the implications of this preference, we examined Gray Treefrog tadpole performance in cattle tanks along a gradient from clearcut to forest habitat. We replicated this design at three experimental clearcut sites. Tadpole performance was measured as length of the larval period, size at metamorphosis, and survival. We also examined the influence of temperature, periphyton productivity, and invertebrate predator abundances (anisopteran and dyticide beetle larvae) on tadpole performance. Time to metamorphosis was shorter in the clearcuts, but metamorphs tended to be smaller than metamorphs in the forest tanks. Survival was also greater in the clearcuts than in the forest treatments. Higher temperatures in the clearcuts primarily contributed to tadpole performance whereas invertebrate predators did not appear to influence performance. Although clearcuts benefited tadpoles through higher survival and shorter larval periods, there are potential fitness consequences for small metamorphs emerging in clearcuts." (Authors)] Address: Hocking, D.J., University of New Hampshire, 215 James Hall, Durham, New Hampshire 03824 USA. E-mail: dhocking@unh.edu

9697. Karpelson, M.; Wei, G.-Y.; Wood, R.J. (2008): A review of actuation and power electronics options for flapping-wing robotic insects. 2008 IEEE International Conference on Robotics and Automation Pasadena, CA, USA, May 19-23, 2008: 779-786. (in English) ["Flapping-wing robotic insects require actuators with high power densities at centimeter to micrometer scales. Due to the low weight budget, the selection and design of the actuation mechanism needs to be considered in parallel with the design of the power electronics required to drive it. This paper explores the design space of flapping-wing microrobots weighing 1g and under by determining mechanical requirements for the actuation mechanism, analyzing potential actuation

technologies, and discussing the design and realization of the required power electronics. Promising combinations of actuators and power circuits are identified and used to estimate microrobot performance." (Authors) A reference to Odonata is made.] Address: Karpelson, M., School of Engineering and Applied Sciences, Harvard University, Cambridge, MA 02138, USA. E-mail: michaelk@seas.harvard.edu

9698. Khan, M.R.; Irshad, M.; Rafi, M.A. (2008): *Insect Fauna of Azad Jammu and Kashmir*. MK Printers, Islamabad. ISBN 978-969-8909-01-07: 143 pp. (in English) ["Due to importance of insects in agriculture, forestry, household and human/animal health of AJ & K, it is essential to document the insect fauna of the area. In the present compilation 941 insect species have been reported. These belong to order Coleoptera, Diptera, Heteroptera, Hymenoptera, Isoptera, Lepidoptera, Neuroptera, Odonata and Orthoptera. The present list has been compiled through the available literature and personal efforts of authors. Forty-nine species have been collected by the authors and reported first time from AJ & K. Efforts have been made to collect all the published material." (Publisher)] Address: Rafi, M.A., National Agricultural Research Centre, Islamabad, National Insect Museum), Pakistan. E-mail: arafiam@yahoo.com

9699. Khrokalo, L.; Nazarov, N. (2008): Odonata of the Poliskyi Nature Reserve, Ukraine. IDF-Report 13: 17-28. (in English) ["Twenty-eight Odonata species were recorded in the Poliskyi Nature Reserve (Zhytomyr oblast', North Ukraine) in 2006 and 2007, 18 of which were reported for the first time from this location. This included such rare species as *Somatochlora arctica* (second record in the Ukraine, first record for 100 years), *Leucorrhinia dubia*, *L. rubicunda* and *L. albifrons*. A breeding site and a dense population of *Nehalennia speciosa* were found in a bog near the river. *Zholobnytsya*. The record of *Orthetrum coerulescens* is the northernmost in Ukraine." (Authors)] Address: Khrokalo, Lyudmyla, Institute of Environment & Biotechnologies, National Agricultural University of Ukraine, Geroiv Oborony str.15, Kyiv, Ukraine 03041. E-mail: Khrokalo@mail.ru

9700. Khrokalo, L.; Krylovskaya, S. (2008): Distribution and current status of *Coenagrion armatum* (Charpentier, 1840) in Ukraine. IDF-Report 13: 1-16. (in English) ["The 14 known localities of *C. armatum* in Ukraine are listed and the 27 dragonfly species recorded are presented. An expedition devoted to revisit 10 of them in spring 2007 did not result in a confirmation at any of them. Here, all localities are described in detail and possible reasons for the absence of the species are discussed. These include habitat alterations because of anthropogenic impact, such as agricultural activity, as well as decreasing competitiveness against Mediterranean species that spread in response to altered climatic conditions. Proposed measures of conservation of *C. armatum* in Ukraine include a) the inclusion into the Red Data Book of Ukraine under category I (Endangered) and b) additional studies, monitoring and habitat conservation." (Authors)] Address: Khrokalo, Lyudmyla, Institute of Environment & Biotechnologies, National Agricultural University of Ukraine, Geroiv Oborony str.15, Kyiv, Ukraine 03041. E-mail: khrokalo@mail.ru

9701. Kochurova, T.I. (2008): The bottom invertebrates of small rivers in an area where pesticides were buried. *Inland Water Biology* 1(3): 287-295. (in English)

["The effect of Kilmezskii pesticide disposal site on the zoobenthos of Osinovka and Loban' rivers (the Vyatka River basin, Kirovskaya oblast) is reviewed. A faunistic list of water invertebrates in these rivers is published for the first time, qualitative and quantitative indices of zoobenthos development are given, and the condition of watercourses is assessed using bioindicative methods. The peculiarities of benthic communities of the Osinovka River and its tribute, i.e., a significant impoverishment of species composition, the simplification of structural organization, and low bioindicative indices, allow us to assume that the burial has a negative effect on zoobenthos condition." (Author) The following Odonata taxa are considered: *Calopteryx virgo*, *C. splendens*, *Platycnemis pennipes*, *Gomphus* sp., and *Somatochlora metallica*. Original Russian Text © T.I. Kochurova, 2008, published in *Biologiya Vnutrennikh Vod*, No. 3, 2008, pp. 93–101.] Address: Kochurova, T.I., Vyatka State University of Humanities, ul. Krasnoarmeiskaya 26, Kirov, 610002, Russia. E-mail: ecolab@vshu.kirov.ru

9702. Krach, J.E. (2008): Libellenvorkommen im Landkreis Eichstätt. *facetta*, Suppl. 3 - Berichte der entomologischen Gesellschaft Ingolstadt e.V.; 338 pp. (in German) [The author presents a detailed study based on 1227 water body situated in the Landkreis Eichstätt, Bayern, Germany. A total of 52 odonate species was recorded; the species are treated in a monographic style providing information on distribution (detailed map), frequency, habitat, phenology, co-occurring species, and some cases also conservation measures and vernacular naming of species. The big population of *Coenagrion ornatum* is of more than regional importance] Address: Krach, J.E., Oberstimmerstr. 62, 85051 Zuchering, Germany. E-mail: JEKrach@gmx.de

9703. Lemelin, R.H. (2008): Dragonfly tourism. In: M. Lück (Ed.). *Encyclopedia of Tourism and Recreation in Marine Environments*. Wallingford, Oxfordshire: CABI: 145. (in English) [Verbatim: "Dragonfly Tourism: While the activity of enjoying (viewing, photographing, collecting) Odonata (dragonflies and damselflies) is a relatively new leisure phenomenon in Western society, in some Asian countries such as China and in Japan dragonflies have a long history of being involved in popular culture and are even raised as pets (Mitchell and Lasswell, 2005). Dragonfly gatherings (i.e. counts and educational outings) in North America and Europe are, however, increasing in popularity. For example, popular Odonata activities include the Valley Nature Centre's Annual Dragonfly Days in Weslaco, Texas, annual Odonata meetings (e.g. the Great Lakes Odonata Meeting) and counts (e.g. the Algonquin Park Odonata Count). Elsewhere, dragonflies are viewed in various sanctuaries found in Japan and the UK (Moore, 1997, 2001). The most notable dragonfly attraction may perhaps be the dragonfly awareness trails located in the National Botanical Gardens in Pietermaritzburg, South Africa (Suh and Samways, 2001). Individuals are also building 'dragonfly ponds' to attract Odonata to their homes (Moore, 2002). Conservative estimates place the number of Odonata enthusiasts belonging to a formal association at over 3000 worldwide. This number increases dramatically if one was to include participants in the growing number of dragonfly events. Facilitating the growth of these leisure activities, but more specifically the viewing of dragonflies, is the availability of field guides (Dunkle, 2000, Mead, 2003, Jones et al, 2006),

associations (e.g. Dragonfly Society of the Americas, Worldwide Dragonfly Association) and online verification of specimens (e.g. Digital Dragonflies). While concerns over the emerging role of Odonata in marine leisure activities (e.g. boat activity) have been noted (Samways, 2005), the greatest concerns over anthropogenic disturbances of Odonata in coastal areas are the loss of suitable habitat (i.e. drained wetlands) and declining water quality (Medland, 2004). Some coastal species may be particularly vulnerable. For example, the Seaside Dragonlet (*Erythrodiplax berenice*), found primarily along the Atlantic Coast from Venezuela's north to southern Canada, breeds mostly in brackish water (salt marshes and estuaries) in coastal areas (Mitchell and Lasswell, 2005; Fig. D6). Odonata are important bio-indicators for both aquatic and semi-aquatic habitats and they can be used as flagship species for tourism and leisure strategies (Moore, 1997)." (Author)] Address: Lemelin, H., Lakehead University, School of Outdoor Recreation, Parks and Tourism, 955 Oliver Rd., Thunder Bay, Ontario, P7B 5E1, Canada. E-mail: harvey.lemelin@lakeheadu.ca

9704. Li, Y.; Wang, X.S. (2008): Investigation on characteristics of structure and simulation analysis for dragonfly wing vein. *Advanced Materials Research* 33-37: 785-788. (in English) ["In this work, the microstructure of the dragonfly wing vein was investigated by the finite element method (FEM). It is a bionic view to simulate the microstructure of the wing vein, which could be used to construct the micro air vehicles (MAVs). From the FEM results, the sandwich structure of the dragonfly wing vein was proved, which could supply more torsional deformation and reduce the weight of dragonfly. And the protein layer in the sandwich structure almost not bear the bending loadings, which could protect the protein not to be destroyed. It could assist us to utilize such design for the new micro air vehicle (MAV), especially ornithopter." (Authors)] Address: Li, Y., Dept of Engineering Mechanics, Tsinghua University, 100084, Beijing, P.R. China. E-mail: Lee2002hu@yahoo.com.cn

9705. Marquez Rodríguez, J.; Ferreras-Romero, M. (2008): Contribution to the knowledge of the Iberian distribution of *Macromia splendens* (Pictet, 1843) (Odonata: Cordulidae). *Boln. Asoc. esp. Ent.* 32(3-4): 371-374. (in Spanish) [A larva of *M. splendens* was caught 2-III-2007, in a tributary of the River Guadiamar, near Cañaverero, Spain (coordinates: 10x10 km: 29S QB36; altitude 160 m a.s.l.).] Address: Rodríguez, J.M., Departamento de Sistemas Físicos, Químicos y Naturales (Zoología), Universidad Pablo de Olavide, A-376 km 1, 41013 Sevilla, Spain.

9706. Naranjo López, C.; Trapero Quintana, A. (2008): Clave dicotómica para la identificación de las especies cubanas del orden Odonata, en estado larval. *Cocuyo* 17: 28-36. (in Spanish, with English summary) ["A dichotomous key for the identification of the 81 Cuban species of the order Odonata, in the larval stage, is presented for the first time. It keys to the level of the six families that comprise the group and in each family keys the 42 genera and all known larvae occurring in the Cuban archipelago. Eleven taxa whose larvae are unknown to science are not keyed. All key characters are based on literature, no new distinguishing morphological data are presented and known larvae are described. The key constitutes an important systematic tool for the study of biodiversity of the dragonflies in the Cuban archipelago." (Authors)] Address: Naranjo Ló-

pez, C., Departamento de Biología. Universidad de Oriente. Patricio, Lumumba s/n. C.P. 90500. Santiago de Cuba, Cuba. E-mail: naranjo@jcnl.uo.edu.cu

9707. Schorr, M. (2008): Die Libellen des Mt Dulit, Borneo, Sarawak, Malaysia – revisited. Spendenaufwurf des International Dragonfly Fund e.V.. IDF-Report 13: 29-32. (in German) [Plea for donations to support an odonatological expedition organised by Rory Dow, UK to the Dulit region.] Address: Schorr, M., Schulstr. 7B, 54314 Zerf, Germany. E-mail: bierschorr@online.de

9708. Silina, A.E.; Prokin, A.A. (2008): The trophic structure of macrozoobenthos in marsh water bodies of the forest-steppe zone. *Inland Water Biology* 1(3): 231-240. (in English) [The trophic structure of macrozoobenthos was studied in a lake and three marshes of different succession stages in a secondary steppe of the Zorinsky part of the Central Chernozem Reserve. Odonata are treated at the genus level. Original Russian Text © A.E. Silina, A.A. Prokin, 2008, published in *Biologiya Vnutrennikh Vod*, No. 3, 2008, pp. 35–44] Address: Silina, A.E., Voronezh State University, pl. Universitetskaya 1, Voronezh, 394600 Russia. E-mail: allasilina@list.ru

9709. Tavares, J.P. (2008): Die Falken der einsamen Inseln. *Der Falke* 55(11): 413-418. (in German) [General note on *Falco eleonorae*'s diet, which also includes Odonata.] Address: not stated

9710. Termaat, T. (2008): Hulp bij het determineren van libellen Glazenmakers. *Vlinders* 4 2008: 21-23. (in Dutch) [Detailed notes on field characteristics of the members of the genera *Aeshna* and *Brachytron* occurring in the Netherlands.] Address: Termaat, T., Rijnsteeg 8-10a, 6708 PP Wageningen, The Netherlands

9711. Termaat, T. (2008): Hulp bij het determineren van libellen Heidelibellen. *Vlinders* 3 2008: 20-21. (in Dutch) [Detailed notes on field characteristics of the members of the genus *Sympetrum* occurring in the Netherlands.] Address: Termaat, T., Rijnsteeg 8-10a, 6708 PP Wageningen, The Netherlands

9712. Termaat, T. (2008): Libellenet online! *Vlinders* 4 2008: 24-25. (in Dutch) [The web page of the Dutch dragonfly watchers was launched: <http://www.libellenet.nl/>] Address: Termaat, T., Rijnsteeg 8-10a, 6708 PP Wageningen, The Netherlands

9713. Trapero Quintana, A.D.; Torres Cambas, Y. (2008): Actualización sistemática de la odonofauna cubana (Insecta: Odonata). *Cocuyo* 17: 25-28. (in Spanish, with English summary) ["This paper updates the Cuban list of the Odonata to 85 species grouped in seven families and 42 genera. *Protoneura viridis* Westfall, 1964, *Erythrodiplax bromeliicola* Westfall 2000, *Macrothemis inequiunguis* Calvert 1895, *Orthemis discolor* (Burmeister 1839) and *Telebasis vulnerata* (Hagen 1861) are considered new records. *E. bromeliicola* and *M. inequiunguis* were reported by foreign authors on surveys from the last century. Endemism remains with five species from suborder Zygoptera while 11 species were changed to different genera." (Authors)] Address: Trapero Quintana, A.D., Depto de Biología. Universidad de Oriente. Patricio, Lumumba s/n. C.P. 90500. Santiago de Cuba, Cuba. E-mail: atrapero@cnuo.edu.cu; traperoquintana76@yahoo.es

9714. Wang, J.Z. (2008): Dragonfly flight. *Physics Today* (October 2008): 74-75. (in English) [Introduction into biophysics of flight in planes and dragonflies.] Ad-

dress: Wang, Z. Jane, Theoretical and Applied Mechanics, Cornell University, Ithaca, New York 14853, USA. E-mail: z.jane.wang@cornell.edu

2009

9715. Allen, K. (2009): The ecology and conservation of threatened damselflies. Integrated catchment science programme. Science report: SC040027/SR1: VII, 142 pp. (in English) ["Background: This report presents the results of an autecological study of *Ischnura pumilio* in south-west England. *I. pumilio* has a sparse, localised distribution in the UK and is classed as "scarce" in the British Red Data Book of Insects. The aim of this study was to raise the ecological understanding of this species to a similar level to that of other threatened odonates such as *Coenagrion mercuriale* with a view to better informing its conservation management. Fieldwork was conducted in the New Forest, Hampshire and at a variety of sites throughout Cornwall and Devon. Main objectives: The primary aim of this study was to examine the dispersal potential, survival rates, population sizes and habitat requirements of *I. pumilio* in the south of England. Similar work on other species, such as *C. mercuriale*, has been useful in guiding conservation efforts, but there are very few studies of *I. pumilio*. It is hoped that this study will inform conservation management and allow more effective monitoring and surveillance of this species. Results: Intensive mark-release-recapture (MRR) studies were conducted at two sites during 2005 and 2006. These revealed that, despite a reputation as long range dispersers, *I. pumilio* were generally very sedentary with movement characteristics similar to those of other similar sized odonates. No movement between sites was recorded and 88 per cent of individuals moved less than 50m (net) in their lifetime. Movement distance was inversely dependent on population density, indicating a tendency to move towards conspecifics or areas of more suitable habitat. The presence of parasitic mites (*Hydryphantas* spp.) significantly increased movement distance. Males consistently moved further than females. Longer intervals between captures resulted in greater movement distances. Surveys of vegetation and environmental factors were conducted at 31 sites with *I. pumilio* records from the previous 10 years. The species occurred at sites with a range of water depths, management regimes and levels of pH, grazing, pollution and disturbance. Occupied habitats generally had slow-flowing water, some bare ground at the water's edge and low levels of shade. A low overall count for odonate species was also associated with the presence of *I. pumilio*. Areas away from water were found to be important for the species and over 30 per cent of matings were recorded at least 10m from water. Existing sites should be actively managed up to 25m from water, and new habitat created, where possible, with dispersal potential in mind. Survival and recapture rates for Scarce Blue-tailed Damselflies and *C. mercuriale* were estimated using single and multistate MRR modelling techniques. The resulting rates were used to estimate population sizes for *I. pumilio* populations surveyed in 2005 and 2006, and two *C. mercuriale* populations in south England surveyed during 2001 and 2002. Survival generally decreased with age and time in the season and a negative effect of parasites was also indicated. Removing a leg for genetic analysis was not found to affect survival. The sex of mature individuals had no, or negligible ef-

fect on their survival rates. *Ischnura pumilio* was found to exist in much smaller populations than *C. mercuriale* and so may suffer greater levels of inbreeding. A comparison of monitoring methods showed that transect walk estimates were a reliable method of estimating abundance and provided a good basis for further work to develop a predictive relationship. Conclusions and recommendations: Despite the strength of some UK populations, such as Latchmoor, *I. pumilio* still requires conservation management at sites that have poorer quality habitat and smaller populations. Many populations are isolated, based on the range of movements observed in this study, and without dispersal to augment genetic diversity even strong populations are at risk of developing high levels of inbreeding. This study has examined several aspects of the species' ecology and is the first large scale study of *I. pumilio* that has been conducted. This report presents estimates of dispersal potential, survival rates and habitat requirements and discusses these with respect to the species' conservation management. Key findings and recommendations include: • The species was found at sites with a range of water depths, management regimes and levels of pH, pollution, grazing and disturbance. However, sites generally had slow-flowing water, with some bare ground in and around the water's edge and were relatively open in terms of shade from tall vegetation. • Management of areas away from water should be incorporated into any habitat management plan, as different individuals may be present and may exhibit different behaviours. A buffer of 25m may be sufficient for the necessary roosting, mating and feeding requirements of *I. pumilio*. • A monitoring program to establish the current status of these and other key odonate sites across the UK would be beneficial. Monitoring of adult *I. pumilio* at existing sites may be achieved using transect walks, which are a useful method for large-scale monitoring. • The ability of *I. pumilio* to colonise newly formed habitat is still open to question. No long-range dispersal movements were recorded in this study and no upward flight behaviour was observed. • In this report, the estimated maximum population sizes for the two studies of *C. mercuriale* are among the highest recorded for any damselfly. However, *I. pumilio* populations were much smaller and as such may be more at risk of genetic effects such as inbreeding." (Author) Available at: <http://publications.environment-agency.gov.uk/pdf/SCHO0809BQVW-e-e.pdf> Address: Environment Agency, Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, BS32 4UD, UK. www.environment-agency.gov.uk; Allen, Kathrine, University of Liverpool Liverpool, L69 3BX, UK

9716. Becker, I.; Sigalas, V. (2009): Von Pfauen, Libellen und Fledermäusen - Geheimnisvolle Tierwelt im Jugendstil. Veröffentlichungen des Bröhan-Museums 14: 63 pp. (in German) [This is a catalogue directed to animals in art nouveau including two pages (14-15) on dragonflies.] Address: Bröhan-Museum, Landesmuseum für Jugendstil, Art Deco und Funktionalismus (1889–1939), Schloßstr. 1a, 14059 Berlin, Germany

9717. Bethoux, O.; De la Horra, R.; Benito, M.I.; Barrenechea, J.F.; Galán, A.B.; López-Gómez, J. (2009): A new triadotypomorphan insect from the Anisian (Middle Triassic), Buntsandstein facies, Spain. *Journal of Iberian Geology* 35(2): 179-184. (in English, with Spanish summary) ["The species *Rabru rubra* sp. nov., a new triadotypomorphan insect from the Iberian Ranges, is

described on the basis of a newly discovered specimen, found in fine grained sandstones of alluvial origin, in the lowermost part of the Eslida Formation (Buntsandstein facies), in the central part of the Iberian Ranges. The occurrence of a triadotypomorphan suggests an Anisian age of the Eslida Formation. The species represents the oldest Mesozoic insect described from Spain, and provides interesting information to better appreciate the process of ecosystems recovery after the Permian-Triassic boundary crisis." (Authors) Odonatoptera] Address: Béthoux, O., Freiberg University of Mining and Technology, Institute of Geology, Department of Palaeontology, Bernhard-von-Cotta Str. 2, D-09596 Freiberg, Germany. E-mail: obethoux@yahoo.fr

9718. Borisov, S.N. (2009): Dragonflies (Odonata) of a thermal spring in «Altyn Emel» Nature Park (South East Kazakhstan). *Euroasien entomological journal* 8(3): 362. (in Russian, with English summary) [*Ischnura elegans*, *I. pumilio*, *Orthetrum brunneum*, and *O. anceps* are newly recorded from a thermal spring (t=32 °C) of Altyn Emel National Park in South-East Kazakhstan (43.921° N, 78.793° E).] Address: Borisov, S.N., Siberian Zoological Museum, Institute of Systematics and Ecology of Animals, Russian Academy of Sciences, Siberian Branch, Frunze str. 11, Novosibirsk 630091 Russia. E-mail: borisov-s-n@yandex.ru

9719. Bouwman, J.; Groenendijk, D.; Termaat, T.; Platte, C. (2009): Dutch Dragonfly Monitoring Scheme. A Manual. Report number VS2009.015, Dutch Butterfly Conservation, Wageningen & Statistics Netherlands, Den Haag, Netherlands: 21 pp. (in English) [Handout with detailed instructions to choose a transect, count and document specimens, and supply data to the Dutch organisers.] Address: Bouwman, J.H., Vlinderstichting, Postbus 506, NL-6700 AM Wageningen, The Netherlands. E-mail: jaap.bouwman@vlinderstichting.nl

9720. Burkart, W.; Kappes, E.; Kappes, W.; Martens, A.; Weihrauch, F. (2009): In memoriam Wolfgang Lopau (29. März 1938-29. Juli 2009). *Libellula* 28(3/4): 221-232. (in German, with English summary) ["Wolfgang Lopau, better known to most of his friends as 'Lopi', was without doubt the worldwide acknowledged authority on the Odonata of Greece and surrounding regions. In this obituary his life is portrayed, and his professional impact on international odonatology as well as the spirit of co-operation and friendship in his work is emphasized. A list of Lopi's odonatological publications is appended." (Authors)] Address: Burkart, W., Am Emel 7, D-27412 Wilstedt, Germany. E-mail: weguburkart@gmx.de

9721. Catling, P.M. (2009): Dragonflies (Odonata) emerging from brackish pools in saltmarshes of Gaspé, Quebec. *Canadian Field-Naturalist* 123(2): 176-177. (in English) ["*Enallagma hageni*, *Lestes disjunctus*, *Sympetrum costiferum*, *S. danae*, *S. internum*, and *S. obtrusum* were observed emerging from brackish pools with an overall salinity range of 6.0–17.3 ppt in three saltmarshes in Gaspé, Quebec. *Lestes* congener, *Libellula quadrimaculata*, and species of *Sympetrum* were prominent among the larvae in these pools." (Author)] Address: Catling, P.M., 170 Sanford Avenue, Ottawa, Ontario K2C 0E9 Canada; E-mail: catlingp@agr.gc.ca

9722. David, S.; Smiga, M. (2009): Dragonflies (Insecta: Odonata) of Považské podolie region in the vicinity of the town of Trenčín. *Folia faunistica Slovaca* 14(16): 107-112. (in Slovakian, with English summary) [Slovakia; between 2002 until 2004, 21 Odonata species were

found at 11 localities studied. Dominant species were *Ischnura elegans*, *Platycnemis pennipes*, *Orthetrum albistylum*, and *O. cancellatum*. The community of Odonata was classified as *Orthetrum – Libellula depressa* odonatocenosis.] Address: David, S., Katedra ekológie a environmentalistiky, Fakulta prírodných vied, Univerzita, Konštatná Filozofa v Nitre, Tr. A. Hlinku 1, SK – 949 74 Nitra, Slovakia. E-mail: stanislav.david@savba.sk

9723. Eggers, T.O.; Martens, A. (2009): Limnische Neozoa in Deutschland: Verbreitungsmuster und Ausbreitungstrends. Deutsche Gesellschaft für Limnologie (DGL). Erweiterte Zusammenfassungen der Jahrestagung 2008 (Konstanz), Hardegsen 2009 : 378-381. (in German) [*Gomphus pulchellus* is considered to have spread along canals ("Hauptmigrationsachse") and nearby situated gravel pits from west to east. Annotation (Martin Schorr): Range extension of *G. pulchellus* is without any doubt, however it is questionable if this expansion was triggered by canals. The later did not exist (with one exception only - Mittellandkanal) and were realised decades after the first records of the species east of the River Rhine.] Address: Martens, A., Abteilung Biologie, Pädagogische Hochschule Karlsruhe, Bismarckstr. 10, 76133 Karlsruhe, Germany. E-mail: martens@ph-karlsruhe.de

9724. Festi, A.; Nössing, T.; Winkler, F.; Werth, A. (2009): Erhebungen der Libellenfauna (Odonata) im Naturpark Trudner Horn (Südtirol, Italien). *Gredleriana* 9: 231-248. (in German, with English summary) ["The Odonata fauna of the area of the „Trudner Horn“ Natural Park (Parco Naturale Monte Corno), which is characterized from several still-water and moorland biotopes, was investigated during the summer of 2008. A total of 22 species of Odonata was identified. Most of those are considered typical generalists of the low mountains. The rarest species of the studied area are the specialized moorland dragonflies like *Aeshna caerulea*, *Leucorrhinia dubia*, *Somatochlora alpestris* and *S. arctica*. Those where found only in a few spots and are to be considered endangered in reason of a progressive loss of habitat due to a deterioration of the moorland biotopes." (Authors)] Address: Festi, A., Dreieheiligenstr. 24, I-39100 Bozen, Italy. E-mail: alex.festi@rol-mail.net

9725. Gilroy, J.J.; Anderson, G.Q.A.; Grice, P.V.; Vickery, J.A.; Watts, P.N.; Sutherland, W.J. (2009): Foraging habitat selection, diet and nestling condition in Yellow Wagtails *Motacilla flava* breeding on arable farmland. *Bird Study* 56(2): 221-232. (in English) ["Yellow Wagtails (Aves) showed seasonally variable foraging preferences, favouring field margin and crop habitats, although habitat availability did not influence brood productivity ... Samples taken in June tended to be dominated by flies and beetles (both adults and larvae) While flies continued to dominate the diet in July, beetles were much less prevalent, and adult damselflies became increasingly frequent in samples. It is not known whether this shift is associated with changes in foraging habitat preference, or the relative scarcity of damselflies across the whole study area prior to strong emergences of the commonest species *Enallagma cyathigerum*, and *Ischnura elegans* in late June. The ability to switch between prey items and/or foraging habitats can be important in multi-brooded species that face sharp seasonal peaks in the abundance of invertebrate taxa." (Authors)] Address: Gilroy, J.J., School of Biological

Sciences, University of East Anglia, Norwich, NR4 7TJ, UK. Email: james.gilroy@googlemail.com

9726. Goffart, P.; Devillers, C.; Bertrand, S. (2009): Observations récurrentes du Leste verdoyant (*Lestes virens*) dans la région de Spa-Malchamps: une population reproductrice s'y maintient-elle? *Les naturalistes Belges* 90(3-4): 47-54. (in French, with English summary) ["A male adult *Lestes virens* was captured near Spa, Liège province, in September 2006. A female probably belonging to this species was also observed. A second male individual was captured at the same place late August 2007. The possibility that a small relict breeding population is maintaining itself in the area seems most likely. But where does it hides and in what state is it (numbers)?" (Authors)] Address: Goffart, P., Observatoire de la Faune, de la Flore et des Habitats (OFFH), Département c/le l'Etude du Milieu naturel et agricole (DEMna) Service Public Wallon (SPW) - DGARNE - Direction de la Nature et de l'Eau. Avenue Maréchal Juin, 23 B-5030 Gembloux, Belgium. E-mail: Philippe.GOFFART@spw.wallonie.be

9727. Goffart, P. (2009): Nouvelle émergence du *Sympetrum méridional* (*Sympetrum meridionale*) en Wallonie. *Les naturalistes Belges* 90(3-4): 55-61. (in French, with English summary) ["The capture of a male Southern Darter (*Sympetrum meridionale*) currently emerging in the vegetation of a marl pool in the Belgian Lhotaringy (south of the Luxembourg province), Vance, August 6, 2007 is reported and commented. It is the third recent record (after 2000) of this species in Wallonia. This probably comes up in a wave of colonization, which reached the Netherlands in 2006. The species could be under-detected in our region because of its superficial resemblance with other darters widespread in our region. The diagnostic characters are recalled." (Author)] Address: Goffart, P., Observatoire de la Faune, de la Flore et des Habitats (OFFH), Département c/le l'Etude du Milieu naturel et agricole (DEMna) Service Public Wallon (SPW) - DGARNE - Direction de la Nature et de l'Eau. Avenue Maréchal Juin, 23 B-5030 Gembloux, Belgium. E-mail: Philippe.GOFFART@spw.wallonie.be

9728. Ichinose, T.; Ishi, J.; Morita, T. (2009): Relationship between distribution of Odonata species and environmental factors on the irrigation ponds in Awaji Island, central Japan, analyzing spatial autocorrelation. *Journal of rural planning association* 27(special issue): 191-196. (in Japanese, with English summary) ["Odonata were surveyed from May to October 2002 at 38 small irrigation ponds in the northern part of Awaji Island, Japan. The investigation was conducted nine times on each pond. A total of 1568 individuals from 28 species was recorded. We selected nine species with at least 40 individuals recorded, and correlated them with environmental factors, as conductivity, NO_2 , NO_3 , NH_4 , PO_4^{3-} , COD, surrounding land uses within 50 meters from the edge of pond, the number of aquatic water plant species, and autocovariates explaining spatial autocorrelation, using Generalized Linear Models (GLM). The result showed that NO_3 , COD, surrounding grassland, woodland and the number of water plant species were critical factors for the distribution of some Odonata species." (Authors)] Address: Ichinose, T., Fac. of Environment and Information Studies, Keio University, Japan

9729. Ivinskis, P.; Rimšaitė, J. (2009): Odonata of Purvinas wetland in eastern Lithuania. *Acta Biol. Univ. Daugavp.* 9(1): 39-42. (in English) [Between 2005-2007

36 odonate species were recorded in the in northeast-ern part of Lithuania in Purvinas wetland. The list of records includes rare species as *Nehalennia speciosa*, *Coenagrion armatum*, *Sympecma paedisca*, *Somatochlora flavomaculata*, *Leucorrhinia pectoralis* and *L. albifrons*.] Address: Ivinskis, P., Jolanta Rimšaite. Institute of Ecology of Vilnius university, Akademijos 2, LT – 08412, Vilnius, Lithuania. E-mail: entlab@centras.lt

9730. Jarju, L.B.S.; Fillinger, U.; Green, C.; Louca, V.; Majambere, S.; Lindsay, S.W. (2009): Agriculture and the promotion of insect pests: rice cultivation in river floodplains and malaria vectors in The Gambia. *Malaria Journal* 8(1): 12 pp. (in English) ["Background: Anthropogenic modification of natural habitats can create conditions in which pest species associated with humans can thrive. In order to mitigate for these changes, it is necessary to determine which aspects of human management are associated with the promotion of those pests. *Anopheles gambiae*, the main Africa malaria vector, often breeds in rice fields. Here the impact of the ancient practice of 'swamp rice' cultivation, on the floodplains of the Gambia River, on the production of anopheline mosquitoes was investigated. Methods: Routine surveys were carried out along 500 m transects crossing rice fields from the landward edge of the floodplains to the river during the 2006 rainy season. Aquatic invertebrates (including 'Zygoptera' and 'Anisoptera') were sampled using area samplers and emergence traps and fish sampled using nets. Semi-field experiments were used to investigate whether nutrients used for swamp rice cultivation affected mosquito larval abundance. Results: At the beginning of the rainy season rice is grown on the landward edge of the floodplain; the first area to flood with fresh water and one rich in cattle dung. Later, rice plants are transplanted close to the river, the last area to dry out on the floodplain. Nearly all larval and adult stages of malaria vectors were collected 0–100 m from the landward edge of the floodplains, where immature rice plants were grown. These paddies contained stagnant freshwater with high quantities of cattle faeces. Semi-field studies demonstrated that cattle faeces nearly doubled the number of anopheline larvae compared with untreated water. Conclusion: Swamp rice cultivation creates ideal breeding sites for malaria vectors. However, only those close to the landward edge harboured vectors. These sites were productive since they were large areas of standing freshwater, rich in nutrients, protected from fish, and situated close to human habitation, where egg-laying mosquitoes from the villages had short distances to fly. The traditional practice of 'swamp rice' cultivation uses different bodies of water on the floodplains to cultivate rice during the rainy season. A consequence of this cultivation is the provizion of ideal conditions for malaria vectors to thrive. As the demand for locally-produced rice grows, increased rice farming will generate great numbers of vectors; emphasizing the need to protect local communities against malaria." (Authors)] Address: Lindsay, S.W., School of Biological and Biomedical Sciences, Durham University, Durham, UK, E-mail: Steve.Lindsay@lshtm.ac.uk

9731. Jongerius, S.R.; Lentink, D. (2009): Structural analysis of a dragonfly wing. *Experimental Mechanics* 50(9): 1323-1334. (in English) ["Dragonfly wings are highly corrugated, which increases the stiffness and strength of the wing significantly, and results in a lightweight structure with good aerodynamic performance.

How insect wings carry aerodynamic and inertial loads, and how the resonant frequency of the flapping wings is tuned for carrying these loads, is however not fully understood. To study this we made a three-dimensional scan of a dragonfly (*Sympetrum vulgatum*) fore- and hindwing with a micro-CT scanner. The scans contain the complete venation pattern including thickness variations throughout both wings. We subsequently approximated the forewing architecture with an efficient three-dimensional beam and shell model. We then determined the wing's natural vibration modes and the wing deformation resulting from analytical estimates of 8 load cases containing aerodynamic and inertial loads (using the finite element solver Abaqus). Based on our computations we find that the inertial loads are 1.5 to 3 times higher than aerodynamic pressure loads. We further find that wing deformation is smaller during the downstroke than during the upstroke, due to structural asymmetry. The natural vibration mode analysis revealed that the structural natural frequency of a dragonfly wing in vacuum is 154 Hz, which is approximately 4.8 times higher than the natural flapping frequency of dragonflies in hovering flight (32.3 Hz). This insight in the structural properties of dragonfly wings could inspire the design of more effective wings for insect-sized flapping micro air vehicles: The passive shape of aeroelastically tailored wings inspired by dragonflies can in principle be designed more precisely compared to sail like wings —which can make the dragonfly-like wings more aerodynamically effective." (Authors)] Address: Lentink, D., Faculty of Aerospace Engineering, Delft University of Technology, 2600 GB Delft, The Netherlands. E-mail: david.lentink@wur.nl

9732. Lafontaine, R.-M.; de Schaetzen, R. (2009): Que s'est-il passé depuis l'an 2000 pour les libellules méridionales en Wallonie et à Bruxelles? *Les naturalistes Belges* 90(3-4): 33-46. (in French, with English summary) ["A previous study showed that at the end of last century southern species of dragonflies were seen more regularly in Wallonia and Brussels. Data collected since then show, first, installation confirmed for all species during the 2000s and, secondly, a good correlation between changes in the number of observations and mean annual temperatures. This development, which can be regarded as favourable, is discussed and put into perspective." (Authors)] Address: Lafontaine, René-Marie, 'Unité Biologie de ja Conservation, Institut royal des Sciences naturelles de Belgique, Rue Vautier 29, B-1000 Bruxelles, Belgium. E-mail: rene-marie.lafontaine@sciencesnaturelles.be

9733. Leong, T.M.; Tay, S.L. (2009): Encounters with *Tetracanthagyna plagiata* (Waterhouse) in Singapore, with an observation of oviposition (Odonata: Anisoptera: Aeshnidae). *Nature in Singapore* 2: 115-119. (in English) ["One of the females was spotted flying low (waist level) over a sandy forest stream, perched on a moss-covered, decomposing log beside the stream and began to arch its abdomen in order to insert its ovipositor into the soft, moist wood. The female deliberately scraped an dug into the branch for over a minute, after which it flew off downstream." (Authors)] Address: Leong, T.M., Central Nature Reserve, National Parks Board. 601 Island Club Road, Singapore 57S775. E-mail: leongtziming@nparks.gov.sg

9734. Liang, Z.; Dong, H. (2009): Computational study of wing-wake interactions between ipsilateral wings of dragonfly in flight. *American Institute of Aeronautics and*

Astronautics Paper 2009-4192: 7 pp. (in English) ["Bilateral and ipsilateral wing-wing interactions can be commonly observed in insect flights. As a representative example of ipsilateral wing-wing interaction, dragonflies in flight have been widely studied. It has been discovered that they utilize changes of phase between ipsilateral forewings and hindwings at different kinds of flying mode. In the current study, we present a direct numerical simulation of a modeled dragonfly in slow flight as reported in Azuma et al (1985). Realistic morphologies of wing, body, and kinematics are used for maximum including wing and body features of a dragonfly. This work aims to study the relations between waketopology and aerodynamic performance due to wing-wing and wing-wake interactions of dragonfly ipsilateral wings. Current high fidelity numerical results are also compared with lowerfidelity aerodynamic modeling method discussed in Azuma et al (1985).] Address: Dong, H., Department of Mechanical & Materials Engineering, Wright State University, Dayton, OH 45435, USA. E-mail: haibo.dong@wright.edu.

