

ODONATOLOGICAL ABSTRACTS

1973

- (17537) DE SANTIS, L., D. URBAN & V. GRAF, 1973. Parasitic Hymenoptera from Brazil and Argentina. *Acta biol. Paraná* 2(1/4): 41-50. (span., with Engl., Fr. & Port. s's). — (Authors' current addresses unknown).
Presents information on bionomics of various taxa of several families; some are parasitic also on Odon.
- (17538) STERGAR, Z., 1973. Preliminarni pregled limnofavne Strunjanskega potoka. — Survey of the fauna of the "Strunjanski potok" brooklet. In: *Mednarodni mladinski raziskovalni tabori 1971-1972*, pp. 163-167. Znanost mladini, Ljubljana. (Slovene, with Engl. s.). — (Author's address unknown).
4 odon. genera are listed from 4 sampling stations (spp. not identified); — Strunjan, Istria, Slovenia.

1974

- (17539) *WATER QUALITY CRITERIA, 1972. A report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences, National Academy of Engineering, Washington/DC, 1974.* Environmental Protection Agency, Washington/DC. xix+594 pp. ISBN none.
From the information on p. 141 it is apparent, the odon. occur at pH gradient 11.0-4.0. "pH 10.5-11.0 is lethal to some Plecoptera and Odon.; the Trichoptera emergence is reduced". At pH 4.0-4.5 "some Trichoptera and Odon. are found".

1977

- (17540) STEWART, R., 1977. *Labrador*. Time-Life

Books, Amsterdam. 184 pp. ISBN none. (Germ.).
The Author made some dragonfly observations at a lake in the vicinity of Churchill Falls (Labrador, Canada; pp. 117-119). The larvae of unnamed anisopteran sp.(?)/spp.(?) were consuming in a small pond up to 20 mosquito eggs per min. The role of odon. in the mosquito and simuliid (black-fly) control in the subarctic environments is emphasized.

- (17541) WEIDNER, H., 1977. Die Entomologische Sammlungen des Zoologischen Instituts und Zoologischen Museum der Universität Hamburg, 14: *Insecta* 9. *Mitt. hamb. zool. Mus. Inst.* 74: 77-138.
The odon. collection includes 760 spp. Some bibliographic references are provided. — This is a supplement to the paper published in the same periodical (60: 81-109; 1962), which includes the list of types and a fairly comprehensive bibliography.

1982

- (17542) LIPSCOMBE VINCETT, B.A., 1982. *Animal life in Saudi Arabia*. Garzanti Editore, Cernusco/MI. 251 pp. Hardcover (21.5 x 30.0 cm). ISBN none.
The odon. chapter (pp. 90-95) was prepared with the assistance of S. Brooks (BMNH). It gives the description of some Saudi Arabian habitats, the information on some Anisoptera spp. and their photos. *Anax imperator* is said to have been abundant in Author's garden near Riyadh, in 1981.
- (17543) WONGSIRI, S., 1982. Preliminary survey of the natural enemies of mosquitoes in Thailand. *J. Sci. Soc. Thailand* 8: 205-213. — (Author's current address unknown).

"Coeoneura" sp. and *Crocothemis servilia* are listed as moderate predators on larvae and pupae of *Aedes aegypti* and *Culex quinquefasciatus* based on laboratory experiments and observations in the field.

- (17544) YÁÑEZ, J.I., H. NÚÑEZ & F.M. JAKSIĆ, 1982. Food habits and weight in Chimango Caracaras in central Chile. *Auk* 99: 170-171. — (Authors' current addresses unknown).
The Chimango Caracaras (*Milvago chimango*) is a common diurnal raptor in central Chile and it is often found in great numbers in areas under cultivation. It is a weak flyer, pursuing its prey from the ground, running and jumping after it. In its stomachs and pellets, the odon. are sporadically found, though the insects represent more than 80 % of its food.

1984

- (17545) HOWELL, F.G. & R.D. ELLENDER, 1984. Observations on growth and diet of *Argiope aurantia* Lucas (Araneidae) in a successional habitat. *J. Arachnol.* 12: 29-36. — (Authors' last known address: Dept Biol. Sci., Univ. Southern Mississippi, Hattiesburg, MS 39401, USA).
A population of *A. aurantia* was studied through the growing season in a swamp habitat nr Aiken, South Carolina. Percent occurrence of Zygoptera (Anisoptera) found wrapped in spider's webs in mid July, early Aug., late Aug., late Sept. and mid Oct. amounted to: 51.4(13.5), 17.9(30.3), 4.0(28.0), 3.2(3.2) and 0.0(7.7)%, respectively. In mid July prey consisted mainly of Zygoptera, which tended to aggregate low in the vegetation. By the end of July the webs were larger and placed either higher or in more open areas (spanning small streams). With the change of web placement, diet consumption consisted primarily of larger-bodied libellulids.
- (17546) WATANABE, H. & R. SATRAWANA, 1984. A list of edible insects at the public market in Khon Kaen, Northeast Thailand. *SEast Asian Stud.* 22(3): 316-325. — (Authors current addresses unknown).
During a short period at the end of the rainy season (Sept.-Oct.), the aeshnid (Thai: *Pong Peng*) and libellulid (*Malaeng Ngum*) living larvae are sold at the price 1 scoop: 2 bath, 3 scoops: 5 bath.

- (17547) WINSTANLEY, W.J., 1984. Odonata from New Caledonia. *Weta* 7(1): 8. — (Author's last known address: 11 Bonnett Str., Motueka, NZ).
This is a brief report on 2 missions to New Caledonia (Nov.-Dec.1981, early Dec. 1982). The adventives, *Anaciaeschna jaspidea*, *Anax guttatus*, *Hemianax papuensis*, *Macrodiplox cora* and *Tholymis tillarga*, were recorded from N.C. for the first time. The undescribed *Caledopteryx maculata* (Winstanley & Davies), *Ischnura mesembrine* Winstanley and *Synthemis serendipicta* Winstanley were described elsewhere. The larvae of *Synthemis miranda*, *S. fenella*, *Caledopteryx sarasini*, *C. uniseries* and *I. mesembrine* were raised to emergence.

2000

- (17548) GERKEN, B., H. BOTTCHER, D. LEIFELD, M. LOHR, K. DÖRFER & C. LEUSHACKE-SCHNEIDER, 2000. Beurteilung von Regenerationsmassnahmen durch vegetationskundliche und faunistische Untersuchungen: Beispiel aus der Oberweserniederung. *Angew. Landschaftsökol.* 37: 205-216. (With Engl. s.). — (Projektgr. Weserniederung, Abt. Höxter, Univ. Paderborn, An der Wilhelmshöhe 44, D-37671 Höxter).
The investigations on the upper Weser (Germany) are used as an example for the assessment of measures of restoration based on phytosociological and faunal evidence. Odonatol. aspects (34 spp.) are considered in detail.
- (17549) RAAB, R., 2000. *Die Libellenfauna in den Massnahmenbereichen Untere Lobau und Orth*. Tech. Büro Biol., Deutsch-Wagram. 74 pp. (With Engl. s.). — (Anton Brucknergasse 2, A-2232 Deutsch Wagram).
The odon. fauna (43 spp.) of the Danube backwater systems of Untere Lobau and Orth (near Vienna, Austria) was mapped during 1998-2000 with the objective the results are to serve as a basis for monitoring the impact of an alteration of the systems. *Somatochlora flavomaculata*, *Orthetrum brunneum* and *O. coerulescens* are recorded for the first time for the Donauauen National Park. Special protection measures for *Ophiogomphus cecilia* and *Leucorrhinia pectoralis* are suggested, and species composition and expected effects of hydrological connectivity are discussed.

2002

- (17550) FELLOWES, J.R., B.P.L. CHAN, S.-C. NG & M.W.N. LAU, [Eds], 2002. Report of rapid biodiversity assessments at Jianling and Shangxi nature reserves, Southeast Hainan, China, May 1999. *Sth China Forest Biodiv. Surv. Rep. Ser.* 21: 1-18 – (First Author: Kadoorie Farm & Bot. Garden Corp., Lam Kam Rd, Tai Po, N.T., Hong Kong, SAR, China).
Includes an annotated list of 26 odon. spp., recorded from the 2 reserves during 18-21 May 1999.

- (17551) FELLOWES, J.R., M.W.N. LAU, B.C.H. HAU, S.-C. NG & B.P.L. CHAN, [Eds], 2002. Report of rapid biodiversity assessment at Qingshitian Headwater Forest Nature Reserve, Northeast Guangxi, China, 25 to 26 August 1998. *Sth China Forest Biodiv. Surv. Rep. Ser.* 17: 1-12 – (First Author: Kadoorie Farm & Bot. Garden Corp., Lam Kam Rd, Tai Po, N.T., Hong Kong, SAR, China).
Includes a list of 16 odon. spp. The record of *Calopteryx melli* is important, as the genus had not been recently reported from China and it was previously known only from Guangdong.

2003

- (17552) HOLLY, M., 2003. Monitoring of the small ponds faunal colonisation in the Bieszczady National Park. *Roczn. bieszczadzkie* 11: 249-257. (Pol., with Engl. s.). – (Ośrodek Nauk.-Dydakt. Bieszczady Natn. Park, Belska 7, PO-38-700 Ustrzyki-Dolne).
The succession was studied (2001, 2003) in 5 man-made (1999-2000) ponds in the Wolosatka Valley (Poland, close to the Ukrainian border). 7 odon. spp. are recorded.

2004

- (17553) GIRIBET, G., G.D. EDGECOMBE, J.M. CARPENTER, C.A. D'HAESE & W.C. WHEELER, 2004. Is *Ellipura* monophyletic? A combined analysis of basal hexapod relationships with emphasis on the origin of insects. *Organisms Diversity Evolution* 4: 319-340. – (First Author: Dept Organismic & Evol. Biol., Mus. Comp. Zool., Harvard Univ., 16 Divinity Ave, Cambridge, MA 02138, USA).
The relationships are analysed among basal hexa-

pod orders via a cladistic analysis of sequence data for 5 molecular markers and 189 morphological characters in a simultaneous analysis framework using myriapod and crustacean outgroups. The odon. are represented by *Anax junius* and *Libellula pulchella*. Most parameter sets support monophyly of the Palaeoptera, others suggest Ephemeroptera as the most basal pterygote order. Most phylogenetic analyses of hexapod relationships have suggested paraphyly of the palaeopteran orders, with Odon. as the sister group of Neoptera, but others support the monophyly of Palaeoptera (= Ephemeroptera+Odon.), while a sister group relationship between Ephemeroptera and Neoptera has also been proposed.

- (17554) MAEZONO, Y. & T. MIYASHITA, 2004. Impact of exotic fish removal on native communities in farm ponds. *Ecol. Res.* 19: 263-267. – (Lab. Biodiv. Sci., Sch. Agric. & Life Sci., Univ. Tokyo, Tokyo, 113-8657, JA).
In Namegawa (Saitama pref., E Japan), 6 ponds (surface 3000-5000 m²) were drained in order to remove the introduced largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*) and other exotic fish spp., and the differences in faunal composition between the drained and undrained ponds were recorded. The *Pseudothemis zonata* population increased rapidly after the drain, but the numbers of *Cercion calamorum* and the total number of odon. spp. decreased. This was probably due to the decreased macrophyte vegetation, caused by the increased population of the herbivorous crayfish, *Procambarus clarkii*. As it appears, the exotic fishes do not control the populations of such odon. spp. as *C. calamorum*, *C. hieroglyphicum* and *Anax parthenope*.

