ODONATOLOGICAL ABSTRACTS

1990

(16728) BRYANT, R. & J. WILHM, 1990. Species diversity of benthic macroinvertebrates in Salt Creek, Oklahoma. *Proc. Okla. Acad. Sci.* 70: 9-12. – (Dept Zool., Oklahoma St. Univ., Stillwater, OK 74078, USA).
44 taxa were collected (July 1986-Nov. 1987) in rock-filled baskets placed at 5 stations in Salt Creek, Osage co., Oklahoma, USA. Only a checklist of genera is provided; the odon. are represented by Enallagma sp. and Telebasis sp.

(16729) MÓCZÁR, L., 1990. *Rovarkalauz*. Gondolat, Budapest. 260 pp., 350 col. figs excl. Hardcover (10.3×19.0 cm). ISBN 963-282-313-3. (Hungarian)
A pictorial field guide to the common insects of Hungary, incl. 11 odon. spp., with taxonomic and Hungarian nomenclature. A brief morphological description and statements on habitat, flight period and general range are provided for each sp.

(16730) SCHULER, C.A., R.G. ANTHONY & H.M. OHLENDORF, 1990. Selenium in wetlands and waterfowl foods at Kesterson Reservoir, California, 1984. *Archs envir. Contam. Toxicol.* 19: 845-853. – (First Author: US Fish & Wildl. Serv., Portland Fld Stn, 727 NE 24th Ave, Portland, OR 97232, USA).
In a way, this is a continuation of the work reported in *OA* 15761; the investigations were carried out at the same localities, in May, Aug. and Dec. 1984. The absolute values of the odon. selenium contents are slightly different from those reported in the said paper, but the overall trend remains the same. At Kesterson, the mean and range of selenium contents (μg/g dry weight) in Zygoptera larvae were 97.7 (50-160) and in those of Anisoptera 69.2 (48-110). The values from Volta were 1.51 (1.3-1.8) and 1.32 (1.0-1.7), respectively. Thus, selenium concentrations in samples from Kesterson were 52 to 64-fold higher than those from Volta.

1991

(16731) CZACHOROWSKI, S. & W. SZCZEPANSKA, 1991. Small astatic pools in the vicinity of Mikołajki and their caddis fly (Trichoptera) fauna. *Polskie Archwn Hydrobiol.* 38(1): 85-104. (With Pol. s.). – (First Author: Dept Ecol. & Nat. Prot., Univ. Warmia & Mazury, Żolnierska 14, PO-10-561 Olsztyn).
25 astatic pools were studied in the vicinity of Mikołajki, NE Poland. For 10 of these are calculated faunistic similarities, considering the co-occurrence of 67 invertebrate spp. (Mollusca 20 spp., Odon. 20, Culicinae 13, Trichoptera 14). The higher the astacism, the more unique is the faunal composition of a pool. It seems, the unstability (astacism) of the environmental conditions depends, among other factors, on the effects of cyclic and non-cyclic climatic changes.

(16732) DEJOUX, C., 1991. Les macro-invertébrés associés à la végétation aquatique dans la partie bolivienne du lac Titicaca. *Revta Hydrobiol. trop.* 24(2): 91-104. (With Engl. s.). – (ORSTOM, 7A rue du Moulin de Bordes, F-33260 La Teste).
Protallagma titicacae is the sole odon. sp. identified; – Bolivia.

(16733) WAYLAND, M., 1991. Effect of carbofuran on selected macroinvertebrates in a prairie parkland

pond: an enclosure approach. *Archs environ. Contam. Toxicol.* 21: 270-280). – (Last known address: Ontario Region, Can. Wildlife Serv., 49 Camelot Dr., Nepean, ON, K1A 0H3, CA).
A series of enclosures were placed in an alkaline, prairie pond near Sherwood Park, Alberta, Canada. 7 of these served as controls 7 were treated with a mid-July application of the carbamate insecticide, carbofuran, at 5 µg/L, and another 7 received a 25-µg/L application. Macroinvertebrate numbers and biomass were monitored for 7 d prior to and 55 d after treatment. At both concentrations of carbofuran, the abundance of coenagrionid larvae increased significantly, in contrast to the pattern in the controls which was not significant. The similarity among treatment levels suggests that the larvae were not secondarily affected by carbofuran.

1992

(16734) DAVIES, T.H., 1992. Three ponds situated on Summerlee Station, Cliftons, Hawkes Bay. *Weta* 15(1): 5-9. – (84 Beach Rd, Haumoana, NZ).
The 3 ponds are described, Ischnura a. aurora and Austrolestes colensonis are listed for all 3 of them; – New Zealand.

(16735) WILSON, K., 1992. New dragonflies in Sha Lo Tung. *Porcupine* 2: 8. – (18 Chatsworth Rd, Brighton, BN1 5DB, UK).
A list of 10 new taxa to Hong Kong, and a brief autobiographic introductory note.

(16736) WINGATE, B., 1992. United Arab Emirates invertebrates. *Tribulus* 2(2): 40.
[Not available for abstracting]. – Anax parthenope and Trithemis annulata are recorded from al-Ain, Apr./May 1992. Cf. *OA* 16322.

1993

(16737) AGUILERA, E., C. RAMO & B. BUSTO, 1993. Food habits of the Scarlet and White ibis in the Orinoco plains. *Condor* 95: 739-741. – (Estación Biol. Doñana, C.S.I.C., Apartado 1056, ES-41080 Sevilla).
Quantitative data are provided on food habits of Eudocimus r. ruber and E. r. albus in the Llanos of Venezuela, and the diets of the 2 bird sspp. in the area of their overlap are compared. As far as the odon. are concerned, the ANOVA analysis indicates that the differences between the 2 sspp. account for 5.2% of the variance.

(16738) BOOMSMA, T., 1993. Dragonflies and damselflies of the Shipstern Nature Reserve (Odonata). *Occ. Pap. Belize nat. Hist. Soc.* 2(6): 54-58. – (P.O. Box 134, Orange Walk, Belize).
A checklist of 54 spp. (incl. Remartinia sp. n.) is provided. All are associated with lotic habitats; lentic waterbodies do not occur in the Park, NE Belize.

(16739) COLLIER, K., 1993. Review of the status, distribution, and conservation of freshwater invertebrates in New Zealand. *N. Z. Jl Marine Freshw. Res.* 27: 339-356. – (Natn Inst. Water & Atmospheric Res., P.O. Box 11-115, Hamilton, NZ).
Includes a brief reference to the endemic odon. genera Xanthocnemis, Uropetala and Antipodochlora.

(16740) JARAMILLO, A.P., 1993. Wintering Swainson's hawks in Argentina: food and age segregation. *Condor* 95(2): 475-479. – (Dept Zool., Univ. Toronto, Toronto, ON, M5S 1A1, CA).
In the pampas of Argentina, juvenile Buteo swainsoni feed on the migratory Aeshna bonariensis. The hawks appear to be nomadic, following A. bonariensis swarms and feeding mostly on the wing. – The first migration was observed on 18-X-1991 nr Atalaya (Buenos Aires prov.). The last witnessed movement occurred on 10-I-1992. All 5 of the large migrations occurred as a cold front passed and the swarms generally travelled northward. Migratory populations were numerically spectacular, involving several million individuals in every swarm. Most of them flew more than 3 m above ground and passed by within ca 30 min. Most A. bonariensis specimens collected were tenerals. On 3 occasions, migrant dragonflies were grounded, due to rain. They perched on the leeside of trees in a mass so thick that all that could be seen was the shimmer of wings. Each time most individuals left by the next day. The only passerine observed to feed on grounded dragonflies was Pitangus sulphuratus. The number of B. swainsoni observed during a day were positively correlated to the abundance of A. bonariensis. The hunting method consisted of hawks stooping and quickly thrusting out their talons and grabbing dragonflies, which they immediately transferred to the bill and devoured whole. A. bonariensis was present in all pellets examined

(40), and was the most abundant prey type on a numerical basis (92.3% of total insect numbers in pellets).

(16741) THORN, T.D. & P.J. ZWANK, 1993. Foods of migrating Cinnamon teal in central New Mexico. *J. Field Ornithol.* 64(4): 452-463. (With Span. s.). – (Second Author: New Mexico Cooperative Fish & Wildlife Res. Unit, New Mexico St. Univ., Las Cruces, NM 88003, USA).
Stomach contents of migrating Anas cyanoptera were studied from 4 plant zones on Bosque del Apache Natn. Wildlife Refuge, NM, USA. In total food dry mass, the odon. were represented during the spring migration by 0.7% (all Coenagrionidae), and during autumnal migration by 0.1% (each: Coenagrionidae, Gomphidae, Libellulidae).

(16742) WILSON, K., 1993. Dragonflies new to Hong Kong, 1993. *Porcupine* 6: 6. – (18 Chatsworth Rd, Brighton, BN1 5DB, UK).
The discovery of various Gynacantha spp., Polygynacantha erythromelas, Onychothemis testacea tonkinensis (also bred), Zygonix sp. n., and the larvae of 2 Lamellogomphus spp., Asiagomphus hainanensis and Labrogomphus torvus in Hong Kong is brought on record.

(16743) YOSEF, R. & T.C. GRUBB, Jr, 1993. Effect of vegetation height on hunting behavior and diet of Loggerhead shrikes. *Condor* 95: 127-131. – (Second Author: Dept Zool., Ohio St. Univ., 1735 Neil Ave, Columbus, OH 43210, UDS).
After the vegetation on their territories nr Lake Placid, Florida, USA was reduced by mowing from >1 m to ≤4 cm, shrikes (Lanius ludovicianus) altered their hunting behaviour: total flight time decreased and a shift from aerial chase to ground hunting occurred. Consequently, significantly fewer Odon. were captured after mowing.

1994

(16744) [CARPENTER, F.M.] FURTH, D.G., 1994. Frank Morton Carpenter (1902-1994): academic biography and list of publications. *Psyche* 101: 127--144. – (Dept Ent., Smithsonian Instn, Washington, D.C., 20560, USA).
A biographic sketch (with 3 portraits) and bibliography (1926-1992). For a posthumously published work, see *OA* 13501; for an obituary, see *OA* 9772.

(16745) LABANDEIRA, C.C., 1994. A compendium of fossil insect families. *Contr. Biol. Geol. Milwaukee publ. Mus.* 88: 1-71. – (Dept Paleobiol., Natn Mus. nat. Hist., Smiths. Instn, Washington, D.C., 20560, USA).
72 extinct odon. fam. are listed. From the 28 extant odon. fam., fossil records are known for 22 (78.6%) of them. The family listing is crossreferenced to the bibliography.

(16746) WILSON, K., 1994. New dragonflies. *Porcupine* 11: 3. – (18 Chatsworth Rd, Brighton, BN1 5DB, UK).
Records of Orthetrum p. poecilops from Nam Chung, and Nannophyopsis clara from Luk Keng Marsh. Both spp. are new to the fauna of Hong Kong.

1996

(16747) KESEL, A.B., U. PHILIPPI & W. NACHTIGAL, 1996. The insect wing, an ultra light-weight construction: an analysis using the finite element method. *Proc. 9th Int. Conf. Mechanics in Medicine and Biology*, Ljubljana, pp. 395-398. – (Dept Zool., Univ. Saarland, D-66041 Saarbrücken).
Insect wings appear as highly functional and largely optimized mechanical constructions. A series of stabilizing constructional elements were "designed" to cope with the loads durig flying. One such element is the material expenditure in the wing, i.e. the vein system in the wing itself. It functions like a zigzag folding framework, which can compensate the main part of the aerodynamic forces. To quantify the quality of the material distribution, models of Aeshna cyanea wing are calcultated via the finite element method.

(16748) LOUTON, J., J. GELHAUS & R. BOUCHARD, 1996. The aquatic macrofauna of water-filled bamboo (Poaceae: Bambusoideae: Guadua) internodes in a Peruvian lowland tropical forest. *Biotropica* 28(2): 228-242. (With Span. s.). – (First Author: Natn Mus. Nat. Hist., Smithsonian Instn, Washington, D.C. 20560, USA).
From Guadua weberbaueri internodes in the tropical lowland forest at Pakitza, a community of 29 spp., dominated by Diptera and an undescribed Mecistogaster sp., is described. Patterns of community structure were explored by descriptive statistical analyses and a tentative food web diagram of this simple aquatic ecosystem is constructed.