9735. Liu, T.J.-C.; Wang, L.-J.; Liu, W.-C.; Wu, H.-C. (2009): Biomechanical analyses of hind wing of dragonfly. *Journal of Advanced Engineering* 4(1): 19-24. (in Chinese, with English summary) ["The purpose of this paper is to investigate the deformation and bending stiffness of the hind wing of the dragonfly *Anax panybeus*. Using the finite element analysis, the results show that the membrane almost provides no contributions for the bending stiffness. But the smallest veins have contributions to support the wing. From the results due to the wind pressure, the maximum stress occurs at the corrugation region in the middle of the wing." (Authors)] Address: Liu, T.J.-C., Dept of Mechanical Engineering, Ming Chi Univ. of Technology, Taishan, Taipei, Taiwan, R.O.C. E-mail: jinchee@mail.mcut.edu.tw

9736. Maiolini, B.; Carolli, M. (2009): Odonata in Trentino (NE-Italy): historical and recent data. *Studi Trentini di Scienze Naturali, Acta Biologica* 84: 11-18. (in English, with Italian summary) ["The historical presence of Odonata in Trentino was reconstructed using data from the collections of the Natural Science Museum of Trento and from existing literature. Recent (2006-2007) observations by the authors in selected biotopes were conducted to start an updated list of species for the Trento Province. Odonata are one of the most interesting invertebrate taxa due to their ecological and trophic features, which allow their use as good and useful indicators of the ecological quality of freshwater biotopes and their neighbouring areas, and of the impact of human activities. The updated database (1699 records) comprises 64 species (77% of the Italian species). Large part of the records regarded lowland areas, but altitudinal preferences in some Odonata species was evident. The database comprises common and widespread species, as *Aeshna juncea*, *A. cyanea*, *Platycnemis pennipes*, *Ischnura elegans*, *Sympetrum striolatum* and *Coenagrion puella*. Rare species were represented by *Epiptera bimaculata*, *C. ornatum*, *Sympetma paedisca*, *Leucorrhinia pectoralis*, *Ophiogomphus cecilia*, *Somatochlora flavomaculata*, *Sympetrum depressiusculum*. Some of these were recorded before the 50's only in floodplain wetlands of the Adige Valley, which were claimed in the second half of last century, thus causing a local extinction. Recent and spatially limited observations allowed recording the presence of 24 species." (Authors)] Address: Maiolini, B., Sezione di

Zoologia degli Invertebrati e Idrobiologia, Museo Tridentino Scienze Naturali, Via Calepina 14, 38122 Trento, Italia. E-mail: maiolini@mtsn.tn.it

9737. Miller, F.P.; Vandome, A.F.; Mcbrewster, J. (2009): *Insect Wing*. Alphascript Publishing. ISBN: 6130242862: 168 pp. (in English) [Articles taken from Wikipedia (and including a few references to Odonata), poorly arranged (e.g. very small letter types), and sold for maximum profit purposes. Before buying this book, you should order a display copy.]

9738. Nakamura, M.; Okamiya, T.; Hasegawa, M.; Hasegawa, M. (2009): Cooperative breeding in the endemic Madagascan Chabert's Vanga *Leptopterus chabert*. *Ornithological Science* 8: 23-27. (in English) ["To examine the breeding system of the endemic Madagascan Chabert's Vanga *Leptopterus chabert* (Aves), we studied the contributions made by adults to nest building, incubating, brooding, and feeding the young at six nests. The study was conducted during November and December in 1999, 2000, and 2005 at Ankara-fantsika Strict Nature Reserve. During the nest-building stage, two adults (perhaps a heterosexual pair) delivered nest materials. Two adults participated in incubating and brooding. During the nestling period, several (3-4) adults delivered food (mainly bees, dragonflies, and moths) to the nestlings at two nests. They also mobbed animals that approached the nest. During the post-fledging period, several (3-4) adults fed the fledglings in two family groups. These observations suggest that Chabert's Vangas are cooperative breeders in which several adults feed the young of one brood." (Authors)] Address: Nakamura, M., Laboratory of Animal Ecology, Department of Biology, Joetsu University of Education, 1 Yamayashiki-machi, Joetsu, Niigata 943-8512, Japan

9739. Oliveira, D.E.; De Marco Jr., P. (2009): Is there a trade-off between the melanin allocated to the immune system and to camouflage on larvae of the dragonfly *Micrathyria catenata* Calvert, 1909 (Odonata: Libellulidae)? *Neotropical Biology and Conservation* 4(3): 133-136. (in English, with Portuguese summary) ["In insects, the immune system responds to the presence of antigens involving them in melanin. However, the melanin is also allocated into the exoskeleton's pigmentation, used to camouflage. We aimed to test the existence of a trade-off between the allocation of melanin to the immune system and to camouflage on the larvae of *Micrathyria catenata*. We conducted the study in the Reserva do km 41, 80 kilometer distant from Manaus, Amazonas, Brazil. We implanted a nylon line into the abdomen of 30 larvae and observed if had or not deposition of melanin in the line. We counted the number of individuals who responded to implant depositing melanin and, later, we took photos of the larvae's heads and calculate gray intensity. We used a t test for independent samples. 76% of larvae responded to treatment depositing melanin on the implants. There were no significant differences in the intensity of gray between the larvae that responded to the implants and those who did not responded. There is no trade-off to allocation of melanin for camouflage and for the immune system. This should happen because the immune system is not limited by the acquisition of resources or the camouflage's demand for melanin is not enough to influence the immune system." (Authors)] Address: De Marco, P., Laboratorio Ecologia Teorica e Sintese, Departamento de Biologia Geral, Universidade Federal de Goias, BR-

74001-970, Goiania, GO, Brazil. E-mail: pdemarco@icb.ufg.br

9740. Perchard, R.; Long, R. (2009): The rediscovery of Dainty Damselfly *Coenagrion scitulum* (RAMB.) in Jersey. *Atropos* 38: 3-5. (in English) [UK; La Rocque, south-eastern corner of Jersey, 16-VI-2009; Grands Vaux, 6km north-west of La Rocque, 7-VII-2009] Address: Perchard, R., 4 New Road, Gorey Village, St Martin, Jersey, JE3 6UN, UK

9741. Phoenix, J.; Hentschel, W. (2009): Die Hochmoore um Prebuz/Frühbuss, Rolava/Sauersack und Jelení/Hirschenstand (Erzgebirge) – bedeutsame Lebensräume für moorgebundene Libellenarten. *Sborník Oblastního muzea v Moste, rada přírodovědná* 31: 31-42. (in German and Czech, with English summary) ["The raised bogs on top of the western part of the Iron Mountains, situated in the communities of Prebuz, Rolava and Jelení are important habitats for dragonflies. In the years 2005 – 2009 the occurrence of species confined to bogs as *Aeshna subarctica elisabethae*, *Somatochlora alpestris* and *S. arctica* have been recorded in this bogland for the first time. The suggestion to preserve this bogland in an expanded scale is also of use to dragonfly protection. In the context with climate change a long-term monitoring of dragonflies is recommended." (Authors)] Address: Phoenix, J., Goethestr. 22, 01824 Königstein, Germany. E-mail: juergen.phoenix@t-online.de

9742. Pick, C.; Schneuer, M.; Burmester, T. (2009): The occurrence of hemocyanin in Hexapoda. *FEBS J.* 276(7): 1930-1941. (in English) ["Hemocyanins are copper-containing, respiratory proteins that have been thoroughly studied in various arthropod subphyla. Specific O(2)-transport proteins have long been considered unnecessary in Hexapoda (including Insecta), which acquire O(2) via an elaborate tracheal system. However, we recently identified a functional hemocyanin in the stonefly *Perla marginata* (Plecoptera) and in the firebrat *Thermobia domestica* (Zygentoma). We used RT-PCR and RACE experiments to study the presence of hemocyanin in a broad range of ametabolous and hemimetabolous hexapod taxa. We obtained a total of 12 full-length and 5 partial cDNA sequences of hemocyanins from representatives of Collembola, Archeognatha, Dermaptera, Orthoptera, Phasmatodea, Mantodea, Isoptera and Blattaria. No hemocyanin could be identified in Protura, Diplura, Ephemeroptera, Odonata, or in the Eumetabola (Holometabola + Hemiptera). It is not currently known why hemocyanin has been lost in some taxa. Hexapod hemocyanins usually consist of two distinct subunit types. Whereas type 1 subunits may represent the central building block, type 2 subunits may be absent in some species. Phylogenetic analyses support the Pancrustacea hypothesis and show that type 1 and type 2 subunits diverged before the emergence of the Hexapoda. The copperless insect storage hexamerins evolved from hemocyanin type 1 subunits, with *Machilis germanica* (Archeognatha) hemocyanin being a possible 'intermediate'. The evolution of hemocyanin subunits follows the widely accepted phylogeny of the Hexapoda and provides strong evidence for the monophyly of the Polyneoptera (Plecoptera, Dermaptera, Orthoptera, Phasmatodea, Mantodea, Isoptera, Blattaria) and the Dictyoptera (Mantodea, Isoptera, Blattaria). The Blattaria are paraphyletic with respect to the termites." (Authors)] Address: Burmester, T., Biozentrum Grindel und Zoologisches Museum, Universi-

tät Hamburg, Hamburg, Germany. E-mail: thorsten.burmester@uni-hamburg.de.

9743. Pivko Knežević, A. (2009): The evaluation of the effect of sewage treatment plant Celje on the river Savinja regarding longitudinal changes of macroinvertebrate community. Graduation thesis (University studies), University of Ljubljana, Biotechnical faculty, Dept. of Biology: 82 pp, 3 app. (in Slovenian, with English summary) ["The aim of our research was to evaluate effect of Central sewage treatment plant Celje (CSPC) on the river Savinja, Slovenia. We assumed that because of its nutrient content, discharge of CSPC causes changes in the number, diversity and structure of macroinvertebrate community in the river. We measured physical, chemical and biological parameters and sampled macroinvertebrates three times at three different locations (location Polule upstream of the CSPC and locations Tremerje and Laško downstream of the CSPC). We determined 80 taxa of macroinvertebrates. The values of Shannon – Wiener index of diversity showed high diversity at all tree researched locations. Values were the highest at location Tremerje, where also the most taxa were present. High diversity at location Tremerje was probably consequence of diverse substrat in the river bed. Saprobic index (SI) was low due to high aeration of water. Referring to values of SI, we can classify the studied part of river Savinja ti the 1. – 2. quality class. Value of SI was slightly increasing down the stream (from Polule to Laško). Analysis of macroinvertebrate functional feeding groups showed dominancy of detritivores, followed by grazers, miners, filtrators and predators. Cluster analysis of data showed that temporal differences were bigger than spatial differences. Seasonal impacts affected macroinvertebrate community more than environmental variables at different locations." (Author) The study includes the following odonate species: *Calopteryx splendens*, *Platycnemis pennipes*, *Gomphus vulgatissimus*, and *Onychogomphus f. forcipatus*.] Address: Pivko Knežević, Alijana, University of Ljubljana, Biotechnical faculty, Dept. of Biology, SI – 1000 Ljubljana, Večna pot 111, Slovenia

9744. Reels, G.T. (2009): Dragonfly emergence at a small newly-created pond in Hong Kong. *Hong Kong Entomological Bulletin* 1(2): 32-37. (in English) ["Dragonfly emergence was monitored at a small (0.02ha) pond in Hong Kong from March 2004 to July 2005. The pond was created in late 2003, with emergent vegetation established along the margin. Dragonfly exuviae were much more abundant in 2004 (597 exuviae in 12 species) than in 2005 (49 exuviae in three species). Exuviae abundance was highest in March in 2004; April in 2005. In 2004, exuviae were recorded until September; in 2005, they were not recorded after May. Exuviae were estimated to have an average persistence of 3.4 days in the field. Emergence patterns varied between species. Most aeshnids and libellulids emerged in March and April 2004, although *Anax guttatus* had a second pulse of emergence in June 2004; *Sinictinogomphus clavatus* and *Ictinogomphus pertinax* (Gomphidae), and *Epopthalmia elegans* (Corduliidae) were late emergers in 2004. Their exuviae first appearing in June or July. The two gomphid species emerged in greater numbers in April and May 2005. The dramatic decline of emergence in 2005 was probably due to the growth and proliferation of predatory fish in the pond. More dragonfly species were recorded as adults than as exuviae, suggesting adult immigration. Surveys of

adult dragonflies alone may not give a completely accurate impression of the value of particular ponds for breeding dragonflies." (Author)] Address: Reels, G.T., H-3-30 Fairview Park, Yuen Long, N.T. Hong Kong. E-mail: gtreels@cyberdude.com

9745. Rehfeld, G.; Bachmann, V. (2009): Renaturierung der Schunteraue im Flurbereinigungsgebiet Hondelage/Dibbesdorf: Monitoring von Libellen und Amphibien. LaReG, Braunschweig: 29 pp. (in German) [Twenty three Odonata species have been recorded for the period 2007-2008 at the Schunter and its oxbow, Braunschweig, Niedersachsen, Germany.] Address: Rehfeldt, G., Zool. Inst. TU Braunschweig, Fasanenstr. 3, 38092 Braunschweig, Germany. E-mail: G.Rehfeldt@tu-bs.de

9746. Strausfeld, N.J.; Sinakevitch, I.; Brown, S.M.; Farris, S.M. (2009): Ground plan of the insect mushroom body: functional and evolutionary implications. *J. Comp. Neurol.* 513(3): 265-291. (in English) ["In most insects with olfactory glomeruli, each side of the brain possesses a mushroom body equipped with calyces supplied by olfactory projection neurons. Kenyon cells providing dendrites to the calyces supply a pedunculus and lobes divided into subdivisions supplying outputs to other brain areas. It is with reference to these components that most functional studies are interpreted. However, mushroom body structures are diverse, adapted to different ecologies, and likely to serve various functions. In insects whose derived life styles preclude the detection of airborne odorants, there is a loss of the antennal lobes and attenuation or loss of the calyces. Such taxa retain mushroom body lobes that are as elaborate as those of mushroom bodies equipped with calyces. Antennal lobe loss and calycal regression also typify taxa with short nonfeeding adults, in which olfaction is redundant. Examples are cicadas and mayflies, the latter representing the most basal lineage of winged insects. Mushroom bodies of another basal taxon, the Odonata, possess a remnant calyx that may reflect the visual ecology of this group. That mushroom bodies persist in brains of secondarily anosmic insects suggests that they play roles in higher functions other than olfaction. Mushroom bodies are not ubiquitous: the most basal living insects, the wingless Archaeognatha, possess glomerular antennal lobes but lack mushroom bodies, suggesting that the ability to process airborne odorants preceded the acquisition of mushroom bodies. Archaeognathan brains are like those of higher malacostracans, which lack mushroom bodies but have elaborate olfactory centers laterally in the brain." (Authors) Two dragonfly species: *Calopteryx splendens*, *Libellula depressa* and one mayfly species: *Potamanthus luteus* were collected near streams and rivers in the vicinity of Würzburg, Bayern, Germany. *Perithemis tenera* (Odonata) and Japanese beetles (*Popillia japonica*, *Scarabaeidae*, *Coleoptera*) were collected in the Morgantown, West Virginia, region, USA.] Address: Strausfeld, N.J., Arizona Research Laboratories, Division of Neurobiology, University of Arizona, Tucson, Arizona 85721, USA. E-mail: flybrain@neurobio.arizona.edu

9747. Strickland, G.; Strickland, J. (2009): Damsellies of Louisiana. The Entomology Club at Louisiana State University: 65 pp. (in English) ["The Odonata have been treated in many wonderful technical and popular guides at both the national and regional levels. Many of these guides provide detailed accounts of each species, including range maps, habitat information, and keys for

species identification. Style of illustration varies from guide to guide, but often photographs of specimens in situ are used. Although these photos are aesthetically pleasing, important characters for species level identification are frequently sacrificed in the process. In addition, the specimen's true life size can be hard to determine. Because of constraints placed on the size of the field guides, photos of specimens showing individual variation due to sex, age, etc. are typically only included when this variation is extreme. This book is not meant to replace other books, but to be used as a local and regional supplement to a field guide of your choice. [...] Gayle and Jeanell Strickland have worked tirelessly to compile each of these species plates. The checklist was compiled by Bill Mauffray. The main purpose of this book is to make Gayle and Jeanell's photographic plates available to a wider audience and especially to aspiring students of the Odonata. We are grateful for their peerless contributions to highlighting the fauna of Louisiana and allowing us to produce this book from their work." (Editors) The authors use a scanner to produce their brilliant figures. The method is introduced in detail. Supplemental material can be accessed at: <http://members.fotki.com/gstrick3/>] Address: Gayle & Jeanell Strickland, Baton Rouge LA, USA. E-mail: gstrick3@cox.net

9748. Termaat, T. (2009): Hulp bij het determineren van libellen. *Pantserjuffers*. *Vlinders* 3/2009: 16-18. (in Dutch) [Detailed notes on field characteristics of the Lestidae (*Lestes dryas*, *L. sponsa*, *L. virens*, *L. barbarus*, *Chalcolestes viridis*) occurring in the Netherlands.] Address: Termaat, T., Rijnsteeg 8-10a, 6708 PP Wageningen, The Netherlands

9749. Termaat, T. (2009): Hulp bij het determineren van libellen Blauwe waterjuffers. *Vlinders* 2/2009: 12-14. (in Dutch) [Detailed notes on field characteristics of *Enallagma cyathigerum* and the species of the genus *Coenagrion* occurring in the Netherlands] Address: Termaat, T., Rijnsteeg 8-10a, 6708 PP Wageningen, The Netherlands

9750. Utz, R.M.; Hilderbrand, R.H.; Boward, D.M. (2009): Identifying regional differences in threshold responses of aquatic invertebrates to land cover gradients. *Ecological Indicators* 9(3): 556-567. (in English) ["Conversion of land from natural to urban or agricultural cover degrades stream ecosystems and results in loss of biodiversity. We compared cumulative frequency distributions to measure responses to land use gradients for aquatic invertebrate taxa to agricultural, urban, and impervious surface cover gradients across the state of Maryland, USA. The technique identifies the upper limit threshold above which taxa cease to occur as well as a lower limit of detection of effect for negatively affected taxa. Urban development and impervious surface cover negatively affected the distributions of 44-56% of the 180 taxa tested, depending on region. Across similar taxa, negative responses occurred at lower levels of urban land covers in the Piedmont compared to the Coastal Plain physiographic province, which suggests that Piedmont aquatic biodiversity may be more vulnerable to urbanization. Most taxa were capable of tolerating high levels of agricultural development, although a number of common taxa in the Coastal Plain and Highlands regions were found to be agriculture-sensitive. Some taxa traditionally used as indicators were tolerant of very high levels of human-altered land uses, suggesting that such taxa require

examination prior to use as indicators of landscape stressors. Our analysis method appears to be sufficiently flexible and sensitive to be used for a variety of taxa and systems for stressor detection, ecosystem monitoring, and spatially explicit forecasts of taxa loss as watershed land cover changes." (Authors) Odonata were found to be positively associated with urbanized land cover.] Address: Utz, R.M., University of Maryland Center for Environmental Science Appalachian Laboratory, 301 Braddock Road, Frostburg, MD 21532, USA. E-mail: rutz@al.umces.edu

9751. Wildermuth, H. (2009): Buchbesprechung: Libellen schützen, Libellen fördern. Leitfaden für die Naturschutzpraxis. Entomo Helvetica 2: 32. (in German) [Book review: "Schweizerische Arbeitsgemeinschaft Libellenschutz (SAGLS). 1. Auflage. Beiträge zum Naturschutz in der Schweiz Nr. 31/2009. A4, broschiert. 88 Seiten, 164 Farbfotos, 7 Zeichnungen und Grafiken, 1 Tabelle. ISSN 1421-5527. Zu beziehen bei: Pro Natura, Postfach, CH-4018 Basel. E-Mail: mailbox@pronatura.ch. Art. Nr. 4631. Preis: Fr. 34.-, für Mitglieder Pro Natura Fr. 29.-; Französische Ausgabe: Groupe de travail pour la conservation des libellules de Suisse (GTCLS): Protéger et favoriser les libellules. Guide pratique de protection de la nature. Contribution à la protection de la nature en Suisse No 32/2009. Pro Natura, case postale, 4018 Bâle. E-Mail: mailbo x@pronatura.ch. Art. no 5632."] Address: Wildermuth, H., Haltbergstr. 43, 8630 Rütli, Switzerland. E-mail: hansruedi@wildermuth.ch

9752. Wohlfahrt, B.; Vamosi, S.M. (2009): Antagonistic selection or trait compensation? Diverse patterns of predation-induced prey mortality due to the interacting effects of prey phenotype and the environment. *Evol. Biol.* 36: 386-396. (in English) ["Differentiation among closely related prey species may result from differing adaptations to heterogeneous environments. Many studies have focused on competition for shared resources as a major factor promoting differentiation, with considerably less attention focused on interacting effects of abiotic factors and predator-prey relationships. To further investigate the effects of interacting selective factors on the outcomes of mortality and survival in aquatic prey, we conducted interrelated laboratory studies examining the effects of water colour and plant density on predator-induced mortality in four dytiscid species (Coleoptera: Dytiscidae) that varied in body size (total body length), and body colouration pattern. Body size was more strongly phylogenetically conserved than colouration pattern, and larger body size generally resulted in decreased predator-induced mortality rates. In contrast, the effectiveness of body colouration patterns in decreasing prey mortality risk depended on water colour and prey body size. In clear water, small and patterned dytiscids had mortality rates equal to medium-sized plain beetles, thereby compensating for differences in mortality risk due to body size differences. Under dark water conditions, small dytiscids experienced higher mortality rates compared to medium-sized dytiscids; however, the effectiveness of colouration patterns in medium-sized beetles decreased to the point that it became detrimental to survival, revealing antagonistic selection. We suggest that colouration patterns are not ubiquitous in prey species and cospecialization in larger size and presence of colouration patterns does not generally result in higher prey survival, because the effectiveness of the two antipredator defences may be

restricted to certain phenotype environment combinations. Our results illustrate how interactions between prey phenotype and variable environmental conditions among habitats dominated by the same predator can lead to adaptive trade-offs, which can increase the number of possible outcomes of predator mediated selection." (Authors) Aeshna juncea larvae were used in laboratory experiments on predation-induced mortality in 4 dytiscid species (Coleoptera). Some notes on the larvae are provided based on brief and clear definitions of various types of their behaviour.] Address: Wohlfahrt, Bianca, Dept Biol. Sci., Univ. Calgary, 2500 Univ. Dr. NW, Calgary. T2N 1N4. Canada

9753. Zhang, Z.-S.; Lu, X.-G.; Wang, Q.-C.; Zheng, D.-M. (2009): Mercury, cadmium and lead biogeochemistry in the soil-plant-insect system in Huludao City. *Bull. Environ. Contam. Toxicol.* 83: 255-259. (in English) ["Mercury, cadmium, and lead concentrations of ashed plants and insects samples were investigated and compared with those of soil to reveal their biogeochemical processes along food chains in Huludao City, Liaoning Province, China. Concentration factors of each fragments of the soil-plant-the herbivorous insect-the carnivorous insect (= "Dragonfly") food chain were 0.18, 6.57, and 7.88 for mercury; 6.82, 2.01, and 0.48 for cadmium; 1.47, 2.24, and 0.57 for lead, respectively. On the whole, mercury was the most largely biomagnified, but cadmium and lead were not greatly accumulated in the carnivorous insects as expected when the food chain extended to the secondary consumers. Results indicated that concentration factors depended on metals and insects species of food chains." (Authors)] Address: Zhang, Z.-S., Key Laboratory of Wetland Ecology and Environment, Northeast Institute of Geography and Agro ecology, CAS, Changchun, China. E-mail: zszlycn@163.com

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9754. Abbott, J.C. (2010): OdonataCentral: The past, present and future. *Argia* 22(4): 10-14. (in English) [Extensive report on activities to launch, run, and improve the functionality of the website of the Dragonfly Society of the Americans with special reference to the management of species records.] Address: Abbott, J.C., Patterson Labs 219, School Bio. Sci., Univ. Texas, Austin TX 78712, USA. E-mail: jcabbott@mail.utexas.edu

9755. Abbott, J.C. (2010): Book Review: Dragonflies of Alaska, Second edition. *Argia* 22(4): 22. (in English) [Compared with the first edition of the book, additional three species had to be considered.] Address: Abbott, J.C., Patterson Labs 219, School of Bio. Sci., University of Texas, Austin TX 78712, USA. E-mail: jcabbott@mail.utexas.edu

9756. Abilhoa, V.; Vitule, J.R.S.; Bornatowski, H. (2010): Feeding ecology of Rivulus luelingi (Aplocheiloidei: Rivulidae) in a Coastal Atlantic Rainforest stream, southern Brazil. *Neotropical Ichthyology* 8(4): 813-818. (in English, with Portuguese summary) ["Odonata - Libellulidae (nymphs)" occurred in 10.1% of the 129 studied stomach of Rivulus luelingi from a Coastal Atlantic Rainforest stream in southern Brazil.] Address: Vitule, J.R.S., Departamento de Engenharia Ambiental, Setor de Tecnologia, Universidade Federal do Paraná. 81531-970 Curitiba, Paraná, Brazil. E-mail: biovitule@gmail.com

- 9757.** Alcocer, J.; Bernal-Brooks, F.W. (2010): Limnology in Mexico. *Hydrobiologia* 644: 15-68. (in English) [The paper "deals with the geography, geology, and climate of the Mexican territory as the basis to further explain the development of Limnology as a science in this country. An early knowledge started with the Aztecs, with evidence of practical solutions for a life within a lake. After the conquest of the American territories by the Spaniards, the exploration of the new territories provided the main source of information relative to natural resources. In 1938, the Mexican government established the Estación Limnológica de Pátzcuaro and the pioneer studies appeared under the name of Spanish scientists not only here but also at the Universidad Nacional Autónoma de México and the Instituto Politécnico Nacional. During the 1970s, the participation of Mexican limnologists began and the attempt to build-up a conceptual framework in its own for lakes, reservoirs, and rivers. This article outlines the main limnological characteristics of Mexican water bodies, highlights the peculiarities of a transitional zone between the tropics and subtropics, and describes the government structure for management and administration. A fast development in this area of knowledge got underway with the creation of the Asociación Mexicana de Limnología in 1997 and the collaboration with international counterparts." (Authors) Table 10 with a list of benthic macroinvertebrates characteristic of some Mexican lakes includes some Odonata.] Address: Alcocer, J., Proyecto de Investigación en Limnología Tropical, FES Iztacala, Universidad Nacional Autónoma de México, Av. de los Barrios No. 1, Los Reyes Iztacala, Tlalnepantla, Estado de México 54090, Mexico. E-mail: jalcocer@servidor.unam.mx
- 9758.** Allen, K.A.; Le Duc, M.G.; Thompson, D.J. (2010): Habitat and conservation of the enigmatic damselfly *Ischnura pumilio*. *Journal of Insect Conservation* 14(6): 689-700. (in English) ["*Ischnura pumilio* is threatened in the UK and its habitat requirements are not well understood. This study tests previously held notions of the habitat requirements of *I. pumilio*, investigates the features of a habitat influencing odonate species composition and provides recommendations for habitat creation and management for *I. pumilio* persistence. Thirty-one sites across south west England with past *I. pumilio* records were surveyed in 2006. Environmental variables and odonate abundance were recorded. Odonate species composition and *I. pumilio* abundance were related to environmental variables using multivariate techniques and GLM. *Ischnura pumilio* was found at a wide variety of habitat types; key habitat features were a muddy substrate with some open ground, turbid water, and low levels of shade. It was associated with increased structural diversity of vegetation away from water but low maximum height; characteristic of early-successional sites. The variables predicting odonate composition were location, shade, level of disturbance, water depth, and cover of terrestrial dwarf shrubs and Sphagnum species. Vegetation height and structure were also highly influential to at least 20 m from water. This study indicates that odonate habitat management should include adjacent hinterland. Management for *I. pumilio* may be complicated by the species' use of two habitat types, each with associated problems. Furthermore, odonate species diversity was negatively associated with *I. pumilio* abundance, which may cause conflict of interest when managing habitats." (Authors)] Address: Thompson, D.J., Population Biology Research Group, School of Biological Sciences (Nicholson Building), University of Liverpool, P.O. Box 147, Liverpool, L69 3BX, UK. E-mail: d.j.thompson@liv.ac.uk
- 9759.** Altmüller, R.; Clausnitzer, H.-J. (2010): Rote Liste der Libellen Niedersachsens und Bremens. 2. Fassung, Stand 2007. Informationsdienst Naturschutz Niedersachsen 4/10: 209-260. (in German, with English summary) [Germany; "This Red List of dragonflies in Lower Saxony and Bremen was derived from a stock of 136.441 datasets, the majority of which were contributed by volunteer faunists participating in Lower Saxony's Fauna Survey Programme. By the end of 2006, 68 species of Odonata had been recorded, equalling 84 % of 81 species occurring in Germany. Of the former, 21 species have been accorded a status of 0 - 3 denoting the extent to which these species are threatened. For one species, threat status is not discernible for the time being. Nine species are naturally extremely rare, necessitating careful monitoring. All in all, 31 species (= 46 %) feature in this Red List, with additional 4 species featuring as 'near threatened'. Besides listing the threat categories on state level, the threat categories have been further regionalized into "western lowlands", "eastern lowlands" and "uplands". Causes of threat are various forms of habitat destruction, e.g. drainage of bogs, mires and wet grasslands as well as amelioration and maintenance of water courses. More recently, eutrophication of wet lowlands adds to the risks." (Authors)] Address: Niedersächsischer Landesbetrieb für Wasserwirtschaft, Küsten- und Naturschutz (NLWKN) - Naturschutzinformation, PF 91 07 13, 30427 Hannover, Germany.
- 9760.** Andersson, J.; Karjalainen, S. (2010): Pellingin sudenkorennot [The dragonflies of Pellinki archipelago]. *Crenata* 3(1): 34-37. (in Finnish) ["The article gives a detailed overview of the dragonfly fauna of Pellinki archipelago at the Finnish south coast 50 km W Helsinki. Earliest Finnish records of *Aeshna mixta* and *Sympetma paedisca* are both from Pellinki (both made in 2002). In total 33 species have been observed in the area, including *Ischnura pumilio*, *Aeshna viridis*, *A. serrata* and *Orthetrum coerulescens*. Due to its favourable geographical position several other interesting migrating insect species, like *Locusta migratoria* (Orthoptera) has been encountered on the archipelago." (Asmus Schröter)] Address: Karjalainen, S., Neidonpuistontie 6 D 8, FI-02400 Kirkkonummi, Finland. Email: sk@korento.net
- 9761.** Andres, C. (2010): Zur Verbreitung der Kleinen Zangenlibelle (*Onychogomphus f. forcipatus*) an der Tauber. *mercuriale* 10: 35-42. (in German, with English summary) ["In July 2010, the river Tauber between Archshofen and the embouchure into the Main river at Wertheim was surveyed for *O. f. forcipatus*. It was a „cursory scan" restricted to a search for imagoes at sites which appeared suitable for the species. One to three males of *O. f. forcipatus* could be found at 26 places. Most sightings were made at bypass water courses" that had been created" not earlier than 11 years ago. The places where the dragonflies were found and the possible dispersal along the river Tauber are discussed." (Author)] Address: Andres, C., Planungsbüro Andrena, Burgweg 22, 97956 Werbach, Germany. E-mail: andrena@gmx.de
- 9762.** Arnoldo, P.; Moreira, J.; Oliveira, I. (2010): Habitat associations of Odonata in mountainous water sites

in northeastern Portugal. *Odonatologica* 39(3): 185-193. (in English) ["A total of 19 species was recorded in a survey carried out at 28 water sites located in the Alvão Natural Park, NE Portugal. Multivariate statistical procedures were used to analyse the relationship between the species and the characteristics of their habitat, in order to determine different species biotope preferences. Aside from species with unspecific habitat requirements, 2 main species assemblages could be detected. *Enallagma cyathigerum*, *Sympetrum fonscolombii*, *S. sanguineum*, *Ischnura pumilio*, *Lestes virens* and *Anax imperator* preferred permanent water bodies characterized by high temperatures, while *Calopteryx virgo*, *Pyrrhosoma nymphula*, *Cordulegaster boltonii* and *Onychogomphus uncatatus* preferred sites with fast-flowing water characterized by low and moderate temperatures. Conservation strategies should take these patterns and habitat requirements into consideration." (Authors)] Address: Arnoldo, P., Forest and Landscape Department, University of Trás-os-Montes and Alto Douro, PT-5000-911 Vila Real, Portugal

9763. Arribére, M.A.; Campbell, L.M.; Rizzo, A.P.; Arcagni, M.; Revenga, J.; Ribeiro Guevara, S. (2010): Trace elements in plankton, benthic organisms, and forage fish of Lake Moreno, northern Patagonia, Argentina. *Water, Air, & Soil Pollution* 212(1-4): 167-182. (in English) ["The Northern Patagonian Andean range shared by Chile and Argentina has numerous glacial oligotrophic lakes protected in a series of National Parks. Recent baseline surveys indicated that concentrations in muscle and liver tissues from various fish species from across Nahuel Huapi and Los Alerces National Parks in Argentina were comparable or higher than similar fish species from other parts of the world. As a result, Lake Moreno, in Nahuel Huapi National Park, was chosen to investigate multiple element sinks, trends, and transfer in a representative Patagonia aquatic food web. The metals and metalloids Ag, As, Ba, Br, Cs, Co, Cr, Fe, Hg, K, Na, Rb, Se, and Zn were analyzed in three size plankton fractions, submerged macrophytes, biofilm, insect larvae, amphipods, decapods, gastropods (snails), annelids (earthworms), and forage fish. Except for nanoplankton (10–53 µm; small-celled algae, rotifers) and microplankton (53–200 µm; larger algae, ciliates, zooplankton nauplii), which share elemental compositional similarities, each taxon category had its own distinctive compositional pattern, revealed by principal component analysis. Nano- and microplankton tend to be relatively elevated in some metals, including As, Co, Cr, Fe, Hg, Zn, and Rb, followed by biofilm. Shredder-scraper Trichoptera (caddisflies) have higher concentration of most of the studied elements than other insect larvae taxa, especially carnivorous Odonata (Anisoptera, dragonflies), which were associated with lower elemental contents. Those trends point to an overall tendency for biodiminishing element concentrations with trophic level in the benthos of Lake Moreno." (Authors)] Address: Arribére, María, Laboratorio de Análisis por Activación Neutrónica, UAIN, Centro Atómico Bariloche, Comisión Nacional de Energía Atómica (CNEA), Bustillo 9500, 8400 Bariloche, Argentina. E-mail: arribere@cab.cnea.gov.ar

9764. Bailowitz, R. (2010): *Lestes australis* (Southern Spreadwing), new for Arizona. *Argia* 22(4): 4. (in English) [Apache, Cochise, and Graham Counties, USA, July and August 2010] Address: Bailowitz, R., USA. E-mail: raberg2@q.com

9765. Bailowitz, R. (2010): *Enallagma novaehispaniae* Calvert (Neotropical Bluet), another new species for Arizona. *Argia* 22(4): 3. (in English) [16-XI-2010, Maricopa county, range extension of app. 225 km to the northwest of its known Mexican range.] Address: Bailowitz, R., USA. raberg2@q.com

9766. Barbosa dos Santos, S.; Rodrigues, S.L.; Menezes Nunes, G.K.; Brum Barbosa, A.; Macedo de Lacerda, L.E.; Miyahira, I.C.; Viana, T.A.; Lopes de Oliveira, J.; Cardoso Fonseca, F.; Campos da Silva, P. (2010): Estado do conhecimento da fauna de invertebrados não-marinhos da Ilha Grande (Angra dos Reis, RJ). *Oecologia Australis* 14(2): 504-549. (in Portuguese, with English summary) ["Ilha Grande, a continental island located at Southern of Rio de Janeiro state, Brazil, has important remnants of Atlantic Rainforest. However, the knowledge of the non-marine invertebrate fauna is not sufficiently well known, concerning not only taxonomic groups but also geographic areas. Considering the relevance of biodiversity inventories to conservation, allied to the absence of organized information about the existing data, we prepared a taxonomic list of the non-marine invertebrates reported to Ilha Grande, including distributional data, based on primary data of ongoing research projects and literature. The list is composed of 465 taxa of non-marine invertebrates, mainly Arthropoda (72.9%), followed by Mollusca (22.15%). [...] (Authors) 41 Odonata taxa (39 at the species level) are listed from the Ilha Grande.] Address: Barbosa dos Santos, Sonia, Universidade do Estado do Rio de Janeiro (UERJ), Inst. de Biologia Roberto Alcântara Gomes, Depto de Zoologia, Laboratório de Malacologia Limnica e Terrestre, Rua São Francisco Xavier, 524, PHLC, sala 525/2, Maracanã, Rio de Janeiro, Brasil. CEP: 20550-900, Brazil. E-mail: sbsantos@uerj.br

9767. Barndt, D. (2010): Beitrag zur Arthropodenfauna des Naturparks Dahme-Heideseen (Land Brandenburg) - Faunenanalyse und Bewertung - (Coleoptera, Auchenorrhyncha, Heteroptera, Hymenoptera part., Saltatoria, Díptera part., Araneae, Opiliones, Chilopoda, Diplopoda u.a.). *Märkische entomologische Nachrichten* 12(2): 195-298. (in German, with English summary) [Between 2004 and 2008, a total of 1600 species was identified. 11 species were recorded for the first time in Brandenburg, Germany and 8 species were rediscovered. The list of taxa includes Odonata; but most of the odonatalogical data are taken from published sources.] Address: Barndt, D., Bahnhofstr. 40d, 12207 Berlin-Lichterfelde Ost, Germany. E-mail: dr.barndt@kabelmail.de

9768. Beatty, C.; Fraser, S.; Pérez-Jvostov, F.; Sherratt, T. (2010): Dragonfly and damselfly (Insecta, Odonata) distributions in Ontario, Canada: Investigating the influence of climate change. *BioRisk* 5: Special issue: Monitoring climatic change with dragonflies: 225-241. (in English) ["We analysed temperature data and odonate distribution data collected in the province of Ontario, Canada, over approximately sixty years. Analysis of temperature data from 31 weather stations collected in the years 1945–2000 showed an overall significant increase in the minimum, maximum and mean monthly temperatures; these trends were not adjusted for changes in urbanisation. Comparison of county level presence/absence data for odonates from the 1950's and 2002 found a slight decrease in the northernmost distributions of some species, although no significant patterns were evident. Lower sampling coverage in the larger, more northerly counties in Ontario, as well as the

assessment of distributions based on county records may limit the sensitivity of our approach in detecting changes in odonate species distributions over time. Future work should focus on increasing the coverage, uniformity and geographic detail of available datasets, as well as evaluating range change through testing predictions based on the ecology and biogeography of odonate species." (Authors)] Address: Beatty, C., Dept Biology, Santa Clara University, 500 El Camino Real, Santa Clara, California 95053-0268, USA. E-mail: cbeatty@scu.edu

9769. Bellstedt, R. (2010): Gratulation zum 75. Geburtstag an Dr. Wolfgang Zimmermann. *Mitteilungen des Thüringer Entomologenverbandes* 17(1/2): 52-53. (in German) [W. Zimmermann is one of the most profiled German odonatologists, and was and is still active in Thüringen.] Address: Bellstedt, R., Brühl 2, D-99867 Gotha, Germany

9770. Betoux, O.; Beattie, R. (2010): *Iverya averyi* gen. nov. and sp. nov., a New Triadotypomorphan Species from the Middle Triassic at Picton, New South Wales, Australia. *Acta Geologica Sinica - English Edition* 84(4): 688-692. (in English) ["A new specimen assigned to the species *Iverya averyi* gen. nov. and sp. nov. is described. This species is considered as a triadotypomorphan insect, a poorly known group of Triassic stem-odonatans. Like other triadotypomorphans, this species exhibits an area between MA and MP that is comparatively broad, and a cubitoanal area involving an AA stem distinct from CuA + CuP + AA emitting several posterior branches. Diagnostic character states of the new species are listed. Although incomplete, the specimen provides new information on the wing morphology of triadotypomorphans. This discovery might contribute to better assessment of the phylogenetic position of triadotypomorphan species with respect to other stem-odonatans." (Authors)] Address: Beattie, R., Department of Earth and Marine Sciences, The Australian National University, Canberra, ACT 0200 Australia and P.O. Box 320, Berry, NSW 2535 Australia. E-mail: Robert.beattie@anu.edu.au

9771. Bieger, L.; Carvalho, A.B.P.; Strieder, M.N.; Maltchik, L.; Stenert, C. (2010): Are the streams of the Sinos River basin of good water quality? Aquatic macroinvertebrates may answer the question. *Braz. J. Biol.* 70(4, suppl.): 1207-1215. (in English, with Portuguese summary) ["The main objective of this study was the assessment of the water quality of the Sinos River basin (Rio Grande do Sul state, Brazil) through biotic indices based on the macroinvertebrate community ("Family Biotic Index – FBI", and "Biological Monitoring Working Party Score System – BMWP"). Three lower order streams (2nd order) were selected in each one of three main regions of the basin. In each stream, the samplings were performed in three reaches (upper, middle, and lower), totalling 27 reaches. Two samplings were carried in each reach over one year (winter and summer). A total of 6,847 macroinvertebrates distributed among 54 families were sampled. The streams from the upper region were of better water quality than the lower region. The water quality did not change between the upper, middle and lower reaches of the streams. However, the upper reaches of the streams were of better water quality in all the regions of the basin. The water quality of the streams did not vary between the summer and the winter. This result demonstrated that water quality may be analysed in both studied seasons (summer

and winter) using biotic indices. The analysis of the results allows us to conclude that the biotic indices used reflected the changes related to the water quality along the longitudinal gradient of the basin. Thus, aquatic macroinvertebrates were important bioindicators of the water and environmental quality of the streams of the Sinos River basin." (Authors) Odonata are treated at the family level.] Address: Maltchik, L., Ecology and Conservation of Aquatic Ecosystems, Universidade do Vale do Rio dos Sinos – UNISINOS, CEP 93022-000, São Leopoldo, Rio Grande do Sul, Brazil. E-mail: maltchik@unisinobr