2005

- (17555) FONNESU, A., A.M. DEIANA & A. BASSET, 2005. Effetti della siccità sull'abbondanza e distribuzione dei macroinvertebrati. *Rc. Semin. Fac. Sci. Univ. Cagliari* 75(1/2): 9-25. (With Engl. s.). – (First Author: Dipto Biol. Anim. & Ecol., Univ. Cagliari, viale Poerto 1, I-09126 Cagliari).
From Rio Pula (Sardinia, Italy) 11 odon. spp. are recorded (2000-2002).
- (17556) GUNZBURGER, M.S. & J. TRAVIS, 2005. Critical literature review of the evidence for palat-

ability of amphibian eggs and larvae. *J. Herpetol.* 39(4): 547-571. — (First Author: US Geol. Surv., Florida Integrated Sci. Cent., 7920 NW 71st St., Gainesville, FL 32653-3701, USA).

In order to investigate whether unpalatability is an important defence against predation for amphibian eggs and larvae, 142 papers are reviewed, containing 603 separate predator-prey trials. Predation by odon. is listed for 28 amphibian spp. from 14 gen. (Anura, Caudata), involving 13 identified odon. spp. (Anisoptera). In all cases tadpoles were found palatable for odon., whereas eggs are reported palatable only for a Gynacantha sp.

- (17557) HOLMEN, M., K. JENSEN & M. JEPSEN, 2005. *Arter 2004. NOVA-overvågning i Frederiksborg Amt*. Landskabsafdelingen, Teknik & Miljø, Frederiksborg Amt 55 pp. ISBN 87-90906-88-8. (Dan.). The 2004 records of *Aeshna viridis* and *Leucorhinia pectoralis* in Frederiksborg Amt (Denmark) are listed and discussed on pp. 19-27.
- (17558) KETELAAR, R., D. GROENENDIJK & P. JOOP, 2005. *Species protection plan Somatochlora arctica, 2006-2010*. Directie Kennis, Ministerie v. Landbouw, Ede. [Rapport DK2005/033]. 55 pp. (Dutch, with Engl. s.). — (De Vlinderstichting, P.O. Box 506, NL-6700 AM Wageningen). In the Netherlands, *S. arctica* declined during the 20th century; at present only 4 populations are known, situated in the eastern and southeastern parts of the country. Its status, ecology and biology are outlined, and the measures required for its conservation are described. The future of the sp. in the Netherlands is precarious, due to desiccation and eutrophication of the habitats, habitat loss, habitat fragmentation and climate change. The inadequate knowledge of its ecology and of the hydrology of the habitats (wet heaths and peat bogs) make an effective conservation strategy a particularly hard proposition. Here, all appropriate measures are summed up in an Action Plan. Their implementation is the responsibility of the government and of the provincial authorities of Gelderland, Noord-Brabant, Limburg and Overijssel, as well as of the various owners of nature reserves where *S. arctica* occurs. Local water boards should also play a crucial role where hydrology represents an important part in peat restoration projects.
- (17559) MARAIS, E., C.J. KLOK, J.S. TER-BLANCHE & S.L. CHOWN, 2005. Insect gas exchange patterns: a phylogenetic perspective. *J. exp. Biol.* 208: 4495-4507. — (First Author: Spatial, Physiol. & Conserv. Ecol. Gr., Dept Bot. & Zool., Stellenbosch Univ., Private Bag X1, Matieland-7602, Sth Afr.). Information on gas exchange patterns for the 8 to date examined orders is compiled, and information on further 10 orders, incl. Odon. (*Ischnura senegalensis*, *Trithemis arteriosa*), is provided. These data are then used in a formal phylogeny-based parsimony analysis of the evolution of gas exchange patterns at the order level. Cyclic gas exchange (as in Odon.) is likely to be the ancestral pattern at rest (recognizing that active individuals, also in Odon., typically show continuous gas exchange), and discontinuous gas exchange probably originated in insects, at least 5 times independently.
- 2006**
- (17560) CURTEAN-BANADUC, A., 2006. Contributions to the study of Cibin river Odonata larvae communities. *Brukenthal. Acta Musei* 1(3): 117-124. (With Romanian s.). — (Dept Ecol. & Envir. Prot., Fac. Sci., Lucian Blaga Univ., Oituz 31, RO-550337 Sibiu). From 8 sampling stations on the Sibin river (Transylvania, Romania) 8 spp. are reported. All were recorded in larval and in adult stage.
- (17561) DE MARMELS, J., 2006. Una pequeña colección de libélulas (Odonata) de Colombia. *Entomotropica* 21(1): 69-71. (With Engl. s.). — (Mus. Inst. Zool. Agric., Fac. Agron., Univ. Central Venezuela, Apartado 4579, Maracay 2101-A, Venezuela). A list of 31 spp. from the Quindío dept, including a new and still undescribed *Telebasis* sp.
- (17562) IHSSSEN, G., 2006. Bemerkenswerte Wiederfunde zweier Flusswasser-Libellenarten im Osten Hamburgs. *Bombus* 3(72/73): 291-292. — (Timm-Kröger-Weg 6, D-22335 Hamburg). The record of *Gomphus flavipes* (1 exuviae on the Elbe river nr Lange Grove, 24-VI-2006) is the first of this sp. from the eastern Hamburg area (Germany) since 1929. Also presented is the information on several *Cordulegaster boltonii* sightings on the Bille (VII/VIII-2006). — (see also OA 17565).

- (17563) KASANGAKI, A., D. BABAASA, J. EFITRE, A. McNEILAGE & R. BITARIHO, 2006. Links between anthropogenic perturbations and benthic macroinvertebrate assemblages in Afromontane forest streams in Uganda. *Hydrobiologia* 563: 231-245. — (First Author: Inst. Trop. Forest Conserv., Mbarara Univ. Sci. & Technol., P.O. Box 44, Kabale, Uganda). Relationships between environmental variables and benthic macroinvertebrate assemblages were investigated among 12 sites that varied in disturbance history in Bwindi Impenetrable Natn. Park (alt. 1160-2607 m), SW Uganda. As apparent from a tab., 5 odon. fam. were considered, but no reference to Odon. is made in the text.
- (17564) NGAL, J.T. & D.S. SRIVASTAVA, 2006. Predators accelerate nutrient cycling in a bromeliad ecosystem. *Science* 314: 963. — (Dept Zool., Univ. Brit. Columbia, 6270 University Blvd, Vancouver, B.C., V6T 1Z4, CA). It is hypothesized that the detritivorous insects, which pupate relatively rapidly, constitute a loss of litter-derived nitrogen for bromeliads when they emerge. A survey indicated that detritivorous insects (e.g. Chironomus, tipulids etc.) generally have higher nitrogen : phosphorus ratios than those found in typical litter, suggesting that, as leaf litter is consumed, the insects will preferentially retain N in their body tissues and release P. Predation by longer-lived zygopteran [*Mecistogaster modesta*] larvae converts the mobile pool of N contained in detritivores into fecal pellets that can be decomposed by microbes or leached to release N in a form available to the bromeliad. Thus, they facilitate nutrient uptake by the plant, but only if both predators and detritivores are present.
- (17565) TOLASCH, T., 2006. Wiederfund von *Gomphus flavipes* (Charpentier, 1825) in Hamburg nach über 70 Jahren. *Bombus* 3(72/73): 292. — (Author's address not stated). With reference to the paper listed in OA 17562, the sightings of ca 10 young *G. flavipes* individuals on the Elbe in the Hamburg area (VIII-2003) is brought on record.
- (17566) VAN TOL, J., [Ed.], 2006. *Gunung Lumut: biodiversity assessment 2005*. Naturalis, Leiden. 24 pp. — (Naturalis, P.O. Box 9517, NL-2300 RA Leiden). The report includes a preliminary list (per habitat) of 39 odon. taxa (probably ca 45 spp.), encountered in the Gunung Lumut Protection Forest (Pasir distr., E Kalimantan, Indonesia) that was selectively logged below 600 m some 30 yr ago.
- 2007**
- (17567) BANADUC, D., 2007. Brukenthal National Museum / Sibiu Natural History Museum hydrobiological collections. *Brukenthal Acta Musei* 2(3): 185-186. — (Nat. Hist. Mus. Sibiu, Cetatii 1, RO-550160 Sibiu). The Odon. collection, with the oldest specimen from 1849, includes 1608 specimens from all continents except Australia. Material from Europe and Romania prevails.
- (17568) BERGOU, A.J., S. XU & Z.J. WANG, 2007. Passive wing pitch reversal in insect flight. *J. Fluid Mech.* 591: 321-337. — (Third Author: Dept Theor. & Appl. Mechanics, Cornell Univ., Ithaca, NY 14853, USA). Wing pitch reversal, the rapid change of angle of attack near stroke transition, represents a difference between hovering with flapping wings and with continuously rotating blade (e.g. helicopter flight). Although insects have the musculature to control the wing pitch during flight, it is shown here that aerodynamic and wing inertial forces are sufficient to pitch the wing without the aid of the muscles. The passive nature of wing pitching is studied in several wing kinematics, including the wing motion of a tethered *Libellula pulchella*. To determine whether the pitching is passive, rotation power about the torsion axis, owing to aerodynamic and wing inertial forces, was calculated. It was found the net rotational power is negative, signifying that the fluid force assists rather than resists the wing pitching. It is concluded the pitching motion of the wings can be passive in insect (dragonfly) flight.
- (17569) CERCION. Bulletin annuel de liaison du Collectif d'Études Régional pour la Cartographie et l'Inventaire des Odonates de Normandie (ISSN 1771-5288), Nos 1 (Apr. 2005), 2 (Apr. 2006), 3 (Apr. 2007). — (Editorial address not provided). [Selected titles:] [No. 1]: *Editorial* (p. 1); — *Dodelin, C.*: Les odonates en Normandie de Gadearde Ker-ville à nos jours (p. 2, portrait incl.); — *Ameline, M. & X. Houard*: Bilan cartographique (pp. 3-17); —

