

Odonatological Abstract Service

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8211. Abilhoa, V.; Bornatowski, H.; Otto, G. (2009): Temporal and ontogenetic variations in feeding habits of *Hollandichthys multifasciatus* (Teleostei: Characidae) in coastal Atlantic rainforest streams, southern Brazil. *Neotropical Ichthyology* 7(3): 415-420. (in English, with Portuguese summary) [Stomach content of *H. multifasciatus* includes odonate larvae but is not further specified.] Address: Otto, G., Universidade Federal do Paraná (UFPR), Depto de Zoologia, CP 2936, 69083-000 Curitiba, PR, Brazil. E-mail: ottogis@gmail.com

8212. Adeyemi, S.O.; Adikwu, I.A.; Akombu, P.M.; Iyela, J.T. (2009): Survey of zooplanktons and macroinvertebrates of Gbedikere Lake, Bassa, Kogi State, Nigeria. *International Journal of Lakes and Rivers* 2(1): 37-44. (in English) [Between July and Sept., 2008, macroinvertebrates were represented by Coleoptera (2.44%), Diptera (48.85%), Ephemeroptera (2.59%), Hemiptera (9.59%), Odonata (29.07%), Trichoptera (0.91%), Plecoptera (0.30%), Arachnida (2.13%), Annelida (2.89%) and Nematoda (1.22%).] Address: Adeyemi, S.O., Dept of Biological Sciences, Benue State University, Makurdi, Nigeria. E-mail: sadeyemi2003@yahoo.com

8213. Akira, M. (2009): Growth of several fish and dragonfly species in the drainage system of a consolidated paddy field. *Japanese Journal of Conservation Ecology* 14(1): 3-11. (in Japanese, with English summary) ["This study examined the growth of aquatic animals in the canal system constituting the main, lateral, and farm drains in a consolidated paddy field, with emphasis on canal structure and year-round water flow in the canals. A field survey at six sites, which involved three different canal levels, was carried out in Chikusei, Ibaraki Prefecture, Japan (36°21'N, 139°59'E). Sampling was conducted at monthly intervals from April 2001 to March 2002. Of the freshwater fish, young-of-the-year (YOY) *Zacco platypus* appeared in September, while YOY *Misgurnus anguillicaudatus* appeared in May. Last instars of *Calopteryx atrata* were collected only in June, suggesting emergence about this time, while those of *Orthetrum albistylum speciosum* were collected in May and July, suggesting a longer duration of emergence. Since populations of the four species decreased during the non-irrigation season when the wa-

ter level was low, I propose that a marsh be developed as a wintering site in the lower reaches of the canal system in consolidated paddy fields." (Author)] Address: not available

8214. Al-Houty, W. (2009): Insect biodiversity in Kuwait. *International Journal of Biodiversity and Conservation* 1(8): 251-257. (in English) ["Natural causes, together with the deliberate destruction of the environment with the objective of forcing political, military and means of civilization have resulted in great deterioration of the environment. The insect fauna of Kuwait has suffered from such destructions, resulting in some becoming extinct, while others are threatened with extinction from Kuwait desert, however, others still flourishing. This contribution records the status of the entomofauna in Kuwait prior to the Gulf War (from 1980 - 1990), and after the Gulf War (from 1992 - 2008), including the effects of new modern dwellings and severe draught. During the first period 474 species of insects were recorded from Kuwait (356 genera, 109 families, 19 orders) but the numbers of species increased to 492 (273 genera, 116 families, 19 orders) during the second period. The differences are caused by disappearance and re-appearance. This study will discuss the reasons for increase, disappearance and reappearance of insects in the desert ecosystem of Kuwait." (Author) 11 odonate taxa - without specification - and each prior and after the war are listed.] Address: Al-Houty, W., Department of Biological Sciences, Faculty of Science, University of Kuwait. E-mail: wamia@kuc01.kuniv.edu

8215. Aliberti Lubertazzi, M.A.; Ginsberg, H.S. (2009): Persistence of dragonfly exuviae on vegetation and rock substrates. *Northeastern Naturalist* 16(1): 141-147. (in English) ["Surveys of dragonfly exuviae have been used to assess rare species' habitats, lake water quality status, and wetland restoration programs. Knowledge of the persistence of exuviae on various substrates is necessary to accurately interpret exuvial surveys. In 2006, we recorded exuvial persistence at defined areas in a variety of small freshwater wetlands in Rhode Island. Exuviae were field-identified, labeled with small daubs of nail polish, and observed every three weeks from June through September. Overall, exuvial persistence displayed exponential decline, disappearing rapidly during the first few weeks, and more slowly

thereafter. The initial rate of decline was similar for most species, but differed in some taxa. There was no significant difference in exuvial retention on emergent vegetation vs. rock substrate." (Authors)] Address: Lubertazzi, Maria, Dept of Plant Sciences/ Entomology, University of Rhode Island, Woodward Hall, Kingston, RI 02881, USA. E-mail: mariaaa@mail.uri.edu

8216. Altamiranda Saavedra, M. (2009): Actualización de registros del orden Odonata del Museo Entomológico Francisco Luís Gallego. Boletín del Museo Entomológico Francisco Luís Gallego 1(3): 6-18. (in Spanish) [Since 1945, 1,180 Odonata specimens were deposited in the collection of the Museo Entomológico Francisco Luís Gallego. In a table, taxonomic information, identifier, and locality data of this collection are compiled. All specimens are from Colombian localities.] Address: Altamiranda Saavedra, M., Biólogo, Estudiante de Maestría Ciencias – Entomología, Universidad Nacional de Colombia sede Medellín, Grupo de Investigación en Ecología y Sistemática de Insectos (GIESI), Museo Entomológico Francisco Luís Gallego MEFLG Apartado Aéreo 3840. Medellín, Colombia

8217. Alvarez, G.; Nicieza, A.G. (2009): Differential success of prey escaping predators: Tadpole vulnerability or predator selection? *Copeia* 2009(3): 453-457. (in English) ["Species inhabiting habitats with different predators are expected to show divergent phenotypes for antipredator traits. Here, we used a predator-prey system of dragonfly larvae and tadpoles to determine if vulnerability to a common predator differs in species with contrasting antipredator strategies. We examined the vulnerability of tadpoles of *Rana temporaria* and *Bufo bufo* to predation by *Aeshna* larvae when the two species co-occur in the same arena. Our results demonstrated that tadpoles of *Bufo* were more vulnerable than tadpoles of *Rana* despite the observation that dragonfly larvae did not show initial preferences for either prey species. Differences in susceptibility to predation seem to be associated with their low performance in evasive responses. Most important, our data suggest that despite chemical protection that effectively prevented the consumption of *B. bufo* by *Aeshna* larvae, injured tadpoles that otherwise had survived are at a high risk of being cannibalized. This loss of survival advantage of a chemical defense is an indirect result of two antipredator responses: the effectiveness of the chemical defense itself and the immobility of refused tadpoles." (Authors)] Address: Álvarez, G, Depto de Biología de Organismos y Sistemas, Unidad de Ecología, Univ. de Oviedo, E-33006 Oviedo, Spain. E-mail: dalvarez@innova.uniovi.es.

8218. Andrew, R.J. (2009): Fine structure of the egg chorion in two anisopteran dragonflies from central India (Libellulidae). *Odonatologica* 38(4): 359-363. (in English) ["The fine structure of the egg chorion in *Brachydiplax sibirica* and *Orthetrum s. sabina*, is described using the scanning electron microscope. The unwetted eggs of *B. sibirica* are bluish-green and spindle-shaped while those of *O. s. sabina* are oval and light brown in colour. The egg chorion is distinctly divided into an outer exochorion and an inner tough endochorion. The exochorion expands into a thick, sticky, jelly-like structure in water during oviposition, whereas the endochorion remains unchanged. The endochorion is thin and smooth in *O. s. sabina*, but in *B. sibirica* the undersurface of the endochorion is pitted and rough. The apical

micropylar apparatus is composed of a sperm storage chamber (atrium) and a median projecting stalk, which possesses a pair of sub-terminal orifices. The atrium in *B. sibirica* is dome shaped with a tiny stalk whereas in *O. s. sabina* the micropylar apparatus is triangular with a longer stalk and a pair of almost apically placed orifices. Significant variations occur in the shape and size of the micropylar apparatus. The functional interrelationship of the micro morphological modifications in the chorionic structures is discussed." (Author)] Address: Andrew, R.J., Post-Graduate Department of Zoology, Hislop College, Nagpur 440 001, India. E-mail: rajuan-drew@yahoo.com

8219. Anonymous (2009): Of damsels and dragons. *The Nature of Scotland* 4 (Summer 2009): 17-19. (in English) [General account on Scottish Odonata.] Address: <http://www.snh.org.uk/pdfs/SNHMagazine/Contents-Summer-2009/Damselsdragons.pdf>

8220. Ardila-Garcia, A.M.; Gregory, T.R. (2009): An exploration of genome size diversity in dragonflies and damselflies (Insecta: Odonata). *Journal of Zoology* 278: 163-173. (in English) ["Like most insect orders, the Odonata remain poorly studied from the perspective of genome size. They exhibit several characteristics that make them desirable targets for analysis in this area, for example a large range in body size, differences in developmental rate, and distinct modes of flight – all of which are related to genome size in at least some animal taxa. The present study provides new genome size estimates and morphometric data for 100 species of odonates, covering about 1/5 of described North American diversity. Significant relationships are reported between genome size and body size (positive in dragonflies, negative in damselflies), and there is also indication that developmental rate and flight are related to genome size in these insects. Genome size is also positively correlated with chromosome number across the order. These findings contribute to an improved understanding of genome size evolution in insects, and raise several interesting questions for future research." (Authors)] Address: Gregory, T.R., Department of Integrative Biology, University of Guelph, Guelph, Ontario N1G 2W1 Canada. Email: rgregory@uoguelph.ca

8221. Argyroudi, A.; Chatzinikolaou, Y.; Poirazidis, K.; Lazaridou, M. (2009): Do intermittent and ephemeral Mediterranean rivers belong to the same river type?. *Aquatic ecology* 43(2): 465-476. (in English) ["The benthic macroinvertebrate communities and ecological quality of eleven temporary rivers (seven intermittent and four ephemeral) in Dadia National Park, north-eastern Greece, were examined with respect to the degree of flow temporality. Sampling took place during the high flow season at both ephemeral and intermittent sites and during the low flow season only at the intermittent ones, which receded to pools. Despite the remarkable seasonal variation in both the hydrology and ecology of the intermittent rivers, the various metrics and indices as well as the multivariate analyses confirmed the clear distinction between the two river types (ephemeral and intermittent). Existing European quality indices do not sufficiently differentiate between ephemeral and intermittent river types, and thus cannot reliably discriminate the degree of natural variability from human induced stressors in temporary rivers." (Authors) Cluster A was composed of the low flow intermittent sites and characterized mostly by the Diptera family of Chironomidae

and the Odonata Platycnemydidae (40.62% and 21.99% contribution, respectively.)] Address: Argyroudi, A., School of Biology, Department of Zoology, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece. E-mail: anna.argyrou@gmail.com

8222. Asokan, S.; Samsoor Ali, A.M.; Manikannan, R. (2009): Diet of three insectivorous birds in Nagapattinam District, Tamil Nadu, India – a preliminary study. *Journal of Threatened Taxa* 1(6): 327-330. (in English) ["The dietary composition of the White-breasted Kingfisher *Halcyon smyrnensis*, the Small Bee-eater *Merops orientalis* and the Black Drongo *Dicrurus macrocercus* was studied between 2005 and 2006 in Nagapattinam District, Tamil Nadu, India by analyzing regurgitated pellets. The analysis revealed that the White-breasted Kingfisher preys mainly on arthropods (83.40%) and less on vertebrates; seven orders of insects were identified, with Coleoptera, Hemiptera, Hymenoptera and Orthoptera predominant. The small bee-eater diet is composed of Coleoptera (22.3%), Hymenoptera (20.8%), Hemiptera (14.1%), Orthoptera (12.6%), Odonata (10.7%), Lepidoptera (10.4%) and Diptera (8.6%). Beetles were also found to be the most frequent prey (23.7%) in the diet of black drongos, followed by Hemiptera (21.6%), Orthoptera (19.3%), Hymenoptera (14.4%), Lepidoptera (7.5%), Diptera (6.8%) and Odonata (6.0%)."] (Authors)] Address: Asokan, S., Ph.D. Research Scholar, Department of Zoology & Division of Wildlife Biology, A.V.C. College (Autonomous), Mannampandal, Mayiladuthurai, Tamil Nadu 609305, India. E-mail: beeeasokan@yahoo.co.in

8223. Ayten, Y.; Özgökçe, M.S. (2009): Odonata species, their distribution and habitats in Van province. *Yyü. Tar. Býl. Derg. (Yyü J. Agr. Sci.):* 1-9. (in Turkish, with English summary) [The Odonata of Van Province, Turkey were investigated in 2003 and 2004. A total of 11 species including new provincial records (*Calopteryx splendens intermedia*, *Lestes barbarus*, *Aeshna affinis*, *Anax imperator* *Orthetrum anceps*, *Sympetrum meridionale*) were recorded.] Address: Özgökçe, M.S., Yüzüncü Yıl Üniversitesi, Ziraat Fakültesi, Bitki Koruma Bölümü, VAN, Turkey. e-mail: msozgekce@yyu.edu.tr

8224. Ballengée, B.; Sessions, S.K. (2009): Explanation for missing limbs in deformed amphibians. *Journal of Experimental Zoology Part B: Molecular and Developmental Evolution* 312(7): 770-779. (in English) ["We present evidence that the most commonly found deformities in wild-caught amphibians, those featuring missing limbs and missing limb segments, may be the result of selective predation. Here we report that predatory dragonfly nymphs can severely injure and even fully amputate developing hind limbs of anuran tadpoles. Developmental responses of the injured/amputated tadpole limbs range from complete regeneration to no regeneration, with intermediate conditions represented by various idiosyncratic limb deformities, depending mainly on the developmental stage of the tadpole at the time of injury/amputation. These findings were reinforced by experimental amputations of anuran tadpole hind limbs that resulted in similar deformities. Our studies suggest that selective predation by dragonfly nymphs and other aquatic predators may play a significant role in the most common kinds of limb deformities found in natural populations of amphibians." (Authors)] Address: Sessions, S.K., Department of Biology, Hartwick College, Oneonta, New York, USA. E-mail: sessions@hartwick.edu

8225. Beckemeyer, R.J. (2009): First record of the dragonfly *Miathyria marcella* (Selys) for Kansas (Odonata: Anisoptera: Libellulidae). *Transactions of the Kansas Academy of Science* 112: 130-132. (in English) [USA, Sedgwick County, Kansas, Wichita State University Ninescah Field Station, 26-IX-2008, single specimen of a mature male *M. marcella*. "This occurrence is approximately 200 miles beyond the previously recorded range, a distance that does not seem likely to be due to an individual wandering about while feeding. Dragonflies are often displaced long distances by weather systems. Such a system was in place from 8 to 15 September, 2008, in the form of Hurricane Ike." (Author)] Address: Beckemeyer, R.J., 957 Perry Ave., Wichita, KS 67203-3141, USA. E-mail: royb@southwind.net

8226. Beckemeyer, R.J. (2009): Kinematics of a territorial defense maneuver by the dragonfly *Pachydiplax longipennis* (Odonata: Anisoptera: Libellulidae). *Transactions of the Kansas Academy of Science* 112(3/4): 169-180. (in English) ["A high speed (1000 frame/s) video segment, 0.367 seconds long, showing a territorial male *P. longipennis* dragonfly responding in the field to a challenge from a conspecific male, reveals that the defender used a high rate yaw-turn to position itself to drive off the challenger. In-phase flapping of the fore and hind wings was used during the yaw turn and in the following pursuit of the challenger. During the right yawing turn, the dragonfly flapped its right wings to a more negative stroke amplitude than its left wings on the first two downstrokes (1st downstroke: -65° right wing, -45° left wing; 2nd downstroke: -90° right wing, -50° left wing). Upstroke amplitudes were the same for both wings throughout the yaw turn. The 135° yaw turn was executed, in three wing beats (0.085 s) and in about 6/10ths of a body length of horizontal travel, at an average yaw rate of 1590%, and a peak turn rate of 3000%. This rapid yawing rotation was accompanied by a significant deceleration in flight path speed, which dropped from 30 to 7 body lengths per second (1.1 m/s to 0.3 m/s) as the dragonfly yawed through 90° in the first half of the yaw turn. The wingbeat frequency dropped from 41.7 Hz at the beginning of the yaw turn to 33.3 Hz at the end. The horizontal and vertical flight velocity components both reached zero near the completion of the yaw turn, during the upstroke portion of the third wing beat. Within 1/10th of a second after completing the yaw turn, the defender had reached speeds of 8 body lengths per second (0.3 m/s) upward and 14 body lengths per second (0.55 m/s) horizontally, and was accelerating along its flight path at approximately 150 body lengths per second² (5.5 m/s²) in its pursuit of the challenger." (Author)] Address: Beckemeyer, R.J., Research Associate, Division of Entomology, Natural History Museum, 1501 Crestline Drive — Suite 140, University of Kansas, Lawrence, Kansas 66049-2811, USA. E-mail: roybeckemeyer@ku.edu

8227. Bedjanic, M. (2009): *Drepanosticta starmuehlneri* St. Quentin, 1972 from Sri Lanka, a synonym of *D. lankanensis* (Fraser, 1931) (Zygoptera: Platystictidae). *Notulae odonatologicae* 7(4): 38-39. (in English) ["The badly damaged holotype of *D. starmuehlneri* in the Vienna Natural History Museum is compared with Fraser's original description and illustrations and with the type-checked specimens of *D. lankanensis*, and it is concluded the former is a junior synonym of the latter." (Author)] Address: Bedjanic, M., Kolodvorska 21b, SI-2310

Slovenska Bistrica, Slovenia. E-mail: matjazbedjanic@yahoo.com

8228. Berezina, N.A.; Zhakova, L.V.; Zaporozhets, N.V.; Panov, V.E. (2009): Key role of the amphipod *Gmelinoides fasciatus* in reed beds of Lake Ladoga. *Boreal Env. Res.* 14: 404-414. (in English) [Russia, "The Baikalian *G. fasciatus*, a successful invader in Eurasia, colonized the coastal zone of Lake Ladoga (northeastern Europe) in late 1990s. In the summers of 2000 and 2005 the density and biomass of benthic communities (including Odonata) associated with macrophyte beds (*Phragmites australis*) and role of the invader in fish diet were studied." (Authors)] Address: Berezina, N.A., Zoological Institute of Russian Academy of Sciences, St-Petersburg 199034, Russia. E-mail: nber@zin.ru

8229. Bergmann, T.; Hadrys, H.; Breves, G.; Schierwater, B. (2009): Character-based DNA barcoding: a superior tool for species classification. *Berliner und Münchener Tierärztliche Wochenschrift* 122(11/12): 446-450. (in English, with German summary) ["In zoonosis research only correct assigned host-agent-vector associations can lead to success. If most biological species on Earth, from agent to host and from prokaryotes to vertebrates, are still undetected, the development of a reliable and universal diversity detection tool becomes a *conditio sine qua non*. In this context, in breathtaking speed, modern molecular-genetic techniques have become acknowledged tools for the classification of life forms at all taxonomic levels. While previous DNA-barcoding techniques were criticised for several reasons (Moritz and Cicero, 2004; Rubinoff et al. (2006a, b; Rubinoff, 2006; Rubinoff and Haines, 2006) a new approach, the so called CAOS-barcoding (Character Attribute Organisation System), avoids most of the weak points. Traditional DNA-barcoding approaches are based on distances, i.e. they use genetic distances and tree construction algorithms for the classification of species or lineages. The definition of limit values is enforced and prohibits a discrete or clear assignment. In comparison, the new character-based barcoding (CAOS-barcoding; DeSalle et al. 2005; DeSalle, 2006; Rach et al. 2008) works with discrete single characters and character combinations which permits a clear, unambiguous classification. In Hannover (Germany) we are optimising this system and developing a semiautomatic high-throughput procedure for hosts, agents and vectors being studied within the Zoonosis Centre of The „Stiftung Tierärztliche Hochschule Hannover“. Our primary research is concentrated on insects, the most successful and species-rich animal group on Earth (every fourth animal is a bug). One subgroup, the winged insects (Pterygota), represents the outstanding majority of all zoonosis relevant animal vectors." (Authors) The method is exemplified using *Crocothemis erythraea*, *Orthetrum chrysostigma* and *Anax imperator*.] Address: Bergmann, T., Institut für Tierökologie und Zellbiologie, Stiftung Tierärztliche Hochschule Hannover, Bünteweg 17d, 30559 Hannover, Germany. E-mail: tjard.bergmann@ecolevol.de

8230. Bhattarai, G.P.; Horner, J.D. (2009): The importance of pitcher size in prey capture in the carnivorous plant, *Sarracenia alata* Wood (Sarraceniaceae). *The American Midland Naturalist* 161(2): 264-272. (in English) ["Prey capture in pitcher plants has been found to be significantly dependent on pitcher size, but the ac-

tual importance of size is not clearly understood. We studied insect capture by the carnivorous plant *Sarracenia alata* and compared the rate of insect capture per unit capture area of plants with that of nonbiological models and traps. The total mass of insects captured was significantly positively related to capture area for both biological and nonbiological systems. However, the rate of insect capture was significantly greater for plants than for models and traps, which suggests a role of attractants in insect capture in pitcher plants. Odor from decaying insects was found to have a significant effect on insect capture on experimental attraction cups. Further study should focus on the nature of other attractants including nectar, UV reflectance and volatiles to determine their role in insect capture by pitcher plants. [...] Even though dragonflies are commonly observed perching on pitcher hoods, we have never observed one captured in hundreds of pitchers examined." (Authors)] Address: Horner, J.D., Department of Biology, Box 298930, Texas Christian University, Fort Worth, Texas 76129, USA. E-mail: J.Horner@tcu.edu

8231. Bjurström, L. (2009): Impacts of the non-native crayfish (*Pacifastacus leniusculus*) on littoral benthic invertebrate communities in Lake Päijänne. Master of Science Thesis, Department of Biological and Environmental Science, International Aquatic Masters Programme, University of Jyväskylä: 28 pp. + attachments. (in English, with Finnish summary) ["The introduced crayfish *P. leniusculus* is now a permanent resident in many of the large lakes in Finland, but the effects of this large omnivore on lake ecosystems are largely unknown. In general, it is thought that when crayfish abundance increases, species composition of benthic invertebrates may change towards species less vulnerable to predation by crayfish and the snail abundance is expected to decrease. However, indirect impacts of crayfish on benthic communities can also be expected. The impacts of *P. leniusculus* on littoral benthic invertebrate communities in large Lake Päijänne were therefore studied by comparing the benthic invertebrate assemblages of stony shores in lake areas with well established crayfish populations to those in areas without crayfish. The invertebrate community composition differed between the areas, and there was a clear reduction in species richness and abundance and of snail abundance in particular in the presence of signal crayfish. The crayfish sites were dominated by Chironomidae and Oligochaeta and small number of other invertebrate groups (including Odonata, Coenagrionidae, Corduliidae). The non-crayfish sites were dominated evenly by Chironomidae and Oligochaeta, Elmidae, Amphipods, Gastropoda and Trichoptera. [...] The invertebrate density was on average 44 % lower at areas with crayfish than without crayfish. [...] Significant negative relationships at the family level included [...] Coenagrionidae." (Author)] Address: Bjurström, Lotta; not stated

8232. Bonino, M.F.; Lescano, J.N.; Haro, J.G.; Leynaud, G.C. (2009): Diet of *Hydromedusa tectifera* (Tentaculata-Chelidae) in a mountain stream of Córdoba province, Argentina. *Amphibia-Reptilia* 30(4): 545-554. (in English) ["The diet of *H. tectifera* occurring in two mountain streams in the province of Córdoba is described through a comparative analysis of 154 individuals. Turtles were manually captured between August 2005 and August 2006 from streams at the localities of Tanti and Flor Serrana. Before being released, turtles were stomach-flushed, and sex and carapace length

were recorded. The stomach contents were observed under stereomicroscope; prey items were identified and classified according to size and volume. The importance of the different items was quantified using the Index of Relative Importance (IRI). Similarity in the diet between sexes and among size classes and seasons of an annual cycle was evaluated using the simplified Morisita index. Trophic breadth was estimated with the Shannon diversity index. Detrended Correspondence Analysis (DCA) was used to evaluate differences in the diet between categories (sex, size classes). Forty-seven food items belonging to the following taxa were identified: leeches, annelids, gastropods, arachnids, insects, and fishes. According to the IRI value, the most important items in the diet of *H. tectifera* were larvae of Trichoptera (IRI = 33.5), fishes (IRI = 30), and naiads of Odonata (IRI = 25.2). The relative importance of the items varied with size of turtles but not with sex. Size of prey consumed increased with increasing turtle size. A greater trophic breadth was observed in smaller individuals." (Authors)] Address: Leynaud, G.C., Centro de Zoología Aplicada. Facultad de Ciencias Exactas, Físicas y Naturales (Universidad Nacional de Córdoba), Rondeau 798, Casilla de Correo 122, Córdoba (5000), Argentina. Email: gleynaud@efn.uncor.edu

8233. Bowers, J. (2009): The Dragonflies of Lesbos. Promoline SA for the Friends of Green Lesbos, Mytilene, Lesbos. ISBN 978-960-930703-1: 92 pp. (in English) [The book starts with a brief discussion of dragonfly biology and ecology. Dragonfly habitats are listed with typical species. 42 species found on the island are briefly described and illustrated with a photograph. Neuroptera that may be confused with dragonflies are also illustrated. There is a gazeteer of the main dragonfly sites. The book finishes with a discussion of problems of dragonfly conservation. For more details on the Odonata of Lesbos, Greece, see: Lopau, W. (1995): Die Libellenfauna der Insel Lesbos. Libellen, Lurche, Kriechtiere. Naturkundliche Reiseberichte, Gnarrnburg 3. 81 pp] Address: Bowers, J., 6 Ashwood Terrace, Leeds, West Yorkshire, L56 2EH, UK

8234. Brauner, O. (2009): Erstnachweis von *Ceragrion tenellum* in Brandenburg (Odonata: Coenagrionidae). *Libellula* 28(1/2): 25-29. (In German, with English summary) ["In 2008 *C. tenellum* was recorded for the first time in Brandenburg, northeastern Germany. The circumstances of the record - a single male only - and the water body are briefly described. The species, which has chiefly an Atlantic and western Mediterranean distribution, benefited from the milder winters during recent years and was observed increasingly at the eastern fringe of its area. The distances to the closest known localities in Saxony-Anhalt and Mecklenburg-West Pomerania were 50 to 85 km. Hence, other hitherto undiscovered occurrences can be expected." (Author)] Address: Brauner, O., R.-Breitscheidstr. 62, D-16225 Eberswalde, Germany. E-mail: oliver.brauner@gmail.com

8235. Brauner, O.; Reichling, A.; Möller, J. (2009): Die Libellenfauna im östlichen Teil des Naturparks Barnim sowie in der nördlich angrenzenden Umgebung von Eberswalde. *Märkische entomologische Nachrichten* 11 (1): 69-90, 4 pl.. (in German, with English summary) [In the period from 1999 to 2008, 175 sites were examined. In total, 59 of the 68 dragonfly species known for Brandenburg, Germany were discovered. Of these, 54

species were proved on the territory of the Nature Reserve Barnim, 46 in the city of Eberswalde and 54 in the southern part of the Biosphere Reserve Schorfheide-Chorin. 25 odonate species are discussed in detail.] Address: Brauner, O., R.-Breitscheidstr. 62, 16225 Eberswalde, Germany. E-mail: oliver.brauner@gmail.com

8236. Brockhaus, T. (2009): Erste kommentierte Checkliste der Libellen des Himalayagebirges (Insecta: Odonata). In: Hartmann, M. & J. Weipert: Biodiversität und Naturlausstattung im Himalaya III. - Verein der Freunde und Förderer des Naturkundemuseums Erfurt e.V., Erfurt: 87-106, Tafel III. (in German, with English summary) [239 species are included into the checklist of the Himalaya's Odonata. A brief discussion is given about typical mountain species, possible endemic species and the zoogeographical composition of the Himalayan odonate fauna.] Address: Brockhaus, T., An der Morgensonne 5, D-09387 Jahnsdorf, Germany. E-mail: T.Brockhaus@t-online.de

8237. Brockhaus, T.; Rychla, A. (2009): Vorläufige kommentierte Checkliste der Libellen des Muskauer Faltenbogens (Insecta: Odonata). *Berichte der Naturforschenden Gesellschaft der Oberlausitz* 17: 77-82. (in German, with English summary) ["The "Muskauer Faltenbogen" is a potential UNESCO area named "Geopark". In this region many water bodies with natural and anthropogenic origin are found. A preliminary checklist of 49 dragonfly species with comments to remarkable discoveries is given. Further research is needed to demonstrate the biodiversity of this area exemplified by the dragonflies." (Authors)] Address: Brockhaus, T., An der Morgensonne 5, D-09387 Jahnsdorf, Germany. E-mail: T.Brockhaus@t-online.de

8238. Brockhaus, T.; Hartmann, A. (2009): New records of *Epiophlebia laidlawi* Tillyard, 1921 in Bhutan with notes on its biology, ecology, distribution, zoogeography and threat status (Anisozygoptera: Epiophlebiidae). *Odonatologica* 38(3): 203-215. (in English) ["*E. laidlawi* larvae were found for the first time in Bhutan, collected in 5 streams in W and central parts of the country, at altitudes 2350-2885 m a.s.l. The habitats and larval development stages are described, and a brief overview is presented on the biology, ecology and known distribution in Bhutan, India and Nepal. The species inhabits fast running mountain streams in Himalayan broadleaf and subtropical pine forests at an altitude of 1300-2885 m a.s.l. The palaeobiogeographical history of the fossil Epiophlebiidae and Stenophlebiidae and of the 2 extant Epiophlebia species is discussed. *E. laidlawi* is a relict species, living in headwaters of pristine mountain forests. It is endangered because human influences, such as deforestation, provision of water power, erosion and other factors. The best protection would be ensured by the conservation of specific habitats in vast protected areas. This has at least partly been put into action in Nepal." (Authors)] Address: Brockhaus, T., An der Morgensonne 5, D-09387 Jahnsdorf, Germany. E-mail: T.Brockhaus@t-online.de

8239. Brooks, A.C.; Gaskell, P.N.; Maltby, L.L. (2009): Sublethal effects and predator-prey interactions: Implications for ecological risk assessment. *Environmental toxicology and chemistry* 28(11): 2449-2457. (in English) ["Ecological risk assessments tend to focus on contaminant effects on single species in isolation. However, additional effects from interactions between spe-

cies (e.g. predator-prey interactions) may also occur in natural systems. This study investigated the consequences of sublethal contaminant effects in prey on predator-prey interactions, particularly the interaction between prey behavioural changes and predation by predators with different hunting strategies. Ambush (*Ischnura elegans*) and active (*Notonecta glauca* (Heteroptera)) predator species were used in conjunction with three prey species (*Asellus aquaticus* (Crustacea, Isopoda), *Cloëon dipterum* (Ephemeroptera), and *Chironomus riparius* (Diptera)). Immobilised prey demonstrated the importance of prey behaviour for determining predation rates for both single and multiple prey species. *C. riparius* was less responsive following exposure to cadmium, becoming more vulnerable to attack by the active but not the ambush predator. There was also some evidence for reduced general activity in *C. dipterum* following cadmium exposure. Sublethal exposure of prey did not affect the prey choice of active predators, possibly due to prey behavioural changes being insufficient to influence their relative availabilities. However, cadmium exposure of prey did alter their susceptibility to ambush predators. There was a reduction in the proportion of *C. dipterum* and an increased proportion of *A. aquaticus* in the diet of ambush predators, possibly due to reduced activity in *C. dipterum* affecting their relative encounter rates with predators. Sublethal exposures can therefore result in reduced prey survival that would not be predicted by single species toxicity tests." (Authors)] Address: Maltby, L.L., Dept Animal & Plant Sciences, Univ. of Sheffield, Western Bank, Sheffield S10 2TN, UK. E-mail: l.maltby@sheffield.ac.uk

8240. Brotóns Padilla, M.; Ocharan, F.J.; Outomuro, D.; Torralba Burrial, A. (2009): "Anaciaeschna isoceles" (Müller, 1767) en el ámbito iberobaleár (Odonata: Aeshni). Boletín de la Sociedad Entomológica Aragonesa 44: 365-374. (in Spanish, with English summary) ["Six Iberian-baleáric localities and biological data on *A. isoceles* are presented, including the first records for Álava, Alacete and Toledo provinces, and the second one for Ciudad Real. A bibliographic review of the scarce Iberian-Baleáric data has been done. The distribution pattern is fairly concordant with bioclimatic factors, being *A. isoceles* a thermal, low-altitude species at the study area. Phenology data indicate a continuous flight season from late March to early August, peaking in early summer, with late records in mid-October. European and North African data on species' phenology and biology are compared with the Iberian ones. The conservation status for the study area is revised using IUCN regional criteria, assigning a Data Deficient (DD) category. Finally, several priority actions to clarify its biology and conservation status are suggested." (Authors)] Address: Torralba Burrial, A., Depto de Biología de Organismos y Sistemas, Universidad de Oviedo, E-33071 Oviedo, Spain. E-mail: antoniob@hotmail.com

8241. Buczyński, P. (2009): Babki, palatiki i dzieweczki, czyli o wazkach – ozdobie przyrody Warmii i Mazur. Natura 3(14): 6-11. (in Polish) [General account on Odonata in a Polish journal dedicated to nature observation and conservation.] Address: Buczyński, P., Dept of Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pawbucz@gmail.com

8242. Buczyński, P.; Jędryczak, P. (2009): On the occurrence of *Orthetrum brunneum* (FONSCOLOMBE,

1837) (Odonata: Libellulidae) in the Polish part of the South Baltic Sea Coast Region. Wiad. entomol. 28(3): 141-147. (in Polish, with English summary) [*O. brunneum* was recorded in northern Poland (54°29'.54'48" N, 18°15'.18'33" E). This is a range extension over 1.5 degree of latitude towards the north compared with localities of species known so far. The distribution of *O. brunneum* in northern parts of Central Europe is also analyzed.] Address: Buczyński, P., Dept of Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pawbucz@gmail.com

8243. Byun, D.-y.; Hong, J.; Saputra; Koa, J.H.; Young, J.L.; Park, H.C.; Byun, B.-K.; Lukes, J.R. (2009): Wetting characteristics of insect wing surfaces. Journal of Bionic Engineering 6(1): 63-70. (in English) ["Biological tiny structures have been observed on many kinds of surfaces such as lotus leaves, which have an effect on the colouration of *Morpho* butterflies and enhance the hydrophobicity of natural surfaces. We investigated the micro-scale and nano-scale structures on the wing surfaces of insects and found that the hierarchical multiple roughness structures help in enhancing the hydrophobicity. After examining 10 orders and 24 species of flying Pterygotan insects, we found that micro-scale and nano-scale structures typically exist on both the upper and lower wing surfaces of flying insects. The tiny structures such as denticle or setae on the insect wings enhance the hydrophobicity, thereby enabling the wings to be cleaned more easily. And the hydrophobic insect wings undergo a transition from Cassie to Wenzel states at pitch/size ratio of about 20. In order to examine the wetting characteristics on a rough surface, a biomimetic surface with micro-scale pillars is fabricated on a silicon wafer, which exhibits the same behaviours as the insect wing, with the Cassie-Wenzel transition occurring consistently around a pitch/width value of 20.2." (Authors) *Pantala flavescens* and *Orthetrum albistylum speciosum* have been studied.] Address: Byun, D., Department of Aerospace Information Engineering, Artificial Muscle Research Center, Konkuk University, Seoul 143-701, Republic of Korea. E-mail: dybyun@konkuk.ac.kr

8244. Cano Villegas, F.J. (2009): Desarrollo larvario de "*Onychogomphus costae*" Sélys, 1885 en el sur de la Península Ibérica y aclaración sobre su confusión con "*Ophiogomphus cecilia*" (Fourcroy, 1785) (Odonata: Gomphidae). Boletín de la Sociedad Entomológica Aragonesa 44: 327-332. (in Spanish, with English summary) ["A preliminary study of the larval development and phenology of *O. costae* in Andalusia is presented. In the studied area, this species exhibits a semivoltine life cycle. Previous records of *O. cecilia* from the studied area are considered to be misidentifications of *O. costae* larvae. These mistakes may be due to faults in the taxonomic keys. Finally, a new taxonomic key is proposed which makes it possible to separate *O. cecilia* larvae from those of *O. costae* as well as from the rest of the Iberian species of the same genus. This key is valid even for larval instars lower than the last one." (Author)] Address: Cano Villegas, F.J., C/Montemayor, 4 1°-2; 14003-Córdoba, Spain. E-mail: fcanovi2@hotmail.com

8245. Cano Villegas, F.J.; Conesa García, M.A. (2009): Expansión de *Trithemis kirbyi* Sélys, 1891 (Odonata: Libellulidae) en la provincia de Málaga (sur de la Península Ibérica). Boletín de la Sociedad Ento-

mológica Aragonesa 44: 569-572. (in Spanish, with English summary) ["Eight new Iberian localities are recorded for the Afro-tropical anisopteran *T. kirbyi*, with an update of its current distribution in Málaga province (Spain). Its reproduction in Europe is confirmed for the first time, and biometric information is given on the collected specimens." (Authors)] Address: Cano Villegas, F.J., C/Montemayor, 4 1º-2; 14003-Córdoba, Spain. E-mail: fjcanovi2@hotmail.com

8246. Cano-Villegas, F.J.; Conesa-Garcia, M.A. (2009): Confirmation of the presence of *Lestes macrostigma* (Eversmann, 1836) (Odonata: Lestidae) in the "Laguna de Fuente de Piedra" Natural Reserve (Málaga, South Spain). *Boln. Asoc. esp. Ent.* 33(1-2): 91-99. (in English, with Spanish summary) ["We introduce new data about 14 species of dragonflies in the Nature Reserve "Laguna de Fuente de Piedra". We especially highlight the persistence of *L. macrostigma* in that area, after fourteen years with no trace of them in Andalusia. Populations of this species are clearly regressive along its European distribution." (Authors)] Address: Cano Villegas, F.J., C/Montemayor, 4 1º-2; 14003-Córdoba, Spain. E-mail: fjcanovi2@hotmail.com

8247. Carroll, T.M. (2009): Resource pulses and spatial subsidies in Ozark Karst Springs: Effects on community structure and food webs. Ph.D. Dissertation. University of Kansas: 162 pp. (in English) [Steury and Danforth Springs (37°21' N, 93°21' W; 37°24' N, 93°15' W) east of Springfield in the James River basin, Missouri, USA. "Spatial and temporal patterns of invertebrate community composition, biomass, functional diversity, foodweb dynamics, and foodweb complexity were examined in three Ozarks springs. Also examined was the effect of an experimental manipulation of algal production (function of light limitation) on foodweb pathways and complexity. Food source-consumer interactions were determined using carbon and nitrogen stable isotope and stoichiometric analyses. Biocomplexity and functional diversity increased temporally and spatially along the spring source-springbrook gradient likely due to variability in the composition and availability of food sources. Foodweb analyses indicated that the trophic base of the foodweb was autochthonous, shifting temporally towards a greater reliance on allochthonous resources. Spatial and temporal shifts in food availability and utilization were associated with corresponding increases in foodweb complexity. Isotope ratios, based on manipulation of algal production, indicated a shift toward more allochthonous-based pathways and increases in omnivory and foodweb complexity in manipulated (shaded) sections of the spring." (Author) The publication includes many notes on *Argia sedula*, represented in Danforth and Steury (coniferous and deciduous canopies, respectively). Young larvae of *A. sedula* feed on protozoans that colonize fine allochthonous detrital matter, and were prominent in springbrooks with heavy riparian growth of coniferous and deciduous trees.] Address: Carroll, Teresa Mae, <http://kuscholarworks.ku.edu/dspace/handle/1808/5571>

8248. Carron, G. (2009): *Coenagrion mercuriale* (Charpentier, 1840) et *Leucorrhinia albifrons* (Burmeister, 1839) (Odonata) dans la région genevoise. *Entomo Helvetica* 2: 71-81. (in French, with English and German summaries) ["A restricted but quite large population of *C. mercuriale* was rediscovered in 2006, after 46 years of absence, in a small river located in the can-

tons of Geneva and Vaud, Switzerland. No other population of this species is known in the Geneva basin. A confirmed reproduction site of a small population of *L. albifrons* was found in 2006 in Cartigny. This is also the single population of this species in the Geneva region, and the third one in Switzerland." (Author)] Address: Bureau Gilles Carron, Bioindication Gestion Monitoring, case postale 90, 2002 Neuchâtel, Switzerland. E-mail: carron.bureau@vtx.ch

8249. Carron, G. (2009): Les coléoptères aquatiques des marais du lac de Pfäffikon (canton de Zürich), avec première mention pour la Suisse de *Hydroporus scalexianus* Stephens, 1828 et recommandations pour la conservation. *Entomo Helvetica* 2: 239-253. (in French, with English and German summaries) [61 species of water beetles have been recorded in two transitional mires adjacent to Lake Pfäffikon. The paper includes a passing reference on Odonata] Address: Bureau Gilles Carron, Bioindication Gestion Monitoring, case postale 90, 2002 Neuchâtel, Switzerland. E-mail: carron.bureau@vtx.ch

8250. Carron, G. (2009): Une illustration de la ponte de *Cordulegaster boltonii* (Donovan, 1807) (Odonata, Cordulegasteridae. *Entomo Helvetica* 2: 200. (in French) [Photograph of an oviposition of *C. boltonii*, 13-VII-2005, Veyron, near Montricher VD, Switzerland.] Address: Bureau Gilles Carron, Bioindication Gestion Monitoring, case postale 90, 2002 Neuchâtel, Switzerland. E-mail: carron.bureau@vtx.ch

8251. Chakona, A.; Phiri, C.; Chinamaringa, T.; Muller, N. (2009): Changes in biota along a dry-land river in northwestern Zimbabwe: declines and improvements in river health related to land use. *Aquatic Ecology* 43(4): 1095-1106. (in English) ["Macroinvertebrates (including Odonata) were sampled from 15 sites along a dry-land river in northwestern Zimbabwe to assess biotic responses to land use changes along the course of the river. The headwater sites were protected by a riparian corridor of native forest, but this was replaced by intensive subsistence agriculture in the mid-reaches while the lower reaches were located within a protected wildlife area with diverse and wide riparian forests. Canonical correspondence analysis indicated that intensive agricultural activities within the mid-reaches caused severe degradation of the stream physical habitat through increased fine sediment deposition. This coincided with a significant decline in macroinvertebrate richness, diversity, and abundance at the agriculturally impacted mid-reach sites. The presence of wide riparian zones at the lower river sites resulted in significant improvements in stream physical habitat quality, and this was paralleled by significant recovery or reappearance of taxa that had disappeared from the mid-reaches. We suggest that restoration of the riparian vegetation within the mid-reaches of the Nyadza River would lead to improved physical habitat and biotic health of this dry-land river." (Authors)] Address: Chakona, A., University of Zimbabwe Lake Kariba Research Station, PO Box 48, Kariba, Zimbabwe. E-mail: achakona@yahoo.com

8252. Chaplin, G.I.; Valentine, J.F. (2009): Macroinvertebrate production in the submerged aquatic vegetation of the Mobile-Tensaw Delta: Effects of an exotic species at the base of an estuarine food web. *Estuaries and Coasts* 32(2): 319-332. (in English) ["This study, conducted in 1997, reports the first estimates of the im-

pacts of the proliferation of an exotic submerged aquatic vegetation (SAV) species (*Myriophyllum spicatum*) on macroinvertebrate production via comparisons with two co-occurring native SAV species (*Heteranthera dubia* and *Vallisneria spiralis*) in the tide-influenced Mobile-Tensaw Delta (located in the north-central Gulf of Mexico, 30°40' N, 87°55' W). Production of macroinvertebrates was greatest on *M. spicatum* and *H. dubia* and least on *V. spiralis*. The key determinant of these differences was a greater abundance of amphipods (*Gammarus mucronatus*) found on the leaves of *M. spicatum* and *H. dubia*. Macroinvertebrate production on *M. spicatum* was three times greater (>1 kg m⁻² year⁻¹) than on either of the native SAV species. No-choice palatability tests showed that these differences could not be attributed to differences in invertebrate grazing on these plants. Instead, it is probable that the high production within the structurally complex *M. spicatum* and *H. dubia* was the result of reduced predator foraging efficiency. If true, then the presence of this exotic species probably renders this elevated production inaccessible to most high-order predators." (Authors) Odonata are treated at the suborder level.] Address: Valentine, J.F., Department of Marine Science, University of South Alabama, Mobile, AL 36688, USA. Email: jvalentine@disl.org