9772. Billqvist, M. (2010): Två nya trollsländor i Sverige – *Aeshna affinis* och *Anax parthenope* påträffade 2010. *fauna och flora* 105(3): 20-23. (in Swedish) [*Aeshna affinis*: 5-VIII-2010, Svarta hål, Revingefältet, Öland?, Sweden; *Anax parthenope*: 15-VII-2010, Hornsjön, Öland, Sweden (57°11'38"N, 16°57' 7"E)] Address: E-mail: magnus.billqvist@naturskyddsforeningen.se

9773. Bogacka-Kapusta, E.; Kapusta, A. (2010): Feeding strategies and resource utilization of 0+ perch, *Perca fluviatilis* L., in littoral zones of shallow lakes. *Archives of Polish Fisheries* 18: 163-172. (in English) [The diet of *P. fluviatilis* L., in two lakes (Goslawskie and Dolgie Wielkie, Poland) includes Anisoptera and Zygoptera without further differentiation to species level.] Address: Bogacka-Kapusta, Elzbieta, Dept of Ichthyology, The Stanislaw Sakowicz Inland Fisheries Institute in Olsztyn, Oczapowskiego 10, 10-719 Olsztyn-Kortowo, Poland. E-mail: ela@infish.com.pl

9774. Bried, J.; Mazzacano, C. (2010): Review of Wildlife Action Plans for Odonata conservation. *Argia* 22(4): 15-16. (in English) ["We found that the wildlife action plans have disturbing gaps. The first state wildlife action plans were developed in 2001-2005, when 441 distinct species were known from the US. Although nearly two-thirds (277) of these species were appointed as Species of Greatest Conservation Need (SGCN) overall (191 dragonfly and 86 damselfly species), over half the states neglected to assign dragonfly SGCN, damselfly SGCN, or both. Most (89%) of the 277 SGCN odonates were recognized as such in five or fewer states; 95 species (34%) were assigned in one state only, with Alaska and Hawaii contributing 30 of these. States in the west and south listed proportionately fewer odonate SGCN than those in the Great Lakes, Mid-Atlantic, and New England regions. We believe this reflects patterns of legal authority, information availability, and involvement by odonatists rather than geographic patterns of true conservation need. Nationally, it appears that few odonatists were involved in wildlife action plans relative to available expertise (potentially only -5% of DSA members), and that Odonata were underrepresented or omitted as SGCN in many states." (Authors)] Address: Bried, J., Albany Pine Bush Preserve Commission, Albany, NY, USA. E-mail: jlbried@albanypinebush.org

9775. Bried, J.T.; Ervin, G.N. (2010): Randomized intervention analysis for detecting non-random change and management impact: Dragonfly examples. *Ecological Indicators* 11(2): 535-539. (in English) ["The quasi-experimental approach of before–after control–impact (BACI) sampling can help decide when changes are due to human activities rather than natural variability. Detailed arguments for and against BACI designs and analytic methods are widespread in the literature, but far less attention has been paid to the mechanics of

analyzing a BACI experiment. This paper demonstrates randomized intervention analysis with user-friendly software, where observations are paired in time before and after intervention. We provide examples using dragonfly count data in vegetation removal experiments." (Authors)] Address: Bried, J., Mississippi State Univ., Dept Biol. Sciences, Rm 130 Harned, PO Box GY, Mississippi State, MS 39762, USA. E-mail: jbried@TNC.org

9776. Brook, J.; Brook, G. (2010): Return of the Dainty Damselfly *Coenagrion scitulum* to the UK. *Dragonfly News* 58: 18-19. (in English) [*Coenagrion scitulum* was discovered in Kent, UK on 21-VI-2010; after the record from 16-VI-2009 on the Channel Island Jersey, this is the second record of this species after 1953, the year the colony along the British coast near Hadleigh was wiped out by a sea water flood.] Address: not stated

9777. Chambers, C.P.; Whiles, M.R.; Rosi-Marshall, E.J.; Tank, J.L.; Royer, T.V.; Griffiths, N.A.; Evans-White, M.A.; Stojak, A.R. (2010): Responses of stream macroinvertebrates to Bt maize leaf detritus. *Ecological Applications* 20(7): 1949-1960. (in English) ["In the mid-western United States, maize detritus enters streams draining agricultural land. Genetically modified Bt maize is commonly planted along streams and can possibly affect benthic macroinvertebrates, specifically members of the order Trichoptera, which are closely related to target species of some Bt toxins and are important detritivores in streams. The significance of inputs of Bt maize to aquatic systems has only recently been recognized, and assessments of potential nontarget impacts on aquatic organisms are lacking. We conducted laboratory feeding trials and found that the leaf-shredding trichopteran, *Lepidostoma liba*, grew significantly slower when fed Bt maize compared to non-Bt maize, while other invertebrate taxa that we examined showed no negative effects. We also used field studies to assess the influence of Bt maize detritus on benthic macroinvertebrate abundance, diversity, biomass, and functional structure in situ in 12 streams adjacent to Bt maize or non-Bt maize fields. We found no significant differences in total abundance or biomass between Bt and non-Bt streams, and trichopteran comprised only a small percentage of invertebrate biomass at all sites (0–15%). Shannon diversity did not differ among Bt and non-Bt streams and was always low (H' range = 0.9–1.9). Highly tolerant taxa, such as oligochaetes and chironomids, were dominant in both Bt and non-Bt streams, and macroinvertebrate community composition (including "Odonata") was relatively constant across seasons. We used litterbags to examine macroinvertebrate colonization of Bt and non-Bt maize detritus and found no significant differences among litter or stream types. Our in situ findings did not support our laboratory results; this is likely because the streams we studied in this region are highly degraded and subject to multiple, persistent anthropogenic stressors (e.g., channelization, altered flow, nutrient and pesticide inputs). Invertebrate communities in these streams are a product of these degraded conditions, and thus the impact of a single stressor, such as Bt toxins, may not be readily discernable. Our results add to growing evidence that Bt toxins can have sublethal effects on nontarget aquatic taxa, but this evidence should be considered in the context of other anthropogenic impacts and alternative methods of pest control influencing streams draining agricultural regions." (Authors)] Address: Whiles, M.R., Department of Zoology and Center for Ecology, Southern Illinois

University, Carbondale, Illinois 62901 USA. E-mail: mwhiles@zoology.siu.edu

9778. Chelmick, D. (2010): Studying British dragonflies in the 1970s: the wilderness years. *J. Br. Dragonfly Society* 26(2): 57-63. (in English) [David Chelmick tells a lot of nice stories with some emphasis on Cyril Hammond who published probably the most influencing book on British amateur odonatology. That book gives some insight into the development of amateur odonatology in UK, especially into the early steps with mapping the distribution of Odonata on the British Isles.] Address: Chelmick, D.G., 31 High Beech Lane, Haywards Heath, West Sussex, RH16 1SQ, UK. E-mail: dgc@david.chelmick.com

9779. Chelmick, D. (2010): The Scarce Emerald Damselfly *Lestes dryas* Kirby with notes on the family Lestidae in the Western Palearctic. *J. Br. Dragonfly Society* 26(2): 66-83. (in English) ["*L. dryas* is a species of marginal habitats and has a life history adapted to temporary waters that dry out in summer. It has one of the largest overall areas of distribution of any UK dragonfly species and is one of only seven circumboreal species that occur in the Western Palearctic. In lowland areas it is much threatened by agricultural practice but in uplands, which today provide its Key habitats in our region, it is probably overlooked." (Author)] Address: Chelmick, D., Macromia Scientific, 31 High Beech Lane, Haywards Heath, West Sussex, RH16 1SQ, UK. E-mail: dgc@davidchelmick.com

9780. Chertoprud, M.V. (2010): Biogeographic zonation of the Eurasian fresh waters based on the macrobenthic faunas. *Journal of General Biology* 71(2): 144-162. (in Russian, with English summary) ["Spatial differentiation of the Eurasian freshwater faunas is analyzed based on the original and published data on the aquatic insects, crustaceans, and molluscs (about 8800 species in total). The Hacker-Dice similarity index is employed as a principal criterion of differentiation. The schemes of biogeographic zonation are constructed for the nine large macrobenthic taxa, namely, Odonata, Ephemeroptera, Plecoptera, Hemiptera, Coleoptera, Trichoptera, Malacostraca, Gastropoda, and Bivalvia. Discussed are principal discordances in distribution of three different ecological-systematic groups of the macrobenthos, namely, limnophylic insects, rheophylic insects, and crustaceans with molluscs. A generalized zonation system of the Eurasian fresh waters is elaborated, which is fundamentally divided into Palaearctic and Oriental Regions. The former is further divided into five subregions: Euro-Ob, Near East, Central Asia, Eastern Siberia, and Japan. The latter is divided into three subregions: Indo-Himalaya, China, and Malay. Preliminary classification of the provinces is also provided. Disagreements between the biogeographic systems of different authors are discussed." (Author)] Address: Chertoprud, M.V., Moscow Lomonosov State University, Faculty of Biology, 119992 Moscow, Leninskie Gory, Russia. E-mail: lymnaea@yandex.ru

9781. Conze, K.-J.; Grönhagen, N.; Lohr, M.; Menke, N. (2010): Trends in occurrence of thermophilous dragonfly species in North Rhine-Westphalia (NRW). *Bio-Risk* 5: Special issue: Monitoring climatic change with dragonflies: 31-45. (in English) ["Since 1996 the "Workgroup Odonata in North Rhine-Westphalia" ("AK Libellen NRW") has built up a data base including about 150.000 data sets concerning the occurrence of drag-

onflies in North Rhine-Westphalia (NRW). This data confirms an increase and spread of some thermophilous dragonfly species in NRW, and the effects of climate change evidenced by an increasing average temperature, are considered to be important reasons for this process." (Authors)] Address: Conze, K.-J., Arbeitskreis Libellen Nordrhein-Westfalen, Listerstr. 13, 45147 Essen, Germany. E-mail: kjc@loekplan.de

9782. Cooper, I.A. (2010): Ecology of sexual dimorphism and clinal variation of coloration in a damselfly. *American Naturalist* 176(5): 566-572. ["Sexual selection, more so than natural selection, is posited as the major cause of sex differences. Here I show ecological correlations between solar radiation levels and sexual dimorphism in body color of a Hawaiian damselfly. *Megalagrion calliphya* exhibits sexual monomorphism at high elevations, where both sexes are red in color; sexual dimorphism at low elevations, where females are green; and female-limited dimorphism at midelevations, where both red and green females exist. Within a midelevation population, red females are also more prevalent during high daily levels of solar radiation. I found that red pigmentation is correlated with superior antioxidant ability that may protect from UV damage and confer a benefit to damselflies in exposed habitats, including males, which defend exposed mating habitats at all elevations, and females, which are in shaded habitats except at high elevation. This study characterizes the ecology of sexual dimorphism and provides a new, ecological hypothesis for the evolution of female-limited dimorphism." (Author)] Address: Cooper, Idelle, Dept of Zoology, Michigan State University, Kellogg Biological Station, Hickory Corners, Michigan 49060, USA. E-mail: cooperi@msu.edu

9783. Cordero-Rivera, A.; Lorenzo Carballa, M.O. (2010): Three sisters in the same dress: cryptic speciation in African odonates. *Molecular Ecology* 19: 3840-3841. (in English) ["The discovery of cryptic species (i.e. two or more distinct but morphologically undistinguishable species) has grown exponentially in the last two decades, due mainly to the increasing availability of DNA sequences. This suggests that hidden in the known species, many of which have been described based solely on morphological information, there might be a high number of species waiting to be discovered. In this issue Damm et al. (2010) use a combination of genetic, morphological and ecological evidence to identify the first cryptic species complex found within dragonflies (insect order Odonata). Their findings add more evidence for the importance of combining information from different disciplines to new species' discovery (DeSalle et al. 2005)." (Authors)] Address: Cordero-Rivera, A., Grupo ECOEVO, Universidade de Vigo, EUET Forestal, Campus Universitario, 36005, Pontevedra, Galiza, Spain

9784. Costa, J.M.; Carriço, C.; Santos, T.C. (2010): *Neocordulia pedroi* sp. nov. (Odonata: Corduliidae) from southeastern Brazil. *Zootaxa* 2685: 51-56. (in English) ["*Neocordulia* (*Mesocordulia*) *pedroi* sp. n. is described and illustrated based on a reared adult male from Tapiuã stream, Estação Biológica de Santa Lúcia, Santa Teresa municipality, Espírito Santo State, Brazil. The holotype is deposited in the Museu Nacional, UFRJ, Rio de Janeiro, Brazil. This new species can be separated of the other species of the genus by the following characters: cerci strongly convergent and vesica spermalis with shorter flagellum." (Authors)] Address: Costa, Jani-

ra, Departamento de Entomologia Museu Nacional – Universidade Federal do Rio de Janeiro – Quinta da Boa Vista – São Cristóvão – Rio de Janeiro – RJ – Brasil – 20940-040. E-mail: jmcosta@globocom

9785. Crumrine, P.W. (2010): Body size, temperature, and seasonal differences in size structure influence the occurrence of cannibalism in larvae of the migratory dragonfly, *Anax junius*. *Aquatic Ecology* 44: 761-770. (in English) ["The aim of this study was to test the hypotheses that body size and seasonal differences in temperature and size structure influence cannibalism in larval dragonflies. In the first two experiments, larvae that were either similar or different in size were paired to examine the potential for intra- and intercohort cannibalism. In the third experiment, size structure of an assemblage of larvae and water temperature were manipulated to explore the seasonal dynamics of cannibalism. Cannibalism was common between individuals that differed in body size by one or more instars. Cannibalism also occurred between individuals similar in size but the rate varied across developmental stages. Results suggest that cannibalism may be most common when water temperatures are warm and late-instar larvae are present at high densities. These results highlight the importance of intra- and intercohort cannibalism as factors that can influence the population dynamics of generalist predators." (Author)] Address: Crumrine, P.W., Dept of Biological Sciences & Program in Environmental Studies, Rowan University, Glassboro, NJ 08028, USA. E-mail: crumrine@rowan.edu

9786. da Silva, M.J.; Figueiredo, B.R.S.; Ramos, R.T.C.; Medeiros, E.S.F. (2010): Food resources used by three species of fish in the semi-arid region of Brazil. *Neotropical Ichthyology* 8(4): 825-833. (in English, with Portuguese summary) [The analysis showed no Odonata species in the diet of *Prochilodus brevis*. Anisoptera were found to be 1.25% of the *Astyanax* aff. *bimaculatus*'s food while in *Hoplias malabaricus* both Anisoptera (3.75%) and Zygoptera (11.36%) were present as food items.] Address: Medeiros, E.S.F., Grupo de Ecologia de Rios do Semiárido, Universidade Estadual da Paraíba, Centro de Ciências Biológicas e Sociais Aplicadas. Campus V, 58020-540 João Pessoa, Paraíba, Brazil. E-mail: elviomedeiros@uepb.edu.br

9787. Damm, S.; Schierwater, B.; Hadrys, H. (2010): An integrative approach to species discovery in odonates: from character-based DNA barcoding to ecology. *Molecular Ecology* 19(18): 3881-3893. (in English) ["Modern taxonomy requires an analytical approach incorporating all lines of evidence into decision-making. Such an approach can enhance both species identification and species discovery. The character-based DNA barcode method provides a molecular data set that can be incorporated into classical taxonomic data such that the discovery of new species can be made in an analytical framework that includes multiple sources of data. We here illustrate such a corroborative framework in a dragonfly model system that permits the discovery of two new, but visually cryptic species. In the African dragonfly genus *Trithemis* three distinct genetic clusters can be detected which could not be identified by using classical taxonomic characters. In order to test the hypothesis of two new species, DNA-barcodes from different sequence markers (ND1 and COI) were combined with morphological, ecological and biogeographic data sets. Phylogenetic analyses and incorporation of all data sets into a scheme called taxonomic circle high-

ly supports the hypothesis of two new species. Our case study suggests an analytical approach to modern taxonomy that integrates data sets from different disciplines, thereby increasing the ease and reliability of both species discovery and species assignment." (Authors)] Address: Damm, Sandra, ITZ, Ecology & Evolution, TiHo Hannover, Bünteweg 17d, 30559 Hannover, Germany. E-mail: sandra.giere@ecolevol.de

9788. Das, S.; Roy, S.; Mukhopadhyay, A. (2010): Diversity of arthropod natural enemies in the tea plantations of North Bengal with emphasis on their association with tea pests. *Current Science* 99(10): 1457-1463. (in English) ["A study was undertaken to explore the diversity of arthropod natural enemies in sub-Himalayan tea plantations of North Bengal, India. The study revealed the presence of 94 species of predators (including *Ceragriion* sp., *Pseudagriion* sp., *Ictinogomphus* sp., *Anax* sp.) and 33 of parasitoids in the region. New records on tea pest–natural enemy associations were made on the basis of field observations as well as laboratory rearing. Among the predators, spider and ladybird fauna, and among the parasitoid groups, *Bracconidae* and *Ichneumonidae* were dominant during the survey period." (Authors)] Address: Das, Soma, Entomology Research Unit, Department of Zoology, University of North Bengal, Darjeeling 734 013, India

9789. David, S. (2010): Recenzia knihy: Dolný A et al., 2007: *Vážky ěskej republiky. Folia faunistica Slovaca* 15(11): 99-100. (in Slovakian) [book review: Dolný Aleš, Bárta Dan, Waldhauser Martin, Holuša Otakar, Hanel Lubomír, Lízler Robert, 2007: *Vážky ěské republiky: Ekologie, ochrana a rozšíření* (The Dragonflies of the Czech Republic: Ecology, Conservation and Distribution). *Vlašim: ěský svaz ochránců přírody Vlašim*, 672 s.] Address: David, S., Katedra ekologie a environmentalistiky Fakulty přírodních věd, Univerzity Konštatína Filozofa v Nitre, Tr. A. Hlinku 1, 949 74 Nitra, Slovakia. E-mail: sdavid@ukf.sk

9790. Davies, P.J.; Wright, I.A.; Findlay, S.J.; Jonasson, O.J.; Burgin, S. (2010): Impact of urban development on aquatic macroinvertebrates in south eastern Australia: degradation of in-stream habitats and comparison with non-urban streams. *Aquatic Ecology* 44: 685-700. (in English) ["Internationally, waterways within urban areas are subject to broad-scale environmental impairment from urban land uses. In this study, we used in-stream macroinvertebrates as surrogates to measure the aquatic health of urban streams in the established suburbs of northern Sydney, in temperate south eastern Australia. We compared these with samples collected from streams flowing in adjacent naturally vegetated catchments. Macroinvertebrates were collected over a 30-month period from riffle, edge and pool rock habitats and were identified to the family level. Macroinvertebrate assemblages were assessed against the influence of imperviousness and other catchment and water quality variables. The study revealed that urban streams were significantly impaired compared with those that flowed through naturally vegetated non-urban catchments. Urban streams had consistently lower family richness, and sensitive guilds were rare or missing. We found that variation in community assemblages among the instream habitats (pool edges, riffles and pool rocks) were more pronounced within streams in naturally vegetated catchments than in urban waterways." (Authors) Odonata are treated at the family level.] Address: Davies, P.J., Ku-ring-gai Council, Locked

Bag 1056, Pymble 2073, Australia. E-mail: pdavies@mkc.nsw.gov.au

9791. de Almeida, M.C.; Cortes, L.G.; de Marco, P. (2010): New records and a niche model for the distribution of two Neotropical damselflies: *Schistolobos boliviensis* and *Tuberculobasis inversa* (Odonata: Coenagrionidae). *Insect Conservation and Diversity* 3(4): 252-256. (in English) ["1. Two new records for the Neotropical damselflies, *S. (Telagriion) boliviensis* and *T. (Leptobasis) inversa*, previously known only from the Amazonia, are presented from the Brazilian Cerrado. 2. Potential distribution models for the two species were built first using only previous occurrence points from the literature, and later adding the new records. The first niche models had low capacity to predict the new records for both species. The models with all biogeographical information increased overall distributional area for both species and indicated priority areas for inventory outside its original distribution. The results reinforce the use of modelling as a tool to increase faunal knowledge in poorly studied areas, allowing an initial evaluation of conservation status and the indication of priority areas for inventories." (Authors)] Address: De Marco Júnior, P., Laboratório de Ecologia Teórica e Síntese, Depto de Ecologia, ICB, Universidade Federal de Goiás, Rodovia Goiânia-Nerópolis, km 5, Campus II, Setor Itatiaia, CP 131, CEP 74001-970, Goiânia (GO), Brasil. E-mail: pdemarco@icb.ufg.br

9792. De Knijf, G.; Anselin, A. (2010): When south goes north: Mediterranean dragonflies (Odonata) conquer Flanders (North-Belgium). *BioRisk* 5: Special issue: Monitoring climatic change with dragonflies: 141-153. (in English) ["Since 1980, eight southern dragonfly species have been regularly recorded in Flanders. They show a significant increase in relative abundance, relative area as well as indications of reproduction since the beginning of the nineties, with peak occurrence mainly in the 1995–1999 period. Since 2000, numbers are lower but more species were simultaneously present. Three species, *Lestes barbarus*, *Crocothemis erythraea* and *Sympetrum fonscolombii*, show a combination of earlier arrival, earlier reproduction with a higher frequency and higher maximum ranges and can be considered as stable populations in Flanders. All other southern species show in general a later arrival, only one confirmed or probable reproduction and have much lower maximum ranges. Two other species, reaching their northern limit of distribution in Flanders, *Erythromma viridulum* and *E. lindenii* have clearly expanded their relative area since the eighties. Their relative abundance also increased although this shows more fluctuations." (Authors)] Address: Knijf, G. de, Instituut voor Natuurbehoud, Kliniekstraat 25, B-1070 Brussel, Belgium. E-mail: geert.deknijf@inbo.be

9793. DePalma, R.; Cichocki, F.; Dierick, M.; Feeney, R. (2010): Preliminary notes on the first recorded amber insects from the Hell Creek Formation. *The Journal of Paleontological Sciences JPS*. C.10.0001: 1-7. (in English) ["Insects, the most diverse of living organisms today, inhabit virtually every terrestrial and freshwater ecosystem on earth. Yet the strata of the Upper Cretaceous Hell Creek Formation, although deposited in a luxuriant subtropical biome during the initial diversification of flowering plants, until now have revealed practically no insect fossils. Here, we provide a preliminary report on the discovery of the first amber insects from the Hell Creek Formation. This well-preserved assem-

blage of amber insects includes members of the Diptera (Suborders Nematocera and Brachycera) and Odonata (Suborder Zygoptera). The discovery will enable future studies to develop a better paleoecological understanding of the Hell Creek that includes the essential role of insects." (Authors)] Address: DePalma, R., Dept. of Paleontology, Palm Beach Museum of Natural History, 2805 E. Oakland Park Blvd., Suite 402, Ft. Lauderdale, FL 33306, Rdepalma@PBMNH.org

9794. Deviche, P. (2010): Copulating pair of *Ischnura barberi* (Desert Forktail) and *I. ramburii* (Rambur's Forktail). *Argia* 22(4): 17-18. (in English) [A heterospecific pair of a male *Ischnura barberi* and a female *I. ramburii* was observed at 14-IX-2010 at aricopa, Arizona, USA.] Address: Deviche, P.J. E-mail: deviche@asu.edu

9795. Dixon, J.R.; Gennard, D.E. (2010): The influence of meteorological conditions on the flight activity of the Blue-tailed Damselfly *Ischnura elegans* (Vander Linden), the Azure Damselfly *Coenagrion puella* (Linnaeus) and the Emerald Damselfly *Lestes sponsa* (Hanse-mann). *J. Br. Dragonfly Society* 26(2): 84-97. (in English) ["The flight activity was compared for *I. elegans*, *C. puella* and *L. sponsa* at an exposed pond and a sheltered pond at Rimac, Saltfleetby National Nature Reserve, Lincolnshire in July and August 1998. Meteorological conditions (air temperature, light intensity, cloud cover, wind speed and direction were investigated in relation to flight activity of the species. Flight activity of all three species increased with rising air temperature, light intensity and declining cloud cover. These factors appear to be the main ones that exert control on day to day variation in flight activity of these three species. Their relative importance varies from species to species, which is most likely to be due to the nature of the exoskeletons (which influences the rate of solar radiation absorption), size (which influences rate of warming and power requirements) and behaviour. Only *C. puella* showed any relationship between mating activity (tandem wheel flight) and meteorological conditions." (Authors)] Address: Dixon, J.R., Department of Environmental Science, University of Lincolnshire and Humberside 61 Bargate, Grimsby DN34 5AA, UK

9796. Dogramaci, M.; DeBano, S.J.; Wooster, D.E.; Kimoto, C. (2010): A method for subsampling terrestrial invertebrate samples in the laboratory: Estimating abundance and taxa richness. *Journal of Insect Science* 10:25 (available online: insectscience.org/10.25): 17pp. (in English) ["Significant progress has been made in developing subsampling techniques to process large samples of aquatic invertebrates. However, limited information is available regarding subsampling techniques for terrestrial invertebrate samples. Therefore a novel subsampling procedure was evaluated for processing samples of terrestrial invertebrates collected using two common field techniques: pitfall and pan traps. A three-phase sorting protocol was developed for estimating abundance and taxa richness of invertebrates. First, large invertebrates and plant material were removed from the sample using a sieve with a 4 mm mesh size. Second, the sample was poured into a specially designed, gridded sampling tray, and 16 cells, comprising 25% of the sampling tray, were randomly subsampled and processed. Third, the remainder of the sample was scanned for 4-7 min to record rare taxa missed in the second phase. To compare estimated abundance and taxa richness with the true values of

these variables for the samples, the remainder of each sample was processed completely. The results were analyzed relative to three sample size categories: samples with less than 250 invertebrates (low abundance samples), samples with 250-500 invertebrates (moderate abundance samples), and samples with more than 500 invertebrates (high abundance samples). The number of invertebrates estimated after subsampling eight or more cells was highly precise for all sizes and types of samples. High accuracy for moderate and high abundance samples was achieved after even as few as six subsamples. However, estimates of the number of invertebrates for low abundance samples were less reliable. The subsampling technique also adequately estimated taxa richness; on average, subsampling detected 89% of taxa found in samples. Thus, the subsampling technique provided accurate data on both the abundance and taxa richness of terrestrial invertebrate samples. Importantly, subsampling greatly decreased the time required to process samples, cutting the time per sample by up to 80%. Based on these data, this subsampling technique is recommended to minimize the time and cost of processing moderate to large samples without compromising the integrity of the data and to maximize the information extracted from large terrestrial invertebrate samples. For samples with a relatively low number of invertebrates, complete counting is preferred." (Authors) Zygoptera only were caught in pan but not in pitfall traps.] Address: Dogramaci, M., Dept of Fisheries and Wildlife, Hermiston Agricultural Research and Extension Center, Oregon State University, Hermiston, OR 97838

9797. Dolný, A.; Drozd, P.; Petříková, M.; Harabiš, F. (2010): Sex ratios at emergence in populations of some Central European Gomphidae species (Anisoptera). *Odonatologica* 39(3): 217-224. (in English) ["At emergence (F-0) a significant bias for females was observed within the Moravian (Czech Republic) populations of *Gomphus flavipes*, *G. vulgatissimus* and *Ophiogomphus cecilia*. Males represented 45.6% of all specimens (43.5% in the first and 46.4% in the second research year). The results of the χ^2 test supported the female-biased sex ratio in populations of all 3 species. The sex ratio in populations varied significantly in time during the emergence season, caused by the fact that all 3 species demonstrated a significant protandric trend. The greatest changes in sex ratio during the emergence season were demonstrated by *G. flavipes* (coefficient value -0.007542); the smallest were recorded in *G. vulgatissimus* (CV -0.008617). Environmental impact did not prove to act be a factor which has an effect on the sex ratio of species with phenotypical determination of sex." (Authors)] Address: Dolný, A., Department of Biology and Ecology, Faculty of Natural Sciences, University of Ostrava, Chittussiho 10, CZ-71000 Slezská Ostrava, Czech Republic. E-mail: ales.dolny@osu.cz

9798. Donnelly, N. (2010): Book Review: *Dragonflies & Damselflies of the Rocky Mountains*. *Argia* 22(4): 22-23. (in English) [Dubois, B. (2010): *Dragonflies & Damselflies of the Rocky Mountains*. Kollath Stensaas. ISBN 10: 0979200687. 200 pp. The review includes some personal and general annotations on the lack of information on high altitude Odonata in USA.] Address: Donnelly, T., 2091 Partridge Lane, Binghamton, NY 13903, USA. E-mail: tdonnel@binghamton.edu

9799. Dow, R.A.; Unggang, J. (2010): The Odonata of Binyo Penyilam, a unique tropical wetland area in Bintu-

lu Division, Sarawak, Malaysia. *Journal of Threatened Taxa* 2(13): 1349-1358. (in English) ["Binyo Penyilam is a unique wetland conservation area within the Sarawak Planted Forest Project zone in Sarawak's Bintulu Division. A variety of forest and open habitats are present in the area; these are characterised. An annotated list of 61 species of Odonata from 11 families collected in the area to-date is presented. At least seven of these species had not been found in Sarawak prior to their discovery at Binyo Penyilam, of these four – *Pseudagrion coomansi*, *Merogomphus femoralis*, *Brachygonia puella* and *Chalybeothemis fluviatilis* – have still not been found elsewhere in the state; no other location is known for the genus *Merogomphus* in Borneo. Although under-sampling makes assessments of the conservation status of south-east Asian Odonata difficult, at least 16 of the species found at Binyo Penyilam can be considered to be of potential conservation concern, at least within Sarawak." (Authors)] Address: Dow, R.A., National Museum of Natural History, P.O. Box 9517, 2300 RA Leiden, The Netherlands. E-mail: rory.dow230@yahoo.co.uk

9800. Dragonfly Society of the Americas (2010): *Argia* 22(4). *Argia* 22(4): 23 pp. (in English) [Calendar of Events, 1; In This Issue 1; Minutes of the 2010 Annual Meeting of the Dragonfly Society of the Americas, S. Valley; 2010 Treasurer's Report J. Daigle 2; Request for *Orthemis* specimens J. Daigle, 8; Minutes of the 2010 Annual Meeting of the Dragonfly Society of the Americas, S. Valley; High Oxygen Levels Spawn Monster Dragonflies, 16] Address: Abbott, J.C., Patterson Labs 219, School of Bio. Sci., University of Texas, Austin TX 78712, USA. E-mail: jcabbott@mail.utexas.edu

9801. Dubois, B. (2010): *Dragonflies & Damselflies of the Rocky Mountains*. Kollath Stensaas. ISBN-10: 0979200687: 200 pp. (in English) [This guide covers the mountainous western interior and adjacent lowlands of USA. The author begins with a complete and easily digested description of odonate morphology, followed by an account of odonate biology, both on larval and adult stages. The author gives a brief characteristic of the Rockies themselves, emphasizing the elevation-defined life zones which govern the distribution of nearly all living creatures, and which have much less relevance in the remainder of North America. The species accounts of the approximately 100 species are thorough, and include not only good colour photos of the adults but also numerous black and white drawings of details. The book contains a description for each species, plus valuable clues for their quick identification. Range maps include the entire western United States, making this a useful guide for a much larger area than the title implies.]

9802. Dupont, P. (2010): Plan national d'actions en faveur des Odonates. Office pour les insectes et leur environnement / Société Française d'Odonatologie – Ministère de Ecologie, de l'Energie, du Développement durable et de la Mer: 170 pp. (in French) [This French species action plan considers the following 18 odonate species: *Aeshna caerulea*, *Coenagrion caerulescens*, *C. lunulatum*, *C. mercuriale*, *C. ornatum*, *G. flavipes*, *G. graslinii*, *L. albifrons*, *L. caudalis*, *L. pectoralis*, *Lestes macrostigma*, *Lindenia tetraphylla*, *Macromia splendens*, *Nehalennia speciosa*, *Ophiogomphus cecilia*, *Oxygastra curtisii*, *Sympetma paedisca*, and *Sympetrum depressiusculum*.] Address: <http://www.developpement-durable.gouv.fr/1-Qu-est-ce-qu-un-plan-national-d.html>

9803. Ferrari, M.C.O.; Wisenden, B.D.; Chivers, D.P. (2010): Chemical ecology of predator-prey interactions in aquatic ecosystems: a review and prospectus. *Can. J. Zool.* 88: 698-724. (in English, with French summary) ["The interaction between predator and prey is an evolutionary arms race, for which early detection by either party is often the key to success. In aquatic ecosystems, olfaction is an essential source of information for many prey and predators and a number of cues have been shown to play a key role in trait-mediated indirect interactions in aquatic communities. Here, we review the nature and role of predator kairomones. chemical alarm cues, disturbance cues, and diet cues on the behaviour, morphology, life history, and survival of aquatic prey, focusing primarily on the discoveries from the last decade. Many advances in the field have been accomplished: testing the survival value of those chemicals, providing field validation of laboratory results, understanding the extent to which chemically mediated learning may benefit the prey, understanding the role of these chemicals in mediating morphological and life-history adaptations, and most importantly. the selection pressures leading to the evolution of chemical alarm cues. Although considerable advances have been made, several key questions remain, the most urgent of which is to understand the chemistry behind these interactions." (Authors) This review includes several references to Odonata.] Address: Ferrari, Maud, Department of Environmental Science and Policy, University of California, Davis, One Shields Avenue, Davis, CA 95616, USA. E-mail: mcferrari@ucdavis.edu

9804. Folz, H.-G. (2010): Gabel-Azurjungfer (*Coenagrion scitulum* RAMBUR, 1842) in Rheinhessen angekommen (Insecta: Odonata: Coenagrionidae). *Fauna und Flora in Rheinland-Pfalz* 11(4): 1411-1412. (in German) [3-06-2010, Gau-Bickelsheim, Landkreis Alzey-Worms, Rheinland-Pfalz, Germany] Address: Folz, H.-G., Hausener Str. 8, 55270 Engelstadt, Germany. E-mail: folz-engelstadt@gmx.de

9805. Folz, H.-G. (2010): Ergänzende Libellenfunde in den Landkreisen Mainz-Bingen und Alzey-Worms, Rheinhessen (Insecta: Odonata). *Fauna und Flora in Rheinland-Pfalz* 11(4): 1163-1174. (in German, with English summary) [Rheinland-Pfalz, Germany; records of 43 species are documented.] Address: Folz, H.-G., Hausener Str. 8, 55270 Engelstadt, Germany. E-mail: folz-engelstadt@gmx.de

9806. Folz, H.-G. (2010): Spitzenfleck - *Libellula fulva* MÜLLER, 1764 - zahlreich bei Bingen (Insecta: Odonata: Coenagrionidae). *Fauna und Flora in Rheinland-Pfalz* 11(4): 1415-1417. (in German) [09-VI-2010, Landkreis Mainz-Bingen, Rheinland-Pfalz, Germany] Address: Folz, H.-G., Hausener Str. 8, 55270 Engelstadt, Germany. E-mail: folz-engelstadt@gmx.de

9807. Fortin, B.L. (2010): Selenium dynamics in Canadian Rocky Mountain lakes. M.Sc. thesis, Department of Biological Sciences, University of Alberta, Edmonton: 142 pp. (in English) ["I investigated, water, invertebrates and fishes from lakes in Banff National Park and Kananaskis Country, Alberta for selenium (Se), an element known to be toxic to vertebrates. At some depths, Se concentrations in sediment exceeded recognized thresholds for bird and fish reproductive impairment. Se concentrations in water were over USEPA guidelines after spring melt runoff. In aquatic invertebrates, Se concentrations exceeded values known to

cause reproductive impairment in fish and bird predators. Se concentrations in all fish species exceeded known thresholds for reproductive impairment in avian consumers and the majority surpassed concentrations that would negatively affect wildlife and human consumers. Se concentrations in some fish species have significantly increased over the past 6-16 years. The strongest predictors of fish Se concentrations were growth rate, condition factor, age, weight, trophic position (within lakes) and vegetation type (among lakes). These results suggest that consumption advisories are desirable for several lakes in the Banff and Kananaskis area, and that Se concentrations in fish from other area lakes should be investigated." (Author) Odonata (= Aeshnidae, Coenagrionidae, Libellulidae) mean Se concentrations exceeded the established toxicity thresholds for fish and bird diets in all lakes. Mud Lake would be the only exception, where the mean Se concentration of Odonates was very close to, but did not exceed the threshold for fish reproductive impairment.] Address: Fortin, Barbra Linda, Dept Biol. Sciences, University of Alberta, Canada. E-mail: bfortin@ualberta.ca

9808. Franzen, J. (2010): Nachweis der Gabel-Azurjungfer - *Coenagrion scitulum* RAMBUR, 1842 - in der Kiesgrube Platten bei Wittlich (Insecta: Odonata: Coenagrionidae). *Fauna und Flora in Rheinland-Pfalz* 11(4): 1413-1414. (in German) [11/18-VII-2010, Platten, Landkreis Bernkastel-Kues, Rheinland-Pfalz, Germany] Address: Franzen, J., Auf Cales 54, 56814 Bremm, Germany. E-mail: juergen@jfranzen.de

9809. Friebe, R. (2010): They call me the wanderer. *Frankfurter Allgemeine Sonntagszeitung* 10. Januar 2010: 52. (in German) [Extensive report on the studies of Charles Anderson published as Anderson, R.C. (2009): Do dragonflies migrate across the western Indian Ocean? *Journal of Tropical Ecology* 25(4): 347-358.] Address: not stated

9810. Fujiwara, Y.; Kobayashi, S. (2010): A study on the distribution of *Mnais costaris* Selys the dragonfly in Ehime Prefecture. *Bulletin of the Ehime Prefectural Science Museum* 15: 1-8. (in Japanese, with English summary) [*M. costaris* was recorded in Imabari and Saijo city, eastern part of Ehime prefecture, Japan. This species has a limited distribution in Shikoku Island. In Ehime prefecture, it is thought living only in the middle part, thus it was categorized as threatened species. In general, any investigation on the distribution of this taxon is insufficient in eastern and northern part of prefecture, and the discovery of new habitats is likely. The taxonomic status of *Mnais costaris* Selys and *M. pruinosa* Selys still awaits clarification, and intensified field work can help to improve the data basis.] Address: Kobayashi, S., Professional Graduate Division of Arts and curator of Natural Ehime Prefectural Science Museum, Niihama, Ehime Prefecture, 792-0060, Japan

9811. Gahl, M.K.; Calhoun, A.J.K. (2010): The role of multiple stressors in ranavirus-caused amphibian mortalities in Acadia National Park wetlands. *Canadian Journal of Zoology* 88(1): 108-121. (in English, with French summary) ["Recent studies suggest that multiple sublethal stressors compromise amphibian immune systems and increase susceptibility to disease. We examined two aspects of multiple stressors and incidence of ranavirus-caused amphibian mortalities in free-living amphibian populations: (1) among-pond differences in physical, chemical, and biological stressors (eg. family

Belostomidae, order Hemiptera; family Dytiscidae, order Coleoptera; some suborder Anisoptera, order Odonata) that may exacerbate mortality events, and (2) temporal changes in within-pond stressors that coincide with mortality events. At the among-pond scale, we used principal components analysis and logistic regression followed by Akaike's information criterion (QAICc) to identify stressors associated with disease incidence. Of the stressors we investigated, aluminum, temperature, and conductivity were most correlated with outbreaks, but it was unclear whether they increased ranavirus-caused mortality events. Sublethal stressors were difficult to isolate in the field and few were significantly associated with ranavirus across all breeding ponds. Our results suggest that each wetland, because of varied physical, biological, and chemical settings, will have its own suite of stressors that sublethally affect amphibians." (Authors)] Address: Gahl, M.K., Dept of Plant, Soil, and Environmental Sciences, University of Maine, 5722 Deering Hall, Orono, ME 04469, USA

