ODONATOLOGICAL ABSTRACTS

1975

(12058) DAVIES, R.W. & R.P. EVERETT, 1975. The feeding of four species of freshwater Hirudinoidea in southern Alberta. *Verh. int. Ver. Limnol.* 19(4): 2816--2827. – (Authors' current addresses unknown).
Prey-range experiments and/or gut contents analysis demonstrated that Zygopt. larvae were consumed by Helobdella stagnalis and Nephelopsis obscura. The latter fed on Anisopt. larvae as well. Erpobdella punctata had been previously reported to ingest Zygopt. larvae (J.P. Moore, 1912, *Zool. Ser. geol. nat. Hist. Surv. Minn.* 1912: 68-150), but no evidence was found in the present study.

(12059) OLIGER, A.I., 1975. K voprosu o zarazhennosti strekoz (Odonatoptera) kleshchami semeystva Arrenhuridae v Donbasse. – [On the problem of dragonfly (Odonatoptera) infestation by the Arrenhuridae mites in the Don Basin]. *Probl. Parazitol.* 2: 78-80 (Russ.). – (Author's current address unknown).
Quantitative data are presented for 15 odon. spp., from 4 localities.

1982

(12060) KURANDINA, D.P., 1982. Gregariny vodnyh chlenistonogih Kievskego vodohranilishcha. – Gregarines of aquatic arthropods from the Kiev reservoir. *Abstr. Pap. 3rd All-Union Congr. Protozool.*, Vilnius, pp. 193-194. (Russ., with Engl. title). – (Author's current address unknown).
Hoplorhynchus oligacanthus is reported from larval Lestes sponsa, Enallagma cyathigerum, Erythromma najas, Aeshna grandis and Sympetrum sanguineum.

1984

(12061) SPENCER, C.N. & D.L. KING, 1984. Role of fish in regulation of plant and animal communities in eutrophic ponds. *Can. J. Fish. aquat. Sci.* 41(12): 1851--1855. (With Fr. s.). – (Dept Fish. & Wildlife, Michigan St. Univ., East Lansing, MI 48824-1222, USA).
The role of various piscivorous and planktivorous fish spp. in regulating the plankton, periphyton, and submerged macrophyte communities in shallow ponds at the Inland Lakes Research & Study Center, located on the campus of Michigan State University, was examined. Stomach analyses of largemouth bass, Micropterus salmoides, indicated that its diet consists primarily of benthic macroinvertebrates, incl. odon. larvae.

1987

(12062) CASTELLA, E., 1987. *Apport des macro-invertébrés aquatiques au diagnostic écologique des écosystèmes abandonnés par les fleuves. Recherches méthodologiques sur le Haut-Rhône français.* PhD thesis, Univ. Lyon-I, Villeurbanne. 458 pp. – (Author's last known address: Lab. Ecol. & Biol. Aquat., Univ. Genève, CH-1200 Genève).
The work is not available for abstracting. According to the paper listed in *OA* 10387, it contains an appreciable amount of information on odon. fauna and ecology of the Upper Rhône R., France.

1993

(12063) HOY, K. [text] & I. BOWRING [illustrations], 1993. *Frightful winged creatures.* Ideals Publishing, Nashville/TN. Pop-up [paper engineering by R. Mawdsley], 10 pp. Hardcover (26.5×24.0 cm). ISBN 0-8249-8618-0. – Price: US$ 12.95 net. – (Available from the Eds of *Odonatologica*).

Directed at primary school children, this is the first pop-up book on record in *OA*. Several (mostly insect) groups are represented, dragonfly biology is well outlined and the illustrations are good. Opening the book, a well done libellulid model (total length 26.5, total wing span ca 36.0 cm) pops up, reaching ca 24 cm above the page.

(12064) RUNDLE, S.D., A. JENKINS & S.J. ORMEROD, 1993. Macroinvertebrate communities in streams in the Himalaya, Nepal. *Freshw. Biol.* 30(1): 169-180. – (First Author: Catchment Res. Gr., Sch. Pure & Appl. Biol., Univ. Wales, P.O. Box 915, Cardiff, CF1 3TL, UK).
58 streams were sampled in the Annapurna, Langtang and Everest regions. The percentage occurrence of Zygopt. and Anisopt. is stated. Voucher specimens are available, but a species list is not given.

1994

(12065) GOWER, A.M., G. MYERS, M. KENT & M.E. FOULKES, 1994. Relationships between macro-invertebrate communities and environmental variables in metal-contaminated streams in south-west England. *Freshw. Biol.* 32(1): 199-221. – (Dept Biol., Geogr. & Environ. Sci., Univ. Plymouth, Plymouth, Devon, PL4 8AA, UK).
Macroinvertebrate occurrence and information on 39 variables were recorded at 46 sites on 12 Cornish streams affected to varying extents by past metalliferous mining. Relationships between macroinvertebrate communities and environmental variables were examined using canonical correspondence analysis (CCA), and 4 CCA-derived groups were identified. Copper was the strongest correlate with Axis 1 of the analysis, suggesting that it may have a major role in determining community structure. Its mean concentrations (μgl^{-1}) were: group 1: 15.9; group 2: 42.1; group 3: 164.5; group 4: 832.1. Cordulegaster boltonii occurred in groups 1-3. In groups 1-2 it was present in most sites, where it was contributing < 1% to the community. In group 3 its occurrence was locally restricted, but the dragonfly contributed 1.0-4.9% to the community. The mean values of some other variables in the Cordulegaster sites, such as e.g. Al, Zn, Cl, $CaCO_3$, hardness, etc., are also highly instructive. No other odon. spp. are mentioned.