1997

(16749) BELZ, A., 1997. Fliessgewässerlibellen in Wittgestein. *Beitr. Tier-Pflanzenwelt Siegen-Wittgestein* 4: 43-51. – (Pulverwaldstr. 5, D-57339 Erndtebrück).
Annotations on 11 spp. (Westphalia, Germany). – See also *OA* 8036 and 14427.

2000

(16750) SALUR, A. & S. KIYAK, 2000. On the systematic and faunistic studies of Anisoptera species (Insecta: Odonata) of Kizilirmak river basin (Kayseri province). *J. Inst. Sci. Technol. Gazi Univ.* 13(3): 829-841. (With Turk. s.). – (Dept Biol., Fac. Sci. & Arts, Gazi Univ., TR-06500 Teknikokullar, Ankara).
Records of 14 spp.; central Anatolia, Turkey.

(16751) SALUR, A. & S. KIYAK, 2000. On the systematic and faunistic studies of Zygoptera species (Insecta: Odonata) of Kizilirmak river basin (Kayseri province). *J. Inst. Sci. Technol. Gazi Univ.* 13(3): 843-854. (With Turk. s.). – (Dept Biol., Fac. Sci. & Arts, Gazi Univ., TR-06500 Teknikokullar, Ankara).
Records of 13 spp.; central Anatolia, Turkey.

2002

(16752) GLOTZHOBER, R.C. & D.L. MOODY, 2002. Somatochlora walshii (Odonata: Corduliidae), a new state record for Ohio. *Ohio J. Sci.* 102(3): 40-42. – (First Author: Ohio Hist. Soc., 1982 Velma Ave, Columbus, OH 43211-2497, USA).
Apparently breeding populations at State Nature Preserves in Ashtabula and Portage counties are reported of this previously in Ohio unknown sp., June 2000. A detailed habitat description is provided.

(16753) INGERMANN, R.L., D.C. BENCIC & P. VERRELL, 2002. Methoxychlor alters the predator-prey relationship between dragonfly naiads and salamander larvae. *Bull. envir. Contam. Toxicol.* 68: 771-778. – (First Author: Dept Biol. Sci., Univ. Idaho, Moscow, ID 83844-3051, USA).
The pesticide methoxychlor (MXC) has been widely used as a replacement for DDT, due to its lower toxicity and shorter half-life. In Canadian rivers, it has been applied to wetlands to control fly and mosquito larvae, with target concentrations of about 0.9 μM (0.31 mg/l). Inadvertent exposure of non-target organisms with such applications cannot be avoided and pesticides may have a variety of sublethal, but nontheless highly deleterious effects on amphibians, including induction of anatomical deformities, alterations in feeding and developmental rates, and they may influence predator-avoidance behaviour. In laboratory experiments, deleterious effects of MXC on the feeding and perching of Aeshna/Anax larvae were not apparent with transient exposures to concentrations below ca 0.4 μM MXC, while the startle response of Amblystoma macrodactylum larvae was severely compromised by transient exposure to at least 0.1 μM MXC. This suggests that odon. larvae should be particularly effective predators of salamander larvae when both are exposed to MXC concentrations between ca 0.1 and 0.4 μM. Indeed, with a transient exposure of both to 0.32 μM MXC, the amphibian larvae were at increased risk of predation. But this relationship did not hold above that concentration, perhaps due to an MXC-induced inhibition of odon. feeding.

2003

(16754) ABBOTT, J.C., R.A. BEHRSTOCK & R.R. LARSEN, 2003. Notes on the distribution of Odonata in the Texas Panhandle, with a summary of new state and county records. *Swest. Nat.* 48(3): 444-448. – (First Author: Sect. Integrative Biol., Univ. Texas, Austen, TX 78712, USA).
Previously, no Odon. have been reported from 44 Texas counties (17%), mainly from the northern Panhandle. Here, adults collected since Sept. 1995 are reported from 24 sites in 14 counties throughout the Texas Panhandle. A total of 35 spp. is discussed, representing 73 new county records and 4 new state records. First records are included for 6 counties.

(16755) CARCHINI, G., M. DI DOMENICO, T. PACIONE, A.G. SOLIMINI & C. TANZILLI, 2003. Species distribution and habitat features in lentic Odonata. *Ital. J. Zool.* 70: 39-46. – (First Author; Dipto Biol., Univ. "Tor Vergata", Via della Ricerca Scientifica s.n.c., I-00133 Roma).
The relationships between species assemblages and pond characteristics were investigated in a well preserved Mediterranean coastal woodland (Castel Porziano nr Rome). Data on adult abundance were collected fortnightly. Pond area and depth, shade,

riparian vegetation, presence of 4 classes of aquatic plants, presence of fish and both the distances from pond to pond and from pond to sea were considered as pond features. Results showed the presence of 23 odon. spp. on 23 ponds. A Mantel test showed that the matrices of pond to pond topographic distances and that of pond to pond faunistic similarity were independent, which supports the hypothesis that the adult Odon. actively choose their breeding site. A stepwise multiple regression showed that only pond size, minimum water level and riparian vegetation had significant effects (all positive) on the total number of odon. spp. in each pond. On the other hand, a canonical correspondence analysis showed that the composition of odon. species assemblages was sensitive to almost all variables. From the point of view of Odon. conservation, both the moderate effect of Gambusia holbrooki and the positive effect of the riparian vegetation on the number of odon. spp. appear particularly interesting for restoring or creating odon. habitats.

(16756) CSABAI, Z., P. BODA, A. MORA & Z. MÜLLER, 2003. Aquatic beetles, aquatic and semi-aquatic bugs, dragonfly and caddisfly larvae from 32 backwaters in the Upper-Tisza-region, NE Hungary (Coleoptera: Hydradephaga, Hydrophiloidea; Heteroptera: Nepomorpha, Gerromorpha; Odonata; Trichoptera). *Folia hist. nat. Mus. matraensis* 27: 217-235. – (Last Author, responsible for Odon.: Hortobágyi Nemzeti Park Directorate, Sumen 2, H-4024 Debrecen).
Includes coll. data for 26 odon. spp.

(16757) GUSENLEITNER, F. & E. AESCHT, 2003. Neu beschriebene Taxa in den Publikationen des Biologiezentrums Linz (1993-2002). *Beitr. Naturk. Oberösterreichs* 12: 299-345. (With Engl. s.). – (c/o G. Theischinger, NSW Dept Envir. & Conserv., P.O. Box 29, Lidcombe, NSW 1825, AU).
23 odon. taxa are listed, all described (1993-2001) by G. Theischinger in *Linzer biologische Beiträge*.

(16758) LÓPEZ CAZORLA, A., W. DURÁN & L. TEJERA, 2003. Alimentación de la ictiofauna del rio Sauce Grande, provincia de Buenos Aires, Argentina. *Biol. acuát.* 20: 73-79. – (Depto Biol., Bioquim. & Farmacia, UNS, San Juan 670, AR-8000 Bahia Blanca).
The annual diet was examined in 604 specimens, referable to 9 fish spp. The odon. larvae (Aeshna bonariensis and/or Oxyagrion hempeli, O. peterseni and Ischnura sp.) are reported from the stomach contents of Bryconamericus iheringi, Cheirodon interruptus, Jenynsia multidentata, Oligosarcus jenynsii, and Rhamdia quelen.

(16759) UBBELOHDE, R.G., 2003. *Zur Biologie und Verbreitung der Späten Adonislibelle (Ceriagrion tenellum de Villers) in der Fischbeker Heide.* Diplomarbeit Univ. Hamburg, 36 pp. – (Author's address not stated).
The biology and behaviour of C. tenellum in the Hamburg area (Germany) is described in considerable detail, and the copulation, oviposition and the ♂/♀ relationships are discussed.

2004

(16760) CALLISTO, M., M. GOULART, A.O. MEDEIROS, P. MORENO & C.A. ROSA, 2004. Diversity assessment of benthic macroinvertebrates, yeasts, and microbiological indicators along a longitudinal gradient in Serra do Cipó, Brazil. *Braz. J. Biol.* 64(4): 743-755. (With Port. s.). – (First Author: Lab. Ecol. Bentos, Depto Biol. Geral, Inst. Ciênc. Biol., Univ. Fed. Minas Gerais, C.P. 486, BR-30161-970 Belo Horizonte, MG).
The structure, diversity and functional trophic group composition of benthic macroinvertebrate communities of the Doce river watershed are evaluated on fam. level. 120 samples were collected during the rainy (Febr.) and dry (June) periods. Information is presented on the abundance (ind/m²) of 5 odon. fam. at 7 sites along the longitudinal gradient in the Serra de Cipó during the 2 sampling periods.

(16761) CANNINGS, R., 2004. Resources for the study of the Odonata in Canada. *Newsl. biol. Surv. Can.* (Terr. Arthr.) 23(1): 25-33. – (Roy. Br. Columbia Mus., 675 Belleville St., Victoria, BC, V8W 9W2, CA).
A review of the most important general and regional literature and web sites pertaining to the Odon. of Canada and organised per subject and/or province.

(16762) HARDERSEN, S., 2004. The dragonflies: species, phenology, larval habitats (Odonata). *In*: P. Cerretti et al., [Eds], *Invertebrati di una foresta della Pianura Padana, Bosco della Fontana*, 2, pp. 29-50, Cierre Grafica, Verona. (With Ital. s.). – (Centro

Naz. Stud. Conserv. Biodiv. Forestale, Strada Mantova 29, I-46045 Marmirolo, MN).
An updated review of the fauna (31 spp.). For the first review, see *OA* 14487; for the book on the Odon. of the Reserve, see *OA* 16573.

(16763) NADOBNIK, J., L. AGAPOW & B. KOROŚCIŃSKI, 2004. The importance of the "Santockie Zakole" Nature Reserve for preservation of biological diversity and tourism. *Teka Kom. Ochr. Kszt. Srod. Przyr.* 2004(1): 157-161. (With Pol. s.). – (First Author: Kat. Przyr. Podstaw Kultury Fizycznej, Akad. Wychowania Fizycznego w Poznaniu, Zamiejscowy Wydzial Gorzowie Wlkp, ul. Estkowskiego 13, Gorzowie Wlkp., Poland).
5 odon. spp. are listed from the samples taken (1992, 2002) from the Warta and Noteć rivers; Poland.

(16764) PALOT, M.J. & V.P. SONIYA, 2004. Studies on the Odonata (Insecta) from a backwater swamp of northern Kerala. *J. Bombay nat. Hist. Soc.* 101(1): 177-180. – (First Author: Western Ghats Fld Stn, Zool. Surv. India, Annie Hall Rd, Calicut-673002, Kerala, India).
From Aug. 1999 to Sept. 2000, systematic studies on the Odon. were conducted at Chemballikundu swamp, Kannur distr., Kerala, India. Its water is saline, except for a brief period during monsoon. The embankments along the marshes and mudflats are covered with patches of mangrove vegetation. A total of 21 spp. were recorded: 9 in pre-monsoon (Feb.-Apr.), 12 in monsoon (July-Sept.) and 20 spp. in post-monsoon (Oct.). Aciagrion occidentale and Mortonagrion varralli are new additions to the estuarine Odon. of India. Brief field notes and the information on adult phenology are provided for all spp., and notes on breeding activities, emergence, roosting and on predators are given for some of them. Of particular interest is the following observation [verbatim]: "A small group of 8 Brachythemis contaminata individuals was observed accompanying one of the Authors during the collection trip. The swarm moved parallel to him, at a height of about 60 cm. When the Author stopped to net them, they dispersed, some hovered, some perched on grass. When he resumed wading through the swamp, they followed him. This continued over a distance of ca 200 m. Swarms of Trithemis pallidinervis also exhibited similar behaviour along the trek path lining the wetlands in September."