8253. Chase, J.M.; Suhlman, R.S. (2009): Wetland isolation facilitates larval mosquito density through the reduction of predators. *Ecological Entomology* 34: 741-747. (in English) ["1. Wetlands harbour high biodiversity and offer important ecosystem services, but they are also a habitat for mosquito larvae (Diptera: Culicidae), which are important disease vectors. 2. Isolation among remnant, or newly created wetlands and ponds, and their consequent density in the landscape, is a key factor that can influence a variety of food web processes, including effects on mosquitoes which are important prey to many predators. 3. We assess the impact of habitat isolation on the density of pond-breeding mosquitoes (several *Anopheles* and *Culex* species) both directly and indirectly through the food web. 4. Results from structural equation modelling of survey data shows that larval mosquitoes are denser in ponds that are more isolated from one another, and that this result was primarily driven indirectly by a reduction of larval mosquito predators (e.g. predaceous insects and amphibians). Furthermore, results from a long-term mesocosm experiment factorially manipulating isolation and predator reduction show that the effect of isolation on mosquito density was eliminated when predators were experimentally reduced. 5. It is concluded that metacommunity processes, both directly and indirectly mediated through predators, can play an important role in the local abundance of wetland breeding mosquitoes and possibly the diseases they spread." (Authors) Mosquito predators are primarily insects in the orders Hemiptera, Odonata, and Coleoptera, as well as salamanders and newts. Their biomass was converted to dry-weight biomass using species-specific conversions.] Address: Chase, J.M., Dept of Biology and Tyson Research Center, Washington University in St. Louis, Saint Louis, MO 63130, USA. E-mail: jchase@wustl.edu

8254. Chase, J.M.; Biro, E.G.; Ryberg, W.A.; Smith, K.G. (2009): Predators temper the relative importance of stochastic processes in the assembly of prey metacommunities. *Ecology Letters* 12(11): 1210-1218. (in English) [St Louis, Missouri, USA. "Communities as-

semble through a combination of stochastic processes, which can make environmentally similar communities divergent (high β -diversity), and deterministic processes, which can make environmentally similar communities convergent (low β -diversity). Top predators can influence both stochasticity (e.g. colonization and extinction events) and determinism (e.g. size of the realized species pool), in community assembly, and thus their net effect is unknown. We investigated how predatory fish influenced the scaling of prey diversity in ponds at local and regional spatial scales. While fish reduced both local and regional richness, their effects were markedly more intense at the regional scale. Underlying this result was that the presence of fish made localities within metacommunities more similar in their community composition (lower β -diversity), suggesting that fish enhance the deterministic, relative to the stochastic, components of community assembly. Thus, the presence of predators can alter fundamental mechanisms of community assembly and the scaling of diversity within metacommunities." (Authors) The following taxa are listed in the supporting material to the paper: *Aeshna canadensis*, *Epiaeschna heros*, *Tetragoneuria synosura*, *Erythemis simplicicollis*, *Libellula cyanea*, *L. incesta*, *L. pulchella*, *Pachydiplax longipennis*, *Pantala hymenaea*, *Perithemis tenera*, *Plathemis lydia*, *Sympetrum rubicundum*, *S. corruptum*, *Tramea lacerata*, *Archilestes grandis*, *Lestes disjunctus*, *Ischnura* sp., *Enallagma* sp. 1, *Enallagma* sp. 2, and *Argia* sp.] Address: Chase, J.M., Department of Biology and Tyson Research Center, Washington University in St. Louis, 1 Brookings Drive, St Louis, MO 63130, USA. E-mail: jchase@wustl.edu

8255. Chelmick, D. (2009): Species Review 2: The Orange-spotted Emerald Dragonfly *Oxygastra curtisii* (Dale 1834). *J. Br. Dragonfly Society* 25(2): 76-93. (in English) ["This review deals with *O. curtisii*, [...] which is locally common in the Iberian peninsula and France south of the 48° parallel. It is endemic to the western Palearctic. In northern Europe it is very local and was last recorded in the UK in 1963. It is the only southern endemic riparian dragonfly to have occurred in the UK and probably became extinct here by a combination of habitat degradation and the extreme winter of 1962/63." (Author) The paper discusses the chances to rediscover the species in UK] Address: Chelmick, D.G., 31 High Beech Lane, Haywards Heath, West Sussex, RH16 1SQ, UK. E-mail: dgc@david.chelmick.com

8256. Chelmick, D.G.; Moore, N.W. (2009): The Scarce Emerald Damselfly *Lestes dryas* Kirby in East Sussex 1940 to 2007: an account of species extinction through changing agricultural practice. *J. Br. Dragonfly Society* 25(1): 27-40. (in English) ["*L. dryas* is a very local damselfly which, in England, is found only in a few localities in the extreme east, mainly in coastal areas. In the 1940's NWM discovered this species in East Sussex and carried out a detailed survey. DGC has visited the historical NWM sites and recorded the fauna now present. This paper covers a period of 67 years and compares the historical and modern habitat and faunal information. The paper first outlines the life history and distribution of *L. dryas* and, from these perspectives, considers how changes in agricultural practice have led to the extinction of *L. dryas* in East Sussex." (Authors)] Address: Chelmick, D.G., 31 High Beech Lane, Haywards Heath, West Sussex, RH16 1SQ, UK. E-mail: dgc@david.chelmick.com

8257. Chen, T.-H.; Lue, K.-Y. (2009): Changes in the population structure and diet of the Chinese Stripe-Necked Turtle (*Mauremys sinensis*) inhabiting a disturbed river in northern Taiwan. *Zoological Studies* 48(1): 95-105. (in English) ["*Mauremys (Ocadia) sinensis* was investigated in the Keelung River, northern Taiwan, following severe habitat disturbances. "During a 2-yr levee construction and channel dredging project, the physical characteristics and riparian vegetation of the river were dramatically altered. Compared with results obtained prior to the disturbance, sex ratios were significantly skewed toward males, and the proportion of larger females significantly decreased both during and after project construction. Moreover, fewer small-sized juveniles were found following the construction disturbance. The diet of *M. sinensis* also changed, with plant materials assuming greater importance than they had prior to the disturbance. Furthermore, the mean volume of food ingested decreased both during and after the project. This tendency was more pronounced in females than males. Dietary overlap indices between the sexes during (0.591) and after (0.922) the project suggest that intraspecific food competition increased throughout the duration of the study." (Authors) Odonata contribute less than 0.1% to diet of the turtle.] Address: Chen, Tien-Hsi, Department of Life Science, National Taiwan Normal University, Taipei 116, Taiwan. E-mail: cuora.flavo@msa.hinet.net

8258. Chin, K.S.; Taylor, P.D. (2009): Interactive effects of distance and matrix on the movements of a peatland dragonfly. *Ecography* 32(5): 715-722. (in English) ["We conducted a mark-release-recapture survey of *Leucorrhinia hudsonica* in each of two years (2002; 2003) in a harvested forest landscape in western Newfoundland, Canada. The odds of an individual male moving between peatlands was influenced by both the distance between peatlands and the type of intervening habitat (the matrix). Specifically, at meso scales (>700 m) there was a positive effect of the amount of cut matrix between peatlands on the odds of moving, but at fine scales (<700 m) there was the opposite effect; proportionally fewer individuals moved between peatlands. The odds of moving out of a peatland decreased as the surface area of water in the peatland increased. Multi-state mark-recapture models showed that the daily probability of a male moving between any two peatlands was 1.9% in 2002 and 6.9% in 2003 (n=1527 and 1280 marked individuals). The results suggest that additional empirical studies that directly measure patterns of movement with respect to landscape structure at multiple spatial scales in other taxa and situations are needed in order to uncover other possible non-linear changes in behaviour." (Authors)] Address: Chin, Krista, Dept of Biology, Acadia Univ., 24 Univ. Ave., Wolfville, NS B4P 2R6, Canada. E-mail: 057448c@acadiau.ca

8259. Clancy, S.P. (2009): Reports from Costal Stations - 2008: Dungeness area, Kent. *Atropos* 36: 47. (in English) [UK; *Anax parthenope*, *Sympetrum fonscolombii*, *Erythromma viridulum*] Address: not stated

8260. Colding, J.; Lundberg, J.; Lundberg, S.; Andersson, E. (2009): Golf courses and wetland fauna. *Ecological Applications* 19(6): 1481-1491. (in English) ["Golf courses are often considered to be chemical-intensive ecosystems with negative impacts on fauna. Here we provide evidence that golf courses can contribute to the support and conservation of wetland fauna,

i.e., amphibians and macroinvertebrates. Comparisons of amphibian occurrence, diversity of macroinvertebrates, and occurrence of species of conservation concern were made between permanent freshwater ponds surveyed on golf courses around Sweden's capital city, Stockholm, and off-course ponds in natureprotected areas and residential parklands. A total of 71 macroinvertebrate species were recorded in the field study, with no significant difference between golf course ponds and offcourse ponds at the species, genus, or family levels. A within-group similarities test showed that golf course ponds have a more homogenous species composition than ponds in natureprotected areas and ponds in residential parkland. Within the macroinvertebrate group, a total of 11 species of odonates were identified, with no difference detected between the categories of ponds, nor any spatial autocorrelation. [...] Among macroinvertebrates of conservation status, *Leucorrhinia pectoralis* was only detected in golf course ponds, and *Tricholeiochiton fagesi* (Trichoptera) was only found in one off-course pond. GIS results revealed that golf courses provide over a quarter of all available permanent, freshwater ponds in central greater Stockholm. We assert that golf courses have the potential to contribute to wetland fauna support, particularly in urban settings where they may significantly contribute to wetland creation. We propose a greater involvement of ecologists in the design of golf courses to further bolster this potential." (Authors)] Address: Colding, J., The Beijer Institute of Ecological Economics, Royal Swedish Academy of Sciences, Box 50005, 104 05 Stockholm, Sweden. E-mail: Johanc@beijer.kva.se

8261. Collier, K.J.; Hamer, M.; Chadderton, W.L. (2009): A new substrate for sampling deep river macroinvertebrates. *New Zealand Natural Sciences* 34: 49-61. (in English) ["We compared macroinvertebrate communities colonising multiplate samplers constructed from perspex or tempered hardboard (wood) with an alternative artificial substrate constructed from folded coconut fibre matting (coir) enclosed in nylon netting. Substrates were incubated for 62 days over January to March 2007 at six sites over 240 km along the Waikato River. The three substrates supported similar numbers of invertebrate taxa (27 - 29 taxa), but coir samples contained 71% of total invertebrate numbers from all substrates combined, compared with <17% for each type of multiplate sampler. Coir faunas were heavily dominated by the hydrobiid snail *Potamopyrgus* (84 % of numbers), and this taxon along with the amphipod *Paracalliope* comprised 58 - 66 % of invertebrates on both types of multiplate samplers. Analysis of a Bray-Curtis matrix suggested statistically significant differences in percent community composition between coir samplers and each type of multiplate sampler over the late summer study period. Densities per cm³ of Oligochaeta, Mollusca, and "other worms" (Platyhelminthes, Rhabdocoela, Nemertea and Hirudinea combined) were significantly higher in coir samples than one or both of the multiplate samplers. Results suggest coir samplers may provide a useful supplement to multiplate samplers for deep river invertebrate studies by collecting a different range of taxa, including those favouring cover and characteristic of depositional environments." (Authors) One specimen of *Hemicordulia* sp. was found in coir; *Xanthocnemis* sp. was represented in all substrates without significant differences.] Address: Collier, K.J., Environment Waikato, PO Box 4010, Hamilton, New Zealand. E-mail: kevin.collier@ew.govt.nz

8262. Coram, R.A.; Nel, A. (2009): A new petalurid dragonfly from the Lower Cretaceous of southern England (Odonata: Petalurida: ?Cretapetaluridae). *Palaeodiversity* 2: 205-208. (in English, with German summary) ["The new petalurid genus and species *Anglopetalura magnifica* n. gen., n. sp. is described from the Lower Cretaceous of southern England, and tentatively attributed to the Mesozoic family Cretapetaluridae, already known by two genera from the Lower Cretaceous Crato Formation of Brazil." (Authors).] Address: Nel, A., Lab. Ent.. Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: anel@cimrs1.mnhn.fr

8263. Cordoba-Aguilar, A. (2009): A female evolutionary response when survival is at risk: male harassment mediates early reallocation of resources to increase egg number and size. *Behavioral Ecology and Sociobiology* 63(5): 751-763. (in English) ["One unexplored area in sexual conflict studies is the female physiological costs and possible resource reallocation that accompany evolutionary costs due to male harassment. Using females of the damselfly *Hetaerina americana*, I first investigated whether male harassment affected female mating rate and survival and explored whether such effects induced a resource allocation from immunity (in the form of phenoloxidase activity) and muscular fat reserves to egg number and size. Using two seasons that differed in male harassment, it was found that the higher the male harassment, the fewer are the female matings and the lower is the female survival. These results were corroborated using an experimental approach in which a situation of high male harassment was induced. It was also found that when the first mating takes place and at high male harassment, females had more reduced phenoloxidase activity and fat reserves and tended to lay most of the eggs they produce in their lifetime and these were considerably large. However, at low male harassment, egg number and size were more equally produced across matings. Females under high male harassment seemed to suffer the survival costs but may show a plastic evolutionary response of reallocating resources to egg traits to maximize fitness." (Author)] 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

8264. Córdoba-Aguilar, A.; Raihani, G.; Serrano-Meneses, M.A.; Contreras-Garduño, J. (2009): The lek mating system of *Hetaerina* damselflies (Insecta: Calopterygidae). *Behaviour* 146(2): 189-207. (in English) ["We investigated whether territorial males of *Hetaerina* damselflies show lekking behaviour using experimental techniques and observations: (i) we altered potential vegetation substrates to determine whether this affected the number of female visitations and matings; (ii) by removing territorial males and allowing other males to occupy the territory, we determined whether females changed their visitation and mating number; (iii) we observed whether vegetation substrates were present and used, and whether lighting conditions affected male territorial behaviour; (iv) we documented female pre- and post-copulatory behaviour to examine whether female choice occurred; and (v) we investigated whether male traits were linked to mating success. Our results revealed that (1) vegetation substrates were rarely found in territories and even when vegetation was present, it did not affect female visitation and mating number; (2)

males constantly moved to more illuminated places and females had little opportunity to exert choice due to harassment from males; (3) females oviposited outside territories; and (4) males with larger wing pigmentation and body size obtained a larger mating number because they were more likely to acquire a territory and/or displace other males while in tandem. This is the first documented evidence that odonate males display a lek mating system." (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

8265. Cordoba-Aguilar, A.; Serrano-Meneses, A.; Cordero-Rivera, A. (2009): Copulation duration in nonterritorial Odonate species lasts longer than in territorial species. *Ann. Entomol. Soc. Am.* 102(4): 694-701. (in English) ["We tested whether long copulation duration is more likely to have evolved in nonterritorial odonate species than in territorial species, given that nonterritorial males do not incur the costs of territory defense. A phylogenetic comparative method that controls for the phylogenetic nonindependence of species was used to compare copulation duration among 46 species of the two main odonate suborders (Anisoptera and Zygoptera). Copulation duration of nonterritorial anisopteran species was longer than for territorial dragonflies; however, this relationship was not found for Zygoptera. Long copulations in Anisoptera may be related to a male's ability to manipulate a female's stored sperm. It is suggested that constraints that prevent a territorial male from lengthening copulation do not seem to operate in Zygoptera. Other selective processes (i.e., cryptic female choice and/or sexual conflict) may also be important determinants of copulation duration in the Zygoptera. To our knowledge, this is the first exploration of the relation copulation duration and mating systems in insects.] 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

8266. Cordoba-Aguilar, A. (2009): Seasonal variation in genital and body size, sperm displacement ability, female mating rate, and male harassment in two calopterygid damselflies (Odonata: Calopterygidae). *Biological Journal of the Linnean Society* 96(4): 815-829. (in English) ["Sperm competition is a pervasive force. One adaptation is the male ability to displace the rivals' sperm that females have stored from previous copulations. In the damselfly, *Calopteryx haemorrhoidalis* asturica, males with wider aedeagi displace more spermathecal sperm. The present study documents that the same mechanism operates in another damselfly, *Hetaerina americana*. However, this genital width in both species decreases along the season, but late-emerging females have more sperm displaced than early-emerging females. Because territorial males mated more and were larger in body and genital size than nonterritorial males, late-season females mated with considerably larger males with respect to female size and this produced higher sperm displacement. Assuming female benefits from storing sperm but that such benefit does not prevail if males displace sperm, it is predicted that, along the season, females will mate less and male harassment (in terms of male mating attempts and oviposition duration) will increase. These predictions were cor-

roborated. In *H. americana*, it was also tested whether spermathecal sperm became less viable along the season. The results obtained did not corroborate this. This is the first evidence indicating that season affects sperm displacement ability and female mating frequency due to changes in male body and genital size." (Author)] 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

8267. Córdova, S.; Gaete, H.; Aránguiz, F.; Figueroa, R. (2009): Evaluación de la calidad de las aguas del estero Limache (Chile central), mediante bioindicadores y bioensayos. *Lat. Am. J. Aquat. Res.* 37(2): 199-209. (in Spanish, with English summary) ["The water quality in the Limache stream was evaluated at five sampling stations during the period of low water flow. At each station, aquatic macroinvertebrates were collected and the following parameters were measured in situ: pH, conductivity, dissolved oxygen, and total dissolved solids. The biological oxygen demand, total phosphorus, and total nitrogen were determined in the laboratory. Water toxicity was determined through toxicity bioassays with the microalga *Pseudokirchneriella subcapitata*. Thirty-three macroinvertebrate families were found and the dominant taxa were Dugessidae, Oligochaeta and Chironomidae. A significant correlation was found among the Family Biotic Index ChFBI, conductivity, and total dissolved solids ($r = 0.92$; $p < 0.05$). Species diversity was lowest, as was the growth rate of *P. subcapitata*, at the stations with the greatest anthropogenic activity and in the discharge zone of a domestic wastewater treatment plant." (Authors) The taxa list includes indetermined specimens of Gomphidae and Coenagrionidae.] Address: Gaete, H., Departamento de Biología y Ciencias Ambientales, Facultad de Ciencias, Universidad de Valparaíso, Av. Gran Bretaña 1111, Playa Ancha, Valparaíso, Chile. E-mail: hernan.gaete@uv.cl

8268. Cortezzi, S.S.; Bispo, P.; Paciencia, G.; Leite, R.C. (2009): Influência da ação antrópica sobre a fauna de macroinvertebrados aquáticos em riachos de uma região de cerrado do sudoeste do Estado de São Paulo. *Iheringia, Sér. Zool.* 99(1): 36-43. (in Portuguese, with English summary) [Macroinvertebrate colonisation of standardized pebble packages at nine stations in the headwaters of the Ribeirão Água do Cervo (the main water supplier of the city of Assis, Brazil). After twenty-five days of exposure, the packages were removed from the stream. The macroinvertebrates associated to each of the pebble packages were identified. Biodiversity was lowest at the most impacted station. No significant trade-off between the physicochemical factors and the fauna were detected. It is concluded that anthropogenic impacts can be identified by the fauna. Taxa including Odonata are treated using the morphospecies concept.] Address: Cortezzi, Sara, Laboratório de Biologia Aquática, Departamento de Ciências Biológicas, Faculdade de Ciências e Letras de Assis, Universidade Estadual, Paulista. Av. Dom Antônio, 2100, Parque Universitário, 19806-900 Assis, SP, Brasil. E-mail: saracortezzi@yahoo.com.br

8269. Costa, J.M.; Santos, T.C. (2009): Description of the larva of *Orthemis schmidti* (Odonata, Libellulidae). *Iheringia, Sér. Zool.* 99(2): 129-131. (in English, with Portuguese summary) ["The larva of *O. schmidti* is described and illustrated for the first time based on one

specimen from the northeastern region Brazil. Diagnostic characters which separate this larva from known larvae of other congeners are mentioned, and some notes on the habitat of the species are presented." (Authors)] Address: Costa, J.M., Depto de Entomologia, Museu Nacional, Universidade Federal do Rio de Janeiro, Quinta da Boa Vista, São Cristóvão, BR-20942-040 Rio de Janeiro, Brazil. E-mail: jcosta@globocom

8270. Crick, K. (2009): Variations in key features of the final instar larvae and exuviae of the Azure Damsel-fly *Coenagrion puella* (Linnaeus). *J. Br. Dragonfly Society* 25(1): 16-26. (in English) ["A number of key features used for species identification of zygopteran final instar larvae and exuviae, published in the United Kingdom can be shown to have levels of variability exceeding the published limits. This paper seeks to record those variations as they apply to *Coenagrion puella*, based on the population contained within the Blackwater Valley catchment area located on the Hampshire/Berkshire border; outlining in detail specific variations found through close examination of 387 individuals. The features addressed include the species-specific characteristics of the caudal lamellae, the prementum and the post ocular region of the head; also some that are not found in current published keys, such as the setae on the labial palps and the lateral carinae on the second abdominal segment. The need to address a combination of key factors and to be aware of the areas of morphology where significant variations occur within species cannot be over emphasised." (Author) In fig. 5, the prementum of *C. puella* and *Ceriagrion tenellum* are transposed.] Address: Crick, K., 29 Village Way, Yateley, Hants, GU46 7SE, UK

8271. Czachorowski, S.; Czachorowski, P. (2009): New localities of *Nehalennia speciosa* (Charpentier, 1840) in the vicinity of Dobre Miasto (north-eastern Poland). *Odonatrix* 5(2): 45-47. (in Polish, with English summary) ["*N. speciosa* is one of the most endangered dragonfly species in Europe. In July 2008, two new localities were recorded. Adults were observed in shore vegetation of two water bodies near Dobre Miasto (north of Olsztyn, Masurian Lakeland), in the area planned to be included in the Natura 2000 network. Together with *N. speciosa* occurred: *Leucorrhinia albifrons*, *Aeshna grandis*, *Cordulia aenea*, *Erythromma najas*, *Coenagrion puella*, *Ischnura elegans*, *Lestes virens*, *Enallagma cyathigerum*." (Authors)] Address: Czachorowski, S., Katedra Ekologii i Ochrony Środowiska, Uniwersytet Warmińsko-Mazurski w Olsztynie, Pl. Łódzki 3, 10-727 Olsztyn, Poland. E-mail: stanislaw.czachorowski@uwm.edu.pl

8272. Daraż, B. (2009): Dragonflies (Odonata) of the Przemysl Foothills and adjacent areas along the San River. *Wiad. entomol.* 28(1): 5-32. (in Polish, with English summary) ["Studies were carried out at 36 localities in Pogórze Przemyskie (the Przemysl Foothills) and adjacent areas along the San River (SE Poland) in the years 2004-2007. 54 species of dragonflies (74% of the Polish dragonfly fauna) were recorded, among them: a) *Nehalennia speciosa* in a highly isolated population, currently situated at the southern border of the species distribution, b) *Crocothemis erythraea* at 5 localities, autochthonous at least at two of them, abundant at one site, and with a probable second generation, c) *Cordulegaster bidentata*, widespread at many localities, d) *Leucorrhinia albifrons* and *L. caudalis* at the southern

border of their distribution, the latter species being extremely rare at these latitudes, e) *L. pectoralis*, rare in southern Poland, f) several thermophilous species as e.g. *Aeshna affinis*, *Orthetrum brunneum*, *O. albistylum*, *Sympetrum meridionale*. The species composition of the odonate fauna and the occurrence of some species are commented on and discussed with reference to the geographical position of the area and the habitat spectrum. Conservation aspects are presented and assessed and some conservation measures are proposed." (Author)] Address: Daraz, B., ul. Kościelna 41, 35-505 Rzeszów; Poland. E-mail: bdaraz@poczta.onet.pl

8273. Dargent, T.; Bao, X.-q.; Grondel, S.; Le Brun, G.; Paquet, J.B.; Soyer, C.; Cattan, E. (2009): Micromachining of an SU-8 flapping-wing flying micro-electro-mechanical system. *J. Micromech. Microeng.* 19, 085028 (doi:10.1088/0960-1317/19/8/085028): 10 pp. (in English) ["This paper presents a feasibility step in the development of an ultra-small biomimetic flying machine. Advanced engineering technologies available for applications such as the micro-electro-mechanical system (MEMS) technologies are used. To achieve this goal, a flapping-wing flying MEMS concept and design inspired from insects is first described. Actuators and an actuation way for the control over the wing kinematics are proposed. The initial concepts are subsequently analyzed and presented using multi-body and finite element models. An overview of SU-8 photoresist structures and their functions in the future micro-robot insect is then presented. Consequently, micromachining enables the implementation of a flying MEMS. It is also demonstrated that the structure can be made at insect sizes and actuated at low power inputs. Moreover, the flapping frequency obtained is within the flapping frequency range of wings of many common insects of millimetric dimensions. Such prototypes are of interest as tools to artificially recreate and study insect flight with characteristics, similar to those of insects, that are able to produce lift and hover. Finally, if a micro-battery, wireless receivers, microcontrollers, sensors and actuators can all be fitted onto chips only a few millimeters square, with a mass in the order of milligrams, then we believe that an insect-size flying MEMS can be realized. All these requirements can now be achieved due to advanced engineering methods." (Authors) The publication includes references to Odonata.] Address: Cattan, E., Université Lille Nord de France, F-59000 Lille, France. E-mail: eric.cattan@univ-valenciennes.fr

8274. Darvizeh, M.; Darvizeh, A.; Rajabi, H.; Rezaei, A. (2009): Free vibration analysis of dragonfly wings using finite element method. *The International Journal of Multiphysics* 3(1): 101-110. (in English) ["In the present work, investigations on the microstructure and mechanical properties of the dragonfly wing are carried out and numerical modeling based on Finite Element Method (FEM) is developed to predict flight characteristics of dragonfly wings. Vibrational behaviour of wings type structures is immensely important in analysis, design and manufacturing of similar engineering structures. For this purpose natural frequencies and mode shapes are calculated. In addition, the kind of deformation in each mode shape evaluated and the ratio between numerical natural frequency and experimental natural frequency presented as damping ratio. The results obtained from present method are in good agreement with same experimental methods."] Address: Guilan University, Iran

8275. de Oliveira, D.E.; de Marco Júnior, P. (2009): Is there a trade-off between the melanin allocated to the immune system and to camouflage on larvae of the dragonfly *Micrathyrja 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 *M. catenata*. We conducted the study in the "Reserva do km 41" (41 km' Reserve), 80 km 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 Oliveira, D.E., Programa de Pós-Graduação em Biologia Animal, Instituto de Ciências Biológicas, Sala AT 159, Campus Universitário Darcy Ribeiro, Universidade de Brasília, 70910-900, Asa Norte, Brasília, DF, Brazil. E-mail: daniloelo@gmail.com

8276. Deans, M. (2009): Reports from Costal Stations - 2008: Bawdsey Peninsula, Suffolk. *Atropos* 36: 53-54. (in English) [UK; *Erythromma viridulum*, *Sympetrum striolatum* (at a light trap)] Address: not stated

8277. Delevati Colpo, K.; Brasil, M.T.; Vielmo Camargo, B. (2009): Macroinvertebrados bentônicos como indicadores do impacto ambiental promovido pelos efluentes de áreas orizícolas e pelos de origem urbana/industrial. *Ciência Rural* 39(7): 2087-2092. (in Portuguese, with English summary) [Cachoeirinha, Rio Grande do Sul, Brazil; Benthic macroinvertebrates as indicators of environmental impact promoted by rice crop flood and by urban/industrial effluents. Table 1 includes data on the abundance of "Anisoptera".] Address: Delevati Colpo, Karine, Depto de Ciências Biol., Univ. Regional Integrada do Alto Uruguai e das Missões (URI), Campus de Santiago. Av. Batista Bonoto Sobrinho, 97700-000, Santiago, RS, Brasil. E-mail: kacolpo@gmail.com

8278. Demarez, L. (2009): Eerste waarneming van eiafzetting bij Zuidelijke keizerlibel (*Anax parthenope*) in Vlaanderen, Het Vinne 30 juli 2008 [First observation of ovipositing *Anax parthenope* in Flanders]. *Nieuwsbrief Libellenvereniging Vlaanderen* 3(2): 2-3. (in Dutch, with English summary) ["Although in Flanders, Belgium *A. parthenope* has been observed quite a few times during the last years, and populations being suspected, real reproduction had not yet been proven. The author describes an observation of a pair ovipositing in tandem at the nature reserve Het Vinne in Zoutleeuw." (Author)] Address: Demarez, L., Ooststraat 2, 8890 Moorslede, Belgium. E-mail: leendemarez@telenet.be

8279. Dibble, E.D.; Thomaz, S.M. (2009): Use of fractal dimension to assess habitat complexity and its influence on dominant invertebrates inhabiting tropical and temperate macrophytes. *Journal of Freshwater Ecology* 24(1): 93-102. (in English) ["We evaluated the feasibility of using fractal geometry to measure the structural complexity innate to 11 species of temperate and tropical macrophytes. The efficacy of fractal dimension (D) as a surrogate of plant complexity was tested by using D values to predict the density of two dominant invertebrate taxa (Annelida and Odonata). Plants and invertebrates were collected from lagoons in the upper Parana River, Brazil, and from a lake in central Minnesota, USA. Fractal dimensions varied from 1.16 (SD=0.03) in *Potamogeton illinoensis* to 1.68 in *Najas conifera* (SD=0.07) and *Myriophyllum spicatum* (SD=0.02). Spatial scale did not affect D values, since the results obtained for pictures taken at 25 cm², 100 cm² and 600 cm² did not differ for five tropical species. Using the results of D recorded at 100 cm², a positive and significant relationship between plant complexity and Annelida and Odonata densities was observed. The biological significance of the positive correlations between D and invertebrate densities and the feasibility in calculating D make this method a potential candidate for measuring plant complexities at small scales." (Authors)] Address: Dibble, E.D., Rm# 217, Thompson Hall, Department of Wildlife and Fisheries, Box 9690, Mississippi State, MS 39762-9690, USA. E-mail: edibble@cfr.msstate.edu

8280. Diomande, D.; Bony, K.Y.; Oi Edia, E.; Konan, K.F.; Gourène, G. (2009): Diversité des Macroinvertébrés Benthiques de la Rivière Agnéby (Côte d'Ivoire; Afrique de l'Ouest). *European Journal of Scientific Research* 35(3): 368-377. (in French, with English summary) [The middle stream range of the Agnébi, Ivory Coast (Pont Autoroute) was sampled monthly over 10 months, and covering the 4 local rainy seasons. Ten samples with an Ekman grab resulted in the record of 50 taxa (Oligochetes: 2, molluscs: 14, and insects: 34 taxa). The following odonate taxa are listed: *Pseudagrion salisburyensis*, *Ictinogomphus*, *Lestiniogomphus angustus*, *Paragomphus*, *Phyllogomphus aethiops*, and *Phyllomacromia*.] Address: Diomandé, D. Laboratoire d'Environnement et Biologie Aquatique UFR Sciences et Gestion de l'Environnement, Université d'Abobo-Adjamé 02 BP 801 Abidjan 02, Ivory Coast. E-mail: E-mail: diomdram@yahoo.fr

8281. Dominak, P.; Michalczuk, W. (2009): Two species of biting midges (Diptera: Ceratopogonidae) new to the Polish fauna. *Dipteron* 25: 8-13. (in Polish, with English summary) ["*Forcipomyia paludis* (Macfie, 1936) and *Monohelea estonica* Remm, 1965 are recorded from Poland for the first time. As a result the number of biting midges species in the Polish fauna increased to 215. Females are briefly diagnosed and illustrated, geographical distribution analysed and Odonata hosts of parasitic *F. paludis* reviewed." (Author)] Address: Dominak, Patrycja, Katedra Zoologii Bezkręgowców Uniwersytetu Gdańskiego, Al. Marszałka Piłsudskiego 46, 81-378 Gdynia, Poland. E-mail: heliocopris@gmail.com

8282. Donoso, D.A.; Salazar, F.; Maza, F.; Cárdenas, R.E.; Dangles, O. (2009): Diversity and distribution of type specimens deposited in the Invertebrate section of the Museum of Zoology QCAZ, Quito, Ecuador. *Ann. soc. entomol. Fr. (n.s.)* 45(4): 437-454. (in English, with French summary) ["The Invertebrate section of the Mu-

seum of Zoology QCAZ at the Pontifical Catholic University of Ecuador in Quito maintains nearly two million curated specimens, and comprises Ecuador's largest collection of native taxa. We review 1902 type specimens from 6 subspecies and 320 species in 121 genera and 42 families, currently kept in the Museum. The list includes 116 holotypes, 10 allotypes, 1774 paratypes and 2 neoparatypes. The collection of type specimens is particularly strong in the Coleoptera (family Carabidae and Staphylinidae) and Hymenoptera. [...]. An analysis of the geographic distribution of type localities showed that collection sites are clustered geographically with most of them found towards the northern region of Ecuador, in Pichincha, Cotopaxi and Napo provinces. Sites are mainly located in highly accessible areas near highways and towns. Localities with a high number of type species include the cloud forest reserve Bosque Integral Otonga and Parque Nacional Yasuní in the Amazon rainforest near PUCE's Yasuní Scientific Station. Type localities are not well represented in the Ecuadorian National System of Protected Areas. Future fieldwork should include localities in the southern region of Ecuador but also target less accessible areas not located near highways or towns. We discuss the value of the collection as a source of information for conservation and biodiversity policies in Ecuador." (Authors) Odonata are represented in the collection by the following type material: *Lestes jerrelli* Tennessen 1997. Paratype; *Oxyagrion tennesse* Mauffray 1999. Paratype.; *Aeshna* (*Marmaraeschna*) *brevicercia* Muzón & Von Ellenrieder 2001. Holotype, paratype (= *Rhionaeschna brevicercia* (Muzón & von Ellenrieder, 2001)).] Address: Salazar, Fernanda, Museo de Zoología, Escuela de Ciencias Biológicas, Pontificia Universidad Católica del Ecuador, Av. 12 de Octubre 1076 y Roca, Apdo. 17-01-2184, Quito, Ecuador. E-mail: mafersalazar@yahoo.es

8283. Ebrahimi, A.; Madjdzadeh, S.M.; Mohammadian, H. (2009): Dragonflies (Odonata) from South-Eastern Iran. *Caspian Journal of Environmental Sciences* 7 (2): 107-112. (in English) [27 species of Odonata (528 specimens from more than 30 sites, 2006-2008) were collected in south-eastern Iran, Kerman province, in contrast to 11 species that were recorded previously from this region. 528 specimens were collected from more than 30 sites in Kerman province during 2006-2008. *Anax imperator* was first recorded for the central plateau of Iran. This species had been recorded only from northern part of Iran (Caspian Sea fringe).] Address: Ebrahimi, A., Dept. of Biology, Faculty of Sciences, Shahid Bahonar University, Kerman, Iran. E-mail: aebrahimi60@yahoo.com

8284. Edokpayi, C.A.; Uwadiae, R.E.; Oluwarotimi, O.T. (2009): The physicochemistry and phytomacrobenthic communities associated with *Pistia stratiotes* (L.) (Water Lettuce) in a non tidal creek within the University of Lagos, South-West, Nigeria. *Journal Sci. Res. Dev.* 11(2008 / 2009): 62-76. (in English) [Samples were collected monthly for six months (March-August, 2003). A total of 5,593 individuals (32 taxa) was dominated by Dipterans (53.21%) and Plecopterans (23.85%). Odonata (*Libellulidae*, "*Coenagrionidae*, *Agriidae*") are represented by 5 specimens only.] Address: Edokpayi, C.A., Dept of Marine Sciences, University of Lagos, Nigeria

8285. El-Kazafy, A.T.; Yousry, A.B. (2009): The value of honey bees (*Apis mellifera*, L.) as pollinators of summer seed watermelon (*Citrullus lanatus* colothyn-

thoides L.) in Egypt. *Acta Biologica Szegediensis* 53(1): 33-37. (in English) [*Hemianax ephippiger* and *Ischnura senegalensis* are listed in Tab. 2 as pollinators on summer seed watermelon plants at Dessouk region, Kafr El-Sheikh Governorate during 2006 season.] Address: Economic Entomology Department, Faculty of Agriculture, Kafrelsheikh University, Kafr El-Sheikh, Egypt

8286. Ellenrieder, N. von; Molineri, C.; Emmerich, D. (2009): Odonata de Uruguay: lista de especies y nuevos registros. *Rev. Soc. Entomol. Argent.* 68(1-2): 227-230. (in Spanish, with English summary) ["A list of 70 species known to occur in Uruguay is given. 14 species are new country records: *Mnesarete pruinosa*, *Acanthagrion lancea*, *A. peruvianum*, *Argia serva*, and *Oxyagrion chapadense*, *Neoneura ethela*, *Progomphus costalis*, *Elasmothermis constricta*, *Erythrodiplax basalis*, *Erythrodiplax media*, *Micrathyria hypodidyma*, *Micrathyria ringueleti*, *Orthemis ambinigrata*, and *Perithemis icteropectera*." (Authors)] Address: Ellenrieder, Natalia von, California State Collection of Arthropods, CDFA, 3294 Meadowview Road, Sacramento, CA 95832. Email: natalia.ellenrieder@gmail.com

8287. Ellenrieder, N. von; Garrison, R.W. (2009): Odonata. In: Domínguez, E. & H. R. Fernández (eds.). *Macroinvertebrados bentónicos sudamericanos. Publicación Especial N° X, Fundación Miguel Lillo, Tucumán, Argentina.* [ISBN 978-950-668-015-2]: 95-143. (in Spanish) [The larvae of South American taxa are keyed to the family level, the imagines to the genus level. Many illustrations demonstrate morphological characters on the species level. The chapter also includes morphological essentials and notes on observing and collecting Odonata.] Address: Ellenrieder, Natalia von, California State Collection of Arthropods, CDFA, 3294 Meadowview Road, Sacramento, CA 95832. Email: natalia.ellenrieder@gmail.com

8288. Endersby, I. (2009): Nomenclatural amendments to the current catalogue of Australian Odonata. *Australian Entomologist* 36(3): 99-101. (in English) ["Notes on the type depositories for seven species of libellulid dragonflies described by J.J. Kaup or F. Brauer from southeast Asia and recorded from Australia are provided, together with a note on the validity of the generic name *Tamea* Hagen." (Author) The paper bases on Schneider (2004), and considers *Gynacantha rosenbergi*, *Brachydiplax denticauda*, *B. duivenbodei*, *Raphisemia bispina*, *Neurothemis stigmatizans*, *Tamea loewii*, and *Macrodiplox cora*.] Address: Endersby, I., 56 Looker Rd, Montgomery, Victoria 3094, Australia. E-mail: endersby@mira.net

8289. Eroukhmanoff, F.; Outomuro, D.; Ocharan, F.J.; Svensson, E.I. (2009): Patterns of phenotypic divergence in wing covariance structure of calopterygid damselflies. *Evolutionary Biology* 36(2): 214-224. (in English) ["Comparing species differences in covariance patterns of traits subject to divergent selection pressures can increase our understanding to the mechanisms of phenotypic divergence. Different species of calopterygid damselflies have diverged in the melanized wing patch of males. This trait serves multiple ecological functions and has behavioural consequences in terms of sexual selection, interspecific interactions, reproductive isolation. We compared the phenotypic variance-covariance matrices (P) of wing traits among nine populations of four European species of calopterygid

damselflies. We found modest divergence in covariance structure among populations of the same species, but strong divergence between species. Interestingly, the orientation of the first eigenvector of P (P max) differed more between closely related species than between distantly related species, although this pattern was absent when overall covariance structures were compared. We also found that distantly related species but geographically closer had converged towards a similar covariance structure. Finally, divergence in covariance structure was correlated with divergence in wing patch length, but not with other wing traits. This last finding suggests that divergent selection on wing patch length might have affected the stability of P. These results indicate that P might not only reflect ancestral developmental pathways but might also be influenced by current ecology." (Authors) *Calopteryx splendens*, *C. xanthostoma*, *C. virgo meridionalis*, and *C. v. virgo*] Address: Eroukhmanoff, Fabrice, Section for Animal Ecology, Ecology Building, Lund University, 223 62 Lund, Sweden. E-mail: fabrice.eroukhmanoff@zoekol.lu.se

8290. Ferro, M.L.; Sites, R.W.; Vitheepadit, A. (2009): Contributions to the faunistics of Odonata in Thailand. *Insecta Mundi* 0104: 1-24. (in English) ["Distribution and habitat information are provided for 1578 adult specimens of Odonata representing 127 species in 70 genera and 16 families that were collected from 143 locations throughout Thailand. Of the species collected, 25 (20%) were represented by a single specimen, and 40 (31%) were collected from a single location. Collections were made at 49 lentic and 85 lotic sites, and an average of 6.9 and 6.6 species were collected at each site in each habitat, respectively." (Authors)] Address: Ferro, M.L., Louisiana State Arthropod Museum, Department of Entomology, LSU Agricultural Center, Baton Rouge, Louisiana, 70803, USA. E-mail: spongymesophyll@gmail.com

8291. Fillinger, U.; Sombroek, H.; Majambere, S.; van Loon, E.; Takken, W.; Lindsay, S.W. (2009): Identifying the most productive breeding sites for malaria mosquitoes in The Gambia. *Malaria Journal* 2009, 8:62: 14 pp. (in English) ["Background: Ideally larval control activities should be targeted at sites that generate the most adult vectors, thereby reducing operational costs. Despite the plethora of potential mosquito breeding sites found in the floodplains of the Gambia River, about 150 km from its mouth, during the rainy season, only a small proportion are colonized by anophelines on any day. This study aimed to determine the characteristics of larval habitats most frequently and most densely populated by anopheline larvae and to estimate the numbers of adults produced in different habitats. Methods: A case-control design was used to identify characteristics of sites with or without mosquitoes. Sites were surveyed for their physical water properties and invertebrate fauna. The characteristics of 83 sites with anopheline larvae (cases) and 75 sites without (controls) were collected between June and November 2005. Weekly adult productivity was estimated with emergence traps in water-bodies commonly containing larvae. Results: The presence of anopheline larvae was associated with high invertebrate diversity (Odds Ratio, OR 11.69, 95% CI 5.61-24.34, $p < 0.001$), the presence of emergent vegetation (OR 2.83, 95% CI 1.35-5.95, $p = 0.006$), and algae (at borderline significance; OR 1.87, 95% CI 0.96-3.618, $p = 0.065$). The density of larvae was reduced in sites that were larger than 100 m in

perimeter (OR 0.151; 95% CI 0.060–0.381, $p < 0.001$), where water was tidal (OR 0.232; 95% CI 0.101–0.533, $p = 0.001$), vegetation shaded over 25% of the habitat (OR 0.352; 95% CI 0.136–0.911, $p = 0.031$) and water conductivity was above 2,000 $\mu\text{S}/\text{cm}$ (OR 0.458; 95% CI 0.220–0.990, $p = 0.048$). Pools produced the highest numbers of *Anopheles gambiae* adults compared with rice fields, floodwater areas close to the edge of the floodplain or close to the river, and stream fringes. Pools were characterized by high water temperature and turbidity, low conductivity, increased presence of algae, and absence of tidal water. Conclusion: There are few breeding sites that produce a high number of adult vectors in the middle reaches of the river in The Gambia, whereas those with low productivity are larger in area and can be found throughout the rainy season. Even though risk factors could be identified for the presence and density of larvae and productivity of habitats, the results indicate that anti-larval interventions in this area of The Gambia cannot be targeted in space or time during the rainy season." (Authors) Odonata are treated at the order level.] Address: Fillinger, Ulrike, Disease Control & Vector Biology Unit, London School of Hygiene & Tropical Medicine, Keppel Street, London, WC1E 7HT, UK. E-mail: Ulrike.fillinger@lshtm.ac.uk;

8292. Fischer, C. (2009): *Enallagma cyathigerum* und *Ischnura elegans* als Kleptoparasiten in Spinnennetzen (Odonata: Coenagrionidae). *Libellula* 28(3/4): 183-186. (in German, with English summary) [Two observations near Starnberg, Bavaria, Germany, are portrayed, when one female *E. cyathigerum* and one male *I. elegans* successfully purloined prey items from spiders' webs.] Address: Fischer, Christine, Ammerseestr. 32, D-82061 Neuried, Germany

8293. Fleck, G.; Hamada, N.; Carvalho, A.L. (2009): A remarkable new genus and species of dragonfly (Odonata: Anisoptera: Libellulidae) from Brazil and notes on its bionomics and phylogenetic affinities. *Ann. soc. entomol. Fr. (n.s.)* 45(3): 275-284. (in English, with French summary) ["*Orionthemis felixorioni* n. gen., n. sp. from Bahia state, Brazil, is described and illustrated from larvae, reared adults and an immature adult male taken in association with its possible larval shuck. This taxon exhibits remarkable features among the Odonata, such as enormous dorsal and lateral spines perpendicular to the body axis, totally fused last abdominal segments in the larva, strongly differentiated and sexually dimorphic posterior legs, and the incompletely chitinized eighth abdominal tergite of the adult. *Orionthemis* is closely related to *Elasmothemis* (Neotropical) and *Onychothemis* (South-East Asia). The larvae were collected in the abundant immersed vegetation in a clear and cool stream in the Brazilian 'planalto' (central plateau) in an area that is endangered by deforestation and irrigation." (Authors)] Address: Hamada, N., Instituto Nacional de Pesquisas da Amazônia (INPA), Coordenação de Pesquisas em Entomologia (CPEN), Avenida André Araújo, n. 2936, CP 47, BR 69011-970, Manaus, AM, Brazil. E-mail: nhamada@inpa.gov.br