- Brunet, L.*: Observer et conserver des odonates (pp. 20-21); – *Anonymous*: Références bibliographiques normandes (pp. 25-30); – *H. Gadeau de Kerville*: Les insectes odonates de la Normandie (pp. 31-35). – [No. 2]: *Houard, X.*: Espèces nouvelles et premières mentions (p. 2); – Bilan cartographique (pp. 3-10); – *Dodelin, C. & X. Houard*: Liste provisoire des odonates de Normandie (pp. 11-12); – *Provost, P.*: Les cimetières à ailes d'odonates, reliquats des repas de prédateurs (p. 24). – [No. 3]: *Houard, X.*: Espèces nouvelles et premières mentions (p. 2); – *Houard, X. & A. Simon*: Bilan cartographique: état des connaissances intégrant les données transmises au 01/04/07 (pp. 3-10); – *Dodelin, C. & X. Houard*: Liste provisoire des odonates de Normandie (pp. 11-12); – *Lemonnier, S.*: Les odonates du Bois des Communes ... à Verengeville-sur-Mer (pp. 24-25). – All issues contain also brief reports on various field trips, with records.
- (17570) **GEURTEN, B.R.H., K. NORDSTROM, J.D.H. SPRAYBERRY, D.M. BOLZON & D.C. O'CARROLL, 2007.** Neural mechanisms underlying target detection in a dragonfly centrifugal neuron. *J. exp. Biol.* 210: 3277-3284. – (Second Author: Dept Physiol., Sch. Mol. & Biomed. Sci., Univ. Adelaide, SA 5005, AU).
Dragonflies utilize specialized optics in the dorsal acute zone, accompanied by higher-order visual neurons in the lobula complex, and descending neural pathways tuned to the motion of small targets. While recent studies describe the physiology of insect small target motion detector (STMD) neurons, little is known about the mechanisms that underlie their exquisite sensitivity to target motion. Lobula plate tangential cells (LPTCs), a group of neurons in dipteran flies selective for wide-field motion, have been shown to take input from local motion detectors consistent with the classic correlation model developed by Hassenstein and Reichardt in the 1950s. Here, the hypothesis that similar mechanisms underlie the response of dragonfly STMDs was tested in *Hemicordulia australiae*. It is shown that an anatomically characterized centrifugal STMD neuron (CSTMD1) gives responses that depend strongly on target contrast, a clear prediction of the correlation model. Target stimuli are more complex in spatiotemporal terms than the sinusoidal grating patterns used to study LPTCs, so a correlation-based computer model was used to predict response tuning to velocity and width of moving targets. It is shown that increasing target width in the direction of travel causes a shift in response tuning to higher velocities, consistent with the model. Finally, it is also shown how the morphology of CSTMD1 allows for impressive spatial interactions when more than one target is present in the visual field.
- (17571) **GOCKING, C., N. MENKE, E.-F. KIEL & T. HÜBNER, 2007** Die Helm-Azurjungfer (*Coenagrion mercuriale* Charpentier, 1840): Vorkommen, Schutz und Management einer FFH-Art in NRW. *Natur Nordrhein-Westfalen* 2: 18-23. – (First Author: NABU, Zumsandstr. 15, D-48145 Münster).
The occurrence and conservation status of *C. mercuriale* in Northrhine-Westphalia (Germany) are stated (recorded from 17 localities), and the required management measures are outlined.
- (17572) **KEREZI, V., 2007.** *Macroinvertebrate community of Glinščica stream*. Graduation Thesis (M.Sc.), Dept Biol., Biotech. Fac., Univ. Ljubljana. x+92 pp., App. A-C excl. (Slovene).
Deals with the same aquatic system as OA 16913. Species composition and macroinvertebrate community distribution were determined at 6 sampling sites on the Glinščica stream and its tributary, the Przanec (Ljubljana, Slovenia) and the values of selected environmental variables were measured. In samples (May 2005-March 2006) *Calopteryx virgo*, *Platycnemis pennipes*, *Somatochlora flavomaculata* and *S. meridionalis* were represented among the 123 identified taxa. Macroinvertebrate diversity was calculated using the Shannon-Wiener diversity index. Cluster analysis showed that spatial differences in the macroinvertebrate community are somewhat higher than temporal differences. Canonic correspondence analysis with the environmental and temporal variables was used to determine the share of the variability in the community. The crucial factor influencing the community was the water temperature range, followed by the maximal value of the saprobic index.
- (17573) **LARISON, B., 2007.** Environmental heterogeneity and alternative mating tactics in the damselfly *Protonotera amatoria*. *Behav. Ecol.* 2007: 8 pp. – DOI: 10.1093/behavco/arm071. – (Dept Ecol. & Evol. Biol., Univ. California, 621 Charles E. Young Dr. South, Los Angeles, CA 90095, USA).
Conditional ♂ mating strategies have been studied

extensively in relation to ♂ attributes, such as size and resource-holding potential, but few studies have considered the effects of environmental heterogeneity on the use of alternative mating tactics. In some systems, environmental heterogeneity may be the key to understanding the evolution and maintenance of such polyphenisms. Here, the influence of the physical environment on the use of alternative tactics by *P. amaloria* was examined on 3 streams within Soberania National Park, Panama. ♂♂ reversibly use 2 tactics to gain matings: (i) sit and wait in the canopy for passing ♀♀ or (ii) hover over the water and attempt to grab ♀♀ that are ovipositing in floating debris. Observations indicated that the use of the hovering tactic was greater under high-light than low-light conditions and at higher densities of ovipositing ♀♀. The density of ovipositing ♀♀ was correlated with both the light conditions and the availability of oviposition substrate, indicating that physical factors exert indirect as well as direct influences on tactic use. Experimental manipulations showed that both ♂♂ and ♀♀ responded directly to light conditions and suggested that ♂♂ responded directly to the density of ovipositing ♀♀. These results can be explained largely in terms of the cues and constraints inherent in different light environments. Thus, the conditional mating strategy of *P. amaloria* appears to have evolved in response to, and been maintained by, fine-scale variation in the physical environment. These findings are discussed in relation to flight dynamics and predation risk.

- (17574) MAHAN, R.D. & J.R. JOHNSON, 2007. Diet of the Gray treefrog (*Hyla versicolor*) in relation to foraging site location. *J. Herpetol.* 41(1): 16-23. – (First Author: Dept Biol. Sci., Univ. Missouri, Columbia, MO 65201, USA).
The study was conducted in the Baskett Wildlife Research Area, Boone co., Missouri (USA), VI/VII-2004. 107 individuals of this nocturnal frog were stomach-flushed and 76 diet samples were obtained in which 204 total individual prey samples were extracted. Among these, a single odon. (Coenagrionidae) was identified.
- (17575) MAILLARD, O., 2007. Observaciones sobre nido, polluelos y cuidado parental de *Bucco macrodactylus* en norte de Bolivia. *Kempffiana* 3(2): 25-27. – (Mus. Hist. Nat. “Noel Kempff Mercado”, Univ. Auton. G.R. Moreno, Avda Irala 565, C.P. 2489, Santa Cruz de la Sierra, Bolivia).

The odon. are listed among food items of the Chestnut capped puffbird, *B. microdactylus*, in N Bolivia.

- (17576) MARCZAK, L.B., J.S. RICHARDSON & M.-C. CLASSEN, 2007. Life history phenology and sediment size association of the dragonfly *Cordulegaster dorsalis* (Odonata: Cordulegasteridae) in an ephemeral habitat in southwestern British Columbia. *Can. Flid Nat.* 120(3): 347-350. – (First Author: Dept Forest Sci., Univ. Brit. Columbia, 3041-3042 Main Mall, Vancouver, B.C., V6T 1Z4, CA).
The life cycle was studied over 1 yr by systematic sampling of larvae in 3 intermittent headwater streams in Malcolm Knapp Research Forest, Maple Ridge, i.e. a Pacific coastal rain forest. Larvae normally take 3 yr to reach maturity, emerging throughout July and August. Limited evidence suggests a split cohort development, with early emergence after 2 yr. Additionally, it was tested whether larval instars were distributed randomly or if they occupied different sediment microhabitats. Smaller animals tend to be associated with smaller grained organic sediments, although there was high variation between the streams.
- (17577) WANG, B. & Z.-m. ZHENG, 2007. Progress of phylogenetic analysis of higher-level relationships of Odonata. *Sichuan J. Zool.* 26(4): 955-957. (Chin., with Engl. s.). – (Inst. Zool., Shaanxi Normal Univ., Xi'an-710062, China).
Various works on phylogenetic relationships of higher taxa within the order are analyzed and it is concluded that the Zygoptera stands at the base as a paraphyletic group, whereas the Anisoptera and Anisozygoptera are closely related.
- (17578) WANG, Z.J. & D. RUSSELL, 2007. Effect of forewing and hindwing interactions on aerodynamic forces and power in hovering dragonfly flight. *Physiol. Rev. Lett.* 2007: 4 pp. – DOI 10.1103/PhysRevLett.99.148101. – (Theor. & Appl. Mech., Cornell Univ., Ithaca, NY 14853, USA).
Odon. have the ability to control aerodynamic performance by modulating the phase lag between forewings and hindwings. The wing motion of a tethered *Libellula pulchella* was filmed and the aerodynamic force and power as a function of phase were computed. It was found that the out-of-phase motion as seen in steady hovering uses nearly minimal power to generate the required force to balance the weight, and the in-phase motion seen in takeoffs

provides an additional force to accelerate. The main hydrodynamic interaction that causes this phase dependence is explained.

- (17579) WINKEL, S. & M. KUPRIAN, 2007. Die Helm-Azurjungfer (Coenagrion mercuriale) bei Gelnhausen (Mainz-Kinzig-Kreis). *MittBl. Zentrum Regionalgesch.* 32: 60-65. – (First Author: Pommernstr. 7, D-63069 Offenbach).

A detailed description of the *C. mercuriale* population at Gelnhausen (Germany), with analysis of water quality parameters and a list of the associated odon. spp.

- (17580) ZHANG, H.-j. & Z.-d. YANG, 2007. Study of Chinese dragonflies of the family Chlorogomphidae (Odonata). *J. Shaanxi Univ. Technol.* 23(1): 73-76. (Chin., with Engl. s.). – (Shaanxi Bioresour. Key Lab., Shaanxi Technol. Univ., Hanzhong-723000, China).

The 14 Chinese spp. are keyed (in Chin. only !).

2008

- (17581) BELANČIĆ, A., T. BOGDANOVIĆ, M. FRANKOVIĆ, M. LJUŠTINA, N. MIHOKOVIĆ & B. VITAS, 2008. *Red Data Book of dragonflies of Croatia*. St. Inst. Nat. Prot., Zagreb. 132 pp. Hardcover (23.2 x 22.5 cm). ISBN 978-953-7169-34-3. (Croat., with Engl. s.).

So far 75 spp. are known from Croatia, of which 5 spp. are deleted from the list, while 18 spp. are regionally extinct (RE), critically endangered (CR), endangered (EN) or vulnerable (VU) and the additional 18 taxa are considered near-threatened (NT) or their data are deficient (DD). Only 34 spp. are frequent and not endangered in Croatia. The reliability of (rather modest) records, the assessment of threats and the threats to habitats are discussed, and the known distribution of the taxa is mapped.

- (17582) BREČKO, B., 2008. *Zivi svet Vrbine*. – [*Living world of Vrbina*]. Agencija za radioaktivne odpadke, Brezice. 79 pp. ISBN 978-961-90482-9-0. (Slovene).

The locality is situated on the Sava river, between the towns of Brezice and Krško (Slovenia). On p. 45, a reference is made to its odon. fauna, 4 spp. are mentioned and photographically documented.

- (17583) BRILIUTE, A. & E. BUDRYS, 2008. New

record of damselfly *Lestes barbarus* in the South of Lithuania (Odonata: Lestidae). *New rare Lithuanian Insect Spec.* 19: 10-12. (With Lithuan. s.). – (First Author: Inst. Ecol., Vilnius Univ. Akademijos 2, LT-08412 Vilnius).

A ♂ (no date, probably before 2000) and a ♀ (17-VII-2007) are brought on record from Puvočini (Varens distr.). This is the 62nd odon. sp. known from Lithuania. However, *Sympetrum eroticum* (recorded in 1988) should be deleted from the list. The record is based on a single specimen that was most likely accidentally introduced along with grass carp fry from the Amur region and the sp. apparently did not get established in Lithuania.

- (17584) CONZE, K.-J. & N. MENKE, 2008. Libellen in Nordrhein-Westfalen: Bearbeitungsstand, Inventar und aktuelle Entwicklungen. *Natur Nordrhein-Westfalen* 4: 27-31. – (First Author: Listerstr. 13, D-45147 Essen).

The Northrhine-Westphalia (Germany) Odon. Databank includes ca 150.000 records of 73 spp. The trends in the fauna of various habitat types are outlined, the effects of climate change and the problems of legal protection of some spp. are stated, and the information on the forthcoming projects is provided.

- (17585) DAPKUS, D., 2008. Protected species of insects found in Verkiiai Regional Park (southeastern Lithuania) in 2007. *New rare Lithuanian Insect Spec.* 19: 5-9. (With Lithuan. s.). – (Dept Zool. Vilnius Pedagog. Univ., Studentu 39, LT-08106 Vilnius). Records of *Ophiogomphus cecilia* and *Leucorrhinia pectoralis*.

- (17586) DE MARCO Jr, P., 2008. Libellulidae (Insecta: Odonata) from Itaipiracó reserve, Maranhão, Brazil: new records and species distribution information. *Acta amazon.* 38(4): 819-822. (With Port. s.). – (Lab. Ecol., Depto Biol. Geral, Univ. Fed. Goiás, BR-74001-970 Goiânia, GO).