(16765) REBORA, M., S. PIERSANTI & E. GAINO, 2004. Visual and mechanical cues used for prey detection by the larva of Libellula depressa (Odonata, Libellulidae). *Ethology Ecology Evolution* 16: 133-144. – (Dipto Biol. Anim. & Ecol., Univ. Perugia, Via Elce de Sotto, I-06123 Perugia).
Nymphs (alive and recently dead) of Cloeon dipterum (Ephemeroptera) and dummies were used as prey models. The responses of the larva to stimulations of different kinds and intensity, in different areas around the body, were tested in the laboratory in different behavioural experiments. From the statistical analysis of the data (Pearson Chi-square and one-way ANOVA) it emerged that: (1) chemical cues seem not to be involved in the detection of the prey or, if they are involved, they are negligible in comparison with other kinds of stimuli; (2) the larva of L. depressa utilizes mechanical and visual cues for the release of the predatory labial strike, and either one of these cues is effective for labial strike elicitation; (3) mechanical stimuli have a predominant role in predation; (4) the larva can rely on a non-contact mechanical sense for the detection of the prey. The importance of mechanical and visual cues is discussed in relation to the pond bed habitat of this sp.

2005

(16766) ABBOTT, J.C. & D. BROGLIE, 2005. OdonataCentral.com: a model for the web-based delivery of natural history information and citizen science. *Am. Entomologist* 51(4): 240-243. – (First Author: Sect. Integrative Biol., Univ. Texas, Austin, TX 78712, USA).
A description of the history, set-up and information provided by the *OdonataCentral* website.

(16767) BO, T. & S. FENOGLIO, 2005. Sulla presenza di alcuni macroinvertebrati bentonici rari o interessanti nei torrenti e fiumi dell'Appennino piemontese. *Riv. piemont. Stor. nat.* 26: 123-128. (With Engl. s.). – (Dipto Sci. Ambiente & Vita, Univ. Piemonte Orientale, via Bellini 25, I-15100 Alessandria).
Cordulegaster boltonii is reported from 4 localities (alt. 230-300 m) in the Piedmont Appennine area, NW Italy.

(16768) CAI, D., G. LIU & D. LI, 2005. Discriminant analysis of 3 genera of Odonata by nonparametric methods. *J. Sth China Univ. trop. Agric.* 11(4): 15-19.

(Chin. with Engl. s.). – (Coll. Envir. & Plant Prot., SCUTA, Danzhou, Hainan-571737, China).
Using the length of abdomen, hindwing, pterostigma in hindwing, superior and inferior appendages, and the 10th abd. segment as quantitative variables, a discriminant analysis of the adult Nannophiopsis, Orthetrum and Pantala was carried out by nonparametric methods. The results indicate that nonparametric discriminant analysis was very effective in separating the adults of the 3 gen., and the total error estimate was 0.0095, either by cross validation or by resubstitution.

(16769) EMILIYAMMA, K.G., C. RADHAKRISHNA & M.J. PALOT, 2005. *Pictorial handbook on common dragonflies and damselflies of Kerala*. Zool. Surv. India, Calcutta. 67 pp. – (Publishers: Publication Div., Zool. Surv. India, 234/4 A.J.C. Bose Rd, 2nd M.S.O. Bldg, Nizam Palace, 13th floor, Calcutta-700020, India).
[Not available for abstracting]

(16770) FAUCHEUX, M.J., F. MEURGEY & Y. EL WAHBI, 2005. Odonates des environs d'Essaouira (Maroc méridional). *Bull. Soc. Sci. nat. Ouest Fr.* (M.S.) 27(3): 122-130. (With Engl. s.). – (Second Author: Mus. Hist. Nat., 12 rue Voltaire, F-44000 Nantes).
The records are presented of 11 spp., including Sympetrum meridionale that was not previously reported from SW Morocco.

(16771) SVENSSON, E.I., J. ABBOTT & R. HÄRDLING, 2005. Female polymorphism, frequency dependence and rapid evolutionary dynamics in natural populations. *Am. Nat.* 165(5): 567-576. – (Sect. Anim. Ecol., Lund Univ., Ecology Bldg, SE-223-62 Lund).
Rapid evolutionary change over a few generations has been documented in natural populations. Such changes are observed as organisms invade new environments, and they are often triggered by changed interspecific interactions, such as differences in predation regimes. However, in spite of increased recognition of antagonistic ♂-♀ mating interactions, there is very limited evidence that such intraspecific interactions could cause rapid evolutionary dynamics in nature. This is because ecological and longitudinal data from natural populations have been lacking. Here it is shown that in colour-polymorphic Ischnura elegans, ♂-♀ mating interactions lead to rapid evolutionary change in morph frequencies between generations. Field data and computer simulations indicate that these changes are driven by sexual conflict, in which morph fecundities are negatively affected by frequency- and density-dependent male mating harassment. These frequency-dependent processes prevent population divergence by maintaining a ♀ polymorphism in most populations. Although these results contrast with the traditional view of how sexual conflict enhances the rate of population divergence, they are consistent with a recent theoretical model of how ♀♀ may form discrete genetic clusters in response to ♂ mating harassment.

(16772) VONESH, J.R., 2005. Sequential predator effects across three life stages of the African tree frog, Hyperolius spinigularis. *Oecologia* 143: 280-290. – (Tyson Res. Cent., Washington Univ.-St Louis, P.O. Box 258, Eureka, MO 63025, USA).
The effects of egg- and tadpole-stage predators on tadpole performance, size at metamorphosis, and postmetamorphic predation in H. spinigularis were examined. The density and survival of arboreal clutches were monitored in the field (Amani Nature Reserve, E Usambara Mts, NE Tanzania) to estimate how much egg-stage predation reduced the input of tadpoles into the pond. In combination with experiments, it was established that reduction in larval densities due to egg predation (primarily by another hyperoliid frog, Afrixalus fornasini and ephydrid fly larvae) tends to increase per capita tadpole survival, decrease tadpole-stage duration and increase mass at metamorphosis. Upon hatching from the arboreal eggs, tadpoles fall into the water, where they encounter a new suite of predators (including odon. larvae, mostly libellulids, such as Tramea basilaris). These decrease tadpole survival and have density-dependent effects on tadpole duration and mass at metamorphosis. The combined effects of embryonic and tadpole-stage predators increase mass at metamorphosis of survivors by 91%, which may have immediate fitness benefits, as larger metamorphs have higher survival in encounters with fishing spiders. Thus, the effects of predators early in ontogeny can alter predation risk even 2 life stages later.

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(16773) BUCZYŃSKA, E. & P. BUCZYŃSKI, 2006.

Aquatic insects (Odonata, Coleoptera, Trichoptera) of the central part of the "Krowie Bagno" marsh: the state before restoration. *Annls Univ. Mariae Curie-Skladowska* (C) 61(2): 71-88. (With Pol. s.). – (Second Author: Dept Zool., UMCS, Akademicka 19, PO-20-033 Lublin).
In 2003, the odon. assemblages (37 spp.) were studied at 2 lakes, surrounded by a transitional peat bog, and at a canal and ditches situated in the meliorated fen (Polesie, SE Poland). Among the noteworthy spp. are Nehalennia speciosa, Leucorrhinia albifrons and L. caudalis.

(16774) CHANG, J.-p. & Z.-s. SUN, 2006. New taxa of Gomphidae (Insecta: Odonata) in Jehol Biota from western Liaoning, China. *Global Geol.* 25(2): 105-111, pl. 1 excl. (Chin., with Engl. s.). – (Coll. Earth Sci., Jilin Univ., Changchun-130061, China).
Liaoninglanthus latus gen. n., sp. n. and Liaoninglanthus sp. are described, and a redescription is provided of Liogomphus yixianensis Ren & Gao, 1996. The material originates from the lower part of the Yixian Formation (Upper Jurassic/Lower Cretaceous) in Huangbanjigou of Beipiao, W Liaoning, China.

(16775) CORBET, P.S., 2006. Foreword. *In*: G. Theischinger & J. Hawking, *The complete field guide to dragonflies of Australia*, CSIRO, Collingwood/VIC. – (Crean Mill, St Buryan, Cornwall, TR19 6HA, UK).
See *OA* 16798.

(16776) DAVID, S., 2006. The hypsometric dragonfly distribution of the Slovak Republic. *Scripta Rer. nat. Univ. ostraviensis* 163: 174-182. (Czech, with Engl. s.). – (Inst. Landscape Ecol., Slovak Acad. Sci., Akademicka 2, SK-949-01 Nitra).
The vertical distribution of 73 spp. in Slovakia is outlined, tabulated and discussed.

(16777) DOLNY, A. & P. DROZD, 2006. Habitat affinity of indicating dragonfly species: myths and reality. *Scripta Rer. nat. Univ. ostraviensis* 163: 193-198. (Czech, with Engl. s.). – (Dept Biol. & Ecol., Fac. Sci., Univ. Ostrava, Chittussiho 10, CZ-710-00 Ostrava).
Based on literature and on unpublished evidence from Upper Silesia (Czech Republic), the odon. relationships with various habitat types (rised bogs, marshes, fens and swamps, running waters) are analysed, the propensities of various ecological types (tyrphobiontic, tyrphophilous, acidobiontic, acidotolerant, rheophilous spp.) are described and defined, and the corresponding taxa identified.

(16778) FERREIRA-PERUQUETTI, P.S., 2006. Microhabitat preference of larval Odonata of Jatai Ecological Station and surroundings, Luiz Antônio, SP. *Estud. integr. Ecossist. Estac. ecol. Jatai* 4: 45-60. (Port., with Engl. s.). – (Depto Hidrobiol., Univ. Fed. São Carlos, C.P. 676, BR-13565-905 São Carlos, SP).
The larvae of 32 odon. gen. were sampled at various habitats in the reserve and the vicinity. In the reserve the number of individuals was lower (116 in lotic, 154 in lentic habitats) than in the vicinity (256 and 306, resp.). Many genera were associated with macrophytes, the clay and silt substrates were preferred. It seems feasible to use odon. larvae as indicators of environmental health.

(6779) FERREIRA-PERUQUETTI, P.S., 2006. Spatial and temporal distribution of Odonata of the Jatai Ecological Station and surroundings, Luiz Antônio, SP. *Estud. integr. Ecossist. Estac. ecol. Jatai* 4: 61-73. (Port., with Engl. s.). – (Depto Hidrobiol., Univ. Fed. São Carlos, C.P. 676, BR-13565-905 São Carlos, SP).
Several spp. were more abundant, outside the reserve (EEJ), including Erythrodiplax fusca, Hetaerina rosea and Tigriagrion aurantinigrum that are apparently associated with disturbed habitats. Argia reclusa and Elasmothemis cannacrioides were more abundant in the EEJ. The similarity index between sampled sites is low, and 3 habitat groups were identified, viz. (1) streams in the EEJ, (2) dams and streams in the monoculture areas, and (3) lakes in the EEJ. In spite of a clear relationship between some spp. and specific habitats, the use of odon. as bioindicators would require more research.

(16780) FOSTER, S.E. & D.A. SOLUK, 2006. Protecting more than the wetland: the importance of biased sex ratios and habitat segregation for conservation of the Hine's emerald dragonfly, Somatochlora hineana Williamson. *Biol. Conserv.* 127: 158-166. – (First Author: Dept Biol., Univ. Toronto, 3359 Mississauga Rd, Mississauga, ON, L5L 1C6, CA).
Within sp., habitat use may depend on age, season

or sex of an individual. The distribution of ♂♂ and ♀♀ may vary both temporally and spatially due to differences in the costs of reproduction and the distribution of critical resources. Conservation of a sp. requires knowledge of the habitat use of both sexes in order to predict the population size and protect all habitats that a sp. requires. Adult dragonfly populations often have highly ♂-biased sex ratios at the breeding habitat. This bias has been attributed to ♀♀ using alternative habitats to avoid ♂ harassment, or to high ♀ mortality. Adult S. hineana populations were monitored in breeding and non-breeding habitats in Door co., Wisconsin and significant differences were found in habitat use between ♂♂ and ♀♀. ♂♂ primarily used wetland habitats, while ♀♀ primarily used dry meadows and marginal breeding habitats, only coming into wetlands to lay-eggs or find mates. Food resources in the different habitats were assessed and it was found that high quality insect prey (primarily adult Diptera) were more available in the wetland habitat, indicating that these areas were likely a more productive foraging area for adult dragonflies. The fact that ♀♀ appear to avoid the wetland habitat is consistent with the hypothesis that ♂ harassment alters ♀ distribution patterns. Consideration of the patterns of habitat use by S. hineana indicates the need to develop a broader understanding of the importance of non-wetland areas in the conservation of wetland spp.