8294. Flenner, I.; Olne, K.; Suhling, F.; Sahlén, G. (2009): Predator-induced spine length and exocuticle thickness in *Leucorrhinia dubia* (Insecta: Odonata): a simple physiological trade-off? *Ecological Entomology* 34: 735-740. (in English) ["1. Morphological defence structures evolve against predators but are costly to the individual, and are induced only when required. A well-

studied example is the development of longer abdominal spines in dragonfly larvae in the presence of fish. Numerous attempts to discover trade-offs between spine size and behaviour, development time or body size have, however, produced little evidence. 2. We considered a physiological trade-off. Spines consist of cuticle and using material to build longer structures may result in less material remaining elsewhere. We therefore measured exocuticle thickness at nine locations on *Leucorrhinia dubia* larvae from habitats with and without fish. 3. Our results show a significant effect of the interaction between fish presence and spine length on head and fore leg exocuticle thickness. Relative thickness increased with relative length of lateral spine 9 in the absence of fish, whereas no such relationship existed with fish. Hence, synthesis and secretion of cuticle material occur as a trade-off when larvae react to fish presence. 4. We assume the mechanism to be a selective synthesis of material with different responses in different parts of the larval body. These findings offer a new angle to the fish/spine trade off debate.] Address: Sahlén, G., Halmstad University, P.O. Box 823, 30118 Halmstad, Sweden. E-mail: goran.sahlen@hh.se

8295. Fliedner, H. (2009): Two remarkable observations from Puerto Rico. *Argia* 21(1): 8-9. (in English) [Lucia Beach east of Yabucoa, eastern coast of Puerto Rico, 4-XII-2008]: *Crocothemis servilia*, which is a new addition to the regional fauna, and *Erythrodiplax umbrata*. This male is "noteworthy because of the irregularity of its wing pattern. On the left forewing the dark band is missing totally, on the right one there is only an irregular dark mark near the anterior margin, and the dark bands on the hindwings are much lighter at the rear. This asymmetrical lack of pigment may be due to an anomaly in development." (Author)] Address: Fliedner, H., Louis-Seegelken Str., D-28717 Bremen, Germany. E-mail: H.Fliedner@t-online.de

8296. Florencio, M.; Serrano, L.; Gomez-Rodriguez, C.; Millan, A.; Dyaz-Paniagua, C. (2009): Inter- and intra-annual variations of macroinvertebrate assemblages are related to the hydroperiod in Mediterranean temporary ponds. *Hydrobiologia* 634: 167-183. (in English) ["Macroinvertebrate assemblages of 22 temporary ponds with different hydroperiod were sampled monthly during a dry year (2005–2006) and a wet year (2006–2007). Coleopteran and Heteropteran adults were most abundant at the end of the hydroperiod, while Coleopteran larvae, mainly Dytiscidae, were mostly recorded in spring. Macroinvertebrate assemblages differed between study years. The shorter hydroperiod of ponds in the dry year constrained the length of the aquatic period for macroinvertebrates, and three distinct wet phases of community composition could be distinguished: filling phase, aquatic phase and drying phase. In the wet year, with a longer pond hydroperiod, five phases could be identified, with the aquatic phase differentiated into winter, early spring and late spring phases. Dispersers such as *Anisops sardeus*, *Berosus guttalis* or *Anacaena lutescens* were typical during the filling phase and *Corixa affinis* or *Enochrus fuscipennis* during the drying phase. The ponds with intermediate hydroperiod showed a similar composition (mainly dispersers) at the beginning and end of their wet period; this is not being seen in early drying or long hydroperiod ponds. A general pattern was detected, with similar variation between both years, which may be associated with the life histories of the macroinvertebrate taxa re-

corded." (Authors) 16 odonate species are listed. Odonata and Heteroptera included the highest number of species and individuals during both years." (Authors)] Address: Florencio, Margarita, Donana Biological Station-CSIC, P.O. Box 1056, 41080 Seville, Spain. E-mail: margarita@ebd.csic.es

8297. Fraker, M.E. (2009): Predation risk assessment by green frog (*Rana clamitans*) tadpoles through chemical cues produced by multiple prey. *Behav. Ecol. Sociobiol.* 63: 1397-1402. (in English) ["Many prey assess predation risk through predator chemical cues. Numerous studies have shown that (1) prey sometimes respond to chemical cues produced by heterospecifics and (2) that many species are capable of associative learning. This study extends this research by focusing on predation risk assessment and antipredator behaviour in environments containing chemical cues produced by multiple prey species. The results show that *R. clamitans* tadpoles (1) assess risk from the chemical cue produced during predation by a heterospecific (gray tree frog, *Hyla versicolor*, tadpoles) and (2) can exhibit similarly strong behavioral responses to a mix of conspecific and heterospecific cues compared to conspecific cue alone, depending on their conditioning environment. I then discuss how the prey choice of the predators and the relative abundances of the prey species should influence the informational value of heterospecific cues." (Authors) The tadpole-odonate larvae interaction was tested using *Anax junius*.] Address: Fraker, M.E., Department of Ecology and Evolutionary Biology, University of Michigan, 830 North University, Ann Arbor, MI 48109-1048, USA. E-mail: mfraker@umich.edu

8298. Funk, A.; Reckendorfer, W.; Kucera-Hirzinger, V.; Raab, R.; Schiemer, F. (2009): Aquatic diversity in a former floodplain: Remediation in an urban context. *Ecological Engineering* 35(10): 1476-1484. (in English) ["The Lobau, a former floodplain area of the Danube River situated within the city limits of Vienna (Austria), was strongly affected by the river regulation in 1875. The reduced hydrological connectivity led to an increasing loss of aquatic habitats. A water enhancement scheme with a maximum water input of 0.5 m³ s⁻¹ was initiated in 2001. The present study assesses the effect of this scheme on biodiversity using three target species groups – aquatic molluscs, dragonflies and fish – following a common Before-After Control-Impact design (BACI). Dragonflies and molluscs were positively affected, reflecting the habitat alterations in the system. For fish, no significant impact was observed. The aim of the scheme has been achieved: increased habitat diversity and improved habitat conditions for the system's initial community and further rheophilic / rheotolerant species. Water enhancement schemes can be effective remediation measures and deserve further attention in the management of urban wetlands." (Authors)] Address: Raab, R., Tech. Büro für Biol., Quadenstr. 13, A-2232 Deutsch-Wagram, Austria. E-mail: rainer.raab@gmx.at

8299. Gaenzle Schilling, E.; Loftin, C.S.; Hury, A.D. (2009): Macroinvertebrates as indicators of fish absence in naturally fishless lakes. *Freshwater Biology* 54 (1): 181-202. (in English) ["1. Little is known about native communities in naturally fishless lakes in eastern North America, a region where fish stocking has led to a decline in these habitats. 2. Our study objectives were to: (i) characterise and compare macroinvertebrate

communities in fishless lakes found in two biophysical regions of Maine (U.S.A.): kettle lakes in the eastern lowlands and foothills and headwater lakes in the central and western mountains; (ii) identify unique attributes of fishless lake macroinvertebrate communities compared to lakes with fish and (iii) develop a method to efficiently identify fishless lakes when thorough fish surveys are not possible. 3. We quantified macroinvertebrate community structure in the two physiographic fishless lake types (n = 8 kettle lakes; n = 8 headwater lakes) with submerged light traps and sweep nets. We also compared fishless lake macroinvertebrate communities to those in fish-containing lakes (n = 18) of similar size, location and maximum depth. We used nonmetric multidimensional scaling to assess differences in community structure and t-tests for taxon-specific comparisons between lakes. 4. Few differences in macroinvertebrate communities between the two physiographic fishless lake types were apparent. Fishless and fish-containing lakes had numerous differences in macroinvertebrate community structure, abundance, taxonomic composition and species richness. Fish presence or absence was a stronger determinant of community structure in our study than differences in physical conditions relating to lake origin and physiography. 5. Communities in fishless lakes were more speciose and abundant than in fish-containing lakes, especially taxa that are large, active and free-swimming. Families differing in abundance and taxonomic composition included Notonectidae, Corixidae, Gyrinidae, Dytiscidae, Aeshnidae, Libellulidae and Chaoboridae. 6. We identified six taxa unique to fishless lakes that are robust indicators of fish absence: *Graphoderus liberus*, *Hesperocorixa* spp., *Dineutus* spp., *Chaoborus americanus*, *Notonecta insulata* and *Callicorixa* spp. These taxa are collected most effectively with submerged light traps. 7. Naturally fishless lakes warrant conservation, because they provide habitat for a unique suite of organisms that thrive in the absence of fish predation." (Authors)] Address: Gaenzle Schilling, Emily, Department of Wildlife Ecology, University of Maine, 5755 Nutting Hall, Orono, ME 04469-5755, USA. E-mail: emily.schilling@umit.maine.edu

8300. Garrison, R.W. (2009): A synopsis of the genus *Telebasis* (Odonata: Coenagrionidae). *International Journal of Odonatology* 12(1): 1-121, 2 pls. (in English) ["In this synopsis all 50 species of the primarily neotropical genus *Telebasis* are keyed, diagnosed, and illustrated. *Helveciagrion* is considered a junior subjective synonym of *Telebasis*, *T. coccinata* a junior subjective synonym of *T. coccinea*, and *T. limoncocha* a junior subjective synonym of *T. griffinii*. Six new species from South America are described: *T. carvalhoi* (holotype male: Brazil, Pará State, Floresta Nacional de Carajás, Parauapebas, S11D-C, 6°02'59"S, 49°53'24"W, ix 2005, leg. N. Ferreira Jr., in UFRJ); *T. corbeti* (holotype male: Peru: Madre De Dios Department, Tambopata-Candamo Reserved Zone, Camp 3, Collpa, Río Tambopata west bank, 13°08'31"S, 69°36'46"W, 17 ix 1992, leg. M. Butt, in BNHM); *T. farcimentum* (holotype male: Colombia: Valle del Cauca Department, Cali, 3°26'14"N, 76°31'21"W, 01 viii 1972, leg. N.B. Stiles, in FSCA); *T. leptocyclus* (holotype male: Brazil: Rondônia State, Abuna, 9°42'S, 65°23'W, 112 m, 09 iii 1922, leg. J.H. Williamson, J.W. Strohm, in UMMZ); *T. levis* (holotype male: Guatemala, El Petén Department, Uaxactun, 03 v 1931, leg. A. Murie, in UMMZ); and *T. williamsoni* (holotype male: Colombia: Magdalena Department, El Banco, 9°02'50"N, 73°58'41"W, 46 m, 25 i 1917, leg. J.H.

Williamson, E.B. Williamson, in UMMZ)." (Author)] Address: Garrison, R.W., Associate Insect Biosystematist, Plant Pest Diagnostics, California Department of Food & Agriculture, 3294 Meadowview Road, Sacramento, CA 95832-1448, USA. E-mail rgarrison@cdfa.ca.gov

8301. Gonzalez-Soriano, E.; Noguera, F.A.; Zaragoza-Caballero, S.; Ramirez-Garcia, E. (2009): Odonata de un bosque tropical caducifolio: sierra de San Javier, Sonora, Mexico. *Revista Mexicana de Biodiversidad* 80: 341-348. (in Spanish, with English summary) ["A faunistic survey of the Odonata from San Javier. Sonora, was undertaken during 7 months between November 2003 and October 2004. A total of 1012 specimens were collected belonging to 7 families. 27 genera, and 52 species. The family Libellulidae was the most diverse with 23 species, followed by Coenagrionidae (16), Gomphidae (5) and Aeshnidae (4). The least diverse families were Lestidae (2). Calopterygidae (1) and Coenagrionidae (1). The genus *Argia* was the dominant one with 10 species followed by *Enallagma* with 4. This diversity of this small area is outstanding, with 42.6% of all the species recorded for the state of Sonora." (Authors)] Address: Gonzalez-Soriano, E., Depto de Zool., Inst. de Biología, Univ. Nacional Autónoma de México. Avenida Universidad 3000, Ciudad Universitaria, 04510 México, D. F., México. E-mail: esoriano@ibiologia.unam.mx

8302. Gorb, S.N.; Tynkkyne, K.; Kotiaho, J.S. (2009): Crystalline wax coverage of the imaginal cuticle in *Calopteryx splendens* (Odonata: Calopterygidae). *International Journal of Odonatology* 12(2): 205-221. (in English) ["In this study we use high resolution SEM to describe the diversity of wax crystals and their distribution on different morphological structures in male individuals of *C. splendens*. The entire cuticle surface of this damselfly, with the exception of ommatidia and ocelli, is covered with crystalline wax in dimensions from submicron to micron range. It is shown that shape – rod-like, plate like, filamentous, etc. –, size, and density of crystals vary on different surfaces and in individuals of different ages. Additionally, we demonstrate different types of damage to the crystalline wax layer: scratches, compressions, wear, and contamination. The primary function of the wax crystalline coverage in odonates is, presumably, reduction of surface wettability by water (superhydrophobicity). However, other functions are also discussed, especially in such specialized body areas as postero-ventral parts of male abdomen, the so called 'lantern'." (Authors)] Address: Gorb, S.N., Department of Functional Morphology and Biomechanics, Zoological Institute, Christian Albrecht University of Kiel, Am Botanischen Garten 1-9, 24118 Kiel, Germany. E-mail: sgorb@zoologie.uni-kiel.de

8303. Hacet, N.; Aktaç, N. (2009): Contribution to the knowledge of Odonata fauna of Southern Marmara Region of Turkey. *Türk. entomol. derg.* 33(3): 171-178. (in English, with Turkish summary) [Records of 17 species and subspecies, collected in 1996, 2002 and 2003 from the Çanakkale and Yalova provinces situated in the Southern Marmara Region of Turkey are listed. *Libellula fulva* is a first record for the region. Species new for the Çanakkale and Yalova provinces are discussed.] Address: Hacet, Nurten, Trakya University, Faculty of Arts and Sciences, Department of Biology, 22030, Edirne, Turkey. E-mail: nhacet@hotmail.com

8304. Hacet, N. (2009): Odonata of the western Black Sea region of Turkey, with taxonomic notes and species list of the region. *Odonatologica* 38(4): 293-306. (in English) ["40 species and subspecies from 58 localities were recorded during 2003 and 2005-2007. *Sympetma fusca*, *Erythromma lindenii*, *Somatochlora meridionalis*, *Orthetrum albistylum* and *Sympetrum pedemontanum* are new for the region. *S. meridionalis* records are the easternmost within its range. Geographical distribution of some other species is discussed, and notes on the morphology and taxonomic status of the regional *Calopteryx splendens*, *C. virgo*, *Ischnura elegans* and *Cordulegaster insignis* are provided. The distributions of *Coenagrion pulchellum*, *C. scitulum*, *Pyrhosoma n. nymphula*, *Aeshna cyanea*, *Cordulia aenea* and *Sympetrum depressiusculum* in Turkey are still largely unknown. Based on all available records, a list of the 51 species and subspecies currently known from the Western Black Sea Region is presented." (Author)] Address: Hacet, Nurten, Department of Biology, Faculty of Arts and Sciences, Trakya University, TR-22030 Edirne, Turkey. E-mail: nhacet@hotmail.com

8305. Hannelly, E.C. (2009): The effects of introduced trout on native macroinvertebrates from lakes in the Trinity Alps Wilderness in northern California. Thesis, Faculty of Humboldt State University, Masters of Arts In Biology: IX, 61 pp. (in English) ["I examined differences in native macroinvertebrates among four lake management categories (fish stocked, temporary stocking suspension, fish removal lakes, and historically fishless lakes) and among three habitats (rock, organic/silt substrate, and emergent vegetation) from 16 different lake basins in a four-year study (2003-2006) in the Trinity Alps Wilderness in northeastern California. This study showed that introduced insectivorous fish reduce the diversity of native aquatic insects. Chironomid midges were more abundant and in greater proportion in fish lakes than in fishless lakes. Additionally, more taxa were sampled each subsequent year following fish removals and more taxa were sampled from Hidden Lake, a stocking suspension lake that did not maintain a fish population, than in the other three stocking suspension lakes that did sustain viable fish populations. The reduction in insect diversity due to fish was further exemplified in Hidden Lake alone, where more taxa were recorded each subsequent year of the study. *Libellula* was most common in fish stocked lakes. The life history and morphology of *Libellula* seems to give them an advantage over other invertebrate predators in fish lakes. Fish create top down effects that are illustrated by the apparent ability of *Libellula* to regulate other insect abundances and proportions. This study also demonstrated how large-bodied insects are more commonly found in complex habitats, which may be attributable to increased habitat availability and resources, to the invertebrates seeking refugia from insectivorous fish, or to a combination of both." (Author)] Address: not stated

8306. Harvey, R.; Higgott, J. (2009): Reports from Coastal Stations - 2008: Minsmere RSPB Nature Reserve, Suffolk. *Atropos* 36: 54-55. (in English) [UK; *Sympetrum flaveolum*; *Anaciaeschna isosceles*, *Erythromma najas*, *E. viridulum*] Address: not stated

8307. Hassall, C.; Thompson, D.J. (2009): Variation in wing spot size and asymmetry of the Banded Demoiselle *Calopteryx splendens* (Harris, 1780). *J. Br. Dragonfly Society* 25(1): 7-15. (in English) ["Wing pigment-

ation of calopterygid damselflies has received considerable attention due to its role as an honest signal of male quality. We describe a quantitative analysis of this trait in two populations of *C. splendens* in England. One population, sampled close to the northern limit of its range in Northumberland, exhibited substantially smaller wing spots than a population sampled in Hampshire. Wing asymmetry (in terms of length and area) did not vary between the two populations, nor did it co-vary with the size of the wing spots. We propose that the decline in wing spot size is the result of variation in climate between the two sites. Such variation in immunocompetence could contribute to the determination of range margins in this species." (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

8308. Hassall, C.; Thompson, D.J.; Harvey, I.F. (2009): Variation in morphology between core and marginal populations of three British damselflies. *Aquatic Insects* 31(3): 187-197. (in English) ["As selective pressures are altered by the changing climate, species have been shown to shift their distributions. Here we investigate morphological variation in dispersal-related traits between core and marginal populations in three species of Odonata, a taxon that is known to be expanding polewards. We sampled individuals of (i) *Calopteryx splendens*, a species with a rapidly expanding range, (ii) *Erythromma najas*, a species with a slowly expanding range, and (iii) *Pyrrhosoma nymphula*, a species that does not exhibit a range margin in the UK (as a control). Only *C. splendens* exhibited consistent trends within two dispersal-related traits (wing:abdomen length ratio and aspect ratio). This result suggests that proximity to range margin alone does not account for variations in damselfly morphology, but that the rate of range expansion may also be important in determining variation." (Authors)] Address: Thompson, D.J., Population Biology Research Group, School of Biol. Sciences (Nicholson Building), Univ. of Liverpool, P.O. Box 147, Liverpool, L69 3BX, UK. E-mail: d.j.thompson@liv.ac.uk

8309. Heidemann, H. (2009): Die Entdeckung von *Coenagrion hylas* in Österreich. *IDF-Report* 18: 5-8. (in German) [Harald Heidemann reports the story of the discovery of the rare and disjunct distributed *C. hylas* in central Europe. The sketch includes brief anecdotes with Gerhard Jurzitza and M.A. Lieftinck.] Address: Heidemann, H., Au in den Buchen 66, 76646 Bruchsal, Germany, German

8310. Hentz, J.-L.; Bernier, C. (2009): *Macromia splendens*, une libellule remarquable dans le département du Gard. *Synthèse des connaissances. Gard Nature*: 16 pp. (in French) [The paper critically reviews the representation of *M. splendens* in the French network of Natura2000 sites. On the basis of 242 records of *M. splendens* along several rivers in the Gard region the current distribution of the species in southern France is documented.] Address: Gard Nature, Mas du Boschet Neuf, 30300 Beaucaire, France. E-mail: gard.nature@laposte.net

8311. Herath, H.M.M.; Edirisinghe, J.P. (2009): Spatial interactions of odonates frequenting "Lanka Pokuna" at the Royal Botanic Gardens, Peradeniya. *Proceedings of the Peradeniya University Research Ses-*

sions, Sri Lanka 14: 275-277. (in English) [A total of 27 Odonata species was recorded at the pond. "Monthly variation in species composition and species presence of Odonata during the study period is shown in Figure 1. The highest species composition was recorded during January-March 2009 and the lowest in December. Only 2 species were present throughout the study period while majority (25 species) was confined to certain months of the year. Presence of different species at the pond varied depending on the time of the day (Figure 1). Majority were active between 10.00-12.00 noon. Two species were present throughout the daytime and others for 2-3 hrs of the day." (Authors)] Address: Herath, H., Dept of Zoology, Faculty of Science, University of Peradeniya, Peradeniya 20400, Sri Lanka

8312. Hoffmann, J. (2009): Summary catalogue of the Odonata of Peru - Kommentiertes Faksimile des Manuskripts von J. COWLEY, Cambridge, 20.05.1933 und aktuelle Liste der Odonaten Perus mit Fundortangaben sowie Historie zu Sammlern und Odonatologen in Peru. *International Dragonfly Fund Report* 16: 1-115. (in German, with English and Spanish summaries) ["In the entomological library of the Natural History Museum of Lima, Peru, a badly damaged manuscript, entitled 'Summary Catalogue of the Odonata of Peru' was discovered at the beginning of the 1990s. This manuscript had been kept there since 1933. Its author was stated as 'J. Cowley'. Whether indeed Cowley is the sole author of the whole text, cannot be asserted with certainty. However there are numerous indications that the manuscript was written in Cambridge, England. It seems certain that the list itself was written by Cowley, since many examples were given from his collection and the way the locations were cited. Presumably the manuscript was written together with the German veterinarian Paul Martin and his wife Margarita who lived in Lima. Martin was a very enthusiastic amateur lepidopterologist who had set up a network of butterfly collectors in Peru. Insects other than Lepidoptera were passed on by Martin to specialists, dragonflies apparently mainly to Cowley, who named a species in honour of Martin. The manuscript is of great value, since it is the first known and most complete list of Odonata with localities based on the state of knowledge of those days. Up to this time these records were scattered across few and also incomplete lists as part of taxonomic works or collection catalogues. On the basis of the state of knowledge and rules of nomenclature of his days (1933) Cowley named a total of 174 dragonfly species (synonymised 168 species) from 71 localities. Eleven years later Schmidt (1942) published a list of 173 Peruvian odonates, while 21 years later a catalogue with 165 species (synonymised 158 species) was published by Soukop in 1954. A comprehensive list of 252 species (synonymised to 243) was published by Racenis (1959) 26 years after Cowleys unpublished list. Since then there have been only a few complete lists. Currently and here presented, there are 481 species known from 238 localities, of which 87 were new species first described on the basis of type material from Peru. Up to the end of the 1960s material from commercial collectors and the trade with insects was the basis for most catalogues, with dragonflies being only a by-catch of butterfly collecting expeditions. Publications of lists from scientific expeditions on the other hand, were a rare event. The history of Odonatology in Peru is, therefore, largely connected to the history of research and collecting expeditions into the Amazon region for the greater

part of the 20th century. Up to the era of Cowley, expeditions into the collection regions of Peru took place mainly out of the east of the continent by way of the Amazon and its tributaries. The first of such odonatological evidences are by the famous Amazon researcher Henry Walter Bates, who also collected a large number of dragonflies between the years 1848 and 1859. With an increasing interest in the flora and fauna in their own country and with the founding of natural history institutions at the beginning of the 20th century in Lima, more and more expeditions were organised from Lima. Until the middle of the last century the majority of researchers and collectors active in Peru were still mainly Europeans. With the beginnings of the 70s of the last century, pure collecting expeditions became progressively less common. Odonata, collected during the last 20 years in Peru, mainly stem from research projects with a defined goal. A map of the locations until 2007 shows that more than 70% of the country is still unexplored as far as odonates are concerned. Thus the list of the 481 species more than likely does not reflect the actual inventory of dragonfly species and distribution of Peru. The register lists all the species which have definitely been recorded for the country and takes into account their present validity and comprehensible taxonomic relationships." (Author)] Address: Hoffmann, J., alauda, Wendenstr. 435, D-20537 Hamburg, Germany. E-Mail: hoffmann@alauda.de

8313. Holusa, O. (2009): New records of *Cordulegaster bidentata* and *Somatochlora alpestris* in the Ukrainian Carpathians (Odonata: Cordulegastridae, Corduliidae). *Libellula* 28(3/4): 191-201. (in English, with German summary) ["During 2005 and 2006, a detailed research of freshwater habitats in the catchment of the Chrepeliv River and in a part of the catchment of the Bistricja Nadvirnjanska River in the Nadvirna district in the Ivano-Frankivsk Oblast, Ukraine, was carried out. *C. bidentata* was found at four localities. Its occurrence in the Ukrainian Carpathians is discussed, and all hitherto published records of *S. alpestris* and *C. bidentata* from the territory of the Ukraine are summarised. In August 2004 and 2006, male adults of *S. alpestris* were recorded at two sites on the massif of Mt. Pip Ivan Maramorosky in the Zakarpattia Oblast, Ukraine. One recording site was in the vicinity of Mt. Berlebashka, and the other on the foot of Mt. Obniz. The occurrence of permanent populations is discussed." (Author)] Address: Holusa, O., Dept Forest Protection & Game Management, Faculty Forestry & Wood Technology, Mendel University of Agriculture & Forestry Brno, Zemedelská 3, CZ-613 00 Brno, Czech Republic. E-mail: holusao@email.cz

8314. Honkavaara, J.; Rantala, M.J.; Suhonen, J. (2009): Mating status, immune defence, and multi-parasite burden in the damselfly *Coenagrion armatum*. *Entomologia Experimentalis et Applicata* 132(2): 165-171. (in English) ["Immunity and reproductive effort are both physiologically costly and often a trade-off between these functions has been shown. In studies with damselflies, parasite load has been associated with fitness costs, such as reductions in mating success, male condition, and survival. Although each individual may be simultaneously infected by various parasite species, most studies have concentrated on the effects of a single parasite taxon. We examined natural ecto- and endoparasite infection levels in male *C. armatum* in relation to their mating status, fat reserves, and ability to further mount an immune response, measured as en-

capsulation of an experimentally introduced foreign object. Encapsulation response was lower for mated (paired) males than for single males and declined with increasing water mite abundance. Mated males had fewer water mites than single males. Male weight or fat reserves did not explain variation in encapsulation response. The number of gregarine gut parasites was not related to the level of encapsulation response and did not differ between mated and single males. However, there was a negative correlation between mite abundance and gregarine load. Our data suggest that current mite infection may compromise a male's resistance against further infections by pathogens and parasites, and there may be a trade-off between reproductive effort and encapsulation response in male *C. armatum*." (Authors)] Address: Honkavaara, J., Department of Biology, Section of Ecology, University of Turku, 20014 Turku, Finland. E-mail: johhon@utu.fi

8315. Hope, P. (2009): Species Review 1: The Small Red Damselfly *Ceriagrion tenellum* (de Villers) and its close relative, the Turkish Red Damselfly *Ceriagrion georgifreyi* (Schmidt). *J. Br. Dragonfly Soc.* 25(1): 41-56. (in English) ["This review deals *C. tenellum*, a widespread species in Europe, with Britain and Ireland at the northern end of its range. It also looks at its close relative, *C. georgifreyi*, only discovered in 1953 and confined to a narrow fringe along the Mediterranean from Israel to southwest Turkey and three Greek islands." (Authors)] Address: Hope, P., English Bridge Court, Wyle Cop, Shrewsbury, Shropshire, SY1 1XH, UK

8316. Horváth, G.; Kriska, G.; Malik, P.; Robertson, B. (2009): Polarized light pollution: a new kind of ecological photopollution. *Front. Ecol. Environ.* 7(6): 317-325. (in English) ["The alteration of natural cycles of light and dark by artificial light sources has deleterious impacts on animals and ecosystems. Many animals can also exploit a unique characteristic of light – its direction of polarization – as a source of information. We introduce the term "polarized light pollution" (PLP) to focus attention on the ecological consequences of light that has been polarized through interaction with human-made objects. Unnatural polarized light sources can trigger maladaptive behaviors in polarization-sensitive taxa and alter ecological interactions. PLP is an increasingly common byproduct of human technology, and mitigating its effects through selective use of building materials is a realistic solution. Our understanding of how most species use polarization vision is limited, but the capacity of PLP to drastically increase mortality and reproductive failure in animal populations suggests that PLP should become a focus for conservation biologists and resource managers alike." (Authors) References to Odonata are made at several occasions.] Address: Horvath, G., Biooptics Laboratory, Department of Biological Physics, Loránd Eötvös University, 1117 Budapest, Pázmány Péter sétány 1, Hungary. E-mail: gh@arago.elte.hu

8317. Hunter, I. (2009): Reports from Costal Stations - 2008: Elms Farm, Icklesham, East Sussex. *Atropos* 36: 46. (in English) [UK; *Erythromma viridulum*] Address: not stated

8318. Hunter, M. (2009): My best day. *Atropos* 37: 44-45. (in English) [The author describes his most memorable day involving Odonata. 5-VIII-2000, Hamsterley Forest, Durham, UK, records of *Aeshna juncea*, *A. grandis*, *A. mixta*, *A. cyanea*, *Anax partenope*, *A. imper-*

ator, and *Cordulegaster boltonii* are reported.] Address: Hunter, M., 9 Colpitts Lane, West Park, Darlington, DL2 2FG, UK

8319. Idris, A.B.; Ismail, S.; Haron, Y.; Suhana, Y. (2009): Insects of Tasik Chini with special emphasis on ichneumonid wasps. *Sains Malaysiana* 38(6): 813-816. (in English) [Tasik Chini, trails to Sg. Gumum and Kampung Melai, Malaysia: a total of 502 insect individuals comprising of seven orders (Hymenoptera, Diptera, Coleoptera, Orthoptera, Blattaria, Odonata and Microcoryphia) and 47 families were collected. Aeshnidae contribute with 12, and Libellulidae with 73 specimens (*Rhythemis phyllis phyllis*, *Nuerothemis fluctuans*, *Orthetrum testateum testateum*, *Orthetrum* sp. 1, *Brachydiplax* sp. 1, *Diplacodes trivialis*, *Cratilla* sp. 1, *Orthetrum sabina* and *Acisoma panorpoides*). In May-Juni 2004, *N. fluctuans* was the dominant species. All taxa are new records for the area as there has been no study conducted previously.] Address: Idris, A.B., Center for Insect Systematics Faculty of Science and Technology Universiti Kebangsaan Malaysia 43600 UKM Bangi, Selangor D.E. Malaysia. E-mail: idrisgh@ukm.my

8320. Ingram, S. (2009): Dragonflies: Marvels of the meadows. *SierraScapes*. The Newsletter of the Eastern Sierra Land Trust. Spring 2009: 2. (in English) [General on Odonata.] Address: www.easternsierralandtrust.org

8321. Iserbyt, A.; Bots, J.; Ting, J.J.; Jvostov, F.P.; Forbes, M.R.; Sherratt, T.N.; Van Gossum, H (2009): Multi-annual variation in female morph frequencies of the polymorphic damselfly, *Nehalennia irene*, at continental and regional scales. *Animal Biology* 59(3): 313-326. (in English) ["Female-limited polymorphism occurs in different animal taxa but is particularly abundant among species of damselflies, most likely as a consequence of selection to avoid excessive male harassment. Recent work *N. irene* indicated that within year spatial variation in female morph frequencies was limited in nearby populations (i.e. intra-regional scale), but large at a continental scale. As anticipated, some of the observed variation in morph frequency was correlated with variation in the estimated degree of male harassment towards female morphs, measured by male density and operational sex ratio. Here, we extended earlier work by quantifying variation in morph frequency over two to three years, allowing us to elucidate how morph frequencies vary temporally at both intra-regional and continental scales (data for 8 populations over three years and for 33 populations over two years, respectively). Annual variation in morph frequencies was relatively high at the intra-regional scale, but was never large enough to obscure the underlying spatial pattern at the continental scale. At both geographic scales, male density and operational sex ratio were highly variable between years. The estimated degree of male harassment correlated with variation in morph frequency within some regions, but not all. Together, the observed natural variation in female morph frequencies may be partly explained by variation in male harassment, but it appears that a complete understanding will require considering the role of other environmental factors." (Authors)] Address: Iserbyt, A., Evolutionary Ecology Group, University of Antwerp, Groenenborgerlaan 171, B-2020 Antwerp, Belgium

8322. IUCN (2009): Odonata Facts. The IUCN Red List of Threatened Species™ 2009 update: 2 pp. (in

English) [*Chlorocypha centripunctata*] – VU known from very few areas in southeast Nigeria and southwest Cameroon, Africa, and *Arabicnemis caerulea* – VU known from Yemen, northeast Oman and the north of the United Arab Emirates are added to the list of threatened Odonata.] Address: Clausnitzer, Viola, Friedländer Weg 53, 37085 Göttingen, Germany. E-mail: violacl@t-online.de

8323. Iwata, S.; Watanabe, M. (2009): Spatial distribution and species composition of larval Odonata in the artificial reed community established as a habitat for *Mortonagrion hirosei* Asahina (Zygoptera: Coenagrionidae). *Odonatologica* 38(4): 307-319. (in English) ["Yearly changes in the odonate larval community were surveyed for 4 year after setting up an artificial reed community adjacent to the original habitat of *M. hirosei*, an endangered brackish water species. Only *M. hirosei* larvae were found in the original habitat during the survey period. In the first year of the established habitat, *Ischnura senegalensis* was the dominant species in the larval community. Although the abundance of *M. hirosei* larvae increased year by year, becoming the most abundant species after the second year, the species composition of the larval community of the established habitat was different between the West and East because of environmental factors, such as saline concentration and reed shoot density. *M. hirosei* larvae had expanded their distribution to the entire area of the established habitat in 2005, while the distribution of *I. senegalensis* had been restricted to several patchy areas in accordance with a decrease in their population. There was a negative relationship between the number of *M. hirosei* and *I. senegalensis* larvae. The prey-predator relationship and competitive relationship between the 2 species should have affected the population dynamics and distribution of *M. hirosei*. The odonate larval community and habitat environment that is optimal for *M. hirosei* conservation are discussed from the viewpoint of both biotic and abiotic factors.] Address: Iwata, S., Graduate School of Environmental Sciences, University of Tsukuba, Tsukuba, Ibaraki 305-8572, Japan. E-mail: shukoaiwa@hotmail.com

8324. Jana, S.; Pahari, P.R.; Dutta, T.K.; Bhattacharya, T. (2009): Diversity and community structure of aquatic insects in a pond in Midnapore town, West Bengal, India. *Journal of Environmental Biology* 30(2): 283-287. (in English) [In total, 20 species of aquatic insects have been recorded from a weed infested pond. Odonata were the most abundant group constituting of 54% of the total aquatic insects. *Urothemis signata* was a eudominant species. *U. signata*, *Agriocnemis pygmaea* and *Enallagma parvum* have been recorded from Paschim Medinipore district for the first time.] Address: Bhattacharya, T., Department of Zoology, Vidyasagar University, Midnapore - 721 102, India. E-mail: prof.t.bhattacharya@gmail.com

8325. Johnson, A. (2009): Dragonflies and Damselflies in Your Pocket: A Guide to the Odonates of the Upper Midwest. *Bur Oak Guides*. University of Iowa Press. ISBN-10: 1587297868: laminated fold-out guide. (in English) [This laminated fold-out guide introduces us to some 50 odonates of the Upper Midwest, USA. Ann Johnson includes common and scientific names, sizes, general flight seasons, and the best habitats in which to find each species. Any more in Odonata experienced user will ask, what such a field guide is good for? May

be that a first insight into the different families of Odonata will be possible. This "guide" is sold for 10 US \$. You can waste your money, or you can buy one of the good US-field guides that work. (Martin Schorr) Address: <http://www.uipress.uiowa.edu/books/2009-spring/johnson-dragons.htm>

8326. Jovic, M.; Mihajlova, B. (2009): Catalogue of the Odonata collection in the Macedonian museum for natural history. *Acta entomologica serbica* 14(2): 133-146. (in English, with Serbian summary) ["The Odonata collection in the Macedonian Museum of Natural History is the most comprehensive collection of this insect order in Macedonia. It is comprised of 1344 specimens, belonging to 46 species. The oldest specimens were collected in 1938, while the freshest material was collected in 2009. This period of time, about 70 years long, presents respectable continuity in collecting Odonata. Unfortunately, explorations didn't equally cover the given period of time and the area from which the entomological material originated. This catalogue includes data on *Lestes parvidens*, which is a new species for Macedonian fauna. New data on the distribution of *Aeshna juncea* and *Gomphus schneiderii* in Macedonia are briefly commented on." (Authors) The collections also includes a few records from Bosnia and Herzegovina, Serbia, Greece and Turkey.] Address: Jovic, M., Natural History Museum Belgrade, Njegoševa 51, P.O. Box 401, YU-11000 Belgrade, Serbia. E-mail: milos.jovic@nhmbeo.rs

8327. Jovic, M.; Andjus, L.; Santovac, S. (2009): New data on some rare and poorly known Odonata species in Serbia. *Bulletin of the Natural History Museum* 2: 95-108. (in English, with Serbian summary) ["In spite of the relatively long tradition of studies on Odonata fauna in Serbia, its territory remains a "blank space" on distribution maps of many European Odonata species. The real distribution of almost all species is poorly known, so this paper presents new data on the least known species (*Lestes viridis*, *Erythromma lindenii*, *Brachytron pratense*, *Anax parthenope*, *A. ephippiger*, *Cordulegaster heros*, *Somatochlora flavomaculata*, *S. metallica*, *Epitheca bimaculata* and *Sympetrum vulgatum*), including overview based on modern tendencies in taxonomy. Also included is a comment on the needs and present state of conservation of certain species as natural rarities and assets of Serbia." (Authors)] Address: Jovic, M., Natural History Museum Belgrade, Njegoševa 51, P.O. Box 401, YU-11000 Belgrade, Serbia. E-mail: milos.jovic@nhmbeo.rs

8328. Junichi, T.; Motoharu, F.; Yoshitaka, T. (2009): Genetic diversity of the dragonfly *Libellula angelina* in the Okegayanuma area of Japan. *Japanese Journal of Conservation Ecology* 14(1): 73-79. (in Japanese, with English summary) ["The genetic diversity and differentiation among 60 individuals of the threatened dragonfly species *Libellula angelina* from three populations in the Okegayanuma area of Japan was determined using random amplified polymorphic DNA (RAPD) analysis. Twenty polymorphic loci were detected by 19 of the 80 RAPD primers examined, and 12 DNA types were determined (only four types were population specific). The diversity among and within the populations was lower; the mean gene diversity and gene differentiation values were 0.317 and 0.007, respectively. No significant between-population genetic differences were detected in the analysis of molecular variance (AMOVA). Of the ge-

netic divergence, 98.7% was attributable to population divergence and 1.3% to individual differences within a population. Cluster analysis indicated that most individuals from the three populations belonged to the same cluster. Our results provide data that could be used to elucidate genetic diversity in *L. angelina* populations, using RAPD analysis." (Authors)] Address: not available

8329. Kadoya, T.; Suda, S.; Washitani, I. (2009): Dragonfly crisis in Japan: A likely consequence of recent agricultural habitat degradation. *Biological Conservation* 142(9): 1899-1905. (in English) ["Many Japanese dragonfly species depend on habitat complexes maintained in rice paddy systems. We postulated that recent alterations to habitat complexes in paddy systems have had adverse effects on dragonfly populations, especially those 'once common species' that have come to depend primarily on paddy systems following losses of natural floodplain habitats. A high proportion of Japanese lentic dragonfly species depends on paddy fields or agricultural ponds that have been extensively degraded, while lotic species can often use both paddies and natural river systems. Thus we also postulated that lentic species are more susceptible to changes in agricultural habitats and are subject to higher extinction risks than lotic species. We aimed to extend previous work on estimating dragonfly extinction risk by developing mechanistic insights into the processes involved. Postulates were tested by analyzing relationships between (1) previous quantitative extinction risk assessments for dragonfly species and (2) species' ecological characteristics (i.e., distribution range and habitat type [lentic or lotic]). Lentic species were disproportionately represented among those with elevated extinction risk. Species with large distribution ranges were also subject to higher extinction risks than those with narrower ranges, reflecting a driving force acting at a national scale (i.e., intensive degradation of paddy systems)." (Authors)] Address: Kadoya, T., Dept Ecosystem Studies, Institute of Agriculture & Life Sci., Univ. Tokyo, 1-1-1 Yayoi, Bunkyo-ku, Tokyo 113-8657, Japan. E-mail: kadoya@e-mail.jp

8330. Kaize, J.; Kalkman, V.J. (2009): Records of dragonflies from kabupaten Merauke, Papua, Indonesia collected in 2007 and 2008 (Odonata). *Suara Serangga Papua* 4(2): 40-45. (in English, with Indonesian summary) ["Odonata were collected in the period 9 July to 4 August 2007 and 4 to 16 June 2008 in the surroundings of Merauke, Papua province, Indonesia. In total 37 species were recorded during the fieldwork bringing the number of species known for the area to 42. It is estimated, that this is about half of the species present in the area. Of the 42 species recorded from the Merauke area 38 belong to the families of Coenagrionidae and Libellulidae. None of the genera endemic to New Guinea were recorded during the fieldwork and only one (*Hemicordulia silvarum* Ris, 1913) of the recorded species is endemic to New Guinea. The results seem to suggest that —compared to the central mountain range or the area in the north of New Guinea— the southern parts of New Guinea have an impoverished fauna. Further fieldwork in the area should be held in different seasons and should try to sample along running waters." (Authors)] Address: Kaize, J., 1d/a Kelompok Entomologi Papua, Kotakpos 1078, Jayapura 99010, Indonesia. Email: jexluz@yahoo.com

8331. Kalkman, V.J.; van Mastrigt, H.; Richards, S.J. (2009): First records of dragonflies (Odonata) from the

Foja Mountains, Papua Province, Indonesia. *Suara Serangga Papua* 4(1): 14-19. (in English, with Indonesian summary) ["A small collection of dragonflies obtained during two RAP biodiversity surveys to the Foja Mountains, organised by Conservation International with help of LIPI, Bogor, in 2005 and 2008 are brought on record. Twelve species were found at two sites below 100 m near Kwerba, a small village adjacent to the Mamberamo River. Thirteen species were recorded at 'Moss Camp' at 1650 m in the Foja Mountains. Of these *Hemicordulia ericetorum* was previously only known from the central mountain range while *Oreoeschna dictatrix* was only known from Lake Paniai and the Cyclops Mountains. It is likely that more genera and species now known only from the central mountain range occur in the Foja Mountains and probably also the Van Rees Mountains. However one species, *Argiolestes* spec. nov. is probably endemic to the Foja Mountains. Although this collection includes only a small fraction of the diversity likely to be present in the mountains it is nonetheless of interest as it represents the first records of dragonflies from the area." (Author)] Address: Kalkman, V.J., European Invertebrate Survey - Nederland, p/a naturalis, Postbus 9517, 2300 RA Leiden, The Netherlands. E-mail: kalkman@naturalis.nl

8332. Kalnins, M. (2009): Lesser Emperor *Anax parthenope* (SELYS, 1839) (Odonata: Aeshnidae) – a new dragonfly species in Latvia. *Latvijas Entomologs* 47: 16-20. (in English) ["In 2008 and 2009, *A. parthenope* has been found at five localities in Latvia. The dragonfly is a new species for Latvian fauna. 59 dragonfly species of nine families have been recorded in Latvia so far, inter alia two or three temporary immigrants and one species with unclear status." (Author)] Address: Kalnins, M., Nature Protection Agency, Bazn cas iela 7, LV-2150, Sigulda, Latvia. E-mail: martins.kalnins@daba.gov.lv

8333. Karjalainen, S (2009): Sudenkorentojen aikaisimmat ja myöhäisimmät aikuishavainnot Suomessa [The earliest and latest observations of dragonflies in Finland]. *Crenata* 2: 39-43. (in Finnish) [Tabulated abstract of the phenological basic data of all Finnish species available from literature or data bank resource is presented. (Asmus Schröter)] Address: not stated

8334. Kishida, O.; Trusseli, G.C.; Nishimura, K. (2009): Top-down effects on antagonistic inducible defense and offense. *Ecology* 90(5): 1217-1226. (in English) ["Antagonistic phenotypic plasticity may strongly influence trait evolution in tightly interacting predator-prey pairs as well as the role that trait plasticity plays in community dynamics. Most work on trait plasticity has focused on single predator-prey pairs, but prey must often contend with multiple predators in natural environments. Hence, a better understanding of the evolutionary and ecological significance of phenotypic plasticity requires experiments that examine how multiple predators shape prey trait plasticity. Here, using a simple food chain consisting of a top predator (dragonfly larvae, *Aeshna nigroflava*), an intermediate predator (salamander larvae, *Hynobius retardatus*), and frog (*Rana pirica*) tadpoles as prey, we show that the presence of dragonfly risk cues substantially modifies the intensity of antagonistic morphological plasticity in both amphibians. In the absence of dragonflies, tadpoles produced bulgier bodies in response to salamanders, and salamanders responded to this defense by enlarging their gape size. However, in the presence of dragonfly risk cues, the ex-

pression of both antagonistic traits was significantly reduced because tadpoles and salamanders produced phenotypes that are more effective against dragonfly predators. Thus, the reduced antagonism likely emerged, in part, because the benefits of antagonistic trait expression were outweighed by the potential cost of increased vulnerability to dragonfly predation. In addition, our results suggest that when all three species were present, salamander activity levels, which influence the amount of signals required to induce antagonistic traits, were more strongly affected by dragonfly risk cues than were tadpole activity levels. This species-specific difference in activity levels was likely responsible for the reduced tadpole mortality caused by salamanders in the presence vs. absence of dragonfly risk cues. Hence, dragonflies had a positive trait-mediated indirect effect on tadpoles by modifying both the morphological and behavioral traits of salamanders." (Authors)] Address: Kishida, O., Center for Ecological Research, Kyoto University, Otsu, Shiga 520-2113 Japan. E-mail: bulgytadpoles@hotmail.com

8335. Knijf, G. de (2009): Waarneming van de Zadelibel (*Anax ephippiger*) in centrum Brussel (België) [Recent observation of *Anax ephippiger* in the city centre of Brussels (Belgium)]. *Nieuwsbrief Libellenvereniging Vlaanderen* 3(2): 4-6. (in Dutch, with English summary) ["At lunchtime of the 9th of May an adult male of *A. ephippiger* was seen flying 1 meter above the buildings of INBO (15 meter above ground level) in Brussels. It came straight from the south and continued flying northwards at the same altitude. This illustrates the inconspicuous movements and migration of *A. ephippiger* and the difficulties to detect the species outside its reproduction sites. A short overview of all observations from Belgium (4 published and 1 unpublished) are given. We further discuss the probability when to detect this species in Belgium and its possible origins." (Author)] Address: Knijf, G. de, Instituut voor Natuurbehoud, Kliniekstraat 25, B-1070 Brussel, Belgium. E-mail: geert.deknijf@inbo.be

8336. Knill-Jones, S. (2009): Reports from Costal Stations - 2008: Isle of Wight. *Atropos* 36: 43-44. (in English) [UK; *Anax parthenope*, *Libellula fulva*, *Cordulia aenea*, *Erythromma najas*, *Brachytron pratense*, *Sympetrum danae*] Address: not stated

8337. Kobingi, N.; Raburu, P.O.; Masese, F.O.; Gichuki, J. (2009): Assessment of pollution impacts on the ecological integrity of the Kisian and Kisat rivers in Lake Victoria drainage basin, Kenya. *African Journal of Environmental Science and Technology* 3(4): 097-107. (in English) ["Macro-invertebrate assemblages were used as bioindicators to assess the ecological integrity of Rivers Kisat (influenced by urban development) and Kisian (influenced by agriculture) using community attributes and the Index of Biotic Integrity. Six stations, three per river, were selected to correspond to different impact types and intensities along the rivers. Physico-chemical parameters and nutrients were determined for each station on a monthly basis from November 2007 to April 2008. Two-way analysis of variance was used to compare water quality and nutrient parameters, and macro invertebrate community attributes between the two rivers, with the river and station as the main factors. Significant differences were accepted at 95% confidence level. There were inconsistencies in the variation of physico-chemical parameters along the two rivers.