An annotated list of 20 spp., with a brief discussion on the coexistence of various *Erythemis* spp.

- (17587) DENG, X. & H. ZHENG, 2008. Wing-wing interactions in dragonfly flight. *Neuromorphic Engineer* 2008, 3 pp. – 10.2417/1200811.1269. – (Mechanical Engineering, Univ. Delaware, Newark, DE, USA).

A pair of robotic wings have been used to investi-

gate why dragonflies use different phase angles for different flight modes.

- (17588) FOMEKONG, A., J. MESSI, S. KEKEU-NOU, F.-N. TCHUENGUEM-FOHOUE & J.L. TAMESSE, 2008. Entomofauna of *Cucumeropsis mannii* Naudin, its impact on plant yield and some aspects of the biology of *Dacus bivittatus* (Diptera: Tephritidae). *Afr. J. agric. Resour.* 3(5): 363-370. – (First Author: Dept Anim. Biol. & Physiol., Fac. Sci., Univ. Yaounde, Cameroon).
Not further identified Coenagrionidae, Gomphidae and Anisoptera spp. were found attacking the predators occurring on *C. mannii* at Yaoundé, S Cameroon.
- (17589) GLIGORVIĆ, B., V. PEŠIĆ & A. ZEKOVIĆ, 2008. A contribution to the knowledge of dragonflies (Odonata) from the area of Gornji Crnci-Piper (Montenegro). *Acta ent. serb.* 13(1/2): 1-7. (With Serb. s.). – (Dept Biol., Fac. Sci., Univ. Montenegro, Cetinjski put b.b., ME-81000 Podgorica).
Records of 14 spp. *Cordulegaster picta* is new for the fauna of Montenegro.
- (17590) GNIADKOWSKI, J., 2008. Dragonflies (Odonata) in the nearby of Czestochowa, 2. *Biul. czestochow. kola ent.* 7: 8-9. (Pol., with Engl. s.). – (ul. Oskara Lange 7/97, Czestochowa, Poland).
The results of the monitoring (2005) of 23 spp. in Bagno w Korzonku, near Czestochowa (S Poland). – For pt 1, see OA 17150.
- (17591) HAO, S.-I. et al. [joint authors not transliterated], 2008. Preliminary report on Odonata in Baxianshan Natural Reserve in Tianjin. *J. Anhui Agric. Soc.* 36(23): 10000-10001. (Chin., with Engl. s.). – (Tianjin Nat. Hist. Mus., Tianjin-300074, China).
An annotated list of records of 14 spp.; 3 spp. are for the first time reported from Tianjin area, China.
- (17592) *IDF-REPORT*. Newsletter of the International Dragonfly Fund (ISSN 1435-3393), Vols 13(2008), 14(2008), 15(2008). – (c/o M. Schorr, Schulstr. 7/B, D-54314 Zerf).
[Vol. 13]: *Khrokalo, L. & S. Krylovskaya*: Distribution and current status of *Coenagrion armatum* (Charpentier, 1840) in Ukraine (pp. 1-16); – *Khrokalo, L. & M. Nazarov*: Dragonflies (Odonata) of the Polkskiy Nature Reserve, Ukraine (pp. 17-28); – [Vol. 14]: *Anonymous*: Nachruf Prof. Dr Philip Steven Corbet (pp. 1-46; with an almost complete bibliography compiled by *M. Schorr*); – *Schorr, M.*: Vorbemerkung (p. 47); – *Corbet, P.S.*: Population matters (very much indeed) (pp. 48-72); – [Vol. 15]: *Jović, M.*: Report on Adriatic Montenegro 2007 project: Odonata (pp. 1-25).
- (17593) KAZANCI, N., 2008. Contribution to the knowledge of Odonata fauna of Turkey: central Anatolia. *Rev. Hydrobiol.* 2: 119-128. (With Turk. s.). – (Sect. Hydrobiol., Dept Biol., Fac. Sci., Hacettepe Univ., Beytepe, Ankara, Turkey).
The records (1977-1980) are presented for 41 spp., and some notes on larval habitats are provided.
- (17594) KAZANCI, N., M. DÜGEL & S. GIRGIN, 2008. Determination of indicator genera of benthic macroinvertebrate communities in running waters in western Turkey. *Rev. Hydrobiol.* 1: 1-16. (With Turk. s.). – (First Author: Sect. Hydrobiol., Dept Biol., Fac. Sci., Hacettepe Univ., Beytepe, Ankara, Turkey).
The study was conducted at 47 sites. Relationships between macroinvertebrate assemblages and environmental variables were explored by canonical correspondence analysis. 12 odon. gen. are considered.
- (17595) KAZANCI, N. & S. GIRGIN, 2008. Ephemeroptera, Odonata, Plecoptera (Insecta) fauna of Ankara stream (Turkey). *Rev. Hydrobiol.* 1: 37-44. (With Turk. s.). – (First Author: Sect. Hydrobiol., Dept Biol., Fac. Sci., Hacettepe Univ., Beytepe, Ankara, Turkey).
14 odon. spp. are recorded from the Nkara stream (IV/XI-1991).
- (17596) KEIL, P., I. SIMOVA & B.A. HAWKINS, 2008. Water-energy and the geographical species richness pattern on European and North African dragonflies (Odonata). *Insect. Conserv. Div.* 1: 142-150. – (First Author: Dept Ecol., Fac. Sci., Charles Univ., Viničná 7, CZ-12800 Praha-2).
Environmental correlates of broad-scale patterns of Odon. species richness were studied in Europe and part of northern Africa using 220 x 220-km gridded data. Relationships with 11 environmental variables were tested using multiple regression. 2 models were constructed: (i) for the entire data set covering both Europe and northern Africa, and (ii)

only for Europe. Across both regions, actual evapotranspiration had the strongest relationship with richness, followed by weaker associations of potential evapotranspiration (a concave polynomial) and summer vegetation index (a positive linear relationship). Within Europe the strongest predictor was a concave polynomial of potential evapotranspiration, followed by vascular plant species richness (a positive relationship) and annual precipitation (a concave polynomial). A test of metabolic theory identified strong non-linearity in the temperature-richness relationship, and geographically weighted regression indicated consistency with the theory in a very limited part of Europe. The results are most consistent with the hypothesis that broad-scale species richness patterns are primarily determined by water-energy balance, similar to many fully terrestrial insect groups.

- (17597) KIM, S.-B., H.-S. JEON, H.-S. OH, J.-H. JUNG & W.-T. KIM, 2008. Phylogenetic relationships of the Anisoptera (Insecta, Odonata) of Jeju Island, Korea, based on partial mitochondrial 16S ribosomal RNA sequences. *Korean J. Genet.* 30(1): 53-61. — (Last Author: Dept Life Sci., Cheju Natn. Univ., Jeju, 690-756, S Korea).

The phylogenetic relationship of the local Anisoptera was analyzed by comparing partial mitochondrial 16S ribosomal RNA (rRNA) gene sequences. The length of the partial mitochondrial 16S rRNA genes for the 27 spp. studied ranged from 405 to 421 base pairs (bp). No intra-genus length-variations were identified in *Anax* and *Orthetrum*, while the genes of *Somatochlora* and *Sympetrum* displayed lengths of 411 to 412 and 406 to 411 bp, respectively. The GC content of the partial mitochondrial 16S rRNA gene ranged from 26.76% to 30.83%. A parsimony analysis of the unambiguously aligned mitochondrial 16S rRNA gene sequences from 28 spp., including the outgroup sp. *Indolestes gracilis*, produced 8 equally most parsimonious trees. The strict consensus tree had 3 large independent groups: I (Aeshnidae), II (Libellulidae), and III (Corduliidae). Interestingly, all *Sympetrum* spp. were clearly distinguishable from the other spp. The strict consensus tree, based on the mitochondrial 16S rRNA gene sequences, contained monophyletic groups. These results concurred with previous studies based on morphological characteristics.

- (17598) KISTERMANN, K. & H. BRUX, 2008.

Pflege- und Entwicklungskonzept für das FFH-Teilgebiet Heumoor (Lkr. Oldenburg) unter besonderer Berücksichtigung von Libellen (Odonata) und Bodenverhältnissen. *Natur Umweltschutz* 7(1): 21-28. (With Engl. s.). — (First Author: Am Glagesch 6, D-49082 Osnabrück).

Heumoor is a former raised bog, part of a larger nature reserve in the district of Oldenburg, W Germany. 17 odon. spp., incl. *Ceriatagrion tenellum*, were recorded from there. Raising the groundwater table is recommended in order to improve the condition of aquatic habitats, and management measures are specified for protection of the endangered odon. spp.

- (17599) KOVÁCS, T., R.J. GODUNKO, P. JUHÁSZ, B. KISS & Z. MÜLLER, 2008. Quantitative records of larvae of Ephemeroptera, Odonata and Plecoptera from the Zakarpats'ka Region, Ukraine (2004, 2006). *Folia hist.-nat. Mus. matraensis* 32: 135-147. — (First Author: Mátra Mus., Kossuth Lajos u. 40, HU-3200 Gyöngyös).

From 7 localities sampled, *Platycnemis pennipes*, *Gomphus vulgatissimus* and *Onychogomphus forcipatus* are reported.

- (17600) MACHADO, A.B.M., G.M. DRUMMOND & A.P. PAGLIA, [Eds], 2008. *Livre Vermelho da fauna brasileira ameaçada de extinção*, Vol. 1: 512 pp., Vol. 2: 908 pp. Ministerio de Meio Ambiente, Brazilia [Biodiversidade 19]. (Softcover, 21.0 x 28.5 cm). ISBN 978-85-7738-102-9. (Port.).

A monumental, minutely documented work on the animals threatened by extinction in Brazil. The Odon. are treated in Vol. 1, pp. 318-323, 451-461, 480-487 (cumulative references), 493 (col. fig. *Minagrion mecistogastrum*). The following spp. are dealt with: *Aeshna eduardoi*, *Praeviogomphus proprius*, *Heteragrion obsoletum*, *H. petiense*, *Acanthagrion taxaensis*, *Leptagrion acutum*, *Minagrion mecistogastrum* and *Mecistogaster pronoti*.

- (17601) MARKWELL, K.A. & C.S. FELLOWS, 2008. Habitat and biodiversity of on-farm water storages: a case study in southeast Queensland, Australia. *Envir. Mngmt* 41: 234-249. — (Austral. Rivers Inst., Griffith Sch. Environment, Nathan, Qld 4111, AU).

The results are presented from a case study which examined the habitat characteristics, and macrophyte and macroinvertebrate biodiversity of 8 farm

ponds in the Stanley Catchment. Representatives of 6 odon. fam. were recorded across all ponds, and farmers' pond and habitat managing is outlined.

- (17602) MATUSHKINA, N.A., 2008. Skeletomuscular development of genital segments in the dragonfly *Anax imperator* (Odonata, Aeshnidae) during metamorphosis and its implications for the evolutionary morphology of insect ovipositor. *Arthropod Struct. Develop.* 37: 321-332. — (Dept Zool., Fac. Biol., Taras Shevchenko Univ., Volodymirs'ka 64, UKR-01033 Kyiv).