(16781) GRAND, D. & J.-P. BOUDET, 2006. *Les libellules de France, Belgique et Luxembourg*. Biotope, Mèze [Collection Parthénope]. 480 pp. Hardcover (17.0×24.7 cm). ISBN 2-914817-05-3. (Publishers: 22 blvd Maréchal Foch, B.P. 58, F-34140 Mèze).
This is certainly one of the most beautifully produced and user-friendly books on the European Odon., covering the fauna (100 spp.) of France, Belgium and Luxemburg. It is organised in 6 chapters, dealing with odon. biology, biogeography, ecology and ethnoodonatology (chapt. 1-4; pp. 18-139), identification of adults and larvae (chapt. 5; pp. 140-189), and species accounts (chapt. 6; pp. 190-445). The pterographs of all spp. and a glossary are presented in the Appendix. The regional bibliography is rather comprehensive, the relevant non-regional works somewhat less so. – In the general chapters, various features of odon. biology are considered on the global rather than the regional scale, which makes the work particularly attractive as a "handbook". The chapters on dragonflies in history and on ethnoodonatology represent brief, richly illustrated reviews, presenting also some previously unknown information. The keys to adults and larvae are enhanced by col. illustrations of diagnostic features, which make them particulary easy-to-use. The species accounts are very informative; they include the descriptions (incl. field diagnostic features), sections on biology, distribution, abundance, behaviour, conservation status and protection. For all spp. are presented a phenology graph, a regional and a European distribution map. – The importance of this work goes far beyond the geographic limits of the treated fauna; it should not be missed in any serious European library.

(16782) GROENENDIJK, D. & J. BOUWMAN, 2006. *Ecologische status van de hoogveenglanslibel in Gelderland. – [Ecological status of Somatochlora arctica in Gelderland]*. Vlinderstichting Rapp. 2006.036, Wageningen. 26 pp. (Dutch). – (Distributor: De Vlinderstichting, P.O. Box 506, NL-6700 AM Wageningen).
S. arctica populations in the Wooldsche Veen and in the Vragenderveen are the sole in Gelderland prov., representing 2 out of the 5 known populations of this sp. in the Netherlands. The ecology and the habitats are described and the measures required for their protection are outlined. As in the case of Noord-Brabant (see *OA* 16783), the drying up of the small breeding pools should be absolutely avoided.

(16783) GROENENDIJK, D. & J. BOUWMAN, 2006. *Ecologische status van de hoogveenglanslibel in Noord-Brabant. – [Ecological status of Somatochlora arctica in Noord-Brabant]*. Vlinderstichting Rapp. 2006.035, Wageningen. 22 pp. (Dutch). – (Distributor: De Vlinderstichting, P.O. Box 506, NL-6700 AM Wageningen).
S. arctica populations in the Reuselse Moeren, Noord Brabant prov. is 1 of the 5 known populations of this sp. in the Netherlands. It is small, viable and vulnerable. Here, its ecology and habitat are described, and both short- and long-term measures required for its protection are outlined.

(16784) HANSEL, G. et al. [13 joint authors], 2006. *Assessing the headwaters of Layawan river: linkage between the terrestrial and aquatic ecosystems in the Mt Malindang, Misamis Occidental*. Biodiv.

Res. Progr. for Development in Mandanao, Laguna. 63 pp. ISBN 971-560-121-9. – (Publishers: SEAMEO SEARCA, Collage, Laguna-4031, The Philippines.).
The study area (in the Malindang Range Natural Park) is located in the vicinity of the village of Sebucal, Mindanao, The Philippines. The odon. are considered along with some other aquatic insect orders. On p. 30 appears a list of 14 encountered taxa, referable to 6 fam., but some are identified to the gen. only.

(16785) HARABIŠ, F., A. DOLNÝ & V. PLÁŠEK, 2006. Could the fen rise in a strip mine lake? *Scripta Rer. nat. Univ. ostraviensis* 163: 212-214. – (Dept Biol. & Evol., Fac. Sci., Univ. Ostrava, Chittussiho 10, CZ-710-00 Ostrava).
A survey of selected bioindicative taxa (mostly odon.) at various localities of anthropogenic origin in the Karvina region, NE Silesia (Czech Republic) has shown that several fen-living odon. occur on irrigated mine subsidence, which apparently provides similar conditions as prevailing in fens. A checklist of 45 odon. spp. recorded from that type of anthropogenic habitat is appended.

(16786) INKI, K. & S. JOKINEN, 2006. *The restoration and management plan of the Bay of Salminlahti.* Southeast Finland Regional Environment Centre, Kouvola. 54 pp. ISBN 952-11-2532-2 (pbk), 952-11-2533-0 (PDF). (Finn., with Engl. s.). – (Available from the publishers: Kauppamiehenkatu 4, P.O. Box 1022, FIN-45101 Kouvola).
The Bay of Salminlahti (or Kaarniemi) is situated at the coast of the Gulf of Finland. The Odon. chapter (p. 25; Aeshna serrata osiliensis, Leucorrhinia pectoralis) was contributed by *E. Korkeamäki.*

(16787) KALNINŠ, M., 2006. The distribution and occurrence of Gomphidae (Odonata: Gomphidae) in river Gauja. *Acta Univ. latviensis* (Biol.) 710: 17-28. (With Latvian s.). – (Dept Zool. & Anim. Ecol., Fac. Biol., Univ. Latvia, LV-1586 Riga).
Based on 280 quanitative and 65 qualitative samples (1998), data are presented on the distribution, occurrence frequency and density of individuals of Gomphus flavipes, G. vulgatissimus, Onychogomphus forcipatus and Ophiogomphus cecilia in the Gauja river (Latvia), in the section between Taurene and Carnikova. The review is supplemented by previously published information and by unpublished evidence gathered during 1933-2005.

(16788) MACHADO, A.B.M., 2006. Three new species of Heteragrion Selys from Brazil with redescription of the holotype of H. dorsale Selys (Odonata, Megapodagrionidae). *Revta bras. Zool.* 23(4): 1062-1070. (With Port. s.). – (Depto Zool., Inst. Cien. Biol., UFMG, C.P. 486, BR-31270-901 Belo Horizonte, MG).
H. luizfelipei sp. n. (holotype ♂: Santa Catarine: Urubuci, 15-I-2005; deposited at UFMG), H. gracile sp. n. (holotype ♂: Minas Gerais: Carmo do Rio Claro, 15-I-1984; deposited in Author's collection), and H. mantiqueirae sp. n. (holotype ♂: São Paulo: Campos do Jordão, 25-I-1992; deposited in Author's collection) are described and illustrated. The colour and structural features that distinguish these spp. from group-2 of Selys are discussed.

(16789) MATÁKOVÁ, K. & S. DAVID, 2006. Dragonflies (Insecta: Odonata) of region Kysuce. *Scripta Rer. nat. Univ. ostraviensis* 163: 183-192. (Slovak, with Engl. s.). – (First Author: Dept Ecol. & Landscape Sci., Univ. Nitra, Tr. A. Hlinku 1, SK-949-74 Nitra).
The region is situated in NW Slovakia; 30 spp. are reported from 45 localities. Ecological composition of the fauna is analysed. The value of the Shannon species diversity of the Kysuce region is considered high: $H_2 = 3.47$ ($M_{max} = 4.91$), but the equitibility value is low ($e = 0.58$). The multivariate analysis of Onychomphus forcipatus and Calopteryx virgo (splendens) has confirmed a high degree of their affinity. A submontane assemblage of these spp., a characteristic element of the hyporithral, was identified.

(16790) MATUSHKINA, N., 2006. New records of rare Odonata in Ukraine (Insecta). *Praci zool. Muz.*, Kiyiv 4: 155-161. (With Ukr. & Russ. s's). – (Dept Zool., Fac. Biol., Shevchenko Univ., Volodymirska 64, UKR-01033 Kiev).
The records are presented of 16 spp., including the nationally redlisted Erythromma lindenii and Calopteryx splendens taurica. Figs are provided of the valvae (lateral view) in Chalcolestes parvidens, C. viridis and in an intermediate C. parvidens/viridis ♀.

(16791) MITRA, T.R., 2006. *Handbook on common Indian dragonflies (Insecta: Odonata).* Zool. Surv.

India, Calcutta. viii+136 pp. ISBN 81-8171-088-6. Softcover with wrappers (18.5×24.2 cm). Price: US $ 35.- net. – (Publishers: 234/4, A.J.C. Bose Rd, 2nd M.S.O. Bldg, Nizam Palace, 13th floor, Calcutta-700020, India).
Directed at nature lovers and conservationists, the book covers 119 spp., providing good descriptions and brief information on habits and distribution of each sp. It is well illustrated and the reproduction of illustrations (almost all in col.) is of good quality. A novelty are simple (col.) sketches of all spp., enabling the recognition of the respective sp. at a glance.

(16792) MITRA, T.R., M. PRASAD & C. SINHA, 2006. Fauna of Nagaland. Insecta: Odonata. *Zool. Surv. India St. Fauna Ser.* 12: 75-87. – (First Author: 208/K/8 Raja Ram Mohan Roy Rd, Netaji Sarak, Calcutta-700008, India).
48 spp. are reported and keyed from the state of Nagaland, NE India (formerly referred to within "Assam").

(16793) MULLER, J., J. LOTZING & R. STEGLICH, 2006. Zu Nahrungsökologie und Brutbiologie der Rauchschwalbe Hirudo rustica. *Ornithol. Jber. Mus. heineanum* 24: 101-108. (With Engl. s.). – (First Author: Frankefelde 3, D-39116 Magdeburg).
At Unseburg (Saxony-Anhalt, Germany), on 29-VII-2006, several subadult Calopteryx splendens, Ophiogomphus cecilia, Crocothemis erythraea, Orthetrum cancellatum and Sympetrum sp. were recorded as food of young barn swallows.

(16794) OPPELTOVÁ, M., 2006. The characteristic of the dragonfly communities (Odonata) of the selected peat bogs at the Jeseniky Mts concerning to bioindication. *Scripta Rer. nat. Univ. ostraviensis* 163: 199-205. (Czech, with Engl. s.). – (Utvar Vodohospodářské laboratoře, Povodi Moravy, s.p., Dřevařská 11, CZ-601-75 Brno).
The odon. communities (15 spp.) were studied (2001-2004) at 5 peat bogs. The communities are analysed and a possible succession at some sites is tentatively outlined.

(16795) PINTOR, L.M. & D.A. SOLUK, 2006. Evaluating the non-consumptive, positive effects of a predator in the persistence of an endangered species. *Biol. Conserv.* 130: 584-591. – (First Author: Dept Envir. Sci. & Policy, Univ. California-Davis, One Shields Ave, Davis, CA-95616, USA).
Failure to consider both the consumptive and non-consumptive effects of predators on prey can lead to erroneous conclusions about the net effect of the relationship. The predatory crayfish, Cambarus diogenes, functions as an ecosystem engineer constructing extensive burrow systems through aquatic habitats. Despite crayfish posing a serious predation threat, preliminary data indicate that Somatochlora hineana larvae regularly inhabit crayfish burrows. During late summer, S. hineana larval habitat dries up; leaving crayfish burrows as some of the only wetted habitats. Thus, C. diogenes can affect S. hineana through both direct, negative and indirect positive effects. The positive role of crayfish burrows as drought refuges, and the threat of predation by C. diogenes on S. hineana larvae were examined. Monthly field sampling indicated that S. hineana use open channel areas in spring and early summer moving into burrow systems in mid summer when channel areas normally dry. Laboratory experiments and field observations confirmed that crayfish prey on S. hineana larvae. Adult crayfish were a larger predation threat than juvenile crayfish. Despite their negative predatory impact, removal of crayfish from burrows in the field did not enhance densities of S. hineana larvae. Although S. hineana may face the threat of predation in burrows, they face a greater risk of desiccation if they remain in the open channel. These results lead to the counterintuitive conclusion that the maintenance of a predator is important for conserving an endangered prey sp.