However, River Kisat recorded higher values for all physico-chemical parameters considered, except pH and DO. Different indices and metrics representing the structural and functional organization of macro invertebrates were computed and evaluated for responsiveness to physico-chemical parameters and nutrient levels. Macro invertebrate diversity, richness and evenness values failed to delineate stations according to the different levels of degradation they were experiencing. However, the differences were captured by the index of biotic integrity, which separated stations into different classes of quality. River Kisat stations in urban areas scored lowest index values, less than 15 out of 25, while two river Kisian stations scored the highest value, more than 19. The index provided evidence of response to changes in ecosystem integrity exhibited by resident macro invertebrate assemblages to pollution arising from both point and nonpoint sources." (Authors) Aeshna sp. and Gomphus sp. are well represented in Kisian River, and only Aeshna sp. is very rare in Kisat River. As regrettably of often, taxonomic work was processed by using identification keys of non-African handbooks.] Address: Kobingi, Nyakeya, Kenya Marine & Fisheries Research Institute (KMFRI), P. O. Box 1881 Kisumu, Kenya. E-mail: kobnyakeya@yahoo.com.

8338. Koch, B.; Wildermuth, H.; Walter, T. (2009): Einfluss der Habitategenschaften auf das Verbreitungsmuster von *Coenagrion mercuriale* an einem renaturierten Fließgewässer im Schweizer Mittelland (Odonata: Coenagrionidae). *Libellula* 28(3/4): 139-158. (in German, with English summary) ["Only few and isolated populations of the Southern Damselfly exist in Switzerland and the species is considered as critically endangered. The recent discovery of a hitherto unknown population of *C. mercuriale* on a revitalized stream in the Canton of Zurich caused a study to be made on the size and the distribution pattern of the population along a heterogeneously structured 2.15 km-stretch. In summer 2007, the abundance of *C. mercuriale* was recorded at 215 sections and data on physical parameters were collected. The results of statistical analyses showed that the distribution pattern of *C. mercuriale* was significantly affected by the width of the watercourse, depth of the water, cover of the water vegetation, cover and width of the riparian vegetation and cover by trees higher than three metres. The composition of the riparian vegetation that could be classified into six different groups using a cluster analysis also exhibited an effect on the distribution. *Coenagrion mercuriale* preferred sites with relatively wide and deep water, luxuriant aquatic vegetation, wide intermittent but jaggy riparian vegetation and little cover by trees shading the water surface. Riparian vegetation that was mainly composed of *Carex* spp., *Lythrum salicaria* or *Phalaris arundinacea* was most densely colonized by *C. mercuriale*. In contrast, sections overgrown predominantly by *Filipendula ulmaria* and *Epilobium hirsutum* were generally avoided. Additionally, data on the local dragonfly fauna were collected and 14 streams in the neighbourhood of the study site were examined for their suitability for colonization by *C. mercuriale*. In total 21 Odonata species were recorded. Maintenance of the habitat by patchy clearance of dense riparian vegetation, aiming at the promotion of the local population, was conducted in the frame of a conservation programme in late 2007 and early 2008. Censuses carried out during the flying season 2008 showed that the measures adopted had a positive effect on *C. mercuriale*.] Address: Koch, Bärbel,

Via Grütli 21, CH-6855 Stabio, Switzerland. E-mail: baerbel.koch@hotmail.com

8339. Kolozsvári, I.; Illar, L. (2009): A Tisza tiszaujlaki szakaszán élő szitakötőfajok faunisztikai felmérése. *Acta Beregsasiensis* 8(1): 231-240. (in Hungarian, with Russian summary) [Study along a stretch of the Tisza-river in Hungaria with focus on *Onychogomphus forcipatus*, *Ophiogomphus cecilia*, *Stylurus flavipes*, *Platycnemis pennipes*, and *Calopteryx splendens*.] Address: Kolozsvári, I., II. Rákóczi Ferenc Kárpátaljai Magyar Főiskola, 4. éves biológia-földrajz szakos hallgató, Hungaria

8340. Koskimäki, J.; Rantala, M.J.; Suhonen, J. (2009): Wandering males are smaller than territorial males in the damselfly *Calopteryx virgo* (L.) (Zygoptera: Calopterygidae). *Odonatologica* 38(2): 159-165. (in English) ["In territorial Odonata, adult males may use 2 mating tactics that may be genetically or environmentally determined: territoriality and non-territoriality. The non-territorial tactic has been sometimes found to include 2 additional males: sneaking and wandering. The non-territorial males, however, often have lower reproductive success than territorial males. Studies on various *Calopteryx* species have repeatedly shown that territorial and non-territorial behaviours are conditional mating tactics and that body size does not predict male resource-holding potential and territorial behaviour. Instead, the resource holding potential seems to depend on the amount of male fat resources. Here, both territorial and wandering *C. virgo* males were collected from a creek in central Finland. It was found that territorial males were larger and heavier than wandering males. The data show that the size of the individual may predict the reproductive tactic of some odonate males to a greater degree than previously thought." (Authors)] Address: Suhonen, J., Sect. Ecology, Dept Biol., Univ. Turku, FIN-20014 Turku, Finland. E-mail: juksuh@utu.fi

8341. Koskinen, J. (2009): Kuutyönkorento ja aapaikiitokorento Suomessa 2008 [*Coenagrion lunulatum* and *Somatochlora alpestris* in Finland 2008]. *Crenata* 2: 2-4. (in Finnish) [In 2008 the national monitoring project laid special emphasis on two target species due to the fact that their distribution pattern and ecology in Finland is not well understood. (Asmus Schröter)] Address: not stated

8342. Koskinen, J.; Mäkinen, J. (2009): Korentokatsaus 2008 [Dragonfly review for 2008]. *Crenata* 2: 8-31. (in Finnish) [The article gives a detailed overview and analysis of the observation data of the national monitoring project and points out the number of records and the phenology of every species in 2008. The commonest dragonfly and damselfly were *Aeshna grandis* and *Coenagrion hastulatum*, whereas *Somatochlora sahlbergi*, *Aeshna viridis* and *Nehalennia speciosa* were seen only once each. Moreover *Aeshna affinis* was observed in Finland for the first time. (Asmus Schröter)] Address: not stated

8343. Kosterin, O.E.; Sivtseva, L.V. (2009): Odonata of Yakutia (Russia) with description of *Calopteryx splendens njuja* ssp. nov. (Zygoptera: Calopterygidae). *Odonatologica* 38(2): 113-132. (in English) ["A short overview of the history of odonatological exploration of Yakutia and an annotated checklist of 35 species currently known from its territory are provided with reference to all earlier records and lists of hitherto unpublished spe-

cimens. *Calopteryx splendens*, *Aeshna grandis* and *Ophiogomphus obscurus* were not previously known from Yakutia. *C. splendens njuja* ssp. n. is described and illustrated. Holotype male: Russia, Sakha Republic, Yakutia: Lena Ulus, the Nyuya river at the mouth of the Chayanda; 14-VII-2006; deposited in Institute of Animal Systematics and Ecology, Novosibirsk. It is characterised by a drastic reduction of wing pigmentation in males." (authors)] Address: Kosterin, O.E., Institute Cytology & Genetics, Siberian Branch, Russian Academy of Sciences, Lavrentiev Ave 10, RUS-630090 Novosibirsk, Russia. E-mail: kosterin@bionet.nsc.ru

8344. Kosterin, O.E.; Lyubchanskii, I.I. (2009): Odonata collection from the Bureinskii State Nature Reserve, Khabarovskii Krai, Russia. *Notulae odonologicae* 7(3): 25-27. (in English) ["11 species, all boreal, were collected in 2004-2005 in the Reserve, which is situated within the larch taiga zone of the Russian Far East, ca 52°N and 500-2175 m a.s.l. Interesting is the presence of *Somatochlora sahlbergi*, but the southernmost locality of this species is on the Sokhondo Mt in Transbaikalia." (Authors)] Address: Kosterin, O.E., Institute of Cytology and Genetics, Siberian Branch, Russian Academy of Sciences, Lavrentiev Ave 10, RUS-630090 Novosibirsk, Russia. E-mail: kosterin@bionet.nsc.ru

8345. Krilowicz, C. (2009): Congregating Odes. *Argia* 21(1): 8. (in English) [oas 25: Cape May, New Jersey, USA. "I then stopped and decided to look more closely for *S. ambiguum*. To my surprise I was surrounded by them. Earlier, I had unsuccessfully been searching in all the local ponds and surrounding fields for this species. My count for this area was 60 males and 8 females with four of those in a wheel. I am not 100% sure why all these bugs were here. The dominant activity was basking and mating. I did not make any observation of feeding behavior. I could only conclude that there was something unique about this site that attracted so many individuals. The date was 14 October 2008 and it happened to be a new late date for New Jersey. On 22 October 2008 I decided to look for *Aeshna umbrosa* in Atlantic County where it had not been recorded. I picked Makepeace Wildlife Management Area in Mayes Landing. While slowly driving down a deserted blacktop drive surrounded by overgrown pines a small bug hit my windshield. I stopped the car and jumped out. It was a *Lestes* congener and I was able to photograph and collect it. I decided to walk this section of road. By the time I finished my tally, I counted 50 male and 10 female *L.* congener and one *S. ambiguum* (late dates are fleeting). I never expected to see this spreadwing here, for it is an Atlantic County record and I had no idea where there was any standing water nearby. Only 100 yards away is a very large vernal pool which was completely dry. Again I did not observe any feeding behaviour and none were in a wheel. I wonder why they all decided to congregate here? May be just another location to pick a mate." (Author)] Address: Krilowicz, C., Haddonfield, NJ, USA. E-mail: chippop@verizon.net

8346. Kriska, G.; Bernath, B.; Farkas, R.; Horvath, G. (2009): Degrees of polarization of reflected light eliciting polarotaxis in dragonflies (Odonata), mayflies (Ephemeroptera) and tabanid flies (Tabanidae). *Journal of Insect Physiology* 55: 1167-1173. (in English) ["With few exceptions insects whose larvae develop in freshwater possess positive polarotaxis, i.e., are attracted to sources of horizontally polarized light, because they detect

water by means of the horizontal polarization of light reflected from the water surface. These insects can be deceived by artificial surfaces (e.g. oil lakes, asphalt roads, black plastic sheets, dark-coloured cars, black gravestones, dark glass surfaces, solar panels) reflecting highly and horizontally polarized light. Apart from the surface characteristics, the extent of such a 'polarized light pollution' depends on the illumination conditions, direction of view, and the threshold p^* of polarization sensitivity of a given aquatic insect species. p^* means the minimum degree of linear polarization p of reflected light that can elicit positive polarotaxis from a given insect species. Earlier there were no quantitative data on p^* in aquatic insects. The aim of this work is to provide such data. Using imaging polarimetry in the red, green and blue parts of the spectrum, in multiple-choice field experiments we measured the threshold p^* of ventral polarization sensitivity in mayflies, dragonflies and tabanid flies, the positive polarotaxis of which has been shown earlier. In the blue (450 nm) spectral range, for example, we obtained the following thresholds: dragonflies: *Enallagma cyathigerum* ($0\% < p^* 17\%$), *Ischnura elegans* ($17\% p^* 24\%$). Mayflies: *Baetis rhodani* ($32\% p^* 55\%$), *Ephemera danica*, *Epeorus silvicola*, *Rhithrogena semicolourata* ($55\% p^* 92\%$). Tabanids: *Tabanus bovinus*, *T. tergestinus* ($32\% p^* 55\%$), *T. maculicornis* ($55\% p^* 92\%$)." (Authors)] Address: Horvath, G., Bio-optics Laboratory, Dept of Biological Physics, Loránd Eötvös University, 1117 Budapest, Pázmány Péter sétány 1, Hungary. E-mail: gh@arago.elte.hu

8347. Kukulova-Peck, J. (2009): Carboniferous protodonatoid dragonfly nymphs and the synapomorphies of Odonoptera and Ephemeroptera (Insecta: Palaeoptera). *Palaeodiversity* 2: 169-198. (in English, with German summary) ["Three extremely rare fossil protodonatoid dragonfly nymphs are described from the middle Pennsylvanian (Moscowian) of Mazon Creek, Illinois: *Dragonympha srokai* n. gen., n. sp. (Meganisoptera), a large, nearly complete young nymph with an extended labial mask and uplifted wing pads; *Alanymphe richardsoni* n. gen., n. sp. (Meganisoptera), a nymphal forewing with two articular plates attached to it; and *Carbonympha herdinae* n. gen., n. sp. (Eomeganisoptera), a detached nymphal forewing. Plesiomorphic states in *Dragonympha* n. gen. indicate homologies unresolved in modern Odonata. The segmented head bears 3rd tergum ventrally invaginated. The extended labial mask still shows limb segments. The prothorax bears a pair of winglets. The short wing pads are fully articulated, twisted, uplifted and streamlined with body. The mesothoracic anepisternum is placed between acrotergite and prescutum. The abdominal leglets form long, segmented, serial gill filaments. In the ontogenesis of modern dragonflies, the wing and articulation disc occurs just above subcoxal pleuron and far from tergum. Wing sclerites are arranged in eight rows protecting eight blood pathways running towards eight wing veins. The sistergroup of Odonoptera has not yet been convincingly resolved with computer cladistic approaches. Reasons are examined and discussed. More accurate, evolution-based character evaluations are shown with examples. The role of a correct model of the pan-arthropod limb and the origin of insect wings is discussed. Groundplan characters in dragonflies and mayflies are compared in their Paleozoic and modern states, their obscurity is clarified and complex synapomorphies are proposed. Palaeoptera is confirmed as a monophyletic group and the following sistergroup relationships are

suggested: Pterygota = Palaeoptera + Neoptera; Palaeoptera = Palaeodictyopteroidea + Hydropalaeoptera; Hydropalaeoptera = Odonatoptera + Ephemeroptera." (Author)] Address: Kukulova-Peck, Jarmila, Department of Earth Science, Carleton University, Ottawa K1S 5B6, Ontario, Canada. E-mail: jarmilapeck@carleton.ca

8348. Kunz, B. (2009): Fehlbildungen der Flügel bei *Libellula depressa* (Odonata: Libellulidae). *Libellula* 28 (3/4): 175-182. (in German, with English summary) ["A teneral female *L. depressa* with one heavily malformed wing, and another individual with completely missing wings were found in June 2008 at two ponds that had been constructed in September 2006. During 2008 *L. depressa* emerged from these ponds in great numbers. The malformations may have been caused by injuries of the wing structures in the larval stage, inflicted by crowded fellow larvae in the newly established ponds with low prey density." (Author)] Address: Kunz, B., Hauptstr. 111, D-74595 Langenburg, Germany. E-mail: libellen@berndkunz.de

8349. Lak, M.; Fleck, G.; Azar, D.; Engel, M.S.; Kad-dumi, H.F.; Neraudeau, D.; Tafforeau, P.; Nel, A. (2009): Phase contrast X-ray synchrotron microtomography and the oldest damselflies in amber (Odonata: Zygoptera: Hemiphlebiidae). *Biol. Jour. Linnean Soc.* 156(4): 913-923. (in English) ["*Electrohemiphlebia barucheli* gen. et sp. nov. and *Jordanhemiphlebia electronica* gen. et sp. nov., two new genera and species are described, based on exceptional inclusions of hemiphlebiid damselflies in Cretaceous amber from France and Jordan. The type specimen of *E. barucheli* was studied using phase contrast X-ray synchrotron microtomography, giving exceptional images and detailed information. Its comparison with the recent *Hemiphlebia mirabilis* confirms the attribution of several Cretaceous damselflies to the Hemiphlebiidae, showing that this particular group was widespread in the Early Cretaceous and probably originated in the Late Jurassic or earlier. The ecological niches today occupied by the small coenagrionoid damselflies were occupied during the Triassic and Jurassic by Protozygoptera, hemiphlebiids during the Early Cretaceous, and modern taxa in the Cenozoic." (Authors)] Address: Nel, A., Lab. Ent. Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: anel@cimrs1.mnhn.fr

8350. Larison, B. (2009): Impacts of environmental heterogeneity on alternative mating tactics in the threadtail damselfly. *Behavioral Ecology and Sociobiology* 63(4): 531-536. (in English) ["Environmental heterogeneity, including variation in the physical environment, may be key to understanding the evolution and maintenance of alternative mating tactics, but its influence is rarely examined. Males of the threadtail damselfly *Protoneura amatoria* reversibly use two alternative mating tactics (perching vs. hovering) and have previously been found to modulate their use of these tactics in response to variation in both light conditions and the density of ovipositing females. Here, I show that mating success payoffs of the two tactics are differentially influenced by these factors. The payoff of the perching tactic was greater than that of the hovering tactic under low light conditions and at low densities of ovipositing females. The payoff of the hovering tactic was greater under high light conditions and higher densities of ovipositing females. The differential success of the two mating tactics in response to light conditions is dis-

cussed in light of flight dynamics, vision, and predation." (Author)] Address: Larison, Brenda Dept Ecology & Evolutionary Biology, Univ. of California, Los Angeles, 621 Charles E. Young Drive So., Los Angeles, CA 90095, USA. E-mail: blarison@ucla.edu

8351. Larkin, P.V. (2009): Photospot: Emporor Anax imperator. *Atropos* 37: 64. (in English) [16-VI-2009, Brockholes Quarry, Lancashire, UK] Address: not stated

8352. Lasley, G.W.; Abbott, J.C. (2009): Two New Damselflies for Texas. *Argia* 21(3): 17-18 (in English) [Mature male *Leptobasis vacillans*, Santa Ana National Wildlife Refuge in Hidalgo Co., Texas, 9-VI-2009. Male *Nehalennia gracilis*, Beaver Ponds in Angelina National Forest, Jasper Co., Texas, 15-VI-2009] Address: Abbott, J.C., Patterson Labs 219, School of Bio. Sci., University of Texas, Austin TX 78712, USA. E-mail: jcabott@mail.utexas.edu

8353. Lau, D.C.P.; Leung, K.M.Y.; Dudgeon, D. (2009): What does stable isotope analysis reveal about trophic relationships and the relative importance of allochthonous and autochthonous resources in tropical streams? A synthetic study from Hong Kong. *Freshwater Biology* 54: 127-141. (in English) ["1. Analysis of the stable isotope signatures of carbon (C) and nitrogen (N) of foods and consumers has led to some preliminary understanding of the relative importance of autochthonous and allochthonous resources in tropical streams. However, robust generalizations about the dynamics of food webs in these habitats, and their response to shading gradients or season, are still lacking. In addition, the feasibility of employing a baseline $\delta^{15}\text{N}$ value for estimating trophic positions (TPs) of consumers in small tropical streams has yet to be explored. 2. We analysed data on stable isotope signatures of food sources and aquatic consumers obtained from 14 studies carried out in small streams in monsoonal Hong Kong (22 30'N, 114 10'E) between 1996 and 2006. Emphasis was placed on determining the relative importance of leaf litter and autochthonous foods in supporting consumer biomass, and the extent to which trophic base and TP vary among streams and seasons. 3. Although allochthonous leaf litter was generally ^{13}C - and ^{15}N -depleted relative to autochthonous foods, there were marked isotopic shifts of food sources and consumers in response to season (dry versus wet) and stream shading. Consumer taxa were generally more ^{13}C - and ^{15}N -enriched in the unshaded streams, but seasonal effects were more variable. Despite these changes, there was consistent evidence that stream food webs were based on periphytic algae and/or cyanobacteria with leaf litter serving as a minor food. 4. Heptageniidae (Ephemeroptera), Tipulidae (Diptera), Elmidae (Coleoptera) and shrimps (Atyidae) were used as a baseline for calculating the TPs of other consumer taxa. The maximum TPs in shaded streams remained fairly constant between seasons (dry = 3.93; wet = 3.97), while those in unshaded streams were higher and showed seasonal fluctuations (dry = 5.13; wet = 4.39). 5. Although variations in consumer isotope signatures in response to season and shading gradients did not confound our interpretation of the stream food base, changes in consumer $\delta^{15}\text{N}$ did affect the calculation of consumer TPs. Misleading estimates of consumer TPs are likely if samples are collected from a narrow range of streams and/or during one season. Overestimation of

the TPs of specialist herbivores (e.g. fish grazers) is also possible when autochthonous resources are substantially more ¹⁵N-enriched than allochthonous foods." (Authors) The study includes *Euphaea decorata*.] Address: Dudgeon, D., Division of Ecology & Biodiversity, School of Biological Sciences, The University of Hong Kong, Pokfulam Road, Hong Kong, China. E-mail: ddudgeon@hkucc.hku.hk

8354. Le Viol, I.; Mocq, J.; Julliard, R.; Kerbiriou, C. (2009): The contribution of motorway stormwater retention ponds to the biodiversity of aquatic macroinvertebrates. *Biological Conservation* 142(12): 3163-3171. (in English) ["Biodiversity conservation does predominantly focus on protected natural areas, but has to consider also the usually Human-dominated matrix in which these natural areas are embedded. Here we study highway stormwater retention ponds, which may act as refuges for native flora and fauna and contribute to the maintenance of biodiversity in Human-dominated landscapes. However, the biodiversity supported by such artificial ponds has received little attention so far. Using standardised methods, we addressed the potential role of highway stormwater ponds as refuges by comparing aquatic macroinvertebrate communities (Coleoptera, Heteroptera, Odonata and Gastropoda) in highway stormwater ponds with ponds in the wider landscape. As expected from their pollutant retention function, highway ponds differed in abiotic conditions from surrounding ponds. However, they supported aquatic macroinvertebrate communities at least as rich and diverse at the family level as surrounding ponds and exhibited similar variability in family community composition and structure. The main difference we observed was a higher abundance of small and/or short-lived invertebrates in the highway ponds. These similar community compositions and structures suggest that highway ponds contribute to the biodiversity of the pond network at a regional scale. Thus, road practitioners should consider highway ponds not only for their hydrological and pollutant retaining purposes but also as a possibility to increase the role of highway verges as a refuge and, consequently, landscape connectivity. The management of these water bodies should recognise their potential for biodiversity especially in Human-dominated landscapes."(Authors)] Address: Le Viol, Isabelle, Muséum national d'Histoire naturelle, Conservation des espèces, restauration et suivi des populations, CERSP – UMR 7204 MNHN-CNRS-UPMC, 55 rue Buffon, 75005 Paris, France

8355. Lee, E.M.; Hong, M.Y.; Kim, M.I.; Kim, M.J.; Park, H.C.; Kim, K.Y.; Lee, I.H.; Bae, C.H.; Jin, B.R.; Kim, I. (2009): The complete mitogenome sequences of the palaeopteran insects *Ephemera orientalis* (Ephemeroptera: Ephemeridae) and *Davidius lunatus* (Odonata: Gomphidae). *Genome* 52(9): 810-817. (in English) ["Currently, the palaeopteran lineages (insect orders Ephemeroptera and Odonata) that have a problematic relationship with neopteran lineages are poorly represented by mitogenome sequences. In this study, we have determined the complete mitogenome of the oriental mayfly, *Ephemera orientalis*, and the dragonfly *Davidius lunatus*. The 16 463 bp mitogenome of *E. orientalis* and the 15 912 bp mitogenome of *D. lunatus* have many of the features typically detected in insect mitogenomes. Although the initiation codon for the *D. lunatus* COI gene is the typical ATA, *E. orientalis* is unusual in that no typical start codon was detected in the start region of

the COI gene. The A+T-rich regions of both mitogenomes have some unusual features. The *E. orientalis* A+T-rich region harbors two identical 55 bp sequences separated by 158 bp, and the *D. lunatus* A+T-rich region harbors a tandem repeat comprising two identical 261 bp copies and one partial copy of the repeat. Additionally, the A+T-rich regions of both mitogenomes harbour the stem-and-loop structures flanked by the conserved sequences "TA(A)TA" at the 5' end and "G(A)nT" at the 3' end, which have been suggested to be the signals involved in minor strand replication initiation. Furthermore, the *D. lunatus* A+T-rich region contains two tRNA-like structures with proper anticodon and cloverleaf structures." (Authors)] Address: Hong, M.Y., Dept of Life Science, Hoseo University, Asan-city, Chungchungnam-do 336-795, Republic of Korea

8356. Lehmann, F.-O. (2009): 17. The limits of turning control in flying insects. In: Dario Floreano, Jean-Christophe Zufferey, Mandyam V. Srinivasan & Charlie Ellington (Eds.): *Flying Insects and Robots*. Springer Berlin Heidelberg. ISBN 978-3-540-89392-9 (Print): 231-246. (in English) ["This chapter provides insights into the turning flight of insects, considering this specific behaviour from experimental and numerical perspectives. The presented analyses emphasize the need for a comparative approach to flight control that links an insect's maneuverability with the physical properties of its body, the properties and response delays of the sensory organs, and the precision with which the muscular system controls the movements of the wings. In particular, the chapter focuses on the trade-off between lift production and the requirement to produce lateral forces during turning flight. Such information will be useful not only for a better understanding of the evolution and mechanics of insect flight but also for engineers who aim to improve the performance of the future generation of biomimetic micro-air vehicles." (Authors) References to Odonata are made.] Address: Lehmann, F.-O., Institute of Neurobiology, University of Ulm, Albert-Einstein-Allee 11, 89081 Ulm, Germany. E-mail: fritz.lehmann@uni-ulm.de

8357. Lemelin, R.H. (2009): Goodwill Hunting? Dragon hunters, dragonflies & leisure. *Current Issues in Tourism* 12(5&6): 553-571. (in English) ["In Asia, insects have a long history of being a part of recreation and tourism activities, with some species such as rhinoceros beetles and dragonflies being raised as pets. While the role of insects in recreation and tourism (i.e. dragonfly gatherings, educational outings) is somewhat more modest in North America, Europe, and Australia, some of these activities are increasing in popularity. The availability of field guides, associations, and websites is helping to facilitate the growth of these leisure activities, and more specifically the viewing of Odonata. Participant observations and interviews were used to provide an empirical understanding of how one particular insect order - Odonata attracts participants to recreation and tourism activities, fosters interests, and creates controversies (e.g. collecting). A theoretical framework provided by naturework, an interpretivistic approach developed by Fine [(2003). *Morel tales: The culture of mushrooming*. University of Illinois Press.] is used to understand the philosophies involved in dragonflying. The conclusion highlights how new forms of recreation and tourism activities can promote greater awareness of insects." (Author)] Address: Lemelin, H., Lakehead University, School of Outdoor Recreation, Parks and Tour-

ism, 955 Oliver Rd., Thunder Bay, Ontario, P7B 5E1, Canada. E-mail: harvey.lemelin@lakeheadu.ca

8358. Li, J.; Luo, Y.-q.; Huang, T.-y.; Shi, J.; Chen, Y.-j.; Heliövaara, K. (2009): Diversity and dominant species of arthropods in different forests of Aershan, Inner Mongolia. *Forestry Studies in China* 11(1): 1-8. (in English) [Four Odonata species without any taxonomic details are listed in a table.] Address: Luo, Y.-q., Key Laboratory for Silviculture and Conservation of Ministry of Education, Beijing Forestry University, Beijing 100083, P.R. China. E-mail: youqingluo@126.com

8359. Liao, L.M. (2009): Recent collecting efforts of Philippine flora and fauna based on a critical assessment of the published literature (2002-2005): Some recommendations for policy re-evaluation and reforms. *Philippine Journal of Systematic Biology* 3: 68-96. (in English) [The bibliography includes papers from Dirk Gassmann, Matti Hämäläinen and Jan van Tol on Odonata.] Address: Liao, L.M., Graduate School of Biosphere Science, Hiroshima University, 1-4-4 Kagamiyama, Higashi-Hiroshima, 739-8528 Japan

8360. Linke, T.J. (2009): Flussjungfern am Niederrhein. Verbreitung und Habitatbindung. Diplomarbeit. Institut für Landschaftsökologie, Westfälische Wilhelms-Universität Münster: III, 44 pp, Anhänge. (in German, with English summary) ["Distribution and population density of clubtails at the lower Rhine over, are poorly investigated: only a few exuviae and adults of *Gomphus flavipes*, *G. vulgatissimus*, *Onychogomphus forcipatus* and *Ophiogomphus cecilia* were observed during the last decade. This study aims at investigating the local distribution and at identifying those environmental factors that determine habitat selection. Research was carried out at 30 study sites of 200 x 10 m size, between May 1st and August 31st 2008. Each site was sampled 10 times for exuviae. Additionally, structural parameters were ascertained. Exuviae of all four gomphids were found; however, numbers differed widely. Compared to other streams total abundances of all species were low. Most common species in the area were *G. flavipes* and *G. vulgatissimus* (4-5 exuviae/200 m waterside). At most sites, *G. flavipes* and *G. vulgatissimus* co-occurred. At five sites, exuviae of *O. forcipatus* occurred together with these two species. Exuviae abundances of *G. flavipes* showed positive correlation with the amount of fine sand fractions. A positive effect of sand and total riparian vegetation cover on the abundances of *G. vulgatissimus* was indicated. In sandy substrates *O. forcipatus* and *O. cecilia* are possibly replaced by *G. flavipes* and *G. vulgatissimus* due to hunting strategy and activity patterns. It is assumed, that low abundances of exuviae are caused by inappropriate and fragmented habitat structures, noticeable by the lack of fine substrate fractions. Additionally, hydromorphology, adjacent land use and shipping traffic may have a negative influence on the species." (Author)] Address: Linke, J., Schillerstr. 71, 48155 Münster, Germany

8361. Linke, T.J. (2009): Exuvienfunde zweier Gomphiden im Brackwasserbereich des Nestos (Odonata: Gomphidae). *Libellula* 28(3/4): 203-208. (in German, with English summary) ["On 30-V-2009 several exuviae of *Gomphus vulgatissimus* and *Onychogomphus f. forcipatus* were found on the beach of the estuary mouth of River Nestos. The possible origin of the exuviae is

briefly discussed.] Address: Linke, T.J., Gertrudenstr. 29A, D-38120 Braunschweig, Germany. E-mail: jonas.linke@web.de

8362. Linke, T.J.; Fartmann, T. (2009): Flussjungfern am Niederrhein: Verbreitung und Habitatbindung (Odonata: Gomphidae). *Libellula* 28(3/4): 159-173. (in German, with English summary) ["This study aims to investigate the local distribution and to identify environmental factors that determine habitat selection of all species of Gomphidae on the Lower Rhine. Altogether exuviae of 4 gomphid species were recorded, however, their numbers differed widely. Compared to other large rivers, the total abundances of all species were low. Most abundant were *Gomphus flavipes* and *G. vulgatissimus*, with 4-5 exuviae on 200 m bank sections. Exuviae abundances of *G. flavipes* were positively correlated with the amount of fine sand, those of *G. vulgatissimus* with sand and total riparian vegetation cover. Both *G. flavipes* and *G. vulgatissimus* can be described as specialists for certain digging substrates and as opportunists in their emergence behaviour. We assume that low abundances of exuviae are caused by inappropriate and fragmented habitat structures, noticeably by the lack of fine substrate fractions. Additionally, hydro-morphology, drift, adjacent land use and shipping traffic may have a negative influence on gomphids." (Authors)] Address: Linke, T.J., Gertrudenstr. 29A, D-38120 Braunschweig, Germany. E-mail: jonas.linke@web.de

8363. Lorenzo-Carballa, M.O.; Cordero-Rivera, A. (2009): Thelytokous parthenogenesis in the damselfly *Ischnura hastata* (Odonata, Coenagrionidae): genetic mechanisms and lack of bacterial infection. *Heredity* 103: 377-384. (in English) ["Thelytokous parthenogenesis, the production of female-only offspring from unfertilized eggs, has been described in all the insect orders, but is a rare phenomenon in the Odonata. The only-known case of parthenogenesis in this group is the North American damselfly species *Ischnura hastata*, which has parthenogenetic populations in the Azores Islands. Here, we present for the first time the results of laboratory rearing, which showed parthenogenetic reproduction in the Azorean I. *hastata* populations. In an attempt to understand how parthenogenesis could have evolved in this species, we first determined the genetic mode of parthenogenesis by analysing the genotype of parthenogenetic females and their offspring at three polymorphic microsatellite loci. In addition, we used polymerase chain reaction amplification to test whether parthenogenesis in I. *hastata* could be bacterially induced. Our data indicate that thelytoky is achieved through an (at least functionally) apomictic mechanism and that parthenogenesis is not caused by endosymbionts. Finally, we discuss possible routes to parthenogenetic reproduction, as well as the evolutionary implications of this type of parthenogenesis." (Authors)] Address: Lorenzo-Carballa, M.O., Departamento de Ecología e Biología Animal, Grupo de Ecología Evolutiva e da Conservación, Universidade de Vigo, EUET Forestal, Campus Universitario, Pontevedra, España 36005, Spain. E-mail: olalla.lorenzo@uvigo.es

8364. Lorenzo-Carballa, M.O.; Beatty, C.D.; Utzeri, C.; Vieira, V.; Cordero-Rivera, A. (2009): Parthenogenetic *Ischnura hastata* revisited: present status and notes on population ecology and behaviour (Odonata: Coenagrionidae). *International Journal of Odonatology* 12(2): 395-411, pl. VIII. (in English) ["Populations of *Ischnura*

hastata found in the Azores archipelago represent the only known example of parthenogenesis in the order Odonata. In this paper, we present results from field-work done on the islands of São Miguel, Pico, Santa Maria, and Graciosa, aimed at characterizing population ecology and habitat preferences of this species. Sampling of several ponds in the islands of São Miguel and Pico showed that *I. hastata* occurred in oligotrophic ponds, but was absent from all eutrophic ponds sampled, many of which have been impacted by cattle grazing and water extraction by humans. This suggests that parthenogenetic populations are highly sensitive to eutrophication, which may be different from suggested habitat preferences of sexual populations for this species. Mark-recapture studies showed *I. hastata* to occur in high densities in the studied populations. Although life expectancy of mature females was estimated at less than one week, their high fecundity and fertility could potentially explain the large number of individuals observed in some of the studied sites. Submerged oviposition seems to be a common behaviour, probably evolved as an adaptation to unfavourable climatic conditions and to avoid egg desiccation caused by water depletion. In summary, this work represents a first attempt to study the ecology and population biology of parthenogenetic populations of *I. hastata*, and may help us to understand the unique conditions under which these populations could have evolved and how to best insure their conservation." (Authors)] Address: Cordero Rivera, A., Departamento de Ecología e Biología Animal, Universidade de Vigo, E.U.E.T. Forestal, Campus Universitario, 36005 Pontevedra, Spain. E-mail: acordero@uvigo.es

8365. Lowe, C.D.; Harvey, I.F.; Watts, P.C.; Thompson, D.J. (2009): Reproductive timing and patterns of development the damselfly *Coenagrion puella* in the field. *Ecology* 90: 2202-2212. (in English) ["By a combination of detailed behavioural observations and molecular genetic approaches we have assessed development time, timing of first maturity, and the extent of genetic structure through the flying season in a wild population of *C. puella* in England. This work provides the first estimate of development time (egg to mature adult) in the field based on individual damselflies. Development time was significantly longer for females than males. In contrast to reported laboratory studies, there was no difference in development times between different female colour morphs. Development time ranged between 347 and 396 days and was negatively correlated with egg-laying date. As a result eggs laid early in one season reach adult maturity relatively late in the next; concurrently individuals developing from eggs laid late mature relatively early. We speculate that this pattern of development is a direct physiological response to seasonal environmental variation and results in reproductive synchrony within a population. Size, specifically hind wing length, declined with development time in males, but not in females. In one of the two years of the study there was evidence for weak clustering of related individuals during the reproductive season. This appeared to be the result of developmental synchronization within families: variance in timing of maturation was smaller in full-sib families than in half-sib families or randomly assigned unrelated groups." (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

8366. Lozano, F.; Muzon, J.; Torres, S. (2009): Description of the final instar larva of *Homeoura lindneri* (Ris, 1928) and redescription of the larva of *H. chelifera* (Selys, 1876) (Odonata: Coenagrionidae). *Zootaxa* 2231: 47-54. (in English, with Spanish summary) ["The final instar larvae of *H. lindneri* and *H. chelifera* are described and illustrated based on reared specimens from Argentina. A generic diagnosis is provided, as well as a key to the larvae of the most common genera of Coenagrionidae present in Argentina." (Authors)] Address: Muzón, J., Inst. Limnol. "Dr. R.A. Ringuelet", C.C. 712, AR-1900 La Plata, Argentina. E-mail: muzon@ilpla.edu.ar

8367. Luostarinen, T. (2009): Sorjahukankorento (*Libellula fulva*) Itä-Suomessa [*Libellula fulva* in eastern Finland]. *Crenata* 2: 5-7. (in Finnish) [*L. fulva* is very rare and localised in Finland, most populations live near-by Kitee (Northern Karelia). A typical biotope of *L. fulva* is shown and described and the role of calcareous water as a possible limiting factor for this species is shortly discussed. (Asmus Schröter)] Address: not stated

8368. Machado, A.B.M. (2009): Studies on Neotropical Protoneuridae. 21. The status of *Amazona Machado, 2004* (Odonata: Protoneuridae). *Lundiana* 9(1) (2008): 53-56. (in English) ["The genus *Amazona* Machado, 2004, regarded by Lencioni (2005) as a junior synonym of *Forcepsioneura* Lencioni, 1999, is revalidated based on morphological and zoogeographic evidence." (Author)] Address: Machado, A. B.M., Depto de Zool., Instituto de Ciên. Biol., Universidade Federal de Minas Gerais, C.P. 486, 31270-901, Belo Horizonte, Minas Gerais, Brasil. E-mail: angelo@icb.ufmg.br.