(12066) ORMEROD, S.J., S.D. RUNDLE, S.M. WILKINSON, G.P. DALY, K.M. DALE & I. JUTTNER, 1994. Altitudinal trends in the diatoms, bryophytes, macroinvertebrates and fish of a Nepalese river system. *Freshw. Biol.* 32(2): 309-322. – (First Author: Catchment Res. Gr., Sch. Pure & Appl. Biol., Univ. Wales, P.O. Box 915, Cardiff, CF1 3TU, UK).
The studies were conducted on tributaries in 2 subsections of the Langtang/Trisuli river system, central Nepal. The percentage occurrence of the "Gomphidae" is stated, but no other odonatol. information is presented.

(12067) PALMER, C., A. PALMER, J. O'KEEFFE & R. PALMER, 1994. Macroinvertebrate community structure and altitudinal changes in the upper reaches of a warm temperate southern African river. *Freshw. Biol.* 32(2): 337-347. – (First Author: Inst. Water Res., Rhodes Univ., Grahamstown-6140, SA).
The role of altitude and slope in structuring the macroinvertebrate community was studied along the uppermost 31 km of the Buffalo R. (Amatole Mts, eastern Cape, South Africa), with an elevation change of 780 m. Riffle samples were collected and environmental variables measured monthly, Apr. 1986-Apr. 1988. The community structure changed most between the headwater and foothill sites. The odon. representation (%) in the communities at 4 stations was in the summer (winter) as follows: stn 1 (alt. 1120 m, afromontane forest) 16.5 (dry in winter); – stn 2 (alt. 520 m foothill site) 29.0 (11.0); – stn 3 (alt. not stated, agricultural land) 33.0 (66.9); – stn 4 (alt. 340 m, market gardening, river affected by fertilizer-rich agricultural run-off) 21.5 (22.1). – A species list is not given, but voucher specimens are deposited at Albany Museum, Grahamstown. – For the same river see also *OA* 8258.

(12068) STRAYER, D.L., 1994. Body size and abundance of benthic animals in Mirror Lake, New Hampshire. *Freshw. Biol.* 32(1): 83-90. – (Inst. Ecosystem Stud., Box AB, Millbrook, NY 12545, USA).
There is a strong negative correlation between body mass and population density for 192 spp. from the zoobenthos of the small, oligotrophic Mirror Lake, White Mts, NH, USA. Data are presented also for a non-identified "Odonata sp.".

(12069) SUREN, A.M., 1994. Macroinvertebrate communities of streams in western Nepal: effects of altitude and land use. *Freshw. Biol.* 32(2): 323-336. – (NIWA Ecosystems, P.O. Box 8602, Christchurch,

NZ).
This is one of the extremely few papers on the entomology of the Dolpo region. 43 streams were surveyed (alt. 850-4250 m), but only a passing reference is made to the "Gomphidae", which is considered a lowland family.

1995

(12070) BAL, H., H.M. BEIJE, Y.R. HOOGEVEEN, S.R.J. JANSEN & P.J. VAN DER REEST, 1995. *Handboek natuurdoeltypen in Nederland. – Handbook of nature target types in the Netherlands.* IKC Natuurbeheer, Wageningen. 408 pp. [Rapport No. 11]. – ISSN 0929-7014. (Dutch, with Engl. s.). – (Orders to the publishers: Postbus 30, NL-6700 AA Wageningen).
The handbook provides a methodological basis for realization of the Netherlands national ecological network by means of a comprehensive set of "nature target types'. 20 odon. spp. are listed as "target species", and 3 as "internationally important species".

(12071) BREWIN, P.A., T.M.L. NEWMAN & S.J. ORMEROD, 1995. Patterns of macroinvertebrate distribution in relation to altitude, habitat structure and land use in streams of the Nepalese Himalaya. *Arch. Hydrobiol.* 135(1): 79-100. – (Catchment Res. Gr., Sch. Pure & Appl. Biol., Univ. Wales, P.O. Box 915, Cardiff, CF1 3TL, UK).
Includes some quantitative (suborder-wise) data on Anisopt. in Likhu Khola and Langtang Valley, central Nepal.

(12072) KOPSCH, H., 1995. Zum Vorkommen der Prachtlibellen (Fam. Calopterygidae) im Kreis Wurzen. *Veröff. NaturkMus. Leipzig* 13: 122-123. – (Müglenzer Str. 3, D-04808 Falkenhain).
The 1991-1994 status of Calopteryx splendens and C. virgo in the Mulde and Lossa rivers is outlined.

(12073) MOUTA FARIA, M., 1995. *Comportamento territorial e reprodutor das libélulas Calopteryx virgo e Calopteryx haemorrhoidalis. Parque Nacional Pineda-Gerês, Braga.* 69 pp., 8 col. pls excl. ISBN 972-8083-41-6. – Price: ESC 500.- net. (Port., with Engl. s.). – (Orders to: Parque Nacional da Pineda--Gerês, Quinta das Parretas, PT-4700 Braga).
A very attractive little book on the behaviour of the 2 spp., as evidenced in the Pineda-Gerês National Park, Portugal. The Author is a veterinary doctor, and many of the older publications on the subject are also considered in the text.