9812. Gashtarov, V.; Beshkov, S. (2010): *Lindenia tetraphylla* (Vander Linden, 1825) (Odonata: Gomphidae) a new genus and species for the Bulgarian fauna. *Entomologist's Rec. J. Var.* 122: 272-274. (in English) [16.vi.2009; Marena Hill, near Novo Konopladi, Bulgaria N 41°26'48"; E 23°18'44", 114 metres a.s.l., *L. tetraphylla*, female. "During the next few days, many other individuals of the same species were observed flying around the same long pathway, with approximately 8-10 individuals on 17 June 2009 and the last observation on the afternoon of 20 June." This species record the total number of known Odonata in Bulgarian to 67.] In fact *L. tetraphylla* is the 69th species reported for Bulgaria. (M. Marinov)] Address: Gashtarov, V., P.O. Box 1733, 1000 Sofia, Bulgaria. E-mail: vgashtarov@yahoo.com; Beshkov, S., National Museum of Natural History, Tzar Osvooboditel Blvd 1, 1000 Sofia, Bulgaria. E-mail: beshkov@mnhs.com

9813. Goforth, C.L. (2010): Behavioural responses of *Enallagma* to changes in weather (Zygoptera: Coenagrionidae). *Odonatologica* 39(3): 225-234. (in English) ["Odonates exhibit a variety of weather associated behaviours, including abandoning ponds just before storms begin. They may be able to detect changes in weather that alert them to approaching storms and allow them to escape the water's edge before it begins to rain. *E. annexum* and *E. boreale* were observed at a Colorado marsh (USA) to determine which weather factors contributed to the weather-induced behaviours they exhibit. They were observed for 191 five-minute periods and their flight activity quantified. Weather parameters were measured during each interval to account for rapid changes in conditions. Based on results from multiple regression analysis, it is clear that light intensity is the strongest weather parameter affecting zygopteran flight activity, but temperature, wind speed, and the presence of rain are also significant. The 2 species exhibited pond abandonment behaviour during storms. It is likely that storms are dangerous to zygopterans and their apparent ability to detect impending storms is a survival mechanism. Alternatively, pond abandonment behaviour may be triggered by the same factors necessary to trigger roosting and the zygopterans simply return to their roosting sites during storms." (Author)] Address: Goforth, C.L., Department of Biology, Olin Hall, Colorado College, Colorado Springs, Colorado 80903, USA

9814. Gomez-Anaya, J.A.; Novelo-Gutierrez, R. (2010): Richness and structure of an Odonata larval assemblage from Río Pinolapa, Tepalcatepec, Michoacán, Mexico in relation to their habitat characteristics. *Odonatologica* 39(4): 287-303. (in English) ["The odonate larval assemblage from Río Pinolapa (RP) in the municipality of Tepalcatepec, Michoacán, is described. Sampling was conducted twice in each season (8 trips in total), and additionally some physicochemical variables of the river channel were recorded. Strata (shores, riffles and eddies) and seasonal variation of assemblages are described and compared using classical diversity measures such as Shannon's diversity index, Simpson's diversity index as a dominance measure, Margalef's richness index and Pielou's evenness index. For comparing strata and seasonal diversity the Renyi's diversity profiles were used. A Cluster Analysis was performed on a Bray-Curtis similarity matrix to explore the faunal relationships among year seasons and strata. CCA was also performed to investigate the relationships between the physicochemical and species abundance matrixes. As results, 28 species (12 Zygoptera and 16 Anisoptera) were recorded as larvae. Most abundant species were *Erpetogomphus elaps*, *Brechmorhoga praecox* and *Phyllogomphoides luisi*. The highest number of species was registered in winter and the lowest in summer. Among strata the highest abundance was recorded in riffles, although the shoreline had the largest number of species. The most similar assemblages were those of autumn and winter. Shore habitats were more heterogeneous than eddies and riffles and this could explain the larger number of species. The Clench's model explains better the data. Additionally, we used the slope of cumulative number of species curve for assessing completeness of the RP list. CCA was significant, with pH, autumn, shoreline and riffles the most important variables. This means that species variation is related to physicochemical, temporal and strata conditions in RP." (Authors)] Address: Gomez-Anaya, J.A., Instituto de Ecología, A.C., Apartado Postal 63, MX-91070, Xalapa, Veracruz, Mexico. E-mail: antonio.gomez@inecol.edu.mx

9815. Gonzalez-Tokman, D.M.; Gonzalez-Santoyo, I.; Lanz-Mendoza, H.; Cordoba Aguilar, A. (2010): Territorial damselflies do not show immunological priming in the wild. *Physiological Entomology* 35(4): 364-372. (in English) ["Adaptive immunity allows vertebrates to gain protection against repeated pathogenic infections. Analogous responses (priming) have been recently uncovered in invertebrates. However, whether such responses are widespread is not known. The present study investigated the presence of immunological priming in males of a species whose phylogenetic position places it in one of the less derived insect orders. It is hypothesized that the efficiency of such a response could be related to animal condition, as assessed by the expression of a sexually selected ornament. *Hetaerina americana* Fabricius (Odonata: Calopterygidae) males bear a conspicuous ornament (a red wing spot), which is evolutionarily maintained via male territorial competition. Using field-collected animals, a group of males is challenged with bacteria before exposure to a higher dose of the same or a different bacteria, and survival is compared with that of infected males not previously challenged, as well as control groups. Gram-positive and Gram-negative bacteria are used. To explore how long priming may take to work, the second exposure is carried out either after 1 or 5 days. Red spot and body size

are entered in the analysis as predictors of survival within and between groups. There is no difference in survival among groups, which suggests no priming effect. Overall, red spot and body size are not consistent in explaining survival." (Authors)] Address: Cordoba-Aguilar, A., Centro de Investigaciones Biologicas, Universidad Autonoma del Estado de Hidalgo, Apdo. P. 69-1, Plaza Juarez, Pachuca, Hidalgo 42001, Mexico E-mail: acordoba@uaeh.reduaeh.mx

9816. Hacker, H.H.; Segerer, A.H. (2010): Herbert K. Pröse (1933-2009). *Beiträge zur bayerischen Entomofaunistik* 10: 1-11. (in German) [H.K. Röse, a well-known specialist in Microlepidoptera and Neuroptera, started his scientific career with some publications on Odonata in Bavaria, Germany.] Address: Hacker, H.H., Kilianstr. 10, 96231 Bad Staffelstein, Germany. E-Mail: hermann-heinrich.hacker@t-online.de

9817. Hämäläinen, M. (2010): Sudenkorentolajien ensilöydöt Suomessa [The discovery of Finnish dragonflies: a chronological list.]. *Crenata* 3(1): 2-7. (in Finnish with English summary) ["The history of the discovery of the Finnish dragonfly fauna is briefly outlined. The first dragonfly record from Finland was published by Pehr Adrian Gadd in 1751. Gadd's brief Latin and Swedish descriptions fits the male of *Leucorrhinia rubicunda* well. The next author Johan Julin (1792, 1803) listed 10 species from northern Finland. Edvard Hisinger (1861) published the first synopsis of Finnish dragonflies, totalling 35 species. In the 20th century, knowledge of the local fauna started to increase due to the activity of K.J. Valle, who, beside research papers and notes, also authored two national guide books (1922, 1952). The publication of Sami Karjalainen's acclaimed book on Finnish dragonflies in 2002 increased the number of dragonfly enthusiasts greatly. This led to increasingly better knowledge of the distribution of species and discovery of novelties moving to Finland from south. Table 1 summarizes the number of known species by decade from the beginning of 19th century. Table 2 lists the known 55 Finnish dragonfly species in chronological order based on the publication of the first record and gives relevant references." (Author)] Address: Hämäläinen M., Dept Applied Zool., P.O.Box 27, FIN-00014 Univ. of Helsinki, Finland; E-mail: matti.hamalainen@helsinki.fi

9818. Haesloop, U. (2010): Nachweis der Westlichen Geisterlibelle *Boyeria irene* in Norddeutschland. *Lauterbornia* 70: 33-35. (in German, with English summary) ["A larva of the Western Spectre *Boyeria irene* (Fonscolombe, 1838) was caught in 2009-05-26 in the lower part of the Oertze, a tributary of the Aller, which is located in the catchment area of the Weser River. This is the first mentioned record of this Mediterranean species in Northern Germany. Discussion of the circumstances of the finding." (Author)] Address: Haesloop, U., Spezialbüro für gewässerfaunistische Untersuchungen im Norddeutschen Tiefland, Jenaer Str. 10; D-28215 Bremen, Germany. E-Mail: haesloop@freenet.de

9819. Harabiš, F.; Dolný, A. (2010): Ecological factors determining the density-distribution of Central European dragonflies (Odonata). *Eur. J. Entomol.* 107(4): 571-577. (in English) ["Habitat specificity is the most important factor affecting the regional distribution of dragonflies. Nevertheless, species with the highest specificity are not always the scarcest. Several important determinants of dragonfly density-distribution relationships were identified. Altitude preference and altitude range

are significantly associated with dragonfly distribution. Some of the species that are habitat specialists but occur over a wide range of altitudes should be classified as rare but not endangered. This very simple principle is based on the assumption that habitat specialists have a very limited number of suitable biotopes. Obviously, dragonflies with a marginal distribution prefer a narrow range of altitudes (especially in terms of temperature limitation) and biotopes (effect of biogeography, marginality). Surprisingly, there is no "critical" life stage that is significantly associated with the regional distribution of dragonflies, although most species spend most time in the larval stage. Knowledge of the dispersal ability of particular species is limited, although it could significantly affect species survival and distribution." (Authors)] Address: Harabiš, F., Department of Ecology, Czech University of Life Sciences Prague, Kamycka 129, 165 21 Praha 6 – Suchdol, Czech Republic. E-mail: harabis.f@gmail.com

9820. Haritonov, A.Yu.; Kiauta, B. (2010): At the centenary of Dr B.F. Belyshev's birth: The impact of his work on Siberian odonatology. *Odonatologica* 39(4): 305-318. (in English) ["A brief appreciation of B.F. Belyshev's (1910-1993) work is presented and its impact on the current development of odonatology in Siberia is outlined. The bibliography (1993-2010, partim) of the members of his "school" is appended." (Authors)] Address: Kiauta, B., Odonatologica Editorial Office, P.O. Box 124, NL5854 ZJ Bergen / LB, The Netherlands. E-mail: mbkiauta@gmail.com

9821. Hassall, C.; Thompson, D.J. (2010): Accounting for recorder effort in the detection of range shifts from historical data. *Methods in Ecology & Evolution* 1(4): 343-350. (in English) ["1. Climate-induced range shifts have been detected in a large number of plant and animal taxa and a significant portion of these shifts have been found using records collected over a long period of time. However, the absence of standardized collecting procedures in some historical data sets introduces bias and skew into the data which can result in misleading conclusions. A range of different methods has been employed to account for this heterogeneity, but these methods have yet to be compared using a single data set. 2. We tested the accuracy of published methods for accounting for this heterogeneity. An extensive, heterogeneous data base of sightings of Odonata from the United Kingdom was analysed using four published methods to control for uneven recorder effort. For each method, five different range statistics were calculated. The results were compared and tested against changes in temperature over time to select the most accurate method. 3. Significant variation existed between results derived using different methods to account for uneven recorder effort. Range statistics were also shown to exhibit different biases to varying recorder effort, particularly those most commonly used in published studies. 4. A combination of existing methods is recommended to control for temporal variation in recorder effort. This focuses on random resampling of the more heavily recorded time period. A novel range statistic based on a gamma frequency distribution, which avoids the inherent bias of existing statistics, is suggested as a descriptor for range margins. 5. When the most robust methods to control for uneven recorder effort were combined with the most robust range statistics describing the range shift, British Odonata as a group were shown to be tracking isotherms between 1960 and 2005. 6.

Accurate description of past range shifts is essential for correct predictions of future trends and for making decisions concerning conservation priorities. We strongly recommend the use of the best performing methods outlined here to ensure consistency and accuracy in future studies." (Authors)] Address: Hassall, C., Department of Biology, Carleton University, Ottawa, ON, Canada K1S 5B6. E-mail: chassall@connect.carleton.ca

9822. Hertzog, M. (2010): Beobachtung eines frisch geschlüpften Weibchens von *Boyeria irene* am Seerhein (Odonata: Aeshnidae). *AGBU e.V. (Arbeitsgruppe Bodenseeufer) – Thema des Monats November 2010 – www.bodensee-ufer.de*: 3 pp. (in German) [17-VIII-2007, Gottlieben, Kanton Thurgau, Switzerland] Address: Manfred Hertzog, M., Rebhaldenstr. 19, CH-596 Scherzingen, Switzerland. E-mail: mhertzog@bluewin.ch

9823. Hilling, B. (2010): Beautiful Demoiselle *Calopteryx virgo* resting with wings spread. *Atropos* 41: 57- [Verbatim: "On 17 May 2009 at Swallowfield, along the River Loddon south of Reading, I found a *C. virgo* resting with its wings open. It sat for some 30 minutes in this position, allowing photographs to be taken. Normally, of course, both species of demoiselle occurring in Britain rest with their wings characteristically folded above the body. It was a rather cold, mainly cloudy and occasionally wet day. In the first photographs the tip of one of the wings was obscured by a leaf; hoping to get better pictures I gently blew on the damselfly whereupon it closed its wings. To my great surprise a minute or so later it spread its wings as illustrated here, maintaining this position some further 25 minutes. Only when a very short interlude of sunshine came along did the insect fly."] Address: Hilling, B., 28 Hampton Road, Worcester Park, Surrey, KT4 8ET, UK

9824. Hoffmann, J. (2010): Do climate changes influence dispersal and population dynamics of dragonflies in the western Peruvian Andes? *BioRisk* 5: Special issue: Monitoring climatic change with dragonflies: 47-72. (in English) ["For nine dragonfly species (five aeshnids and four libellulids) all previous and verifiable data are related to the vertical climate zones and nature regions of the western Peruvian Andes and the Peruvian Pacific coast. Climate changes due to the El Niño and La Niña phenomena, as well as the global climate change have an influence on the different natural regions and also restrict aquatic biotopes. These changes influence the dispersal and behavior of some dragonflies and concern also loss of habitats as well as alterations of biotic and abiotic factors at and in water. However new waters and habitats also are formed in most nature regions. Specialists like *Rhionaeschna peralta*, a species of high mountain regions and the Puna, are not able to react to habitat losses by adaptation, while other species such as *R. maita* and *R. marchali* do colonize new habitats also in higher altitudes. While the here represented aeshnids change their distribution ranges within the vertical nature regions of the west Andes, this is suspected for three of the four libellulids (*Orthemis ferruginea*, *O. discolor* and *Pantala flavescens*) as latitudinally respectively longitudinally immigrations and expansions of their areals. For all species discussed, a seasonally earlier flight beginning is detectable, but for no species an extension of their flight time. Altogether, the above named three libellulid do react more flexibly and faster to the alterations by climate changes than the majority of the five aeshnid species. The influence of increased

UV-B and UV-A radiation possibly affects also the site occurrence of some species in high altitudes of the Andes." (Author)] Address: Hoffmann, J., Alauda, Wendenstr. 435, D-20537 Hamburg, Germany. E-mail: hoffmann.joa@t-online.de

9825. Holmes, P. (2010): Seasons' Summary. East Keswick Wildlife Trust Newsletter 35: 2. (in English) [East Keswick, Leeds, West Yorkshire, England. "A notable addition to the species of the Parish is that of *Orthetrum cancellatum*. One was seen on the bridle path down to the river and a group of about 25 were found at a pond on land owned by David Cook (permission had been given). This dragonfly is unusual in that it prefers bare ground on which to perch rather than prominent branches and twigs. Their usual range is south of The Wash with scattered populations up to the Humber so our sightings have confirmed its expansion northwards. Other species seen were Southern Hawker, a few of which were emerging from the Hirsts' garden pond, Emperor Dragonfly, Brown Hawker, 4-spot Chaser, Blue-tailed Damsel, Common Blue and Azure Damselflies. During the day of the survey we did not visit Ox Close so did not see the Banded Demoiselles which had made their usual spectacular appearance." (Author)] Address: E-mail: paul@ox-close.co.uk

9826. Holomuzki, J.R.; Klarer, D.M. (2010): Invasive reed effects on benthic community structure in Lake Erie coastal marshes. *Wetlands Ecol. Manage.* 18: 219-231. (in English) ["We examined how dominance (% canopy cover) and invasion history of common reed, *Phragmites australis*, affected benthic macroinvertebrate diversity and density in 8 marshes along Lake Erie's southern shoreline. We also compared macroinvertebrate densities among patches (0.25 m²) of reed, cattail (*Typha* spp.), and native flora (e.g., *Sagittaria*, *Sparganium*) and epiphytic algal communities on submerged stems of reed and cattail. Narrow-leaf cattail (*T. angustifolia*) is also a common invasive plant to these wetlands, but does not greatly change plant community composition or ecosystem conditions like reed. Macroinvertebrate diversity (Shannon-Weaver H₀) was positively related to reed cover and was highest (4.6) in two marshes with *35- and 5-year invasion histories. Shading from high reed cover increased H₀-diversity, in part, by reducing the abundance of floating duckweed, which harboured many *Hyalella azteca* amphipods. Percent Ephemeroptera, Odonata, and Trichoptera was low to moderate across marshes, regardless of reed cover and invasion history. Macroinvertebrate density was not affected by reed cover or average plant stem density, and did not differ among plant types. However, epiphyton densities and % diatoms were greater on reed than on cattail, suggesting reed provides a better feeding habitat for microalgal grazers than *Typha*. Abundance rankings of common species in these diatom-dominated communities were also typically dissimilar between these plant types. Although % grazers was unrelated to epiphyton densities and % diatoms, grazer identity (snails) differed between natural and diked marshes, which had different microalgal food supplies. Our findings suggest that *Phragmites* does not necessarily adversely affect macroinvertebrate community structure and diversity and that invasion history alone has little effect on the H₀-diversity–reed dominance relationship." (Authors) Dominant odonates were *Anax junius*, *Drury*, *Ischnura verticalis*, and *I. posita*.] Address: Holomuzki, J.R., Department of Evolution, Ecol-

ogy, and Organismal Biology, Ohio State University, 1760 University Drive, Mansfield, OH 44906, USA. E-mail: holomuzki.3@osu.edu

9827. Huang, D.-Y.; Petrulevicius, J.F.; Nel, A. (2010): New morphological data from the Jurassic of Inner Mongolia confirms the damselfly aspect of Protomyrmeleontidae (Insecta: Odonatoptera). *Eur. J. Entomol.* 107(4): 615-620. (in English) ["Protomyrmeleon daohugouensis sp. n. and Protomyrmeleon lini sp. n., two new species of Protomyrmeleontidae from the Middle Jurassic of Jiulongshan Formation are the first Chinese representatives of this Mesozoic odonatopteran family. The type specimen of *P. lini* is exceptionally well preserved, showing several particular wing and body structures that were unknown, viz. unique shape of tarsal claws, extreme thoracic skewness, presence of three pairs of long spurs on all femora and tibiae. The type "A" (sensu Nel et al., 2005) of wing venation (i.e. with a very long bridge between IR₂ and RP_{3/4}) corresponds to that of the protomyrmeleontid fore wing. The nearly complete absence of the meso-metathoracic interpleural suture, newly discovered in the Protomyrmeleontidae, can be considered as a synapomorphy of the clade Protozygoptera + Odonata." (Authors)] Address: Nel, A., Lab. Ent. Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: anel@cimrs1.mnhn.fr

9828. Hunt, R.J.; Swift, M.C. (2010): Predation by larval damselflies on cladocerans. *Journal of Freshwater Ecology* 25(3): 345-351. (in English) ["We quantified the strike and capture efficiency, handling time, and functional response of *Enallagma hageni* and *Ischnura verticalis* larvae feeding on several sizes of the cladocerans *Polyphemus pediculus*, *Daphnia pulex*, and *Holopedium gibberum*. Both species were most efficient at capturing and ingesting *P. pediculus*, the smallest and most vulnerable prey, followed by *D. pulex*, a larger, faster prey. *H. gibberum* was rarely eaten due to a protective gelatinous sheath. The handling time was shortest for *P. pediculus* and longest for *D. pulex* due to a combination of size and carapace protection. Both damselfly species exhibited a Type II functional response with a maximum of 20-30 prey eaten per hour. Both *E. hageni* and *I. verticalis* larvae are efficient predators that selectively capture *P. pediculus* and small *D. pulex*; they avoid *H. gibberum*. Due to this differential predation, these larvae may substantially alter zooplankton community composition." (Authors)] Address: Swift, M.C., Dept of Biology, St. Olaf College, Northfield, Minnesota 55057 USA. E-mail: swift@stolaf.edu

9829. Johnson, J. (2010): *Ischnura barberi* (Desert Forktail) found in Oregon. *Argia* 22(4): 4-5. (in English) [18-IX-2010, Borax Lake, Harney County, Oregon, USA] Address: Johnson, J., 3003 Unander Avenue, Vancouver, WA 98660, USA. E-mail: jtjohnson@comcast.net

9830. Johnson, J. (2010): Using wing vein coloration to identify *Argia agrioides* (California Dancer) and *A. nahuana* (Aztec Dancer). *Argia* 22(4): 19-20. (in English) ["Recently, I discovered what appears to be another helpful character for identifying both males and females of these species in the field or in good quality, well-exposed photos. On *nahuana*, the subcosta, radius anterior, radius posterior first branch, and cubitus are noticeably paler (light brown or golden) than other major veins. In particular, the pale subcosta and radius anterior contrast with the darker costa, and especially compared with the costa proximal to the nodus (some-

times more obvious, sometimes more subtle — possibly depending on the angle and lighting). On agrioides the wing veins are relatively uniform in tone without any contrastingly pale veins, or if there is any difference in tone, the costa is paler than the other veins." (Author)] Address: Johnson, J., 3003 Unander Avenue, Vancouver, WA 98660, USA. E-mail: jtjohnson@comcast.net

9831. Johnson, J. (2010): A nymph found out of water. *Argia* 22(4): 18-19. (in English) [Libellula cf quadrimaculata was found crawling out of water at Great Meadow near Lake of the Woods, Klamath County, Oregon, USA, 20-VIII-2010.] Address: Johnson, J., 3003 Unander Av., Vancouver, WA 98660, USA. E-mail: jtjohnson@comcast.net

9832. Johnson, P.T.; Bowerman, J. (2010): Do predators cause frog deformities? The need for an eco-epidemiological approach. *Journal of Experimental Zoology Part B: Molecular and Developmental Evolution* 314B(7): 515-518. (in English) ["Renewed controversy has emerged over the likely causes and consequences of deformed amphibians, particularly those with missing limbs. The results of a series of experiments by Balengée and Sessions (2009) implicate aquatic predators (i.e. dragonfly larvae) in causing such abnormalities. Skelly and Benard (2010), however, argued that the small scale of these experiments and the absence of a correlation between predator abundance and deformity frequencies in natural amphibian populations undermine such a conclusion. Drawing upon our experiences with frog malformations, we suggest that the study of amphibian deformities has been hindered by two, inter-related problems. First, empirical studies often fail to critically define the expected baseline level of abnormalities and differentiate between "epidemic" and "endemic" frequencies of malformations. Second, recognizing the likelihood of multiple causes in driving amphibian malformations, continued research needs to embrace a "multiple lines of evidence" approach that allows for complex ethologies by integrating field surveys, diagnostic pathology, comparative modelling, and experiments across a range of ecological scales. We conclude by highlighting the results of a recent study that uses this approach to identify the role of aquatic predators (i.e., fishes and dragonflies) in causing high frequencies of deformed frogs in Oregon. By combining long-term data, comparative data and mechanistic experiments, this study provides compelling evidence that certain predators do cause deformities under ecologically relevant conditions. In light of continuing concerns about amphibian deformities and population declines, we emphasize the need to integrate ecological, epidemiological, and developmental tools in addressing such environmental enigmas." (Authors)] Address: Pieter T.J. Johnson, Ecology and Evolutionary Biology, University of Colorado, Ramaley N122, Campus Box 334, Boulder, CO 80309. E-mail: pieter.johnson@colorado.edu

9833. Juutinen, R. (ed.) (2010): Restoration decision-making in boreal spring complexes – an assessment of insect fauna and summary of the whole project. *Metsähallituksen luonnonsuojelujulkaisuja. Sarja A* 193: 133 pp. (in Finnish, with Swedish and English summaries) ["Restoration of springs has been evoked as a tool for enhancing the natural state of disturbed springs. However, preliminary vegetation mapping as well as research and monitoring concerning restoration of springs has thus far been scarce. At 2008 Metsähallitus Natural Heritage Services launched a pilot project aiming to as-

sess the flora and fauna, natural state and restoration needs of 30 spring complexes. This publication presents the results for insect fauna and recommendations for restoration. In the first part of this publication it is assessed whether the natural state of a spring complex affects the overall abundance of individuals, species diversity, community structure and conservation value based on adult aquatic insects and/or semiaquatic flies. In addition, the chosen response variables are compared between aquatic insects and semiaquatic flies. Naturalness was not found to be among the most important factors affecting the overall abundance of individuals, species diversity, community structure and conservation value based on adult aquatic insects and/or semiaquatic flies. The spring complexes with highest conservation value were partially different, when based on aquatic insects or semiaquatic flies. The most important conclusion concerning restoration decision-making is that even seriously disturbed spring complexes can harbour valuable, endangered species. And, on the other hand, pristine spring complexes can be species-poor and harbour no taxa with high conservation value. In the second part, restoration needs and possibilities of the studied spring complexes based on flora and fauna, and other field data and subsequent analyses are assessed for each study site. Sites are presented in detail with maps and factors affecting restoration are discussed. Also, the required conservation measures concerning endangered or otherwise valuable species are stated. One aim of this project was to make possible a thorough and scientific monitoring of restoration success. Methods used are documented in detail and planned so that they can be accurately repeated. Species surveys conducted in 2008 thus serve as a baseline survey before restoration." (Author) *Coenagrion hastulatum*, *C. johanssoni*, *C. lunulatum*, and *Leucorrhinia dubia* were sampled at very few localities and in very small abundances.] Address: Juutinen, R., Metsähallitus, luontopalvelut, Finland. E-mail: riikka.juutinen@metsa.fi

9834. Karjalainen, S. (2010): *Suomen Sudenkorennot (The Dragonflies of Finland)* (2nd edition, 2010). ISBN-13: 9789513154257: 239 pp. (in Finnish) ["The new edition of the book covers all the 55 species of dragonfly recorded in Finland, of which 54 were observed in the field and photographed by the author over a period of more than 15 years. All the insects were photographed free in the wild. The first part of the book provides a broad general introduction to dragonfly life. In the main part of the book, a double page spread is reserved for each of the 55 local species. On the left page is one full page photo and on the right 1-2 smaller photos, distribution map, diagrams showing flight season and size and a brief text giving identification characters, habitats and habits. Brief instructions are given in English to help interpret data given in specific accounts. This revised edition includes updated maps and photos along with new information gathered since the publication of the original book." (Publisher)] Address: Karjalainen, S., Neidonpuistontie 6 D 8, FI-02400 Kirkkonummi, Finland. Email: sk@korento.net

9835. Kharitonov, A.; Eremina, E.E. (2010): Dragonflies (Odonata) of the Southern Urals - the experience of regional faunistic studies. *Eurasian Entomological Journal* 9(2): 263-271. (in Russian, with English summary) ["The results of long-term faunistic research on South Ural dragonflies are summarized. Data on the

abundance, occurrence, flight period and biotopical distribution of 69 species are provided. It is concluded that the structure of this regional odonate fauna has been markedly changed over time, especially in recent years." (Authors)] Address: Eremina, Ekatherina, Post Box 2775, Chelyabinsk 454014 Russia. E-mail: karmiska@mail.ru

9836. Khrokalo, L. (2010): Expansion of *Crocothemis erythraea* in Ukraine. *BioRisk* 5: Special issue: Monitoring climatic change with dragonflies: 211-223. (in English) ["A noticeable expansion of some Mediterranean species takes place in Europe during last several decades and this data are related to climatic effects clearly. The present work is a review of literature and original data on distribution of *C. erythraea* in Ukraine. In the beginning and middle of XX century in Ukraine *C. erythraea* was observed in southern area at Dnieper valley, in outmost southwest at Danube delta at the west of Ukraine in Transcarpathian and Forecarpathian. Next, this species was registered at the foothills of Carpathian Mountains. During last three decades *C. erythraea* was also recorded at the north and east (central regions, eastern, northern and northeastern areas). Since 2000 new points have been registered in Odessa, Kherson, Vinnytsya, Cherkasy, Chernihiv, Kyiv administrative regions and in Crimea." (Author)] Address: Khrokalo, Lyudmila, P.O. Box 16, Kyiv-118, Ukraine 03118. E-mail: lkhrokalo@mail.ru

9837. Kipping, J. (2010): *Lestinogomphus silkeae* sp. nov. from the Okavango and Zambezi Rivers (Odonata: Gomphidae). *International Journal of Odonatology* 13(2): 255-265. (in English) ["*Lestinogomphus silkeae* sp. nov. from the northern Okavango Delta in Botswana, the Kavango River in northern Namibia and the middle Zambezi River in Zimbabwe is described and illustrated (holotype male: Botswana, Xaro Lodge, 09 vi 2000, dep. at ZMBH). The shape of the male appendages distinguishes this species from all others in the genus. The new species is compared with the widespread type species of the genus, *L. angustus*." (Author)] Address: Kipping, J., Naturkundliches Museum 'Mauritianum' Altenburg, Parkstrasse 1, 04600 Altenburg, Germany. E-mail: kipping@mauritianum.de

9838. Kita, H. (2010): Charm of dragonflies. *Japic News* 313: 8-9. (in Japanese) [Verbatim: "Now the season of fresh green is coming. I like it so much. The season is also the one for rice sprouts and for rice planting. And in the season we see various insects in neighbouring nature, ponds and streams. Among them dragonflies are popular insects and here I will tell you about them. I have been engaged in public information in a pharmaceutical company. My job is to publicize charmingly correct and useful information to people. And I am very pleased if I can tell you a charm of dragonflies. I am a member of The Japanese Society for Odonatology, and have been studying the ecology of dragonflies, traveling from the north, Hokkaido, to the south of Iriomote Island or the Ogasawara Islands, almost all over Japan for taking photographs of them in nature. Japan is a long and narrow mountainous island, however, it is rich in water, and about 200 odonatas inhabit it. At Shiretoko I chased species of cool region being frightened of bears, and landed on a desert island of Ogasawara in a small boat and photographed an indigenous species there. As mentioned above, I am continuing travel for dragonflies besides working in a pharmaceutical company. It may be my life work. What makes me so much be interested in dragonflies? I think it is the

flight of them. The dragonfly is an insect with excellent flight ability. In Japan tomo is derived from "tobu bou", "tobu": to fly, and "bou": a stick that is a flying stick. Most of the life of dragonflies, though it varies by the species, is occupied by flight behaviour. Some dragonflies fly at a flight speed of more than 100 km/h, and they can catch preys in the air as well as they can fly so far a distance, and can copulate and lay eggs in the air and can hover or can turn a somersault so skillfully. The present day aerodynamics is not a match for their flight technique. The secret is due to the mechanism of the flight muscles and the wings. They have four thoracic muscles with each wings directly attached to it, and they can move them separately, different from other insects, therefore, they can fly straight without up and down movement like butterflies. Also the beautiful water habitat of them is attractive. In this season I am relieved with a sound of streams in neighbouring nature, and when a dragonfly will appear at such a scene, it will be much more the best. Thus, I cannot tell you all of the charms of dragonflies. Photographing dragonflies is my pleasure and expression of the charm of them. In my boyhood, I used reflex cameras with micro-lenses. But now, digital cameras became widespread. If you want to take ecological photos of dragonflies, you are required to use a digital reflex camera with a few conversion lenses of a micro 100 mm a wide lens, a fish-eye lens and a stroboscope. These apparatuses made us everybody enjoy readily insect photographing now. Since ancient times of Emperor "Jinmu" our land was called "Akitsu-shima". Akitsu is an old name of dragonfly, and its origin is when Emperor Jinmu looked out over the land from the hill of Asuka, it resembled the shape of copulation by dragonflies, or a lot of swarms of dragonflies were seen. Also, according to Kojiki, when Emperor Yuryaku visited Yoshino for hunting, a horsefly stung his arm, a dragonfly caught it and preyed. Then, he praised the dragonfly so much, and thereafter, dragonflies were called "kachi-mushi"; insect of victory, and became a representative of lucky insects. Dragonflies have been used for one of old wive's remedy, effects of whooping cough, tonsillitis and asthma. Kuro-yaki, char, and decoction are said to be useful for the effects. The species for it is said to be aka-tombo, *Sympetrum* species. Dr. Ogata, Akira, former president of The Pharmaceutical Society of Japan had investigated whether kuro-yaki of aka-tombo included the effect of sedation or not. He roasted aka-tombo at temperatures 200-300 degrees C for 34 hours, and then, after extraction by alcohol, he refined it, which had an effect of sedating the cramp of the muscle of the bronchi. He noticed that old wive's remedy was effective. Also, dried *Orthetrum* species seems to have been used for a tonic in Taiwan and China. Moreover, we might have used dragonflies for food according to a survey in the Taisho era (1910's). We ate insects such as locusts and larvae of wasps from long time ago, so dragonflies might have been an important source of protein. When people of ancient times saw aka-tombo flying in tandem over the rice paddies in the harvest time of autumn, they might have felt as if the aka-tombo delivered the harvest to them. Dragonflies were very familiar insects for us from ancient times. I hear the most popular children's song is "Aka-tombo" and the important and typical scenery of Japan for us seems to be aka-tombo perching on the harvested ears of rice. However, recently it is often said that dragonflies decreased. Now water environment was contaminated and beautiful water edges are being lost by exploitation here and there in Japan. Larvae of

dragonflies are underwater dwellers, and when the suitable water environment is lost, they cannot live. I experienced often that nice habitats were lost in a few years. The extremely decreasing of dragonflies may be largely due to the change of water environment. It is doubtful whether we can live in such an environment or not, where dragonflies cannot live as well as such scenery as that relieve us is lost. Dragonflies and nature seem to warn us." (Translation: Naoya Ishizawa)] Address: Kita, H., Takiyama 6-2-15-308, Higashikunime City, Tokyo, 203-0033, Japan.

9839. Klausnitzer, B. (2010): Entomologische Schulen in der Oberlausitz - Ergebnisse vorbildlicher, bis heute wirkender Freizeitforschung. Berichte der Naturforschenden Gesellschaft der Oberlausitz 18: 21-42. (in German) [Michael Rostock is the most prominent regional odonatologist at the end of the 19th and beginning of the 20th century in Sachsen, Germany.] Address: Klausnitzer, B., Lannerstr. 5, 01219 Dresden, Germany

9840. Klausnitzer, H. (2010): Bericht über die 18. Tagung Sächsischer Entomologen. Entomologische Nachrichten und Berichte 54(3/4): 174. (in German) [The report includes a note on the lecture of Thomas Brockhaus on *Somatochlora alpestris* and reasons of its occurrence in the Erzgebirge-mountains, Sachsen, Germany.] Address: Klausnitzer, Hertha, PF 202731, 01193 Dresden, Germany

9841. Kleinsteuber, W. (2010): Zur aktuellen Verbreitung der Grundwanze *Aphelocheirus aestivalis* (Fabricius, 1794) in Thüringen (Heteroptera: Aphelocheiridae). Mitteilungen des Thüringer Entomologenverbandes 17 (1/2): 2-10. (in German) [Along four rivers (24 sampling sites) in Thüringen, Germany, the distribution of the heteropteran *Aphelocheirus aestivalis* was studied. Sampling also resulted in locating many macroinvertebrate species, including *Calopteryx splendens*, *Gomphus vulgatissimus*, *Ophiogomphus cecilia*, and *Platycnemis pennipes*.] Address: Kleinsteuber, W., Hirtenweg 15, 04425 taucha, Germany. E-mail: aquahet@gmx.net

9842. Koehler, G.; Frey, W.; Hauptlorenz, H.; Schindler, H. (2010): Konzept zur ökologischen Bewertung und Entwicklung der Wooge im Biosphärenreservat Pfälzerwald. Berichte des Fachgebietes Wasserbau und Wasserwirtschaft der TU Kaiserslautern 20: 312 pp. (in German) [Rheinland-Pfalz, Germany; Odonata are treated on pages 122 - 139.] Address: Koehler, G., FG Wasserbau und Wasserwirtschaft, Technische Universität Kaiserslautern, Paul-Ehrlich-Straße 14, 67663 Kaiserslautern, Germany

9843. Kohl, S. (2010): Binsenjungfer-Weibchen (*Lestes sponsa*) überfällt Paarungsrad der Zwerglibelle (*Nehalennia speciosa*). *mercuriale* 10: 49-50. (in German) [Switzerland, 3-VII-2010: Predation by a female *Lestes sponsa* on a copulating pair of *Nehalennia speciosa*.] Address: Kohl, S., Fuchsgasse 5, CH-8610 Uster, Switzerland. E-mail: stefan.kohl@bluewin.ch

9844. Kohler, N. (2010): Recent discoveries in Montana. *Argia* 22(4): 5-8. (in English) [Montana, USA; Records of the following species are documented and discussed: *Ischnura damula*, *Argia apicalis*, *A. moesta*, *A. immundum*, *Macromia pacifica*, *Calopteryx aequabilis*, *Lestes forcipata*, *Aeshna subarctica*, *Somatochlora ensigera*.] Address: Kohler, N.S. E-mail: nskohler@bresnan.net

9845. Kondratieff, B.C.; Durfee, R.S. (2010): Aquatic Insects (Ephemeroptera, Odonata, Hemiptera, Coleoptera, Trichoptera, Diptera) of Sand Creek Massacre National Historic Site on the Great Plains of Colorado. *Journal of the Kansas Entomological Society* 83(4): 322-331. (in English) ["The Great Plains of Colorado occupies over two-fifths of the state, yet very little is known about the aquatic insects of this area. This paper reports on the aquatic insects found in temporary and permanent pools of Big Sandy Creek within the Sand Creek Massacre National Historic Site, on the Great Plains of Colorado. A total of 107 distinguishable taxa were collected representing six orders and 27 families of insects. The orders Coleoptera (39% or 42 taxa), Diptera (23% or 25 taxa), and Odonata (21% or 23 species) dominated this site. Most of these taxa are geographically widespread and considered common." (Authors)] Address: Kondratieff, B.C., Colorado State University, Department of Bioagricultural Sciences and Pest Management, Fort Collins, CO 80523-1177, USA

9846. Langheinrich, U.; Braumann, F.; Lüderitz, V. (2010): Niedermoor- und Gewässerrenaturierung im Naturpark Drömling (Sachsen-Anhalt). *Waldökologie, Landschaftsforschung und Naturschutz* 10: 23-29. (in German, with English summary) [oas 30, "The Drömling Natural Park is the largest fen area in Central Germany. The management and development plan defines the re-wetting of fens, the preservation and development of extensively used wetlands and the improvement of the ecological status of water bodies as the main aims. In 11 areas, re-wetting already started or will start in the near future. Habitat quality of canals and ditches was enhanced by building shallow water zones and careful management. Function of canals and ditches changes stepwise from drainage to irrigation. Furthermore, new shallow ponds were created. This contribution presents examples for implementation of measures and first results of scientific evaluation. All the measures help to maintain and enhance aquatic and amphibic biodiversity and conservation value. A high total number of species correlates well with the occurrence of endangered species. 50 of such Red Lists species (including 14 Odonata species) were found among aquatic macroinvertebrates and 20 among aquatic macrophytes. These values are above average compared to other fens in Germany. However, the maintenance of diverse landscape and water body structure demands high management efforts. A rising problem for native diversity is the appearance of invasive neozoons." (Authors)] Address: Langheinrich, Uta, Hochschule Magdeburg-Stendal, FB Wasser- und Kreislaufwirtschaft, Breitscheidstr. 2, 39114 Magdeburg, Germany. E-mail: uta.langheinrich@hs-magdeburg.de