(16796) SCHMIDT, E.G., 2006. Ein dunkelflügliges Weibchen von Calopteryx splendens bei Wesel/Niederrhein mit Diskussion der östlichen ssp. ancilla (Selys, 1853). *Beitr. Ent.* 56(2): 422-433. (With Germ. s.). – (Coesfelder Str. 230, D-48249 Dülmen).
A dark-winged C. splendens ♀ is brought on record from the Issel R nr Wesel, Germany (16-VII-1995), and exhaustive considerations on taxonomy and biogeography of C. s. ancilla are presented.

(16797) SVENSSON, E.I., F. EROUKHMANOFF & M. FRIBERG, 2006. Effects of natural and sexual selection on adaptive population divergence and premating isolation in a damselfly. *Evolution* 60(6): 1242-1253. – (First Author: Anim. Ecol., Ecology

Bldg, Lund Univ., SE-22362 Lund).
The relative strength of different types of directional selection has seldom been compared directly in natural populations. A recent meta-analysis of phenotypic selection studies in natural populations suggested that directional sexual selection may be stronger in magnitude than directional natural selection, although this pattern may have partly been confounded by the different time scales over which selection was estimated. Knowledge about the strength of different types of selection is of general interest for understanding how selective forces affect adaptive population divergence and how they may influence speciation. Here, divergent selection on morphology in parapatric, natural Calopteryx splendens populations was studied. Sexual selection was stronger than natural selection measured on the same traits, irrespective of the time scale over which sexual selection was measured. Visualization of the fitness surfaces indicated that population divergence in overall morphology is more strongly influenced by divergent sexual selection rather than natural selection. Courtship success of experimental immigrant ♂♂ was lower than that of resident ♂♂, indicating incipient sexual isolation between these populations. It is concluded that current and strong sexual selection promotes adaptive population divergence in this species and that premating sexual isolation may have arisen as a correlated response to divergent sexual selection. The results highlight the importance of sexual selection, rather than natural selection in the adaptive radiation of odon., and supports previous suggestions that divergent sexual selection promotes speciation in this group.

(16798) THEISCHINGER, G. & J. HAWKING, 2006. *The complete field guide to dragonflies of Australia*. CSIRO Publishing, Collingwood/VIC. x+366 pp. Softcover (14.5×21.5 cm). ISBN 0-643-09073-8. – (Available from the Publishers: 150 Oxford St., P.O. Box 1139, Collingwood, VIC 3066, AU).
Subsequent to the monograph described in *OA* 8155, this is a comprehensive, user-friendly guide to the Australian Odon., covering 324 spp. in 110 gen. and 30 fam. The book is a great leap forward in Australian odonatology and it will greatly facilitate all the work with dragonfllies, for years to come. The more so, as in addition to the keys to adults, it also presents the keys to the known larvae. Moreover, the concise species accounts, with diagnostic notes, figs and photographs will suffice for identification of individual spp. The taxonomic nomenclature is accompanied by Engl. names of all spp. – The fauna of Australia includes numerous members of Megapodagrionidae, Petaluridae, Telephlebiidae, Synthemistidae and Austrocorduliidae, but lacks Platystictidae, Platycnemididae and Cordulegastridae, while the representation of Calopterygidae, Coenagrionidae, Corduliidae, Macromiidae and Libellulidae is relatively poor. On the other hand, it is noted by a high number of endemic taxa (Chorismagrion risi, Lestoidea, Episynlestes, Synlestes, Cordulephya, Austrocordulia, Apocordulia, Archaeophya, Pseudocordulia, Hesperocordulia, Micromidia, Lathrocordulia and Austrophya). – The 2 Authors deserve congratulations and thanks for this outstanding work.

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(16799) (Anonymous), 2007. Dragon hunters. *Twin Rivers Review* 11(1): 6. – (c/o Editor & Publishers: Jones Co. Conservation Board, 12515 Central Park Rd, Center Junction, IA 52212, USA).
"Kids page", providing some general facts about dragonflies.

(16800) BAPTISTA, D.F., D.F. BUSS, M. EGLER, A. GIOVANELLI, M.P. SILVEIRA & J.L. NESSIMIAN, 2007. A multimetric index based on benthic macroinvertebrates for evaluation of Atlantic Forest streams at Rio de Janeiro state, Brazil. *Hydrobiologia* 575: 83-94. – (First Author: Lab. Avaliação e Promoção da Saúde Ambiental, FIOCRUZ/IOC, Av. Brasil, 4365, Manguinhos, Rio de Janeiro, RJ, Brazil).
The study describes the application of a protocol for biological assessment of water quality at first to third order streams at Serra dos Orgãnos. The multimetric index is based on macroinvertebrates, sampled at 12 reference and 7 impaired sites. As apparent from the Box-and-Whiskar plots, 14 metrics were sensitive to discriminate between reference and impaired sites, while the metrics, "% Odonata", was not sensitive to site conditions.

(16801) BECKEMEYER, R.J. & J.D. HALL, 2007. The entomofauna of the Lower Permian fossil insect beds of Kansas and Oklahoma, USA. *African Invertebrates* 48(1): 23-39. – (First Author: 957 Perry Ave, Wichita, KS 67203-3141, USA).
The history of insect-bearing beds of the Lower Per-

mian Wellington Formation at Elmo (KS) and Midco (OK) is recounted and the insect faunal composition is briefly reviewed. The Protodonata+Odonata are represented by 21 spp., of which 17 spp. are restricted to either site, whereas 4 spp. are common to both localities.

(16802) BEDJANIČ, M., G. DE SILVA WIJEYERATNE & K. CONIFF, 2007. *Dragonflies of Sri Lanka*. Jetwing Eco Holidays, Colombo. Brochure of 7 col. pls. ISBN none. – (Publisher/Distributor: Jetwing House, 46/26 Navam Mowatha, Colombo-2, Sri Lanka).
89 col. phot. of Sri Lankan odon. adults, with Engl. and taxonomic names, and statements on their respective status. No other text.

(16803) *BRACHYTRON* (ISSN 1386-3460), Vol. 10, No. 2 (July 2007). (Dutch, with Engl. s's). – (c/o R. Manger, Stoepveldsingel 55, NL-9403 SM Assen).
Calle, P., G. Kurstjens & B. Peters: Dragonflies of gravel pits near Asselt in the Meuse valley: more natural reconstruction proves fruitful (pp. 167-173); – *Bouwman, J.H.*: Changes in the dragonfly fauna of the 'Deurnsche Peel' between 1963 and 2003 (pp. 174-184); – *Verdonschot, R.C.M., D. Groenendijk & J.H. Bouwman*: Dragonflies on shallow soft-water lakes in Noord Brabant: a first attempt for a synecological analysis of the Dutch national dragonfly database (pp. 185-193); – *Manger, R. & J.J. Beukema*: The dragonflies of the Grafelijkheidsduinen: influence of the water level on the dragonfly fauna (pp. 194-204); – *Van Eijk, J.-L.*: Large population of Orthetrum coerulescens in the northeastern part of the Achterhoek, province of Gelderland (pp. 205-211); – *Beukema, J.J. & R. Manger*: The slow return of dragonflies to dune ponds that temporarily dry up (pp. 212-218); – *Manger, R., J. Rocks, A. Rocks & T. Knegt*: Early or late emerged Leucorrhinia rubicunda in October? (pp. 219-221); – *Bouwman, J.*: [book review] Die Libellenfauna Sachsens, by Th. Brockhaus & U. Fischer, 2006 (p. 222).

(16804) BUCZYNSKA, E., P. BUCZYNSKI & L. LECHOWSKI, 2007. Selected aquatic insects (Odonata, Heteroptera, Coleoptera, Trichoptera) of Narwiański National Park: results of preliminary studies. *Parki nar. Rezerw. Przyr.* 26(1): 25-40. (Pol., with Engl. s.). – (First Author: Dept Zool., Agric. Univ., Akademicka 13, PO-20-033 Lublin).
A checklist of 36 odon. spp., recorded from the central part of the Park (Upper Narew valley, Poland). For 12 spp. of particular interest, the exact localities are stated, and some comments on their occurrence are provided.

(16805) BUCZYNSKI, P., 2007. Dragonflies (Odonata) of the valley of the river Bug between Golebie and Wlodawa. *Nowy Pam. fizjogr.* 5(1/2): 3-16. (Pol., with Engl. s.). – (Dept Zool., UMCS, Akademicka 19, PO-20-033 Lublin).
A commented review and analysis of 52 spp., recorded (1993-2005) in the central section of the Bug, i.e. the largest non-regulated river in Poland.

(16806) BUCZYNSKI, P., M. CIECHANOWSKI, J.K. KOWALCZYK & M. KUKWA, 2007. [Value of the nature in the proposed Reserve, "Torfowiska źródliskowe nad jeziorem Jaczno"]. *In*: Z. Fałtynowicz et al., [Eds], *Kraina Hanczy*, pp. 41-48, Suwalski Park Krajobraz., Turtul; ISBN 83-919011-5-7. (Pol.). – (First Author: Dept Zool., UMCS, Akademicka 19, PO-20-033 Lublin).
Among the botanical and zoological highlights, the occurrence of several odon. spp. is emphasized; – Poland.

(16807) CHAPUT-BARDY, A., O. PAYS, T. LODE & J. SECONDI, 2007. Morphological clines in dendritic landscape. *Freshw. Biol.* 2007, 12 pp.; – doi: 10.1111/j.1365-2427.2007.01794.x – (First Author: Lab. Paysages & Biodiv., UFR Sciences, 2 Bd Lavoisier, F-49045 Angers cedex 01).
In complex landscapes such as river networks, organisms usually face spatio-temporal heterogeneity and gradients in geomorphological, water, ecological or landscape characteristics are often observed at the catchment scale. These environmental variables determine developmental conditions for larval stages of freshwater insects and influence adult phenotypic characteristics. Environmental clines are therefore expected to generate morphological clines. Such a process has the potential to drive gradual geographical change in morphology-dependent life history traits, such as dispersal. Here, the influence was studied of aquatic and terrestrial environmental factors on morphological variations in Calopteryx splendens across the Loire drainage (France). To investigate these effects, the hierarchical structure of the river network was explicitely taken into account.

8 morphological traits were analysed. The results show a significant body size variation between tributaries and the presence of a morphological cline at the drainage scale. An effect of pH and water temperature on body size was observed. Individuals in downstream sites were larger than those in upstream sites, and adults whose larval stages were exposed to alkaline pH and high temperatures during summer were larger. Body size affects flight abilities in insects. Thus, the results suggest that morphological clines may generate an asymmetric dispersal pattern along the downstream-upstream axis, downstream populations dispersing farther than upstream ones. Such a process is expected to influence population genetic structure at the drainage scale if larval drift and floods do not balance an asymmetrical dispersal pattern of adults along the downstream-upstream gradient. To assess the influence of environmental gradients on the variation of life history traits it is important to understand the population biology of freshwater insects, and more generally of riverine organisms. It is also essential to integrate such data in conservation or restoration programmes.

(16808) CORBET, P.S., 2007. *Dragonflies: behavior and ecology of Odonata*, Kaiyusha, xxxvi+798 pp, 17 col. pls excl. ISBN 978-4-905930-34-1. Hardcover with wrappers (19.3×18.4 cm). Price: ¥ 26000.- (Jap., with Engl. title).
Japanese edn of the work described in *OA* 12810.

(16809) DAGUET, C., 2007. *Dragonflies and damselflies in your garden*. Natural England, Sheffield. 27 pp. ISBN 978-1-84754-015-7. – (Publishers: 1 East Parade, Sheffield, S1 2ET, UK).
A slightly modified edn of the work described in *OA* 16305.