(12074) WOHL, D.L., J.B. WALLACE & J.L. MEYER, 1995. Benthic macroinvertebrate community structure, function and production with respect to habitat type, reach and drainage basin in the southern Appalachians (U.S.A.). *Freshw. Biol.* 34(3): 447-464. – (First Author: Dept Ent., Univ. Georgia, Athens, GA 30602, USA).
In order to identify taxonomic differences in invertebrate biomass and production in different habitat types, quantitative samples were collected during 1 yr from depositional cobble-riffle, and bedrock outcrop habitats at 4 stream reaches in Wine Spring Basin, W North Carolina. In depositional habitats, functional group biomass was comprised primarily of predators (incl. odon., largely Lanthus), shredders and some collector-gatherers. Some odon. (incl. Lanthus) occurred also in cobble-riffle samples, but they were completely absent in the bedrock community. Quantitative data of annual mean standing stock of habitat-specific biomass and secondary production are stated for the order and for Lanthus separately.

(12075) ZBOROWSKI, P. & R. STOREY, 1995. *A field guide to insects in Australia.* Reed Books, Chatswood/ NSW. 208 pp., 244 col. phots & 140 figs incl. ISBN 0-7301-0414-1. – Price UK £ 17.50 net.
The book is directed at the reader "with minimal prior knowledge"; its primary objective is to provide a means of identification to the level of order. The odon. are dealt with on pp. 46-50, where some general features are outlined, and col. phots of 6 spp. are presented.

1996

(12076) BROCK, T.C.M. & G. VAN DER VELDE, 1996. Aquatic macroinvertebrate community structure of a Nymphoides peltata-dominated and macrophyte-free site in an oxbow lake. *Neth. J. aquat. Ecol.* 30(2/3): 151-163. – (First Author: DLO Winand Staring Cent., Postbus 125, NL-6700 AC Wageningen).
The investigations were carried out in the Bemmelse Strang, a shallow, alkaline, eutrophic oxbow in the forelands of the Waal R., nr Nijmegen, the Netherlands. Mean abundance per m^2 of the Nymphoides littoral is stated for Ischnura elegans; while no odon. were evidenced at the open water site.

(12077) CELLOT, B., 1996. Influence of side-arms on

aquatic macroinvertebrate drift in the main channel of a large river. *Freshw. Biol.* 35(1): 149-164. – (Ecol. Eaux Douces, Univ. Lyon-I, F-69622 Villeurbanne).
Drift from lotic and lentic side-arms to the main channel of the Upper Rhône R. was studied over 2 yr in the Brégnier-Cordon area, at about mid-distance between Geneva and Lyon, France. 4 odon. spp. and their abundances (number of individuals) in drift were identified, viz. Calopteryx splendens (35), Platycnemis pennipes (42), Enallagma cyathigerum (8), and Anax imperator (2).

(12078) HOFFMAN, R.L., W.J. LISS, G.L. LARSON, E.K. DEIMLING & G.A. LOMNICKY, 1996. Distribution of nearshore macroinvertebrates in lakes of the northern Cascade Mountains, Washington, USA. *Arch. Hydrobiol.* 136(3): 363-389. – (Dept Fish. & Wildlife, 104 Nash Hall, Oregon St. Univ., Corvallis, OR 97331, USA).
Various attributes of high mountain lake ecosystems were found to affect distributions of nearshore macroinvertebrates in 41 oligotrophic lakes of North Cascades National Park Service Complex. 6 odon. fams were collected from forest lakes, 2 of these also from subalpine lakes, and none in the alpine zone. Taxonomic names are not stated.

(12079) MARCHANT, R. & C.M. YULE, 1996. A method for estimating larval life spans of aseasonal aquatic insects from streams in Bougainville Island, Papua New Guinea. *Freshw. Biol.* 35(1): 101-107. – (First Author: Mus. Victoria, 71 Victoria Crescent, Abbotsford, Vic. 3067, AU).
The larval life span of Lieftinckia kimminsi in 2 tropical streams with near constant water temperatures lasts 250 days.

(12080) MÖCKEL, R., 1996. Zur Libellenfauna des NSG "Putgolla" bei Kolkwitz. *Natur Landsch. Niederlausitz* 17: 25-30. – (Buchwalder Str. 13, D-01968 Kleinkoschen).
A checklist of 18 spp., incl. Coenagrion hastulatum, with water quality data of the respective habitats; – Südbrandenburg, E Germany.

(12081) PRENDA, J. & A. GALLARDO-MAYENCO, 1996. Self-purification, temporal variability and the macroinvertebrate community in small lowland Mediterranean streams receiving crude domestic sewage effluents. *Arch. Hydrobiol.* 136(2): 159-170. – (First Author: Depto Biol. Animal/Zool., Fac. Cienc., Univ. Cordoba, Avda San Alberto Magno s/n, ES-14004 Cordoba).
In monthly samples (Jan.-May 1987), Salado stream (Guadalquivir system), S Spain, Chalcolestes viridis and Sympetrum striolatum were identified. No comments on their occurrence are given.