The skeleton-muscular organisation of abdominal segments 7-9 in ♀ was examined in the stages of ultimate larva, and teneral and mature imago, with special emphasis on the transformation of the muscle arrangement. The absence of certain muscles in the genital segments compared to the 7th pre-genital segment was noted on all studied stages. Reductions of certain muscles in adults compared to those in larvae are reported. Some of ovipositors's muscles appear already in larvae. Attachment sites of larval muscles are retained in freshly emerged females concurrently with integument transformations. This situation allows for precise determination of the borders of newly differentiated genital sclerites and, therefore, of the possible origin of certain ovipositor elements in odon. All changes in the segmental sets of studied abdominal muscles during metamorphosis are tabulated, and displacements of muscles are documented and illustrated. Schematic figures illustrating homologies between the parts of larval and imaginal abdominal sclerites are provided. The origins of the components of the endophytic ovipositor in Odon. as well as their implications for the evolutionary morphology of the insect ovipositor are discussed.

- (17603) MINNESOTA ODONATA GAZETTE (ISSN none), Vol. 1, No. 3 (Fall 2008). — (c/o D. Rowse, 10704 Prescott Ct., Burnsville, MN 55337, USA).

Rowse, D.: The 2008 dragonfly workshops a success! (p. 1); — Mead, K.: More odonates for Minnesota (p. 2); — Grosshuesch, D.: Superior National Forest odonate 2008 survey (p. 3); — King, S.: The dragonhunters on Mallard Island: a journal of dragonfly encounters (pp. 4-7).

- (17604) OSADOWSKI, Z., K. OBOLEWSKI & A. STRZELCZAK, 2008. Influence of anthropogenic

factors on microhabitats inhabited by riverine hydrobionts: assessment with MRT method. *Ecol. Quest.* 10: 41-50. — (First Author: Dept Bot. & Genet., Inst. Biol. & Environ. Prot., Pomeranian Univ., Arciszewskiego 22/B, PO-76-200 Slupsk).

The influence of the urban area on vegetation and invertebrate assemblages of the Slupia river (N Poland) was studied. *Lestes viridis* and Aeshnidae are the only 2 odon. taxa listed. Their densities at various sampling stations are stated.

- (17605) PISICA, E.J. & R. POPESCU-MIRCENI, 2008. Data on some dragonflies (Insecta: Odonata) from western Turkey. *Trav. Mus. natn. Hist. nat. Gr. Antipa* 51: 335-344. (With Fr. s.). — (First Author: Muzeul Natn. Ist. Naturala 'Gr. Antipa', Sos. Kiseleff 1, RO-011341 Bucurest-2).

A list of 27 spp., with some general data on distribution in Turkey and elsewhere.

- (17606) RAFI, M.A., 2008. Hands on training of taxonomists through expedition: report. *Newsl. invert. Conserv. Inform. Network Sth Asia* 16: 17-21. — (Natl. Insect Mus. & Insect Pest Informatics, Inst. Plant & Envir. Prot., Natn. Agric. Res. Cent., Islamabad, Pakistan).

Includes a list of 10 odon. taxa, but the respective localities are not specified; — Pakistan.

- (17607) SCHIEL, F.-J. & M. RADEMACHER, 2008. Artenvielfalt und Sucession in einer Kiesgrube südlich Karlsruhe: Ergebnisse des Biotopmonitoring zum Naturschutzgebiet „Kiesgrube am Hardtwald Durmersheim“. *NatSchutz Landschaftsplanung* 40(3): 87-94. (With Engl. s.). — (First Author: INULA, Turenneweg 9, D-77880 Sasbach).

The results are presented of a 6 yr monitoring programme of a gravel pit (surface ca 30 ha) in the Upper Rhine Valley, ca 10 km S from Karlsruhe, alt. 109-118 m a.s.l.), Baden-Württemberg, SW Germany. 34 odon. spp. were recorded (22 autochthonous), but a list is not provided. From a nearby temporary pond in the NE section of the area, *Ischnura pumilio*, *Lestes barbarus*, *Aeshna affinis*, *Orthetrum brunneum*, *O. coerulescens* and *Sympetrum danae* are reported.

- (17608) SUNDARARAJAN, R.P., K. GUNATHI-LAGARAJ & V. LAKSHMANAN, 2008. A preliminary note on Odonata in the Eastern Ghats of Tamil Nadu. *Newsl. invert. Conserv. Inform. Net-*

work Sth Asia 16: 14-15. – (First Author: Horticult. Res. Stn, Yeroaud, Salem distr., Tamil Nadu-636602, India).

A commented list of 8 Anisoptera spp.; – India.

- (17609) SRIVASTAVA, D.S., M.K. TRSCINSKI, B.A. RICHARDSON & B. GILBERT, 2008. Why are predators more sensitive to habitat size than their prey? Insights bromeliad insect food web. *Am. Nat.* 172(6): 761-771. – (First Author: Dept Zool., Univ. Brit. Columbia, 6270 University Blvd, Vancouver, B.C., V6T 1Z4, CA).

Ecologists have hypothesized that the exponent of species-area power functions (z value) should increase with trophic level. The main explanation for this pattern has been that specialist predators require prior colonization of a patch by their prey, resulting in a compounding of the effects of area up trophic levels. 2 novel explanations are here proposed, neither of which assumes trophic coupling between spp. First, sampling effects can result in different z values if the abundances of spp. differ (in mean or evenness) between trophic levels. Second, when body size increases between trophic levels, effects of body size on z values may appear as differences between trophic levels. These alternative explanations are tested using invertebrate food webs in 280 bromeliads from 3 countries. The z value of predators was higher than that of prey. Much of the difference in z values could be explained by sampling effects but not by body size effects. When *Mecistogaster modesta* occurred in the species pool, predator z values were even higher than predicted, as these odon. avoid small, drought-prone bromeliads. In one habitat, dwarf forests, detrital biomass became decoupled from bromeliad size, which also caused large trophic differences in z values.

- (17610) *SYMPETRUM PIÉMONTAIS*. Circulaire de Groupe de recherche et de protection des libellules Sympetrum, No. 59 (March 2007–Oct. 2008). – (c/o C. Deliry, Villa D, 2 rue de la Forge, F-38200 Villette de Vienne).
In addition to various minor news items, it includes the reports on the Plenary meeting (pp. 5-8) and on the meeting of the Administrative Council (pp. 10-11), both having taken place on 24 Feb. 2007. A review of the 2005-2006 activities is also provided (pp. 8-10).

- (17611) TAM, T.-z., B.S.P. KWAN, K.K.Y. WU, B.S.F. WONG, S.S.H. TANG, C.H.L. FUNG, W.S.Y. WONG, J.K. WONG, S.W.L. FONG & A.H.C. LEI, 2008. Current status of dragonflies (Odonata) and their representation in protected areas of Hong Kong. *Hong Kong Biodiv.* 16: 1-7. (With Chin. s.). – (First Author: Agric., Fish. & Conserv. Dept, 7/F, Cheung Sha Wan Government Offices, 303 Cheung Sha Wan Rd, Kowloon, Hong Kong, China).

The work is based on analysis of data gathered through baseline survey (2002-2004, 207 sites) and monitoring of representative sites. 8 new spp. were recorded from 1997 to 2008, bringing the current status up to 115 known spp. An annotated list of uncommon, endemic or rare spp. is provided along with a review of the representative Hong Kong odon. sites and their noteworthy spp.

- (17612) USHERWOOD, J.R. & F.-O. LEHMANN, 2008. Phasing of dragonfly wings can improve aerodynamic efficiency by removing swirl. *Jl R. Soc. Interface* 2008: 5 pp. – DOI: 10.1098/rsif.2008.0124. – (First Author: Structure & Motion Lab., Royal Veterinary Coll., North Mymms, Hatfield, Herts, AL9 7TA, UK).

Odon. are dramatic, successful aerial predators, notable for their flight agility and endurance. Further, they are highly capable of low-speed, hovering and even backwards flight. While insects have repeatedly modified or reduced one pair of wings, or mechanically coupled their fore- and hindwings, odon. have maintained their distinctive, independently controllable, 4-winged form for over 300 Myr. Despite efforts at understanding the implications of flapping flight with 2 pairs of wings, previous studies have generally painted a rather disappointing picture: interaction between fore- and hindwings reduces the lift compared with 2 pairs of wings operating in isolation. Here, it is demonstrated with a mechanical model dragonfly that, despite presenting no advantage in terms of lift, flying with 2 pairs of wings can be highly effective at improving aerodynamic efficiency. This is achieved by recovering energy from the wake wasted as swirl in a manner analogous to coaxial contra-rotating helicopter rotors. With the appropriate fore-hindwing phasing, aerodynamic power requirements can be reduced up to 22% compared with a single pair of wings, indicating one advantage of 4-winged flying that may apply to both dragonflies and, in the future,

biomimetic micro air vehicles.

- (17613) WANG, Z.J., 2008. Aerodynamic efficiency of flapping flight: analysis of a two-stroke model. *J. exp. Biol.* 211: 234-238. – (Dept Theor. & Appl. Mechanics, Cornell Univ., Ithaca, NY 14853, USA).

To seek the simplest efficient flapping wing motions and understand their relation to steady flight, a 2-stroke model in the quasi-steady limit was analyzed. It was found that a family of 2-stroke flapping motions have aerodynamic efficiency close to, but slightly lower than, the optimal steady flight. These 2-stroke motions share 2 common features: the downstroke is a gliding motion and the upstroke has an angle of attack close to the optimal of the steady flight of the same wing. With the reduced number of parameters, the aerodynamic cost function in the parameter space can be visualized. This was examined for wings of different lift and drag characteristics at Reynolds numbers between 10^2 and 10^6 . The iso-surfaces of the cost function have a tube-like structure, implying that the solution is insensitive to a specific direction in the parameter space. Related questions in insect flight that motivated this work are discussed.

- (17614) WANG, Z.J., 2008. Dragonfly flight. *Physics Today* 2008 (Oct.): 78-79. – (Dept Theor. & Appl. Mechanics, Cornell Univ., Ithaca, NY 14853, USA).

A brief outline of aerodynamic tricks discovered by dragonflies.

- (17615) WILDERMUTH, H., 2008. Konstanz und Dynamik der Libellenfauna in der Drumlinlandschaft Zürcher Oberland: Rückblick auf 35 Jahre Monitoring. *Vjschr. naturf. Ges. Zürich* 153(3/4): 57-66. (With Engl. s.). – (Haltbergstr. 43, CH-8630 Rütli).

In the „Drumlin Landscape Zurich Oberland“, Switzerland (47 19'N, 08 48'E), a nature reserve consisting of fragmented and disturbed bogs, fens and woodland with a variety of small water bodies, 51 odon. spp. had been recorded during ca 1000 monitoring days from 1973 to 2007. Regular reproduction was found in 27 spp., all the others reproduced sporadically or occurred as vagrants. *Nehalennia speciosa* became extinct, and 3 spp. have colonized the reserve permanently since 2005. Quantitative exuviae collections of the Anisoptera on 6 focus

peat ponds during 24 yr revealed strong spatial differences and temporal fluctuations of the annual population size of all spp. These dynamics were considered in the mode of peat pond management that was especially aimed at *Leucorrhinia pectoralis*. In the course of the monitoring period fruitful interactions between research and water management arose, resulting in successful conservation and promotion of the local odon. fauna. The indigenous populations can only be preserved and promoted by creating new water bodies and by sophisticated management of the extant waters. The results of this long-term study underline the importance of the moorland reserve as a biodiversity hotspot in a highly man-modified landscape.

- (17616) XU, Q.-h., 2008. Notes on the Chinese *Sarasaeschna*, with description of a new species from Fujian (Odonata, Aeshnidae). *Acta zootax. sin.* 33(3): 480-483. (With Chin. s.). – (Zhangzhou City Univ., Fujian-363000, China).

The 6 spp. known from China are keyed. *S. zhuae* sp. n. is described and illustrated from a single ♂ (China: Fujian prov., Huaan co., alt. ca 1200 m a.s.l., 5-VII-2007; deposited at Zhangzhou City Univ., China).