8369. Mäkinen, J. (2009): Havainnot hyötykäyttöön [The use and report of dragonfly observation data]. *Crenata* 2: 34-35. (in Finnish) [The scheme of the Finnish national data bank for dragonfly records is presented. (Asmus Schröter)] Address: no stated

8370. Mäkinen, J. (2009): Pääkirjoitus [Preface]. *Crenata* 2: 1. (in Finnish) [Introducing words to volume 2 of 'Crenata', the journal of the Finnish Odonatological Society.] Address: Finnish Dragonfly Society/ Suomen sudenkorentoseura ry. www.sudenkorento.fi. makisenjussi@gmail.com

8371. Magnusson, A.K.; Williams, D.D. (2009): Top-down control by insect predators in an intermittent pond – a field experiment. *Ann. Limnol. - Int. J. Lim.* 45: 131-143. (in English, with French summary) ["The role of predation in the regulation of freshwater communities is predicted to decrease along a habitat-duration gradient, from permanent to episodic waters. We tested the role of invertebrate predation in shaping the community structure in a fishless temperate intermittent pond with a three month long hydroperiod by comparing the community structure in two large field enclosures (4.2 m²) with added predators to two enclosures without added predators. The added predators reflected the density and composition of top predators in the pond and comprised weekly additions of dytiscid larvae (for three weeks) followed by weekly additions of odonate nymphs (for five weeks). Compared with the enclosure controls, the predator addition enclosures had fewer dipterans and crustaceans, higher concentrations of benthic ciliates and other protozoans, higher chlorophyll a and bacterial counts, and lower abundance of rotifers. Many treatment effects were temporally variable and this ap-

peared to be linked to predator identity, predator size, and prey availability. Compared with the surrounding pondwater, the enclosed areas had lower abundance of molluscs, ostracods and cladocerans but higher abundance of cyclopoids and higher concentrations of phytoplankton and ciliates. Despite high productivity and seasonally variable predator and prey assemblages, which likely buffered against strong top-down control, we conclude that the top-predators regulate the dipterans and zooplankton in this intermittent pond and that the effects propagated down through the food web to lower trophic levels." (Authors)] Address: Magnusson, Katarina, Dept Biol. Sc., Univ. Toronto at Scarborough, 1265 Military Trail, Scarborough, Ontario M1C 1A4, Canada. E-mail: a.katarina.magnusson@gmail.com

8372. Maguregi Arenaza, J. (2009): Presencia de *Brachytron pratense* (Müller, 1764) en la Comunidad Autónoma Vasca, norte de la Península Ibérica (Odonata: Aeshnidae). *Heteropterus Revista de Entomología* 9(1): 53-55. (in Spanish, with Euskarian and English summaries) [Field observations of *B. pratense* in Forua, Bizkaia, are reported. It is the first record of this species (rare and localised in the Iberian Peninsula) from the Basque Autonomous Community.] Address: Maguregi Arenaza, J., B° Altamira 64. 3o izda.: 48350 Busturia (Bizkaia), Spain. E-mail: fotosmagu@gmail.com

8373. Markovic, G.; Karan-Znidarsic, T.; Simonovic, P. (2009): Bryozoan species *Hyalinella punctata* Hancock in the gut content of chub *Leuciscus cephalus* L.. *Pol. J. Ecol.* 57(1): 201-205. (in English) [In spring, Odonata make up to 10%, in summer 9%, and in autumn 6% of food items in the gut content of *L. cephalus* in the Zapadna Morava river (West Serbia, Danube River basin).] Address: Markovic, G., Faculty of Agronomy, Cacak, University of Kragujevac, Cara Dušana 34, 32000 Cacak, Serbia. E-mail: goranmsv@tfc.kg.ac.yu

8374. Marrocco, J. (2009): Biomimetic design of a flexible wing. *ACCEESS Proceedings 0908*: 5 pp. (in English) ["The practical application of relatively small, and light weight micro air vehicles (MAV), is of great interest to the engineering community. Innovative and interesting approaches are being utilized to address the many constraints that arise from attempting to design a flapping MAV. The goal of this research is to investigate the structural and mechanical properties of the dragonfly, that give it its unique flight capabilities, and mimic the design in a finite element model to simulate the wings structural dynamics for analyses." (Author)] Address: Computational Science Research Center, 5500 Campanile Drive, San Diego, CA 92182-1245, USA

8375. Martens, A. (2009): Die Libellenfauna von Samos (Odonata). *Libellula* 28(3/4): 209-220. (in German, with English summary) ["From 28-VII to 09-VIII-1999, 24 species were recorded from a total of 24 localities. *Selysiotthemis nigra* is new for the fauna of Samos, which now includes 32 species of Odonata. An overview of the Odonata fauna is given. Emphasis is placed on the fauna of permanent lotic waters, which are threatened by intensive use of water for irrigation purposes and touristic development." (Author)] Address: Martens, A., Pädagogische Hochschule Karlsruhe, Bismarckstr. 10, D-76133 Karlsruhe, Germany. E-mail: martens@ph-karlsruhe.de

8376. Martens, A.; Griese, J. (2009): Verschleppung von *Agrionemys pygmaea* mit exotischen Wasserpflan-

zen nach Deutschland (Odonata: Coenagrionidae). *Libellula* 28(3/4): 187-189. (in German, with English summary) ["Two very small zygopteran larvae were taken from an aquarium with exotic plants in a pet shop in Karlsruhe, Germany. After emergence, one individual was clearly identified as a male *A. pygmaea* (Rambur). The species is distributed from India to Japan and Australia, where it is common at waters with rich vegetation. Currently, tropical plants for aquaristics in Europe are mainly imported from Singapore, Indonesia and Thailand, and it is suggested that the damselflies originated in one of those countries." (Authors)] Address: Griese, J., Bahnhofstr. 34, D-76461 Muggensturm, Germany. E-mail: lilly.Griese@t-online.de

8377. Martinez, N.; Küttel, M.; Weber, D. (2009): Deutliche Zunahme wildlebender Tierarten in der Schweiz seit 1900. Aussterbe- und Einwanderungsereignisse über 107 Jahre. *Naturschutz und Landschaftsplanung* 41(12): 375-381. (in German, with English summary) ["The number of species recorded on Red Lists in Central European countries is high and includes several species that already have disappeared. This suggests that the total species number is declining in these countries. However, besides disappearing species there are species immigrating into new areas, either due to human help or due to natural area expansion, as well as formerly extinct species that are re-migrating. Regional extinction of some species therefore does not necessarily lead to a decrease in total species number. The study analysed the influence of extinction and of immigration on total species number in Switzerland for the last 107 years and for several taxonomic groups (mammals without bats, breeding birds, reptiles, amphibians, fish, cyclostomes, butterflies, grasshoppers and dragonflies). During this period total species number clearly increased (+19 species). This increase is mainly due to species that immigrated autonomously from other European countries. Most of them are wetland inhabitants." (Authors) As new to the Odonata fauna are listed *Erythromma lindenii* (1910), *Crocothemis erythraea* (1990), and *Orthetrum albistylum* (1990). Lost Odonata are *Coenagrion lunulatum* (2000), *C. ornatum* (1960), and *Onychogomphus uncutus* (1990).] Address: Martinez, N., Hintermann & Weber AG, Austr. 2a, CH-4153 Reinach, Switzerland. E-Mail martinez@hintermannweber.ch

8378. Matsumoto, K. (2009): Odonate fauna of Tama Forest Science Garden. *Bulletin of Forest Entomology, Forestry and Forest Research Institute (FFPRI)* 8(1): 109-114. (in Japanese, with English summary) [33 odonate species were collected in the Tama Forest Science Garden of Forestry and Forest Products Research Institute, Hachioji City, Tokyo Metropolis, Japan. Species occurring in Hachioji City but unrecorded from the study locality were mostly those preferring un-shaded ponds or marshy habitats, and those preferring middle reaches or limited to upper reaches of running waters. Twelve red data listed species for South Tama Region of Tokyo Metropolis are represented in this study: three B-ranked species (*Onychogomphus viridicostus*, *Boyeria maclachlani* and *Aeschna juncea juncea*), and eight C-ranked species (*Asiagomphus melaenops*, *Lanthus fujiacus*, *Sieboldius albardae*, *Gynacantha japonica*, *Polycanthagyna melanictera*, *Somatochlora uchidai*, *Sympetrum parvulum*, and *Sympetrum infuscatum*).] Address: Matsumoto, K., Division of Forest Entomology, Forestry & Forest products Research Institute, Matsun-

osato 1, Tsukuba, Ibaraki 305-8687 Japan. E-mail: kazuma@ffpri.affrc.go.jp

8379. McMullen, L.E.; Campbell, E.Y.; Lytle, D.A. (2009): Burrowing behaviour of *Progomphus borealis* (McLachlan) larvae (Anisoptera: Gomphidae). *Notulae odonatologicae* 7(4): 39-41. (in English) ["Burrowing behaviour was studied in the Big Sandy River (Mojave co., Arizona, USA). Observations of (1) burrowing speed and (2) trail length of different instars are discussed. *P. borealis* is shown to have the fastest burrowing speed of all larval Odonata. on record." (Authors)] Address: McMullen, L.E., Department of Zoology, Oregon State University, Corvallis, OR 97331, USA

8380. Metsälä, P.; Parkko, P. (2009): Summit sahlbergi [Sahlbergi summit]. *Crenata* 2: 32-33. (in Finnish) [The authors report about a typical trip to northern Finnish-Lapland with *Somatochlora sahlbergi* as the target species. Plenty of dragonflies were observed during the four days trip but not the elusive *S. sahlbergi*. (Asmus Schröter)] Address: not stated

8381. Meurgey, F. (2009): Description of the larva of *Macrothemis meurgeyi* Daigle from the Lesser Antilles (Anisoptera: Libellulidae). *Odonatologica* 38(4): 365-368. (in English) ["The last instar larva is described and illustrated for the first time, and compared with the known congeneric larvae from the Caribbean. Its peculiarities are: size reduction of dorsal hooks, the presence of a dorsal hook on segment 2, and the absence of dorsal hooks on segments 6-9. *M. meurgeyi* has a triangular ligula with 10 premental setae and 6 palpal setae. Notes on the ecology of this lotic species are provided." (Author)] Address: Meurgey, F., Muséum d'Histoire Naturelle, 12 rue Voltaire, F-44000 Nantes, France. E-mail: Francois.Meurgey@mairie-nantes.fr

8382. Meurgey, F. (2009): Redescription of *Argia concinna* (Rambur), with a description of *Argia telesfordi* spec. nov. from Grenada, West Indies (Zygoptera: Coenagrionidae). *Zootaxa* 2272: 54-62. (in English) ["*Argia telesfordi* sp. nov. a new species close to *Argia concinna*, is described from Grenada. Both species are illustrated and diagnosed. They can be distinguished by morphology of male tori, cerci and paraproct and female mesostigmal laminae. Their distribution is allopatric, with *Argia telesfordi* distributed on Grenada and *Argia concinna* known only from Guadeloupe and Dominica." (Author)] Address: Meurgey, F., Muséum d'Histoire Naturelle, 12, rue Voltaire, 44000 Nantes, France. E-mail: Francois.Meurgey@mairie-nantes.fr

8383. Meurgey, F. (2009): The Odonata of Grenada (Lesser Antilles). Survey report May 1 – 14 2009. L'Herminier Natural History Society. *Odonata report* # 1: 33 pp, app.. (in English) ["This report is based on the examination of 200 specimens, collected by two individuals. Although 23 specimen localities are included in this report, and although these localities occur in the totality of the six parishes of Grenada, the areal coverage of the island is uneven. The principal collecting localities have been in the north part of the island, and especially on St Andrews and St Marks parishes, along the east coast, in the central uplands of the island and in the most of waterfalls. There are very few collections from the south part of the island, and almost none from the south-west coast of the island. The most important locality, on the northeast coast of Grenada is the large swamp at Meadow Beach, at Conference Bay, where a

variety of habitats have been collected rather thoroughly. The most of the species are far more common here than elsewhere, and *Lestes tenuatus* and *Erythrodiplax fervida* has been recorded on Grenada only from this locality. Several waterfalls in the central upland region were collected repeatedly. These streams and small rivers are characteristically rocky, more or less swift, and have very limited emergent vegetation. They have limited odonata fauna, consisting mainly of *Argia concinna*, *Dythemis sterilis* and *Brechmorhoga praecox grenadensis*. From a biogeographical point of view, the dragonfly fauna of Grenada is clearly a mix between the Caribbean and the South American fauna, with three species originated from South America not shared with other islands, and one (*Argia concinna*) which is a Caribbean endemic. This first survey needs to be completed by further researches on the ecology and on the biology of species. The dragonfly fauna of Grenada could increase to 20-22 species." (Author)] Address: Meurgey, F., Muséum d'Histoire naturelle de Nantes, 12, rue Voltaire, F-44000 Nantes, France. E-mail: Francois.Meurgey@mairie-nantes.fr

8384. Michalczyk, M.; Buczyński, P.; Daraż, B. (2009): First data from the monitoring of population condition of Ornate Bluet *Coenagrion ornatum* (Selys, 1850) in the valley of Sieniocha river (Sniatycze, south-eastern Poland) *Wiaczeslaw. Odonatrix* 5(2): 33-44. (in Polish, with English summary) ["*Coenagrion ornatum* is a critically endangered dragonfly species in Poland known nowadays from only one site (three others given after 1990 extinguished). The authors discuss first data (2007–2008) coming from regular observations of the last known population discovered in 2007 r. in Sniatycze near Zamosc (50°38'–50°39'N, 23°32'E, UTM square: FB71). *C. ornatum* inhabits one of drainage ditches in the area of a spring fen of calcareous character (Fig. 1). *Molinietum caeruleae* and *Caricetum appropinquatae* are dominating in vegetation, in some places *Cladietum marisci* and *Schoenetum ferruginei*, associated with shallowly situated calcareous substratum, are also preserved. The described fen is systematically burnt-out together with surrounding meadows. The ditch with *C. ornatum* has no direct connection with springs. Its water is warmer, slightly impoverished in oxygen and more fertile than spring waters (Tab. 1). During the warmer winter in 2007 ice layer did not cover the whole water surface –it was present only in sides. In the cooler winter in 2008 layer reached the thickness of 5 cm and covered the whole water surface, however, the ditch were not frozen to the bottom. The ditch is shallow (a few cm), narrow (the width of water surface up to 1m, however, in many places only to 20–30 cm), the bottom is covered with muddy substrata. Current is slow, water transparent. The bottom is grown by *Berula erecta*: in varied density –from a single plant to compact clusters. In large part of the watercourse the expansion of *Phragmites communis* and *Carex appropinquata* is visible, banks are grown by single scrubby willows in some places. In the front part of the ditch water is covered by moss mats. Regular observations were conducted in the year 2007, from the moment of discovery of the site and through the whole year 2008. *C. ornatum* was noted during 11 controls (Tab. 2). Maximum number of individuals was 195, they inhabited the stretch of ditch with length of ca. 170 m –with *Berula erecta* the least choked by *Phragmites communis* and *Carex appropinquata*. The period of imaginal flight lasted from the last decade of May till the last decade of July (individuals

observed on 3 June were very numerous and partially mature therefore their emergence must have taken place several days earlier). It is a relevant supplement to the previous data from Poland. This corresponds with the data from Czech Republic and is similar to data from other countries of Central and Eastern Europe. The features of habitat correspond with these in literature. The fact that the species is resistant to ice layer seems to be important (however, water must be flowing just above the bottom). Two colour forms were distinguished within females: blue and green, within males – only blue one. Juvenile individuals of blue form were violet, green one – beige-brown. The base of eyes corresponded with colour forms. Three forms of abdominal pattern of males and two of females were described (Fig. 2). One of the forms of males (spot in form of goblet without a stem on the second segment) has been described for the first time. The following species coexisted with *C. ornatum* in the ditch (* autochthonic ones or probably autochthonic): *Lestes barbarus*, **L. sponsa*, *Ischnura elegans*, *I. pumilio*, **Enallagma cyathigerum*, **Coenagrion puella*, **C. pulchellum*, **Somatochlora flavomaculata*, *Libellula quadrimaculata*, *L. fulva*, **Orthetrum coerulescens*, *O. cancellatum*, *Sympetrum danae*, **S. sanguineum*, *S. vulgatum*. In neighbouring habitats (other ditches, peat excavations) there were also: *Calopteryx virgo*, **Sympecma paedisca*, *Pyrrhosoma nymphula*, **Aeshna juncea*, *Leucorrhinia albifrons*. The threat to the ornate bluet in Sniatycze is mainly the expansion of vegetation (reed and sedges). Moreover, water surface is covered with litter. In 2008, by the efforts of Nature Association of Zamosc, first protection activities were taken like mowing reeds in some places and removing reed and sedge litter from current to the banks of the watercourse. The aim of these activities is to redouble the length of the ditch with optimal conditions for the species. These actions will be continued and their results monitored. *C. ornatum* is the species proposed by Poland to the appendix II of Habitats Directive. On this account, as well as due to its legal protection and Red List status, this species should be encompassed by national program of inventarisation, monitoring and protection. In the meantime there are no funds for this purpose – at the same time money is available for researches of species important but not endangered in Poland to Nature 2000, like *Ophiogomphus cecilia* and *Leucorrhinia pectoralis*. The authors criticise this situation." (Authors)] Address: Michalczuk, M., Zamojskie Towarzystwo Przyrodnicze, ul. Szymonowica 19/6, 22-400 Zamość, Poland. E-mail: wiack@wp.pl

8385. Miszta, A.; Cuber, P. (2009): New localities of dragonflies (Odonata) endangered in Poland recorded in the years 2006–2008 in Silesian Province outside of protected areas. *Odonatrix* 5(2): 48-54. (in Polish, with English summary) ["In the area of districts: Chelm Slaski, Tarnowskie Góry, Ogródzieniec and the city of Cze-stochowa, five new sites were found in 2006–2008, which occurred to be the breeding and development sites of endangered dragonfly species in Poland, such as: *Nehalennia speciosa*, *Somatochlora arctica*, *Cordulegaster boltonii*, *Aeshna subarctica elisabethae* and *A. juncea*. One of those sites, a sinkhole pond in Bledów near Chelm Slaski, is quite interesting for *N. speciosa*, *A. subarctica* and *A. juncea* were recorded all together. Another interesting site is in Pniowiec, where *S. arctica* and *C. boltonii* were found, which completed previous observations of the other dragonfly species in this site: *Brachytron pratense*. Because of their natural aspects

both sites are going to be included in the conservation system of Nature 2000 areas." (Authors)] Address: Miszta, Alicja, Centrum Dziedzictwa Przyrody Górnego Śląska, ul. Św. Huberta 35, 40-543 Katowice, Poland. E-mail: a.miszta@cdpigs.katowice.pl

8386. Mitra, T.R.; Babu, R. (2009): Previously unrecorded Odonata from salt ranges and Sind in Pakistan. *Notul. odonatol.* 7(4): 37-44. (in English) [238 specimens in the National Zoological Collection at Zoological Survey of India: 28 species are new records for Salt Ranges and 11 species for Sind. (Authors)] Address: Babu, R., Zoological Survey of India, M-Block, New Alipore, Kolkata/Calcutta - 700 053, India. E-mail: rb-abu2000@rediffmail.com

8387. Montana, C.G.; Winemiller, K.O. (2009): Comparative feeding ecology and habitats use of *Crenicichla* species (Perciformes: Cichlidae) in a Venezuelan floodplain river. *Neotropical Ichthyology* 7(2): 267-274. (in English, with Spanish summary) ["Feeding behaviour and habitat use of two species of pike cichlids *Crenicichla lugubris* and *C. aff. wallacii* were studied in the río Cinaruco, a floodplain river in the Venezuelan llanos. We examined 309 individuals of *C. lugubris* and 270 individuals of *C. aff. wallacii* from both the main channel and lagoons throughout the falling-water phase of the annual hydrological cycle. [...] Analysis of stomach contents showed that larger specimens (> 100 mm SL) *C. lugubris* fed mostly on small fishes (e.g. characids, cichlids), but juveniles (< 100 mm SL) consumed mostly aquatic insects, fish scales, and shrimps. *Crenicichla aff. wallacii* fed on aquatic insects and other invertebrates associated with leaf litter substrates." (Authors) "Odonata" contributed up to app. 10% of the diet depending on the age class of the fish.] Address: Montaña, Carmen, Section of Ecology, Evolution and Systematic Biology, Dept Wildlife & Fisheries Sciences. Texas A&M University, College Station, TX 77843-2258, USA. E-mail: car1607@tamu.edu

8388. Moreira-Hara, S.S.; Zuanon, J.A.S.; Amadio, S.A. (2009): Feeding of *Pellona flavipinnis* (Clupeiformes, Pristigasteridae) in a Central Amazonian floodplain. *Iheringia, Sér. Zool.* 99(2): 153-157. (in English, with Portuguese summary) ["The feeding habits of *P. flavipinnis* at Catalão, a floodplain area on the Brazilian Central Amazon was studied. Data was obtained during three hydrological cycles, between September 1999 and September 2003. Diet composition, daily and seasonal variation in the feeding activity and the relationship between predator's size and its prey were analyzed. Almost 80% of the food consumed has autochthonous origin and diet was composed basically by insects and fish. Juvenile fish predominated in the stomach contents of all size classes but there was no significant relationship between predator's size and its prey. *P. flavipinnis* may be considered a carnivorous species which feeds mainly on juvenile (young-of-the-year) specimens of other fish. More intense feeding activity occurred at night and in the high water period." (Authors) "Odonata" accounted significantly to the diet of the fish species.] Address: Moreira-Hara, Sandra, Escola Superior Batista do Amazonas, Rua Leonor Telles, 278, Conj. Abílio Nery, Adrianópolis, Manaus, AM, Brazil. E-mail: sandrasocorromoreira@yahoo.com.br

8389. Moreno, P.; Franca, J.S.; Ferreira, W.R.; Paz, A.D.; Monteiro, I.M.; Callisto, M. (2009): Use of the

BEAST model for biomonitoring water quality in a neotropical basin. *Hydrobiologia* 630: 231-242. (in English) ["The use of predictive models in Neotropical basins is relatively new, and applying these models in large basins is hindered by the lack of ecological, geographical, and social-environmental knowledge. Despite these difficulties, we used data from the das Velhas River basin to apply the BEAST (Benthic Assessment of SedimenT) methodology to evaluate and classify the level of environmental degradation. Our two main objectives were to modify and implement the BEAST methodology for use in biomonitoring programs of Brazilian basins, and to test the hypothesis that a gradient of environmental degradation determines a gradient in the structure and composition of benthic macroinvertebrate assemblages. We evaluated 37 sites: 8 in the main river, 15 in the main tributaries with different impact levels, and 14 in tributaries with minimally disturbed conditions (MDC). The BEAST model allowed us to classify 16 test sites: two as natural, four as altered, three as highly altered, and seven as degraded. Our results indicated degradation of the das Velhas River basin near its urban areas. The BEAST model indicated that the pollution gradient found among the sites generated a gradient of the macroinvertebrate assemblages, corroborating the hypothesis." (Authors) Odonata are treated at the family level.] Address: Callisto, M., Laboratório de Ecologia de Bentos, Departamento de Biologia Geral, Instituto de Ciências Biológicas, Universidade Federal de Minas Gerais, Av. Antônio Carlos 6627, Belo Horizonte, Minas Gerais, Brazil. E-mail: callistom@ufmg.br

8390. Msyani, E.K.; Lazaro, J.; Castor, O.N.; Chambegega, O.A. (2009): Seasonal inventory and status of flying insects, in Kihansi Gorge, Tanzania. *African Journal of Ecology* 47(3): 267-275. (in English) ["Sampling of flying insects in Kihansi Gorge was conducted in six micro-habitats namely Lower, Upper, Main, Mid-Gorge and Mhalala Spray Wetlands and adjacent forest. The four traps used were, malaise, pitfall, light and artificial substrate sampler, besides sweep netting and beating. In the wet season, 65,549 flying insects (65.13%) were recorded when compared to 35,633 flying insects (34.87%) in dry season. At its peak, 29,783 flying insects (29.15%) were recorded at the start of wet season (December 2004). The abundance value was significant ($\chi^2=1794.98$, d.f.= 5, $P \leq 0.001$). The favourable weather condition at the beginning of the wet season might have triggered emergence of high numbers of winged insects like ants, to facilitate migration through dispersal and reproduction, and some aquatic insects (Plecoptera, Odonata and Trichoptera) moulted and entered into terrestrial life to raise terrestrial abundance. No association was recorded between abundance of flying insects and amphibians (Kihansi Spray Toad; *Nectophrynoides asperginis*), for Mid-Gorge and Main Spray Wetlands ($r = -0.71$, $n = 4$, $P = 0.147$ and $r = -0.69$, $n = 5$, $P = 0.201$) respectively." (Authors)] Address: Msyani, E.K., Coll. of African Wildlife Management, Mweka, PO Box 3031, Moshi, Tanzania; E-mail: emsyani@yahoo.com

8391. Müller, J. (2009): Bibliographie zur Libellen-Fauna (Odonata) Sachsens-Anhalts. Erstes Verzeichnis der Schriften zur Libellen-Fauna Sachsens-Anhalts. Abhandlungen und Berichte des Museums Heineanum 8: 55-83. (in German, with English summary) [An annotated bibliography of odonatological literature from Saxony-Anhalt, Germany is presented, comprising 275 literature-references and 178 unpublished expert research

reports.] Address: Müller, J., Frankefelde 3, 39116 Magdeburg, Germany. E-mail: FaunOek.JMueller@t-online.de

8392. Müller, J.; Steglich, R. (2009): Zum Vorkommen der Scharlachlibelle *Ceragrion tenellum* in Sachsen-Anhalt. *halophila*, Mitt.-Bl. FG Faun. u. Ökol. Staßfurt 53: 14. (in German) [Sachsen-Anhalt, Germany; compilation of records of this regionally very rare species.] Address: Müller, J., Frankefelde 3, 39116 Magdeburg, Germany. E-mail: FaunOek.JMueller@t-online.de

8393. Müller, J. (2009): Beitrag zur Geschichte der Libellenkunde (Odonatologie) in Sachsen-Anhalt. Abhandlungen und Berichte des Museums Heineanum 8: 35-53. (in German, with English summary) [The paper presents a concise history of odonatological research in Sachsen-Anhalt, Germany, documents regional museum collections of Odonata, and compiles biographic data of 65 odonatologists / persons involved in odonatological research in Sachsen-Anhalt.] Address: Müller, J., Frankefelde 3, 39116 Magdeburg, Germany. E-mail: FaunOek.JMueller@t-online.de

8394. Muzon, J. (2009): Estado actual del conocimiento del orden Odonata en la Patagonia. *Rev. Soc. Entomol. Argent.* 68(1-2): 163-167. (in Spanish, with English summary) [Patagonian (Argentina) Odonata are represented by 36 species belonging to nine families and 18 genera. "The endemism level is high being approximately 60% of the species and 40% of genera endemic. The specific richness in Patagonia decreases from West to East and from North to South, being Nahuel Buta (Chile) and Andes mountains between 38° and 41° S on the forest area, and the Somuncurá plateau (Argentina) on the steppe the richest areas. An update of its records and an analysis of the main distribution patterns are provided in this paper." (Author)] Address: Muzon, J., Instituto de Limnología "Dr. Raúl A. Ringuelet", C.C. 712, 1900 La Plata, Argentina. E-mail: muzon@ilpla.edu.ar

8395. Nel, A.; Huang, D.-y. (2009): First Chinese *Cymatophlebiidae* from the Middle Jurassic of Inner Mongolia (Odonata: Anisoptera: Aeshnoptera). *Palaeodiversity* 2: 199-204. (in English, with German summary) ["*Sinacymatophlebia mongolica* n. gen., n. sp., the oldest and first Chinese record of the Mesozoic aeshnopteran dragonfly family *Cymatophlebiidae*, is described from the Middle Jurassic Jiulongshan Formation of Inner Mongolia." (Authors).] Address: Nel, A., Lab. Ent. Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: anel@cimrs1.mnhn.fr

8396. Nel, A.; Bechly, G. (2009): The third petalurid dragonfly from the lower cretaceous of Brazil (Odonata: Cretapetaluridae). *Annales zoologici (Warszawa)* 59(3): 281-285. (in English) ["*Cratopetalura petruleviciusi* gen. et sp. nov. is the third genus and species of the Mesozoic petalurid family Cretapetaluridae from the Lower Cretaceous of Brazil. With the recent discovery of another representative of this family in the Lower Cretaceous of England, it demonstrates the great diversity of this group during this period." (Authors)] Address: Nel, A., Lab. Ent. Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: anel@cimrs1.mnhn.fr

8397. Nel, A.; Bechly, G.; Declos, X.; Huanag, D.-y. (2009): New and poorly known Mesozoic damselfly dragonflies (Odonata: Isophlebiodea: Campterothlebiidae,

Isophlebiidae). *Palaeodiversity* 2: 209-232. (in English, with German summary) ["The diagnoses of the families Camptero-phlebiidae and Isophlebiidae are emended. *Camptero-phlebia elegans* BODE, 1905, type of the Camptero-phlebiidae, and *Sinitia sophiae* PRITYKINA, 2006 are redescribed. The latter is transferred from the Isophlebiidae into the Camptero-phlebiidae sit. nov. Two new camptero-phlebiids are described: *Pritykinia rasnitsyni* n. gen., n. sp. (Lowermost Cretaceous of Russia) and *Qibinlina sinica* n. gen., n. sp. (Middle Jurassic of China). Three new isophlebiids are described: *Walleria magnifica* n. gen., n. sp. (Upper Jurassic of Kazakhstan), *Parawalleria mongolica* n. gen., n. sp. and *Parawalleria incompleta* n. sp. (Upper Jurassic of Mongolia)."] (Authors.) Address: Nel, A., Lab. Ent. Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: anel@cimr1.mnhn.fr

8398. Niederbichler, C. (2009): Hartmut Spaeter: Weltreisender, Naturschützer, Förderer des LBV. Großherzige Unterstützung der LBV-Stiftung „Bayerisches Naturerbe“: LBV Vogelschutz 1/2009: 11. (in German) [Hartmut Spaeter, Munich, Germany (1922 - 2007). The published note refers to *Polythore spaeteri* Burmeister & Börsöny, 2003, and provides a figure with a portrait of H. Spaeter.] Address: <http://www.lbv.de/fileadmin/lbvde/service/HeftVogelschutz/Heft109www.pdf>

8399. Niehuis, M. (2009): Nur scheinbar die Altbekannte. Boten des Klimawandels: Die Südliche Mosaikjungfer findet man in Flachgewässern im Oberrheingraben. Rheinpfalz - Marktplatz aktuell vom 29.07.09 Ausgabe Kandel und Ausgabe Edenkoben; eine Woche vorher in Bad Bergzabern und Germersheim: (in German) [Rheinland-Pfalz, Germany; popular account in a regional significant newspaper on Odonata with special emphasis on *Aeshna affinis* resp. species favoured by climate change.] Address: Niehuis, M., Im Vorderen Großthal, D-76857 Albersweiler, Germany. E-mail: Niehuis@t-online.de

8400. Novelo-Gutiérrez, R. (2009): Description of the larva of *Acanthagrion quadratum* Selys, with a key to the known larvae of the genus (Zygoptera: Coenagrionidae). *Odonatologica* 38(4): 321-328. (in English) ["The larva is described, illustrated, and compared with other described congeneric larvae. *A. quadratum* is distinguished from all others by possessing 3 premental setae, 4 setae on labial palp, and caudal lamellae 8-10 times longer than their widest part. A key to the 9 known congeneric larvae is provided."] (Author)] Address: Novelo-Gutiérrez, R., Departamento de Entomología, Instituto de Ecología A.C., Km 2.5. antigua carretera a Coatepec, Aparatdo Postal 63, 91000 Xalapa, Veracruz, Mexico. E-mail: rodolfo.novelo@inecol.edu.mx

8401. Ober, S.V.; Staniczek, A.H. (2009): A new genus and species of coenagrionid damselflies (Insecta, Odonata, Zygoptera, Coenagrionidae) from Vanuatu. *Zoosystema* 31(3): 485-497. (in English, with French summary) ["A new genus, *Vanuatubasis* n. gen., is described and illustrated based on specimens from the islands of Aneityum, Espiritu Santo, and Malekula, Vanuatu. Males of the new genus differ from males of the similar *Nesobasis* Selys, 1891 in having short and broad superior anal appendages and long, forcipate inferior anal appendages. The already described species, *Nesobasis malekulana* Kimmins, 1936 and *N. bidens* Kimmins, 1958, are transferred to the new genus. Both

species, only known from males, are redescribed. Additionally, a new species, *Vanuatubasis santoensis* n. gen., n. sp., is described from Espiritu Santo. Males of *V. santoensis* n. gen., n. sp. differ from males of the closely related *V. malekulana* n. comb. by their larger size, a more raised hind ridge of the pronotum, the less prominent medio-posterior protuberance of the mesostigmal laminae, and the paisley-shaped superior anal appendages. A key to the males of *Vanuatubasis* n. gen. is provided."] (Authors)] Address: Ober, S.V., Staatliches Museum für Naturkunde Stuttgart, Abteilung Entomologie, Rosenstein 1, D-70191 Stuttgart, Germany. E-mail: ober.smns@naturkundemuseum-bw.de

8402. Odin, N. (2009): Reports from Costal Stations - 2008: Landguard Bird Observatory, Suffolk. *Atropos* 36: 52-53. (in English) [UK; *Lestes sponsa*, *Erythromma viridulum*; *Libellula depressa*, *L. quadrimaculata*] Address: not stated

8403. Palacino-Rodríguez, F. (2009): Dragonflies (Odonata: Anisoptera) of the collection of the Instituto de Ciencias Naturales, Universidad Nacional de Colombia. *Boletín del Museo de Entomología de la Universidad del Valle* 10(1): 37-41. (in English, with Spanish summary) [This collection of Anisoptera holds 2900 specimens which have been collected since 1940 across 27 departments of the country. "More than a half of the specimens are Anisoptera (53%) and these are represented by three families Aeshnidae, Gomphidae, and Libellulidae, 38 genera and 91 species. These numbers constitute 80% of the genera and species of the suborder reported from Colombia. The more abundant genera are *Erythrodiplax* (37%), *Uracis* (15%), and *Erythemis* (8%). The presence of *Uracis siemensii* Kirby, 1897, *U. infumata* (Rambur, 1842), and *Zenithoptera viola* Ris, 1910, in Colombia, is confirmed."] (Authors)] Address: Palacino-Rodríguez, F., Instituto de Ciencias Naturales, Universidad Nacional de Colombia, A. A. 7495, Bogotá - Colombia. E-mail: fpalacinor@unal.edu.co

8404. Parr, A.J. (2009): Winter damselfly *Sympecma fusca* Vander Linden in West Glamorgan. *Atropos* 37: 28-31. (in English) [14-XII-2008, Tonna, UK.] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

8405. Parr, A.J. (2009): Migrant Dragonflies in 2008 including recent decisions and comments by the Odonata Records Committee. *Atropos* 36: 28-32. (in English) [UK; the following species are considered in the report: *Sympecma fusca*, *Aeshna grandis*, *A. mixta*, *Anax* sp. (*Anax junius* cf.), *A. imperator*, *A. parthenope*, *Libellula fulva*, *Sympetrum danae*, *S. striolatum*, *S. flaveolum*] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

8406. Parr, A.J. (2009): Migrant and dispersive dragonflies in Britain during 2008. *J. Br. Dragonfly Society* 25(2): 94-99. (in English) ["The year 2008 was rather a quiet one for dragonfly migration in Britain, probably no surprise given the frequently unfavourable summer and autumn weather. A low level of immigration did however take place, especially during warmer spells in late July and early August. One or two species also appeared to show enhanced dispersal within Britain, whilst other interesting sightings probably related to the consequences of previous migration/dispersion events. The highlight of 2008 must be the discovery to-

wards the end of the year of a female Winter Damselfly *Sympecma fusca*, apparently attempting to hibernate inside a house in south Wales. This represents the first record of the species for Britain, though its appearance had been anticipated." (Author)] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

8407. Parr, M.J. (2009): Professor Philip S. Corbet, 21 May 1929 - 13 February 2008. *J. Br. Dragonfly Society* 25(1): 1-6. (in English) [Obituary.] Address: Parr, M. J., Hele Barton, 9c St James's St., South Pethcrton, Somerset, TA13 5BS, UK. E-mail: mima37@tiscali.co.uk

8408. Paulson, D.R. (2009): A new species of *Leptobasis* from Costa Rica (Odonata: Coenagrionidae). *Zootaxa* 2239: 62-68. (in English) ["*Leptobasis guanacaste* is described from seasonal wetlands in dry forest in Guanacaste, Costa Rica. It is unique among the five species of the genus in thoracic colour pattern and the structure of the male terminal appendages and female mesostigmal laminae and appears to be closest to *L. candelaria* through similarities in genital ligula, male metafemur, and female ovipositor." (Author)] Address: Paulson, D.R., Slater Museum, Univ. of Puget Sound, Tacoma, WA 98416, USA. E-mail: dpaulson@ups.edu

8409. Paulson, D.R. (2009): Scarlet Skimmer (*Crocothemis servilia*) in Jamaica. *Argia* 21(1): 9. (in English) [Iverclaud Hotel in Black River, St. Elizabeth Parish, July 2008.] Address: Paulson, D.R., Slater Museum, Univ. of Puget Sound, Tacoma, WA 98416, USA. E-mail: dpaulson@ups.edu

8410. Peixoto, P.E.C.; De Marco Jr., P. (2009): No size or density effect on alternative mate-locating tactics in the tropical damselfly *Hetaerina rosea* males (Odonata: Calopterygidae). *Rev. Biol. Trop.* 57(1-2): 361-370. (in English, with Spanish summary) ["Males of *H. rosea* may defend mating sites along river margins (resident males) or, alternatively, wander among different areas presumably searching for mates (nonterritorial males). Although the occurrence of territorial and non-territorial males of *H. rosea* is very common in Brazil, studies examining which factors may be responsible for the adoption of alternative mate-locating tactics in this species are inexistent. We investigated the relationship between the adoption of these alternative mate-locating tactics by males of *H. rosea* and two possible causes: body weight and male abundance. We carried the study in three areas: sites 1, 2 and 3. Samples were monthly undertaken in sites 1 and 2 between September/2001 and August/2002 and in site 3 between May/1999 and January/2001. Using the scan method with fixed areas and mark-resighting techniques, we did not find any relationship between the proportion of nonterritorial males and male abundance per month on sites 2 (n=6) and 3 (n=7), indicating that the adoption of alternative mate-locating tactics is not affected by competition for territories. In the same way, nonterritorial and resident males showed similar body and thoracic weight measures (n=30 and n=27 for sites 2 and 3 respectively). Maybe the nonterritorial tactic is adopted by individuals searching for better territories or males that were evicted from their defended sites. The absence of relationship between weight and male territorial status is in accordance with other *Hetaerina* species. However, other traits not investigated here such as parasitic load, fat content and age may influence the adoption of different mate-ac-

quisition tactics in *H. rosea* males.] Address: Peixoto, P.E.C., Departamento de Zoologia, IB, UNICAMP, C.P.6109, CEP 13083-970, Campinas, São Paulo, Brasil. E-mail: popscardoso@yahoo.com.br

8411. Penney, D. (2009): Field guide to wildlife of The Gambia: an introduction to common flowers & animals. Siri Scientific Press, Manchester, U.K.. ISBN 978 0 9558636 1 5: 120 pp. (in English) [14 of the 554 colour photographs show Odonata: *Ceriagrion*, *Azuragrion*, *Palpopleura*, *Pantala*, *Diplacodes*, *Crocothemis*, *Orthetrum*, *Brachythemis*, and *Bradinopyga*.]

8412. Petrulevicius, J.F.; Nel, A. (2009): First *Cordulephyidae* dragonfly in America: A new genus and species from the Paleogene of Argentina (Insecta: Odonata). *Comptes Rendus Palevol.* 8(4): 385-388. (in English, with French summary) ["*Palaeophya argentina* gen. et sp. n. is the first American representative of the *Cordulephyidae*. The fossil belongs to *Neophyinae* and is closely related to the unique genus *Neophya* present in the Early Oligocene of England and extant in Africa. This fossil record supports the evidence of a Cretaceous age and a wide ancient distribution in Palaeogene warm regions for the *Neophyinae*, which acquire the status of relict in recent intertropical Africa." (Authors)] Address: Nel, A., Lab. Ent. Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: anel@cimr-s1.mnhn.fr

8413. Porst, G.; Irvine, K. (2009): Implications of the spatial variability of macroinvertebrate communities for monitoring of ephemeral lakes. An example from turloughs. *Hydrobiologia* 636(1): 421-438. (in English) ["Turloughs, ephemeral water bodies associated with karstified limestone, are an important habitat found in the West of Ireland. They are a priority habitat under the European Habitats Directive (92/43/EEC) and are groundwater-dependent habitats under the European Water Framework Directive (2000/60/EC; WFD). Sampling to meet the objectives of either Directive requires discrimination of inherent natural variation from anthropogenically induced disturbances and accounting for both spatial and seasonal patterns of biotic distribution. This study reports within. (submerged grassland) and between-habitat (submerged and emergent grassland) variability of macroinvertebrate (including *Lestes dryas*) communities in six turloughs. Two different habitat types were sampled from two turloughs in April 2007, and further assessment of spatial pattern in commonly found submerged grassland habitat was determined from four additional turloughs in spring 2008. While cluster analysis and non-metric multidimensional scaling identified differences in macroinvertebrate community structures between habitats in one out of two turloughs, congruence of invertebrate communities was, nevertheless, greater within than among turloughs. Within-habitat variability of macroinvertebrate communities across sampling locations of submerged grassland habitat was sufficiently low so that samples collected at any location of a turlough can provide a reliable metric of the macroinvertebrate community of a turlough as a whole. A standardized submerged grassland sampling approach for routine turlough sampling is recommended as a pressure response method to fulfil the requirements of the WFD. For a comprehensive conservation assessment, however, as demanded under the EC Habitats Directive, we suggest a multi-habitat sampling approach to obtain a thorough assessment of turlough

macroinvertebrate biodiversity." (Author)] Address: Porst, Gwendolin, Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB), Müggelseedamm 301, 12587 Berlin, Germany. E-mail: porst@igb-berlin.de

8414. Precigout, L.; Prud'Homme, E.; Jourde, P. (Coord.) (2009): *Libellules du Poitou-Charentes*. Poitou-Charentes Nature. ISBN: 978-2-918831-00-6: 256 pp. (in French) ["The fruit of 18 years of sampling and of the accumulated experience of more than 200 naturalists, this work treats the 73 species of dragonflies currently known in the Poitou-Charentes. Precise descriptions of the distribution, abundance, life cycle and conservation status of each species are presented. This detailed information is accompanied by graphs, distribution maps and by numerous photographs. More than a simple field guide, this is a book to read at home. It will please naturalists, fishermen and those who enjoy simply observing the natural world around them. It is a collective and associative work where each chapter reflects the different personalities of the contributors. To know, to respect, and to protect dragonflies - such are the principles which have led us to publish this work today. May it contribute to a better understanding and long term protection of these marvellous creatures which form an important part of our natural heritage." (Editors)] Address: <http://www.poitou-charentes-nature.asso.fr/Livre-Libellules-extraits.html>

8415. Proess, R. (2009): Plan national pour la protection de la nature (PNPN). Plans d'actions espèces: Plan d'action Agrion de mercure *Coenagrion mercuriale*. <http://www.environnement.public.lu/conservation/dossiers/Plansdactions/PAECoenagrionmercuriale.pdf>: 4 pp. (in French) [Fundamentals for conservation of the single locality of *C. mercuriale* (Wollefsbach, sw of Useldange) in Luxembourg are outlined.] Address: Proess, R., ECOTOP, 6, rue Gustave Kahnt, L-1851 Luxembourg, Luxembourg. E-mail: ecotop@pt.lu

8416. Pryke, J.S.; Samways, M.J. (2009): Conservation of the insect assemblages of the Cape Peninsula biodiversity hotspot. *Journal of Insect Conservation* 13(6): 627-641. (in English) ["The Cape Peninsula is an area of outstanding biological importance, not only for its high levels of floristic diversity and endemism, but also for its number of localised endemic invertebrates. Little is known of the spatial distribution of invertebrates across the Peninsula, or how best to conserve them. Sampling by visual searches assisted by aerial and aquatic hand-nets was undertaken throughout the Peninsula. The most important areas for insect diversity on the Peninsula, and associated environmental variables, were determined. The 'Peninsula effect' was also investigated. Nine Red Listed species and five new species for the Peninsula were recorded. This high number of Red Listed species (for those few groups that have been assessed) emphasises the biological importance of the Cape Peninsula. Table Mountain had the most Red Listed species, while Cape Point had many species not found in the other areas. Noordhoek Wetland is very important for aquatic Coleoptera. Small hills on the Peninsula are important for overall insect diversity. Elevation, slope, aspect, distance to water and vegetation structure were the most important environmental variables in determining the insect assemblages. The Peninsula effect appears to have no influence on these particular insect assemblages of the Cape Peninsula. The high number of new Peninsula records for well-known

taxonomic groups indicates that still little is known of the insect assemblages across the Peninsula. Nevertheless, areas of conservation priority identified in this study are Table Mountain (for Red Listed species), Noordhoek (for aquatic Coleoptera) and Cape Point and the small hills across the Peninsula (for their unique invertebrate assemblages). Conservation of a variety of elevations, including steep and flat areas, all aspects of mountains, as well as both the wet and dry areas, overall will contribute to the conservation of the insects." (Authors) The paper includes references to Odonata. For more details also see: <http://etd.sun.ac.za/bitstream/10019/1452/2/Pryke,JS.pdf>] Address: Pryke, J. S., Dept Conservation Ecology and Entomology, Centre for Agricultural Biodiversity, Faculty of AgriSciences, University of Stellenbosch, Private Bag X1, Matieland, 7602, South Africa. E-mail: Jpryke@sun.ac.za

8417. Purse, B.V.; Thompson, D.J. (2009): Emergence site selection in the endangered Southern Damselfly *Coenagrion mercuriale* in its UK stronghold, with observations on the Small Red Damselfly *Ceragrion tenellum*. *J. Br. Dragonfly Society* 25(2): 68-75. (in English) ["Emergence site selection was compared between *C. mercuriale* and *C. tenellum* in one of the UK strongholds for the former species. The mean height of exuviae above water level was 3.64 ± 0.36 cm ($n = 74$) for *C. mercuriale* and 2.35 ± 0.18 cm ($n = 68$) for *C. tenellum*. For both species there was a significant difference between observed and expected (based solely on relative abundance) plant species used as emergence perches. *Eleocharis palustris* and *Juncus articulatus* were used more, and *Hypericum elodes* less, often than expected. The national vegetation community in 13 cages was M29 i.e. *Hypericum elodes*-*Potamogeton polygonifolius* (Bog Pondweed) mire. Two other cages contained Si9a and Si9b which is *Eleocharis palustris* swamp. Broadly, suitable emergence habitat consisted of semi-submerged communities of *H. elodes* (mean % cover $50 \pm 4.4\%$), *P. polygonifolius* (mean % cover $5.8 \pm 1.9\%$), *E. palustris* (mean % cover $19.2 \pm 2.6\%$) and *J. articulatus* (mean % cover $3.2 \pm 1.1\%$)] 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

8418. Querino, R.B.; Hamada, N. (2009): An aquatic microhymenopterous egg-parasitoid of *Argia insipida* Hagen in Selys (Odonata: Coenagrionidae) and biological observations in the Central Amazon, Brazil. *Neotropical Entomology* 38(3): 346-351. (in English, with Portuguese summary) ["The tritrophic interaction *A. insipida*, the Trichogrammatidae egg parasitoid *Pseudoligosita longifrangata* (Viggiani) and the host plant *Tonina fluviatilis* (Eriocaulacea), which is a substrate for egg deposition of *A. insipida*, was investigated. The study locality was a stream with rapids where macrophytes such as *T. fluviatilis* grow. Information on aquatic egg parasitoids is scarce. This is the first record of egg parasitism of *A. insipida* by *P. longifrangata* in Brazil, and the first record of occurrence of *P. longifrangata* in the country. Parasitized and unparasitized eggs of *A. insipida* were observed only on leaves 0-5 cm below the water surface. The maximum number of pairsof *A. insipida* laying eggs in the study area was observed between 13:00h and 14:00h. Leaves of *T. fluviatilis* become yellowish and dry out when large numbers of eggs of *A. insipida* are laid on them." (Authors)] Ad-

dress: Querino, R.B., Embrapa Roraima, BR 174, km 8, Distrito Industrial, 69301-970, Boa Vista, RR; ranys@cpafrr.embrapa.br