(12082) SCHRACK, M., S. HEISE & U. KLUDIG, 1996. Zur Libellenfauna in zwei Waldmooren der Königsbrück-Ruhlander Heiden. *Veröff. Mus. Westlausitz Kamenz* 19: 65-80. – (First Author: Eugen-Hoffmann-Str. 7, D-01219 Dresden).
An annotated and commented list of 33 spp. The autochthony of Somatochlora arctica and Leucorrhinia albifrons, and the 1995 records of Hemianax ephippiger are of particular local interest; – Grossdittmannsdorf, Saxony, E Germany.

(12083) SUGIMURA, M., 1996. *Tombo okoku: Tombo Shizen-koen ga mietekuru.* – [*Dragonfly Kingdom guide: Dragonfly Natural Park at a glance*]. Tombo to Shizen wo kangaeru kai, Nakamura. 112 pp. ISBN none. – Price: ¥ 1200.- net. (Jap., with taxonomic nomenclature). – (Publishers: Tombo to Shizen wo kangaeru kai, 8055-5, Gudo, Nakamura, Kochi, 787, JA).
Another valuable guide to the dragonfly world of the Nakamura "Dragonfly Park", by its Director. (For some other book titles on the same subject see *OA* 5171, 6901, 7414.) The highly interesting novelty of the present work is the concise and illustrated account on the origin and history of the Park. Intended as a field guide, the book actually is a small dragonfly "handbook", outlining the main biological features of the order, and presenting a concise, pictorial "key" for the area, incl. the Shikoku taxa outside the Kochi prefecture.

(12084) VAN DEN BRINK, F.W.B., G. VAN DER VELDE, A.D. BUIJSE & A.G. KLINK, 1996. Biodiversity in the Lower Rhine and Meuse River-floodplains: its significance for ecological river management. *Neth. J. aquat. Ecol.* 30(2/3): 129-149. – (First Author: Dept Water Manag., Prov. Limburg, Postbus 5700, NL-6202 MA Maastricht; – Second Author: Lab. Aquat. Ecol., Univ. Nijmegen, Postbus 9010, NL-6500 GL Nijmegen).
Includes summary data on the past and current numbers of odon. spp. in the Lower Rhine and Meuse R. and in the floodplain lakes, the Netherlands. Species are not listed.

1997

(12085) ADAMOVIĆ, Ž.R. & S.T. VIJATOV, 1997. Morphometric distinction of Platycnemis pennipes nitidula Brullé, 1832 from P. p. pennipes Pallas, 1771 (Odonata: Platycnemididae). *Acta ent. serb.* 2(1/2): 61--75. (With Serb. s.). – (First Author deceased; – Second Author: Inst. Med. Res., P.O. Box 721, YU-11001 Beograd, Serbia).
It is shown statistically that in both sexes of P. p. nitidula the hind tibiae are significantly larger than in the nominate ssp. Likewise, the ratio, maximum width of hind tibia : length of median tibial spine, is in both sexes of nitidula significantly higher than that in the nominate ssp. The distribution of the 2 taxa is discussed.

(12086) CONZE, K.-J., 1997. Die Libellenkartierung Nordrheinwestfalen. *Verh. westdt. EntTag. Düsseldorf* 1996, p. 88 [abstract only]. – (Listerstr. 13, D-45147 Essen).
A brief outline of the set-up and objectives of the Rhineland-Westphalia odon. mapping scheme. The preliminary publications, "*Erste vorläufige Verbreitungskarten der Libellen in NRW*" and "*Bibliographie der Libellenliteratur in NRW*", are available from the Author, at cost.

(12087) DAVIDS, C., 1997. The influence of larval parasitism on life history strategies in water mites (Acari, Hydrachnidia). *Arch. Hydrobiol.* 141(1): 35-43. – (Dept Aquat. Ecotoxicol., Univ. Amsterdam, Kruislaan 320, NL-1098 SM Amsterdam).
Emerged Acari larvae have to find a proper host (e.g. Odon., Heter., Trich., Col. or Dipt.) and, if successful, they gain as a parasite the amount of energy necessary to complete the next step in their life cycle. The duration of the parasitic phase depends on the life span of the host and can last from a few days (Dipt., Odon.) to a couple of weeks (Heter., Col.). Larvae parasitizing in chironomids or odon. increase only slightly in size, but Arrenurus agrionicolus larvae, parasitic on Zygopt., increased 27 times in dry weight during 6 days of parasitism (cf. R. Mitchell, 1969, *Am. Midl. Nat.* 82: 359--366).

(12088) HABDIJA, I., I. RADANOVIĆ & B. PRIMC--HABDIJA, 1997. Longitudinal distribution of predatory benthic macroinvertebrates in a karstic river. *Arch. Hydrobiol.* 139(4): 527-546. – (Dept Zool., Fac. Sci., Univ. Zagreb, Rooseveltov trg 6, CRO-10000 Zagreb).
The biomass and habitat data are presented for 4 odon. taxa from the Kupa/Kolpa R., a boundary river between Croatia and Slovenia.

(12089) HOLUŠA, O., 1997. Vážky (Odonata) širšího okoli Lednice na Moravě. – The dragonflies (Odonata) of the broad surroundings of Lednice in Moravia. *Sb. přír. Klubu Uher. Hradišti* 2: 93-108. (Czech, with Engl. s.). – (Bruzovská 420, CZ-73801 Frýdek--Mistek).
30 spp. are listed, with detailed locality data and comments. 5 of these, incl. Crocothemis erythraea, are new for the region; – Czech Republic.