- (17617) XU, Q.-h. & C.-m. LIU, 2008. Classification and new records of Fujian Corduliidae (Insecta: Odonata). *J. Fujian Coll. Forest.* 28(3): 237-239. (Chin., with Engl. s.). – (Second Author: Inst. Biol. Control Res., Fujian Agric. & Forest Univ., Fuzhou, Fujian-350002, China).

9 spp. are dealt with. *Macromia septima* is for the first time recorded from China. *M. unca* and *M. flavocolorata* are new to Fujian. *Macromidia hangzhouensis* Zhou & Wei, 1979 is synonymized with *M. kelloggi* Asahina, 1978.

- (17618) ZHANG, D., G. YANG & Z. ZHENG, 2008. Comparison of cytochrome *b* gene sequences and phylogenetic analysis of partial Libellulidae [sic!] (Odonata: Anisoptera). *J. Ningxia Univ.* (Nat. Sci.) 29(2): 161-165. (Chin., with Engl. s.). – (First Author: Sch. Life Sci., Ningxia Univ., Yinchuan-750021, China).

Based on 576 bp sequences, phylogenetic relationship among 8 spp. is examined. *Neurothemis* and *Palpopleura* are a sister group of *Diplacodes* and *Pantala*.

2009

- (17619) (Anonymous), 2009. Lompe soortenjager kwelt Fryske Gea. *Leeuwarder Courant*, issue of 27 June, p. 1. (Dutch).
A regional daily's note on the "magnetic" attraction exercised by the *Leucorrhinia albifrons* site in the Fryske Gea reserve nr Oldeberkoop (Friesland, the Netherlands) on dragonfly photographers. — (See OA 17625).
- (17620) BEDJANIĆ, M., 2009. On dragonflies in the area between Pohorje and Haloze (Insecta: Odonata). *Zborn. Obč. Slovenska Bistrica* 3: 549-577. (Slovene, with Engl. & Germ. s's). — (Kolodvorska 21/b, SI-2310 Slovenska Bistrica).
A monograph on the odon. fauna (59 spp.) of this area (Slovenia), with a complete regional bibliography (82 titles, 1864-early 2008). The area is considered among the odonatologically most interesting regions in this part of Europe.
- (17621) BEDJANIĆ, M. K. CONNIFF, N. VAN DER POORTEN & A. ŠALAMUN, 2009. *Preliminary results of the work on the odonatological database: Distribution atlas of the dragonflies of Sri Lanka. Version 2.0, April 2009*. Draft publication, pdf distributed by the authors. 72 pp., 138 figs. — (First Author: Kolodvorska 21/b, SI-2310 Slovenska Bistrica).
This is among the first publications of its kind in S and SE Asia. Its aims are: (1) to summarize the knowledge on the odon. distribution in Sri Lanka, (2) to point out the lacunae in the knowledge on distribution, biology and taxonomy of several endangered endemic spp., and (3) to rise the local interest in odonatol. topics.
- (17622) BEHR, H., 2009. Notizen zur Libellenfauna des Siebendorfer Moore bei Schwerin (Mecklenburg-Vorpommern). *VirgolMittBl. ent. Ver. Mecklenburg* 12(1): 44-46. — (Herrengrabenweg 57, D-19061 Schwerin).
A commented list of 32 spp., recorded (1992-1994) and/or photographically documented (2005-2008) from the Siebendorfer Moor (surface 596 ha) nr Schwerin, E Germany, is presented. Some *Crocothemis erythraea* adults were noticed in 2007. *Erythromma viridulum* and *Lestes barbarus* are among the noteworthy southern spp.
- (17623) BENNETT, M. & K.A. HOBSON, 2009. Trophic structure of a boreal forest arthropod community revealed by stable isotope ($d^{13}C$, $d^{15}N$) analyses. *Ent. Sci.* 12(1): 17-24. — (Second Author: Environment Canada, 11 Innovation Blvd, Saskatoon, SK, S7N 3H5, CA).
 $d^{13}C$ and $d^{15}N$ values were measured in a broad range of arthropod taxa from boreal forest in Prince Albert Natn. Park, Saskatchewan, Canada. Isotopic measurements support previous conventional investigations on foraging niches based on stomach content analysis and direct feeding observations, but additional new information was also obtained using the stable isotope approach. Aquatic insect $d^{13}C$ values tend to be lower than those of their terrestrial counterparts. As expected, Odon. occupied one of the highest trophic levels, indicated by high $d^{15}N$ values (mean: 6.2 ± 1.4 , range: 3.5-8.2). Unexpectedly, Zygoptera values (mean: 7.3 ± 0.6) were higher than those for Anisoptera (mean: 5.2 ± 1.2) despite evidence that Anisoptera also feed on smaller odon. such as zygopterans. Larger Anisoptera may have fed more on lepidopterans than on Zygoptera. Alternatively, because aquatic insects may be more enriched in ^{15}N than terrestrial insects, zygopterans may have consumed more emerged aquatic insects like mosquitoes. The potential for using stable isotope methods to reconstruct trophic linkages and interaction involving arthropods is discussed.
- (17624) BORISOV, S.N., 2009. Distribution patterns of dragonflies (Odonata) in Central Asia. *Ent. Rev.* 89(1): 26-33. Russian version in *Zool. Zh.* 88(1): 11-17; 2009. — (Inst. Anim. Syst. & Evol., Russ. Acad. Sci., Frunse 11, RUS-610091 Novosibirsk).
The odon. fauna of Central Asia reveals distinct vertical differentiation. 3 groups of spp. can be distinguished: mountain (24 spp), plain (18), and plain-mountain (34). The ranges observed can be classified into 7 principal types: plain, mountain, continuous boreo-montane, disjunctive Central Asian boreo-montane, disjunctive Tien Shan boreo-montane, Central Asian, and Pamir-Alay plain-mountain. The leading factors determining the odon. distribution are the temperature and the presence of streams suitable for preimaginal development; the former factor determines the potential ranges, and the latter, the actual ones. The present-day composition, structure, and vertical distribution of the odon. fauna formed during the historical

time, after the development of artificial irrigation canals which provided new odon. habitats.

- (17625) BOSMA, W., 2009. Deze had ik nog niet. *Leeuwarder Courant*, issue of 27 June, p. 13. (Dutch).

The *Leucorrhinia albifrons* site at the Deleboerster Heide nr Oldeberkoop in Friesland (the Netherlands) is continuously attracting the attention of dragonfly photographers. In June 2009, about 100 visitors were noticed, some in guided groups. The access to the site is free, but some of the visitors had to be expelled from the area by the Fryska Gea rangers because of their inadequate behaviour in the reserve, or their apparent intention to catch dragonflies.

- (17626) BOUDOT, J.-P., V.J. KALKMAN, M. AZPILICUETA AMORIN, T. BOGDANOVIĆ, A. CORDERO RIVERA, G. DEGABRIELE, J.-L. DOMMANGET, S. FERREIRA, B. GARRIGOS, M. JOVIĆ, M. KOTARAC, W. LOPAU, M. MARINOV, N. MIHOKOVIĆ, E. RISERVATO, B. SAMRAOUI & W. SCHNEIDER, 2009. Atlas of the Odonata of the Mediterranean and North Africa. *Libellula* (Suppl.) 9: 1-256. (With Germ. s.). – (First Author: LIMOS, UMR 7137 CNRS, Fac. Sci., Univ. Nancy, B.P. 70239, F-54506 Vandoeuvreles-Nancy Cedex).

The atlas presents the odon. distribution in Africa N of the 18th northern parallel, the Levant, Anatolia and in the whole of the Mediterranean Europe. Some nearby areas like Portugal, the Canary Islands, Madeira, Serbia, Macedonia, Bulgaria and parts of the Arabian Peninsula, Iraq and Iran are also included. Records, shown on a 50 x 50 km UTM MGRS grid, are categorized according to their date (prior to 1980 and from 1980 onwards). 179 spp. are presently recognized in this area.

- (17627) CLAUSNITZER, V., V.J. KALKMAN, M. RAM, B. COLLEN, J.E.M. BAILLIE, M. BEDJANIĆ, W.R.T. DARWALL, K.-D.B. DIJKSTRA, R. DOW, J. HAWKING, H. KARUBE, E. MALIKOVA, D. PAULSON, K. SCHÜTTE, F. SUHLING, R.J. VILLANUEVA, N. VON ELLENRIEDER & K. WILSON, 2009. Odonata enter the biodiversity crisis debate: the first global assessment of an insect group. *Biol. Conserv.* 2009, 6 pp. – DOI 10.1016/j.biocon.2009.03.028. – (First Author: Inst. Geogr., Philipps-Univ. Mar-

burg, Deutschhausstr. 10, D-35032 Marburg).

The status and trends of global biodiversity are often measured with a bias towards datasets limited to terrestrial vertebrates. The first global assessment of an insect order provides new context to the ongoing discussion of current biodiversity loss. A randomly selected sample of 1500 (26.4%) of the 5680 described Odon. spp. was assessed using IUCN's Red List criteria. Distribution maps for each sp. were created and spp. were assigned to habitat types. These data were analysed in respect to threat level for regions and habitat types. It was found that one in 10 Odon. spp. is threatened with extinction. This threat level is among the lowest of groups that have been assessed to date, suggesting that previous estimates of extinction risk for insects might be misleading. However, Odon. only comprise a small invertebrate order, with above-average dispersal ability and relatively wide distribution ranges. For conservation science and policy to be truly representative of global biodiversity a representative cross-section of invertebrates needs to be included.

- (17628) DE MOOIJ, P., 2009. Welkom in libellenland. – [Welcome in dragonfly land]. *Landleven* 14(4): 73-75. (Dutch). – (Author's address not stated). Impressions from the dragonfly world of the Krimpenerwaard (Zuid Holland prov., the Netherlands), with phot. of 5 spp.

- (17629) HAMMERS, M., R.A. SANCHEZ-GUILLEN & H. VAN GOSSUM, 2009. Differences in mating propensity between immature female colour morphs in the damselfly *Ischnura elegans* (Insecta: Odonata). *J. Insect Behav.* 22: 324-337. – (First Author: Anim. Ecol. Gr., Cent. Ecol. & Evol. Stud., Univ. Groningen, P.O. Box 14, NL-9750 AA Haren).

♀-limited colour polymorphisms occur in a variety of animal taxa where excessive ♂ sexual harassment may explain the coexistence of multiple ♀ colour morphs. In the colour polymorphic *I. elegans*, mature and immature ♀ colour morphs coexist at the mating site where ♂♂ are in search for suitable mating partners. Here, ♂ preference and ♀ mating propensity were studied for the 2 immature ♀ morphs. As would be expected, compared to mature morphs, both immature ♀ morphs mate much less. Within immature ♀♀, one morph consistently mates more frequently compared to

the other morph, a pattern that is similar for the ontogenetically corresponding mature ♀ morphs. Preference experiments with the 2 differently coloured immature ♀ morphs, however, did not indicate ♂ mate preference for either morph. Low mating frequencies of immature ♀♀ at natural sites in combination with relatively high attractiveness of immature models in terms of ♀ preference indicate that ♀ behaviour influences ♀ mating success.

- (17630) *IDF-REPORT*. Newsletter of the International Dragonfly Fund (ISSN 1435-3393), Vols 19 & 20 (received June 2009). – (c/o M. Schorr, Schulstr. 7/B, D-54314 Zerf).

[Vol. 19]: *Dow, R. & G. Reels*: Expedition to Mount Dullit Sarawak, August-September 2008: Odonata (pp. 1-16); – [Vol. 20]: *Khrokalo, L. & G. Prokopov*: Review of the Odonata of Crimea (Ukraine) (pp. 1-32).