(16810) DALLAS, H.F. & J.A. DAY, 2007. Natural variation in macroinvertebrate assemblages and the development of a biological banding system for interpreting bioassessment data: a preliminary evaluation using data from upland sites in the south-western Cape, South Africa. *Hydrobiologia* 575: 231-244. – (Dept Zool., Univ. Cape Town, P. Bag Rondebosch, Cape Town-7700, W Cape, SA).
The variability of macroinvertebrate assemblages was investigated at 27 reference sites. Multivariate analyses showed that sites did not group on the basis of geomorphological zonation, i.e. mountain stream (n=21) and foothill-cobble bed sites (n=6). Among the taxa contributing to within-group similarity of groups identified were Coenagrionidae, Chlorolestidae, Aeshnidae and Gomphidae (spp. are not stated).

(16811) DANKS, H.V., 2007. The elements of seasonal adaptations in insects. *Can. Ent.* 139(1): 1-44. (With Fr. s.). – (Biol. Surv. Canada, Terrest. Arthropods, Can. Mus. Nature, P.O. Box 3443, Station D, Ottawa, ON, K1P 6P4, CA).
The many components of seasonal adaptations in insects are reviewed, especially from the viewpoint of aspects that must be studied in order to understand the structure and purposes of the adaptations.

(16812) DE MARMELS, J., 2007. An endemic new species of Heteragrion Selys, 1862 from the coastal Cordillera, Venezuela (Odonata, Zygoptera: Megapodagrionidae). *Resumen. 20 Congr. venez. Ent.*, pp. 68-69. (With Engl. title). – (Mus. & Inst. Zool. Agric., Fac. Agron., Univ. Central Venezuela, Apdo 4579, Maracay 2101-A, Venezuela).
A report on the discovery of a new sp., similar to H. palmichale Hartung. The taxon is not named, but the locality and the principal structural features are stated.

(16813) DIJKSTRA, K.-D.B., 2007. *Demise and rise: the biogeography and taxonomy of the Odonata of tropical Africa*. PhD diss., Univ. Leiden. 204 pp. (With Dutch s.). – (Natn. Zool. Colln Surinam, Univ. Surinam, P.O. Box 9212, Paramaribo, Surinam).
The dissertation consists of 8 chapters, 7 of which are reproductions of the papers listed/abstracted in *OA* 16234, 16455, 16628, 16684, 16686, 16687 and 16691. The last chapter bears the title of the book and appears on pp. 144-183. An update on the paper listed in *OA* 16628 is provided on pp. 184-187. A brief autobiography (pp. 200-201) and his bibliography (pp. 202-204; 1993-2007; 71 titles, newsletter articles and conference presentations excl.) are appended. – Most of the Author's publications are available and could be downloaded from his personal website: *http:/www.barakken.nllkddijkstral*

(16814) DIJKSTRA, K.-D.B. & E.M. PILGRIM, 2007. Trithetrum, a new genus of African dragonflies formerly placed in Sympetrum (Odonata, Libellulidae). *J. afrotrop. Zool.* 3: 77-81. – (First

Author: Natn. Zool. Colln Surinam, Univ. Surinam, P.O. Box 9212, Paramaribo, Surinam).
Based on many morphological differences, the new genus is described as distinct from Sympetrum Newman; type sp.: S. navasi Lacroix, 1921. It contains Trithetrum congoense (Aguesse) and T. navasi (Lacroix), both formerly placed in Sympetrum. 2♂ from Congo-Kinshasa constitute the first records of T. congoense since its description from Congo-Brazzaville.

(16815) DYATLOVA, E.S., 2007. First record of Cordulia aenea (Odonata, Corduliidae) in Dnieper Delta. *Vest. Zool.* 41(4): 326. (Engl., with Russ. title). – (Frantsuzkij Bul'var 37, kv. 3, UKR-65044 Odessa).
1♂, nr Golaya Pristan, left bank of the Konka river, The Ukraine, 17-V-2007; more individuals sighted on the wing.

(16816) DYATLOVA, E.S., 2007. Informacionyy resurs "Strekozy Ukrainy". – [Information source "Ukrainian dragonflies"]. *Tezi Dopov. 7 Z'izd ukrain. ent. Tov.*, p. 40, Nizhin. (Russ.). – (Frantsuzkij Bul'var 37, kv. 3, UKR-65044 Odessa).
The web site *http://dragonflyforall.narod.ru/* is directed at professional and non-professional odon. students of the Ukraine, with the objective to facilitate their work. Its main sections are titled: "Odonatologists of the Ukraine", "History of Ukrainian odonatology", "Dragonfly biology", "Methods of research", "Dragonfly conservation", and "Museum collections". Most frequently visited sections are those on current literature, expeditions, conferences and seminars. Several other covered subjects are also listed and a call is made for assistance.

(16817) DYATLOVA, E.S., 2007. On the occurrence of abnormalities in venation of drgonflies (Insecta, Odonata). *Vest. Zool.* 41(3): 219-225. (Russ., with Engl. s.). – (Frantsuzkij Bul'var 37, kv. 3, UKR-65044 Odessa).
The occurrence and frequency of wing abnormalities in SW Ukrainian Calopteryx splendens, Platycnemis pennipes, Ischnura pumilio, Aeshna mixta, Crocothemis erythraea and Orthetrum brunneum are described, illustrated and discussed.

(16818) FERLETIČ, U., 2007. *Small red damselfly, Ceriagrion tenellum (Insecta; Odonata), in Slovenia.* M.Sci. thesis, Univ. Ljubljana. xi+89 pp. (Slovene, with Engl. s.). – (Merezige 1, SI-6273 Merezige).
In Slovenia, C. tenellum is known at present from 18 localities, all in the mediterranean region, viz. 2 in the Vipava valley, 2 in the inland of NW Istria, and 14 on the Istrian Adriatic coast. Only at 4 of these, the populations are relatively large and considered stabile. The habitats are described, the details on the respective populations are presented, and the required conservation measures are proposed.

(16819) GARRISON, R.W. & N. VON ELLENRIEDER, 2007. The true Argia difficilis Selys, 1865, with the description of Argia yungensis sp. nov. (Odonata: Coenagrionidae). *Trans. Am. ent. Soc.* 133(1/2): 189-204. (With Span. s.). – (Second Author: Inst. Bio y Geocien., Mus. Cienc. Nat. Salta, Univ. Nac. Salta, Mendoza 2, AR-4400 Salta).
The nw sp., close to A. difficilis, is described. Holotype ♂, allotype ♂: Argentina: Salta prov., Rio Anta Muerta, side shady creek, alt. 496 m, 18-V-2006, deposited at MLP. Both spp. are illustrated and diagnosed and their distributions mapped. They can be distinguished by the morphology of ♂ torsi, cerci and paraproct, and ♀ prothorax. Their distributions are allopatric, with A. yungensis distributed along the foothill jungle of the Yungas rain forest from NW Argentina to Peru, and A. difficilis from Peru and Brazil to Venezuela across the lowland Amazon forest. A. extranea forficula Fraser is synonymized with A. difficilis, and the latter is redescribed.

(16820) HANCOX, J., 2007. Dragonfly year. *Potteric Carr Nature Reserve Recorder* 10: 8-9. – (57 Braithwell Rd, Ravenfield, Rotherham, S65 4LH, UK).
A summary of the 2006 records and observations on 17 spp.; Potteric Carr Nature Reserve, Yorkshire, UK.

(16821) [HANCOX, J.], 2007. Early and late sightings 1998-2006. *Potteric Carr Nature Reserve Recorder* 10: 5. – (57 Braithwell Rd, Ravenfield, Rotherham, S65 4LH, UK).
A table is presented of the earliest/latest dates (and their 1998-2006 means) for adults of the 17 odon. spp. occurring in the Potteric Carr Nature Reserve, Yorkshire, UK.

(16822) HIROSE, Y., S. ITOH & T. YOKYAMA, 2007. *The dragonflies of Hokkaido.* Minamiyam-

ma Club, Tokyo. 184 pp. + CD-Rom. Softcover with flappers/wrappers (14.8×21.0 cm). ISBN 978--4-87051-214-6. Price: ¥ 3800.- net. (Jap., with Engl. title & taxonomic nomenclature in the main text). – (Publishers: Kajima Bldg, 2-4-10 lida-bashi, Chiyoda-ku, Tokyo, 102-0072, JA).

A companion vol. to that listed in *OA* 16835, this is a descriptive and richly illustrated atlas of the Hokkaido spp., including the regional distribution maps for all spp. The regularly or incidentally visiting spp. are added; – Japan.

(16823) HORVÁTH, G., P. MALIK, G. KRISKA & H. WILDERMUTH, 2007. Ecological traps for dragonflies in a cemetery: the attraction of Sympetrum species (Odonata: Libellulidae) by horizontally polarizing black gravestones. *Freshw. Biol.* 52: 1700-1709. – (Last Author: Haltbergstr. 43, CH-8630 Rüti).

S. flaveolum, S. striolatum, S. sanguineum, S. meridionale and S. danae were attracted by polished black gravestones in a Hungarian cemetery. The insects showed the same behaviour as at water: (1) they perched persistently in the immediate vicinity of the chosen gravestones and defended their perch against other dragonflies; (2) flying individuals repeatedly touched the horizontal surface of the shiny black tombstones with the ventral side of their body; (3) pairs in tandem position frequently circled above black gravestones. Tombstones preferred by the dragonflies were in the open and had an area of at least 0.5 m^2 with an almost horizontal, polished, black surface and with at least one perch in their immediate vicinity. Using imaging polarimetry, it was found that the black gravestones, like smooth water surfaces, reflect highly and horizontally polarized light. In double-choice field experiments with various test surfaces, it is shown that the dragonflies attracted to shiny black tombstones display positive polarotaxis and, under natural conditions, detect water by means of the horizontally polarized reflected light. This, and the reflection-polarization characteristics of black gravestones, explain why these dragonflies are attracted to black tombstones. If ♀♀ attracted to the black gravestones oviposit on them, the latter constitute ecological traps for dragonflies that are not close to water.

(16824) LORENZO CARBALLA, O. S. GIERE, A. CORDERO & H. HADRYS, 2007. Isolation and characterization of microsatellite loci to study parthenogenesis in the citrine forktail, Ischnura hastata (Odonata: Coenagrionidae). *Mol. Ecol. Notes* 2007, 3 pp.; – doi: 10.1111/j.1471-8286-2007.01722.x – (Third Author: Evol. Ecol. Gr., Dept Ecol. & Anim. Biol., Univ. de Vigo, EUIT Forestal, Campus Universitario, ES-36005 Pontevedra).

I. hastata is a widely distributed American sp., with only-♀ populations also found in the Azores Isls. Here, the development is reported of 9 microsatellite loci for this sp. The number of alleles per locus ranged from 6 to 11, with an observed heterozygosity ranging from 0.245 to 0.737. 8 of the 9 loci successfully amplified in a sample of parthenogenetic ♀♀ from the Azores. The developed microsatellite system will be a useful tool for the investigation of population structure, as well as the number of clones, the type of parthenogenesis and the origin of parthenogenetic populations of this sp.

(16825) LOTZING, K., 2007. Massenvorkommen der Gebänderten Prachtlibelle (Calopteryx splendens Harris, 1782) (Insecta: Odonata) im Bereich des Mühlengrabens zwischen Tarthun und Mündung in die Bode bei Unseburg innerhalb des Landkreises Aschersleben-Stassfurt (Sachsen-Anhalt). *Ent. Mitt. Sachsen-Anhalt* 15(1): 33-36. (With Engl. s.). – (Am Hollschen Bruch 4 c, D-39435 Unseburg).

On the Mühlengraben, between Tarthun and Unseburg (Sachsen-Anhalt, E Germany), in some sections up to 45 C. splendens ♂♂ occurred along ca 100 m stretches of the stream in 2006.