9847. Leipelt, K.G.; Suhling, F.; Gorb, S.N. (2010): Ontogenetic shifts in functional morphology of dragonfly legs (Odonata: Anisoptera). *Zoology* 113: 317-325. (in English) ["Anisopteran leg functions change dramatically from the final larval stadium to the adult. Larvae use legs mainly for locomotion, walking, climbing, clinging, or burrowing. Adults use them for foraging and grasping mates, for perching, clinging to the vegetation, and for repelling rivals. In order to estimate the ontogenetic shift in the leg construction from the larva to the adult, this study quantitatively compared lengths of fore, mid, and hind legs and the relationships between three leg segments, femur, tibia, and tarsus, in larval and adult Anisoptera of the families Gomphidae, Aeshnidae, Cor-

dulegastridae, Corduliidae, and Libellulidae, represented by two species each (*Gomphus vulgatissimus*, *Ophiogomphus cecilia*, *Cordulegaster insignis*, *C. picta*, *Orthemtrum cancellatum*, *Sympetrum sanguineum*, *Cordulia aenea*, *Somatochlora metallica*, *Aeshna cyanea*, and *Anax imperator*). We found that leg segment length ratio as well as ontogenetic shift in length ratios was different between families, but rather similar within the families. While little ontogenetic shift occurred in Aeshnidae, there were some modifications in Corduliidae and Libellulidae. The severest shift occurred in Gomphidae and Cordulegastridae, both having burrowing larvae. These two families form a cluster, which is in contrast to their taxonomic relationship within the Anisoptera. Cluster analysis implies that the function of larval legs is primarily responsible for grouping, whereas adult behavior or the taxonomic relationships do not explain the grouping. This result supports the previous hypothesis about the convergent functional shift of leg characters in the dragonfly ontogenesis." (Authors)] Address: Suhling F., Inst. Geoökologie, TU Braunschweig, Langer Kamp 19c, D-38102 Braunschweig, Germany. E-mail: f.suhling@tu-bs.de

9848. Lentink, D.; Jongerius, S.R.; Bradshaw, N.L. (2010): Chapter 14: The scalable design of Flapping Micro-Air Vehicles inspired by insect flight. In: D. Floreano, Zufferey, J.-C.; Srinivasan, M.V.; Ellington, C. (Eds.): *Flying Insects and Robots*. Springer-Verlag Berlin Heidelberg. 1st Edition. 2010, XII, 316 pp. ISBN: 978-3-540-89392-9: 185-205. (in English) ["Here we explain how flapping micro air vehicles (MAVs) can be designed at different scales, from bird to insect size. The common believe is that micro fixed wing airplanes and helicopters outperform MAVs at bird scale, but become inferior to flapping MAVs at the scale of insects as small as fruit flies. Here we present our experience with designing and building micro flapping air vehicles that can fly both fast and slow, hover, and take-off and land vertically, and we present the scaling laws and structural wing designs to miniaturize these designs to insect size. Next we compare flapping, spinning and translating wing performance to determine which wing motion results in the highest aerodynamic performance at the scale of hummingbirds, house flies and fruit flies. Based on this comparison of hovering performance, and our experience with our flapping MAV, we find that flapping MAVs are fundamentally much less energy efficient than helicopters, even at the scale of a fruit fly with a wing span of 5 mm. We find that insect-sized MAVs are most energy effective when propelled by spinning wings. [...] We used dragonfly wings (*Sympetrum vulgatum*) as an inspiration to develop design principles for such stiffer micro-wings with venation-like tear-stoppers." (Authors)] Address: Lentink, D., Experimental Zoology Group, Wageningen University, 6709 PG Wageningen, The Netherlands; Faculty of Aerospace Engineering, Delft University of Technology, 2629 HS Delft, The Netherlands. E-mail: david.lentink@wur.nl

9849. Lin, C.-P.; Chen, M.-Y.; Huang, J.-P. (2010): The complete mitochondrial genome and phylogenomics of a damselfly, *Euphaea formosa* support a basal Odonata within the Pterygota. *Gene* 468(1-2): 20-29. (in English) ["This study determined the first complete mitochondrial genome of a damselfly, *Euphaea formosa* (Insecta: Odonata: Zygoptera), and reconstructed a phylogeny based on thirteen protein-coding genes of mitochondrial genomes in twenty-five representative hexapods to ex-

amine the relationships among the basal Pterygota. The damselfly's mitochondrial genome is a circular molecule of 15,700 bp long, and contains the entire set of thirty-seven genes typically found in insects. The gene arrangement, nucleotide composition, and codon usage pattern of the mitochondrial genome are similar across the three odonate species, suggesting a conserved genome evolution within the Odonata. The presence of the intergenic spacer s5 likely represents a synapomorphy for the dragonflies (Anisoptera). Maximum parsimony, maximum likelihood, and Bayesian analyses of both nucleotide and amino acid sequences cannot support the three existing phylogenetic hypotheses of the basal Pterygota (Palaeoptera, Metapterygota, and Chistomyaria). In contrast, the phylogenetic results indicate an alternative hypothesis of a strongly supported basal Odonata and a sister relationship of the Ephemeroptera and Plecoptera. The unexpected sister Ephemeroptera + Plecoptera clade, which contradicts with the widely accepted hypothesis of a monophyletic Neoptera, requires further analyses with additional mitochondrial genome sampling at the base of the Neoptera." (Authors)] Address: Lin, C.-P., Department of Life Science, Tunghai University, Taichung, Taiwan. E-mail: treehops@thu.edu.tw

9850. Locklin, J.L. (2010): Gregarine parasitism in dragonfly populations of Central Texas with an assessment of fitness costs in *Erythemis simplicicollis*. Ph.D. thesis, Dept. of Biology, Baylor University: XI, 88 pp. (in English) ["Dragonfly parasites are widespread and frequently include gregarines (Phylum Apicomplexa) in the gut of the host. Gregarines are ubiquitous protozoan parasites that infect arthropods worldwide. More than 1,600 gregarine species have been described, but only a small percentage of invertebrates have been surveyed for these apicomplexan parasites. Some consider gregarines rather harmless, but recent studies suggest otherwise. Odonate-gregarine studies have more commonly involved damselflies, and some have considered gregarines to rarely infect dragonflies. In this study, dragonfly populations were surveyed for gregarines and an assessment of fitness costs was made in a common and widespread host species, *Erythemis simplicicollis*. Adult dragonfly populations were surveyed weekly at two reservoirs in close proximity to one another and at a flow-through wetland system. Gregarine prevalences and intensities were compared within host populations between genders, among locations, among wing loads, and through time. Host fitness parameters measured included wing load, egg size, clutch size, and total egg count. Of the 37 dragonfly species surveyed, 14 species (38%) hosted gregarines. Thirteen of those species were previously unreported as hosts. Gregarine prevalences ranged from 2% – 52%. Intensities ranged from 1 – 201. Parasites were aggregated among their hosts. Gregarines were found only in individuals exceeding a minimum wing load, indicating that gregarines are likely not transferred from the naiad to adult during emergence. Prevalence and intensity exhibited strong seasonality during both years at one of the reservoirs, but no seasonal trend was detected at the wetland. The seasonal trend at the reservoir suggests that gregarine oocyst viability parallels increasing host population densities and may be short-lived. Prevalence and intensity also differed between dragonfly populations at the locations. Regression analyses revealed that host species, host gender, month, and year were significant explanatory variables related to grega-

rine prevalence and intensity. The fitness parameters measured were not correlated with presence or intensity of gregarines, suggesting that either gregarines do not affect wing loading and egg production in *E. simplicicollis*, or that virulence depends on parasite intensity and/or the specific gregarine species infecting the hosts. Our results emphasize the importance of considering season, hosts, and habitat when studying gregarine-dragonfly ecology." (Author)] Address: Locklin, J.L., Department of Biology, Baylor University, One Bear Place 76798, Waco, TX 97388, USA. E-mail: jasonlocklin@baylor.edu

9851. Locklin, J.L.; Vodopich, D.S. (2010): Eugregarine parasitism of *Erythemis simplicicollis* (Say) at a constructed wetland: A fitness cost to females? (Anisoptera: Libellulidae). *Odonatologica* 39(4): 319-331. (in English) ["Eugregarine parasites infect a wide variety of invertebrates. Some authors suggest that eugregarines are rather harmless, but recent studies suggest otherwise. Among odonate-eugregarine investigations, Zygoptera have been more frequently studied than Anisoptera. Adult dragonfly populations were surveyed for eugregarines at a constructed, flow-through wetland system and the fitness cost of infection was assessed in a common and widespread dragonfly host species, *E. simplicicollis*. Populations were sampled weekly throughout the flight season. Host fitness parameters measured included wing load, egg size, clutch size, and total egg count. Of the 22 host species surveyed, 8 hosted eugregarines and 2 of these odonate species were previously undocumented as hosts. While eugregarine parasitism has been shown to exhibit seasonality, parasite prevalence and intensity in *E. simplicicollis* in this study showed no seasonal trend. The fitness parameters measured were not correlated with the presence or intensity of eugregarines. These findings suggest that either eugregarines do not affect wing loading and egg production in *E. simplicicollis*, or that virulence depends on parasite intensity and/or the specific eugregarine species infecting the hosts." (Authors)] Address: Locklin, J.L., Department of Biology, Baylor University, One Bear Place 97388, Waco, TX 76798, USA

9852. Mabry, C.; Dettman, C. (2010): Odonata richness and abundance in relation to vegetation structure in restored and native wetlands of the prairie pothole region, USA. *Ecological Restoration* 28(4): 475-484. (in English) ["Over the past couple of decades, 2,200,000 ha of wetlands and grasslands have been restored in the prairie pothole region, USA. However, many restored and remnant wetlands in the region are dominated by two invasive plant species, reed canary grass (*Phalaris arundinacea*) and cattail (*Typha* spp.), which form dense monotypic stands. These restorations are usually evaluated as habitat for waterfowl and other birds; however, there is a need to evaluate their success for invertebrates. Odonata are ideal organisms to include in our evaluations of restored wetland habitat quality for both ecological and practical reasons. To examine the association between vegetation structure and odonate assemblages in shoreline vegetation of prairie pothole wetlands, we compared odonate richness and abundance in dense, monotypic stands to that of vegetation with diverse vertical structure. We also observed the use of these two different habitats by odonate species classified as "of conservation concern" in Iowa. Odonate species richness was substantially greater in the mixed-structure vegetation than in monotypic

stands. A similar trend was found in odonate species with a "vulnerable" or "uncommon" conservation status. The number of occurrences of species of conservation concern was four times greater in mixed than in monotypic vegetation. A comparison of our data to those collected in the 1990s for one monotypic vegetation site further supported this conclusion. Many odonate species are targets for conservation and can readily benefit from wetland restoration and reconstruction if the sites are managed for proper vegetation structure." (Authors)] Address: Mabry McMullen, Cathy, Iowa State Univ., Dep.t of Natural Resource Ecology & Management, 339 Science Hall II, Ames, Iowa 50011, USA. E-mail: mabry@iastate.edu

9853. Machado, A.B.M. (2010): *Oxyagrion mirmae* spec. nov. from Brazil (Zygoptera: Coenagrionidae). *Odonatologica* 39(4): 353-356. (in English) ["The new species is described, illustrated and compared with the other 25 congeners. Holotype male: Virginia, Minas Gerais, Brasil, 3-II-2010; deposited in author's collection." (Author)] Address: Machado, A.B.M., Departamento de Zoologia, Inst. Cienc. Biol., Universidade Federales de Minas Gerais, Caixa Postal 486, 31270-901 Belo Horizonte, Minas Gerais, Brazil. E-mail: angelo@icb.ufmg.br

9854. Mäkinen, J. (2010): Kirja-arvostelu: Sami Karjalainen - Suomen sudenkorennot [Review of new edition of Suomen sudenkorennot (The Dragonflies of Finland) by Sami Karjalainen]. *Crenata* 3(1): 40. (in Finnish) [The publication of the first edition of Suomen sudenkorennot in 2002 raised the interest in dragonflies in Finland enormously. Finnish Dragonfly Society was founded few years later. There are a number of reasons why the publication of new edition is important. The book has been sold out for many years and no other Finnish guides are available. After the publication of the first edition significant changes in Finnish fauna and distribution areas of many species have happened. Also maps and flight charts are updated with new information. The new edition includes 92 new photos and 17 pages more than the first edition. Thirteen species from neighbouring areas are also presented in the book, including all Scandinavian species. All of them are presented with Finnish (vernacular) names for the first time. (Asmus Schröter)] Address: Mäkinen, J. E-mail: makisenjussi@gmail.com

9855. Mäkinen, J. (2010): Sudenkorennoille oma suojelualue [A nature reservation area for dragonflies]. *Crenata* 3(1): 38-39. (in Finnish) ["Finnish Dragonfly Society has started a project, which aims for a nature reservation area for dragonflies. Fundraising has already begun. When enough money has been collected, a bog with a good dragonfly fauna will be bought and then protected." (Asmus Schröter)] Address: Mäkinen, J. E-mail: makisenjussi@gmail.com

9856. Mäkinen, J.; Koskinen, J.; Tuohimaa, J. (2010): Sudenkorentokatsaus 2009 [Dragonfly review 2009]. *Crenata* 3(1): 8-33. (in Finnish with English summary) ["This article presents the most interesting dragonfly records from Finland in 2009. For each observed species the following information is presented: first and last records of the summer, greatest sums and northernmost records. Seven new provincial records were made: *Coenagrion lunulatum* was found for the first time in Keski-Pohjanmaa, *Aeshna crenata* in Pohjois-Savo, *Aeshna viridis* and *Orthetrum coerulescens* in

Uusimaa, *Orthetrum cancellatum* in Pohjois-Karjala and *Leucorrhinia albifrons* in Pohjois-Pohjanmaa. A map of Finnish biogeographical provinces is shown in the end of the article. Table 1 presents the total number of records of each species, as well as their rankings between 2007 and 2009. Most of the records for this article were gathered from Hatikka database (www.hatikka.fi). The records were made by 104 observers. Their names (abbreviations are used for the members of the Finnish Dragonfly Society) are presented in the end of the article." (Authors)] Address: Mäkinen, J. E-mail: makisenjussi@gmail.com

9857. Magoba, R.N.; Samways, M.J. (2010): Recovery of benthic macroinvertebrate and adult dragonfly assemblages in response to large scale removal of riparian invasive alien trees. *Journal of Insect Conservation* 14(6): 627-636. (in English) ["Invasive alien organisms can impact adversely on indigenous biodiversity, while riparian invasive alien trees (IATs), through shading of the habitat, can be a key threat to stream invertebrates. We ask here whether stream fauna can recover when the key threat of riparian IATs is removed. Specifically, we address whether IAT invasion, and subsequent IAT removal, changes benthic macroinvertebrate and adult dragonfly assemblages, for the worse or for the better respectively. Natural riparian zones were controls. There were statistically significant differences between stream reaches with natural, IAT-infested and IAT-cleared riparian vegetation types, based on several metrics: immature macroinvertebrate taxon richness, average score per macroinvertebrate taxon (ASPT), a macroinvertebrate subset (Ephemeroptera, Plecoptera, Trichoptera and Odonata larvae; EPTO), and adult dragonfly species richness. Reaches with natural vegetation, or cleared of IATs, supported greater relative diversity of macroinvertebrates than reaches shaded by dense IATs. Greatest macroinvertebrate ASPT and EPTO were in reaches bordered by natural vegetation and those bordered by vegetation cleared of IATs, and the lowest where the riparian corridor was IATs. Highest number of adult dragonflies species was along streams cleared of dense IATs. Overall, results showed that removal of a highly invasive, dense canopy of alien trees enables recovery of aquatic biodiversity. As benthic macroinvertebrate scores and adult dragonfly species richness are correlated and additive, their combined use is recommended for river condition assessments." (Authors)] Address: Samways, M.J., Dept Entomol. & Nematol., Univ. Stellenbosch, Private Bag X1, ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za

9858. Maltchik, L.; Stenert, C.; Bender Kotzian, C.; Marques Pires, M. (2010): Responses of odonate communities to environmental factors in southern Brazil wetlands. *Journal of the Kansas Entomological Society* 83(3): 208-220. (in English, with Portuguese summary) ["Odonate larvae play an important role in wetland systems, providing food for many fish species and birds. Besides, they are important predators in these ecosystems. However, studies of factors that determine odonate species richness and distribution in wetlands are scarce in the Neotropical region. The objectives of this study were to: 1) conduct a survey of the diversity of odonate larvae in southern Brazil wetlands, and 2) determine how much variation in odonate richness, abundance and composition is explained by wetland area, altitude, water conductivity and nitrate, hydroperiod, and dominant aquatic vegetation in 140 wetlands in

an extensive area of the Neotropical region (280,000 km², southern Brazil). A total of 4,039 individuals distributed among five families and 28 genera were collected. Libellulidae, Coenagrionidae and Aeshnidae were the families that showed the greatest richness. *Erythrodiplax* was observed in more than 70% of the sampled wetlands, and comprised 61% of individuals collected. Richness was negatively associated with wetland area and nitrate concentration. Odonate abundance was negatively associated with water conductivity and nitrate, and it was higher in aquatic beds than in emergent wetlands. Richness and abundance were higher in permanent than in intermittent wetlands. Variation in odonate composition was correlated with wetland altitude, area and water conductivity. Hydroperiod and dominant aquatic vegetation also influenced composition. Our results showed that southern Brazil wetlands are important habitats for 28 odonate genera, and that richness, abundance and composition are influenced mainly by hydroperiod, nitrate, and aquatic vegetation type. These results should be seen as important to determine the environmental factors that shape and maintain odonate diversity in southern Brazil wetlands." (Authors)] Address: Maltchik, L., Laboratório de Ecologia e Conservação de Ecossistemas Aquáticos, Universidade do Vale do Rio dos Sinos, UNISINOS, Av. Unisinos, 950, CEP 93022-000, Sao Leopoldo, Rio Grande do Sul, Brasil. E-mail: maltchik@unisinos.br

9859. Marrocco, J.; Demasi, L.; Venkataraman, S. (2010): Investigating the structural dynamics implication of flexible resilin joints on dragonfly wings. *San Diego State University Access proceedings* 10-09: 6 pp. (in English) ["The practical application of relatively small, light weight micro air vehicles by biomimicry is of great interest to the engineering community. The goal of this research project is to improve the understanding of the structural construction of insect wings. A dragonfly insect has been chosen, as it has a very revealing structure and is an insect that has unique flight capabilities. Dragonfly wings are able to withstand the forces imposed upon them by the surrounding air, inertial forces caused by acceleration and decelerating their own weight. The basic design of a dragonfly wing is a pleated membrane stiffened by tubes at the apexes of the pleats, forming a particularly rigid and strong structure. This tubular pleated membrane provides a stiff structure along the length (span wise) direction of the wing and a flexible structure along the width (chord wise direction) of the wing. The tailoring flexibility in the wing is essential as it can play significant role in the aerodynamics wing airfoil shape it can achieve, in addition to the benefits of gust alleviations, and damage tolerance. The investigation into the material composition and architecture on the dragon fly wings revealed that while a large part of the wing structure is made of chitin protein, there is a regular pattern of joints on the wing made of less stiffer resilin protein. The focus of this effort is to understand the effect and implications of the resilin joints on the structural dynamics of the wing. To achieve this goal a finite element structural analysis tool has been used and a detailed model of the dragonfly wing was created. Main focus of the present analysis is to understand how the presence of flexible resin joints affects the natural vibration and mode shapes of the dragonfly wing." (Authors); <http://www.csrc.sdsu.edu/csrc/access/reports/AP10-09.pdf>] Address: Marrocco, J., Department of Biology, Department of Aerospace Engineering and Engi-

neering Mechanics, San Diego State University, USA.
E-mail: JosephMarrocco@yahoo.com

9860. Martens, A.; Hazevoet, C.J. (2010): Dragonflies (Insecta, Odonata) of São Vicente, Cape Verde Islands: 10 species on a desert island. *Zoologia Caboverdiana* 1 (2): 112-115. (in English) [Records of the following species are documented and briefly discussed: *Lestes pallidus*, *Ischnura senegalensis*, *Anax ephippiger*, *A. imperator*, *Crocothemis erythraea*, *Orthetrum trinacria*, *Pantala flavescens*, *Sympetrum fonscolombii*, *Tramea limbata*, *Trithemis annulata*, and *Zygonyx torridus*.] Address: Hazevoet, C.J., Instituto de Investigação Científica Tropical - Jardim Botânico Tropical, Unidade de Zoologia, Rua da Junqueira 14, 1300-343 Lisboa, Portugal

9861. Martens, A. (2010): Ecology of the dragonflies at the westernmost spot of Africa, the island of Santo Antão, Cape Verde (Odonata). *International Journal of Odonatology* 13(2): 241-254, pl. IVa. (in English) ["From 12 to 25 August 2009, the odonate fauna of Santo Antão, Cape Verde was surveyed by recording adults and collecting larvae and exuviae at 26 localities, mostly situated in the northwest of the island. Based on the results of this survey and literature data on the Cape Verde it appears that the resident odonate fauna consists of only five species, namely *Anax imperator*, *Crocothemis erythraea*, *Orthetrum trinacria*, *Trithemis annulata* and *Zygonyx torridus*. Three additional species, *Anax ephippiger* and *Pantala flavescens*, which were recorded as single adults in this study, and *Sympetrum fonscolombii*, which was previously recorded in another study, represent seasonal invaders that do not establish permanent populations on the island. Surprisingly, there is no zygopteran species recorded from the island, although a few occur on the neighbouring islands. The breeding habitats of the resident odonates on the island comprise short perennial stream sections in large wadi beds ('ribeiras') that are intensely used for agriculture, as well as artificial irrigation tanks. The odonate assemblage is very uniform, although *Z. torridus* prefers micro-habitats with flowing water and *O. trinacria* is found only in micro-habitats with fine sediments. In the absence of fish, crabs and large water beetles, the larva of *A. imperator* appears to be the top predator in freshwater habitats." (Author)] Address: Martens, A., University of Education Karlsruhe, Bis-marckstraße 10, 76133 Karlsruhe, Germany. E-mail: martens@ph-karlsruhe.de

9862. Matthews, J. (2010): Anthropogenic climate change impacts on ponds: a thermal mass perspective. *BioRisk* 5: Special issue: Monitoring climatic change with dragonflies: 193-209. (in English) ["Small freshwater aquatic lentic systems (lakes and ponds) are sensitive to anthropogenic climate change through shifts in ambient air temperatures and patterns of precipitation. Shifts in air temperatures will influence lentic water temperatures through convection and by changing evaporation rates. Shifts in the timing, amount, and intensity of precipitation will alter the thermal mass of lentic systems even in the absence of detectable ambient air temperature changes. These effects are likely to be strongest in ponds (standing water bodies primarily mixed by temperature changes than by wind), for whom precipitation makes up a large component of inflows. Although historical water temperature datasets are patchy for lentic systems, thermal mass effects are likely to outweigh impacts from ambient air temperatures in

most locations and may show considerable independence from those trends. Thermal mass-induced changes in water temperature will thereby alter a variety of population- and community-level processes in aquatic macroinvertebrates." (Authors) This review includes data on Odonata.] Address: Matthews, J.H., University of Texas, Section of Integrative Biology, Austin, USA. E-mail: johoma@gmail.com

9863. Mauersberger, R. (2010): *Leucorrhinia pectoralis* can coexist with fish (Odonata: Libellulidae). *International Journal of Odonatology* 13(2): 193-204. (in English) ["The Palearctic libellulid *Leucorrhinia pectoralis* is generally considered to be a species inhabiting fish-free water bodies. Yet, a long-term monitoring study of 38 water bodies in NE Germany resulted in 16 species of fish being recorded in reproductive habitats of *L. pectoralis*, with *Rutilus rutilus* and *Carassius carassius* as the most numerous and widespread fish species. Only 14 water bodies were certainly or probably without fish. The seasonal numbers of exuviae of *L. pectoralis* at the water bodies ranged between 0.1 and 136 per 10 m of bank section. The abundance of *L. pectoralis* was higher in fish-free water bodies (an average of 28.0 exuviae/10 m) than in fish-inhabited waters (1.7 exuviae/10 m). The emergence success of *L. pectoralis* depended on the density and species composition of the fish. If only one non-piscivorous fish species (*Carassius carassius*, *Tinca tinca*) was present at low density, the abundance of exuviae averaged 6.5/10 m. In water bodies containing a multispecies fish fauna that included piscivorous species, combined with high fish density only 0.7 exuviae/10 m were found on average. At localities where the fish fauna was dominated by *Perca fluviatilis* virtually no emergence of *L. pectoralis* occurred." (Author)] Address: Mauersberger, R., Prenzlauer Allee 66, 17268 Templin, Germany. E-mail: rue.mau@web.de

9864. Mauersberger, R.; Bukowsky, N. (2010): Moor-Wiedervernässung als Maßnahme zur Grundwasseranreicherung und Hochwasserableitung - Praxisbeispiel aus dem Naturpark Uckermärkische Seen. *Naturschutz und Landschaftspflege in Brandenburg* 19(3/4): 167-169. (in German) [The revitalisation of two bogs in Brandenburg, Germany resulted in a significant increase in population density of *Aeshna viridis* and *Leucorrhinia pectoralis*. No details are given.] Address: Mauersberger, R., Bahnhofstr. 24, D-17268 Templin, Germany. E-mail: FoerderevereinUeckermark.Seen@t-online.de

9865. Mauersberger, R.; Gunnemann, H.; Rowinsky, V.; Bukowsky, N. (2010): Das Mellenmoor bei Lychen - ein erfolgreich revitalisiertes Braunmoosmoor im Naturpark Uckermärkische Seen. *Naturschutz und Landschaftspflege in Brandenburg* 19(3/4): 182-186. (in German) [Brandenburg, Germany; the revitalisation of the intermediate bog resulted in local range extensions and population increase of several Odonata, including the rare *Leucorrhinia pectoralis*.] Address: Mauersberger, R., Bahnhofstr. 24, D-17268 Templin, Germany. E-mail: FoerderevereinUeckermark.Seen@t-online.de

9866. Mbabazi, D.; Makanga, B.; Orach-Meza, F.; Hecky, R.E.; Balirwa, J.S.; Ogutu-Ohwayo, R.; Verburg, P.; Chapman, L.; Muhumuza, E. (2010): Intra-lake stable isotope ratio variation in selected fish species and their possible carbon sources in Lake Kyoga (Uganda): implications for aquatic food web studies. *African Journal of Ecology* 48(3): 667-675. (in English, with French summary) ["The stable isotopes of nitrogen ($\delta^{15}\text{N}$) and

carbon ($\delta^{13}\text{C}$) provide powerful tools for quantifying trophic relationships and carbon flow to consumers in food webs; however, the isotopic signatures of organisms vary within a lake. Assessment of carbon and nitrogen isotopic signatures in a suite of plants, invertebrates, and fishes in Lake Kyoga, indicated significant variation between two sites for $\delta^{13}\text{C}$ (paired $t = 6.305$; $df = 14$, $P < 0.001$ and $\delta^{15}\text{N}$ paired $t = 1.292$; $df = 14$; $P < 0.05$). The fish fauna in Bukungu was generally more $\delta^{13}\text{C}$ enriched (mean $\delta^{13}\text{C} = -16.37 \pm 1.64\text{‰}$) than in Iyingo (mean $\delta^{13}\text{C} = -20.80 \pm 2.41\text{‰}$) but more $\delta^{15}\text{N}$ depleted (mean $\delta^{15}\text{N} = 5.57 \pm 0.71\text{‰}$) than in Iyingo (mean $\delta^{15}\text{N} = 6.92 \pm 0.83\text{‰}$). The simultaneous shifts in phytoplankton and consumer signatures confirmed phytoplankton as the major source of carbon for the food chain leading to fish. Limited sampling coverage within lakes may affect lake wide stable isotope signatures, and the same error is transferred into trophic position estimation. Consideration of potential intra-lake spatial variability in isotope ratios and size is essential in evaluating the spatial and trophic structure of fish assemblages." (Authors) Odonata are treated at the order level.] Address: Mbabazi, D., National Fisheries Resources Research Institute, PO Box 343, Jinja, Uganda. E-mail: mbabazidismas@yahoo.com

9867. McHugh, E.S. (2010): The northward extension and new county records of five Kansas dragonflies. *Argia* 22(4): 8-9. (in English) [During the 2010 field season *Libellula deplanata*, *Tramea carolina*, *Celithemis fasciata*, *Dythemis fugax*, and *D. velox* were found further north in Kansas than had been previously reported.] Address: Earl S. (Mick) McHugh DDS, Kansas City, USA. E-mail: Emchugh2@kc.rr.com

9868. Miller, F.P.; Vandome, A.F.; Mcbrewster, J. (2010): Dragonfly: Odonata, Epiprocta, Eye, Damselfly, Insect, Insect Wing, Predation, Mosquito, Fly, Bee, Ant, Butterfly, Wetland, Larva, Nymph (Biology). Alphascript Publishing. ISBN: 6130601638: 168 pp. (in English) [Articles taken from Wikipedia (focusing on Odonata), poorly arranged (e.g. very small letter types), and sold for maximum profit purposes. Before buying this book, you should order a display copy.]

9869. Mollov, I.; Boyadzhiev, P.; Donev, A. (2010): Trophic role of the Marsh frog *Pelophylax ridibundus* (Pallas, 1771) (Amphibia, Anura) in the aquatic ecosystems.. *Bulgarian Journal of Agricultural Science* 16(3): 298-306. (in marsh frog, diet, trophic spectrum, niche breadth, South Bulgaria) ["During our study we identified 1356 prey items, divided in 64 prey categories in the trophic spectrum of *Pelophylax ridibundus* from the surrounding of Skutare Village (Plovdiv District, South Bulgaria). The average number of prey items per stomach for all studied seasons is as follows: spring 1994 - 11.93 (SD=18.31); autumn 1994 - 9.65 (SD=13.44); spring 1995 - 11.84 (SD=16.34) and totally - 11.49 (SD=38.67). The most important prey category for the whole period of study is Coleoptera (31.93%), followed by Diptera (27.65%) and Hymenoptera (13.42%)." (Authors) Odonata, mainly Zygoptera contributed with 3% to the prey items.] Address: Mollov, I., Univ. of Plovdiv "Paisii Hilendarski", Faculty of Biology, Department of Ecology and Environmental Conservation, 4000 Plovdiv, Bulgaria. E-mail: E-mail: mollovi@yahoo.com

9870. Monroe, E.M.; Lynch, C.; Soluk, D.A.; Britten, H.B. (2010): Nonlethal tissue sampling techniques and microsatellite markers used for first report of genetic di-

versity in two populations of the endangered *Somatochlora hineana* (Odonata: Corduliidae). *Annals of the Entomological Society of America* 103(6): 1012-1017. (in English) ["Techniques for obtaining DNA noninvasively or nonlethally are highly desirable in molecular genetic studies of protected species, and several advances have been made in these types of sampling and extraction techniques. Insects present a unique set of difficulties in this regard that are not present when working with most vertebrates. This study evaluated the effectiveness of several nonlethal sampling techniques for larval and adults of the federally listed endangered dragonfly *Somatochlora hineana*. Fecal pellets and shed exuviae from captive *S. hineana* larvae did not provide high enough quality DNA for microsatellite analyses. Invasive, but nonlethal, wing clips from adults and tarsi from larvae provided high-quality DNA that amplified 10 microsatellite markers for this species. Ten loci were polymorphic in 94 specimens with four to 14 alleles per locus. Two populations in WI had average observed heterozygosity of 0.47, which is within the range reported for other odonates. Our sampling techniques and these new microsatellite markers provide an essential tool for determining the genetic structure of *S. hineana* populations throughout its range." (Authors)] Address: Monroe, Emy, Department of Biology, University of South Dakota, 414 E. Clark Avenue, Vermillion, SD 57069, USA. E-mail: emy.monroe@usd.edu.

9871. Morimoto, M.; Yamamura, Y.; Watanabe, M. (2010): Conservation ecology of the brackish water damselfly, *Mortonagrion Hirosei* Asahina: Dynamics of a newly established reed community (Zygoptera: Coenagrionidae). *Odonatologica* 39(4): 333-340. (in English) ["The endangered *M. Hirosei* perches in the understory of dense reed communities in brackish water. To aid the conservation of a population, a new reed community (2110 m²) was established in abandoned rice paddy fields adjacent to the original, threatened community (500 m²) by transplanting reed rhizomes in January 2003; brackish water was supplied to the new community. It was assessed whether the new community developed into a suitable habitat for *M. Hirosei* by comparing it to the original community in 2005. Shoot height, density, and aboveground biomass of the reeds and relative light intensity in the community were measured periodically during the growing season. Reed height and biomass were significantly lower in the new community than in the original one. This suggests that 3 yr after transplantation the new community was still underdeveloped. However, shoot density and relative light intensity in the understory were not significantly different between the two communities. Thus, the new reed community was offered in 2005 to *M. Hirosei* adults as a suitable habitat." (Authors)] Address: Yamamura, Y., College of Science, Ibaraki University, Mito, Ibaraki 310-8512, Japan. E-mail: yama@mx.ibaraki.ac.jp

9872. Mousat, F.; Dumont, H.J.; Karrom, M.; Ali, N.M. (2010): Dragonflies from northern Syria (Insecta: Odonata). *Zoology in the Middle East* 51: 105-112. (in English) ["Nineteen stations distributed across the northern part of Syria were inventoried for dragonflies between 2006 and 2010. About 37 species were recorded, and four species are added to the list of known Syrian species. Because of a generalized decrease in the water quality of Syrian rivers, and an increasing number of rivers falling dry, lotic species such as the calopterygids have suffered and the remaining populations have be-

come reduced to disjunct islands. *Calopteryx splendens hyalina*, once extending from Lake Hula to the Wadi Af-rin, now appears to have become extinct in the Orontes valley, and only survives in few short Syrian coastal riv-ers." (Authors)] Address: Dumont, H.J., Univ. Gent, Inst. Animal Ecology, K.L. Ledeganckstraat 35, B-9000 Gent, Belgium. E-mail: Henri.Dumont@ugent.be

9873. Müller, G.A.; Name, F.T.; Pacheco, F.C.L.; Marcondes, C.B. (2010): Analysis of an alternative method for the study of bromeliad-associated fauna in plants with different foliar organization. *Anais da Academia Brasileira de Ciências* 82(4): 903-906. (in English, with Portuguese summary) ["The efficiency of an alternative method of collection (by suction of water) for the study of Culicidae and Chironomidae (Diptera), Scirtidae (Coleoptera) and Coenagrionidae (Odonata; Leptagrion sp1 and sp2) in bromeliads with different foliar architec-ture in a restinga at Florianópolis, SC, Brazil, was stud-ied. The alternative method was less efficient to collect Culicidae and Chironomidae (Wilcoxon test $p < 0.05$) and was more efficient to Scirtidae and Coenagrionidae (Wilcoxon test $p > 0.05$) from *Aechmea lindenii*. This method was less efficient to collect insects of all groups from *Vriesea friburgensis* (Wilcoxon test $p < 0.05$). The alternative method was efficient to estimate the diversity of these insects in both species of bromeliads. The higher mobility of immature forms of beetles and drag-onflies, and the availability of only one tank in *Aechmea lindenii*, contrasting to several tanks in *Vriesea fri-burgensis* that help the suction of these immature, probably influenced the results, which indicated that the suction method should not replace the dismantling in the study of Culicidae and Chironomidae. This method can be useful to get immature forms of Scirtidae and Coenagrionidae in one-tank bromeliads." (Authors)] Ad-dress: Müller, G.A., Departamento de Zoologia, Setor de Ciências Biológicas, Universidade Federal do Para-ná Caixa Postal 19020, Centro Politécnico, 81531-980 Curitiba, PR, Brasil

9874. Müller, J. (2010): Dr. rer. nat. Wolfgang Zimmer-mann zum 75. Geburtstag. *Entomologische Nachrichten und Berichte* 54(3/4): 271-274. (in German) [Wolfgang Zimmermann is one of the leading limnologists - with focus on Ephemeroptera and Odonata - in Thür-ingen, Germany. For several decades he was and is in-volved in many odonatological activities. The paper compiles milestones in his professional and voluntary life, and adds an updated bibliography.] Address: Mü-ller, J., Frankefelde 3, 39116 Magdeburg, Germany. E-mail: FaunOek.JMueller@t-online.de

9875. Muzon, J.; Spinelli, G.R.; Rossi, G.C.; Marino, P.I.; Diaz, F.; Melo, C. (2010): Nuevas citas de insectos acuáticos para la Meseta de Somuncurá, Patagonia, Argentina. *Rev. Soc. Entomol. Argent.* 69(1-2): 111-116. (in Spanish, with English summary) [Total of 12 Odon-ata species have been recorded on the Somuncurá plat-eau (Argentinean Patagonia). Six of them (*Andinagrion peterseni*, *Rhionaeschna absoluta*, *R. variegata*, *Progomphus joergenseni*, *Dasythemis mincki clara*, and *Erythrodiplax atroterminata*) are listed.] Address: Mu-zón, J., Inst. Limnol. "Dr. R.A. Ringuelet", C.C. 712, AR-1900 La Plata, Argentina. E-mail: muzon@ilpla.edu.ar

9876. Nagy, H.B. (2010): Population dynamics of *Li-bellula fulva* Müller, 1764 in the lowland creeks of land-scape Bihari-sík. PhD-thesis, University of Debrecen: VIII, 113 pp. (in Hungarian, with English summary)

[Hungary; "In quantitative ecology few invertebrates are better study targets than dragonflies and damselflies. Dragonflies were used as model organisms in the de-velopment of mark-recapture methods, because their study yielded in a relatively short period large amount of data. I carried out my studies on two sites located near two lowland creeks, in the Bihar Plain, Hajdú-Bihar County, Hungary between 2002 and 2007. [...] In the first part of my dissertation I estimated the population sizes for each study day and year, for the comparison of the two populations studied at the two sites. In the second part I analysed the effect of males' density on their mating behaviour. For this analysis I determined the number of assessed matings (mating frequency) and fights (fight frequency) per individual from the daily number of matings which was divided by the daily esti-mated population sizes. Then I compared the mating and fight frequency in the function of the yearly popula-tion sizes between the two sites. In the third part I stud-ied how the temperature and rainfall affected daily male density, their fight and mating habits and site fidelity. In the last part of the dissertation I analysed whether there could be a discrepancy between the body size of males in the smaller and larger populations; and whether there could be any correlation between the body size and be-haviour of males. My results showed that the popula-tions near Ártánd were significantly smaller than the populations near Bojt. The density of males did not af-fect their intraspecific aggression, but at higher popula-tion densities males mate less than at lower ones. In the case of the larger population the site fidelity of males decreased as compared to the smaller popula-tion. The frequencies of matings and fights showed a weak significantly positive correlation with the daily mean temperatures. The number of larger and medium sized males was higher in the site near Bojt than near Ártánd, where the frequency of larger males correspon-ded with the frequency of smaller ones." (Author)] Ad-dress: Nagy Beáta, Dept of Taxonomy & Ecology, Babeş-Bolyai Univ., 400006 Cluj Napoca, Clinicilor str. 5-7, Romania. E-mail: nagy.beata@gmail.com

9877. Narita, S.; Pereira, R.A.S.; Kjellberg, F.; Kageyama, D. (2010): Gynandromorphs and intersexes: potential to understand the mechanism of sex de-termination in arthropods. *Terrestrial Arthropod Reviews* 3(1): 63-96. (in English) ["Arthropods are sexually di-morphic. An arthropod individual usually differentiates into a male or a female. With very low frequencies, however, individuals with both male and female mor-phological characters have repeatedly been found in natural and laboratory populations of arthropods. Gy-nandromorphs (i.e., sexual mosaics) are genetically chi-meric individuals consisting of male and female tissues. On the other hand, intersexes are genetically uniform (i.e., complete male, complete female or intermediate in every tissue) but all or some parts of their tissues have either a sexual phenotype opposite to their genetic sex or an intermediate sexual phenotype. Possible devel-opmental processes (e.g., double fertilization of a binu-cleate egg, loss of a sex chromosome or upregula-tion/downregulation of sex-determining genes) and causal factors (e.g., mutations, genetic incompatibilities, temperatures or endosymbionts) for the generation of gynandromorphs and intersexes are reviewed and dis-cussed." (Authors) The paper includes a list of publica-tions with reference to gynandromorphs in Odonata.] Address: Kageyama, D., National Institute of Agrobio-

logical Sciences, Owashi 1-2, Tsukuba, Ibaraki 305-8634, Japan. E-mail: e-mail: kagymad@aff rc.go.jp