8419. Rainier Audubon Society (2009): Monday, November 16, at 7:00 PM. Rainier Audubon Presents Dr. Dennis Paulson Dragonflies and Damselflies of Washington. The Heron Herald November 2009: 1. (in English) [Introduction to a lecture of Dennis Paulson on the Odonata of Washington, USA.] Address: Rainier Audubon Society, PO Box 778. Auburn WA 98071. (253) 796-2203, USA

8420. Ramos-Elorduy, J.; Pino Moreno, J.M.; Martínez Camacho, V.H. (2009): Edible aquatic Coleoptera of the world with an emphasis on Mexico. Journal of Ethnobiology and Ethnomedicine 2009, 5:11 doi:10.1186/1746-4269-5-11: 13 pp. (in English) [Passing references on Odonata. Anthropoentomophagy is an ancient culinary practice wherein terrestrial and aquatic insects are eaten by humans. Of these species of insects, terrestrial insects are far more commonly used in anthropoentomophagy than aquatic insects. In this study we found that there are 22 genera and 78 species of edible aquatic beetles in the world. [...] Address: Ramos-Elorduy, Julieta, Instituto de Biología, UNAM, Apdo. Postal 70-153, 04510, México. E-mail: relorduy@ibunam2.ibiologia.unam.mx

8421. Reborá, M.; Piersanti, S.; Gaino, E. (2009): A comparative investigation of the antennal sensilla in adult Anisoptera. Odonatologica 38(4): 329-340. (in English) ["A fine structural overview of the flagellar sensilla of *Onychogomphus forcipatus*, *Aeshna cyanea*, *Somatochlora metallica*, and *Cordulegaster boltonii* revealed the presence of pits containing sensilla typically located on the latero-ventral side of the first flagellar segments in all four species. These sensilla are represented by coeloconic single-walled olfactory sensilla and deeply sunken sensilla styloconica (type-1 and type-2) sharing common features typical of thermo-hygroreceptors. Sensilla styloconica are located inside deep convoluted cavities. It is suggested that olfactory and thermo-hygroreceptive sensilla are the main sensilla on the antennae of all anisopteran families. The attribution of the coeloconic sensilla of dragonflies to single-walled olfactory sensilla (confirmed by the finding of pore tubules in *O. forcipatus*), together with their common occurrence in the suborder Anisoptera, are relevant for phylogenetic studies." (Authors)] Address: Reborá, Manuela, Dipto di Biologia Cellulare e Ambientale, Università di Perugia, Via Elce di Sotto, I-06123 Perugia, Italy

8422. Reinboud, W. (2009): View and reviews: Field Guide to the Larvae and Exuviae of British Dragonflies, Volume 1. Atropos 36: 63. (in English) [Review of: Cham, S. (2007): Field Guide to the Larvae and Exuviae of British Dragonflies. Volume 1: Dragonflies (Anisoptera). British Dragonfly Society. ISBN-13: 9780955647109. 80 pp] Address: Reinboud, Weia

8423. Reinhardt, K. (2009): Ein Nachweis des Plattbauches von 1797 – der erste Libellennachweis in Bayern? IDF-Report 18: 3-4. (in German) [In a publication by Johann Heinrich Jördens (1764–1813) [Jördens, J. H. 1798. Geschichte der kleinen Fichtenraupe, oder der Larve von der Phalaena Monacha Linn. Nebst einem Beytrag zur Berichtigung der Ausrottungsmittel dieser Waldverheererin und einer mit Farben erleuchteten Kupfertafel. 46 S. Hof, Verlag von Grau.] Libellula de-

pressa is documented. The author discusses the probability that this is the first published record of this species in Bavaria, Germany.] Address: Reinhardt, K., Dept Animal & Plant Sciences, Univ. Sheffield, Sheffield S10 2TN, UK. E-mail: K.Reinhardt@sheffield.ac.uk

8424. Reinhardt, R. (2009): Bericht über die 17. Tagung der Sächsischen Entomologen der EFG e.V.. Entomologische Nachrichten und Berichte 53(3-4): 187-188. (in German) [Sachsen, Germany, Jens Kipping made a lecture reporting on his activities on African Odonata.] Address: Reinhardt, R., Burgstädter Str. 80a, 09648 Mittweida, Germany

8425. Renker, C.; Henrich, B. (2009): Die Entomologischen Sammlungen des Naturhistorischen Museums Mainz / Landessammlung für Naturkunde Rheinland-Pfalz. Mainzer naturwiss. Archiv 47: 395-447. (in German, with English summary) [The paper summarizes the development of the entomological collections at the Mainz Museum of Natural History / State Collection of Natural History of Rhineland-Palatinate, Germany. After the nearly complete destruction of the museum and its collections during the air raid on Mainz on February 27th, 1945, the rebuilding of the entomological collections started in the 1960's. The different phases of the rebuilding are described, introducing the volunteers, and important persons who worked for a long time in the entomological collections of the museum. In a second section the nowadays available collections and their collectors are presented. The most comprehensive inventory exists for the butterflies (Lepidoptera), true bugs (Heteroptera), wasps and bees (Hymenoptera), and beetles (Coleoptera). Concerning flies (Diptera) the museum has the largest individual collection based on the hoverflies (Syrphidae) from Franz Malec. Other insect orders are represented by small or very small collections or are lacking completely. Odonata are represented in five boxes, in most cases in poor labelling condition. Taxa are represented by records from Germany, Austria, Denmark, Norway, 10 specimens from Peru, and 44 specimens from Ruanda.] Address: Renker, C., Naturhistorisches Museum Mainz / Landessammlung für Naturkunde Rheinland-Pfalz, Reichklarastr. 10, 55116 Mainz, Germany. E-mail: dr.carsten.renker@stadt.mainz.de

8426. Repenning, M.; de P. Basso, H.C.; Rossoni, J.R.; Krügel, M.M.; Fontana, C.S. (2009): Análise comparativa da dieta de quatro espécies de cucos (Aves: Cuculidae), no sul do Brasil. Zoologia 26(3): 443-453. (in Portuguese, with English summary) [The diet from 4 species of cuckoos (Aves: Cuculidae) in South Brazil was studied by analyzing stomachs contents of 50 specimens: *Guira guira* (Gmelin, 1788) (n = 21), *Coccyzus melacoryphus* (Vieillot, 1817) (n = 8), *Crotophaga ani* (Linnaeus, 1758) (n = 11), and *Piaya cayana* (Linnaeus, 1766) (n = 10). One item of Odonata was found in a *Guira guira* stomach.] Address: Fontana, Carla, Setor de Ornitologia, Museu de Ciências e Tecnologia, Pontifícia Universidade Católica do Rio Grande do Sul. Avenida Ipiranga 6681, 90619-900 Porto Alegre, Rio Grande do Sul, Brasil. E-mail: carla@pucrs.br

8427. Riservato, E.; Boudot, J.-P.; Ferreira, S.; Jovice, M.; Kalkman, V.J.; Schneider, W.; Samraoui, B.; Cuttelod, A. (compilers) (2009): The status and distribution of dragonflies of the Mediterranean basin. Gland, Switzerland and Malaga, Spain: IUCN. ISBN: 978-2-

8317-1161-4: vii + 33 pp. (in English) [Executive Summary: Aim: This report contains a review of the conservation status of 165 Mediterranean species of dragonflies occurring in the Mediterranean basin, according to the IUCN regional Red Listing criteria. It identifies species that are threatened with extinction at regional level so that appropriate conservation action can be taken to improve their status. Scope: The geographical scope of this report is the Mediterranean region in terms of freshwater hydrosystems, defined by identifying all catchments of rivers flowing into the Mediterranean Sea as well as in the adjacent Atlantic waters of Spain, Portugal and Morocco. Status assessment: The status of all species was assessed using the IUCN Red List Criteria (IUCN 2001), which are the world's most widely accepted system for measuring extinction risk. All assessments followed the Guidelines for Application of IUCN Red List Criteria at Regional Levels (IUCN 2003). The assessments were peer-reviewed by other experts during a workshop and through correspondence with relevant experts. Results: Almost a fifth (19%) of the dragonfly species occurring in the Mediterranean region are threatened and a further 16% are Near Threatened. Four species (2%), *Agriocnemis exilis*, *Ceriatrigon glabrum*, *Rhyothemis semihyalina* and *Phyllomacromia africana* are listed as Regionally Extinct. Threatened dragonflies are found all over the Mediterranean region. However, some areas have a particular high concentration of threatened species: the most notable are the southern Balkans, northeastern Algeria and the Levant with the adjacent southern parts of Turkey. Fourteen percent of the species in the Mediterranean Basin are endemic, (9 of these are threatened and 5 Near threatened). This highlights the responsibility that the Mediterranean countries have to protect the global populations of these species. The highest number of endemics are found in the Maghreb and in the Levant whereas the smaller numbers are found in the southern Balkans, Crete and the Western Mediterranean. Dragonfly diversity is greatest in the northern parts of the region as both Mediterranean and more boreal species can be found in the same area. Italy has the highest number of species due to its particular shape allowing the presence of North African species in the south and alpine species in the north. Other species rich areas are found in France, the Balkans region, Greece, Tunisia and Turkey. Habitat destruction, degradation, pollution and mismanagement of water bodies are significant threats to dragonflies in the Mediterranean Basin. In recent years it has become clear that Climate Change will turn out to be one of the most important threats to dragonflies in the Mediterranean. Increased water demand together with a lower level of precipitation will result in the desiccation of brooks, a habitat on which many of the endemics are dependent. Conclusions: Threatened dragonflies in the Mediterranean Basin require urgent action to improve their status: While some species are already receiving some conservation attention thanks to international laws (e.g. the European Habitat Directive), others are not. The priorities identified in this study include addressing the threats, such as the destruction and degradation of freshwater habitats, and the need to improve monitoring, surveys and studies in some important areas of the Mediterranean Basin. Regional action is urgently needed: This report shows where the highest diversity, the highest level of endemism, and the highest portion of threatened dragonflies are found within the Mediterranean region. Based on this, five areas of high conser-

vation concern were selected (Maghreb, The Levant, Crete, Southern Balkans and Western Mediterranean). These areas are discussed separately, and for each one, conservation actions are prioritized. A sustained investment in the conservation and monitoring of species sites and landscapes is needed for all Mediterranean countries: To ensure that Mediterranean species are secure in the long term, this needs to be combined with the political will to integrate biodiversity conservation into all policy sectors.] Address: IUCN Centre for Mediterranean Cooperation, C/ Marie Curie 22, 29590 Campanillas, Malaga, Spain

8428. Riservato, E. (2009): Atlante delle libellule della Provincia di Novara. Provincia di Novara: 180 pp. (in Italian) [51 odonate species occurring in the Italian province Novara are monographically introduced giving information on morphology, ecology, phenology, status of conservation, and regional distribution.] Address: agricoltura@provincia.novara.it

8429. Robinette, P.R. (2009): A macroinvertebrate study of the Shenango River Westinghouse Superfund Site, Sharon, PA. M.s. thesis, Environmental Studies Program, Youngstown State University: VII, 41 pp. (in English) [Odonata are treated on the genus, a few at the family level.] Address: not stated

8430. Romo-Beltrán, A.; Macías-Ordóñez, R.; Córdoba-Aguilar, A. (2009): Male dimorphism, territoriality and mating success in the tropical damselfly, *Paraphlebia zoe* Selys (Odonata: Megapodagrionidae). *Evolutionary Ecology* 23(5): 699-709. (in English) ["The tropical damselfly *Paraphlebia zoe* has two male morphs: a black-winged (BW) male which is associated with territorial defense of oviposition sites; and a hyaline-winged (HW) male similar in appearance to females, and, compared to the black morph, less frequently found defending territories. In a wild population of this species, we first assessed the relationship between phenotypic traits [male morph, size and territorial status (being territorial or non-territorial)], their role on mating success, and the degree to which a particular territory may contribute to male mating success. Second, to relate a physiological basis of being territorial we compared both morphs in terms of muscular fat reserves and thoracic muscle, two key traits related to territory defense ability. Males of both morphs defended territories although the BW males were more commonly found doing this. BW males were larger than HW males and size predicted being territorial but only within HW males (territorial males were larger) but not in BW males. Male mating success was related to territorial status (territorial males achieved a higher mating success), but not to morph or size. Furthermore, territory identity also explained mating success with some territories producing more matings than others. The BW morph stored more fat reserves which may explain why this morph was more likely to secure and defend a place than the HW morph. However, the HW morph showed higher relative muscle mass which we have interpreted as a flexible strategy to enable males to defend a territory. These results are distant to what has been found in another male dimorphic damselfly, *Mnais pruinosa*, where the advantage of the non-territorial morph relies on its longevity to compensate in mating benefits compared to the territorial morph." (Authors)] Address: Cordoba-Aguilar, A., Centro de Investigaciones Biológicas, Universidad Autónoma del Estado de Hidalgo, Apdo. P. 69-1, Plaza

Juarez, Pachuca, Hidalgo 42001, Mexico E-mail: acordoba@uaeh.reduaeh.mx

8431. Sadeghi, S.; Adriaens, D.; Dumont, H.J. (2009): Geometric morphometric analysis of wing shape variation in ten European populations of *Calopteryx splendens* (Harris, 1782) (Zygoptera: Calopterygidae). *Odonatologica* 38(4): 341-357. (in English) ["The wings of 10 *C. splendens* populations were examined by landmark-based geometric morphometric analysis. Subspecific taxa in this group are currently based on wing spot size in males. Here, the variation in wing shape and size is evaluated, to test whether shape is different at a population level, and whether this has implications at a taxonomic level. It was found that Geometric Morphometrics successfully discriminates populations; overall wing shape significantly differed between populations but the results were only partly compatible with taxonomic studies based on wing spot size. Irrespective of wing spot, all populations showed differentiation in wing shape even though not in wing size; 4 groups were recognized based on wing shape: (1) Turkish1 population; (2) Spanish, Finnish, Russian and Turkish populations; (3) Italian, German and French populations; (4) Greek and Albanian populations. Ordination of the populations based on consensus data and cluster analysis phenogram confirmed such a pattern. The Spanish population (*C. xanthostoma*), did not show a strong identity, while the Turkish1 (*C. s. waterstoni*) was quite isolated. The Italian population (*C. s. caprai*) showed more relation to the French (*C. s. fairvei*) and German populations than to Albanian and Greek populations." (Authors)] Address: Dumont, H.J., Univ. Gent, Inst. Animal Ecology, K.L. Ledeganckstraat 35, B-9000 Gent, Belgium. E-mail: Henri.Dumont@ugent.be

8432. Samways, M. (2009): Book Review: Rosser W. Garrison, Natalia von Ellenrieder and Jerry A. Louton, *Dragonfly Genera of the New World: An Illustrated and Annotated Key to the Anisoptera*. The John Hopkins University Press, Baltimore MS, USA, 2006, Hardback, US\$99.00, ISBN: 0-8018-8446-2, 368 pp. *Journal of Insect Conservation* 13: 137-138 (in English) [Review]. Address: Samways, M.J., Dept Entomol. & Nematol., Univ. Stellenbosch, Private Bag X1, ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za

8433. Sánchez-Montoya, M.M.; Suárez, M.L.; Vidal-Abarca, M.R. (2009): Seasonal and interannual variability of macroinvertebrate reference communities and its influence on bioassessment in different Mediterranean stream types. *Fundamental and Applied Limnology / Archiv für Hydrobiologie*, Volume 174(4): 353-367. (in English) ["We investigated the seasonal changes in macroinvertebrate reference communities in four Mediterranean stream types (temporary, evaporite calcareous at medium altitude, siliceous headwaters at high altitude, and calcareous headwaters at medium and high altitudes) and the interannual changes in the two headwaters stream types in Spain. Eighty-eight seasonal reference sites distributed into 23 basins were sampled on three occasions (spring, summer and autumn of 2003), and 18 interannual reference sites distributed in 6 basins were sampled in the autumn of 2003, 2004 and 2005 to examine this temporal variability. Interannual reference sites were a subset of seasonal reference sites. The analysis of similarity (ANOSIM) performed on Bray-Curtis similarity distances, using presence-absence data, showed no seasonal or inter-

annual changes in the macroinvertebrate communities. The influence of seasonal and interannual variability was also tested in all the stream types using 18 macroinvertebrate metrics classified as richness, index, multi-metric index, tolerance/intolerance and diversity. ANOVAs showed no seasonal differences in any of the studied metrics for temporary and evaporite calcareous at medium altitude and most of the metrics in the two headwaters stream types. This suggests the suitability of using a single season approach for the biomonitoring purposes of these metrics. Conversely, the seasonal differences detected in the metrics related with EPT (Ephemeroptera, Plecoptera and Trichoptera) and OCH (Odonata, Coleoptera and Heteroptera) taxa in calcareous headwaters indicate possible differences in the relative presence of macrohabitats (riffles and pools) as a result of flow variation. No interannual changes were detected in any of the metrics except EPT/OCH in siliceous headwaters. However, the large variability in the annual rainfall in this study area suggests that this three-year study period may be too short to assess the effect of climatic variations on the ecological status assessment. In general, the lower temporal variability (measured as seasonal and interannual coefficients of variation) of the taxon richness metric (S) and the two studied indices (IBMWP and IASPT), compared with the other metrics, make them a priori robust indicators to assess ecological status in Mediterranean streams." (Authors)] Address: María del Mar Sánchez Montoya, Dept of Ecology and Hydrology, University of Murcia, E-30100, Murcia, Spain. E-mail: marsanch@um.es

8434. Sasamoto, A.; Kawashima, I. (2009): Description of the last instar larva of *Hylaeothemis clementia* Ris from Laos (Anisoptera: Libellulidae). *Odonatologica* 38(4): 369-374. (in English) ["The larva is described and illustrated for the first time, based on the last instar exuviae. It is compared with the known *Tetrathemistinae* larvae and appears similar to the African *Neodythemis* rather than to the Asian members of the subfamily." (Author)] Address: Sasamoto, A., 190-4 Yakuoji, Tawaramoto-chô, Shiki-gun, Nara, 636-0341, Japan. E-mail: aksmt@sea.plala.or.jp

8435. Schmutterer, H. (2009): *Tropische Insekten - Meisterwerke der Evolution. Einblick in die Formenvielfalt und faszinierende Biologie tropischer Kerbtiere*. Neue Brehm Bücherei 671: 269 pp. (in German) [Chapter 2.1 Ordnung Libellen (Odonata) (Abb. 1-4), pages 12-17 are directed to the dragonflies]

8436. Schneider, B.; Wildermuth, H. (2009): Libellen als Individuen – zum Beispiel *Aeshna cyanea* (Odonata: Aeshnidae). *Entomo Helvetica* 2: 185-199. (in German, with English and French summaries) ["All ascertainable males and females of *A. cyanea* that were present in the course of about two months in autumn 2008 at four small adjacent ponds near Winterthur (Switzerland) were documented by digital photography. The insects were examined for morphological features by which the individuals could be recognized. Distinct differences were found in the marking-pattern of head, thorax and abdomen as well in the fine wing veins. Altogether 66 males and nine females could be identified with certainty. They were present at the study site on one to eleven different days over a maximum period of 43 days. The advantages and disadvantages of photodocumentation of the individuality with respect to morphology and behaviour are discussed." (Authors)] Address: Schneider,

B., Wolfbühlstrasse 34a, CH-8408 Winterthur, Switzerland. E-mail: beatsch@bluemail.ch

8437. Schröter, A.; Karjalainen, S. (2009): Hohtoukkokorento (*Aeshna affinis*) tavattiin Suomessa ensi kerran [First record of the Blue-eyed Hawker/Migrant Hawker *Aeshna affinis* in Finland]. *Crenata* 2: 36-38. (in Finnish) [The article describes the circumstances of the discovery of the first record of *A. affinis* in Finland (2nd August 2008; Vuosaari, Helsinki) and gives a short synopsis of the species status and recent records in adjacent countries and the northern half of Europe. The origin and possible migration route of the Finnish specimen is shortly discussed. (Asmus Schröter)] Address: not stated

8438. Schultz, T.D.; Fincke, O.M. (2009): Structural colours create a flashing cue for sexual recognition and male quality in a neotropical damselfly. *Functional Ecology* 173: 724-732. (in English) ["Structural colouration is common among animals that produce sexual displays involving motion or ultraviolet reflection. Different sources of colour may provide multicomponent signals that indicate the location, sex, and fitness of a potential mate or rival. We investigated the proximate basis and ultimate function of the wing colouration of the territorial damselfly *Megaloprepus caerulatus*, which produces a dynamic, high contrast display during flight. The wings of both sexes have blue and white bands, but the location of the white patches are sex specific. Wax filaments produce diffuse, white areas through broadband scattering of wavelengths between 300 and 700 nm. Blue bands reflect wavelengths between 300 and 500 nm (max = 398 nm) and shift in hue with viewing angle, the result of thin layer interference produced by layers of cuticle and pigment within the wing membrane. Both wing bands strongly reflect UV wavelengths. Both the iridescent UV-blue and white wing patches provide high contrast against the vegetation in forest light gaps where mating occurs. Moreover, the iridescent signal oscillates during flight. Angle-dependent UV-blue iridescence is periodically extinguished during each wing beat cycle, in contrast to the white areas, which remain bright. Males distinguish potential mates from rivals by the presence of a female's white wing tip. Blackening the white wing bands of males and adding white wing tips to resemble a female elicits a sexual rather than aggressive response from males. Conversely, blackening the white wing tips of females reduces sexual responses. The proportional area of the white wing bands of males is indicative of wing symmetry, correlated with body size, and in turn, territory residency suggesting that it may serve as a signal of male condition during intra- and intersexual interactions. We propose that the flashing iridescent UV-blue wing bands provide a beacon to potential mates across forest light gaps, whereas the white patches serve in mate recognition and may indicate male quality or territorial status. Our study identifies a unique combination of interference and broadband reflectors that provide a dynamic multicomponent signal." A(authors)] Address: Fincke, O.M., Dept Zool., Univ. Oklahoma, 730 Van Vleet Oval, Room 314, Norman, OK 73019, USA. E-mail: fincke@ou.edu

8439. Scott, M.A.; Scott, W.J.; Scott, T.R. (2009): Reports from Costal Stations - 2008: Longstone Heritage Centre, St Mary's, Isles of Scilly. *Atropos* 36: 35-36. (in English) [UK; *Ischnura elegans*, *Aeshna mixta*] Address: not stated

8440. Segura, N.A.; Usaquén, W.; Sánchez, M.C.; Chuaire, L.; Bello, F. (2009): Succession pattern of cadaverous entomofauna in a semi-rural area of Bogotá, Colombia. *Forensic Science International* 187: 66-72. (in English) ["The main objective of this work was to examine the succession of insects colonizing three pig (*Sus scrofa*) cadavers in a semi-rural area of Bogotá. The 12 kg pigs were shot and put into metallic mesh cages to allow access by insects. Arthropods were then sampled at different intervals depending on the corresponding stage of decomposition. In total 5981 arthropods were collected during decomposition, 3382 adults and 2599 immature stages, belonging to 10 orders and 27 families. *Sarconesia magellanica* and *Comptosomyia verena* (Diptera: Calliphoridae) were the first species to colonize the corpses. Egg masses and 1st stage Calliphoridae larvae were associated with the fresh stage of decomposition, 1st and 2nd stage larvae of Calliphoridae and Sarcophagidae during chromatic and emphysematous stages, immature *Chrysomya albiceps* (Diptera: Calliphoridae), *Ophyra* sp. (Diptera: Muscidae) and *Oxellytrum discicolle* (Coleoptera: Silphidae) during the colliquative stage and mainly Coleoptera during the skeletization phase (plus some adult Diptera). The data obtained in the present investigation could be used for the estimation of postmortem interval (PMI) in real cases when the conditions to which a cadaver has been exposed are similar to those recorded during this work." (Authors) During the chromatic and emphysematous stages (days 4–10) of decomposition, Odonata were represented by 0.08% of the total fauna.] Address: Bello, F., Laboratorio de Entomología Médica y Forense, Facultad de Ciencias Naturales y Matemáticas, Universidad del Rosario, Calle 63D No. 24-31, Bogotá D.C., Colombia. E-mail: fbello@urosario.edu.co

8441. Shang, J.K.; Combes, S.A.; Finio, B.M.; Wood, R.J. (2009): Artificial insect wings of diverse morphology for flapping-wing micro air vehicles. *Bioinspiration & Biomimetics* 4: 6 pp. (in English) ["The development of flapping-wing micro air vehicles (MAVs) demands a systematic exploration of the available design space to identify ways in which the unsteady mechanisms governing flapping-wing flight can best be utilized for producing optimal thrust or maneuverability. Mimicking the wing kinematics of biological flight requires examining the potential effects of wing morphology on flight performance, as wings may be specially adapted for flapping flight. For example, insect wings passively deform during flight, leading to instantaneous and potentially unpredictable changes in aerodynamic behaviour. Previous studies have postulated various explanations for insect wing complexity, but there lacks a systematic approach for experimentally examining the functional significance of components of wing morphology, and for determining whether or not natural design principles can or should be used for MAVs. In this work, a novel fabrication process to create centimeter-scale wings of great complexity is introduced; via this process, a wing can be fabricated with a large range of desired mechanical and geometric characteristics. We demonstrate the versatility of the process through the creation of planar, insect-like wings with biomimetic venation patterns that approximate the mechanical properties of their natural counterparts under static loads. This process will provide a platform for studies investigating the effects of wing morphology on flight dynamics, which may lead to the design of highly maneuverable and efficient MAVs and insight into the functional morphology of natural

wings." (Authors) The paper includes references to dragonfly wings.] Address: Wood, R.J., School of Engineering & Applied Sciences, Harvard Univ., Cambridge, MA 02138, USA. E-mail: rjwood@seas.harvard.edu

8442. Sharma, R.C.; Arambam, R.; Sharma, R. (2009): Surveying macroinvertebrate diversity in the Tons river, Doon Valley, India. *Environmentalist* 29: 241-254. (in English) ["A survey of macro-invertebrates and their monthly variations occupying the Tons river in Doon Valley was conducted from August 2003 – July 2004. Macroinvertebrate collections and water samples were taken from three sampling stations every month during the period of study. All the hydrological attributes were measured monthly for 1 year. The present study showed that the water velocity, hydromedian depth, turbidity and dissolved oxygen and nature and size of the bottom substrates do play a major role in determining the macroinvertebrate diversity of Tons river. The ecological relevance of the measured hydrological attributes was investigated by comparing their degree of correlation with invertebrate density and diversity. The Shannon–Wiener index (H0) of macroinvertebrates was found to be highest (3.60) during spring season (February and March) and lowest (2.59) during monsoon season (July and August). The high values of diversity index of macro-invertebrates at all the three sampling sites indicate diverse macroinvertebrate communities in the Tons river in Doon Valley, India." (Authors) The following taxa are listed in table 2: Agrion, Ceriagrion cerinorubellum, Ischnura, and Ophiogomphus.] Address: Sharma, R.C., Department of Environmental Sciences, H.N.B. Garhwal University, Post Box 67, Srinagar-Garhwal, Uttarakhand 246174, India. E-mail: drrameshchsharma@yahoo.com

8443. Sherwin, G. (2009): Submergence of both sexes during oviposition in the Large Red Damselfly *Pyrhosoma nymphula* (Sulzer) in Norfolk. *J. Br. Dragonfly Society* 25(2): 62-67. (in English) ["A pair of *P. nymphula* was observed and filmed whilst ovipositing in Norfolk in the summer of 2008. During previous observations, pairs were usually seen on floating *Ceratophyllum demersum* with attached males in the sentinel position contact guarding their respective mates. Females oviposited into the Hornwort with only a part of their abdomens submerged. Similar behaviour was also observed by pairs perched on other plants, including *Menyanthes trifoliata*. On 11 May a pair was observed when the female submerged completely for just over a minute. On 23 May a pair was seen with the female already completely submerged and the male followed. At the same time a second pair was also observed nearby with both sexes submerged. To the best of my knowledge this is the first report of complete male submergence in this species." (Authors)] Address: Sherwin, G., The Beeches, Sporle Road, Little Dunham, King's Lynn, Norfolk, PE32 2DG, UK

8444. Slos, S.; De Meester, L.; Stoks, R. (2009): Food level and sex shape predator-induced physiological stress: immune defence and antioxidant defence. *Oecologia* 161: 461-467. (in English) ["Despite the potential impact on prey fitness and predator–prey interactions, most studies of predation risk ignore physiological responses and their dependence upon food level and sex. Therefore, we reared male and female larvae of the damselfly *Lestes viridis* under predator stress (dragonfly larvae) at high and low food levels, and sub-

sequently scored for important variables of insect immune defence (i.e. phenoloxidase) and antioxidant defence [i.e. superoxide dismutase, and catalase (CAT)]. Under predation risk, larvae did not decrease growth rate or immune defence, and only slightly reduced food intake in the high food treatment, probably because of time stress, i.e. little time available to complete the larval development. However, larvae facing predator stress did show an upregulation of antioxidant enzymes. This upregulation was dependent upon food level for CAT and both food level and sex for SOD, consistent with energetic constraints and sex differences in the link between longevity and adult fitness. Our results illustrate that predator stress can influence life history, behavioural and physiological responses differentially and in a context-dependent way. This implies that non-consumptive physiological effects of predators on their prey show independent yet similar complexities in behavioural and life history response variables. In general, our results advocate that mechanistic studies on predator–prey interactions may benefit from including physiological variables." (Authors)] Address: Slos, Stefanie, Lab. of Aquatic Ecology and Evolutionary Biology, Univ. of Leuven, Ch. Debériotstraat 32, B-3000 Leuven, Belgium. E-mail: stefanie.slos@bio.kuleuven.be

8445. Solly, F.; Milton, P.; Sawyer, D.; Woods, C.; Hodge, T. (2009): Reports from Costal Stations - 2008: Isle of Thanet, Kent. *Atropos* 36: 50-51. (in English) [UK; *Sympetrum fonscolombii*] Address: not stated

8446. Song, H.; Bucheli, S.R. (2009): Comparison of phylogenetic signal between male genitalia and non-genital characters in insect systematics. *Cladistics* 25: 1-13. (in English) ["It is generally accepted that male genitalia evolve more rapidly and divergently relative to non-genital traits due to sexual selection, but there is little quantitative comparison of the pattern of evolution between these character sets. Moreover, despite the fact that genitalia are still among the most widely used characters in insect systematics, there is an idea that the rate of evolution is too rapid for genital characters to be useful in forming clades. Based on standard measures of fit used in cladistic analyses, we compare levels of homoplasy and synapomorphy between genital and non-genital characters of published data sets and demonstrate that phylogenetic signal between these two character sets is statistically similar. This pattern is found consistently across different insect orders (- the genus *Enallagma* represents the Odonata -) at different taxonomic hierarchical levels. We argue that the fact that male genitalia are under sexual selection and thus diverge rapidly does not necessarily equate with the lack of phylogenetic signal, because characters that evolve by descent with modification make appropriate characters for a phylogenetic analysis, regardless of the rate of evolution. We conclude that male genitalia are a composite character consisting of different components diverging separately, which make them ideal characters for phylogenetic analyses, providing information for resolving varying levels of hierarchy." (Authors)] Address: Song, H., Dept Biology, Brigham Young University, Provo, UT 84602, USA. E-mail address: hojunsong@byu.edu

8447. Spaccesi, F.; Rodrigues Capitulo, A. (2009): Benthic invertebrate assemblage in Samborombón River (Argentina, S. America), a brackish plain river. *Aquatic Ecology* 43(4): 1011-1022. (in English) ["The

spatial and temporal differences in the structure and composition of benthic invertebrates were studied at three sites of the Samborombón River, which is an important tributary of the Río de la Plata Estuary (Argentina), having a low slope and brackish drainage. Biological samples were taken during each season. Physico-chemical variables were measured to determine their association in the benthic fauna distribution. Site 1, in the headstream, was characterized by freshwater Pampean organisms; site 2 showed the highest density, taxa diversity, and richness; brackish species, e.g., *Laonereis culveri*, were found here. Site 3, close to the Samborombón Bay, was characterized by an unstable taxonomic composition that is strongly influenced by the estuary. The lowest density and taxonomic diversity of organisms were registered and distinguished by estuarine species. The multivariate method (redundancy analysis) showed the benthic groups having an important spatial variability, superimposed on the temporal variability, associated with the salinity gradient of the river." (Authors) *Erythrodiplax nigricans* and *Oxyagrion hemmeli* were sampled at site 1 resp. site 2.] Address: Spaccesi, F., Laboratorio de Bentos, Instituto de Limnología Dr. Raúl A Ringuet (ILPLA) UNLP-CONICET, Av. Calchaquí, km 23,5 CC 712, CP 1900 La Plata, Buenos Aires, Argentina. E-mail: spaccesi@ilpla.edu.ar

8448. Spence, B. (2009): Reports from Coastal Stations - 2008: Spurn Point, East Yorkshire. *Atropos* 36: 57-58. (in English) [UK; *Calopteryx splendens*, *Erythromma viridulum*] Address: not stated

8449. Stavenga, D.G. (2009): 15. Surface colours of insects: Wings and eyes. In: Gorb, S.N. (Ed): *Functional surfaces in biology. Little structures with big effects. Volume 1.* Verlag Springer Netherlands. ISBN 978-1-4020-6696-2 (Print): 285-306. (in English) [On pages 288-289 Odonata are treated: "14.3 Damselfly Wing colours: The wings of damselflies are thin chitinous structures with mechanically strong veins, bordering membranous cells. Damselfly wings are usually rather colourless, although often adorned with some black spots. A few species have colourful wings, however A notable example is the damselfly *Neurobasis chinensis*, where the membranous structure in the cells of the hindwings feature beautiful multilayers, causing blue-green iridescent wings (Vukusic et al.. 2004). Remarkably, the mature males of another Asian damselfly, *Calopteryx japonica*, also display iridescent wings, but here the multilayers are exclusively in the wing veins. They provide the wings with a blue-green sheen (Fig. 14.3). Measurements of the reflectance of immature and mature males and females show that the reflectance is generally rather low (Fig. 14.4a-d), but the mature male wings have a noticeable reflectance peak in the blue (Fig. 14.4d). The wing transmittance varies strongly with age and sex. The transmittance spectra of the wings of immature and mature females indicate that the wings contain some melanin pigment (Fig. 14.4e, 0, so that the wings have a rather inconspicuous, brownish colouration. The wing transmittance of the immature males is much lower than that of the females (Fig. 14.4g), due to a higher concentration of melanin, and this concentration increases sharply with age (Fig. 14.4h). The deposition of melanin in the wing cells and the vein multilayers causes a dark background upon which the iridescence of the mature males, although not very intense, still clearly stands out. Behavioral observations show that the resulting striking blue colour of the mature

males plays an important role in the sexual recognition and discrimination of immature and mature animals (Hariyuma et al.. 2005)." (Author)] Address: Stavenga, Doekele, Department of Neurobiophysics, University of Groningen, Nijenborgh 4, 9747 AG Groningen, The Netherlands. Email: d.g.stavenga@rug.n

8450. Strand, L.; Billqvist, M.; Karlsson, T. (2009): Projekt trollslandor i Skane 2009 - 2014. Inventeringsmanual. Entomologiska sällskapet i Lund, Naturskyddsföreningen i Skåne och Studieförbundet: 37 pp. (in Swedish) [Well organized manual to survey the Odonata in the Skane-region, Sweden. For details see: <http://www.trollslandor.se/trollslandemanual.pdf>] Address: Strand, Linda

8451. Subramanian, K.A. (2009): *Dragonflies of India: A Field Guide.* Published by Vigyan Prasar, Noida. ISBN: 978-81-7480-192-0: XII + 168 pp. (in English) [Photographic field guide with more than 200 photographs to 111 Indian Odonata species, with English common names introduced to Indian dragonflies and damselflies for the first time. Implemented are field keys for the identification of larvae and adults, and information on key characteristics and ecology of each species.] Address: <http://www.vigyanprasar.gov.in>; Subramanian, K.A., Zoological Survey of India, Western Regional Station, Pune-411 044 Maharashtra, India. E-mail:subbuka.zsi@gmail.com

8452. Subramanian, K.A. (2009): A checklist of Odonata (Insecta) of India (version December 2009). Zoological Survey of India. <http://zsi.gov.in/zoological-survey-of-india/zsi-data/checklist/OdonataIndia151209.pdf>: 36 pp. (in English) [463 species are included into the checklist of the Indian Odonata. Thirteen of these are critically commented. Information on species described after 1995 (n=5), new species reports to India after 1995 (n=4), species synonymised after 1995 (n=16), species removed (n=7) and 18 taxa declared as nomen nudum according the provisions of ICZN Articles-13 & 16, as well as acknowledgements and references are added.] Address: Subramanian, K.A., Zoological Survey of India, Western Regional Station, Pune-411 044 Maharashtra, India. E-mail:subbuka.zsi@gmail.com

8453. Subramanian, K.A. (2009): A checklist of Odonata (Insecta) of India (version July 2009). Zoological Survey of India, Western Regional Station. <http://zsi.gov.in/zoological-survey-of-india/zsi-data/checklist/OdonataIndia110709.pdf>: III, 34 pp. (in English) [Globally app. 5,740 species of Odonata are known. Of these 470 species in 139 genera and 19 families exist in India. The taxa are listed and discussed. The type materials of following species (18 species) published by Sathe & Shinde (2006a,b, 2008a,b) are not deposited in any recognized national or international repositories. Moreover, the species descriptions do not provide illustrations or photographs of genitalia, anal appendages, wing venation etc. for a critical comparative study. Since the species descriptions does not adhere to the provisions of ICZN Articles-13 & 16 (Edition-4, 2000), the species may be considered nomen nudum until the types and illustrations are made available for scientific scrutiny: 1. *Agriocnemis kolhapurensis*; 2. *Anax mahaxmi*; 3. *Bradinopyga satarens*; 4. *Crocothemis rage-shri*; 5. *Gynacantha sathei*; 6. *Indothemis indica*; 7. *Indothemis koyinei*; 8. *Mesogomphus humani*; 9. *Mesogomphus indica*; 10. *Onychothemis patani*; 11. *Pantala*

shalakhi; 12. *Pantala shivajiensis*; 13. *Potamarcha humani*; 14. *Potamarcha koynii*; 15. *Rhyothemis rangiri*; 16. *Rhyothemis yashawanti*; 17. *Trithemis hivei*; 18. *Trithemis maharashtri*.] Address: Subramanian, K.A., Zool. Survey India, Western Regional Station, Pune-411 044 Maharashtra, India. E-mail:subbuka.zsi@gmail.com

8454. Suhling, F.; Martens, A.; Leipelt, K.-G.; Schütte, K.; Hoppe-Dominik B. (2009): Libellen Braunschweigs – Verbreitungsmuster und Bestandstrends der Libellenfauna einer Großstadt (Odonata). *Braunschweiger Naturkundliche Schriften* 8(2): 449-476. (in German, with English summary) ["In the period from 1980 to 2009, 51 odonate species were recorded in the area of Braunschweig, Lower Saxony, Germany. With a data base of 4405 records from 180 localities and a relatively continuous field work in that period, distribution patterns as well as long-term trends in the occurrence of species were analysed. For several species distinct trends of decline or increase could be detected and related to local habitat variation and general population trends. 30 of the recorded species were categorised as more or less frequent, 13 as rare and eight species were only recorded as single specimens. *Sympetrum pedemontanum*, *Coenagrion pulchellum*, *Ischnura pumilio* and especially *Sympetrum danae* showed a decline, whereas *Sympecma fusca*, *Gomphus vulgatissimus*, *Ophiogomphus cecilia*, *Orthetrum brunneum* and *O. coerulescens* became more frequent during that period. The diversity of the dragonfly fauna of Braunschweig can be explained by the presence of pond systems in the urban periphery and by the presence of two rivers and their floodplain remnants: both habitat types were improved by restauration and conservation measures, i.e. construction of small ponds and sympathetic river management, respectively." (Authors)] Address: Suhling F., Inst. Geoökologie, TU Braunschweig, Langer Kamp 19c, 38102 Braunschweig, Germany. E-mail: f.suhling@tu-bs.de

8455. Suutari, E.; Salmela, J.; Paasivirta, L.; Rantala, M.J.; Tynkkynen, K.; Luojumäki, M.; Suhonen, J. (2009): Macroarthropod species richness and conservation priorities in *Stratiotes aloides* (L.) lakes. *Journal of Insect Conservation* 13(4): 413-419. (in English) ["Species with narrow ranges and specialised traits are most at risk, and the extinction wave is further enhanced by coextinctions. We studied the conservation value and indicator potential of *Stratiotes aloides*, an aquatic macrophyte that has declined considerably in Europe. Our purpose was to determine whether *S. aloides* could be used as an indicator of a valuable habitat in terms of macroarthropod diversity and species richness. The potential occurrence of an internationally endangered *Stratiotes*-habitat specialist, the dragonfly *Aeshna viridis*, can increase the conservation value of plant colonies. *S. aloides* beds harboured diverse macroarthropod fauna often containing species of conservation concern, including *A. viridis*. *Stratiotes* is a potential indicator of a valuable habitat, and its indicator value is enhanced by the easy identification of the species. However, its use as an indicator of a defined macroarthropod community is limited because no particular community type is connected to it. We suggest that protecting *Stratiotes* simultaneously conserves valuable arthropod fauna, including *A. viridis*." (Authors)] Address: Suutari, Erna, Department of Biological and Environmental Science, University of Jyväskylä, P.O. Box 35, FI-40014 Jyväskylä, Finland. Email: ermasuut@jyu.fi

8456. Swillen, I.; De Block, M.; Stokks, R. (2009): Morphological and physiological sexual selection targets in a territorial damselfly. *Ecological Entomology* 34(6): 677-683. (in English) ["1. Several morphological and physiological traits may shape fitness through the same performance measure. In such cases, differentiating between a scenario of many-to-one mapping, where phenotypic traits independently shape fitness leading to functional redundancy, and a scenario where traits strongly covary among each other and fitness, is needed. 2. A multivariate approach was used, including morphological and physiological traits related to flight ability, a crucial performance measure in flying insects, to identify independent correlates of short-term mating success (mated versus unmated males) in the territorial damselfly *Lestes viridis*. 3. Males with higher flight muscle mass, higher relative thorax mass, and more symmetrical hindwings, all traits presumably linked to manoeuvrability, were more likely to be mated. Unexpectedly, although relative thorax mass is often used as a proxy for flight muscle mass, both traits were selected for independently. Mated males had a higher thorax fat content than unmated males, possibly because of enhanced flight endurance. 4. The finding of several independent targets of sexual selection linked to flight ability is consistent with a scenario of many-to-one mapping between phenotype and performance. Identifying such a scenario is important, because it may clarify situations where animals may show suboptimal values for some phenotypic traits shaping a performance measure, while still having high performance and fitness. We argue in the discussion that the functional approach of sexual selection provides a potent tool for examining unresolved issues in both sexual selection theory, as well as life-history theory." (Authors)] Address: Swillen, Ine, Laboratory of Aquatic Ecology and Evolutionary Biology, University of Leuven, Deberiotstraat 32, B-3000 Leuven, Belgium. E-mail: Ine.swillen@bio.kuleuven.be

8457. Takahashi, Y.; Watanabe, M. (2009): Diurnal changes and frequency dependence in male mating preference for female morphs in the damselfly *Ischnura senegalensis* (Rambur) (Odonata: Coenagrionidae). *Entomological Science* 12(3): 219-226. (in English) ["*I. senegalensis* females exhibit colour dimorphism, consisting of an andromorph and a gynomorph, which might be maintained under a frequency-dependent process of mating harassment by mate-searching males. Males change their mating preference for female morph depending on prior copulation experience. Binary choice experiments between two female morphs were carried out in four local populations in the early morning (07.00–09.00 hours) and the afternoon (12.00–14.00 hours), times which mark the onset and the end of diurnal mating activity, respectively. According to the line census along the water's edge, the proportion of andromorphs in the female population varied from 21 to 67% throughout the survey period for four local populations. Males showed non-biased preference for female morphs in the early morning in each local population, while they chose the common morph in the afternoon. Male mating preference for female morphs was positively correlated to the proportion of female morphs in the population. If the selective mating attacks on the common female morphs inhibit their foraging and/or oviposition behaviour, frequency-dependent male mating attacks might provide a selective force for maintaining the female colour dimorphism in *I. senegalensis*." (Authors)] Address: Watanabe, M., Graduate School of Life

& Environmental Sciences, Univ. of Tsukuba, Tsukuba, Ibaraki 305-8572, Japan. Email: watanabe@kankyo.envr.tsukuba.ac.jp