- (17631) JONES, C., 2009 [Meeting report]: Dragonflies and damselflies of Ontario. *Ontario Insect* 14(3): 30-31. – (Box 182, Lakefield, ON, K0L 2H0, CA).

A brief review of Author's work on the Odon. of Ontario, Canada.

- (17632) KIM, S.-B., H.-S. OH, W.-T. KIM & O. TADAUCHI, 2009. Phenetic analysis of the Anisoptera (Insecta: Odonata) in Jeju Island, Korea, based on morphological characters. *J. Fac. Agr. Kyushu Univ.* 54(1): 123-132. – (Second Author: Dept Sci. Educ., Cheju Natn. Univ., Jeju, 690-756, S Korea).

The relationships of 27 local Anisoptera spp. were investigated using a phenetic analysis of external morphological characters. The generated phenogram revealed the presence of 2 superfam., Aeshnoidea and Libelluloidea. The 3 groups, Aeshnidae, Libellulidae and Corduliidae, were clearly branched. As a result, the phenogram was similar to that of the ordinary systematic classification. The Aeshnidae was divided into *Anax* and *Gynacantha*, and *Polycanthagyna* and *Aeschnophlebia*. *Anax guttatus*, *A. parthenope* and *A. nigrofasciatus* appear to have very similar external morphological characteristics. However, major differences were observed in the upper edge of the frons and the anterior femur in these spp. Therefore, *A. guttatus* is to be considered a good sp. rather than a synonym of *A. parthenope*, as suggested by S. Asahina (*OA* 6951). The studied

Libellulidae consist of 3 subgroups. When the relationship of *Sympetrum* was considered, the key features are the patterns of the first lateral suture, the second lateral suture and the humeral suture. The Corduliidae was divided into Macromiinae and Cordulinae. *Somatochlora graeseri* and *S. clavata* were not previously recorded from Jeju Island.

- (17633) KURY, D., 2009. Krebssschere (Stratiotes aloides) in Naturschutzweihern der Schweiz. *Bauhinia* 21: 49-56. (With Engl. s.). – (Life Science AG, Greifengasse 7, CH-4058 Basel).

S. aloides is an aquatic macrophyte, colonizing shallow water zones in meso- and eutrophic lakes, lowland rivers and ditches. It is distributed in N and E central Europe and in S Scandinavia. In the past it was introduced in other regions, such as France and Switzerland. In the latter country it is being planted out since several yr in newly created ponds, where it had rapidly overgrown most of the water surface. By its introduction, the conservationists intend to foster the pond fauna, but the consequences for the pond system are rather disadvantageous: the growth of other hydrophytes is inhibited and faunal diversity decreases. This applies also to Odon., whereas *Aeshna viridis*, which is associated with the Stratiotes vegetation in the regions where it is autochthonous, does not occur in Switzerland. – The pond management should aim at creating habitats similar to the stagnant waters that existed more than 150 yr ago, when floodplains in Switzerland (and elsewhere) were still natural landscapes.

- (17634) LEUTHOLD, W., 2009. Libellen (Odonata) im Neeracherried (Kanton Zürich): das Artenspektrum und seine Veränderungen in 20 Jahren. *Vjschr. naturf. Ges. Zürich* 154(1/2): 21-29. (With Engl. s.). – (Kinkelstr. 61, CH-8006 Zürich).

Neeracherried is a marsh (surface ca 100 ha) situated ca 10 km NNW of Zurich, Switzerland. A survey in 1985/86 yielded 33 spp., whereas during a recent survey 42 spp. were recorded, but *Lestes dryas* and *Sympetrum flaveolum* have disappeared, while a reasonable *Lestes virens* population still resides. The factors that could be responsible for changes in the composition of the fauna during the past 2 decades are tentatively discussed.

- (17635) *LIBELLULA* (SUPPL.) (ISSN 0723-6534). Vol. 9 (20 March 2009): Boudot, J.-P. et al.: *Atlas of the Odonata of the Mediterranean and North Africa*.

256 pp. – (c/o Mrs G. Peitzner, Hemfelderredder 7/a, D-21039 Börnsen).

For abstract see OA 17626.

- (17636) LOK, A.F.S.L. & A.G. ORR, 2009. The biology of *Euphaea impar* Selys (Odonata: Euphaeidae) in Singapore. *Nature Singapore* 2: 135-140. – (First Author: Dept Biol. Sci., Natn. Univ. Singapore, 14 Science Dr. 4, SG-117543 Singapore). A brief overview is presented of the *Euphaea* biology, supplemented with details on *E. impar*. Richly illustrated.
- (17637) MACHADO, A.B.M., 2009. Denticulobasis and Tuberculobasis, new genera close to Leptobasis, with description of ten new species (Odonata; Coenagrionidae). *Zootaxa* 2108: 1-36. – (Depto Zool., Inst. Cien. Biol., Univ. Fed. Minas Gerais, Caixa Postal 486, BR-31270-901 Belo Horizonte, MG).
Denticulobasis gen. n. and Tuberculobasis gen. n. are described. Denticulobasis contains *D. dunklei* sp. n. from Loreto (Peru) and *D. garrisoni* sp. n. and *D. ariken* sp. n. from Rondônia (Brazil). Tuberculobasis includes 12 spp., all from S America, 7 of which are new, viz.: *T. arara* sp. n. from Rondônia (Brazil), *T. geijskesi* sp. n. from Surinam, *T. guarani* sp. n. from São Paulo (Brazil), *T. karitiana* sp. n. from Rondônia (Brazil), *T. macuxi* sp. n. from Roraima (Brazil), *T. tirio* sp. n. from Pará (Brazil) and *T. williamsoni* sp. n. from Colombia and Venezuela. 5 spp. are herein transferred from *Leptobasis* Selys, 1877 to *Tuberculobasis*: *L. cardinalis* (Fraser, 1946), *L. costalimai* Santos, 1957, *L. inversa* Selys, 1876, *L. mammilaris* Calvert, 1909, and *L. yanomami* De Marmels, 1992. The new genera are close to *Leptobasis*; differences between them are analyzed and their diagnostic characters are described. In addition, diagnostic characters of ♀♀ of 3 *Tuberculobasis* spp., most likely new, are illustrated but they are not named. A key for ♂♂ and ♀♀ of *Tuberculobasis* is provided, and an attempt to understand their life cycle is made. – (Note: *T. williamsoni* sp. n. is missing in the Table of contents).
- (17638) MAGJAR, M., 2009. *Prehrana rib v Bohinjskem jezeru in uporabnost rezultatov za ribogojstvo*. – [Fish diet in Bohinj lake and the applicability of the results in pisciculture]. Graduation Thesis (M.Sc.), Fac. Envir. Sci., Univ. Nova Gorica. ix + 77 pp., App. A-K excl. (Slovene, with Engl. s.). – (c/o Prof. A. Brancelj, St. Inst. Biol., Večna pot, SI-1000 Ljubljana).
The diet and feeding habits of Arctic charr (*Salvelinus alpinus*), European chub (*Leuciscus c. cephalus*) and European perch (*Perca fluviatilis*) were investigated (Apr. 2007-Sept. 2008) in the Alpine lake of Bohinj (NW Slovenia); out of the 3 spp., only *Leuciscus* is autochthonous in the lake. Minor quantities of odon. larvae were identified in stomach contents of the charr and the perch only. The dates of capture, size and sex of the examined fish are stated and the information on the % of occurrence, % of number of the respective prey items and % of weight they represent in the total stomach contents is provided along with the respective Index of Relative Importance (IRI) based on the said values.
- (17639) NGIAM, R.W.J., 2009 The biology and distribution of *Pseudagrion rubriceps rubriceps* Selys, 1876 (Odonata: Zygoptera: Coenagrionidae) in Singapore. *Nature Singapore* 2: 209-214. – (Natn. Biodiv. Cent., Natn Parks Board, J. Cluny Rd, Singapore-259659).
P. rubriceps was known from a single locality in Singapore; here a second locality is brought on record and some observations on its biology and ecology are outlined.
- (17640) ODONATOLOGICAL ABSTRACT SERVICE (ISSN 1438-0269), No. 24 (July 2009). 62 pp. – (Distributor: M. Schorr, Schulstr. 7/B, D-54314 Zerf).
Abstracts Nos 7574-7908 of works published in 1997-2009.
- (17641) PARKES, K.A., W. AMOS, N.W. MOORE, J.I. HOFFMAN & J. MOORE, 2009. Population structure and speciation in the dragonfly *Symptetrum striolatum/nigrescens* (Odonata: Libellulidae): an analysis using AFLP markers. *Eur. J. Ent.* 106: 179-184). – (Fourth Author: Dept Zool., Univ. Cambridge, Downing St., Cambridge, CB2 3EJ, UK).
The genetic analysis lends strong support to the notion that *S. striolatum* and *S. nigrescens* represent morphs within a single sp. The dark form is quite likely to reflect a beneficial polymorphism that allows individuals to take advantage of short periods of warmer weather. Some reasonably strong population structure is detected across the British Isles, but

this relates mostly to restricted gene flow associated with island populations, and not with the 2 morphotypes.

- (17642) REECE, B.A. & N.E. McINTYRE, 2009. Community assemblage patterns of odonates inhabiting a wetland complex influenced by anthropogenic disturbance. *Insect Conserv. Div.* 2009: 8 pp.; – DOI: 10.1111/j.1752-4598.2008.00044-x. – (Dept Biol. Sci., Texas Tech. Univ., Lubbock, TX 79409-3131, USA).
The distribution and community structure of odon. occupying a wetland complex in Texas was quantified over a 5-yr period. When using traditional community metrics, there were no significant differences in diversity or evenness in the odon. assemblages in wetlands surrounded by the 2 dominant regional forms of land use (tilled cropland and grassland). Similarity analyses likewise failed to detect any significant differences in odon. community composition with land use. Discriminant function analysis, however, revealed that spp. co-occurrences could be distinguished on the basis of surrounding land use, which indicates that odon. assemblages in these wetlands are structured in a manner that typical community metrics fail to adequately describe. Differences between the approaches are discussed, particularly with regard to the use of presence-absence data.
- (17643) REECE, B.A. & N.E. McINTYRE, 2009. Odonata of playas in the southern High Plains, Texas. *SWest. Nat.* 54(1): 96-99. (With Span. s.). – (Dept Biol. Sci., Texas Tech. Univ., Lubbock, TX 79409-3131, USA).
An annotated and commented list of 25 spp., recorded (July 2003-Aug. 2007) at 76 playas across 16 counties. The 5 seasons of observation and collection yielded important presence/absence data, resulting in 110 co. records.
- (17644) SCHMIDT, E.G., 2009. Langzeit-Beobachtungen zur Libellenfauna am Garten-Kleinteich im Münsterland/Westfalen. *Virgol/MittBl. ent. Ver. Mecklenburg* 12(1): 37-43. – (Coesfelder Str. 230, D-48249 Dülmen).
A concise report and analysis of systematic long-term (> 10 yr) odon. observations (17 spp.) in sub-optimal conditions of a small garden-pond (volume < 1000 l water) at Dülmen, W Germany. Adjacent to the pond was a 80 l water bucket. Species- and ecological composition of the fauna and the periods of emergence and flight are analyzed and discussed.
- (17645) SENEGAČNIK, A. & Mojca BEDJANIČ, 2009. Nature between Pohorje and Haloze. *Zborn. Obč. Slovenska Bistrica* 3: 381-421. (Slovene, with Engl. & Germ. s's). – (Second Author: Kolodvorska 21/b, SI-2310 Slovenska Bistrica).
Includes a reference to the occurrence of *Symptetrum depressiusculum* at the retention lake of Medvedce (Slovenia). – For the regional odon. monograph, see *OA* 17620.
- (17646) ŚNIEGULA, S., 2009. Dragonflies (Odonata) of eutrophic waterbodies of Borne Sulinowo commune (West and South Pomeranian Lakeland district). *Wiad. ent.* 28(2): 73-82. (Pol., with Engl. s.). – (Inst. Nat. Conser., PAN, Mickiewiczza 33, PO-31-120 Kraków).
37 spp. are recorded from 3 localities (NW Poland) and the high natural value of these sites is emphasized.
- (17647) ŚNIEGULA, S. & M.J. GOLAB, 2009. The dragonflies (Odonata) of peat bog water bodies in the vicinity of Borne Sulinowo (West and South Pomeranian Lakeland district). *Wiad. ent.* 28(1): 33-41. (Pol., with Engl. s.). – (Inst. Nat. Conserv., PAN, Mickiewiczza 33, PO-31-120 Kraków).
36 spp. are recorded from 5 sites (NW Poland) and faunal composition of particular habitats is briefly discussed.
- (17648) STENMAN, K. & F. JOHANSSON, 2009. Röd flickslända och finnmyrten, två nya arter för Pitea kommun. – [Pyrhosoma nymphula and Chamaedaphne calyculata, two new species for the Pitea district]. *Skörvnöpparn*, Umea 1(1): 1-2. (Swed.). – (First Author: Anim. Ecol., Dept Ecol. Envir. Sci., Umea Univ., S-90187 Umea).
P. nymphula is reported from a locality 30 km W of Pitea (Sweden) and 6 other odon. spp. from the same site are listed (25-VII-2008).
- (17649) SUBRAMANIAN, K.A., 2009. *A checklist of Odonata (Insecta) of India*. *Zool. Surv. India*, Pune. vi+34 pp. – (Author: Western Reg. Stn, Zool. Surv. India, Pune-411044, Maharashtra, India).
An updated, thoroughly revised and commented checklist of 470 spp.