(16826) LOWE, C.D., S.J. KEMP, I.F. HARVEY, D.J. THOMPSON & P.C. WATTS, 2007. Variable microsatellite loci isolated from the azure damselfly, Coenagrion puella (L.) (Zygoptera: Coenagrionidae). *Mol. Ecol. Notes* 2007, 3 pp; – doi: 10.1111/j.1471-8286.2007.01736.x – (Sch. Biol. Sci., Univ. Liverpool, Biosci. Bldg, Crown St., Liverpool, L69 7ZB, UK).

10 polymorphic microsatellite loci from C. puella were isolated and characterized as part of a study assessing reproductive success and genetic structure in an isolated population of this sp. Levels of genetic diversity were assessed in 50 individuals collected from Queen Elizabeth Country Park, Hampshire, UK. The number of alleles per microsatellite loci ranged from 3 to 22 and the observed and expected heterozygosities varied between 0.26 and 0.84 and between 0.23 and 0.91, respectively. Two loci showed

significant ($p<0.05$) heterozygote deficits, likely because of null (non-amplifying) alleles; one pair of loci was in linkage disequilibrium.

(16827) MACHADO, A.B.M., 2007. Leptagrion afonsoi sp. n. from the state of Minas Gerais, Brazil (Odonata: Coenagrionidae). *Lundiana* 7(2): 125-126. – (Depto Zool., Inst. Cien. Biol., UFMG, C.P. 486, BR-31270-901 Belo Horizonte, MG).
The new sp. is described and illustrated from a single ♂ (Minas Gerais, Santa Bárbara, Caraça, XI-1988; deposited in Author's collection. It is close to L. dispar and L. elongatum, but differs from them by having a bifid cercus.

(16828) MARINOV, M. & R. SEIDENBUSCH, 2007. Corduliochlora gen. nov. from the Balkans (Odonata: Corduliidae). *IDF-Report* 10: 1-13. – (First Author: P.O. Box 134, BG-1000 Sofia).
The new gen. is established for Somatochlora borisi Marinov, 2001. A detailed description and figs are provided, and the diagnostic features are summarized in the Cordulia-Corduliochlora-Somatochlora key.

(16829) NAKAHARA, M. & Y. TSUBAKI, 2007. Sperm mortality, insemination and fertilization in the damselfly Ischnura senegalensis: comparisons between wild and inbred populations. *J. Ethol.* 2007, 7 pp.; – doi: 10.1007/s10164-007-0046-z – (First Author: Natn. Inst. Envir. Stud., 16-2 Onogaea, Tsukuba, Ibaraki, 305-8506, JA).
Inbreeding can have deleterious effects on individual or population fitness. To avoid fitness reduction, individuals may adopt behavioral or physiological mechanisms to reduce their investment in the production of off-spring with genetically similar mates. Here, it was examined whether insemination by inbred ♂♂ introduced more dead sperm than insemination by wild ♂♂ by counting sperm in ♀ I. senegalensis sperm storage organs. If inbred ♂♂ inseminated fewer or lower-quality sperm, ♀♀ would avoid inferior sperm The results revealed 3 features of damselfly inbreeding: insemination failed in a larger proportion of inbred pairs than in wild pairs, inbred pairs showed significantly reduced fertility, and the numbers of live and dead sperm in inbred ♀'s sperm storage organs did not differ from those in wild ♀♀. This suggests that neither sperm quantity nor sperm quality was responsible for low fertility to a significant extent, but some kind of ♀ quality, such as sperm usage or storing ability, was. Although inbred pairs had lower fertility, there were no significant differences between inbred and wild pairs in the total numbers of live or dead sperm. It seems that ♀ choice at the insemination stage was responsible for low fertility rather than sperm quantity or quality measured by live-to-dead ratio.

(16830) NEEDHAM, K. & R. KENNER, 2007. Chapter 14: Aquatic insects. *In*: D. Klinkenberg et al., [Eds], *A biophysical inventory and evaluation of the Lulu Island Bog, Richmond, British Columbia*. Ecol. Committee, Richmond Nature Park Soc., Richmond/BC, 5 pp. – Available on-line at http://www.geog.ubc.ca/richmond/city/inventory2002.htm – (Second Author: Spencer Ent. Mus., Dept Zool., Univ. Brit. Columbia, Vancouver, BC, V6T 1Z4, CA).
The introductory text, with a description of the survey methods, and with reference to the checklist listed in *OA* 16831. The record of Sympetrum illotum is emphasized.

(16831) NEEDHAM, K. & R. KENNER, 2007. Checklist of the insects of the Lulu Island Bog. *In*: D. Klinkenberg et al., [Eds], *A biophysical inventory and evaluation of the Lulu Island Bog, Richmond, British Columbia*. Ecol. Committee, Richmond Nature Park Soc., Richmond/BC, 4 pp. – Available on-line at http://www.geog.ubc.ca/richmond/city/inventory2002.htm – (Second Author: Spencer Ent. Mus., Dept Zool., Univ. Brit. Columbia, Vancouver, BC, V6T 1Z4, CA).
The checklist includes 13 odon. spp., from the Richmond Nature Park and from the Richmond Nature Study Area, recorded during the 2002-2004 field seasons. – See also *OA* 16830.

(16832) *ODONATRIX*. Bulletin of the Odonatological Section of the Polish Entomological Society (ISSN 1733-8239), Vol. 3, No. 2 (31 July 2007) (Pol. or Engl., with Engl. s's). – (c/o dr P. Buczyński, Dept Zool., UMCS, Akademicka 19, PO-20-033 Lublin).
Wendzonka, J.: Second record of Crocothemis erythraea (Brullé, 1832) in western Poland, with remarks on its distribution and ecology (pp. 33-39); – *Buczyńska, E.*: [cartoon strip] Adventures of the dragonfly from Lublin (p. 39); – *Michalczuk, W.*: Coenagrion ornatum (Selys, 1850) found in the Wołyńska Upland (southeastern Poland) (pp.

40-42); – *Miszta, A., M. Boroń, P. Cuber & A. Dolný*: The occurrence of Aeshna affinis Vander Linden, 1820 and Crocothemis erythraea (Brullé, 1832) in sinkhole ponds in the Silesian voivodeship in 2006 (pp. 42-46); – *Śniegula, S.*: The Odonata of the Täftean river (Västerbotten province, Sweden) (pp. 47-49); – *Bernard, R. & O.E. Kosterin*: Odonatological impressions from the Vasyugan Plain, western Siberia (pp. 50-58); – *Tończyk, G.*: The 4th All-Polish Symposium of Odonatology of the Polish Entomological Society, Brda, May 18-20, 2007 (pp. 59-61); – *Buczyński, P.*: Polish and to Poland dedicated odonatological papers, 5: the second half of 2006 (pp. 62-64).

(16833) OTT, J., 2007. The expansion of Mediterranean dragonflies in Europe as an indicator of climatic changes: effects on protected species and possible consequences for the Natura 2000 web. *Emerging issues for biodiversity conservation in a changing climate* [Convention on Biological Diversity Technical Series No. 29], pp. 22-24, Montreal/ Canada. – (L.U.P.O., Friedhofstr. 28, D-67705 Trippstadt).
A brief interim report on the first results of a 4-yr (2005-2008) study of the impact of climate on the odon. fauna of the transboundary (Germany--France) Biosphere Reserve, "Pfälzerwald-Vosges du Nord", covering the 2005-2006 observations. The evidence of several meteorological stations in the investigated area indicates a clear trend towards higher temperatures as compared to the long-term means (ca 1.0-1.5°C mean increase) and the occurrence of more extremes in precipitation during the last years. Particularly remarkable is the impact of the 2003 dry summer, in consequence of which the water level dropped for about 1-2 m, causing a dramatic decrease of water bodies' surface and the disconnection between open water and the (former) shoreline vegetation, resulting in the appearance of large open areas around the (now much smaller) water bodies. Within a very short time most of the stenoecious moorland spp., such as Coenagrion hastulatum, Aeshna juncea, Somatochlora arctica and Leucorrhinia dubia, have disappeared while, on the other hand, these habitats were colonised by euryoecious spp. and they are now dominated by Anax imperator, Libellula depressa, Orthetrum cancellatum etc. Some water bodies dried out completely. Although the warmer climate triggers range expansion of the southern spp., this does not increase the biodiversity, as the spp. adapted to the previous cool climatic conditions disappear. If the current climatic trends are to continue, the spp. adapted to moorlands, springs, small brooks and to the alpine habitats are expected to suffer most.

(16834) OTT, J., M. SCHORR, B. TROCKUR & U. LINGENFELDER, 2007. *Artenschutzprogramm für die Gekielte Smaragdlibelle (Oxygastra curtisii, Insecta: Odonata) in Deutschland – das Beispiel der Population an der Our*. Pensoft, Sofia-Moscow. 131 pp. Softcover (16.4×23.3 cm). ISBN 978-954-642--299-6. [*Invert. Ecol. & Conserv. Monogr.* 3; ISSN 1312-9082]. Price: € 66.47 net. (With Engl. & Fr. s.'s). – (Publishers: Geo Milev 13 a, BG-1111 Sofia).
An outstanding monograph on biology, ecology and behaviour of O. curtisii (adult and larva), based on a 2-yr study of the Our river population (Germany-Luxembourg border), with a species protection programme and an exhaustive O. curtisii bibliography.

(16835) OZONO, A., K.-i. WATANABE, R. YAKITA & T. KOHAMA, 2007. *The dragonflies of Okinawa*. Minamiyamma Club, Tokyo. 200 pp. Softcover with flappers (14.8×21.0 cm). ISBN 978--4-87051-215-3. Price: ¥ 2800.- net. (Jap., with Engl. title & taxonomic nomenclature in the main text). – (Publishers: Kajima Bldg, 2-4-10 Iida-bashi, Chiyoda-ku, Tokyo, 102-0072, JA).
A companion vol. to that listed in *OA* 16822; this is in the first place a beautiful and richly illustrated descriptive album of the Okinawa (Japan) spp. The distribution of Rhipidolestes and Coeliccia spp. is mapped, and a map is presented, indicating the progressive northward range expansion in Trithemis aurora (stands for 1981, 1983, 1986, 1993, 1999, 2000, 2002 and 2005).

(16836) PETROVIČOVÁ, K. & S. DAVID, 2007. Dragonflies (Odonata) of the upper reaches of the Kysuca river (NW Slovakia). *8 Vedecká Konf. Doktorandov a mladých vedeckúch Pracovnikov*, Nitra, pp. 392-403. (Slovak, with Engl. s.). – (First Author: Hlavná 83, SK-95195 Obyce).
An account and analysis are presented of the odon. fauna of the typical Kysuca river habitats (39 spp.), based on a systematic survey (2003-2005), at 16 sampling sites, covering 3 habitat types.

(16837) PIERSANTI, S., M. REBORA, G. SALER-

NO & E. GAINO, 2007. Behaviour of the larval dragonfly Libellula depressa (Odonata: Libellulidae) in drying pools. *Ethology Ecology & Evolution* 19: 127-136. – (Second Author: Dipto Biol. Cellulare & Ambientale, Univ. Perugia, Via Elce di Sotto, I-06123 Perugia).

Under experimental field conditions, the behaviour of L. depressa larvae (F-1) in a drying pond and their ability to seek for water in dry conditions were investigated. Most of the larvae left the pond a higher percentage of them did so after the formation of puddles. The ability of the larvae to move towards a nearby pond was investigated by placing them 5 m away from a natural pond, with the freedom to walk on the ground. More individuals, released nearest the low edge of the pond where the humidity gradient was present, were able to reach the water, while only some of those released nearest the high edge where no humidity gradient was available, were able to reach the pond. The ecological significance of the behaviour of L. depressa larvae is discussed in relation to the typical habitat of this sp., represented by small, shallow ponds, and with reference to the presence of hygroreceptors in odon. larvae.

(16838) QUERINO, R.B. & J.D. PINTO, 2007. A new Hydrophylita (Hymenoptera: Trichogrammatidae) from the Neotropics, with a key to species. *Zootaxa* 1437: 47-54. – (Second Author: Dept Ent., Univ. California, Riverside, CA 92521, USA).