8458. Takehara, S.; Uchida, S.; Kimura, K. (2009): Impact assessment of deposit removal on the physical habitat for aquatic insects in the middle reach of the Yahagi River, central Honshu, Japan. *Aichi Kogyo Daigaku Kenkyu Houkoku B* [Annual Report of Aichi Institute of Technology B.] 44(21): 155-162. (Japanese, with English summary) ["We assessed the impact of deposit removal from the middle reach of the Yahagi River, central Honshu, Japan, on the physical habitat availability for five species of aquatic insects (*Macromia daimoji*, *Gomphus postocularis*, *Onychogomphus viridicostus*; *Oyamia seminigra*, *Neoperla* sp. (Plecoptera: Perlidae), by employing the IFIM / PHABSIM. The weighted usable area (WUA) of the species that live in the cobble substrates with interstitial spaces, *O. viridicostus*, *O. seminigra*, and *Neoperla*, were expected to become wider in the estimated riverbed after the deposit removal than in the present riverbed. On the other hand, the WUA of the species that live on the mud and sand substrates in a backwater pool along the channel margin, *M. daimoji* and *G. postocularis*, were expected to become smaller in the estimated riverbed after the deposit removal than in the present riverbed, if the gravel bar around the backwater pool would be removed. But, it was difficult to accurately assess the physical habitat in the places like the backwater pool after the deposit removal. Therefore, the practice of deposit removal work should follow the process of adaptive management in order to determine the best management strategy." (Authors)] Address: not transliterated into English

8459. Taylor, P.; Smallshire, D.; Parr, A. (2009): Revised list of Odonata recorded in the United Kingdom. *J. Br. Dragonfly Soc.* 25(1): 57-61. (in English) ["The Trustees of the BDS recently decided that the species list used in all BDS publications should follow the same systematic order. Additionally it was felt that a system of categories for UK species is needed. The Odonata lists presented follow the taxonomic sequence of Davies & Tobin (1984, 1985) and employ similar groupings to the example set by the British Ornithologists' Union Records Committee for its bird list, although it has not been sensible to use exactly the same categories." (Authors)] Address: Taylor, Pam, Decoy Farm, Decoy Rd, Potter Heigham, Norfolk NR29 5LX, UK

8460. Tennessen, K.J. (2009): Description of the final instar nymph of *Homeoura nepos* (Selys, 1876) (Odonata: Coenagrionidae). *Zootaxa* 2286: 65-68. (in English) ["The description of the nymph of *H. nepos* by Calvert (1948) was based on a single, immature specimen from São Paulo, Brazil which lacked gills. The nymphs of *H. chelifera* and *H. lindneri* were described by Lozano et al. (2009), who considered Calvert's description of the nymph of *H. nepos* doubtful. The following description and illustrations of the nymph of *H. nepos* are based on reared specimens from Bolivia. The nymphs of the three species now definitely known are compared; the nymphs of *H. sobrina* and *H. obrieni* remain unknown." (Author)] Address: Tennessen, K.J., 125 N Oxford St., Wautoma, WI 54982, USA. E-mail: ktennessen@centurytel.net

8461. Teuscher, M.; Brändle, M.; Traxel, V.; Brandl, R. (2009): Allometry between leg and body length of in-

sects: lack of support for the size-grain hypothesis. *Ecological Entomology* 34(6): 718-724. (in English) ["The size-grain hypothesis (Kaspari & Weiser, 1999) states that (1) as organisms decrease in size, they perceive their environment as being more rugose; (2) long legs allow organisms to step over obstacles but hinder them from entering small gaps; and (3) as the size of an organism decreases, the benefits of long legs begin to be outweighed by the costs of construction. Natural selection should therefore favour proportionally longer legs in larger organisms, thereby leading to a positive allometry between leg and body length (scaling exponent $b > 1$). Here we compare the scaling exponent of leg-to-body length relationships among insects that walk, walk and fly, and predominantly fly. We measured the lengths of the hind tibia, hind femur, and body length of each species. The taxa varied considerably in the scaling exponent b . In seven out of ten groups (Formicidae, Isoptera, Carabidae, Pentatomidae, Apidae, Lepidoptera, Odonata adult), b was significantly greater than one. However, there was no gradual decrease in b from walking to walking/flying to flying insects. The results of the present study provide no support for the size-grain hypothesis. We propose that leg length is not only affected by the rugosity of the environment, but also by (1) functional adaptations, (2) phylogeny, (3) lifestyle, (4) the type of insect development (hemimetabolism or holometabolism), and (5) constraints of gas exchange." (Authors)] Address: Teuscher, Miriam, Animal Ecology, Department of Ecology, Faculty of Biology, Philipps-Universität Marburg, Karl-von-Frisch Str. 8, 35032 Marburg, Germany. E-mail: miriam.teuscher@gmx.de

8462. Thiery, G.; Milenkovski, S.; Lindgren, P.E.; Sahlén, G.; Berglund, O.; Weisner, S.E.B. (2009): Wetland creation in agricultural landscapes: Biodiversity benefits on local and regional scales. *Biological Conservation* 142: 964-973. (in English) ["Wetland creation aiming at a simultaneous increase in nutrient retention and species diversity in agricultural landscapes has recently become applied as a catchment-scale compensation measure for past wetland losses. Here, we evaluate if, and to what extent, dual-purpose wetlands benefit local and regional diversity of agricultural landscapes. We analysed composition and a , b , and c diversity of aquatic macroinvertebrate assemblages among dual-purpose wetlands in an agricultural region in southwest Sweden in relation to local (water quality, wetland morphology, succession stage, proximity to other aquatic habitats) and landscape parameters (regional connectivity, wetland density). Diversity of mature agricultural ponds was used as a standard to evaluate the value of dual-purpose wetlands. Dual-purpose wetlands sustained a , b , and c diversity similar to that of natural lentic water bodies in agricultural landscapes in the region and elsewhere. Over 80% of the overall species richness was attributed to b diversity, and each created wetland contributed to overall species accumulation. Ecosystem parameters explained 19% of the compositional variation among assemblages, but were only marginally related to diversity. Wetland density promoted a and c diversity, while spatial heterogeneity (b) remained equally high, independent of wetland density. Our results indicate that catchment-scale wetland creation for simultaneous retention and diversity purposes benefits the biodiversity of agricultural landscapes, particularly if the density of aquatic habitats is increased by at least 30%." (Authors) Odonata belong to the most diverse insect orders in man-made water bodies.] Address: Sah-

lén, G., Systematic Zoology, Evolutionary Biology Centre, Uppsala University, Norbyvägen 18D, S-752 36 Uppsala, Sweden. E-mail: goran.sahlen@set.hh.se

8463. Ting, J.T.; Bots, J.; Pérez Jvostov, F.; van Gossum, H.; Sherratt, T.N. (2009): Effects of extreme variation in female morph frequencies on the mating behaviour of male damselflies. *Behavioral Ecology and Sociobiology* 64(2): 225-236. (in English) ["Female-limited polymorphism is often attributed to selection to avoid excessive male mating attempts. It is encountered in various taxonomic groups, but is particularly common in damselflies, where one female morph (andromorph) typically resembles the conspecific male in colour pattern, while the other(s) (gynomorph(s)) do not. Two sets of theories have been proposed to explain the phenomenon in damselflies, which can be classified as the learned mate recognition (LMR) and male mimicry (MM) hypotheses. To test predictions of these hypotheses, we evaluated the rate of male sexual response towards female morphs and conspecific males in *Nehalennia irene*. The LMR hypothesis predicts that males should respond sexually to andromorphs at greater rates in populations containing a higher relative frequency of andromorphs. The MM hypothesis predicts that males respond more often sexually to both andromorphs and males as the ratio of andromorphs to males increases. While LMR predicts that the rate of mating attempts towards gynomorphs should vary, the MM predicts that it should be relatively fixed. On experimentally presenting live specimens to focal males in five different populations with extreme variation in female morph frequencies, we observed that as the andromorph frequency and ratio of andromorphs to males increased, the proportion of male mating attempts increased on both andromorphs and males, whereas it decreased on gynomorphs. While the simplest form of the MM hypothesis is rejected, the results support specific predictions of both hypotheses and suggest that future studies should not treat these hypotheses as mutually exclusive." (Authors)] Address: Sherratt, T.N., Department of Biology, Carleton University, 1125 Colonel By Drive, Ottawa ON, K1S 5B6, Canada. E-mail: sherratt@ccs.carleton.ca

8464. Toivanen, T.; Rantala, M.J.; Suhonen, J. (2009): Influence of alternative mating tactics on predation risk in the damselfly *Calopteryx virgo*. *Can. Jour. Zool.* 87: 684-688. (in English, with French summary) ["Alternative mating tactics are a widespread feature in insects. A typical form of alternative mating behaviour is being a sneaker in the vicinity of a territorial male. Such nonterritorial males have lower mating success, but they may benefit from lower energetic costs and decreased predation risk. In this study, we examined whether nonterritorial male damselflies *C. virgo* are subject to lower predation risk than territorial males. To distinguish predation from other sources of mortality, we used models. The experiment consisted of dried male damselflies settled into the typical perching positions of territorial and nonterritorial males. Also the spatiotemporal patterns of predation risk were studied. The survival of nonterritorial male models was consistently higher than that of territorial male models, which can be attributed to different predation risk. Survival of the models was lower in the presence of avian predators and in large populations. Survival rates were affected by habitat type but did not change during the season. We conclude that nonterritorial male damselflies are less vulnerable to predation and that there may be a

trade-off which could potentially make the fitness of sneakers equal to that of territorial males." (Author)] Address: Suhonen, J., Secti. Ecology, Dept Biology, Univ. Turku, 20014 Turku, Finland. E-mail: juksuh@utu.fi

8465. Torralba Burrial, A.; Mezquita, I. (2009): De Monstruos y Prodigios (23): un caso de teratología abdominal en *Ischnura pumilio* (Charpentier, 1825) (Odonata: Coenagrionidae). *Boletín de la Sociedad Entomológica Aragonesa* 44: 349-350. (in Spanish, with English summary) [A teratology in last abdominal segments of a male specimen of *I. pumilio* is reported] Address: Torralba Burrial, A., Departamento de Biología de Organismos y Sistemas, Universidad de Oviedo, E-33071 Oviedo, Spain. E-mail: antoniotb@hotmail.com

8466. Torralba Burrial, A.; Mezquita, I. (2009): Fallos en reconocimiento de pareja en libélulas: cinco tandems intrasexuales inter e intraespecíficos (Odonata: Lestidae, Coenagrionidae y Gomphidae). *Boletín de la Sociedad Entomológica Aragonesa* 44: 522-524. (in Spanish, with English summary) ["Partner recognition failure in dragonflies: five intrasexual inter and intraspecific tandems (Odonata: Lestidae, Coenagrionidae and Gomphidae) 5 intrasexual tandems in dragonflies are reported. Two are intraspecific tandems (*Ischnura pumilio* and *Lestes sponsa*) and three are interspecific tandems (*L. sponsa* with *Lestes barbarus*, *L. sponsa* with *Chalcolestes viridis* and *Onychogomphus uncutus* with *Onychogomphus forcipatus*)." (Authors)] Address: Torralba Burrial, A., Departamento de Biología de Organismos y Sistemas, Universidad de Oviedo, E-33071 Oviedo, Spain. E-mail: antoniotb@hotmail.com

8467. Torralba-Burrial, A. (2009): Libélulas de montaña: cuatro especies amenazadas en la Península Ibérica. *El Ecologista* 62: 40-41. (in Spanish, with English summary) [*Aeshna juncea*, *Cordulegaster bidentata*, *Sympetrum flaveolum*, and *Leucorrhinia pectoralis* are threatened in the Iberian Peninsula, due to distribution fragmentation, loss of its habitats and climatic change.] Address: Torralba Burrial, A., Departamento de Biología de Organismos y Sistemas, Universidad de Oviedo, E-33071 Oviedo, Spain. E-mail: antoniotb@hotmail.com

8468. Torralba-Burrial, A.; Ocharan, F.J. (2009): Two gynandromorphs of *Sympetrum striolatum* (Charpentier, 1840) (Odonata: Libellulidae). *Entomological Science* 12(2): 182-187. (in English) [Spain; 2 gynandromorphs of *S. striolatum*, with different features, are described here, with special emphasis on the genitalic structures.] Address: Torralba Burrial, A., Departamento de Biología de Organismos y Sistemas, Universidad de Oviedo, E-33071 Oviedo, Spain. E-mail: antoniotb@hotmail.com

8469. Trautner, J. (2009): Artenschutz und Umweltaftung bei Pflege- und Unterhaltungsmaßnahmen an Fließgewässern. Ein Streiflicht zur Berücksichtigung der relevanten Rechtsnormen in der Praxis. *Naturschutz und Landschaftsplanung* 41(3): 78-82. (in German, with English summary) ["Species Protection and Environmental Liability in Watercourse Maintenance – Consideration of relevant legal norms'. Measures in the context of watercourse maintenance may seriously impair protected species. Some examples are given, including strictly protected species of the European Habitats Directive (92/43/EEC). It is necessary to pay attention to the regulations of the German Federal Nature Conservation Act (BNatSchG) on species protection as well as

to those of the Environmental Damage Act (USchadG) on environmental liability. Currently this seems to be insufficiently known or is not taken seriously enough. Concerning measures planned in the framework of watercourse maintenance firstly at least a rough estimation of their effects is necessary. If highly endangered species could be affected a more detailed assessment should be done. Both the estimation and the assessment aim to clarify (a) which particularly sensitive and protected species are affected, (b) which possibilities for prevention or reduction of negative impacts respectively a careful management are given, (c) if nevertheless legal prohibitions are touched, (d) if a legal exemption is necessary and even possible under the specific circumstances (reasons for the planned measures, lack of satisfactory alternative solutions, conservation status of the populations), (e) if and which additional measures could be necessary in this context." (Author) Coenagrion mercuriale serves as an example to outline legal considerations to maintain watercourses.] Address: Trautner, J., Arbeitsgruppe für Tierökologie und Planung, Johann-Strauß-Straße 22, D-70794 Filderstadt, Germany. E-Mail info@tieroekologie.de

8470. Tun-Lin, W.; Lenhart, A.; Nam, V.S.; Rebolgar-Tellez, E.; Morrison, A.C.; Barbazan, P.; Cote, M.; Midega, J.; Sanchez, F.; Manrique-Saide, P.; Kroeger, A.; Nathan, M.B.; Meheus, F.; Petzold, M. (2009): Reducing costs and operational constraints of dengue vector control by targeting productive breeding places: a multi-country non-inferiority cluster randomized trial. *Tropical Medicine and International Health* 14(9): 1143-1153. (in English) ["Objectives: To test the non-inferiority hypothesis that a vector control approach targeting only the most productive water container types gives the same or greater reduction of the vector population as a non-targeted approach in different ecological settings and to analyse whether the targeted intervention is less costly. Methods: Cluster randomized trial in eight study sites (Venezuela, Mexico, Peru, Kenya, Thailand, Myanmar, Vietnam, Philippines), with each study area divided into 18-20 clusters (sectors or neighbourhoods) of approximately 50-100 households each. Using a baseline pupal-demographic survey, the most productive container types were identified which produced $\geq 55\%$ of all *Ae. aegypti* pupae. Clusters were then paired based on similar pupae per person indices. One cluster from each pair was randomly allocated to receive the targeted vector control intervention; the other received the 'blanket' (nontargeted) intervention attempting to reach all water holding containers. Results: The pupal-demographic baseline survey showed a large variation of productive container types across all study sites. In four sites the vector control interventions in both study arms were insecticidal and in the other four sites, non-insecticidal (environmental management and/or biological control methods). Both approaches were associated with a reduction of outcome indicators in the targeted and non-targeted intervention arm of the six study sites where the follow up study was conducted (PPI, Pupae per Person Index and BI, Breteau Index). Targeted interventions were as effective as non-targeted ones in terms of PPI. The direct costs per house reached were lower in targeted intervention clusters than in non-targeted intervention clusters with only one exception, where the targeted intervention was delivered through staff-intensive social mobilization. Conclusions: Targeting only the most productive water container types (roughly half of all water holding container types) was

as effective in lowering entomological indices as targeting all water holding containers at lower implementation costs. Further research is required to establish the most efficacious method or combination of methods for targeted dengue vector interventions." (Authors) In Myanmar, the study included dragonflies to reduce *Ae. aegypti*, and is in combination with sweeps and fishes as predators of *Aedes* the most effective method to reduce *Ae. aegypti* as well as community participation in controlling and maintaining water containers.] Address: Tun-Lin, W., Dept Medical Research, Yangon, Myanmar

8471. Tunmore, M. (2009): Reports from Costal Stations - 2008: Lizard Peninsula. *Atropos* 36: 36-38. (in English) [*Sympetrum fonscolombii*, *Ceragrion tenellum*] Address: Tunmore, M., 36 Tinker Lane, Meltham, Huddersfield, West Yorkshire HD7 3ES, UK. E-mail: atropos@atroposed.freeseerve.co.uk

8472. Tynkkynen, K.; Raatikainen, K.J.; Häkklä, M.; Haukilehto, E.; Kotiaho, J.S. (2009): Alternative reproductive tactics and the propensity of hybridization. *J. evol. biol.* 22: 2512-2518. (in English) ["One explanation for hybridization between species is the fitness benefits it occasionally confers to the hybridizing individuals. This explanation is possible in species that have evolved alternative male reproductive tactics: individuals with inferior tactics might be more prone to hybridization provided it increases their reproductive success and fitness. Here we experimentally tested whether the propensity of hybridization in the wild depends on male reproductive tactic in *Calopteryx splendens* damselflies. Counter to our expectation, it was males adopting the superior reproductive tactic (territoriality) that had greatest propensity to hybridize than males adopting the inferior tactics (sneakers and floaters). Moreover, among the territorial males, the most ornamented males had greatest propensity to hybridize whereas the pattern was reversed in the sneaker males. Our results suggest that there is fluctuating selection on male mate discrimination against heterospecific females depending on both ornament size and the male's reproductive tactic." (Authors)] Address: Tynkkynen, Katja, Centre of Excellence in Evolutionary Research, Department of Biological and Environmental Sciences, PO Box 35, University of Jyväskylä, FI-40014 Jyväskylä, Finland. E-mail: katja.m.m.tynkkynen@jyu.fi

8473. Tyrrell, M.; Emary, C.; Piper, M. (2009): The Beautiful Demoiselle *Calopteryx virgo* (Linnaeus) in Northamptonshire: eastwards expansion & habitats. *J. Br. Dragonfly Soc.* 25(2): 100-106. (in English) ["Northamptonshire is at the eastern limit of the range of *C. virgo* in the Midlands of England, making this population of regional importance. *C. virgo* is included as a Key County species according to key sites criteria (French & Smallshire, 2008). Historically, *C. virgo* in Northamptonshire has been limited to two river systems, the Rivers Tove and Cherwell, with its range showing few signs of expanding. However, since 2003, it has undergone a significant range expansion and is now recorded on six river systems, adding the Great Ouse near Brackley, the Leam, the Avon and the Nene to the list. While increased recording in the County over this time period will have undoubtedly contributed new records, this is mainly infilling, and a genuine expansion has been noted into new previously well recorded areas. This paper discusses this expansion using a series of dated distribution maps, and reviews the river habitats of all

river systems with possible expansion corridors discussed." (Authors) Address: Tyrrell, M., 8 Warwick Close, Raunds, Northamptonshire, NN9 6JH, UK

8474. Uzenbaev, S.D.; Lyabzina, S.N. (2009): An experimental study of the effects of spider venom on animals. *Entomological Review* 89(4): 479-486. (in English) ["The effects of venom of spiders from the families Pisauridae, Argyronetidae, and Araneidae on different animals (worms, molluscs, arthropods, fishes, and mammals) were studied. The animals of different classes varied in their sensitivity to spider venom. The animals that can be a potential prey were the most sensitive. The venom of spider females was more efficient than that of males. The spiders were found to be able to kill five victims in sequence; the most effective action of venom was on the first two ones. The venom regenerates in 1.5–2 hours." (Authors) In case of the two odonata taxa studied, the results are as follows: Sensitivity of *Lestes sponsa* larvae to venom of terrestrial *Araneus bituberculatus* (7.4 h before death); *A. diadematus* (1.5 h before death); Sensitivity of *Lestes sponsa* larvae to venom of aquatic *Argyroneta aquatica* (12.4 h \pm 2.3 before death); *Dolomedes fimbriatus* (14.3 h \pm 4.2 before death); Sensitivity of *Aeshna juncea* larvae to venom of aquatic *Argyroneta aquatica* (17.7 h \pm 5.6 before death); *Dolomedes fimbriatus* (44.8 h \pm 4.2 before death)] Address: Uzenbaev, S.D., Petrozavodsk State University, Petrozavodsk, 185910 Russia. E-mail: uzenbaev@petrsu.ru

8475. Van Passel, B. (2009): Dragonflies in the northern part of the Waasland (province of East-Flanders) in 2008. *Libellenvereniging Vlaanderen —nieuwsbrief* 3(1): 8-10. (in Dutch, with English summary) [Belgium; *Ceragrion tenellum*, *Coenagrion pulchellum*, *Leucorhinia dubia*, and *Aeshna isocoles* were found by surveying a region with relatively few historical data.] Address: Van Passel, Brigitte, (Libellenwerkgroep Natuurpunt Waasland-Noord), Bormte 24, 9190 Stekene, Belgium. E-mail: brigitte.van.passel1@telenet.be

8476. Veber, T.; Kotta, J.; Lauringson, V.; Kotta, I. (2009): Influence of the local abiotic environment, weather and regional nutrient loading on macrobenthic invertebrate feeding groups in a shallow brackish water ecosystem. *Oceanology* 51(4): 541-559. (in English) ["This study evaluated the extent to which depth, sediment type, exposure to waves and coastal slope inclination modulate the relationships between regional nutrient loading, weather patterns and the species composition and dominance structure of macrobenthic invertebrate feeding groups in a brackish water ecosystem of the Baltic Sea. Irrespective of feeding function, the species composition and dominance structure of benthic invertebrate communities were determined by local abiotic variables such as exposure, depth and sediment type. Regional weather variables (average southerly winds, salinity, water temperature, ice conditions) either separately or interactively contributed to the variability of benthic invertebrates. Nutrient loading had significant effects on benthic invertebrates only in interactions with local abiotic or regional weather variables. Herbivores, deposit feeders and suspension feeders exhibited a stronger response to the studied environmental variables than carnivores. All this suggests that (1) the dynamic coastal habitats studied in this work are not very sensitive to shifts in nutrient loading and (2) local abiotic conditions and weather patterns largely define the ob-

served biotic patterns. We believe that the benthic invertebrate time series will only be a better reflection of the nutrient loading signal if more years covering extreme events are included." (Authors) Odonata are referred on the order level.] Address: Kotta, J., Estonian Marine Institute, University of Tartu, Mäealuse 10a, EE-12618 Tallinn, Estonia. E-mail: jonne.kotta@sea.ee

8477. Vercruyssen, W.; Feys, S.; Provoost, S. (2009): Two years of dragonflies in the PINK-project, an inventory of ponds at the Belgian coast. *Libellenvereniging Vlaanderen —nieuwsbrief* 3(1): 2-7. (in Dutch, with English summary) ["Very few historic dragonfly data exist from the coastal region. Till 2006, 27 species had been reported. In this three-year project some 150 waterbodies, some created recently as drinking reservoirs for nature-helping grazers, will be monitored. Till now 32 species have been found during these visits (two from the past haven't been found back yet), meaning 7 new species for the coast, some relatively rare for the western provinces of Belgium. One of the most extraordinary facts is the now almost omnipresence of *Coenagrion scitulum*, where the less good weather of 2008 seems to have had no impact on its populations." (Authors)] Address: Vercruyssen, W., INBO, Kliniekstraat 25, 1070 Brussel, Belgium. E-mail: edward.vercruyssen@inbo.be

8478. Versigghel, J. (2009): Ontdekking van een populatie Tangpantserjuffer (*Lestes dryas*) op de grens tussen West- en Oost-Vlaanderen [Discovery of a population of *Lestes dryas* on the border of West- and East-Flanders]. *Nieuwsbrief Libellenvereniging Vlaanderen* 3(2): 7-10. (in Dutch, with English summary) ["In the summer of 2009 a population of this rare damselfly was discovered in Wingene (on the border the provinces of East- and West-Flanders. The spot is situated in woodland, but parts have been cleared and ponds digged as part of a Life project. The area - as the nearby "Gulke Putten" nature reserve - holds quite a number of typical species from the Campine region. As the species is very rare, except in parts of the eastern half of Flanders (Antwerp and Limburg Campine), it seems that she is capable of colonising rather far away regions given a suitable habitat." (Author)] Address: Versigghel, J., Gouvernementstraat 34, 9880 Aaler, Belgium. E-mail: jan.versigghel@skynet.be

8479. Victorian Department of Sustainability and Environment (2009): Advisory list of threatened invertebrate fauna in Victoria - 2009. Department of Sustainability and Environment, East Melbourne, Victoria. ISBN 978-1-74242-058-5: 12 pp. (in English) [Australia; the red list of includes the following odonate species: *Calagrion billinghami*, *Hemiphysalia mirabilis* (endangered), *Austroaeschna flavomaculata* (vulnerable), *Austrolestes aridus*, *Austropetalia tonyana*, *Coenagrion lyelli* (near threatened), and *Dendroaeschna conspersa* (data deficient).] Address: Dept of Sustainability & Environment, 8 Nicholson Street, East Melbourne 3002, Australia

8480. Villanueva, R.J.T. (2009): Odonata of Dinagat Island, the Philippines: updated species list and notes on conservation of species and habitats. *Notulae odonatologicae* 7(3): 27-35. (in English) ["69 species were recorded from the island in 2007-2008, raising the number of the known species up to 83, but 12 species from the 1997 list of M. Hämäläinen & R.A. Müller (*Odonatologica* 26: 249-315) were not recorded during the present survey. 7 species and 3 sites are considered im-

portant from conservation viewpoint." (Author)] Address: Villanueva, R.J.T., D3C Gahol Apartment, Lopez Jaena St., Davao City, 8000 Philippines. E-mail: reaganjoseph@lycos.com

8481. Vintchevski, D.; Yasievitch, A. (2009): Comparison of a diet of the Montagu's Harrier *Circus pygargus* L. during breeding season in two distinct plots in the western Belarus. *Studia i Materialy Centrum Edukacji Przyrodniczo-Lesnej R. 11. Zeszyt 3 (22):* 110-117. (in English, with Polish summary) [Hrodna and Smarhon' districts, Belarus; the diet of *Circus pygargus* included *Sympetrum* sp.] Address: Vintchevski, D., Hrodna regional branch of APB-BirdLife Belarus. E-mail: Harrier@tut.by

8482. von Ellenrieder, N. (2009): Five new species of *Orthemis* from South America (Odonata: Libellulidae). *International Journal of Odonatology* 12(2): 347-381, pl. VII. (in English, with Spanish summary) ["Five new species of the levis-group of *Orthemis*, *O. cinnamomea* (holotype male in USNM: Peru, Madre de Dios Department, Explorer's Inn on Río Tambopata, 12°50'S, 69°17'W, 300 m, 23 vii 2002, leg. D. Paulson & N. Smith), *O. coracina* (holotype male in USNM: Ecuador, Sucumbíos Province, Limoncocha, 00°24'S, 76°36'W, 300 m, 23 vii 1977, leg. D. Paulson), *O. harpago* (holotype male in USNM: Peru, Madre de Dios Department, Explorer's Inn on Río Tambopata, 12°30'S, 69°12'W, 300 m, 17 vi 1977, leg. D. Paulson), *O. philipi* (holotype male in MLP: Argentina, Salta Province, pond at route 15 between route 5 and Las Varas, 23°21'S, 64°08'W, 392 m, 23 v 2008, leg. N. von Ellenrieder), and *O. tambopatae* (holotype male in USNM: Peru, Madre de Dios Department, Explorer's Inn on Río Tambopata, 12°30'S, 69°12'W, 300 m, 16 vi 1977, leg. D. Paulson), are described, illustrated, and diagnosed. A key for all species of the levis-group of *Orthemis* is provided." (Author)] Address: Ellenrieder, Natalia von, Museo de Ciencias Naturales, Universidad Nacional de Salta, Mendoza 2, Salta 4400, Argentina. E-mail: natalia.ellenrieder@gmail.com

8483. von Reumont, B.M.; Meusemann, K.; Szucsich, N.U.; Dell'Ampio, E.; Gowri-Shankar, V.; Bartel, D.; Simon, S.; Letsch, H.O.; Stocsits, R.R.; Luan, Y.-x.; Wägele, J.W.; Pass, G.; Hadrys, H.; Misof, B. (2009): Can comprehensive background knowledge be incorporated into substitution models to improve phylogenetic analyses? A case study on major arthropod relationships. *BMC Evolutionary Biology* 2009, 9:119: 19 pp. (in English) ["Background: Whenever different data sets arrive at conflicting phylogenetic hypotheses, only testable causal explanations of sources of errors in at least one of the data sets allow us to critically choose among the conflicting hypotheses of relationships. The large (28S) and small (18S) subunit rRNAs are among the most popular markers for studies of deep phylogenies. However, some nodes supported by this data are suspected of being artifacts caused by peculiarities of the evolution of these molecules. Arthropod phylogeny is an especially controversial subject dotted with conflicting hypotheses which are dependent on data set and method of reconstruction. We assume that phylogenetic analyses based on these genes can be improved further i) by enlarging the taxon sample and ii) employing more realistic models of sequence evolution incorporating nonstationary substitution processes and iii) considering covariation and pairing of sites in rRNA-genes.

Results: We analyzed a large set of arthropod sequences, applied new tools for quality control of data prior to tree reconstruction, and increased the biological realism of substitution models. Although the split-decomposition network indicated a high noise content in the data set, our measures were able to both improve the analyses and give causal explanations for some incongruities mentioned from analyses of rRNA sequences. However, misleading effects did not completely disappear." (Authors)] Address: Björn M von Reumont, Molecular Lab, Zoologisches Forschungsmuseum A. Koenig, Bonn, Germany. E-mail: bmvr@arcor.de

8484. Waldhauser, M. (2009): First record of *Erythromma lindenii* (Sélys, 1840) (Odonata, Coenagrionidae) in the Czech Republic. *Bulletin Lampetra* VI: 26-29. (in Czech, with English summary) [In July 2009, *E. lindenii* was recorded for the first time in Czech Republic (northern Bohemia, Liberec region, at a pond called Horní Kunratický rybník near the village of Kunratice u Cvikova). It is a mesotrophic pond of 0,07 km² at 350 m a.s.l. with submerged vegetation dominated by *Myriophyllum spicatum* and a narrow zone of littoral vegetation. It is located approx. 65 km SE from the nearest known locality - Knappensee - in Saxony, Germany.] Address: Waldhauser, M., Petrovice 136, 47125 Jablonné v Podještědí, Czech Republic. E-mail: martin.waldhauser@nature.cz

8485. Walker, I. (2009): Emergence of aquatic insects and spider abundance in the Balbina Reservoir (Presidente Figueiredo, Amazonas, Brazil) during the phase of declining eutrophication. *Acta Limnol. Bras.* 21(2): 199-207. (in English, with Portuguese summary) ["Aim: Between April 1991 and December 1994 the patterns of insect emergence were assessed by a total of 422 emergence traps that were set for 24 hours periods on the water surface of the riparian zones of two islands in the Balbina Lake; Methods: These collections were accompanied by observations of spider densities along the shrubby forest margins of the islands. Furthermore, to characterize the lake ecosystem, casual observations on Odonata and spider abundance within the inundated forest with dead, emergent trees were recorded, and some of the species were identified; Results: Insect emergence did not decline during the 4 years of collection, and the Chironomidae and Chaoboridae were dominant throughout, adding up to 70-90% of the catches. There is some indication of seasonal cycles, and the specific pattern of Ephemeroptera emergence is demonstrated in more detail; Conclusions: It appears that production of aquatic insects in the Balbina Reservoir, while still in its eutrophic phase, is lower than along the Tarumã- Mirim, an undisturbed Central Amazonian forest stream of nutrient-poor, acid water. [...] A total of 37 counts made during these excursions resulted in a mean estimate of 40-55 adult Odonata/ha of inundated dead forest, and there was no consistent trend of change of abundance during the seven-year period of observation. On a single occasion no Odonata were seen (20 July/94, 8:30 hours, Ilha das Aranhãs), and it may be that this is due to the relatively early hour of the day, because the highest number recorded from this area was 306/ha, between 14:00-16:00 hours (28 November/95). This interpretation is favored by the observation that on May 2nd 1993, 37% of emergent tree tops were occupied by Odonata at 9:00 in the morning, as against 68% at midday on the same day in the same place (near the Ilha das Aranhãs). Excessive densities

were recorded in July/97 when approaching the Serra do Chocador: 5-15 individuals per 100 m², which amounts to 500-1500/ha. Extension of the 100 m² values to hectares, however, may not be realistic, because naiads may accumulate locally for emergence; for example, on March/94, 41 Odonata-exuviae were counted within 1 m² of aquatic macrophytes that floated between the dead trees near the Serra do Chocador. Although adult Odonata were not specified when motoring to the research sites, the abundance of *Brachymesia herbida* in the emergent dead forest of the reservoir between the dam and the research islands was noted during the whole period of the project." (Author) In tab. 4 the following taxa are listed: *B. herbida*, *Erythemis hematogaster*, *Erythemis vesiculosa*, *Orthemis ferruginea* (?), *Perithemis lais*, *Ischnura fluviatilis*, and *Protoneura* sp.] Address: Walker, I., Coordenação de Pesquisa em Ecologia – CPEC, Instituto Nacional de Pesquisa da Amazônia – INPA, Av. André Araújo, 2936, Aleixo, CP 478, CEP 69011-970, Manaus, AM, Brazil. E-mail: iwalker@inpa.gov.br

8486. Walker, I. (2009): Omnivory and resource - sharing in nutrient - deficient Rio Negro waters: Stabilization of biodiversity? *Acta Amazonica* 39(3): 617-626. (in English, with Portuguese summary) [*Ischnura* spec. and *Aeschnosoma* spec. "are essentially insectivores, [...] any other prey type is sporadic. The only exception is oligochaete capture by *Aeschnosoma*. The Anisoptera occupy niches within the litter layers, and thus, have access to the small oligochaetes that colonize the surface of litter leaves, while the Zygoptera usually occupy surfaces near the open water, where oligochaetes are less frequent. The prevalent prey of both Odonata species are Ephemeroptera and Chironomidae, presumably because these are the most frequent and ubiquitous insect larvae in these benthic habitats (Walker 1994, 1998). Algae ingestion is questionable, because small algae may accidentally enter the ventricle in the course of prey capture. Rather surprising are fish vertebrae within an Odonata ventricle, yet, the smallest fish species of the litter habitat is a tiny gobby *Microphylipnus*, with a standard length of 1,2cm. This fish, therefore, is within the range of the normal prey of larger anisopteran larvae, furthermore, there are the larvae and juveniles of other small litter-colonizing fish species, which may serve as prey. On the whole it appears that both Odonata species, [...] accept any animal prey within the range of their perception and size that allows for successful capture and ingestion. Thus, even if algae- feeding is excluded, they are omnivores in the sense that they feed on various trophic levels, considering that larger insect larvae (Ephemeroptera, Trichoptera) feed on algae, microcrustacea and chironomids (Walker 1987)." (Author)] Address: Walker, Ilse, Instituto Nacional de Pesquisas da Amazônia (INPA), Coordenação de Pesquisas em Ecologia (CPEC), Caixa Postal 478, 69011-970, Manaus (AM), Brazil. E-mail: iwalker@inpa.gov.br

8487. Ware, J.L.; Simaika, J.P.; Samways, M.J. (2009): Biogeography and divergence time estimation of the relict Cape dragonfly genus *Syncordulia*: global significance and implications for conservation. *Zootaxa* 2216: 22-36. (in English) ["*Syncordulia* (Libelluloidea) inhabits mostly cool mountainous streams in the Cape Floristic Region of South Africa. It is found at low densities in geographically restricted areas. *Syncordulia* is endemic to South Africa and, until recently, only two spe-

cies were known, *S. venator* and *S. gracilis*, both considered Vulnerable by the World Conservation Union (IUCN). Two new species, *S. serendipator* and *S. legator*, were described from previously unrecognized museum specimens and new field collections. Here we corroborate the validity of these two new species using multiple genes and propose intergeneric relationships within *Syncordulia*. Molecular data from two independent gene fragments (nuclear 28S and ribosomal and cytochrome oxidase subunit I mitochondrial data) were sequenced and/or downloaded from GenBank for 7 libelluloid families, including 12 *Syncordulia* specimens (2 *Syncordulia gracilis*, 4 *S. serendipator*, 2 *S. legator* and 4 *S. venator*). The lower libelluloid group GSI (sensu Ware et al. 2007), a diverse group of non-corduliine taxa, is strongly supported as monophyletic. *Syncordulia* is well supported by both methods of phylogenetic analyses as a monophyletic group deeply nested within the GSI clade. A DIVA biogeographical analysis suggests that the ancestor to the genus *Syncordulia* may have arisen consequent to the break-up of Gondwana (>120 Mya). Divergence time estimates suggest that *Syncordulia* diverged well after the breakup of Gondwana, approximately 60 million years ago (Mya), which coincides with the divergence of several Cape fynbos taxa, between 86 – 60 Mya. DIVA analyses suggest that the present distributions of *Syncordulia* may be the result of dispersal events. We relate these phylogenetic data to the historical biogeography of the genus and to the importance of conservation action." (Authors)] Address: Ware, Jessica Dept Ent., Rutgers Univ., New Brunswick, NJ, USA. E-mail: jware@amnh.org

8488. Watts, P.C. (2009): Characteristics of microsatellite loci in Odonata. *International Journal of Odonatology* 12(2): 275-286. (in English) ["Microsatellite loci have become the genetic markers of choice for population-level molecular ecological studies. However, microsatellite loci had been isolated for comparatively few species of odonate until the past five years. This review summarises the main characteristics – expected heterozygosity and microsatellite length – of 116 microsatellite loci that have been isolated from the genomes of 11 odonate species and discusses potential problems associated with using microsatellite loci to study odonate biology. It is clear that odonates are characterised by relatively short microsatellites, typically less than 10 core motifs, that demonstrate a high level of heterozygote deficits. Some reasons why some odonate species have particularly low levels of gene diversity are discussed also." (Author)] Address: Watts, P.C., School of Biol. Sc., Biosciences Building, Univ. Liverpool, Crown Str., L69 7ZB, Liverpool, UK. E-mail: phill@liv.ac.uk

8489. Weiss, K. (2009): Libellen-Beobachtungen im Queich-Gebiet/TK 6715-Lingenfeld und Basaltsteinbruch/TK 6312-Rockenhausen. *Pflanzen und Tiere in Rheinland-Pfalz (Berichtsjahr 2008)* 19: 159. (in German) [Germany, Rheinland-Pfalz; a list of 17 species includes *Coenagrion mercuriale* and *Ophiogomphus cecilia*, species protected by law.] Address: not stated

8490. Wichard, W.; Gröhn, C.; Seredszus, F. (2009): Aquatic Insects in Baltic Amber - Wasserinsekten im Baltischen Bernstein. Verlag Kessel. ISBN: 978-3-941300-10-1: 336 pp. (in Bilingual text (English/German)) ["At first sight the embedment of aquatic insects in Baltic amber seems to be contradictive, as the insects live in water and amber originated from resin of

extinct trees that grew in a Fennoscandian montane forest approximately 40–50 million years ago. About 25% of all animals found in amber are aquatic insects. The larvae of these amphibious forms lived in water whereas adults were frequently terrestrial and capable of flying. The Tertiary “amber forest” apparently contained a great amount of lentic waters, flood plains and flowing waters. The resin was washed out of dead wood and streams and rivers transported it to the sea where it became fossilized into amber. Without water, the genesis of amber would be impossible. The high number of aquatic insects in amber is connected with the process of its fossilization. As if in a complex “paleontological jigsaw puzzle” amber inclusions are combined together so that the whole mosaic of the nature of 40–50 million years ago can be reconstructed.” (Authors) Odonata are treated on pages 19-29.] Address: www.verlagkessel.de.