9878. Nattress, B. (2010): Wing-folding behaviour in the Golden-ringed Dragonfly *Cordulegaster boltonii* (Donovan). *J. Br. Dragonfly Society* 26(2): 64-65. (in English) [26-VI-2006, Kinlochewe, Wester Ross, Scotland, UK; an observation of *C. boltonii* folding its wings over its back is reported. This behaviour is not related to bad (e.g. rainy) weather.] Address: Nattress, B., 25 West Lea Drive, Tingley, Wakefield, West Yorks. WF3 1DH, UK

9879. Nedjah, R.; Bouchecker, A.; Samraoui, F.; Menai, R.; Alfarhan, A.; Al-Rasheid, K.A.S.; Samraoui, B. (2010): Breeding ecology of the Purple Heron *Ardea purpurea* in Numidia, north-eastern Algeria. *Ostrich* 81(3): 189-196. (in English) ["During 2002-2007, we assessed the status of the Purple Heron *Ardea purpurea* in Numidia, Algeria by surveying all the major wetlands in the region. We located six distinct breeding sites; four of these were not previously known. We also investigated nest site selection and determined the species' reproductive success at Dakhla, a dunary pond during two successive years (2006 and 2007). The egg laying period was comparable to that reported for southern Europe (March-May) and a seasonal change of breeding success was recorded. A growth curve was derived for developing nestlings and the impact of an ectoparasite (mite) infestation upon nestling's growth was considered. We also examined 73 food boluses regurgitated by nestlings and identified 329 prey items. Fish, mainly *Gambusia holbrooki* and *Cyprinus carpio*, dominated by mass, whereas insects, mainly aquatic Coleopteran larvae and aeshnids (Odonata), were the most frequent prey (67.1%). Loss of habitat is identified as a major threat to the future of colonial herons in Algeria." (Authors)] Address: Nedjah, R., Laboratoire de Recherche et de Conservation des Zones humides, Dept de Biologie, University of Guelma, Guelma, Algeria

9880. Nel, A.; DePalma, R.A.; Engel, M.S. (2010): A possible hemiphlebiid damselfly in late cretaceous amber from South Dakota (Odonata: Zygoptera). *Transactions of the Kansas Academy of Science* 113(3&4): 231-234. (in English) ["The first damselfly in Late Cretaceous amber from South Dakota is described and figured. The specimen preserves the forewing apex of a possible hemiphlebiid, a group of relict damselflies today that were apparently widespread and diverse during the Cretaceous." (Authors)] Address: DePalma, R.A., Division of Vertebrate Paleontology, Natural History Museum, and Department of Geology, 1475 Jayhawk Boulevard, University of Kansas, Lawrence, Kansas 66045-7613, USA. E-mail: paleogen@aol.com

9881. North East Scotland Biological Records Centre (2010): *Dragonflies and Damselflies: a distributional atlas for Aberdeenshire, Aberdeen City, Moray and the Cairngorms 1900-2008*. North East Scotland Biological Records Centre: II, 44 pp. (in English) ["This colourful A5 booklet is an interesting new addition to the growing range of county dragonfly atlases. It differs from many in not being the result of a specific survey or driven by key individuals; rather it is essentially a 'summary statement' of all the dragonfly records from the region that are currently held on the National Biodiversity Network (NBN) database, and is dedicated to the International Year of Biodiversity. There is a brief introduction to dragonflies and to recording, then for each species

there follows a short summary of identification features and habitat preference, a detailed flight period diagram based on local data, a summary map of past/present national distribution, and a detailed (1km grid square resolution) map of local distribution that also shows key geographical features. Records are assigned either to 'confirmed breeding' or to 'presence', but are not subdivided by time period due to the scarcity of information from many areas — a familiar problem for much of Scotland, though this is gradually being overcome. There are several strengths to this book and relatively few errors or omissions, most of which arise out of the need for succinctness. Unfortunately the photograph illustrating a female *Sympetrum striolatum* is a *S. danae*. In the section on *Aeshna caerulea* the authors could have been more strongly dismissive of erroneous English records that have somehow recently appeared in the NBN database, though this fortunately doesn't affect their own regional treatment. This publication serves both as a statement of the known biodiversity of Odonata in northeast Scotland, and more importantly as an incentive for further study. It is a well-produced and professional example of what can be done with modern data handling and publishing packages, and I would strongly recommend it to all dragonfly-watchers who are ever likely to visit the Aberdeenshire area, or who have an interest in Scotland in general." (taken from: Adrian Parr, *Atropos* 41: 48-49, 2010)] Address: Available free from NESBReC whilst stocks last. Send a self-addressed A5 envelope with 81 p stamp to NESBREC, Room G29, University of Aberdeen, 23 St Machar Drive, Aberdeen, AB24 3RY, UK

9882. Oertli, B. (2010): The local species richness of dragonflies in mountain waterbodies: an indicator of climate warming? *BioRisk* 5: Special issue: Monitoring climatic change with dragonflies: 243-251. (in English) ["With climate warming, many Odonata species are extending their geographical area. In Switzerland, as in many parts of the world, this phenomenon may lead to a regional increase in species richness. The local richness (the richness of individual waterbodies) is also expected to increase, particularly in the alpine or subalpine areas where the waterbodies are particularly species-poor. Based on the species richness recorded in 109 waterbodies scattered all across Switzerland, a model is presented here relating the local species richness (adult dragonflies) to environmental variables, including the mean annual air temperature. This model predicts a sharp increase in species richness for alpine or subalpine waterbodies, which is expected to double or even treble before the end of this century. This increase would mainly be the consequence of the immigration of eurythermal species extending their geographical range, together with potential local extinctions of the cold stenothermal species." (Author)] Address: Oertli, B., University of Applied Sciences Western Switzerland, École d'Ingénieurs HES de Lullier, 150 route de Presinge, CH-1254 Jussy / Geneva, Switzerland. E-mail: beat.oertli@hesge.ch

9883. Offenberger, M. (2010): *Libellen auf Fernreise. Fliegen die Insekten jedes Jahr 18 000 Kilometer von Indien nach Afrika und zurück?* *Süddeutsche Zeitung* 25/7/2010: 22. (in German) [This report in a nationwide German newspaper is based on Anderson, R.C. (2009): Do dragonflies migrate across the western Indian Ocean? *Journal of Tropical Ecology* 25(4): 347-358.] Address: Offenberger, Monika

9884. Olberg, R.M. (2010): Insect Optic Glomeruli: exploration of a universal circuit for sensorimotor processing. Air Force Office of Scientific Research, 875 N. Randolph Street, Room 31 I 2, Arlington., VA 22203-1768. Contract No.: AFRL-SR-AR-TR-10-0109: 33 pp. (in English) ["Electrophysiological investigations of dragonfly target-selective descending neurons yielded the following findings: (1) Outdoor experiments with 2 families of dragonflies with different prey capture strategies (*Aeshna canadensis* and *Pachydiplax longipennis*) revealed family-specific differences in the receptive fields. (2) Real objects moving in 3 dimensions elicited greater responses to nearby small objects than predicted from responses to images on a flat visual display. (3) Outdoor experiments and experiments with expanding images on a flat display revealed looming-object preference of 2 TSDNs, which appear to predict time-to-contact. (4) TSDNs showed extremely high spike rates with the raised body temperatures (30°-35°C) seen in naturally behaving dragonflies. (5) Two TSDNs were tuned to looming objects, coding for time-to-contact. (6) Two TSDNs were identified whose spikes carry predictive information about future object position. Investigation of flight behavior revealed that take-off direction is a linear function of the prey's angular velocity 28 ms before takeoff. Collaboration with Dr. Anthony Leonardo (HHMI-JFRC) led to development of a flight arena, a chronic electrode implantation technique, and a miniature telemetry chip, paving the way for wireless recording of TSDN activity during prey interception." (Author)] Address: Olberg, R.M., Department of Biological Sciences, Union College, Schenectady, NY 12308, USA. E-mail: olberg@union.edu

9885. Orr, A.G.; Ngiam, R.W.J.; Leong, T.M. (2010): The larva of *Tetracanthagyna plagiata*, with notes on its biology and comparisons with congeneric species (Odonata: Aeshnidae). *International Journal of Odonatology* 13(2): 153-166, pl. Ia. (in English) ["The F stadium larva of both sexes of *Tetracanthagyna plagiata* is described and figured based on exuviae from which confirmed adult specimens had been reared. Larvae were originally collected in small, slow forest streams in Singapore, and in captivity were fed on local shrimp and small fish species. The known larvae of *Tetracanthagyna* species, *T. degorsi*, *T. plagiata* and *T. waterhousei* are compared and characters for separating the three species are tabled and figured. *T. plagiata* larvae reared in captivity exhibited obligate ambush predation and ballistic defaecation." (Authors)] Address: Orr, A.G., Griffith, School of the Environment, Griffith University, Nathan, Q4111, Australia. E-mail: agorr@bigpond.com

9886. Orrock, J.L.; Dill, L.M.; Sih, A.; Grabowski, J.H.; Peacor, S.D.; Peckarsky, B.L.; Preisser, E.L.; Vonesh, J.R.; Werner, E.E. (2010): Predator effects in predator-free space: the remote effects of predators on prey. *The Open Ecology Journal* 3: 22-30. (in English) ["Predators can have remote effects on prey populations that are connected by migration (i.e. prey metapopulations) because predator-mediated changes in prey behavior and abundance effectively transmit the impact of predators into predator-free prey populations. Behavioral changes in prey that might give rise to remote effects are altered rates of migration or activity in the presence of predation risk (called non-consumptive effects, fear- or μ -driven effects, and risk effects). Changes in prey abundance that may result in remote effects arise from changes in prey density due to direct predation (i.e.

consumptive effects, also called N-driven effects and predation effects). Remote effects provide a different perspective on both predator-prey interactions and spatial subsidies, illustrating how the interplay among space, time, behavior, and consumption generates emergent spatial dynamics in places where we might not expect them. We describe how strong remote effects of predators may essentially generate "remote control" over the dynamics of local populations, alter the persistence of metapopulations, shift the importance of particular paradigms of metacommunity structure, alter spatial subsidies, and affect evolutionary dynamics. We suggest how experiments might document remote effects and predict that remote effects will be an important component of prey dynamics under several common scenarios: when predators induce large changes in prey dispersal behavior, when predators dramatically reduce the number of prey available to disperse, when prey movement dynamics occur over greater distances or shorter timescales than predator movement, and when prey abundance is not already limited by competitors or conspecifics." (Author) The paper also includes references to Odonata.] Address: Orrock, J.L., Department of Zoology, University of Wisconsin, Madison, WI, 53706, USA. E-mail: jorrock@wisc.edu

9887. Ott, J. (2010): Zur aktuellen Situation der Moorlibellen im «Pfälzerwald» – wie lange können sie sich in Zeiten des Klimawandels noch halten?. *Annales scientifiques de la réserve de Biosphère transfrontalière Vosges du Nord-Pfälzerwald* 15 (2009-2010): 123-139. (in German, with French and English summary) ["In this contribution, the situation is analyzed with regard to mire dragonflies in the German part of the Pfälzerwald-Vosges du Nord Biosphere Reserve, in which a comparison is made between their distribution up to 2007 and their development in the past few decades. While most types of mires were still fairly widespread up until the nineteen-eighties, they have since shrunk significantly, something which is attributable to a number of causes (among other, biotope degradation). In most recent years, this regression process has been accelerated still further due to the extreme dryness in 2003 and the general climate change. Most types are now only found in isolated waters and/or have very small populations. Possible regeneration and resettlement processes are hindered by other communities, which have been established in the meantime in the water bodies, and these water bodies also have changed their structure (succession processes involving water and riverbank vegetation). The dystrophic ponds areas (FFH habitat type, Natura 2000-Code 3160) are in this context not only losing their unique features, but also their significance for the Natura 2000 network, which is very well indicated by the dragonfly coenoses." (Author)] Address: Ott, J., Friedhofstr. 28, D-67705 Trippstadt, Germany. E-mail: L.U.P.O.GmbH@t-online.de

9888. Ott, J. (2010): Bemerkungen zum Vorkommen von *Aeshna affinis* VANDER LINDEN, 1820, *Somatochlora arctica* (ZETTERSTEDT, 1840) und *Crocothemis erythraea* (BRULLÉ, 1832) (Insecta: Odonata: Aeshnidae, Corduliidae, Libellulidae) in Woogen des Biosphärenreservates Pfälzerwald-Vosges du Nord. *Fauna und Flora in Rheinland-Pfalz* 11(4): 1291-1310. (in German, with English summary) [The author presents the situation of *A. affinis*, *S. arctica*, and *C. erythraea* in the German part of the biosphere reserve "Palatinate forest – Northern Vosges". Whereas *S. arctica* has only

a single but stable population, *A. affinis* and *C. erythraea* show a remarkable expansion in higher altitudes and also in waters of the centre of the dense forest. Meanwhile *C. erythraea* is found indigenous even in an acidic moorland water (pH 5). Possible consequences for nature protection and the protection of the generally rare moorland dragonfly species are discussed.] Address: Ott, J., Friedhofstr. 28, 67705 Trippstadt, Germany. E-mail: L.U.P.O.GmbH@t-online.de

9889. Ott, J. (2010): Dragonflies and climatic change - recent trends in Germany and Europe. *BioRisk 5: Special issue: Monitoring climatic change with dragonflies: 253-286.* (in English) ["In this paper the trends of dragonfly expansions during the last decades in Germany and Europe are summarized. It is shown, that there is a general expansion of many species to the north: Mediterranean species expanded to Central and Northern Europe, whereas some African species expanded to Southern Europe, some are even new to the continent. In general this means an increase of biodiversity, but looking at the ecological effects, in the medium term a decrease can be expected for moorland and alpine species. Dragonflies can be regarded as a good indicator group for climatic change. Already now in some areas or regions negative effects on waters bodies and their dragonfly communities can be observed and more will occur if e.g. temperature rises or precipitation decreases. The consequences for nature conservation strategies - such as the NATURA 2000 network - are outlined and the general need for monitoring programmes is emphasised." (Author)] Address: Ott, J., Friedhofstr. 28, 67705 Trippstadt, Germany. E-mail: L.U.P.O.GmbH@t-online.de

9890. Ott, J. (2010): Die Zweigestreifte Quelljungfer - Ein typischer Pfälzer Bachdrache. *Heimatjahrbuch des Landkreises Kaiserslautern 2011: 59-60.* (in German) [Rheinland-Pfalz, Germany; this is a brief general introduction into dragonfly biology exemplified with *Cordulegaster boltonii*.] Address: Ott, J., Friedhofstr. 28, 67705 Trippstadt, Germany. E-mail: L.U.P.O.GmbH@t-online.de

9891. Owens, D.C. (2010): Seasonal variation in terrestrial insect subsidies to tropical streams and implications for the diet of *Rivulus hartii*. *Natural Resources, School of Dissertations & Theses in Natural Resources, University of Nebraska, USA: VIII, 73 pp.* (in English) [Trinidad; "Terrestrial invertebrates subsidize fish diets in lotic ecosystems. Seasonality strongly influences terrestrial invertebrate abundance in temperate regions and alters their delivery to streams. Seasonal changes in the tropics are characterized by distinct wet and dry periods, with marked variation in invertebrate abundance. However, little is known about how these seasonal changes affect invertebrate subsidies and their ecological consequences for tropical streams. We measured the effect of rainfall and canopy density on terrestrial invertebrate falling input, as well as seasonal variation in falling input, benthic and drifting invertebrate, and *Rivulus hartii* (Hart's *Rivulus*) diet composition during both the wet and dry seasons at three stream sites in Trinidad. Rates of input of terrestrial invertebrates showed seasonal trends in biomass and abundance. Rainfall magnitude and canopy density were directly correlated with falling input. The delivery of terrestrial invertebrates increased from an average of 52 mg m⁻² day⁻¹ to 72 mg m⁻² day⁻¹ from wet to dry season. Conversely, average benthic invertebrate

abundance and biomass decreased from 382 mg m⁻² in the dry season to 130 mg m⁻² in the wet season, presumably due to displacement and mortality resulting from severe flow conditions. A 75% increase in drifting invertebrate biomass was driven by a terrestrial invertebrate biomass that more than doubled during the wet season. Prey selectivity in *Rivulus* diets mirrored this seasonal variation in prey invertebrate availability, as percent composition of terrestrial invertebrate volume in *Rivulus* guts also doubled during the wet season. We conclude that terrestrial invertebrates are a substantial energetic subsidy for tropical river ecosystems, and the spatial and temporal variation in delivering these resources from wet to dry season have profound effects on consumer-resource dynamics." (Author) Macrozoobenthic taxa including Odonata are treated at the order level. This paper is posted at DigitalCommons@University of Nebraska - Lincoln. <http://digitalcommons.unl.edu/natresdiss/8>] Address: Owens, D.C., University of Nebraska at Lincoln, USA. E-mail: davidchristopherowens@yahoo.com

9892. Papazian, M.; Mary-Sasal, N. (2010): Description of male *Rhyothemis phyllis apicalis* Kirby, 1889 (Anisoptera: Libellulidae). *Odonatologica 39(4): 357-361.* (in English) ["The male allotype is described and illustrated from the Northern Province of New Caledonia, and compared with the *R. p. phyllis* from Thailand. The habitats of *R. p. apicalis* are described and a list of odonate species recorded during the 1999 and 2000 surveys is added." (Authors)] Address: Papazian, M., Le Constellation Bât.A, 72 Avenue des Caillols, F-13012 Marseille, France. E-mail: papazianmcm@wanadoo.fr

9893. Parr, A. (2010): Monitoring of Odonata in Britain and possible insights into climate change. *BioRisk 5: Special issue: Monitoring climatic change with dragonflies: 127-139.* (in English) ["The history of recording and monitoring of Odonata in Britain is briefly described. Results are then presented which suggest that the country's Odonata fauna is currently in a period of flux, in a manner consistent with the actions of a high-level regulatory factor such as climate change. The ranges of many resident species are shifting. *Leucorhinia dubia* has recently been lost from southern England, but many species are presently expanding their ranges to the north and west, some (such as *Aeshna mixta* and *Anax imperator*) with considerable speed. In addition to these changes, a number of 'southern' species have started to appear in Britain for the very first time. These include *Lestes barbarus*, *Erythromma viridulum* (which has now become a locally-common resident in southeast England), *Anax parthenope* and *Crocothemis erythraea*. In addition to these distributional changes, some recent trends in flight times are also discussed. Evidence indicates that many species are now emerging significantly earlier than in the past, though trends relating to the end of the flight period are less clear cut." (Author)] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

9894. Parr, A. (2010): Records of exotic Odonata in Britain during 2010. *Atropos 41: 39-42.* (in English) [Recent UK records of *Ischnura senegalensis* and *Crocothemis servilia* resulting from indoor fish tanks resp. aquatic plant nurseries are documented.] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

- 9895.** Parr, A.J. (2010): Migrant and dispersive dragonflies in Britain during 2009. *J. Br. Dragonfly Society* 26(2): 98-107. (in English) ["The 2009 season saw major arrivals of *Sympetrum fonscolombii* during the late spring and summer, and a significant hot weather movement of many migratory/dispersive species during a short period around the end of June/early July. Other significant finds included the discovery of singleton *Lestes barbarus* at three sites on the East Anglian coast during August. The highlight of the year was, however, the discovery of large numbers of *Lestes viridis* in southeast Suffolk, under circumstances strongly suggestive of the presence of a recently-established breeding population." (Author)] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk
- 9896.** Paula, M.C.; Fonseca-Gessner, A.A. (2010): Macroinvertebrates in low-order streams in two fragments of Atlantic Forest in different states of conservation, in the State of São Paulo (Brazil). *Braz. J. Biol.* 70(3, suppl.): 899-909. (in English, with Portuguese summary) ["The presence of a riparian forest is one of the main factors that act directly on the ecology of a fluvial system, and the relation of the forest and the lotic environments might have an important influence on the distribution of the macroinvertebrates. In this context, the benthic macroinvertebrate communities in four low-order streams in São Paulo (Brazil) were analysed, with the aim of assessing the state of recovery of the surrounding forest fragments. The benthic organisms were sampled in the winter, a period of low rainfall. Of the 6,331 specimens of macroinvertebrates collected, 124 taxa belonging to 48 families were identified. The results showed greater diversity in the Canchim Farm streams and greater abundance in the Lake Park streams. Cluster analysis showed that the stream Canchim distanced itself from the others, being considered reference." (Authors) Taxa including Odonata are treated at the genus level.] Address: Paula, M.C., Programa de Pós-graduação em Ecologia e Recursos Naturais, Universidade Federal de São Carlos – UFSCar, Rod. Washington Luiz, Km 235, CP 676, CEP 13565-905, São Carlos, SP, Brazil. E-mail: marciacdp@ig.com.br
- 9897.** Perez-Bilbao, A.; Alonso, A.I.; Garrido, J. (2010): Phenology of aquatic insects in a protected wetland (Natura 2000 network) in northwestern Spain. *Limnetica* 29(2): 379-386. (in English, with Spanish summary) ["The aim of this study was to gather new data about the life cycle phenologies of several species of aquatic insects in the "Gándaras de Budino" (Galicia, NW Spain) protected wetland, included in the Natura 2000 network. During an annual cycle (2004-2005), three shallow lakes and four streams were sampled monthly using a semi-quantitative sampling method. The body lengths of the larvae and nymphs of thirteen species were measured, and their life cycles were analysed. All species had univoltine or semivoltine cycles. Additionally, a possible correlation between larval and nymphal lengths and water temperature was examined. We found a significant correlation for two species: the water beetle (*Noterus laevis*) and the dragonfly (*Boyeria irene*)." (Authors) The following Odonata species have been studied: *Coenagrion mercuriale*, *C. puella*, *Pyrrhosoma nymphula*, *Calopteryx virgo*, *Boyeria irene*, *Onychogomphus uncatatus*, and (*Cordulegaster boltonii*.) Address: Pérez-Bilbao, Amaia, Department of Ecology and Animal Biology, Faculty of Biology, University of Vigo. 36310, Vigo, Spain. Email: amaiapb@uvigo.es
- 9898.** Pessacy, P.; Costa, J.M. (2010): *Epipleoneura angeloi* (Odonata: Protoneuridae), a new species from the central region of Brazil. *Zootaxa* 2721: 55-61. (in English, with Portuguese summary) [*Epipleoneura angeloi* sp. nov., is described and illustrated based on males from Mato Grosso and Goiás states, central region of Brazil.] Address: Pessacy, P., Universidad Nacional de La Patagonia "San Juan Bosco", LIESA, Sarmiento 849, 9200, Esquel, Chubut, Argentina. E-mail: pablopessacq@yahoo.com.ar
- 9899.** Plotnikova, S.I. (2010): About the olfactory system of the dragonfly *Aeschna* genus. *Journal of Evolutionary Biochemistry and Physiology* 46(4): 420-421. (in English) [Original Russian Text © S. I. Plotnikova, 2010, published in *Zhurnal Evolyutsionnoi Biokhimi i Fiziologii*, 2010, Vol. 46, No. 4, p. 352. Verbatim: Strausfeldt [1] thinks that of the most essential significance in life of insect are two systems of the subesophageal ganglion — the visual and the olfactory ones. The olfactory system in dragonflies is poorly developed. However, in 17 dragonfly species [2] organs of chemical perception were observed, and later, on antennae of *Libellula depressa*, chemoreceptor celoconical sensillae were revealed [3] after which they were found to perceive some odors in imago [4]. In the *Aeshna* sp. larva, we have managed to trace the nerve from antenna to the subesophageal ganglion and to reveal on it a nodule, in which sensory fibers of antenna receptors are terminated. It has its own interneurons and the interneuron connecting this nodule with lateral protocerebrum [5]. When visiting laboratory of Invertebrate Neurophysiology of Sechenov Institute of Evolutionary Physiology and Biochemistry. Strausfeldt examined the total methylene blue-stained preparations of A.A. Zavarrin and found in neuropil of this nodule the olfactory glomerulus, which confirmed our point of view of the nodule olfactory significance. It is also to be noted that, besides, this nodule contains motor neurons of antenna muscles and that it is connected with the β -lobe of the mushroom body. The most interesting is connection of the nodule with aid of the interneuron with lateral protocerebrum. The cerebral branching of this interneuron is going forwards along the lateral protocerebrum and is spreading onto its significant part; the same area of lateral protocerebrum contains lateral processes of Canyon cells. Thus, there is present here the characteristic chain of the neurons that have been described by Strausfeldt [1] in other insects in the olfactory nervous system: the olfactory bulb (it corresponds to the nodule on the olfactory nerve), protocerebrum and Canyon cells in the area, in which in other insects and in the *Aeshna* imago (the Strausfeldt's preparation) there is located the mushroom body calyx. Thus, the general plan of structure of the *Aeshna* olfactory system is the same as in other insects, but its nuclei are expressed poorly. The weak development of the *Aeshna* olfactory system is compensated by development of its visual system that has not only the huge visual blades, but also unites all structures of the subesophageal ganglion. It seems that the strong development of the visual system resulted in development of the unique locomotion providing the high rate and maneuver flight allowing this ancient insect genus to survive until our time."] Address: Plotnikova, S.I., Sechenov Institute of Evolutionary Physiology and

Biochemistry, Russian Academy of Sciences, St. Petersburg, Russia. E-mail: gorelkin@iephb.ru

9900. Poinar, G.; Bechly, G.; Buckley, R. (2010): First record of Odonata and a new subfamily of damselflies from Early Cretaceous Burmese amber. *Palaeodiversity* 3: 15-22. (in English, with German summary) ["A new subfamily, genus and species of damselfly, *Palaeodisparoneura burmanica* n. gen., n. sp. (Platycnemididae; Palaeodisparoneurinae n. subfam.) is described as the first fossil odonate from Early Cretaceous Burmese amber. This fossil taxon is tentatively considered as sistergroup of Recent Disparoneurinae. The remains of a lizard in the same piece of amber suggest that the damselfly may have been targeted as prey." (Authors)] Address: Poinar, G. Jr., Department of Zoology, Oregon State University, Corvallis, OR 97331, USA: E-mail: poinarg@science.oregonstate.edu

9901. Popova, O.N.; Haritonov, A.Yu. (2010): Population dynamics and migration in the dragonfly *Libellula quadrimaculata* L., 1758 (Odonata, Libellulidae). *Eurasian entomological journal* 9(2): 231-238. (in Russian, with English summary) [ISEA SO RAN Biological Station near Chany Lake, Russia; Long-term data of population dynamics and spatial distribution of *L. quadrimaculata* are provided. "Counts of dragonflies, conducted from 1972 to 2009, demonstrate that *L. quadrimaculata* population size varied significantly during this period, the minimum density being 250 times lower than the maximum one (i.e. 0.04 vs 10 larval specimens per 1 m²). The population density correlates with the water supply of the region, the dragonfly numbers reaching their highest values in one or two years after a maximum water level. A mass migration in *L. quadrimaculata* which occurred in the southwestern part of the West-Siberian Plain in the Ishym River Valley, is described in detail. The reason for the mass migrations is an excessive growth in population density. As a result, a mass exodus from native habitats takes place which not only optimizes their population size but also increases the input of chemical elements and organic matter into the soil ecosystem from eutrophic water bodies." (Authors)] Address: Popova, Olga, Institut Sistemati i Zkologii Zhivotnykh, 630091 Novosibirsk, Ul. Frunse 11, Russia. E-mail: pc@eco.nsc.ru

9902. Radhakrishnan, V.; Zawal, A.; Ramaraju, K. (2010): First record of parasitized *Trithemis pallidinervis* (Kirby) from Tamil Nadu, India by *Arrenurus* larvae with a description of larval morphology (Anisoptera: Libellulidae; Acari: Hydrachnidia). *Odonatologica* 39(3): 243-252. (in English) ["Out of a total of 20 adult *T. pallidinervis* specimens, collected in Tamil Nadu, India, 164 larvae of *Arrenurus* sp. were found; prevalence: 57.5%, intensity: 5-12. They were attached to the mesosternum and metasternum. Their morphology is very similar to that of *A. cuspidator* and *A. maculator*, but differs by the absence of Mp1 tripartite seta, V2 seta and secondary seta in PIII 1 and the presence of secondary setae on both sides of V3 setae. They also differ from *A. maculator* by the absence of hairbrush on the base of C1 seta." (Author)] Address: Radhakrishnan, V., Department of Agricultural Entomology, Tamil Nadu Agricultural University, Coimbatore - 641 003, Tamil Nadu, India

9903. Rasmussen, R.D.; Dixon, J.W. (2010): An unusual occurrence of Golden-winged Skimmer (*Libellula auripennis* Burmeister, 1839) (Anisoptera: Libellulidae) in Iowa. *Argia* 22(3): 12-13. (in English) ["On 10 July

2010 two male *L. auripennis* were observed near the Horseshoe Bend Division of the Port Louisa National Wildlife Refuge (41.1096° N, 091.0777° W) in Louisa County, Iowa." (Authors)] Address: Ryan D. Rasmussen, R.D., Muscatine Soil and Water Conservation District, 3500 Oakview Dr, Ste A, Muscatine, Iowa 52761, E-mail: ryan.rasmussen@ia.nacdn.net

9904. Ratti, J.; Vachtsevanos, G. (2010): A biologically-inspired micro aerial vehicle. Sensing, modeling and control strategies. *Journal of Intelligent and Robotic Systems* 60(1): 153-178. (in English) ["This paper introduces a novel framework for the design, modeling and control of a Micro Aerial Vehicle (MAV). The vehicle's conceptual design is based on biologically-inspired principles and emulates a dragonfly (Odonata-Anisoptera). We have taken inspiration from the flight mechanism features of the dragonfly and have developed indigenous designs in creating a novel version of a Flapping Wing MAV (FWMAV). The MAV design incorporates a complex mechanical construction and a sophisticated multi-layered, hybrid, linear/non-linear controller to achieve extended flight times and improved agility compared to other rotary wing and FWMAV Vertical Take Off and Landing (VTOL) designs. The first MAV prototype will have a ballpark weight including sensor payload of around 30 g. The targeted lifting capability is about twice the weight. The MAV features state of the art sensing and instrumentation payload, which includes integrated high-power on-board processors, 6DoF inertial sensors, 3DoF compasses, GPS, embedded camera and long-range telemetry capability. A 3-layer control mechanism has been developed to harness the dynamics and attain complete navigational control of the MAV. The inner-layer is composed of a 'quad hybrid-energy controller' and two higher layers are at present, implementing a linear controller; the latter will be replaced eventually with a dynamic adaptive non-linear controller. The advantages of the proposed design compared to other similar ones include higher energy efficiency and extended flight endurance. The design features elastic storage and re-use of propulsion energy favouring energy conservation during flight. The design/modeling of the MAV and its kinematics & dynamics have been tested under simulation to achieve desired performance. The potential applications for such a high endurance vehicle are numerous, including air-deployable mass surveillance and reconnaissance in cluster and swarm formations. The efficacy of the design is demonstrated through a simulation environment. The dynamics are verified through simulations and a general linear controller coupled with an energy based non-linear controller is shown to operate the vehicle in a stable regime. In accordance with specified objectives a prototype is being developed for flight-testing and demonstration purposes." (Authors)] Address: Vachtsevanos, G., Intelligent Control Systems Laboratory, School of Electrical & Computer Engineering, Georgia Institute of Technology, 777 Atlantic Dr. NW, Atlanta, GA 30332-0250, USA. E-mail: gjv@ece.gatech.edu

9905. Rawson, A.; Lim, R.P.; Tremblay, L.A.; Warne, M.S.J.; Ying, G.-g.; Laginestra, E.; Chapman, J.C. (2010): Benthic macroinvertebrate assemblages in remediated wetlands around Sydney, Australia. *Ecotoxicology* 19(8): 1589-1600. (in English) ["To investigate potential high organisational level impacts of persistent organic pollution in the wetlands in the Sydney Olympic Park (SOP) remediated site, the benthic macroinverte-

brate assemblages of seven wetlands within SOP and two off-site reference wetlands were examined. Sediment cores were collected, stained and preserved from each study site and the macroinvertebrates identified to the appropriate taxonomic level (class, order, family, subfamily) (in Odonata: Coenagrionidae & Corduliidae). Data were analysed for taxon richness and macroinvertebrate abundance and multivariate techniques were used to identify chemical/physical characteristics of the sediment, which were important influences on the differences in the assemblage between study sites. Macroinvertebrate abundance was highly variable between study sites and taxon richness was low across all sites. Oligochaetes, nematodes, ostracods and chironomids were the most common taxa found and were the most important in influencing differences between the macroinvertebrate assemblages among the study sites. Sediment grain size and chemical characteristics of the sediments (RPAH, RPCB, TCDDeq and heavy metal concentrations) were important in separating the study sites based on taxon richness and abundance. Canonical correspondence analysis separated the macroinvertebrate assemblages at newly two created wetlands from those at other study sites including the urban reference sites. Increased sediment POP contamination (particularly as measured TCDDeq and RDDT concentrations) is a likely contributor in excluding pollution sensitive taxa and, therefore, alterations to benthic macroinvertebrate assemblages. Further, the influence of TOC suggests the significance of catchment inputs in contributing to changes in macroinvertebrate assemblage. The SOP remediation led to the establishment of wetlands with benthic communities representative of those expected in urban wetlands." (Authors)] Address: Rawson, C.A., Department of Environmental Sciences, Institute of Water and Environmental Resource Management (IWERM), University of Technology, Sydney (UTS), PO Box 123, Broadway, Sydney, NSW 2001, Australia. E-mail: C.Rawson@curtin.edu.au

9906. Reels, G.T. (2010): Seasonal emergence of dragonflies (Odonata: Anisoptera) at ten ponds in Hong Kong. *Hong Kong Entomological Bulletin* 2(1): 24-31. (in English) ["Dragonfly emergence was monitored at ten ponds in Hong Kong, using emergence traps, for periods of varying duration between February 2004 and September 2007. Three newly created ponds, five re-profiled ponds and two long-established former commercial fish ponds were included in the study. Exuviae abundance varied considerably between ponds and years, as did the number of species recorded. There was an overall declining trend over the four year period. The causes of these variations were not determined. Dragonfly emergence was strongly seasonal in all four years, with > 80% of total annual emergence occurring in March to May in most ponds. A winter emergence peak, dominated by *Pantala flavescens*, was recorded in ponds which had only been filled in the preceding summer." (Author)] Address: Reels, G.T., H-3-30 Fairview Park, Yuen Long, N.T. Hong Kong. E-mail: gtreels@cyberdude.com

9907. Resende, D.C.; De Marco, P. (2010): First description of reproductive behavior of the Amazonian damselfly *Chalcopteryx rutilans* (Rambur) (Odonata, Polythoridae). *Revista Brasileira de Entomologia* 54(3): 436-440. (in English, with Portuguese summary) ["Polythoridae comprise a widespread group of species in the New World tropics, but little is known about their behav-

ior or life history. Here, we described the reproductive behavior of Amazonian *Chalcopteryx rutilans*, using mark-recapture techniques. Males were resident and territorial, though we found disputes (complex flight manoeuvres) to be rare. Trunks (rotting wood) were important to male persistence in sites, as these are the locations preferred by females for oviposition. The mating system of *C. rutilans* may be comparable to the resource limitation category, described by Conrad & Pritchard (1992), where males cannot control female access to oviposition sites. So, female choice becomes important and apparently, the observed displays (in which males flash the coppery coloration of their hind wings) may be related to attraction of females to territories, as in a lek system." (Authors)] Address: Resende, D.C., Laboratório de Bioinformática e Evolução, Depto. de Biologia Geral, Universidade Federal de Viçosa, 36570-000 Viçosa-MG, Brazil. E-mail: dcresende@ig.com.br

9908. Risely, K. (2010): A mixed bag for Britain's birds. *BTOnews* 290: 21-22. (in English) [Recent increase in population and northward range extension in UK of the Hobby (*Falco subbuteo*; Aves) is explained as follows: "Numbers are increasing and the species' range expanding, perhaps in response to climate change affecting dragonfly numbers and range, a key food source for this dashing falcon."] Address: not stated

9909. Ross, A.J. (2010): A review of the Carboniferous fossil insects from Scotland. *Scottish Journal of Geology* 46: 157-168. (in English) ["The known fossil insects of Carboniferous age from Scotland are reviewed. Of the seven recorded, one record is highly dubious and rejected, and another is herein identified as a crustacean. The remaining five insects belong to three orders: The extinct order Protodonata (giant dragonflies) is represented by the holotype of *Truemanina multiplicata* (Bolton 1922). The extinct order Palaeodictyoptera is represented by the holotypes of *Lithomantis carbonarius* Woodward 1876 and the nymph *Idoptilus peachii* (Woodward 1887b) comb. nov. The order Blattodea (cockroaches) is represented by the lost holotype of '*Lithomylacris*' *kirkbyi* Woodward 1887a and a nearly complete cockroach, herein identified as *Archimylacris*? sp. The localities and ages are reviewed and the five insect specimens came from the Coal Measures (Westphalian) of Ayrshire and Fife." (Author)] Address: Ross, A.J., Department of Natural Sciences, National Museums Collection Centre, National Museums Scotland, 242 West Granton Road, Edinburgh, EH5 1JA, UK. E-mail: a.ross@nms.ac.uk

9910. Rosset, V.; Lehmann, A.; Oertli, B. (2010): Warmer and richer? Predicting the impact of climate warming on species richness in small temperate waterbodies. *Global Change Biology* 16: 2376-2387. (in English) ["Climate change is expected to affect communities worldwide. Many studies focus on responses at the regional level and show an increase in species richness. However, less is known about the consequences of climate change at the local scale (in ecosystems). Small waterbodies, such as ponds, could play an important role for the assessment of the impact of future changes in climate at the local level. We evaluated here the potential changes due to climate warming in the species richness for various groups (plants, snails, beetles, dragonflies, amphibians) across 113 lowland and high altitude ponds in Switzerland. We modelled the relationships between species richness and environmental variables (including temperature) and predicted species

richness changes for the end of the century (2090–2100; using the A2 IPCC scenario). Temperature rise could significantly increase pond species richness. For the five taxonomic groups pooled, species richness would potentially increase from 41 to 75 (183%) in lowland ponds. In presently species-poor high altitude ponds, the potential increase would be particularly marked, with a proportional increase (1150%; from 14 to 35 species) almost double that in lowland areas. A strong increase in species richness also resulted from models including changes in additional variables, such as land-use or water quality. Future reductions in water quality (e.g. increase in nutrients) may limit the predicted increase in lowland species richness or, conversely, result in a greater increase in species richness in high altitude areas. Nutrient enrichment is shown to affect the taxonomic groups differentially, with plant species richness the most negatively influenced. Climate warming could therefore affect species richness of temperate ponds not only regionally, but also at the local, within ecosystems-scale; species richness could increase markedly in temperate regions, and especially so at higher altitude." (Author)] Address: Rosset, Veronique, Dept of Nature Management, Hepia University of Applied Sciences Western Switzerland, hepia Geneva technology, architecture and landscape, CH 1254 Jussy-Geneva, Switzerland. E-mails: veronique.rosset@hesge.ch

9911. Rüppele, G.; Hilfert-Rüppele, D. (2010): Kinematic analysis of maiden flight of Odonata. *International Journal of Odonatology* 13(2): 181-192. (in English) [The maiden flight of *Calopteryx splendens*, *Coenagrion puella*, *Aeshna cyanea*, *Cordulia aenea*, *Libellula quadrimaculata* "was filmed by slow motion up to 500 f/s and analysed frame by frame. The aim of this study was to find out if the maiden flight differs among various species as well as between teneral and adults within the same species with respect to wing beat frequency, phase-relationship between fore- and hind wings, flight speed and acceleration. All the values of the flight parameters were much lower in maiden flight than in the flight of adults. The possible reasons for the weakness of the maiden flight are discussed." (Authors)] Address: Hilfert-Rüppele, Dagmar, An der Wasserfurche 32, 38162 Cremlingen, Germany. E-mail: d.hilfert-rueppell @tu-bs.de

9912. Šácha, D. (2010): Dragonflies (Odonata) observed during monitoring of species of the European importance in southern Slovakia. *Folia faunistica Slovaca* 15(6): 43-46. (in Slovakian, with English summary) [In 2007, at 6 sites in southern Slovakia 16 odonate species were observed. Three of them are protected by the European law: *Cordulegaster heros*, *Gomphus flavipes*, and *Ophiogomphus cecilia*. In addition, records of *Onychogomphus forcipatus* and *Coenagrion pulchellum* are of regional interest.] Address: Šácha, D., Podtatranského 31, 031 01 Liptovský Mikuláš, Slovakia. E-mail: dusan.sacha@vazky.sk