(12090) HOLUŠA, O., 1997. Výskyt šidla rašelinného (Aeshna subarctica Walker, 1908; Odonata: Aeshnidae) v Hrubém Jeseniku (Česká republika). – The occurrence of dragonfly Aeshna subarctica Walker, 1908 (Odonata: Aeshnidae) in the Hrubý Jesenik Mts (Czech Republic). *Čas. slez. Muz. Opava* (A) 46(3): 287-288. (Czech, with Engl. s.). – (Bruzovská 420, CZ-73801 Frýdek-Mistek).
5 ♂, 1 ♀, 2 exuviae; Rejviz moorland, alt. 745 m; 8--IX-1997. Oviposition in Eriophorum stands was also noticed

(12091) KIPPING, J., 1997. Zur Situation der Kleinen Königslibelle, Anax parthenope (Insecta, Odonata) in Thüringen. *Mauritiana* 16(2): 462-464. – (Ringstr. 5/6, D-04600 Altenburg).
The 1991-1997 occurrence of A. parthenope in Thuringia, E Germany, is reviewed and the possible factors, responsible for the recent significant increase of records, are tentatively discussed.

(12092) MÖCKEL, R., 1997. Die Libellen der Calauer Schweiz mit "angeschlossenen" Teichlandschaften. *Natur Landsch. Niederlausitz* 18: 16-36. – (Buchwalder Str. 13, D-01968 Kleinkoschen).
The odon. fauna (34 spp.) of an area S of Calau, Oberspreewald-Lausitz distr., Brandenburg, E. Germany, is described and discussed. Much emphasis is given to the habitat and water quality descriptions and to detailed field observations (1993, 1994) on single spp. and their local ecology.

(12093) NIEDRINGHAUS, R., 1997. Die Bestands-situation der Fauna einer intensiv genutzten Agrarlandschaft in Nordwestdeutschland: Konzept, Zielrichtung und Ablauf des Untersuchungsprogramms. *Abh. westf. Mus. Naturk.* 59(4): 75-88. – (Fachb.

Biol., Univ. Oldenburg, Postfach 2503, D-26111 Oldenburg).
The assessment is largely based on faunal evidence, as given in the paper listed in *OA* 12094; – Lingen, Ems; surface of the area ca 8 km².

(12094) NIEDRINGHAUS, R., 1997. Die Limnofauna (Mollusken, Libellen, Köcherfliegen, Wasserkäfer, Wasserwanzen) eines durch Ausbau und Agrarnutzung stark gestörten Gewässersystems in Nordwestdeutschland. *Abh. westf. Mus. Naturk.* 59(4): 209-236. – (Fachb. Biol., Univ. Oldenburg, Postfach 2503, D-26111 Oldenburg).
Includes an annotated and commented list of 24 odon. spp. The exact locality (in Emsland, NW Germany) is not stated. – See *OA* 12093.

(12095) PONTA, U., 1997. [Die Gurk und ihre Seitengewässer]. Odonata (Libellen). *Carinthia II* (Sonderh.) 55: 86-89, 166. – (Kärntner Inst. Seenforschung, Flatschacher Str. 70, A-9020 Klagenfurt).
Based on larval evidence, 10 spp. are listed from the Gurk R. and its tributaries, Carinthia, Austria, without precise localities. The list includes Cordulegaster bidentata, C. boltoni and Somatochlora metallica.

(12096) SAVAGE, A.A. & D.L. BEAUMONT, 1997. A comparison of the benthic macroinvertebrate communities of a lowland lake, Oak Mere, in 1980 and 1994. *Arch. Hydrobiol.* 139(2): 197-206. – (Dept Biol. Sci., Keele Univ., Staffordshire, ST5 5BG, UK).
10 odon. spp. are listed for 1980. In the subsequent surveys no marked changes were noted until 1994, when the water level was very low and not a single odon. sp. was present at this NW Midlands lake, England. In other taxa, species richness decreased by 78% and numbers of individuals by 92%. The marked change in the macroinvertebrate community is attributed to the fall in water level, which left vegetation stranded and a large area of the former littoral zone exposed.

(12097) SCHRACK, M., 1997. Moorwälder und Waldmoore am Pechfluss in der Laussnitzer Heide. *Veröff. Mus. Westlausitz Kamenz* (Sonderh.) 1997: 7-112. – (Eugen-Hoffmann-Str. 7, D-01219 Dresden).
The monograph includes an annotated and commented list of 29 odon. spp. (pp. 88-92, 112); – Laussnitzer Heide, nr Medingen, Saxony, E Germany.

(12098) STERNBERG, K., 1997. Metapopulationskonzept am Beispiel von Aeshna subarctica elisabethae Djakonov und anderen Libellenarten (Odonata) und seine Bedeutung für den Naturschutz. *Verh. westdt. EntTag, Düsseldorf* 1996, p. 92 [abstract only]. – (Schillerstr. 15, D-76297 Stutensee).
For the full paper see *OA* 10610.

(12099) TOMAN, M.J. & P.C. DALL, 1997. The diet of Erpobdella octoculata (Hirudinea: Erpobdellidae) in two Danish lowland streams. *Arch. Hydrobiol.* 140(4): 549-563. – (Second author: Freshw. Biol. Lab., Univ. Copenhagen, 51 Helsingørsgade, DK-3400 Hillerød).
The guts of 5 size classes of leeches were examined, and the prey, referable to 3 insect orders and several other invertebrate taxa, was identified. Although some potential prey taxa could escape recognition, Odon. and Heteroptera are excluded as a likely prey.