8491. Wildermuth, H.; Küry, D. (2009): Libellen schützen, Libellen fördern. Leitfaden für die Naturschutzpraxis. Beiträge zum Naturschutz in der Schweiz 31: 88 pp. (in German; French) [This is a manual on protection and conservation of Odonata including the management of their habitats in Switzerland.] Address: Schweizerische Arbeitsgemeinschaft Libellenschutz, SAGLS, Life Sciences AG, Greifengasse 7, CH-4058 Basel, Switzerland

8492. Willigalla, C.; Fartmann, T. (2009): Die Libellenfauna der Regenrückhaltebecken der Stadt Mainz (Odonata). Libellula 28(3/4): 117-137. (in German, with English summary) [“Between 2006 and 2008, 32 species of Odonata were recorded at twelve rain-storage ponds (RSP) in Mainz. This is 84 % of the total Odonata fauna of the city area of Mainz, which comprises 38 species in total. Twenty-two of the observed species were classified as indigenous. On average, we found between six and nine species per RSP. Therefore, beside park ponds, RSP serve as a second important habitat for dragonflies and damselflies in urban areas. The diversity of Odonata depended on pond size and the position of the ponds in different city zones. In the suburbs more species were found than in the city centre. In damselflies the abundance was negatively correlated with the density of buildings in the surroundings (up to 200 m around the ponds). Where building cover exceeded 40 %, damselfly abundances were very low. The spatial distance between the RSP was the main driver of similarity among Odonata assemblages of the RSP. Due to the warm urban climate in cities RSP generally favour Mediterranean species. However, the macroclimate had a stronger impact on community composition in cities. The Odonata fauna of the RSP of Mainz was very similar to those of the cities of Münster and Osnabrück. The main reason for this seems to be that the majority of species occurring in RSP are widespread and common species that are typical of eutrophic ponds. We assume that in Germany about 35 Odonata species are able to colonize RSP in cities. Enallagma cyathigerum, Erythromma viridulum, Aeshna affinis, A. mixta, Libellula depressa and Orthetrum cancellatum act as regional character species.] Address: Willigalla, C., Am Großen Sand 22, D-55124 Mainz, Germany. E-mail: christoph@willigalla.de

8493. Wingate, D.B.; Madeiros, J.L.; Kushlan, J.A. (2009): Green Heron colonizes Bermuda. Waterbirds 32(1): 162-168. (in English) [“The only non-fish prey

item observed to be taken by Green Herons (*Butorides virescens*) during the study period was a *Tremea abdominalis*, captured by a recently-fledged bird.” (Author)] Address: Kushlan, J.A., P.O. Box 2008, Key Biscayne, FL 33149, USA. E-mail: jkushlan@earthlink.net

8494. Winkler, C.; Neumann, H.; Drews, A. (2009): Verbreitung und Ökologie von *Coenagrion armatum* am südwestlichen Arealrand in Schleswig-Holstein (Odonata: Coenagrionidae). Libellula 28(1/2): 1-24. (in German, with English summary) [“Distribution and ecology of *C. armatum* on the southwestern fringe of its area in Schleswig-Holstein, Germany — The last systematical surveys of *C. armatum* in Schleswig-Holstein (SH) had been conducted during the 1960s and 1970s. The last population was detected in 1982. In order to record the present distribution of *C. armatum* in SH a countrywide survey was carried out between 24-IV and 5-VI-2008. Based on former records, 137 standing waters in 37 sites were investigated. Imagines of *C. armatum* were found at 18 waters, which were situated in 12 sites. All these sites were located in the northern part of SH. More than ten imagines were detected at eight waters, whereas more than 100 imagines were recorded from a shallow lake and a peat digging hole. Tandems were found at 13 waters and ovipositions at four of these localities. Only one pair was seen in wheel position. *C. armatum* populated mesotrophic waterbodies from 0.01 to 4.7 ha with shallow water zones. Most waters were regarded as perennial. All known occurrences were restricted to moor- and heathland. The soft rush *Juncus effusus* occurred, at least partially, as riparian vegetation on all colonised waters. Stocks of soft rush offered perches and were used by *C. armatum* for hiding and mating. Broken stems of soft rush on the water surface were even used for oviposition. The flying period of *C. armatum* extended at least from 6-V to 30-V-2008.” (Authors)] Address: Winkler, C., Bahnhofstr. 25, 24582 Bordesholm, Germany. E-mail: chr.winkler@email.de

8495. Winkler, C.; Neumann, H. (2009): Neu für Schleswig-Holstein: Die Feuerlibelle (*Crocothemis erythraea* (Brullé, 1832)). Bombus 3(76-78): 312. (in German) [Germany; 19.VI.2007, Stadthagen (Kreis Rendsburg-Eckemförde; 10°04'46.77"E, 54°25'13.50"N). 15.VII.2007, N Muggenburg, NSG Salemer Moor (Kreis Hzt. Lauenburg; 10°49'03"E, 53°40'54"N).] Address: not stated

8496. Wolff, L.L.; Abilhoa, V.; Sant'Anna Rios, F.; Donatti, L. (2009): Spatial, seasonal and ontogenetic variation in the diet of *Astyanax aff. fasciatus* (Ostariophysi: Characidae) in an Atlantic Forest river, Southern Brazil. Neotropical Ichthyology 7(2): 257-266. (in English, with Spanish summary) [Odonata are of minor importance as food for *A. aff. fasciatus*.] Address: Wolff, L.L., Departamento de Biologia Celular, Universidade Federal do Paraná. Caixa Postal 19031, 81531-990 Curitiba, PR, Brazil. E-mail: lucianobiol@yahoo.com.br;

8497. Wu, Z.-r.; Han, L.-x.; Kuang, Z.-f. (2009): Breeding behaviors of Blue Tailed Bee-eater of Nujiang valley. Zoological Research 30(4): 429-432. (Chinese, with English summary) [China; observations from 26th March to 17th July, 2007 showed that the most common food items male *Merops philippinus* fed to females are Odonata and Hymenoptera, accounting for 83.56% (Odonata: 63%) of all food items.] Address: Han, L.-x., Faculty of Conservation Biology, Southwest Forestry

University, Kunming, 650224, China. E-mail: lianxian.han@gmail.com

8498. Wu, Y.-t.; Wang, C.-h.; Zhang, X.-d.; Zhao, B.; Jiang, L.-F.; Chen, J.-k.; Li, B. (2009): Effects of salt-marsh invasion by *Spartina alterniflora* on arthropod community structure and diets. *Biol. Invasions* 11: 635-649. (in English) ["Invasive plants strongly affect physical and biotic environments of native ecosystems. Insects and other arthropods as one of the major components of many ecosystems are very sensitive to subtle changes in abiotic and biotic environments. We examined the effects of exotic *Spartina alterniflora* invasion on community structure and diets of arthropods in a saltmarsh previously dominated by native *Phragmites australis* in Yangtze River estuary through net sweeping and plant harvesting methods and stable isotope analysis. [...]."] (Authors) According to the authors, the plants *Phragmites* and *Spartina* contribute 100% to diets of the *Caeneagriidae* (Odonata).!!!] Address: Li, B., Coastal Ecosystems Research Station of Yangtze River Estuary, Ministry of Education Key Lab. Biodiv. Science & Ecological Engineering, Institute of Biodiversity Science, Fudan Univ., Shanghai 200433, China. E-mail: bool@fudan.edu.cn

8499. Yu, X.; Bu, W. (2009): A revision of *Mesopodagrion* McLachlan, 1896 (Odonata: Zygoptera: Megapodagrionidae). *Zootaxa* 2202: 59-68 (in English) ["A synopsis of *Mesopodagrion* including diagnostic illustrations, distribution maps, and keys to all taxa incorporates the following taxonomic changes: *Mesopodagrion yachowensis* Chao, 1953 is resurrected from synonymy, *Mesopodagrion tibetanum* McLachlan, 1896 comprises two subspecies, one new *M. tibetanum australe* and a unique character for the genus, the bifurcate process on distal dorsum of S10 of the male."] (Authors)] Address: Bu, W., Institute of Entomology, College of Life Sciences, Nankai University, Tianjin, 300071 China. E-mail: wenjunbu@nankai.edu.cn

8500. Xu, Q.-h.; Chen, Z.; Qiu, Z.-p. (2009): A new species of the genus *Planaeschna* McLachlan from Fujian, China (Odonata, Aeshnidae). *Acta zootaxonomica Sinica* 34(3): 439-442. (in English, with Chinese summary) [*Planaeschna liui* sp. nov. is described and illustrated from a single male. The holotype is deposited at Institute of Biological Control Research, Fujian Agriculture and Forestry University, Wuyi Mountain (27°33'-54'N, 117°27'-51'E), 16 July 2008.] Address: Xu, Q.h., Zhangzhou City University, Zhangzhou, Fujian 363000, China

8501. Yu, X.; Bu, W. (2009): Description of two new damselflies, *Protosticta zhengi* and *Sinosticta sylvatica*, from China (Odonata: Zygoptera: Platystictidae). *Zootaxa* 2245: 54-58. (in English) ["2 new species of Platystictidae (*Sinosticta sylvatica*, holotype male: China, Hainan, Diaoluoshan Nature Reserve, 620m, 29-V-2007; and *Protosticta zhengi*, holotype male; China, Yunnan, Xishuangbanna, Menghun, 750m, 30-V-1958; both deposited in Inst. Ent., Nankai Univ., Tianjin, China) are described, and a key is provided for the identification of all described species of *Sinosticta* Wilson."] (Authors)] Address: Yu, X., Coll. Environmental Science & Engineering, Nankai Univ., Tianjin, 300071, China. E-mail: nkyuxin@yahoo.cn

8502. Zampaulo, R.; Ferreira, R.L. (2009): Diversidade de invertebrados terrestres cavernícolas em nove

cavidades naturais no município de Aurora do Tocantins (TO). *ANAIS do XXX Congresso Brasileiro de Espeleologia, Montes Claros MG, 09-12 de julho de 2009 - Sociedade Brasileira de Espeleologia: 267-274.* (in Portuguese, with English summary) ["Odonata" are listed without any further details as recorded in the caves of Aurora, Brazil.] Address: Zampaulo, R., Univ. Federal de Lavras, Depto de Biologia, Setor de Ecologia, Campus Universitário, Caixa Postal 3037, 37200-000, Minas Gerais, Brasil. E-mail: rzampaulo@yahoo.com.br

8503. Zessin, W.; Günther, A. (2009): Bericht über das 18. Internationale Symposium der Odonatologie, 5. bis 13. November 2008 in Nagpur, Indien. *Virgo - MittBl. ent. Ver. Mecklenburg* 12(1): 57-71. (in German) [Report on the 18th International Symposium of Odonatology in India, with the list of presentations, a checklist of Odonata of the Nagpur area (Tamil Nadu), documents of reports in local newspapers, and the list of records made during the Symposium at 8 localities. Many photographs are included in the paper.] Address: Zessin, W., Lange Str. 9, D-19230 Jasnitz, Germany. E-mail: zessin@zoo-schwerin.de

8504. Zessin, W. (2009): Erstnachweis der Zierlichen Moosjungfer (*Leucorrhinia caudalis*) in West-Mecklenburg 2008 am Kraaker Waldsee, Landkreis Ludwigslust. *Virgo - MittBl. ent. Ver. Mecklenburg* 12(1): 76-78. (in German) [*L. caudalis* was recorded on 24-V-2008 in the western part of the federal state Mecklenburg-Vorpommern, Germany. There, a total of 22 Odonata species is co-occurring.] Address: Zessin, W., Lange Str. 9, D-19230 Jasnitz, Germany. E-mail: zessin@zoo-schwerin.de

8505. Zhao, Y.; Tong J.; Sun J.; Chen D.; Zhang, J. (2009): Property tests of nanoindentation on membranous wings of dragonflies. *Journal of Agricultural Mechanization Research* 11: 26-29. (in Chinese, with English summary) ["The nano-mechanical behaviour of dragonfly membranous wings was investigated with a nano-indenter. The holding time and the loading rate were selected 20s and 53µN/s by the method of test optimization. In nano-indentation experiment, 6 indentation measurements were done in an area of 0.075mm × 0.01mm and then took the mean value as the nano-mechanical parameter of this position. It was shown that the maximums of the reduced modulus and the hardness of the living dragonfly *Anax parthenope julius* Brauer and *Pantala flavescens* Fabricius are about at position of 0.7L of their wings, where L is the total length of their wings. The maximums of the reduced modulus and the hardness of the dragonfly *Sympetrum striolatum* are at position of 0.5L of its wing, where L is the total length of the wing. The reduced modulus and the hardness of *A. parthenope julius* are maximum on the corresponding parts among the three dragonflies, related to the large somatotype."] (Authors)] Address: Zhao, Y., The College of Mechanical and Power Engineering, Henan Polytechnic University, Jiaozuo 454000, China

8506. Zherikhin, V.V.; Sukacheva, I.D.; Rasnitsyn, A.P. (2009): Arthropods in contemporary and some fossil resins. *Paleontological Journal* 43(9): 987-1005. (in English) ["More than 4800 arthropod inclusions were isolated and identified from resin of various contemporary conifer trees in various parts of northern Eurasia. Their composition is compared with that in representat-

ive collections of Baltic and Rovno ambers (Upper Eocene) and with that in Dominican amber (Lower Miocene). The original composition of inclusions of Dominican amber is reconstructed for the first time using a procedure intended to reduce the effect of human bias. Taphonomical characteristics of resins and their effects on the composition of inclusions are studied. The actual paleontological approach reveals a trend towards a decrease in the relative abundance of arboreal springtails and nematoceran dipterans and an increase in that of the true bugs, beetles, lepidopterans, and hymenopterans (especially ants) between the Eocene and the present. Relative abundances of spiders and mites show no clear trend. The available data on other arthropods are still insufficient for elucidating evolutionary trends. Surprisingly, a small contemporary sample from Taimyr (N. Siberia) was inexplicably more similar to the Eocene amber than to other contemporary resins. No other significant differences in composition of inclusions, compared across different conifer genera or geographic areas, have been revealed. A more detailed comparison between contemporary and fossil hymenopteran and beetle inclusions reveals correlations with both age (= evolutionary change) and geography. The absolute dominance of ants, particularly Formicinae and Myrmicinae, and, among solitary hymenopterans, Ichneumonidae, Braconidae, and Pteromalidae, and a corresponding decline in the abundance of Scelionidae and Dolichoderinae in contemporary resins compared to amber reflect evolutionary changes. In contrast, the overwhelming abundance of Formicinae and consistent occurrence of sawflies in contemporary resins of northern Eurasia appear to be explained by geography. The Eocene assemblages of beetle inclusions are characterized by a wider and more variable set of dominant families, in sharp contrast to contemporary resins, which are uniformly dominated by Curculionidae, Chrysomelidae, and Staphylinidae. Additional analyses are needed to explain this difference." (Authors)] Address: V. V. Zherikhin, V.V., Borissiak Paleontological Institute, Russian Academy of Sciences, Profsoyuznaya ul. 123, Moscow, 117997, Russia. E-mail: lab@palaeontolog.ru

2010

8507. Allen, K.A.; Thompson, D.J. (2010): Movement characteristics of the Scarce Blue-tailed Damselfly, *Ischnura pumilio*. *Insect Conservation and Diversity* 3(1): 5-14. (in English) ["1. *I. pumilio*, is threatened in the UK and exists in small, transient colonies. Consequently, little is known about its dispersal characteristics. This study investigates movement in two contrasting habitats with the aim of informing conservation management on a landscape scale. 2. Mark-release-recapture studies were performed at an established colony in the New Forest and a smaller population in the Red River valley in southern England. A total of 2304 individuals was marked. 3. *I. pumilio* was found to be exceptionally sedentary. Mean gross lifetime movement was 56 m and 43% of individuals moved <50 m in their lifetime. Movements over 150 m were very rare. Maximum lifetime movement was 1165 m. As such, *I. pumilio* is the most sedentary odonate studied in the UK to date. 4. Movement was inversely density dependent, which has important conservation implications if individuals attempt to emigrate from small populations be-

cause of low density. The presence of parasitic mites (*Hydryphantes* sp.) significantly increased movement distance. 5. *I. pumilio* had a low dispersal probability compared to other damselflies. As the smallest British odonate, this is in keeping with the relationship between size and dispersal found across taxa. 6. *I. pumilio* has been regarded as a 'wandering opportunist' due to its tendency to appear in locations far from known sites. However, this study suggests that long range movement rarely occurs from prime habitat that is maintained in an early successional stage. This has implications for the conservation of the species in the UK." (Author)] Address: Allen, Katherine, School Biol. Sc., University of Liverpool, Liverpool, UK. E-mail: kaallen@liv.ac.uk

8508. Anderson, C.N.; Grether, G.F. (2010): Inter-specific aggression and character displacement of competitor recognition in *Hetaerina* damselflies. *Proc. R. Soc. B* 277: 549-555. (in English) ["In zones of sympatry between closely related species, species recognition errors in a competitive context can cause character displacement in agonistic signals and competitor recognition functions, just as species recognition errors in a mating context can cause character displacement in mating signals and mate recognition. These two processes are difficult to distinguish because the same traits can serve as both agonistic and mating signals. One solution is to test for sympatric shifts in recognition functions. We studied competitor recognition in *Hetaerina* damselflies by challenging territory holders with live tethered conspecific and heterospecific intruders. Heterospecific intruders elicited less aggression than conspecific intruders in species pairs with dissimilar wing colouration (*H. occisa*/*H. titia*, *H. americana*/*H. titia*) but not in species pairs with similar wing colouration (*H. occisa*/*H. cruentata*, *H. americana*/*H. cruentata*). Natural variation in the area of black wing pigmentation on *H. titia* intruders correlated negatively with heterospecific aggression. To directly examine the role of wing colouration, we blackened the wings of *H. occisa* or *H. americana* intruders and measured responses of conspecific territory holders. This treatment reduced territorial aggression at multiple sites where *H. titia* is present, but not at allopatric sites. These results provide strong evidence for agonistic character displacement." (Authors) The experiments reported here were carried out in June–August 2006, May–July 2007 and April–May 2008 at 10 sites in Texas, USA and Mexico.] Address: Grether, G.F., Dept Ecology & Evolutionary Biol., Univ. California, 621 Charles E Young Drive South, Los Angeles, CA, 90095. USA. E-mail: ggrether@oeb.ucla.edu

8509. Azpilicueta Amorin, M.; Vila, M.; Cordero Rivera, A. (2010): Population genetic structure of two threatened dragonfly species (Odonata: Anisoptera) as revealed by RAPD analysis. In: Jan Christian Habel and Thorsten Assmann (Eds.): *Relict species. Phylogeography and conservation biology*. Springer Berlin Heidelberg. ISBN 978-3-540-92161-5 (Print): 295-308. (in English) ["*Macromia splendens* and *Oxygastra curtisii* were included in the European Habitats directive as taxa of special concern. Nevertheless, there is almost no genetic information about them. We assessed the genetic diversity and population structuring among several Northwest Iberian locations where these species occur. For this, we examined the genetic pattern revealed by RAPD markers in 4 locations of *M. splendens* and five locations of *O. curtisii*. The former showed strong population structuring, whereas gene flow bet-

ween different river systems may be the reason for the lower structuring inferred for *O. curtisii*. Based on these results, we support the need of special management for *M. splendens* in Northwest Iberia." (Authors)] Address: Azpilicueta Amorin, Mónica, Department of Ecology and Animal Biology, University of Vigo, EUET Forestal, Campus Universitario, E-36006 Pontevedra, Spain. E-mail: mazpilicueta@sek.es

8510. Bogut, I.; Cerba, D.; Vidakovic, J.; Gvozdic, V. (2010): Interactions of weed-bed invertebrates and *Ceratophyllum demersum* stands in a floodplain lake. *Biologia* 65(1): 113-121. (in English) ["This investigation reports on weed-bed invertebrate abundance associated with the submersed macrophyte *Ceratophyllum demersum* L. in Lake Sakadaš within Kopacki rit Nature Park (Croatia). Twenty five taxonomic groups, with the dominance of chironomids (79%), were recorded at three stations during the investigation from July 14 to September 8, 2004. Nematodes and large predatory larvae of Zygoptera with 6% were second in dominance, followed by oligochaetes with 5%. Weed-bed invertebrates on *C. demersum* were more abundant than on *Myriophyllum spicatum* L. due to different morphology of the host plants. Environmental parameters within *C. demersum* stands were found in the same range at all stations, but they changed during the season. They indicated eutrophy with the tendency to hypertrophy which is reflected by the composition of the weed-bed invertebrate community." (Authors)] Address: Bogut, Irela, Fac.Education, J. J. Strossmayer Univ., Lorenza Jägera 9, Osijek, Croatia. E-mail: dcerba@gmail.com

8511. Bots, J.; de Bruyn, L.; Snijkers, T.; van den Branden, B.; van Gossun, H. (2010): Exposure to perfluorooctane sulfonic acid (PFOS) adversely affects the life-cycle of the damselfly *Enallagma cyathigerum*. *Environmental Pollution* 158(3): 901-905. (in English) ["We evaluated whether life-time exposure to PFOS affects egg development, hatching, larval development, survival, metamorphosis and body mass of *Enallagma cyathigerum* (Insecta: Odonata). Eggs and larvae were exposed to five concentrations ranging from 0 to 10 000 µg/L. Our results show reduced egg hatching success, slower larval development, greater larval mortality, and decreased metamorphosis success with increasing PFOS concentration. PFOS had no effect on egg developmental time and hatching or on mass of adults. Eggs were the least sensitive stage (NOEC = 10 000 µg/L). Larval NOEC values were 1000 times smaller (10 µg/L). Successful metamorphosis was the most sensitive response trait studied (NOEC < 10 µg/L). The NOEC value suggests that *E. cyathigerum* is amongst the most sensitive freshwater organisms tested. NOEC for metamorphosis is less than 10-times greater than the ordinary reported environmental concentrations in freshwater, but is more than 200-times smaller than the greatest concentrations measured after accidental releases. Long-term laboratory exposure to perfluorooctane sulfonic acid reduces survival and interferes with metamorphosis of *Enallagma cyathigerum* (Insecta: Odonata)." (Authors)] Address: Bots, Jessica, Evolutionary Biology Group, University of Antwerp (RUCA), Groenenborgerlaan 171, B-2020 Antwerp, Belgium. E-mail: Jessica.bots@ua.ac.be

8512. Buden, D.W. (2010): *Pantala flavescens* (Insecta: Odonata) rides west winds into Ngulu Atoll, Micronesia: Evidence of seasonality and wind-assisted

dispersal. *Pacific Science* 64(1): 141-143. (in English) ["Observations of *P. flavescens* on Ngulu Island during early August 2008 constitute the first report of Odonata on Ngulu Atoll, Yap State, Federated States of Micronesia; no other odonate is documented on the atoll, but descriptions by local residents of a larger, rarely encountered, blue dragonfly may pertain to *Anax guttatus*. The sudden appearance of *P. flavescens* on Ngulu after its apparent absence during the previous two and a half weeks of this study, together with the absence of exuviae at potential breeding sites and remarks by local residents alluding to its appearance each year around August and September, suggests that it occurs regularly in migration and that there is no permanent resident population. Its appearance often coincides with winds from a westerly direction." (Author)] Address: Buden, D.W., Division of Natural Sciences and Mathematics, College of Micronesia-FSM, P.O. Box 159, Kolonia, Pohnpei, Federated States of Micronesia 96941. E-mail: donbuden@comfsm.fm

8513. Buffagni, A.; Erba, S.; Armanini, D.G. (2010): The lentic-lotic character of Mediterranean rivers and its importance to aquatic invertebrate communities. *Aquatic Sciences* 72(1): 45-60. (in English) ["Hydromorphological features are crucial in structuring habitats for freshwater organisms. The quantification of these variables is often performed through accurate measuring or detailed estimation, but their assessment is not always feasible for river management purposes. Economic and time constraints often lead to difficulty in creating simple summaries of collected data for practical use. The Lentic-lotic River Descriptor (LRD) was developed to identify the character of a river site in terms of local hydraulic conditions. Information about the presence of flow types, channel substrates, in-stream vegetation, organic debris and artificial features is included in its calculation. The main aim of this paper is to investigate whether the lentic-lotic character of a river site, as summarized with the LRD descriptor, is relevant to aquatic invertebrate communities in nearly natural river sites. Invertebrate data were collected with multi-habitat, proportional sampling and hydromorphological information was gained by applying the CARAVAGGIO method (river habitat survey technique) in the field. The dataset was generated from High or Good ecological status river sites located in Mediterranean areas of Italy. Correspondence Analysis was performed to relate the invertebrate community structure to a set of catchment-scale, reach-scale and chemical environmental variables. The results of the multivariate analysis indicate that LRD provides a persuasive explanation of the most important axis of variation in benthic data. This paper also presents the optimal LRD range for a set of invertebrate taxa, accompanied by a short discussion of their potential use in conservation issues." (Authors) Odonata are treated at the genus level (*Calopteryx*, *Orthetrum*.)] Address: Buffagni, A., CNR, IRSA, Water Research Institute, Via del Mulino, 19, 20047 Brugherio (MB), Italy. E-mail: buffagni@irsa.cnr.it

8514. Davis, J.M.; Rosemond, A.D.; Eggert, S.L.; Cross, W.F.; Wallace, J.B. (2010): Long-term nutrient enrichment decouples predator and prey production. *PNAS* 107(1): 121-126. (in English) ["Increased nutrient mobilization by human activities represents one of the greatest threats to global ecosystems, but its effects on ecosystem productivity can differ depending on food web structure. When this structure facilitates efficient

energy transfers to higher trophic levels, evidence from previous large-scale enrichments suggests that nutrients can stimulate the production of multiple trophic levels. Here we report results from a 5-year continuous nutrient enrichment of a forested stream that increased primary consumer production, but not predator production. Because of strong positive correlations between predator and prey production (evidence of highly efficient trophic transfers) under reference conditions, we originally predicted that nutrient enrichment would stimulate energy flow to higher trophic levels. However, enrichment decoupled this strong positive correlation and produced a nonlinear relationship between predator and prey production. By increasing the dominance of large-bodied predator-resistant prey, nutrient enrichment truncated energy flow to predators and reduced food web efficiency. This unexpected decline in food web efficiency indicates that nutrient enrichment, a ubiquitous threat to aquatic ecosystems, may have unforeseen and unpredictable effects on ecosystem structure and productivity." (Author) The paper includes data on *Cordulegaster* and *Lanthus*.] Address: Davis, J.M., Odum School of Ecology, University of Georgia, Athens, GA 30602, USA. E-mail: jmdavis@isu.edu.

8515. Dumont, H.J.; Vierstraete, A.; Vanfleteren, J.R. (2010): A molecular phylogeny of the Odonata (Insecta). *Systematic Entomology* 35: 6-18. (in English) ["We estimated the phylogeny of the order Odonata, based on sequences of the nuclear ribosomal genes 5.8 S, 18S, and ITS1 and 2. An 18S-only analysis resolved deep relationships well: the order Odonata, as well as suborders Zygoptera and Epiprocta (Anisoptera + Epiophlebia), emerged as monophyletic. Some other deep clades resolved well, but support for more recently diverged clades was generally weak. A second, simultaneous, analysis of the 5.8S and 18S genes with the intergenic spacers ITS1 and 2 resolved some recent branches better, but appeared less reliable for deep clades with, for example, suborder Anisoptera emerging as paraphyletic and Epiophlebia superstes recovered as an Anisopteran, embedded within aeshnoid-like anisopterans and sister to the cordulegastrids. Most existing family levels in the Anisoptera were confirmed as monophyletic clades in both analyses. However, within the corduliids that form a major monophyletic clade with the Libellulidae, several subclades were recovered, of which at least Macromiidae and Oxygastridae are accepted at the family level. In the Zygoptera, the situation is complex. The lestid-like family groups (here called Lestomorpha) emerged as sister taxon to all other zygopterans, with Hemiphlebia sister to all other lestomorphs. Platystictidae formed a second monophylum, subordinated to lestomorphs. At the next level, some traditional clades were confirmed, but the tropical families Megapodagrionidae and Amphipterygidae were recovered as strongly polyphyletic, and tended to nest within the clade Caloptera, rendering it polyphyletic. Platycnemididae were also non-monophyletic, with several representatives of uncertain placement. Coenagrionids were diphyetic. True Platycnemididae and non-American Protoneurids are closely related, but their relationship to the other zygopterans remains obscure and needs more study. New World protoneurids appeared relatively unrelated to old world + Australian protoneurids. Several recent taxonomic changes at the genus level, based on morphology, were confirmed, but other morphology-based taxonomies have misclassified taxa considered currently as Megapodagrionidae, Pla-

tycnemididae and Amphipterygidae and have underestimated the number of family-level clades." (Authors)] Address: Dumont, H.J., Department of Biology, Ghent University, Ledeganckstraat, 35, B-9000 Ghent, Belgium. E-mail: Henri.Dumont@ugent.be

8516. Eberhard, W.G. (2010): Evolution of genitalia: theories, evidence, and new directions. *Genetica* 138: 5-18. (in English) ["Many hypotheses have been proposed to explain why male intromittent genitalia consistently tend to diverge more rapidly than other body traits of the same individuals in a wide range of animal taxa. Currently the two most popular involve sexual selection: sexually antagonistic coevolution (SAC) and cryptic female choice (CFC). A review of the most extensive attempts to discriminate between these two hypotheses indicates that SAC is not likely to have played a major role in explaining this pattern of genital evolution. Promising lines for future, more direct tests of CFC include experimental modification of male genital form and female sensory abilities, analysis of possible male-female dialogues during copulation, and direct observations of genital behaviour." (Author) References on Odonata are made.] Address: Eberhard, W.G., Smithsonian Tropical Research Institute, and Escuela de Biología, Universidad de Costa Rica, Ciudad Universitaria, San Pedro, Costa Rica. E-mail: william.eberhard@gmail.com

8517. Flenner, I.; Richter, O.; Suhling, F. (2010): Rising temperature and latitudinal development in dragonfly populations. *Freshwater biology* 55: 397-410. (in English) ["1. For modelling the future ecological responses to climate change, data on individual species and on variation within and between populations from different latitudes are required. 2. We examined life cycle regulation and growth responses to temperature in Mediterranean and temperate populations of a widespread European odonate, *Orthetrum cancellatum*. In an experiment, offspring from individual females from different parts of the range were kept separately to elucidate differences between families. 3. The experiment was run outdoors at 52°N at a natural photoperiod for almost a year. We used four temperature regimes, ambient (i.e. following local air temperature) and ambient temperature increased by 2, 4 and 6°C, to mimic future temperature rise. A mathematical model was used to categorise the type of seasonal regulation and estimate parameters of the temperature response curve. 4. Growth rate varied significantly with temperature sum, survival and geographic origin, as well as with family. Offspring of all females from the temperate part of the range had a life cycle with a 12 h day-length threshold necessary to induce diapause (i.e. diapause was induced once day length fell below 12 h). By contrast, Mediterranean families had a 10 h threshold or had an unregulated life cycle allowing winter growth. The temperature response did not significantly differ between populations, but varied between families with a greater variation in the optimum temperature for growth in the Mediterranean population. 5. The variation in seasonal regulation leads to a diversity in voltinism patterns within species, ranging from bivoltine to semivoltine along a latitudinal gradient. Given that the type of seasonal regulation is genetically fixed, rising temperatures will not allow faster than univoltine development in temperate populations. We discuss the consequences of our results in the light of rising temperature in central Europe." (Authors)] Address: Flenner, Ida, Ecology & Environmental

Sciences, Halmstad Univ., PO Box 823, SE-30118 Halmstad, Sweden. E-mail: ida.flenner@hh.se

8518. González-Tokman, D.-M.; Córdoba-Aguilar, A. (2010): Survival after experimental manipulation in the territorial damselfly *Hetaerina titia* (Odonata: Calopterygidae): more ornamented males are not more pathogen resistant. *Journal of Ethology* 28(1): 29-33. (in English) ["It has been hypothesized that sexual ornaments communicate pathogen resistance ability. We experimentally explored the relationship between the expression of a male ornamental trait (wing pigmentation) of *H. titia* and survival after a bacterial challenge. We infected males with *Serratia marcescens* (a Gram-negative bacteria typical of insects) and compared survival against a group infected with dead bacteria and a noninfected group. Wing pigmentation was entered as a predictor of survival in this comparison. Our study indicated that wing pigmentation was not a good predictor of immune ability against bacteria. This result contradicts previous findings in the same and other calopterygid species in which wing pigmentation intensity inversely correlated with gregarine infection levels. It also contradicts the general idea that ornaments are honest indicators of pathogen defense." (Authors)] Address: González-Tokman, D.-M., Depto de Ecología Evolutiva, Instituto de Ecología, Universidad Nacional Autónoma de México, Apdo. Postal 70-275, Ciudad Universitaria, 04510 Mexico D.F., Mexico. E-mail: danielgt@miranda.ecologia.unam.mx

8519. Heiser, M.; Schmitt, T. (2010): Do different dispersal capacities influence the biogeography of the western Palearctic dragonflies (Odonata)? *Biological Journal of the Linnean Society* 99(1): 177-195. (in English) ["The biogeography of the western Palearctic has been intensively studied for more than a century. Recent advances in genetics have allowed the testing of old theories based on distribution patterns, although these analyses are obviously restricted to a reduced number of specific genetic data sets. On the other hand, an increased knowledge on the distributions of species and advances in computer capacities have allowed more detailed biogeographical analyses based on species presence/absence. In the present study, we selected the Odonata as the study group. For all 162 species native to the western Palearctic, we compiled their respective presence or absence in 97 predefined biogeographical regions. Using cluster analyses and principal component analyses, both based on Jaccard similarity coefficients, we analysed the differentiation among these regions and species. In subsequent analyses, the data set was reduced to the Zygoptera, Anisoptera, and the western Palearctic endemics. All analyses consistently showed different faunal regions and faunal elements. In particular, the (1) western and (2) eastern Mediterranean; (3) Central and (4) Northern Europe; and (5) the British Isles were invariably found in all cases. Although the two major Mediterranean regions were characterized by several endemic faunal elements, Northern Europe and the British Isles lacked such elements, but were characterized by faunal compositions strongly deviating from the rest of the western Palearctic region. Moderate differences between Zygoptera and Anisoptera existed, with the latter more clearly redrawing the Mediterranean refuge areas, whereas the former reflected to a greater extent the postglacial expansion patterns from these regions. In general, our findings underline the old biogeographical

theories, but refine especially our understanding of the Atlanto- and Ponto-Mediterranean region. Central Europe, comprising the area with the highest species numbers of our whole study region, unravels as a crossroad of postglacial immigrations, but might also represent a region of in situ glacial survival." (Authors)] Address: Schmitt, T., Biogeographie, Fachbereich VI, Am Wissenschaftspark 25-27, Universität Trier, 54296 Trier, Germany. E-mail: thsh@uni-trier.de

8520. Kefford, B.J.; Zalizniak, L.; Dunlop, J.E.; Nugge-goda, D.; Choy, S.C. (2010): How are macroinvertebrates of slow flowing lotic systems directly affected by suspended and deposited sediments? *Environmental Pollution* 158(2): 543-550. (in English) ["The effects of suspended and deposited sediments on the macroinvertebrates are well documented in upland streams but not in slower flowing lowland rivers. Using species found in lowland lotic environments, we experimentally evaluate mechanisms for sediments to affect macroinvertebrates, and in one experiment whether salinity alters the effect of suspended sediments. Suspended kaolin clay reduced feeding of *Ischnura heterosticta* at high turbidity (1000–1500 NTU) but had no effects on feeding of *Hemianax papuensis* and *Micronecta australiensis* (Hemiptera: Corixidae). In freshwater (0.1 $\mu\text{S}/\text{cm}$), survival of *Ischnura aurora* was poor in clear water, but improved with suspended kaolin. Growth and feeding of *I. aurora* were unaffected by suspended sediments and salinity. Burial (1–5 mm) of eggs with kaolin or sand reduced hatching in *Physa acuta* (Gastropoda: Physidae), *Gyraulus tasmanica* (Gastropoda: Planorbidae) and *Chironomus cloacalis* (Diptera: Chironomidae). Settling sediments may pose greater risk to lowland lotic invertebrates than suspended sediments." (Authors)] Address: Kefford, B.J., Dept of Biotechnology & Environmental Biology, RMIT University, PO Box 71, Bundoora, 3083, Victoria, Australia. E-mail: ben.kefford@rmit.edu.au

8521. Koperski, P. (2010): Diversity of macrobenthos in lowland streams: ecological determinants and taxonomic specificity. *J. Limnol.* 69(1): 1-14. (in English) ["The present study contains the results of an investigation of the relationships between the environmental variables and the taxonomic diversity of common and important groups of benthic macrofauna: Chironomidae, Ephemeroptera, Odonata, Hirudinea and Gastropoda, collected from various types of bottom substrate in seven lowland streams of north-eastern Poland. Four metrics were used to express the diversity of the studied taxa in each sample as the examples of its four different aspects: species richness, rarity, Shannon-Weaver's diversity index and Pielou evenness index. The values of total species richness and Shannon-Weaver index were rarified by functional extrapolation with Michaelis-Menten asymptotic function chosen as a richness estimator. There are high differences in taxonomic diversity of benthic animals between the studied streams. The results of estimation of total species richness and total species diversity are mainly affected by the diversity of the taxon richest in species – larval Chironomidae and, to a lesser extent, Hirudinea. The total taxonomic diversity significantly correlates with the status of riparian vegetation and with the isolation of the sampling site, while the relationship with other environmental parameters, i.e. pollution and seasonality, is not significant. The diversity of Gastropoda and Hirudinea is significantly affected by pollution (positively), water depth and season-

ality; whereas the diversity of Ephemeroptera and Chironomidae by the state of riparian vegetation, and that of Odonata by stream width and isolation of the site. The study presents and discusses reduced diversity of certain higher taxa as a result of a reduction in pollution loading to a stream with simultaneous unchanged values of the total diversity." (Authors)] Address: Koperski, P., Dept Hydrobiol., Univ.Warsaw, Banacha 2, 02-097 Warszawa, Poland. E-mail: p.t.koperski@uw.edu.pl

8522. Marques Couceiro, S.R.; Hamada, N.; Forsberg, B.R.; Padovesi-Fonseca, C. (2010): Effects of anthropogenic silt on aquatic macroinvertebrates and abiotic variables in streams in the Brazilian Amazon. *Journal of Soils and Sediments* 10(1): 89-103. (in English) ["Purpose: While environmental risks associated with petroleum extraction such as oil spills or leaks are relatively well known, little attention has been given to the impacts of silt. The increase in petroleum exploitation in Amazonia has resulted in sediment input to aquatic systems, with impacts on their biodiversity. Here we use a combination of field measurements and statistical analyses to evaluate the impacts of anthropogenic silt derived from the construction of roads, borrow pits, and wells during the terrestrial development of gas and oil, on macroinvertebrate communities in streams of the Urucu Petroleum Province in the Central Brazilian Amazon. Material and methods: Ten impacted and nine non-impacted streams were sampled in January, April, and November of 2007. Macroinvertebrates were sampled along a 100-m continuous reach in each stream at 10-m intervals using a dip net. Abiotic variables including, a siltation index (SI), suspended inorganic sediment (SIS), sediment colour index (SCI), suspended organic sediment (SOS), pH, electrical conductivity, dissolved oxygen, temperature, water velocity, channel width, and depth, were measured at three equidistant points in each stream (~30-m intervals). Results and discussion: SI did not differ between impacted and undisturbed streams. SIS was higher and SCI lower (more reddish) in impacted than in non-impacted streams. SCI had a positive and SIS a negative effect on both macroinvertebrate richness and density. SIS and SCI also influenced macrophyte taxonomic composition. In impacted streams, taxonomic richness and density were 1.5 times lower than in non-impacted streams. No taxon was significantly associated with impacted streams. SIS was positively correlated with SOS and electrical conductivity while SCI was negatively correlated with SOS, electrical conductivity, and pH. The lack of difference in SI between impacted and non-impacted streams suggests that anthropogenic sediment does not accumulate on stream beds. The reddish colour of SIS in impacted streams reflects terrestrial erosion and indicates the rapid flow of suspended sediments through these reaches, impacting macroinvertebrate richness, density, and species composition. Conclusions: Anthropogenic suspended silt has had a significant negative impact on aquatic macroinvertebrate diversity and density in streams in the Urucu Petroleum Province. Soil conservation measures are needed to reduce silt inputs and restore these streams to their natural condition. Additional studies are also needed to investigate the dynamics of sediments in the impacted streams." (Authors) Odonata are treated at the genus level.] Address: Marques Couceiro, Sheyla Regina, Instituto Nacional de Pesquisas da Amazônia/Coordenação de Pesquisas em Entomologia, Av. André Araújo, 2936, Aleixo, CP 478 CEP 69060-001 Manaus,

Amazonas, Brazil. E-mail: sheylacouceiro@yahoo.com.br

8523. Muscatello, J.R.; Janz, D.M. (2010): Selenium accumulation in aquatic biota downstream of a uranium mining and milling operation. *Science of the total environment* 407(4): 1318-1325. (in English) ["Uranium mining and milling operations have the potential to release trace elements such as arsenic, molybdenum, nickel, selenium and uranium and ions (e.g., sulfate, ammonium) into the receiving aquatic ecosystem. The major implication of elevated environmental selenium is its propensity to accumulate in the aquatic food chain, potentially impairing fish reproduction. The objective of this study was to investigate the accumulation of selenium in the major compartments of aquatic ecosystems (lakes) upstream and downstream of a uranium mine in northern Saskatchewan, Canada. Selenium concentrations in aquatic biota were elevated in the exposure lake although water and sediment concentrations were low (0.43 µg/L and 0.54 µg/g dry weight, respectively). Biomagnification of selenium resulted in approximately 1.5 to 6 fold increase in the selenium concentration between plankton, invertebrates and fish. However, no biomagnification was observed between forage and predatory fish. Although some aquatic biota (e.g., forage fish) exceeded the lower limit of the proposed 3 to 11 µg/g (dry weight) dietary toxicity threshold for fish, no adverse effects of selenium could be identified in this aquatic system. Continued environmental monitoring is recommended to avoid potential selenium impacts. [...] Selenium concentrations in Diptera, Trichoptera and Odonata were significantly ($p < 0.05$) greater in the exposure site than the reference site. In addition, there were significant ($p < 0.05$) increases in the concentrations of Co and Mn in Gastropoda, Odonata and Hirudinea between sites. The concentration of As was greater for Odonata collected from exposure site compared to the reference site ($p < 0.05$). In contrast, other concentrations of trace elements in Diptera (Ba, copper [Cu], Mn, Ni and zinc [Zn]), Trichoptera (Ba and V), Gastropoda (Cr, Fe and V) and Odonata (Cd, Cu and Sr) collected from the exposure site were significantly less ($p < 0.05$) than the reference site." (Authors)] Address: Janz, D.M., Toxicology Centre, University of Saskatchewan, 44 Campus Drive, Saskatoon, SK Canada S7N 5B3. E-mail: david.janz@usask.ca

8524. Omoigberale, M.O.; Ogbeibu, A.E. (2010): Environmental impacts of oil exploration and production on the macrobenthic invertebrate fauna of Osse River, southern Nigeria. *Research Journal of Environmental Sciences* 4(2): 101-114. (in English) [The impact of Dubri Oil Company operations on the macrobenthic invertebrate fauna of Osse River, Edo State (Nigeria) was investigated between July 2000 and June 2002 at five sites. A total of fifty-seven taxa was identified; Odonata accounted to 6.56% of the taxa. The Odonata listed are a mixture of North-American and European taxa.] Address: Omoigberale, M.O., Department of Animal and Environmental Biology, University of Benin, P.M.B. 1154, Benin City, Nigeria

8525. Paralikidis, N.; Papageorgiou, N.; Tsiompanoudis, A.; Konstantinou, L.; Christakis, T. (2010): Foods of hunter-killed Black Francolins (*Francolinus francolinus*) in Cyprus. *European Journal of Wildlife Research* 56(1): 89-93 (in English) [Odonata contributed accidentally as diet of the Black Francolin on the island of

Cyprus during November and December of 2004 and 2005.] Address: Paralikiadis, N., Dept Forestry & Natural Environment, Laboratory of Wildlife and Fisheries, Aristotle University of Thessaloniki, 541 24 Thessaloniki, Greece. E-mail: atsiompa@for.auth.gr

8526. Reinhardt, K. (2010): Natural selection and genital variation: a role for the environment, parasites and sperm ageing? *Genetica* 138: 119-127. (in English) ["Male genitalia are more variable between species (and populations) than other organs, and are more morphologically complex in polygamous compared to monogamous species. Therefore, sexual selection has been put forward as the major explanation of genital variation and complexity, in particular cryptic female choice for male copulatory courtship. As cryptic female choice is based on differences between males it is somewhat paradoxical that there is such low within-species variation in male genitalia that they are a prime morphological identification character for animal species. Processes other than sexual selection may also lead to genitalia variation but they have recently become neglected. Here I focus on pleiotropy and natural selection and provide examples how they link genitalia morphology with genital environments. Pleiotropy appears to be important because most studies that specifically tested for pleiotropic effects on genital morphology found them. Natural selection likely favours certain genital morphology over others in various environments, as well as by reducing re-infection with sexually transmitted diseases or reducing the likelihood of fertilisation with aged sperm. Both pleiotropy and natural selection differ locally and between species so may contribute to local variation in genitalia and sometimes variation between monogamous and polygamous species. Furthermore, the multitude of genital environments will lead to a multitude of genital functions via natural selection and pleiotropy, and may also contribute to explaining the complexity of genitalia." (Authors) References to Odonata are made.] Address: Reinhardt, K., Dept Animal and Plant Sciences, University of Sheffield, Sheffield S10 2TN, UK. E-mail: K.Reinhardt@sheffield.ac.uk

8527. Starzomski, B.M.; Suen, D.; Srivastava, D.S. (2010): Predation and facilitation determine chironomid emergence in a bromeliad-insect food web. *Ecological Entomology* 35: 53-60. (in English) ["1. Ecological theory has focused on negative interactions, such as competition and predation, to explain species' effects on one another. This study demonstrates the importance of considering both positive and negative interactions in explaining how species influence abundances at the local scale. 2. Two experiments were conducted using the aquatic insect food web in Costa Rican bromeliad phytotelmata. Manipulations contrasted the strength of predation between trophic levels versus facilitation within a trophic level on the emergence of detritivore chironomids. 3. Predation had a strong negative effect on chironomids, reducing emergences by 81% overall. Most predation was as a result of the top predator, *Mecistogaster modesta*; the intermediate predator, a tany-podine chironomid, had little effect. In the absence of predators, shredder and scraper detritivores (tipulid and scirtid larvae) increased the emergence rate of chironomid larvae by 86%. The mechanism of facilitation was likely the processing, by tipulids and scirtids, of intact detritus into fine particles that the detritivore chironomids consume or use to build protective cases. 4. This study is among the first demonstrations of a pro-

cessing chain in a multispecies context, and in bromeliad-insect food webs. Our finding that top-down effects are of similar magnitude to facilitative effects suggests that the relative importance of processing chains in nature will depend on food web context." (Authors)] Address: Starzomski, B.M., School of Environmental Studies, Univ. Victoria, Victoria, British Columbia V8P 5C2, Canada. E-mail: starzom@uvic.ca

8528. Takahashi, Y.; Watanabe, M. (2010): Female reproductive success is affected by selective male harassment in the damselfly *Ischnura senegalensis*. *Animal Behaviour* 79: 211-216. (in English) ["In animals without any courtship behaviour, persistent mating attempts by males are frequently observed. Male harassment affects female reproductive success in the laboratory, but few studies have evaluated the costs of male harassment in the wild. In *I. senegalensis*, females exhibit colour dimorphism (andromorph and gynomorph), and the morph frequency varies between local populations. In two populations where gynomorphs were common, we found that males harassed more gynomorphs than andromorphs throughout their daily foraging and oviposition activity period. Gynomorphs excreted less faeces than andromorphs, indicating that preferential harassment of gynomorphs decreased their food intake. Gynomorphs also produced fewer eggs than andromorphs. As a result, gynomorphs laid 35% fewer eggs per day than andromorphs, suggesting that male harassment decreased their reproductive success." (Authors) Address: Watanabe, M., Conservation Biology Laboratory, Graduate School of Life & Environmental Sciences, Univ. Tsukuba, 1-1-1 Tennodai, Tsukuba, Ibaraki, Japan. E-mail address: watanabe@kankyo.envr.tsukuba.ac.jp

8529. Vernoux, J.; Huang, D.-y.; Jarzembowski, E. A.; Nel, A. (2010): The Proterogomphidae: a worldwide Mesozoic family of gomphid dragonflies (Odonata: Anisoptera: Gomphidae). *Cretaceous Research* 31(1): 94-100. (in English) ["The first Chinese and English representatives of the Mesozoic gomphid family Proterogomphidae are described, respectively *Lingomphus magnificus* gen. et sp. nov., and *Cordulagomphus europaeus* sp. nov. A phylogenetic analysis of the most 'basal' gomphid lineages is proposed, showing the monophyly of the Proterogomphidae and the position of *Lingomphus* as sister group of all other representatives of this family. *C. europaeus* is the first Eurasian representative of the subfamily Cordulagomphinae that was previously restricted to the Lower Cretaceous of Crato Formation (South America). The Proterogomphidae has a known distribution very similar to those of several other Lower Cretaceous insect groups, viz. Asia, Europe, and South America, showing that the distribution of the climates and land masses at that time was not a 'serious' impediment for the displacements of these organisms." (Authors)] Address: Nel, A., Lab. Ent. Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: anel@cimrs1.mnhn.fr

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