- (17650) TRAPERO-QUINTANA, A.D. & N. CUÉLLAR ARAÚJO, 2009. Description of the last instar larva of *Cannophila insularis funerea* (Carpenter, 1897) (Anisoptera: Libellulidae), with notes on the habitat of the species. *Zootaxa* 2034: 61-64. – (Depto Biol., Univ. de Oriente, Ave. Patrio Lumumba, CU-90500 Santiago de Cuba).
The description and illustrations are based on 2 exuviae from 2 streams in northern Santiago de Cuba, Cuba. The larva is similar to *C. vibex*; the separating features are stated.
- (17651) UZENBAEV, S.D. & S.N. LYABZINA, 2009. An experimental study of the effects of spider venom on animals. *Ent. Rev.* 89(4): 479-486. Russ. version published in *Zool. Zh.* 88(3): 300-307; 2009. – (Petrozavodsk St. Univ., RUS-185910 Petrozavodsk).
The effects of venom of spiders of the fam. Pisauridae, Argynonetidae and Araneidae on different animals (incl. adult and larval *Lestes sponsa* and *Aeshna juncea*) was studied. The venom of spider ♀ was more efficient than that of the ♂. The spiders were found to be able to kill up to 5 victims in sequence, the most effective action of venom was on the first 2 ones. The venom regenerates in 1.5-2 h. Precise data are stated for each spider and for each victim sp.
- (17652) VAN GOSSUM, H., J. BOTS, T. SNIJKERS, J. MEYER, S. VAN WASSENBERGH, W. DE COEN & L. DE BRUYN, 2009. Behaviour of damselfly larvae (*Enallagma cyathigerum*) (Insecta, Odonata) after long-term exposure to PFOS. *Envir. Pollut.* 2009: 5 pp.; – DOI 10.1016/j.envpol.2008.11.031. – (First Author: Evol. Ecol. Gr., Univ. Antwerp, Groenenborgerlaan 171, B-2020 Antwerpen).
Perfluorooctane sulfonic acid (PFOS) is a persistent and ubiquitous environmental contaminant that has been detected in organisms worldwide. Here, it is evaluated whether long-term (1 and 4 months) exposure to PFOS contamination affects the behavioural performance of *E. cyathigerum* larvae. The results show reduced behavioural performance with increasing PFOS concentration. In 1 month exposed larvae, no observed effect concentrations (NOECs) were 100 mg/L for general activity. In 4 months exposed larvae, NOECs were 10 mg/L, for each behavioural trait, except swimming acceleration of ♂ larvae where the NOEC was 100 mg/L.
When faced with PFOS concentrations above the NOEC, the larvae were less active, less capable to escape a simulated predator attack and less efficient in foraging. In summary, the results indicate that zygopteran larvae suffer reduced survival-related behavioural performance.
- (17653) VON ELLENRIEDER, N., C. MOLINERI & D. EMMERICH, 2009. Odonata from Uruguay: species list and new records. *Revta Soc. ent. argent.* 68(1/2): 227-230. (Span., with Engl. s.). – (First Author: Inst. Bio y Geocien., Mus. Cienc. Nat. Salta, Univ. Nac. Salta, Mendoza 2, AR-4400 Salta).
70 spp. known to occur in Uruguay are listed and cross-referenced to bibliography. 14 of these are new to the country.
- (17654) VON ELLENRIEDER, N. & R.W. GARRISON, 2009. Odonata. In: E. Dominguez & H.R. Fernandez, [Eds], *Macroinvertebrados bentónicos sudamericanos: sistemática y biología*, pp. 95-143, Fundación Miguel Lilo, Tucumán, ISBN 978-950-668-015-2. – (First Author: Inst. Bio y Geocien., Mus. Cienc. Nat. Salta, Univ. Nac. Salta, Mendoza 2, AR-4400 Salta).
The S American genera are keyed and their countrywise distribution is stated.
- (17655) VOUTEYEN, S., 2009. Biogéographie et spéciation des odonates de l'île de la Réunion. *Annls Soc. ent. Fr.* (N.S.) 45(1): 83-91. (with Engl. s.). – (Assoc. réunionnaise Ecol., 188 ch. Nid-Joli, F-97430 Tampon, Réunion).
The odon. fauna of Réunion is fundamentally of Mauritian origin, due to the geological history of the Mascarenes and the cyclone routes in SW Indian Ocean. Species distribution in various ecological systems of the island is outlined. It seems, the speciation takes place in a set of marginal ecosystems with low odon. diversity.
- (17656) [WICKEN FEN DRAGONFLY CENTRE], 2009. Launch of dragonfly centre creates a buzz. *Cambridge Evening News*, issue of 27 July.
The British Dragonfly Centre was opened on 27 July 2009 by the BBC presenter C. Packham in a renovated former fen worker's cottage at Wicken Fen nature reserve. This is the sole institution of this kind in Britain and is a joint initiative between the National Trust, the British Dragonfly Society and the Dragonfly Project. After the opening, there

was a guided walk and talk on dragonflies. A photo of the event is included.

- (17657) WILDERMUTH, H. & D. KURY, 2009. Libellen schützen, Libellen fördern: Leitfaden für die Naturschutzpraxis. *Beitr. NatSchutz Schweiz* 31: 88 pp. (ISSN 1421-5527). (Orders to: Schweizerische Arbeitsgemeinschaft Libellenschutz, SAGLS, Life Sciences AG, Greifengasse 7, CH-4058 Basel). A handbook on protection and conservation of odon., including the management of their habitats in Switzerland. It is directed at the concerned local and government institutions, land owners, land and industry managers, forest, game and fishery organisations, nature conservation institutions and authorities, personnel teaching at all levels, from the primary school to the university, etc. This is the first book devoted monographically to this subject. It will be inevitable to the conservationists in Europe, and applicable also for use in any other region within the Temperate Zone.
- (17658) WILSON, K.D.P. & Z. XU, 2009. Gomphidae of Guangdong and Hong Kong, China (Odonata: Anisoptera). *Zootaxa* 2177: 1-62. – (First Author: 18 Chatsworth Rd, Brighton, BN1 5DB, UK). Taxonomic and faunistic information is provided for 24 poorly known spp. A total of 50 gomphid spp. belonging to 25 gen. are enumerated, including 12 newly recorded from Guangdong and 1 newly recorded from Hong Kong. 4 spp. are synonymised, 1 ssp. is promoted to species status and new generic combinations are provided for 2 spp. The synonyms comprise: *Lamelligomphus jiuquensis* Liu, 1993 = *Lamelligomphus formosanus* (Oguma, 1926), *Lamelligomphus parvulus* Zhou & Li, 2000 = *Lamelligomphus laetus* Yang & Davies, 1993, *Melligomphus moluami* Wilson, 1995 = *Ophiogomphus guandongensis* Chao, 1994 and *Phaendrogomphus chaoi* Zhu & Liang, 1994 = *Phaendrogomphus tonkinicus* (Fraser, 1926). The subspecies *Leptogomphus elegans hongkongensis* Asahina, 1988 is elevated to species status, viz. *Leptogomphus hongkongensis*. *Ophiogomphus guandongensis* is transferred to *Melligomphus* Chao, 1990 and *Nihonogomphus indicus* Lahiri, 1987 is transferred to *Orientogomphus* Chao, 1990. Keys are provided for the identification of Chinese *Lamelligomphus* Fraser and all known spp. of *Nihonogomphus* Oguma.
- (17659) YU, X. & W. BU, 2009. Description of two new damselflies, *Protosticta zhengi* and *Sinosticta sylvatica*, from China (Odonata: Zygoptera: Platystictidae). *Zootaxa* 2245: 54-58. – (First Author: Coll. Envir. Sci. & Engin., Nankai Univ., Tianjin-300071, China). *P. zhengi* sp. n. (holotype ♂: Yunnan, Xishuangbanna, Menghun, alt. 750 m a.s.l., 30-V-1958) and *S. sylvatica* sp. n. (holotype ♂: Hainan, Diaoluoshan Nat. Reserve, alt. 620 m a.s.l.) are described and illustrated. The types are deposited at Inst. Ent., Life Sci. Coll., Nankai Univ. A key is provided for identification of all described *Sinosticta* spp.
- (17660) ZAMPAULO, R.A. & R.L. FERREIRA, 2009. Terrestrial cave invertebrate diversity in nine caves in the municipality of Aurora de Tocantins (TO). *Anais 30 Congr. bras. Espeleol.*, Montes Claros/MG, pp. 267-274. (Port., with Engl. s.). – (Sector Ecol., Depto Biol., Univ. Fed. Lavras, Camps Universitário, C.P. 3037, BR-37200-000 Minas Gerais). Among 267 morphospp., the occurrence of Odon. is recorded, but no taxa are stated; – Brazil.
- (17661) ZESSIN, W., 2009. Erstnachweis der Zierlichen Moosjungfer (*Leucorrhinia caudalis*) in West-Mecklenburg 2009 am Kraaker Waldsee, Landkreis Ludwigslust. *VirgolMittBl. ent. Ver. Mecklenburg* 12(1): 76-78. – (Lange Str. 9, D-19230 Jasnitz). A breeding population of *C. caudalis* is brought on record (V/VI-2008; Kraaker Waldsee, distr. Ludwigslust, Mecklenburg, E Germany) and the co-occurring 22 odon. spp. are listed.
- (17662) ZESSIN, W. & A. GÜNTHER, 2009. Bericht über das 18. Internationale Symposium der Odonatologie, 5. bis 13. November 2008 in Nagpur, Indien. *VirgolMittBl. ent. Ver. Mecklenburg* 12(1): 57-71. – (First Author: Lange Str. 9, D-19230 Jasnitz). A comprehensive account on the proceedings of the 18th Int. Symp. Odonatol., with the list of presentations, an exhaustive checklist of Odon. of the Nagpur area (Tamil Nadu), an the list of records made during the Symposium at 8 localities in central India. 44 phot. are included in the paper.