(12100) UBUKATA, H., 1997. Impact of global warming on insects. *In*: A. Domoto & K. Iwatsuki, [Eds], Threats of global warming to biological diversity, pp. 273-307, Takijishokan, Tokyo. (Jap.). – Unabridged Engl. translation, by N. Ishizawa, 17 pp. – (Copies available from the Eds of *Odonatologica*, Bilthoven; 7 international postal reply coupons should be enclosed with the order for each copy required.)
A good review, with much emphasis on Odon. Some of the main chapters: "Global warming ... What is happening to insects now?"; – "What has happened in the world of dragonflies? Northward expansion of dragonflies"; – "Northward expansion of dragonflies in America and in Europe" – "Disappearance of northern dragonflies"; – "How far North can butterflies and dragonflies reach?" – "'Green deserts' and 'concrete jungles' that obstruct northward range shifts"; – "The fate of the northern insects" – "Will endemic dragonflies be extinguished from brackish water habitats?". – The publication contains many previously unpublished data, notably also those of Dr S.W. Dunkle.

1998

(12101) ABBOTT, J. & K. STEWART, 1998. Current knowledge of Odonata in the south central nearctic region, including northeastern Mexico. *Bull. N. Am. benthol. Soc.* 15(1): 168 [abstract only]. – (Dept Biol. Sci., Univ. North Texas, Denton, TX 76203, USA).
[Verbatim:] There has not been a concerted effort to document the extent of biodiversity, distribution and geographic affinities of the Odon. of the south central

US and NE Mexico. The area is an important boundary for some spp. representing eastern nearctic and subtropical faunas, and a mixing zone or dispersal corridor for other spp. Since 1993, we have done extensive collecting of all life stages in the 7 biotic provinces of Texas, and compiled published and extensive unpublished records from the portions of these provinces of US and Mexican states that join Texas. Here we list 227 spp. for this region (197 in Texas), indicate their distributions by biotic province, and discuss the regional biogeography and importance of rare spp.

(12102) *AGRION, NJN*, Vol. 43, No. 1 (July 1998). (Dutch). – (c/o J. van der Meulen, Oude Rijnsburgerweg 42, NL-2342 BC Oegstgeest).
[Odonatol. articles; in Dutch only]: *Van Grunsven, R.* Libo's van de Kampina (pp. 15-21); – *Vahl, W.*: Dagvlinders, nachtvlinders, libo's èn zweefjes [...] in Limburg (pp. 25-27); – *De Heij, M.*: Motregen en watersnuffel (pp. 30-32); – *Jonker, A., P.P. Jonker & J. van der Meulen*: Onderzoek naar territoriumgedrag bij juffers (pp. 39-40).

(12103) *AGRION, PURLEY*. Newsletter of the Worldwide Dragonfly Association, Vol. 2, No. 2 (June 1998). – (c/o Mrs J. Silsby, 1 Haydn Ave, Purley, Surrey, CR8 4AG, UK).
In addition to various WDA management news and the standard sections, viz. "News from members", "News from the universities" and "News from the national groups", the following are some of the articles of general interest: *Sahlen, G.*: Current research on dragonflies in Sweden (pp. 15-16); – *Parr, A.*: Recent migrant dragonflies in Britain (pp. 17-18); – and *Goodyear, K.*: Thoughts on Sympetrum fonscolombei (p. 18; in Dorset, UK). The issue also contains several minor personal notes, various meeting and other announcements, and the membership list mutations.

(12104) *ARGIA*. The news journal of the Dragonfly Society of the Americas, Vol. 10, No. 2 (5 July 1998). – (c/o Dr & Mrs T.W. Donnelly, 2091 Partridge Lane, Binghamton, NY 13903, USA).
[Signed articles:] *Tennessen, K.*: Results of the Southeastern DSA Meeting in Georgia, May 15-17, 1998 (pp. 1-2); – *Donnelly, N.*: Northeastern Meeting in Maine: good bugs in spite of the weather! (pp. 2-3); – *Daigle, J.*: The use of odonates to assess lake quality in Florida (p. 4); – *Donnelly, N.*: The history of Odonata: the fourth phase (pp. 5-8); – *Tingley, S.*: More Somatochlora brevicincta (p. 8); – *Carpenter, G.*: Notes from Rhode Island (p. 8); – *O'Brien, M.*: Notes from Michigan (pp. 8-9); – *Valley, S.*: Notes from Oregon (p. 9); – *Muller, B.*: Pursuing the Arrow Clubtail (pp. 9-10); – *Donnelly, N.*: Back to Thailand and Malaysia: Farangpo 98 (pp. 10-13); – *Daigle, J.J.*: Megalagrion and Heteragrion: two notes (pp. 14-15); – *Corbet, P.*: Correction: authorship of poem in previous issue (p. 15; incl. a statement that his "Behaviour and ecology of dragonflies" is now "due for publication early in 1999").