9913. Samways, M. (2010): Impacts of extreme weather and climate change on South African dragonflies. *BioRisk* 5: Special issue: Monitoring climatic change with dragonflies: 73-84. (in English) ["The absence of ice sheets for many millions of years, yet variable topography and changing climate, has generated considerable biodiversity in South Africa. There is no evidence to date that anthropogenic climate change has affected odonate populations in the region. One reason is that the highly varying weather and climate constitutes considerable background noise against which any effects of

modern climate change must be measured. Evidence is accumulating that the Holocene interglacial and gradual warming has left some species with isolated populations in montane areas among a matrix of arid land. Many South African odonate species are remarkably vagile and elevationally tolerant, readily immigrating into and emigrating from pools during wet and dry phases respectively. Some species take this movement to greater extremes by moving the southern margins of their geographical range back and forth with varying climate. After floods, populations of riverine odonates can recover within a year, although where the riparian corridor has been stripped of its trees, the recovery is very slow. Various synergistic impacts, particularly from invasive alien woody plants, area severe impact on many riverine species, and reducing their ability to respond positively to changing environmental conditions. Large-scale removal of these woody aliens is greatly benefiting the odonates' ability to survive in the short-term and to restore natural corridors for movement in the face of possible future climatic changes." (Author)] Address: Samways, M.J., Dept Entomol. & Nematol., Univ. Stellenbosch, Private Bag X1, ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za

9914. Samways, M.; Niba, A. (2010): Climate and elevational range of a South African dragonfly assemblage. *BioRisk* 5: Special issue: Monitoring climatic change with dragonflies: 85-107. (in English) ["Elevation and climate are interrelated variables which have a profound affect on biota. Flying insects such as dragonflies can rapidly disperse and optimal habitat conditions at appropriate elevations. Such behaviour is likely to be especially important in geographical areas which are subject to major climatic events such as El Niño. Accordingly, we studied dragonflies and environmental variables in a series of reservoirs over an elevational range of 100–1350 m a.s.l. at the same latitude on the eastern seaboard of South Africa. The aim was to determine how elevation and climate (as regional processes), as well as local factors, influence species assemblage variability, habitat preference and phenology. Certain environmental variables strongly explained the main variation in species assemblage. These included local factors such as pH, marginal grasses, percentage shade, exposed rock, marginal forest and to a lesser extent, marshes and flow. Different species showed various tolerance levels to these variables. Elevation and climate as regional processes had very little influence on dragonfly assemblages in comparison with these environmental factors. These odonate species are essentially sub-tropical, and are similar to their tropical counterparts in that they have long flight periods with overlapping generations. Yet they also have temperate characteristics such as over-wintering mostly as larvae. These results indicate evolutionary adaptations from both temperate and tropical regions. Furthermore, most were also widespread and opportunistic habitat generalists. The national endemics *Pseudagrion citricola* and *Africallagma sapphirinum* only occurred at high elevations. However, the endemic *Agriocnemis falcifera* was throughout all elevations, suggesting regional endemism does not necessarily equate to elevational intolerance. Overall, the results suggest that many millennia of great climatic variation have led to a highly vagile and elevation-tolerant dragonfly assemblage which readily occupies new water bodies. Such an assemblage is likely to be highly tolerant of global climate change, so long as there is sufficient water to keep the

reservoirs at a constant level." (Authors)] Address: Samways, M.J., Dept Entomol. & Nematol., Univ. Stellenbosch, Private Bag X1, ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za

9915. Samways, M.J. (2010): The rare Ghost Duskdarter dragonfly *Zyxomma petiolatum* on Desroches Island, Seychelles. *Phelsuma* 18: 98. (in English) [Verbatim: "On each evening at dusk, between 11th and 21st April 2010, the rare *Zyxomma petiolatum* was hawking the northern shoreline of coralline Desroches Island, Amirantes, Seychelles. It also attempted to lay eggs in swimming pools. What is surprising is that this sandy island is virtually waterless, with only a small pool for tortoises. These dragonfly individuals may have come from the granitic Seychelles, where it has been recorded (Bowler 2006). However, its rarity there, and in Asia (Bedjaniè et al. 2007), does not make it a normal candidate for migratory behaviour, suggesting that there is also a chance that it might be breeding in very small semi-permanent pools on Desroches Island. The only other odonate recorded on Desroches at the same time, was *Tramea limbata*, a well-known long-distance migrant."] Address: Samways, M.J., Dept Entomol. & Nematol., Univ. Stellenbosch, Private Bag X1, ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za

9916. Sarfaty, A.; Pruettt-Jones, S. (2010): Coloration indicates body size in *Calopteryx maculata* (Odonata: Calopterygidae). *International Journal of Odonatology* 13(2): 167-180. (in English) ["*Calopteryx maculata* has become a model system for studying behaviour and reproduction in odonates. Its iridescent coloration is thought to be important in intraspecific interactions but no study has yet measured coloration in a quantitative manner. In a recent study, Fitzstephens & Getty (2000. *Animal Behaviour* 60: 851-855) showed that lipid levels predict coloration as determined by Munsell chips, such that fat males were blue and lean males were green. In this study we quantified color in *C. maculata* with a spectrometer to test the prediction of Fitzstephens & Getty (2000) using quantitative measures. We found that body size, but not lipid levels, correlates with color. In our study, larger males were green and smaller males blue. Territorial males did not differ from non-territorial males in color, size, or lipid levels. Coloration thus predicts size in male *C. maculata*, but the significance of this in intraspecific interactions remains unclear." (Authors)] Address: Sarfaty, Anna, Department of Ecology and Evolution, University of Chicago, 1101 East 57th St., Chicago IL 60637, USA. E-mail: asarf@uchicago.edu

9917. Sauber, F. (2010): Hommage à Jos Hoffmann (1911–2000). *Bull. Soc. Nat. luxemb.* 111: 145-149. (in French) [In the 1960ies, J. Hoffmann contributed significantly to the knowledge of the odonate fauna in Luxembourg.] Address: not stated

9918. Schlotmann, F. (2010): Arealerweiterung der Gemeinen Winterlibelle (*Sympecma fusca*) (Odonata: Lestidae) in Rheinhessen – eine Folge der Klimaänderung und von anthropogener Gewässerunterhaltung. *Fauna und Flora in Rheinland-Pfalz* 11(4): 1385-1396. (in German, with English summary) ["Due to findings in the early 1980 decade in Rheinhessen (Rhineland-Palatinate, Germany) *S. fusca* had a distribution gap that has been explained by climatic parameters and a lack of woodland. New investigations have shown that since 1984 the species has silently expanded its range across

the whole region of about 1400 square kilometers. *S. fusca* prefers shallow ponds of anthropogenic origin that are in an early stage of natural succession and typically have developed reed or cattail stands along the littoral zone. This kind of habitat can be frequently found in flood retention basins and nature conservation ponds and the species seems to be profiting much of these types of stagnant waters. Additionally, the effects of the man-made climate change are thought to be a reason for the expansion. In contrast to most literature statements the winter habitats in Rheinhessen cannot be wooded areas, because these are missing in the region. Wintering seems to take place in habitats of the open landscape like hedges and elements of fallow land. The pioneer character of the species is pointed out." (Author)] Address: Schlotmann, F., Weserstr. 11, 55296 Harxheim, Germany. E-mail: frank.schlotmann@gmx.net

9919. Schlumprecht, H.; Bittner, T.; Jaeschke, A.; Jentsch, A.; Reineking, B.; Beierkuhnlein, C. (2010): Gefährdungsdiskussion von FFH-Tierarten Deutschlands angesichts des Klimawandels. Eine vergleichende Sensitivitätsanalyse. *Naturschutz und Landschaftsplanung* 42(10): 293-303. (in German, with English summary) ["Risk Assessment of Animal Species of the EU Habitats Directive in View of Climate Change: Climate change presumably means greater vulnerability for many animal species of the Habitats Directive. This susceptibility was comparatively estimated for all German animal species of the Habitats Directive based on a uniform database of ecological traits using a uniform methodology. The estimated additional vulnerability was analysed with reference to the Red List status for Germany, the Annexes of the Habitats Directive, to species group and habitat constellation. The results show that endangerment increases in line with the Red List status. Species of Annex II are more endangered than species of Annex IV or V. Beetles are probably more vulnerable than other species groups. Species essentially requiring small structures (mainly butterflies, beetles) are additionally endangered, followed by species requiring aquatic habitats and surroundings or species found exclusively in aquatic habitats. Species which do not necessarily require unfragmented habitats but at least specific or limited habitat patches, or species with a large home range appear to be less vulnerable. The consequences for the conservation of species within Natura 2000 are discussed." (Authors) The analysis includes five odonate species: *Coenagrion hylas*, *C. ornatum*, *Ophiogomphus cecilia*, *Oxygastra curtisii*, *Sympecma paedisca*.] Address: Schlumprecht, H., Büro für ökologische Studien, Oberkonnorsreuther Str. 6a, 95448 Bayreuth, Germany. E-Mail kontakt@bfoes.de

9920. Schneider, T.; Schneider, J. (2010): Occurrence, behaviour, and habitat preference of the Levant Pincertail, *Onychogomphus macrodon* Selys, 1887 in Turkey (Insecta: Odonata). *Zoology in the Middle East* 49: 79-88. ["The current status and distribution of the rare and threatened *O. macrodon* was studied in Turkey 2006-2009. Despite an intensive search for the species, it was found only at one locality in the middle course of the Ceyhan river. Other localities in Turkey, from where the species has been reported in the literature which could not be confirmed. The habitat preference of the species is described and observations on the behaviour of both sexes were made. Some morphological details are described and notes on the colour are given. Litera-

ture records are summarised and reasons for the decline of this species are discussed." (Authors)] Address: Schneider, T., Arnold-Knoblauch-Ring 76, 14109 Berlin-Wannsee, Germany. E-mail: karin.thomas.schneider@gmx.de.

9921. Schorr, M. (2010): Umzug der Libellensammlung Jurzitza von Karlsruhe nach Frankfurt, Senckenbergmuseum. *Libellennachrichten* 23: 12-14. (in German) [The important collection of Gerhard Jurzitza, Karlsruhe, Germany with many thousand Southamerican specimens and including holo- and paratypes was translocated from his private property to the Senckenberg Museum in Frankfurt, Germany.] Address: Schorr, M., Schulstr. 7B, 54314 Zerf, Germany. E-mail: bierschorr@online.de

9922. Schröter, A. (2010): On a collection of dragonflies from eastern Georgia, with the first record of *Sympetrum arenicolor* (Odonata: Libellulidae). *Libellula* 29(3/4): 209-222. (in English, with Georgian and German summary) ["On a short field trip in 2006 to eastern Georgia, 14 Odonata species were recorded at six localities. A male of *Sympetrum arenicolor* was collected in the outskirts of Tbilisi. This species is new for the Georgian fauna. All species are annotated and a list of the sampled localities is given." (Author)] Address: Schröter, A., Rasenweg 10, D-37130 Gleichen, Germany. E-mail: asmustim@gmx.de

9923. Shieh, S.-H.; Chi, Y.-S. (2010): Factors influencing macroinvertebrate assemblages in artificial subtropical ponds of Taiwan. *Hydrobiologia* 649: 317-330. (in English) ["Macroinvertebrate assemblages and its association with environmental factors at the 11 artificial subtropical ponds of Taiwan were examined using the multivariate analysis software STATICO. The aims of the study were to determine whether spatial and seasonal variation of macroinvertebrate assemblages changed seasonally, to examine which environmental factors determined the spatial and temporal structure of macroinvertebrate assemblages, and to compare between-pond variations in the taxon composition of macroinvertebrates. Macroinvertebrates were collected seasonally by a corer and a sweep net in 2007, and 13 physical and chemical factors were measured at the same time. A total of 31 macroinvertebrate taxa were collected during the sampling period, and the most dominant taxa were Chironomidae (31.7% of total animal abundance) and Tubificidae (22.4%). STATICO identified pond size, pond depth, sediment depth, and altitude as the major abiotic factors and *Bufo melanostictus* (Amphibia) as the major biotic factor to influence macroinvertebrate assemblages at these ponds. These factors changed with seasonality. For example, the abundance of *B. melanostictus* was the most important factor during the spring but became much less important in other seasons. According to the spatial distribution patterns of macroinvertebrate assemblages, macroinvertebrates could be split into two groups based on their dispersal. The active dispersers, such as insect taxa, were strongly associated with pond size and the passive dispersers, such as non-insect taxa, were strongly associated with the pond depth and/or sediment depth. The results of this study suggested that pond size might influence macroinvertebrate assemblages through their dispersal mechanisms and that the environmental factors which influenced the macroinvertebrate assemblages most changed with seasons in this study area." (Authors) Odonata were represented by nine taxa.] Address:

Shieh, S.-H., Department of Ecology, Providence University, 200 Chung-Chi Rd, Shalu, Taichung, 43301, Taiwan, ROC, E-mail: shshieh@pu.edu.tw

9924. Siraj, S.; Yousuf, A.R.; Bhat, F.A.; Parveen, M. (2010): The ecology of macrozoobenthos in Shallabugh wetland of Kashmir Himalaya, India. *Journal of Ecology and the Natural Environment* 2(5): 84-91. (in English) ["Macrozoobenthos comprise of an important group of aquafauna by way of their contribution to ecosystem stability, besides acting as potential bioindicators of trophic status. Being efficient energy converters, they constitute an important link in the aquatic food web. In view of importance of such an aquatic bioresource, on one hand, and scarcity of information about them, on the other, the present study aimed at working out the species composition, distribution pattern and abundance of macrozoobenthos in relation to several physico-chemical parameters of the Shallabugh wetland of Kashmir Himalaya. The data collected on various physico-chemical parameters showed wide seasonal and site-specific fluctuations. Dissolved oxygen concentration fluctuated between 3 - 12 mg/l, while as free CO₂ ranged from 1 - 19 mg/l showing also high values of bicarbonates of Ca and Mg, nitrogen and total phosphorus. The pH of the wetland remained mostly alkaline but at the emergent macrophytic site it showed a slight acidic trend (6.6) in during late summer. Benthos of the Shallabugh wetland was represented by Arthropoda, Annelida and Mollusca, and was studied in relation to abiotic and biotic factors for one year. Perusal of the results revealed that Arthropoda, Annelida and Mollusca were represented by 10, 7 and 6 species respectively. The abundance of some specific pollution indicator species, especially Annelids such as *Limnodrilus* sp, *Tubifex tubifex* and *Branchiura sowerbyii*, is depictive of transition in trophic status of the wetland from meso- to eutrophy. In view of the eutrophication-induced changing biotic community structure, the present study calls for urgent management and restoration of the Shallabugh wetland ecosystem." (Authors) "*Lestes spec.*" larvae were recorded only once at site W2.] Address: Siraj, S., Centre of Research for Development (CORD), University of Kashmir, Srinagar, J & K, India, 190006. E-mail: mashah75@yahoo.com.

9925. Skvortsov, V.E. (2010): The dragonflies of Eastern Europe and Caucasus: An illustrated guide. KMK Scientific Press Ltd. Moscow. ISBN: 9785873176571: 623 pp. (in bilingual Russian and English) [Reviewed by Asmus Schröter:

Mainly due to the language barrier 20 years after the fall of the Iron Curtain both exchange and cooperation between Odonatologists from Europe and Russia and the successor states of the former Soviet Union still remains on an unsatisfying low level. The result is a considerable mutual lack of knowledge of the respective Odonata fauna of the other side's part of the world. Whilst on the one hand European Russia and the Caucasus region faunistically are still largely terra incognita for most of the European odonatologists, their Russian speaking colleagues on the other hand are frequently unaware of the situation in the West. According to the book author's introduction one of the aims of his work is to function as a link between Russian and English-speaking Odonatologists and in this perspective this consequently bilingual guide of the Odonata fauna of European Russia and the Caucasus region conceptually fills this gap.

The book to be discussed covers the European part of Russia, stretching to the Yamal Peninsula and Tyumen Province in the east. Moreover, the territories of Moldova, Estonia, Lithuania, Latvia, Belarus, Ukraine and Georgia, Armenia and Azerbaijan are considered.

Almost all of the 120 species which are subject of the book are depicted, including numerous detail drawings of appendages, secondary genitalia, wings, larvae and other features substantial for determination. Beside the author's introduction and a concise and well illustrated introduction on morphology of imago and larvae, the main part of the book consists of a dichotomous identification key. The key is organized from suborder down to species level, whereas each species additionally is shortly described in an extra chapter, supplying information on flight period, measurements, distribution and ecology whenever available.

As a special feature of the key and probably a novelty in dragonfly guides, diagnostic traits of the larvae and wing venation (whenever available) are incorporated in the key.

The chapters following the key offer distribution maps based on more than 350 localities, a list of localities, toponyms and administrative items. With extra schemes in a larger scale in some species special attention is paid to the complicated situation of the species rich Caucasus region. The book ends with species annotations and comments on distribution and a list of references.

When first paging through, the most conspicuous feature of the voluminous book is without doubt the more than 2000 (!) aesthetically appealing drawings and illustrations, which alone makes the book a remarkable piece of odonatological artwork. These drawings were made exclusively for this book. Some images, however, show unrealistic proportions, f. ex. the much too big terminalia of the males in *Coenagrion australocaspicum* (page 200) and *ponticum* (208), the inadequately big head in the depicted male of *Cordulegaster insignis charpentieri* (374) etc.

However, the majority of the drawings in view of accuracy and clarity satisfy high scientific demands.

Generally the book's importance as a profound and comprehensive fully illustrated diagnostic key for Russian speaking people interested in the dragonflies of the region cannot be assessed highly enough, as to date no up-to-date dragonfly guide for the region was available.

As the level of odonatological exploitation in the considered region, compared to the Asian part within the area of the former Soviet Union, curiously still remains on a lower level, the book hopefully will have a positive effect on the faunistic survey of the region encouraging more people interested in nature to deal with dragonflies.

As far as the authors second aim is concerned - to provide a complete revision of the faunistic data of European Russia and the Caucasus especially for non-Russian speaker - unfortunately the book does not meet the requirements.

Beside many unnecessary spelling errors, even very eye catching ones in bold headlines, f. ex. "*Cordulegasler*" (359), in author names, f. ex. "*Kolentai*" (359) or species names, f. ex. constantly "*stirolatum*" (459 onwards), several inconsistencies concerning the contents hamper the reader, f. ex. an incomplete list of abbreviations (23), not allowing the interpretation of several ab-

brevisions in the section "general distribution" in species descriptions, f. ex. MDT, ME, TEA, AM etc.

The same goes for missing entries concerning the navigation of the headers and footers of the key, f. ex. in *Onychogomphus lefebvrei* (346) no indication to the annotation on page 593 is given, the latter being written inconsistently on one and the same page (346) "*lefebvrei*" (species description) and "*lefebvrei*" (footer below) etc.

Several contents are incorrect displayed, f. ex. *Onychogomphus assimilis* is stated for Lagodekhi NE Georgia in the species annotation (593; i. e. Bartenev 1932), but this is not plotted on the species distribution map (583).

Data given for several species concerning the status in the region are blurred and lost in vagueness, f.ex. in *Onychogomphus lefebvrei*:

Whilst the genus introduction (340) ["The only species widespread over the region is *O. forcipatus*; however, three other species occur in its Caucasus part where field separation of all the congeners is complicated."] implicitly mentions this species as part of the regional fauna and thus leads to the assumption, that *O. lefebvrei* definitively occurs in Caucasus, it is relativised in the following annotation "only reported from NW Caucasus; no exact data cited" (593). Thus, the reader is left in the lurch about the status of *O. lefebvrei* in the region and it remains unclear for which reason this species is dealt with at all etc.

Other data are out of date and incorrect, f. ex. in *Ophiogomphus*:

Four North Asian members of the genus *Ophiogomphus* are known from the area of the former Sowjet Union, not only three! (338/339): *O. cecilia* (Geoffroy in Fourcroy, 1785) (= *O. serpentinus* (Charpentier, 1825), *O. obscurus* Bartenev, 1909, *O. reductus* Calvert, 1898 and *O. spinicornis* Selys, 1878. For *O. spinicornis* in Russia see Kosterin & Zaika (2003). Even though the latter three are not very likely to be found in the covered area, they are now widely accepted as full species (inter alia Asahina (1979), Haritonov & Borisov (1990).

Moreover, several species included in the key do decidedly not occur in the considered region, but have been recorded in adjacent areas and countries and might be considered as hopeful candidates to be discovered once. Those species are marked with an asterisk, and thus being clearly designated as such. However, at least some of the included species marked with an asterisk, like *Oxygastra curtisii* and *Somatochlora borisi*, are in hardly any respect connected to the region and according to the author included just on account of interest to show the fascinating taxonomical variety of dragonflies (16/17). However, I would have cautioned the author from doing so, as the pure mention of such species bearing no relation to the region or the content of the book at all, is just another unnecessary source of misunderstanding.

The same applies for the dubious Lithuanian record of *Sympetrum eroticum* (Stanionyte 1989) which, although clearly marked with an asterisk, should have better been neglected at all.

Some further species are presented in a very general way and a more precise and differentiated contemporary presentation or at least the attempt to do so would have been desirable:

Gomphus flavipes: Unfortunately no indication on the occurrence of *Gomphus ubadschii* Schmidt, 1953 (sub

(*Gomphus flavipes lineatus* Bartenev, 1929) is given and only the nominate taxon is considered (337). *Lineatus* was described from Poti/Georgia by Bartenev (1929) and it appears likely that all records of *flavipes* from Transcaucasia in fact pertain to *ubadschii*.

Aeshna juncea: The bewildering phenotypical variability of *A. juncea* in the Caucasus region and the doubtful status of two regional taxa *atshischgho* Bartenev, 1929 and *crenatoides* Bartenev, 1929 are mentioned shortly (285), but unfortunately no new information or interpretation is given. Especially against the background of recent records of specimens of *A. juncea* of the "mongolica-type" with distinctly enlarged yellow thorax pattern in adjacent NE Turkey

(<http://www.libellen.org/epallage/pubs/juncea.html>)

further information on distribution and colouration of Caucasian populations would have been highly appreciated. From this perspective "the comma-like spot below spiracle" presented as diagnostic feature in the key (274) to separate *subarctica* from *juncea* may apply elsewhere, but should be treated with some caution in the Caucasus region.

However, such weak points are of minor importance and do not affect the general quality of the book. Much more serious in this context is, however, the frequent uncritical reviewing and subsequent repeating of obviously or probably erroneous records. Undoubtedly, the book boasts an impressive amount of data and contains the essence of virtually the complete literature relevant for the region and one can easily imagine the huge amount of work behind it. However, one main problem - beside the language barrier - most of the European Odonatologists are constantly facing while dealing with (mainly old) faunistic data from Russia and the Caucasus, are the numerous doubtful records and unclear status of several taxa described from the region. In this respect the book unfortunately does hardly provide any progress as it does largely not represent the current state of knowledge and unfortunately contains such doubtful data throughout. Considering the stated aim of the author on the one hand, to improve the insufficient communication between East and West (9), and the nature of many of the erroneous data presented on the other hand, one could easily get the impression, that the author itself became a victim of insufficient exchange with colleagues from elsewhere as obvious errors like *Cordulegaster princeps* etc. might easily have been avoidable just by a few words from an expert of the region. Those mistakes cast a shadow on the pleasure to read and work with this otherwise useful book.

The following seven species and taxa dealt with in identification key and species description, which are presented as part of the fauna of the area covered by the book are either doubtful or with the outermost probability erroneous and should be therefore deleted from the species list at all:

1. *Platycnemis latipes*: Stated for Kabardino-Balkaria (Russian Caucasus).

P. latipes is a western Mediterranean Endemic confined to Iberia and France and definitively not part of Russia and adjacent countries. According to the cited reference (594) ([Byuleten' gosudarstvennogo muzeya Gruzii] 6:85-96) another specimen from that area was considered (...) "a form of *P. pennipes* closely resembling *P. latipes*." However, obviously the same goes for that particular specimen stated as *P. latipes*. Another explanation

might be confusion with the similar regional congener *P. dealbata*.

2. *Coenagrion mercuriale*: Stated for Armenia, Azerbaijan and Belarus (588/589). This species has been rejected by Taily et al. (2004) from the checklist of Armenia, and Dijkstra (2006: 110) consider even all records of *C. mercuriale* from Eastern Europe to be erroneous. Hence, the occurrence of this western Mediterranean species in the Caucasus region generally seems to be most unlikely.

3. *Onychogomphus forcipatus unguiculatus*: Both taxa *albotibialis* and *unguiculatus* are stated for Caucasus (593). However, Boudot et al. (1990) outlined the nature and distribution of the subspecies of *Onychogomphus forcipatus*, whereupon the taxon *O. f. unguiculatus* is confined to the western Mediterranean and is replaced by *O. f. albotibialis* in Asia Minor. Therefore, *O. f. unguiculatus* is certainly not part of the regional fauna. As far as the Caucasus is concerned Reinhardt (1992) and Schröter (2010b) decidedly assigned specimens from Georgia to *O. f. albotibialis*.

4. *Gomphus davidi*: *G. davidi* is stated for Caucasus without further information (336). However, *Gomphus davidi* is a Levantine Endemic restricted to a small range within Turkey, Israel, Jordan, Lebanon and Syria (Suhling & Müller 1996, Kalkman 2006, Boudot et al. 2009) and most probably does neither occur nor will ever be expected in the Caucasus or elsewhere within the region covered by this book.

5. *Cordulegaster princeps*: *C. princeps* is an endemic confined to the Middle and High Atlas of Morocco (Boudot 2001, Van Pelt (2006), Boudot et al. 2009) and thus the stated record from Tbilisi/Georgia is with the outermost certainty erroneous and one could hardly imagine another Palaearctic dragonfly species, whose occurrence in Georgia is as unlikely than this.

6. *Cordulegaster coronata*: Included in the diagnostic key (364) and in the species description (367), but no further information or data are given - "no regional data" (367), "no local record" (590). However, this Central Asian species is very unlikely to occur within the considered region. In addition to all this, images which should depict *Cordulegaster coronata* are erroneous and both images of the male in top and lateral view (375) do for sure not show this species! *C. coronata* has a much yellower overall appearance and the yellow abdominal markings do laterally not descend onto the underside of the segments, every segment additionally shows yellow apical patches and on segments 8 and 9 very distinctive shaped yellow "double-7 spots" are present. For accurate drawings of males of *C. coronata* see Fraser (1929), Schmidt (1961) and for photos of both sexes Schröter (2010a).

7. *Brachythemis impartita* (Karsch, 1890) (see: Dijkstra & Matushkina, 2009: sub *B. leucosticta*): *Brachythemis impartita* has an Afrotropical distribution and comes closest to the considered region in the Near East, where it is locally very common. Notably only a few records from adjacent southern Turkey are known to date (Kalkman 2006, Dijkstra 2006). Although a wandering individual could not be excluded a priori, the cited very old single record (586; referring to Bartenev 1912d) appears to be erroneous beyond doubt.

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- Author: Schröter, A. Rasenweg 10, D-37130 Gleichen, Germany. E-mail: asmustim@gmx.de
- 9926.** Smallshire, D.; Beynon, T. (2010): *Dragonfly Monitoring Scheme Manual*. British Dragonfly Society: 12 pp. (in English) [Handout with detailed instructions to choose a transect, count and document specimens, and supply data to the Dutch organisers. The BDS acknowledges the help and encouragement of De Vlinderstichting (Dutch Butterfly Conservation) in the production of this manual, which was based largely on Ketelelaar, R. & C. Plate (2001) *Manual Dutch Dragonfly Monitoring*.] Address: Prentice, S., Dragonflies in Focus Project Officer, British Dragonfly Society, c/o Natural England, Parkside Court, Hall Park Way, Telford TF3 4LR, UK. E-mail: stephen.prentice@naturalengland.org.uk
- 9927.** Smith, P.; Snook, D.; Muscutt, A.; Smith, A. (2010): Effects of a diesel spill on freshwater macroinvertebrates in two urban watercourses, Wiltshire, UK. *Water and Environment Journal* 24(4): 249-260. (in English) ["The impacts of a spill of approximately 9800 L of diesel on a small stream and the River Ray (near Swindon, Wiltshire, UK) were examined using kick-net sampling of freshwater macroinvertebrate families at impacted and reference sites. Initial impacts (10 days after the spill) 50 m downstream of the spill were severe, with only 9% survival of individuals (excluding oligochaete worms) and 56% survival of invertebrate families. The percentage survival of macroinvertebrates increased progressing downstream from the spill, with no detectable impacts beyond approximately 4 km downstream. The crustacean families Asellidae and Gammaridae were particularly sensitive to the diesel spill. The recovery of the macroinvertebrate community was assessed 13.5 months after the spill. At this time, recovery was almost complete, with only minor impacts at the sites closest to the spill. The use of live laboratory sorting of samples from impacted sites provided essential information on the impacts of the diesel spill." (Authors) Appendix A: Calopterygidae; Coenagrionidae] Address: Smith, P., Aquatronics Ltd., Glenthorne, Searle Street, Crediton, Devon EX17 2DB, UK. Email: phil@aquatronics.com
- 9928.** Smith-Patten, B.D.; Patten, M.A. (2010): Broken antehumeral stripes in a male *Enallagma civile* (Familial Bluet). *Argia* 22(3): 20. (in English) [Two avoid identification confusion it is important to consider that life and dried specimens may differ in appearance: Broken antehumeral stripes on a male *E. civile* collected near Fonda, Dewey County, Oklahoma, USA, 23-V-2010 are shown by the authors. These stripes were symmetric in life, but postmortem desiccation of the specimen has distorted this symmetry.] Address: Smith-Patten, Brenda, Dept of Recent Invertebrates, Sam Noble Oklahoma Museum of Natural History, University of Oklahoma, Norman, Oklahoma 73072, E-mail: argia@ou.edu

- 9929.** Spitzer, S. (2010): Striped Saddlebags (*Tramea calverti*) new for Illinois. *Argia* 22(4): 9. (in English) [7-IX-2010, Montrose Dunes along Lake Michigan, north of Chicago, Illinois USA] Address: Spitzer, S. E-mail: steven0703@yahoo.com
- 9930.** Suhling, F.; Marais, E. (2010): *Crenigomphus kavangoensis* sp. nov. from the Okavango River, Namibia (Odonata: Gomphidae). *International Journal of Odonatology* 13(2): 267-276, pl. lb, c. (in English) ["A new species of *Crenigomphus* is described and illustrated from a type series of eight males and eight females, all collected along the Okavango River in Namibia during December 2004, three non-type adult specimens and several exuviae (holotype male: Namibia, N'Kwazi Lodge, 19 xii 2004, deposited at NMNW). Both sexes lack foliations at S8-9 as occur in some *Crenigomphus*, but the male is peculiar in having exceptionally long cerci. The latter character is normally present in the genus *Paragomphus*. Other characters typical of *Crenigomphus* include all wings having a bright yellow costal border, S10 longer than S9 in males, colouration mostly ochreous with few darker markings, and the strong blackish serration at the posterior end of the cerci. The larval characters based on exuviae, one associated with an emerged male, do not allow clear separation from *Paragomphus*." (Authors)] Address: Suhling F., Inst. Geoökologie, TU Braunschweig, Langer Kamp 19c, D-38102 Braunschweig, Germany. E-mail: f.suhling@tu-bs.de
- 9931.** Szekers, J.; Csányi, B. (2010): Seasonal investigations on the macroinvertebrate fauna of the stream Burnót-Patak. *Acta Biol. Debr. Oecol. Hung.* 21: 189-196. (in Hungarian, with English summary) [Hungary; "Our survey on the macroinvertebrate fauna was conducted at 4 sampling sites at Burnót stream and an additional site of the inflowing Sásdi stream 3 times in 2009. The results were evaluated according to the seasonal variability of the macroinvertebrate fauna. Furthermore we analyzed the seasonal changes in species diversity and differences in diversity at sampling sites. We found that the rich runoff of the stream during spring was more favourable for the macroinvertebrates than it was in other periods of the year. The stream dried out in summer, resulted in a decreased number of taxa, lower abundance and lower diversity." The list of taxa includes "*Corduliidae* juv." and *Libellula fulva*.] Address: Szekers, J., VITUKI Environmental and Water Management Research Institute Non-profit Ltd., Kvassay Jenő út 1., H-1095 Budapest, Hungary. E-mail: szekeresj@vituki.hu
- 9932.** Szivák, I.; Deák, C.; Kálmán, Z.; Soós, N.; Mauchart, P.; Lökkös, A.; Rozner, G.; Móra, A.; Csabai, Z. (2010): Contribution to the aquatic macroinvertebrate fauna of the mountains Mecsek with the first record of *Limnius opacus* P.J.W. MÜLLER, 1806 in Hungary. *Acta Biol. Debr. Oecol. Hung.* 21: 197-222. (in English, with Hungarian summary) [In 2005, 2008 and 2009 faunistic and quantitative samplings were carried out at 54 sampling sites in the mountains Mecsek. The species list includes many records of *Cordulegaster heros*, and a single record of *Calopteryx virgo*.] Address: Szivák, I., University of Pécs, Department of General and Applied Ecology, Ifjúság útja 6, H-7624 Pécs, Hungary. E-mail: szivaki@gamma.ttk.pte.hu
- 9933.** Tajima, V.; Watanabe, M. (2010): Sperm transfer process in the non-territorial *Ischnura asiatica* (Brauer) during copulation (Zygoptera: Coenagrionidae). *Odonatologica* 39(3): 253-258. (in English) ["According to the movements of the male abdomen, the copulation process in *I. asiatica* is divided into 3 stages (I, II and III). The mean duration of each stage was 75.8 ± 8.8 min, 6.4 ± 0.3 min and 15.8 ± 0.9 min for stage I, II and III, respectively (S.E.). No sperm transfer was found during stage I. The prolonged duration in stage I was related to the time of onset of copulation. Sperm was transferred into the bursa copulatrix during stage II. Although stage III was a phase without apparent abdominal movement, the sperm transfer was continued, following the sperm migration from the bursa copulatrix to the spermatheca. Immediately after copulation termination, the estimated number of sperm was $64,500 \pm 4,425$ in the bursa copulatrix and $43,143 \pm 6,397$ in the spermatheca (S. E.). The role of each stage in copulation will be discussed from the viewpoint of sperm competition." (Authors)] Address: Tajima, V., Graduate School of Life and Environmental Sciences, University of Tsukuba, Tsukuba, Ibaraki 305-8572, Japan. E-mail: tj@ies.life.tsukuba.ac.jp
- 9934.** Takahashi, Y.; Yoshimura, J.; Morita, S.; Watanabe, M. (2010): Negative frequency-dependent selection in female color polymorphism of a damselfly. *Evolution* 64(12): 3620-3628. (in English) ["Negative frequency-dependent selection (NFDS) is one of the most powerful selective forces maintaining genetic polymorphisms in nature. Recently many prospective cases of polymorphisms by NFDS have been reported. Some of them are very complicated, although strongly supportive of the NFDS. Here we investigate NFDS in wild populations of the dimorphic damselfly *Ischnura senegalensis*, in which females occur as andromorphs and gynomorphs. Specifically, we (1) test fitness responses to morph frequencies, (2) built a simple population genetic model, and (3) compare the observed and predicted morph-frequency dynamics. Fitnesses of the two morphs are an inverse function of its own frequency in a population, and are about equal when their frequencies are similar. Thus the conditions necessary for NFDS are satisfied. The long-term field surveys show that the morph frequencies oscillate with a period of two generations. Morph frequencies in a small population undergo large oscillations whereas those in a large population do small oscillations. The demographic properties of the observed dynamics agree well with those of our model. This example is one of the simplest confirmed cases of NFDS maintaining genetic polymorphisms in nature." (Authors)] Address: Watanabe, M., Grad. School of Life & Environmental Sc., Univ. Tsukuba, Tennodai, Tsukuba, Ibaraki 305-8572, Japan
- 9935.** Tang, H.B.; Wang, L.K.; Hämäläinen, M. (2010): *A Photographic Guide to the Dragonflies of Singapore*. ISBN-13: 9789810861551: 222 pp. (in English) [This fieldguide includes details of all 124 species currently found in Singapore "and almost all are illustrated in brilliant colour photographs. There are additional chapters covering Odonata taxonomy, morphology, ecology and conservation and tips on where to find and how to study them." (Publisher)] Address: Nature's Niche Pte Ltd, 10 Lorong Lada Hitam, Singapore 778793, Singapore
- 9936.** Taylor, P.; Smallshire, D. (2010): A change in status of the Dainty Damselfly *Coenagrion scitulum* (Rambur) in the United Kingdom. *J. Br. Dragonfly Society* 26(2): 108-109. (in English) ["The revised list of Odonata in the United Kingdom produced by Taylor et al. (2009) contained 42 species in Category A, a further

12 species in Category B and 3 species in Category C (former breeding species not recorded since 1970). The discovery of at least four *Coenagrion scitulum* adults in Kent during June and July 2010 and the identification of two exuviae from the same species, require *C. scitulum* to be moved from Category C to Cat. B (vagrant species)." (Authors)] Address: Taylor, Pam, Decoy Farm, Decoy Rd, Potter Heigham, Norfolk, NR29 5LX, UK

9937. Termaat, T.; Kalkman, V.; Bouwman, J. (2010): Changes in the range of dragonflies in the Netherlands and the possible role of temperature change. *BioRisk* 5: Special issue: Monitoring climatic change with dragonflies: 155-173. (in English) ["The trends of 60 Dutch dragonfly species were calculated for three different periods (1980–1993, 1994–1998 and 1999–2003). Comparing period 1 and period 3 shows that 39 of these species have increased, 16 have remained stable and 5 have decreased. These results show a revival of the Dutch dragonfly fauna, after decades of ongoing decline. The species were categorized in different species groups: species with a southern distribution range, species with a northern distribution range, species of running waters, species of fenlands and species of mesotrophic lakes and bogs. The trends of these different species groups were compared with the all-species control group. As expected, a significantly higher proportion of the southern species show a positive trend than the all-species group. In the northern species group on the contrary, a significantly higher proportion of the species show a negative trend than the all-species group. Different explanations for these results are discussed, such as climate change, improved quality of certain habitats and degradation of other habitats. It is likely that the observed increase of southern species is at least partly caused by the increasing temperatures. The less positive picture of the northern species group is probably more influenced by other environmental factor than directly by climate change. Three out of six southern species which have become established since 1990 have done so during the aftermath of large invasions. It is concluded that dragonflies are well capable of using changing climate circumstances to colonise new habitats." (Authors)] Address: Termaat, T., Rijnsteeg 8-10a, 6708 PP Wageningen, The Netherlands

9938. Thienel, F.; Holtmann, B. (2010): Libellen (Odonata) im EU-Vogelschutzgebiet Südradde sowie in den NSG Molberger Dose und Hahnenmoor. *Feuchtwiesen-Info* 10: 25-28. (in German) [Niedersachsen, Germany. Between 2009 and 2010 a total of 30 odonate species was recorded. The list of species includes regionally rare or threatened species as *Ceragrion tenellum* and *Sympetrum depressiusculum*.] Address: Thienel, F., St. Antoniort 1, 49610 Quakenbrück, Germany

9939. Tom, K.R.; Newman, M.C.; Schmerfeld, J. (2010): Modeling mercury biomagnification (South River, Virginia, USA) to inform river management decision making. *Environmental Toxicology and Chemistry* 29: 1013-1020. (in English) ["Mercury trophic transfer in the South River (VA, USA) was modelled to guide river remediation decision making. Sixteen different biota types were collected at six sites within 23 river miles. Mercury biomagnification was modelled using a general biomagnification model based on $\delta^{15}N$ and distance from the historic mercury release. Methylmercury trophic transfer was clearer than that for total Hg and, therefore, was used to build the predictive model ($r^2_{\text{prediction}} = 0.76$).