H. (Lutzimicron) neusae sp. n. is described and illustrated from unidentified Zygoptera eggs at Manaus, Amazonas, Brazil. This is the fourth known member of the genus. The other 3 spp. are also known from Zygoptera eggs, viz. H. aequivolans (Ischnura sp.), H. bachmanni (unidentified Zygopt.), and H. lestesi (Lestes sp.).

(16839) SERRANO-MENESES, M.-A., M. AZPILICUETA-AMORIN, T. SZÉKELY & A. CORDOBA-AGUILAR, 2007. The development of sexual differences in body size in Odonata in relation to mating systems. *Eur. J. Ent.* 104: 453-458. – (First Author: Dept Biol. & Biochem., Univ. Bath, Claverton Down, Bath, BA2 7AY, UK).

Adult body size is the result of important environmental, maternal and/or genetic effects acting on animals during development. Here it is investigated how sexual size dimorphism (SSD) develops in Erythromma lindenii, Ischnura graellsii, Platycnemis acutipennis, Anax imperator, Cordulegaster boltonii, Onychogomphus uncatus and Oxygastra curtisii. SSD of both the last larval and adult stages of the same individuals, which were reared under laboratory conditions, was measured. The aims were to investigate (1) whether SSD develops during the larval stage, (2) the direction of larval and adult SSD, and (3) whether the direction of adult SSD can be predicted by the mating system of a given species (e.g. males of territorial species being larger than females and the opposite for non-territorial species). It was found that although larval differences in size may be present between the sexes, these are not necessarily shown in the adult stage (they may change or disappear). Also, the mating system was not related to patterns of adult SSD. Differences in SSD in larvae may be caused by differential use of resources via differential niche-utilisation or sex specific growth patterns. The fact is highlighted that sexual selection favouring large ♂ size and fecundity selection, which selects for large ♀ ♀ may be acting on the observed patterns in SSD in adults.

(16840) SERRANO-MENESES, M.A., A. CORDOBA-AGUILAR, V. MENDEZ, S.J. LAYEN & T. SZÉKELY, 2007. Sexual size dimorphism in the American rubyspot: male body size predicts male competition and mating success. *Anim. Behav.* 73: 987-997. – (First Author: Dept Biol. & Biochem., Univ. Bath, Claverton Down, Bath, BA2 7AY, UK).

Sexual differences in body size are widespread among animals, and various explanations for the evolution and maintenance of sexual size dimorphism have been proposed. Here, the effects of sexual selection and fecundity selection on the size of Hetaerina americana ♂ ♂ and ♀ ♀, respectively, were investigated. ♂ ♂ are larger than ♀ ♀ and have large red spots at the base of each wing that are sexually selected via ♂-♂ contests. Mating success is determined by the ownership of a territory. Large ♂ ♂ held territories for longer and sustained longer territorial fights than small ♂ ♂. Territorial ♂ ♂ obtained more copulations than nonterritorial ones. Large ♂ ♂ also had more wing pigmentation and mated with large ♀ ♀. Large territorial ♂ ♂ had high energy reserves, whereas non-territorial ♂ ♂ appeared to have depleted reserves. Selection analyses of body size showed disruptive selection acting on ♂ body size, suggesting that both small

and large ♂♂ may be favoured in terms of mating success. It was also tested whether fecundity selection acts on ♀ size. However, ♀ bodysize was unrelated to the number of eggs carried. Taken together, the results suggest that in this territorial sp. ♂-biased size dimorphism is driven by large ♂ size in ♂-♂ competition being selectively advantageous in territory acquisition and/or maintenance. It is also suggested that small size is advantageous in nonterritorial ♂♂ to improve their agility in courting (or subduing) ♀♀.

(16841) SHAALAN, E.A.-S., D.V. CANYON, R. MULLER, M.W.F. YOUNES, H. ABDEL-WAHAB & A.-H. MANSOUR, 2007. A mosquito predator survey in Townsville, Australia, and an assessment of Diplonychus sp. and Anisops sp. predatorial capacity against Culex annulirostris mosquito immatures. *J. Vector Ecol.* 32(1): 16-21. – (Second Author: Sch. Public Health, James Cook Univ., Townsville, Qld 4811, AU).
Among the predaceous aquatic insects, the odon. occurred in the field during Jan.-May; spp. are not stated.

(16842) SONG, F., K.W. XIAO, K. BAI & Y.L. BAI, 2007. Microstructure and nanomechanical properties of the wing membrane of dragonfly. *Materials Sci. Engin.* (A) 457: 254-260. – (First Author: State Key Lab. Nonlinear Mechanics, Inst. Mechanics, Chin. Acad. Sci., Beijing-100080, China).
Detailed investigations on the microstructure and the mechanical properties of the wing membrane of Libellula basilinea were carried out. It was found that in the direction of the thickness the membrane was divided into 3 layers rather than as traditionally considered as a single entity, and on the surfaces the membrane displayed a random distribution rough microstructure that was composed of numerous nanometer scale columns coated by the cuticle wax secreted. The characteristics of the surfaces were accurately measured and a statistical radial distribution function of the columns was presented to describe the structural properties of the surfaces. Based on the surface microstructure, the mechanical properties of the membranes taken separately from the wings of living and dead dragonflies were investigated by the nanoindentation technique. The Young's moduli obtained here are approximately 2 times greater than the previous result, and the reasons that yield the difference are discussed.

(16843) SVENSSON, E.I. & M. FRIBERG, 2007. Selective predation on wing morphology in sympatric damselflies. *Am. Nat.* 170(1): 101-112. – (First Author: Anim. Ecol., Ecology Bldg, Lund Univ., SE-22362 Lund).
Although predation is thought to affect species divergence, the effects of predator-mediated natural selection on species divergence and in nonadaptive radiations have seldom been studied. Wing melanization in Calopteryx has important functions in sexual selection and interspecific interactions and in species recognition. This genus and other Zygoptera genera have also been put forward as examples of radiations driven by sexual selection. It is shown that avian predation strongly affects natural selection on wing morphology and ♂ wing melanization in 2 congeneric and sympatric spp. (C. splendens, C. virgo). Predation risk was almost 3 times higher for C. virgo, which has an exaggerated degree of wing melanization, than it was for the less exaggerated, sympatric congener C. splendens. Selective predation on C. virgo favoured a reduction and redistribution of the wing melanin patch. There was evidence for nonlinear selection involving wing patch size, wing patch darkness, and wing length and width in C. splendens but weaker nonlinear selection on the same trait combinations in C. virgo. Selective predation could interfere with species divergence by sexual selection and may thus indirectly affect ♂ interspecific interactions, reproductive isolation, and spp. coexistence in this genus.

(16844) THEISCHINGER, G., 2007. *Preliminary keys for the identification of larvae of Australian Odonata: Cordulephyidae, Oxygastridae, Corduliidae and Hemicorduliidae (all Corduliidae s.l.), Libellulidae and Urothemistidae (both Libellulidae s.l.)*. Dept Envir. & Conserv. NSW, Sydney. iv+124 pp. Spiral binding (20.5×29.5 cm). ISBN 978-1-74122-387-3. – (Publishers: P.O. Box A290, Sydney South-1232, AU).
The Australian odon. fauna has up to 30 fam., 110 gen. and 324 recognized spp. This book provides illustrated identification keys to the larvae of the Australian odon. families and to the known larvae of the spp. of the Corduliidae s.l. and Libellulidae s.l. that include 73 described spp. in 34 gen. In addition to the keys, there are diagnostic descriptions of final instar larvae, checklists of spp., and references to the taxonomic and descriptive literature for all gen. and spp., as well as information on the ecology

and distribution. – The text is concise and very well organized, the highly informative species treatments are uniformly presented under 5 headings ("Dimensions", "Diagnosis", "Remarks", "Ecology" and "Distribution"). The 170 diagnostic illustrations are large, artistically "simple" and very clear. – A remarkable, much appreciated and very useful work by the Doyen of the Australian odonatology.

(16845) TITAR, V.M., 2007. The first record of Selysiothemis nigra (Insecta, Odonata) from Ukraine. *Vest. Zool.* 41(2): 122. (Russ., with Engl. title). – (Schmalhausen Inst. Zool., Ukr. Acad. Sci., Chmelnickogo 15, UKR-252601 Kiev).
1 ♀, on the shore of Chernino Lake, Nikolaevsk distr., 20-VII-2002.

(16846) VON ELLENRIEDER, N. & R.W. GARRISON, 2007. *Dragonflies of the Yungas (Odonata). A field guide to the species from Argentina.* Pensoft, Sofia-Moscov. iv+116 pp. Softcover (13.8×21.4 cm). ISBN 954-642-305-X. (Bilingual: Span./Engl.). – (Publishers: Geo Milev 13a, BG-1111 Sofia).
The Yungas are cloud forests, extending from Venezuela into NW Argentina, along the eastern slope of the Andes. In Argentina they are distributed discontinously along the subandean chaines within the provinces of Salta, Jujuy, Tucumán and Catamarca. Biogeographically they belong to the Yungas province of the neotropical region and in Argentina they represent one of the most species-rich biogeographic provinces, functioning as a corridor for Amazon biodiversity. – The goal of this book is to provide an easy-to-use identification means for the 102 odon. spp. of the Argentinian part. At the time of publication, 4 of these, in the genera Argia, Triacanthagyna, Limnetron and Micrathyria, were still undescribed; 1 description has appeared by now (see *OA* 16819), the remaining are under way. The species accounts provide information on identification and distribution, and (where known) on habitat and behaviour. A colour portrait is given of each sp., and diagnostic figs are included where considered appropriate. – A well organised and refreshing book that will greatly facilitate the work on the regional fauna.

(16847) ZESSIN, W., 2007. Bericht über das 17. Internationale Symposium der Odonatologie in Hongkong, China, vom 31. Juli bis 9. August 2006. *Virgo/MittBl. ent. Ver. Mecklenburg* 10(1): 5-16. – (Lange Str. 9, D-19230 Jasnitz).
A very detailed report on the 17th Int. Symp. Odonatol. (Hongkong, 2006), with a complete list of oral presentations and posters (incl. authors' e-mail addresses) and enhanced by 27 photographs.

(16848) ZESSIN, W., 2007. Reproduktionsnachweis der Feuerlibelle (Crocothemis erythraea) in Mecklenburg-Vorpommern 2007 am Kraaker Waldsee, Landkreis Ludwigslust. *Virgo/MittBl. ent. Ver. Mecklenburg* 10(1): 63-64. – (Lange Str. 9, D-19230 Jasnitz).
In June 2007, numerous C. erythraea individuals, including a teneral ♀, were sighted on a lake in the district of Ludwigslust (Mecklenburg, E Germany). From the same locality, 10 other spp. are also listed.

(16849) ZESSIN, W., 2007. Variabilität und Formenkonstanz: Schlüssel für die Beurteilung fossiler Insekten. *Virgo/MittBl. ent. Ver. Mecklenburg* 10(1): 45-56. – (Lange Str. 9, D-19230 Jasnitz).
Grimmenagrion ansorgei gen. n., sp. n. is described from the Upper Lias of Grimmen (Vorpommern, E Germany). The systematics of the Protomyrmeleontidae is outlined and the Obotritagrioninae sfam. n. (for Obotritagrion, Paraobotritagrion and Grimmenagrion) and Zirzipanagrioninae sfam. n. (for Zirzipanagrion) are introduced and defined. The hypothetical dendrogram and kladogram of the Protomyrmeleontidae are provided.

(16850) ZHU, H.-q., G.-h. YANG & T. WU, 2007. A new species of the genus Perissogomphus Laidlaw (Odonata: Gomphidae) from Yunnan, China. *Entomotaxonomia* 29(2): 81-84. (Chin., with Engl. s.). – (First Author: Shanxi Univ., 42-38, Taiyuan, Shanxi-030006, China).
P. asahinai sp. n. is described, illustrated and the diagnostic features separating it from the similar P. stevensi Laidlaw are stated. Holotype ♂: China: Yunnan prov., Dali city, Yang-bi river, 7-VIII-1999; deposited in Dali Coll., Dali, Yunnan, China.