(12105) *ATROPOS* ["the UK's premier journal for active Lepidoptera and Odonata enthusiasts"], No. 5 (June 1998). – (36 Tinker Lane, Meltham, Huddersfield, W Yorks, HD7 3EX, UK).
[Odon. articles:] *Davey, P.*: The winter immigration of 1998 (pp. 7-12); – *Parr, A.*: Winter dragonfly sightings in Britain during early 1998 (pp. 13-16); – *Elsby, K.*: My best day (pp. 33-35); – *Porter, J.*: My suburban garden (pp. 37-38); – *Wildermuth, H.*: Vagrant Emperor, Hemianax ephippiger (Burm.), female, Unterlunkhofen, Switzerland, August 1989 (pl. 2, fig. 8; photographic record); – *Evans, M. & S. Preddy*: The dragonfly fauna of the Bristol district (pp. 51-54); – *Hill, P.M.*: (Insects reported during January-June 1998 (pp. 62-65); – *Parr, A.*: Lesser Emperor Anax parthenope in Britain during early 1998 (p. 66); – Red-veined darter Sympetrum fonscolombei in Britain during early 1998 (p. 67); – *Goodey, B.*: Addition to Thompson Common, Norfolk (p. 70; reference to Lestes dryas and Sympetrum flaveolum); – White-faced darter Leucorrhinia dubia in Cheshire: a request for information (p. 71); – *Parr, A.*: New Odonata Records Committee (p. 72).

(12106) BARENDREGT, A., P. OOSTERBROEK, W. VAN STEENIS & T. ZEEGERS, 1998. Rode Lijsten als instrument bij bescherming van insecten. – Red Data Lists as an instrument for the conservation of insects. *Ent. Ber., Amst.* 58(6): 124-132. (Dutch, with Engl. s.). – (First Author: Koninginnelaan 9, NL-3781 GK Voorthuizen).
The different aims of the use of Red Data Lists are discussed. These aims lead us to the formulation of 5 central questions. First, the objectiveness and correctness of the procedure for composing such lists is investigated. Different criteria for presence and decline result in Red Data Lists containing totally different sets of spp. From a scientific point of view the procedure nowadays used by the Dutch government is proven not to be the best one. Secondly, it is asked to

what extent Red Data Lists may be useful in protecting individual spp. Preservation of individual spp. is only possible with concrete insight in the ecology of the spp. Red Data Lists do not generate these insights themselves, but may be useful in drawing the attention of scientists and the public to endangered spp. The third question concerns the usefulness of Red Data Lists for the protection of the complete biodiversity in The Netherlands. If Red Data Lists would be available for all groups of organisms found in The Netherlands, we would have at least 15,000 spp. on these lists. Clearly, this is of no use. However, the idea of making a selection in these Red Data Lists is obviously of limited use to protect our biodiversity in total. The fourth question concerns the use of Red Data Lists in measuring the quality of areas of natural interest. The Dutch Government has decided to use a selection of the Red Data Species as target spp. for nature conservation activities. However, selecting the most scarce and endangered spp. results in poorly defined ecosystems. The suggestion that 100 insect spp. can indicate the niche of all insect spp. in all ecosystems has not been verified and, in the view of the present authors, seems rather unlikely. Finally the alternative methods to ensure a real protection of all biodiversity, as prescribed by the Rio-treaty, are investigated. Since most insects are poorly known, a policy focusing on habitats and their protection is of the utmost importance. The best way to incorporate the conservation of insects in such a policy is not by using the rare and endangered spp., but by using the characteristic insects in a system of target spp. for the measurement of the ecological quality of sites (Green Lists).

(12107) BATTLE, J.M., S.W. GOLLADAY & L.K. KIRKMAN, 1998. Seasonal changes in invertebrate communities in three types of limesink wetlands in SW Georgia. *Bull. N. Am. benthol. Soc.* 15(1): 161 [abstract only]. – (J.W. Jones Ecol. Res. Center, Ichauway, Rte 2, Box 2324, Newton, GA 31717, USA).
[Verbatim:] Limesink wetlands are a common feature in SW Georgia, USA. These are non-alluvial, shallow depressions that are seasonally inundated. Previous analysis of vegetation and soil data collected on these wetlands has suggested 3 types: closed-canopy forested, cypress-gum, and herbaceous. We wanted to determine if macroinvertebrates assemblages and water chemistry differed between these wetland types. Macroinvertebrates and physico-chemical variables were sampled in 29 undisturbed wetlands located on Ichauway Ecological Reserve (10,500 ha), SW Georgia during Feb., Apr. and June 1997. Principle components analysis indicated the 3 wetland types had similar environmental characteristics upon initial inundation, but by Apr. wetland types diverged. Forested wetlands tended to have higher NH_4N levels, darker color, higher carbon concentrations, more organic matter, and lower pH than the cypress and herbaceous wetlands. Multivariate statistics indicated Chaoboridae (Chaoborus) and hemipterans (Notonecta, Hesperocorixa) were abundant in forested wetlands. Herbaceous sites tended to be dominated by Coenagrionidae (Ischnura, Enallagma), Chironomidae and Ceratopogonidae (Bezzia). In cypress-gum wetlands, isopods (Caecidotea) and amphipods (Crangonyx) were common. Despite the close proximity of all wetlands, distinct plant and invertebrate assemblages appear to be present. The underlying factors controlling the biota of limesink wetlands is unknown, but is being addressed in long-term research.