The methylmercury biomagnification factors were similar among sites, but model intercept did increase with distance down river. Minimum Akaike's Information Criterion Estimation (MAICE) justified the incorporation of distance in the model. A model with a very similar biomagnification factor to the South River (95% confidence intervals [CI] = 0.38–0.52) was produced for a second contaminated Virginia river, the North Fork Holston River (95% CI = 0.41–0.55). Percent of total Hg that was methylmercury increased monotonically with trophic position. Trophic models based on $\delta^{15}N$ were adequate for predicting changes in mercury concentrations in edible fish under different remediation scenarios." (Authors) Organisms analyzed from the South and Holston Rivers (VA, USA) include "Gomphidae" and "Zygoptera".] Address: Newman, M.C., College of William and Mary—VIMS, Gloucester Point, Virginia 23062, USA. E-mail: newman@vims.edu

9940. Trockur, B.; Boudot, J.-P.; Fichet, V.; Goffart, P.; Ott, J.; Proess, R. (2010): Atlas der Libellen / Atlas des libellules (Insecta, Odonata). Fauna und Flora in der Großregion / Faune et Flore dans la Grande Région, Band 1; Hrsg./Éd.: Zentrum für Biodokumentation (Landsweiler-Reden): 201 pp. (Bilingual in German and French, with English summary) ["All data on dragonflies collected in the databases of the five partner regions of the „Sar-Lor-Lux+-region" have been put together and on this basis, actual maps have been compiled. Existing databases of four regions were completed with the data up to the year 2006. Furthermore, for the first time ever, a database on dragonflies was established for the German federal state Rhineland-Palatinate. Concerning the depiction of the total number of 117 053 records, two time spans are compared: before 1990, and from 1990 onwards whereupon 70 % of all records originate from the second period. In the „Großregion", a total of 75 species are known, whereas in each of the three big regions (regarding their extension) Wallonia, Lorraine and Rhineland-Palatinate, 67 species have been detected. On the basis of the total number grid cells (10x6 minutes, about 134 km² each grid cell) where a species was recorded, a simple analysis of the most common and the rarest species is conducted, as well as of the species with the biggest increase and the biggest decline during the two time spans which have been compared. In addition, maps showing the "dragonfly hotspots" (areas with a high number of different species) in the "Großregion" were created by summarizing all species per grid cell. All species listed in the different Red Lists and in the Annexes II and IV of the EC Habitats Directive are presented in a table. Range expansions or changes within the faunas - observed or expected - are described and discussed; some remarkable species of the "Großregion" are presented and described. All species are described in a single chapter by one of the five authors — representing the five regions — who were also responsible for the photos of the species and typical biotopes thus emphasizing the cross-border cooperation. Finally, the experiences made in compiling the atlas are discussed and suggestions for further cross-border cooperation are presented." (Authors)] Address: Zentrum für Biodokumentation, Am Bergwerk Reden 11, 66578 Schiffweiler, Germany. E-mail: info.biodoku@lua.saarland.de

9941. White, E.L.; Corser, J.D.; Schlesinger, M.D. (2010): Distribution and Status of the Odonates of New York. A Partnership between The Nature Conservancy

and the NYS Department of Environmental Conservation, 625 Broadway, 5th Floor Albany, NY 12233-4757: 424 pp. (in English) ["The New York Dragonfly and Damselfly Survey (NYDDS) began in 2005, spanned five field seasons through 2009, and relied heavily on citizen scientists to help collect data over a large geographic area. Its primary goal was to document the current distribution of all odonate species in New York State. This cooperative project between the New York State Department of Environmental Conservation (NYSDEC), Division of Fish, Wildlife and Marine Resources, and the New York Natural Heritage Program was funded through New York State Wildlife Grant T-2-1 in cooperation with the U.S. Fish and Wildlife Service Division of Wildlife and Sport Fish Restoration. Survey efforts were directed toward under-surveyed regions, areas with potential high diversity, and locations with potential for harboring Species of Greatest Conservation Need (SGCN). NYDDS volunteers were trained at workshops held throughout the state during the summers of 2005-2007. The training was designed for beginners from all walks of life and focused on basic odonate biology, taxonomy, and identification, as well as field capture and specimen preservation techniques. Nearly 300 people were trained at these workshops, some of whom were NYSDEC or NY Natural Heritage staff. We focused most of our survey efforts on adults rather than larvae due to their relative ease of identification. Surveys were completed from April through October in or near aquatic breeding habitats such as lakes, ponds, bogs and fens, rivers and streams, marshes, swamps, and forest seeps. Wooded areas and fields near aquatic habitats were also fruitful survey sites, as adults use these areas to mature, roost, and forage. We took many steps to ensure that data received from volunteers were accurate. Participants were provided with a list that noted, for each species (and in some cases, for each sex) the level of verification necessary for record confirmation (observation, photograph or specimen). These photo and specimen vouchers were verified by odonate experts. Our five-year sampling effort yielded many important finds. Most notable were five species added to the list of known odonates for the state, bringing the cumulative total to 194 species, one of the highest diversities of any U.S. state. Owing to the efforts of entomologists, odonatologists, and odonate enthusiasts prior to the NYDDS, New York has records extending back to the late 1800s. This existing county distribution information was compiled by odonatologist Thomas Nick Donnelly of the Dragonfly Society of the Americas in 1999 and again in 2004. We were unable to confirm the presence of 15 of the 189 Odonata species ever documented in New York by Donnelly, and every one of these species was rare in the state to begin with. Participants visited over 2,170 survey sites statewide and a total of 4,383 surveys were conducted, including repeat visits. We confirmed over 18,000 individual species records based on our verification protocol. NYDDS yielded 1,111 new county records beyond these preexisting data. Each county's documented richness increased by 18 species on average, and we documented at least 75 species in two-thirds of New York's 62 counties. A list was compiled for each county as well as a distributional map and phenology chart for all 194 species and full species accounts are included for all 48 SGCN. We calculated draft S-ranks for rare species using NatureServ's Element Rank Calculator and we found that of N's 194 odonate species, 26% are likely to be ranked as critically imperiled (S1) or imperiled

(S2). Surveys for the state historical *Williamsonia lintneri* were unsuccessful, but produced leads in the Grafton and Rome areas. We completed at least five group surveys in western NY for the Federally Endangered *Somatochlora hineana* in appropriate habitat; we did not confirm the species, and it seems unlikely to be present, with the nearest known population occurring in Michigan. Multiple surveys have often been required before the presence of *S. hineana* was confirmed at new sites discovered in Wisconsin and other states, so future survey work may yet prove fruitful. Surveys for New York's state-threatened damselflies in Suffolk county revealed two new sites for *Enallagma recurvatum* (previously known from nine ponds), seven new sites for *Enallagma pictum* (previously known from three ponds), and *Enallagma minusculum* is known from three locations (two in Suffolk county and one in Queens). These surveys will inform the development of a Recovery Plan for these species. Analyses of survey effort showed that the state was sampled sufficiently to document its odonate fauna. Similarly, each of the state's seven ecoregions was well sampled, while some counties could have used additional survey effort. Such counties where additional survey effort would be most productive were identified and survey effort, ecological and biogeographical explanations were forwarded as possible reasons for the apparent lower species richness in western vs. eastern New York. Since odonates are noted indicators of water quality, biodiversity, and ecological change, our findings should help inform future conservation efforts in freshwater habitats. Along with previous distribution information, this report provides baseline information on the distribution and status of odonates in New York against which to measure future change. Much like the 2000-2005 Breeding Bird Atlas followed up on the 1980-1985 Atlas, leading to some highly informative analyses of distributional shifts, we hope that in the future this survey effort will be similarly revisited to assess shifts in odonate distributions. Monitoring of this sort may be the only way to know whether we are maintaining New York's dragonfly and damselfly biodiversity in the face of continuing global change." (Authors)] Address: White, E., NYSDEC-DFWMR, NY Natural Heritage Program, 625 Broadway, 5th Floor, Albany, NY 12233-4757, USA: E-mail: nydds@gw.dec.state.ny.us

9942. Wildermuth, H. (2010): *Somatochlora flavomaculata* als Beute von Radnetzspinnen (Araneae: Araneidae). *mercuriale* 10: 43-46. (in German, with English summary) [Switzerland; *S. flavomaculata* "has been recorded three times deadily entangled in orb webs. In all cases ovipositing females were concerned, in two of them also males were caught, probably after they had grasped an ovipositing female. The findings are discussed with respect to gender-specific predation-proneness of *S. flavomaculata* by orb-web spiders." (Author)] Address: Wildermuth, H., Haltbergstr. 43, 8630 Rütli, Switzerland. E-mail: hansruedi@wildermuth.ch

9943. Wildermuth, H. (2010): Ein Dreigespann der Großen Moosjungfer (*Leucorrhinia pectoralis*). *mercuriale* 10: 47-48. (in German) [Intraspecific triple connection in *Leucorrhinia pectoralis* (Odonata: Libellulidae).] Address: Wildermuth, H., Haltbergstr. 43, 8630 Rütli, Switzerland. E-mail: hansruedi@wildermuth.ch

9944. Wildermuth, H. (2010): Monitoring the effects of conservation actions in agricultural and urbanized landscapes – also useful for assessing climate change?.

BioRisk 5: Special issue: Monitoring climatic change with dragonflies: 175-192. (in English) ["Various methods for measuring the success of conservation actions and for evaluating aquatic habitats are outlined, based on quantified dragonfly monitoring. They are discussed with respect to their practicability and information value, counts of adult males and especially of exuviae yielding the most valuable results. These are presented by actual examples of mire ponds, streams, ditches and rivers from central Europe, making allowance for the dynamics of the habitats and their dragonfly community. Records of detailed data, if repeated subsequently at the same localities with the same methods, are considered a useful basis for preparation of distribution maps and for comparison of the fauna over the time. Fauna shifts in horizontal and vertical distribution over the time should be judged critically with respect to climate change as they could also be caused by anthropogenic habitat changes." (Author)] Address: Wildermuth, H., Haltbergstr. 43, 8630 Rütli, Switzerland. E-mail: hansruedi@wildermuth.ch

9945. Willigalla, C.; Fartmann, T. (2010): Libellen-Diversität und -zönos in mitteleuropäischen Städten. Ein Überblick. *Naturschutz und Landschaftsplanung* 42(11): 341-350. (in German, with English summary) ["Since 1986 nearly 30 Odonata surveys in cities have been published in Central Europe. 77% (62 species) of the total Odonata fauna of Germany have been found in cities. This high Odonata species richness can be explained by the structural richness due to the high natural diversity of habitats within the biogeographical regions of the cities. However, increased urbanization leads to homogenization of the Odonata fauna. The Odonata assemblages of the cities are more similar than those of not built-up areas, which was indicated by a significantly higher Sørensen coefficient. Within the city borders an urban gradient can be observed. To the city centre the total number of species and the proportion of specialists markedly decreases. In the cities' centers, the Odonata communities only occur rudimentarily, and not even the 21 most frequent species have been found in all cities. The highest species diversity in cities was reported before 1975 with a decreasing trend thereafter. Since the 1990ies the number of species recorded in cities has increased again, probably because of the improvement of the total quality of lotic waters. Approximately 37% of the total Odonata fauna of Germany can be classified as "urbano-neutral" to moderately "urbano-philous". Correspondingly, 63% of all species are restricted to non-sealed areas and can be classified as (moderately) urbanophobe." (Authors)] Address: Willigalla, C., Willigalla - Ökologische Gutachten, Am großen Sand 22, D-55124 Mainz, Germany. E-mail: christoph@willigalla.de

9946. Worthen, W.B. (2010): Emergence-site selection by the dragonfly *Epitheca spinosa* (Hagen). *South-eastern Naturalist* 9(2): 251-258. (in English) ["Odonates are vulnerable during emergence, when they shed their exuvia to take flight as adults. Emergence-site selection should adapt to the local mortality risks. Here, I characterized emergence-site selection of *E. spinosa* by noting the substrate, height, and distance from water of exuviae in a 300 m × 5 m plot at Weston Lake, Congaree National Park, Hopkins, SC, USA. Of the 82 *E. spinosa* exuviae sampled, 52 (63.4%) were found on trees with corky bark (*Nyssa aquatica* [Water Tupelo], *Nyssa biflora* [Swamp Tupelo], *Fraxinus penn-*

sylvanica [Green Ash]), while no exuviae were found on the peeling, flaky trunks of *Taxodium distichum* (Bald Cypress) or the smooth, platy trunks of *Acer rubrum* (Red Maple). However, 26 (31.7%) exuviae were on *T. distichum* pneumatophores. This pattern was significantly different from the relative abundances of these substrate types ($\chi^2 = 19.8$, $df = 3$, $P < 0.001$). Most exuviae (93.9%) were on substrates touching the water, suggesting that larvae climb directly from the water to their emergence site. The mean height of exuviae on trees was 3.3 ± 1.37 m, with a range from 1.8–7.7 m. High-climbing by *E. spinosa* larvae may be an adaptation to flooding at Weston Lake; major flood events (>3 m) are common (5 of the last 10 years) during their March–April emergence period." (Author)] Address: Worthen, W.B., Biology Dept, Furman Univ., Greenville, SC 29613, USA. E-mail: wade.worthen@furman.edu

9947. Zawal, A.; Czachorowski, S. (2010): Dragonflies (Odonata) and caddisflies (Trichoptera) of water reservoirs in the suburban landscape of Swinoujscie (north-west Poland). *Natura Montenegrina, Podgorica* 9(3): 481-488. (in English) ["In 2007, ten dragonfly species and eight caddisflies species were recorded in periodical water reservoirs situated at the site where a liquefied natural gas terminal was going to be constructed. The encountered dragonfly and caddisfly fauna was typical of periodical reservoirs. Three communities of these insects were differentiated. Faunistic similarities among the reservoirs only partly corresponded to habitat diversity and reservoir types, which might indicate that species composition depends also on colonization processes, which are well described by the model of ecological islands." (Authors)] Address: Zawal, A., Department of Invertebrate Zoology S Limnology, University of Szczecin. 71-415 Szczecin. Wąska 13. Poland. E-mail: zawal@univ.szczecin.pl

9948. Zha, L.-S.; Jiang, Y.-H. (2010): *Epophthalmia bannaensis* spec. nov., a new dragonfly from Yunnan, China (Anisoptera: Corduliidae). *Odonatologica* 39(4): 363-366. (in English) ["The new species is described and illustrated. Holotype male: China, Yunnan: Xishuangbanna Tropical Botanical Garden (21.55°N, 101.13°E), 500m, 4-VIII-2004; deposited at the Institute of Zoology, Shaanxi Normal University, Xi'an, China. It is related to *Epophthalmia frontalis* Selys, but is easily separated based on structural differences of the secondary and caudal genitalia and slight differences in colouration." (Authors)] Address: Jiang, Y.-H., Yuntai-xiang Culture Station, Xinpu district, Lianyungang, Jiangsu-222064, China. E-mail: Jiangyh26@yahoo.com.cn

9949. Zhang, H.; Tong, X. (2010): Descriptions of the final instar larvae of three Chinese *Idionyx* species (Odonata: Anisoptera: Corduliidae). *Zootaxa* 2716: 53-63. (in English) ["The larvae of *Idionyx carinata* Fraser, 1926, *I. selysi* Fraser, 1926 and *I. victor* Hämäläinen, 1991 are described and illustrated for the first time based on final stage larvae reared in laboratory. *Idionyx selysi* is newly recorded from China. A generic diagnosis and biological information are provided." (Authors)] The paper also includes impressive figures of the imaginal stages of the species studied.] Address: Tong, X., Department of Entomology, College of Natural Resources and Environment, South China Agricultural University, Guangzhou, 510642, Guangdong Province, P. R. of China. E-mail xtong@scau.edu.cn

9950. Zhang, H.-m.; Tong, X.-l. (2010): Chlorogomphinae dragonflies of Guihou province (China) with first descriptions of Chlorogomphus tunti Needham and Watanabeopetalia usignata (Chao) larvae (Anisoptera: Cordulegastriidae). *Odonatologica* 39(4): 327-338. (in English) [Chlorogomphus papilio, C. nasutus, C. suzukii, C. tunti, and Watanabeopetalia usignata are recorded from Guihou province. Four of them are new for the region. C. tunti and W. usignata larvae are described based on the specimens reared in the laboratory. The adults are illustrated and some biological information is provided.] Address: Tong, X.-L., Dept of Entomology, College of Natural Resources and Environment, South China Agricultural University, Guangzhou-510642, China. E-mail: xtong@scau.edu.cn

9951. Zhang, H.-m.; Yeh, W.-c.; Tong, X.-i. (2010): Descriptions of two new species of the genus *Planaeschna* from China (Odonata: Anisoptera: Aeshnidae). *Zootaxa* 2674: 51-60. (in English) ["Two new species of *Planaeschna* McLachlan, *P. laoshanensis* sp. nov. from Shandong, China and *P. nankunshanensis* sp. nov. from Guangdong, China are described and illustrated and diagnosed from their congeners. Description of the final stadium larva of *Planaeschna nankunshanensis* is also provided." (Authors)] Address: Tong, X.-i., Department of Entomology, College of Natural Resources and Environment, South China Agricultural University, Guangzhou, 510642, Guangdong Province, P. R. of China. E-mail: xtong@scau.edu.cn

9952. Zoder, S. (2010): *Libellula fulva* MÜLLER, 1764 (Spitzenfleck) am Unteren Inn (Odonata, Anisoptera, Libellulidae). *Mitteilungen der zoologischen Gesellschaft Braunau* 10(1): 91-94. (in German) [Studies of ditches in the lower River Inn region (Landkreise Passau and Rottal-Inn, Bayern, Germany) prior 2008 didn't prove any records of *L. fulva*. First unpublished records from this region of this species dates from 2008. In 2009 and 2010 two additional small populations were found. This is assessed as range extension of *L. fulva*, which also is observed in others west- and central European regions. The paper also includes a record of the rare *Coenagrion ornatum*.] Address: Zoder, S., Am Ziegelstadelberg 17, D-94094 Rotthalmünster, Germany. E-mail: Sebastian.Zoder@gmail.com

2011

9953. Cannings, R.A.; Cannings, S.G. (2011): Chapter 10: Odonata (dragonflies and damselflies) of the montane Cordillera ecozone. In: *Assessment of Species Diversity in the Montane Cordillera Ecozone*. Edited by G.G.E. Scudder and I.M. Smith. Royal British Columbia Museum: 1-31 (in English). ["The Odonata are energetic aerial predators of other insects; the aquatic larvae are voracious predators of invertebrates and small vertebrates. Over 5500 species of the order are described worldwide; the Montane Cordillera Ecozone supports about 40% of the Canadian fauna. A checklist and systematic overview of the Suborders Zygoptera and Anisoptera, their 10 families and 81 species (19 of which are listed as potentially endangered, threatened, or vulnerable), and an analysis of their biogeographic elements are presented. Twenty-eight species of Boreal origin (35%) are recorded. Of these, 13 (16%) are Widespread Boreal, 9 (11%) are Southern Boreal, 4 (5%) are Northern Boreal, and 2 (3%) are Western Boreal. Transition species total 18 species (22%) and there are 12

(15%) Cordilleran species. Nine species (11%) are Western, 8 (9%) are Austral, and 6 (8%) are widespread species according to our definitions. Ecozone aquatic habitats and their typical species are divided into 12 categories: large lakes (wave-washed shores with little vegetation), small lakes and ponds (floating, but little emergent vegetation), alkaline ponds, ephemeral ponds, cattail/bulrush marshes (including margins of lakes and ponds), sedge marshes, small peatland ponds with aquatic moss, three types of fens, streams and springs. Stress on dragonfly populations is discussed under the headings of draining of wetlands, flooding of wetlands, fish introductions, lakeshore modifications, livestock disturbance, hot springs development, logging, and climate change. Recommendations for inventory and taxonomic research are noted." (Authors) Address: Cannings, R.A., Royal British Columbia Museum, 675 Belleville Street, Victoria, BC, V8W 9W2, Canada

9954. Chakravorty, J.; Ghosh, S.; Meyer-Rochow, V.B. (2011): Practices of entomophagy and entomotherapy by members of the Nyishi and Galo tribes, two ethnic groups of the state of Arunachal Pradesh (North-East India). *Journal of Ethnobiology and Ethnomedicine* 2011, 7:5 doi:10.1186/1746-4269-7-5: 35 pp. (in English) [We prepared a consolidated list of edible and therapeutic insects used in Arunachal Pradesh (N.E. India) by two tribal societies (i.e., the Nyishi of East Kameng and the Galo of West Siang). The list is based on thorough, semi-structured field-interviews with 20 informants of each tribal group. At least 81 species of local insects, belonging to 26 families and five orders of insects, namely Coleoptera (24 species), Orthoptera (17 species), Hemiptera (16 species), Hymenoptera (15 species) and Odonata (9 species), are being used as food among members of these two indigenous societies. However, Nyishi use overall more species of insects as food than Galo people do and consume mostly Coleoptera and Hemiptera; amongst the Galo, on the other hand, Odonata and Orthoptera dominate. The selection of the food insects amongst the Nyishi and Galo is dictated by traditional tribal beliefs as well as the taste and availability of the insects. Depending on the species, only particular or all developmental stages are consumed. Some food insects may be included in the local diet throughout the year, others only when seasonally available. Commonly specimens are being prepared for consumption by roasting, frying or boiling. Twelve species of insects are deemed therapeutically valuable by the locals and are being used by the tribes investigated to treat a variety of disorders in humans and domestic animals. Members of the Galo use a greater number of insect species for remedial purposes than the Nyishi. With the degradation of natural resources, rapid population growth, and increasing influence of 'westernization', the traditional wisdom of entomophagy and entomotherapy is at risk of being lost. There is thus an urgent need to record the role insects play as components of local diets and folk remedies and to assess insect biodiversity in the light of these uses." (Authors)] Address: Meyer-Rochow, V.B., School of Engineering and Science, Jacobs University, Research II (rm. 37) D-28759 Bremen, Germany. E-mails: b.meyer-rochow@jacobs-university.de

9955. Do Manh, C.; Bui Minh, H.; Nguyen Thi, H.; and Phan Quoc, T. (2011): Anisoptera of Cuc Phuong National Park, North Vietnam. *International Dragonfly Report* 33: 1-18 (in English) [During three field trips in

2006 and 2010 to Cuc Phuong National Park in northern Vietnam, a total of 19 anisopteran taxa was recorded. The most interesting records are documented here with field photographs of living specimens or collection material. Observations on their biology and behaviour are also noted." (Authors)] *Asiagomphus xanthenatus* *acco* Asahina, 1996 is given species rank. Address: Do Manh Cuong, Hom thu so 16, Buu Dien 10210, 35 Thai Thinh, Hanoi, Vietnam. E-mail: docuong@gmail.com

9956. Feld, C.K.; Tangelder, M.; Klomp, M.J.; Sharma, S. (2011): Comparison of river quality indices to detect the impact of organic pollution and water abstraction in Hindu Kush-Himalayan rivers of Nepal. *Journal of Wetlands Ecology* 4: 112-127. (in English) ["Several assessment methods exist for river quality classification in the Hindu Kush-Himalayan region. While rapid field bioassessment (RFB)1 applies on-site screening protocols, more sophisticated multi-habitat sampling (MHS) is employed to generate biotic scores using benthic macroinvertebrates as bioindicators. This study presents the comparison of River Quality Classifications (RQC) according to i) 40 RFB records based on two slightly different RFB protocols and ii) 20 qualitative benthic macroinvertebrate samples used to calculate two different scores (average scores per taxon; ASPT). Sensory attributes, such as odour, colour, foam and epilithic algal cover, were used in addition to biological samples for RFB. All samples were taken at two river basins in Nepal, the Punyamata river (12 stations, stressor: organic pollution) and the Khimti river (8 stations, stressor: damming and water abstraction). RQCs revealed organic pollution to impact benthic invertebrate communities in the Punyamata river, while the impact of water abstraction and damming was not detectable in the Khimti basin based on the methods compared. Furthermore, a pollution gradient was clearly detectable based on 66 macroinvertebrate families and genera found in our samples. Our results confirm the applicability of RFB protocols and scoring systems to assess the impact of organic pollution in Nepalese rivers. Further research, however, will be required to adjust the protocols and taxon scores to assess also the impact of other stressors present in the region." (Authors) Gomphidae is the only Odonata family included in the study. No species names are represented.] Address: Feld, C.K., University of Duisburg-Essen, Faculty of Biology and Geography, Applied Zoology/Hydrobiology, D-45117 Essen, Germany. E-mail: christian.feld@uni-due.de

9957. Fredricks, T.B.; Giesy, J.P.; Coefield, S.J.; Setton, R.M.; Haswell, M.M.; Tazelaar, D.L.; Bradley, P.W.; Moore, J.N.; Roark, S.A.; Zwiernik, M.J. (2011): Dietary exposure of three passerine species to PCDD/DFs from the Chippewa, Tittabawassee, and Saginaw River floodplains, Midland, Michigan, USA. *Environmental Monitoring and Assessment* 172(1-4): 91-112. (in English) ["Dietary exposure of house wrens (*Troglodytes aedon*), tree swallows (*Tachycineta bicolor*), and eastern bluebirds (*Sialia sialis*) to polychlorinated dibenzofurans (PCDFs) and polychlorinated dibenzo-p-dioxins (PCDDs) near Midland, Michigan (USA) was evaluated based on site-specific data, including concentrations of residues in bolus samples and individual invertebrate orders and dietary compositions by study species. Site-specific dietary compositions for the three species were similar to those reported in the literature, but differed in their relative proportions of some dietary items. Oligochaeta (non-depurated) and Brachycera (Diptera) con-

tained the greatest average concentrations of SPCDD/DFs of the major site-specific dietary items collected via food web-based sampling. Average ingestion values of SPCDD/DFs from site-specific bolus-based and food web-based dietary concentrations for nestlings at study areas (SAs) were 6- to 20-fold and 2- to 9-fold greater than at proximally located reference areas (RAs), respectively. Average ingestion values of total 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalents (TEQWHO?-?Avian) from site-specific bolus-based and food web-based dietary concentrations for nestlings at SAs were 31- to 121-fold and 9- to 64-fold greater than at proximally located RAs, respectively. Estimates of SPCDD/DFs and TEQWHO?-?Avian tissue concentrations based on nestling dietary exposures were greater than those measured. Plausible explanations include nestling metabolism of 2,3,7,8-tetrachlorodibenzofuran and assimilation rates of less than the 70% assumed to occur over the nestling growth period. Profiles of the relative concentrations of individual PCDD/DF congeners in samples of invertebrates and bolus at SAs on the Tittabawassee River downstream of the source of contamination were dominated by 1,2,3,4,6,7,8,9-octachlorodibenzo-p-dioxin (22% to 44%) and 2,3,7,8-tetrachlorodibenzofuran (18% to 50%)."] (Authors)] Address: T. B. Fredricks, T.B., Dept of Zoology, Michigan State Univ., East Lansing, MI 48824, USA. E-mail: fredri29@msu.edu

9958. Gäde, G.; Simek, P.; Fescemyer, H.W. (2011): Adipokinetic hormones provide inference for the phylogeny of Odonata. *Journal of Insect Physiology* 57(1): 174-178. (in English) ["Adipokinetic neuropeptides from the corpora cardiaca of 17 species of Odonata encompassing mainly the families Corduliidae and Libellulidae were isolated and structurally elucidated using liquid chromatography coupled with ion trap electrospray ionization mass spectrometry. It became evident that all species of the family Corduliidae studied express the peptide code-named Libau-AKH (pGlu-Val-Asn-Phe-Thr-Pro-Ser-Trp amide), which is also present in all but one libellulid species, *Erythemis simplicicollis* which expresses Erysi-AKH (pGlu-Leu-Asn-Phe-Thr-Pro-Ser-Trp amide). This divergence from all other Libellulids is due to a nonsynonymous missense single nucleotide polymorphism (SNP) in the nucleotide coding sequence (CDS) of prepro-AKH CDS and supports the polyphyletic nature of Sympetrinae and other subfamilies of libellulids. Despite this exception, these findings then support the hypothesis that Corduliidae and Libellulidae are closely related as stated in most phylogenies. The presence of Anaim-AKH (pGlu-Val-Asn-Phe-Ser-Pro-Ser-Trp amide) in Macromiidae likely distinguishes species in this family from Corduliidae. Current molecular genetic phylogenies and our AKH findings suggest that *Syncordulia gracilis*, which expresses Anaim-AKH, does not belong in Corduliidae. Evolution of AKHs in anisopteran Odonata are likely due to nucleotide substitution involving nonsynonymous missense SNPs in the CDS of prepro-AKH." (Authors)] Address: Gäde, G., Zoology Dept, Univ. of Cape Town, Rondebosch 7701, South Africa. E-mail: gerd.gade@uct.ac.za

9959. Gorb, S.N. (2011): Insect-Inspired Technologies: Insects as a Source for Biomimetics. Vileinskas, A. (Ed.): *Insect Biotechnology. Biologically-Inspired Systems*, 2011, Volume 2, Part 3: 241-264. (in English) ["The understanding of functional principles of insect materials, structures, sensors, actuators, locomotion,

control systems, and behaviour is of major scientific interest. On the other hand, this basic knowledge is also highly relevant for technical applications. One of the greatest challenges for today's engineering science is miniaturization. Insects have solved many problems correlated with extremely small size, during their evolution. Zoologists, entomologists, morphologists, and neurobiologists have collected a huge amount of information about the structure and function of such living micro-mechanical systems. This information can be utilized to mimic them for industrial applications. Insect solutions may be applied in the following main technology areas: (1) materials science and technology, (2) surface science, (3) science of adhesives, (4) optics, (5) photonics, (6) sensorics, and (7) robotics. A few selected examples are discussed in this chapter, but with over one million described species as a source for inspiration, one can expect many more ideas from entomological science for biomimetics." (Author) The paper includes references to Odonata.] Address: Gorb, S.N., Functional Morphology and Biomechanics, Zoological Institute, Christian-Albrecht University of Kiel, 24098 Kiel, Germany. E-mail: sgorb@zoologie.uni-kiel.de

9960. Honkavaara, J.; Dunn, D.W.; Ilvonen, S.; Suhonen, J. (2011): Sympatric shift in a male sexual ornament in the damselfly *Calopteryx splendens*. *Journal of Evolutionary Biology* 24(1): 139-145. (in English) ["Character displacement is a process by which interactions between two species that exhibit similar traits, results in geographical patterns of trait divergence in one or both species. These traits evolve to reduce costs of interspecific interactions in sympatry and thus differ from their condition in allopatry. In male damselflies *Calopteryx splendens*, large wing spots are sexually selected. However, in sympatric populations with *Calopteryx virgo*, wing spot size decreases as *C. virgo* abundance increases. The stability of this pattern is unclear, because previous studies have focused on sympatric populations with potentially fluctuating relative abundances. We studied the wing spot sizes of *C. splendens* in both sympatric and allopatric populations. Our data show that male *C. splendens*' wing spots are larger in allopatry than in sympatry with *C. virgo*. We suggest that both interspecific aggression and avoidance of interspecific reproductive interactions may result in this pattern, although their relative importance remains unclear." (Authors)] Address: Honkavaara, J., Department of Biology, Section of Ecology, University of Turku, 20014 Turku, Finland. E-mail: johhon@utu.fi

9961. Kuitunen, K.; Kotiaho, J.S.; Luojumäki, M.; Suhonen, J. (2011): Selection on size and secondary sexual characters of the damselfly *Calopteryx splendens* when sympatric with the congener *Calopteryx virgo*. *Canadian Journal of Zoology* 89(1): 1-9. (in English) ["Male mating success is often determined by body size or secondary sexual characters because of female mate choice or competition for females. In addition to intraspecific interactions, interspecific interactions may interfere with intraspecific selection. In this study, we investigated sexual selection on size and sexual characters of male banded demoiselle (*Calopteryx splendens* (Harris, 1780)) in wild populations sympatric with the beautiful demoiselle (*Calopteryx virgo* (L., 1758)). As secondary sexual characters, male *C. splendens* have pigmented wing spots whose size appears to be under positive selection. Male *C. virgo* resemble male *C. splendens* that have the largest wing spots, leading to

interspecific male-male aggression and possibly also to heterospecific matings via mistaken species recognition. If interspecific interactions interfere with intraspecific sexual selection on wing-spot size of *C. splendens*, their effects should increase with the increasing relative abundance of *C. virgo*. Our results did not show the expected positive selection on wing-spot size in *C. splendens*, suggesting that interspecific interactions might interfere with sexual selection. Also, we observed no relationship between the strength of interspecific sexual selection and the relative abundance of *C. virgo*. However, there was a positive intraspecific density-dependent sexual selection for larger size. Although the present results are tentative, we suggest that interspecific interactions should be considered along with intraspecific selection when studies of sexual selection are performed in the wild." (Authors)] Address: Suhonen, J., Department of Biological and Environmental Science, P.O. Box 35, FI-40014, University of Jyväskylä, Finland

9962. Mishra, A.S.; Nautiyal, P. (2011): Factors governing longitudinal variation in benthic macroinvertebrate fauna of a small Vindhyan river in Central Highlands ecoregion (central India). *Tropical Ecology* 52(1): 103-112, 2011: 103-112. (in English, with Portuguese and Spanish summary) ["Variation in the taxonomic composition of benthic macroinvertebrate fauna was examined in the Paisuni river at four stations (P1 to P4) located longitudinally along the river, with P1 being nearest the source of origin. The fauna was dominated by insects at all the stations. Total density increased from P1 to P3, decreased at P4 and differed significantly among the stations. Increase in the relative abundance from P1 to P4 was observed for Baetidae, Chironomidae and Gomphidae, and a decrease for Leptophlebiidae, Heptageniidae, Neophemeridae, Rhyacophilidae and Thiaridae. Ordination analysis indicated that Rhyacophilidae was the characteristic taxon at P1, Thiaridae at P2 and Chironomidae at stations P3 and P4. Ordination also revealed that current velocity, substratum and landuse were the major environmental factors influencing the relative composition of macroinvertebrates. The longitudinal variation in taxonomic composition and assemblages showed a change of trophic status due to direct human interference at P2. Collectors were abundant at all stations but predominated the assemblages from P3 to P4. The balance between collectors, scrapers and predators shifted to predominance by collectors indicating heterotrophic conditions at P3 and P4 in contrast to autotrophic conditions at P1 and P2. Hence, two ecological zones are evident in the Paisuni river." (Authors)] Address: Mishra, A.S., Aquatic Biodiversity Unit, Department of Zoology, H.N.B. Garhwal University, Srinagar Garhwal 246174, Uttarakhand, India. E-mail: shivama2000@yahoo.co.in

9963. Ott, J. (2011): Wie helfe ich einer Libelle? Lebensweise und Schutz der Libellen. www.bund.net: 16 pp. (in German) [This is a basic introduction to dragonflies and their habitat requirements within the framework of the activities of the BUND (Friends of the Earth) directed to dragonfly conservation in 2011.] Address: Bund für Umwelt und Naturschutz Deutschland e.V., Friends of the Earth Germany, Am Köllnischen Park 1, 10179 Berlin. Germany. E-Mail: info@bund.net. www.bund.net

9964. Outomuro, D.; Johansson, F. (2011): The effects of latitude, body size, and sexual selection on wing shape in a damselfly. *Biological Journal of the Linnean*

Society 102(2): 263-274. (in English) ["Under natural selection, wing shape is expected to evolve to optimize flight performance. However, other selective factors besides flight performance may influence wing shape. One such factor could be sexual selection in wing sexual ornaments, which may lead to alternative variations in wing shape that are not necessarily related to flight performance. In the present study, we investigated wing shape variations in a calopterygid damselfly along a latitudinal gradient using geometric morphometrics. Both sexes show wing pigmentation, which is a known signal trait at intra- and interspecific levels. Wing shape differed between sexes and, within the same sex, the shape of the hind wing differed from the front wing. Latitude and body size explained a high percentage of the variation in wing shape for female front and hind wings, and male front wings. In male hind wings, wing pigmentation explained a high amount of the variation in wing shape. On the other hand, the variation in shape explained by pigmentation was very low in females. We suggest that the conservative morphology of front wings is maintained by natural selection operating on flight performance, whereas the sex-specific differences in hind wings most likely could be explained by sexual selection. The observed sexual dimorphism in wing shape is likely a result of different sex-specific behaviours." (Authors)] Address: Outomuro, D., Depto de Biología de Organismos y Sistemas, E-33071 University of Oviedo, Spain. E-mail: outomuro.david@gmail.com

9965. Phan Quoc, T.; Do Manh, C.; Hämäläinen, M. (2011): Xuan Son National Park, a paradise for Caloptera damselflies in northern Vietnam. *International Dragonfly Fund Report 32*: 1-34 (in English) ["During three field trips in 2009-2010 to Xuan Son National Park in Phu Tho province in northern Vietnam, a total of 13 species of damselflies of the superfamily Calopterygoidea were recorded. These records are documented here with field photographs of living damselflies. Observations on their biology and behaviour are also noted. Three of the species are reported from Vietnam for the first time: *Rhinocypha arguta*, an undescribed *Matrona* species and *Vestalaria miao*. The last species was first found in Huu Lien Nature Reserve in Lang Son province in June 2008." (Authors)] Address: Phan Quoc, T.; Vietnam National Museum of Nature, 18 Hoang Quoc Viet, Cau Giay, Hanoi, Vietnam. E-mail: phanquoctoan-84@gmail.com

9966. Scheibler, E.E.; Ciocco, N.F. (2011): Distribution of macroinvertebrate assemblages along a saline wetland in harsh environmental conditions from Central-West Argentina. *Limnologica - Ecology and Management of Inland Waters* 41(1): 37-47. (in English) ["The goal was to examine how macroinvertebrate taxonomic richness and density respond to spatial-temporal changes and to the influence of water physicochemical characteristics along the Bañado Carilauquen (BC). Benthic samplings were conducted seasonally and environmental parameters were recorded in five reaches of the BC. Cluster analysis was applied to compare taxonomic richness among sites. Community structure and spatial-temporal variation were explored using logarithmic regression. CCA was applied to explore the relationship between species and environmental variables. A total of 36 taxa were identified, predominantly insects. A growing gradient of conductivity and hardness was registered between headwaters (HD; relatively soft waters) and outlet (OL; very hard and saline waters). Total

density of taxa showed significant differences among sampling sites and climate seasons. A decline in richness and density was observed from HD to OL. The spatial conductivity gradient is the major factor modulating macroinvertebrate distribution along this saline arid wetland. With the exception of the headwaters, hard, eutrophic, polysaprobic and contaminated waters such as those of the BC represent critical conditions for the development of macroinvertebrate assemblages." (Authors) Odonata taxa in the Bañado Carilauquen are: *Rhionaeshna absoluta* and *Ischnura fluviatilis*.] Address: Scheibler, Erica, IADIZA, CCT CONICET Mendoza, sede Cricyt. Avda. Ruiz Leal s/n. Parque General San Martín, CC 507, 5500 Mendoza, Argentina. E-mail: escheib@mendoza-conicet.gov.ar

9967. Simaika, J.P.; Samways, M.J. (2011): Comparative assessment of indices of freshwater habitat conditions using different invertebrate taxon sets. *Ecological Indicators* 11(2): 370-378. (in English) ["Monitoring changes in population levels of a wide range of species in biodiversity research and conservation requires practical, easy-to-use and efficient assessment and monitoring methods. Dragonflies (Insecta: Odonata) are a valuable tool for assessing aquatic systems and have been used as indicators of ecological health, ecological integrity, and environmental change, including climatic change, as well as indicators of habitat recovery. We field-tested a freshwater ecological integrity index, the Dragonfly Biotic Index (DBI), based on dragonfly assemblages at the local scale, and compared the DBI to a biodiversity index (average taxonomic distinctness, AvTD) as well as to a standard freshwater benthic macroinvertebrate-based freshwater health index (South African Scoring System, using Average Score Per Taxon, ASPT). We sampled 20 river sites, selected a priori. Adult dragonflies and benthic macroinvertebrates were collected using standardized methods. Environmental variables were collected in situ, and water samples taken. Temperature and pH were the most important physical environmental variables in explaining the assemblage structure, and we found significant abiotic-biotic relationships, as well as biotic-biotic relationships. Overall, dragonflies were more sensitive to changes in river condition than were macroinvertebrates, in part because they were responding at the species rather than higher taxonomic level. AvTD scores did not show any significant relationship with changes in river condition. Furthermore, sites with low biotic scores (indicating disturbance) had high AvTD values. In contrast, DBI site value and ASPT scores were highly significantly correlated. We conclude that dragonfly assemblages in the form of a DBI are an excellent tool for environmental assessment and monitoring freshwater biodiversity, with the potential to replace labour-intensive benthic macroinvertebrate-based freshwater quality assessments, such as SASS." (Authors)] Address: Samways, M.J., Dept Entomol. & Nematol., Univ. Stellenbosch, Private Bag X1, ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za

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