(12108) BAUER, S., 1998. Libellenbeobachtungen im westlichen Allgäu. *Mitt. ArbGem. Wangen Allgäu* 5: 104-112. – (Im Tobel 5, Immenried, D-88353 Kisslegg).
Annotations on field observations on 41 spp., from 17 localities in Allgäu, S Germany.

(12109) [BISTERBOSCH, E. & R. DEN BESTEN] AALDIJK, I., 1998. Op zoek naar Ikarusblauwtje. *Utrecht present* (Overvecht) 14 (8 Sept.): 3. (Dutch).
Incidental article in a local newspaper, includes several (dated) odon. records from the Beatrixpark in Lunetten, Utrecht, the Netherlands.

(12110) BOURASSA, J.-P., 1998. Quelques éléments sur l'histoire et les préoccupations de l'entomologie québécoise. *Insects, Opie* 109(2): 11-13. – (Dép. Chim.-Biol., Univ. Québec, Trois-Rivières, QC, CA).
A brief, incomplete review of the history of entomology in Quebec, Canada, with a passing reference to the odon.

(12111) BOWEN, K.L., N.K. KAUSHIK & A.M. GORDON, 1998. Macroinvertebrate communities on biofilm chlorophyll on woody debris in two Canadian oligotrophic lakes. *Arch. Hydrobiol.* 141(3): 257-281. – (Second Author: Dept Environ. Biol., Univ. Guelph, Guelph, ON, N1G 2W1, CA).
Wood-associated macroinvertebrates and biofilm chlo-

rophyll-a were investigated in 2 lakes in Algonquin Provincial Park, Ontario. Invertebrate communities on littoral submerged coarse woody debris were compared with those on experimentally introduced substrates consisting of fresh branches, which were monitored for 1 yr. The data include 4 aeshnid and corduliid genera, Coenagrionidae, and early instar Zygoptera and Anisoptera. – For the odon. fauna of the Park see *OA* 10984.

(12112) *BRACHYTRON*, Vol. 2, No. 1 (May 1998). (Dutch, with Engl. s's). – (c/o W.J.A. Hoeffnagel, Krekelmeent 72, NL-1218 ED Hilversum).
Van Delft, J.J.C.W.: Sympetrum pedemontanum (Allioni, 1766) in the Netherlands (pp. 3-9); – *Bal, D.*: The role of dragonflies in the Dutch nature policy (pp. 10-15); – *Wasscher, M. & E. Goutbeek*: Tropical Neurothemis fluctuans (Fabricius) in a Dutch greenhouse (pp. 16-17); – *Beukema, J.J.*: The possible functions of the tail-tip display in male Calopteryx (pp. 18-22); – *Dijkstra, K.-D.B., D. Groenendijk & V.J. Kalkman*: Odonata of the Dutch St Petersberg (pp. 23-27); – *Book reviews*, by *R. Ketelaar, K.-D. Dijkstra, J. Hermans* and *F. Bos* (pp. 28-30). – (*Abstracter's Note*: In his book review of the volume listed in *OA* 11587, *R. Ketelaar* makes some comparisons between the mapping work in Slovenia and in the Netherlands. For the latter cf. *OA* 10331. One of the principal differences between the 2 projects is not mentioned: all Slovene records are documented by voucher specimens, while the Dutch maps are largely based on sight records, though prior to their entry they are "evaluated" by a "Committee for evaluation of the Netherlands Odonata observations, CWNO").

(12113) BUCZYŃSKI, P., 1998. Ważki (Odonata) reserwatu "Torfowisko przy Jeziorze Czarnym" i okolic (Pojezierze Łeczyńsko-Włodawskie). – Dragonflies (Odonata) of the "Peatbog at Czarne Lake" Nature Reserve and environs (Łeczna-Włodawa Lake District). *Parki narod. Rezer. Przyr.* 17(2): 87-96. (Pol., with Engl. s.). – (Dept Zool., Crie-Skladowska Univ., Akademicka 2, PO-20033 Lublin).
34 spp. were evidenced during 1995-1997, incl. Sympetrum pedemontanum, which is new for the Podlasie region, Poland. Significant changes that thave occurred in the regional odon. fauna during the past 3 decades are discussed.

(12114) CANFIELD, T.J., E.L. BRUNSON, F.J. DWYER, C.G. INGERSOLL & N.E. KEMBLE, 1998. Assessing sediments from Upper Mississippi river navigational pools using a benthic invertebrate community evaluation and the sediment quality triad approach. *Archs environ. Contam. Toxicol.* 35(2): 202-212. – (First Author: R.S. Kerr Environ. Res. Lab., US Environ. Prot. Agency, 919 Kerr Research Dr., Ada, OK 74820, USA).
24 stations between Hastings/MN and St Louis/MO were selected for assessment of sediment toxicity, sediment chemistry and bethic macroinvertebrate communities, based on historical chemistry data and the availability of soft sediments. The odon. were present in only 4 samples; their occurrence is not further discussed.

(12115) CANNINGS, S.[G.], R.[J.] CANNINGS & R.[A.] CANNINGS, 1998. *The world of fresh water.* Greystone Books, Vancouver-Toronto. x+118 pp. ISBN 1-55054-635-X. – Price: Can.$ 20.- net.
This is one of the 6 small softcover books, based on various chapters of the larger British Columbia natural history work, as listed in *OA* 11371, and published by the same Publisher. The present text comes from a single chapter, but it is much enlarged, doubling the amount of the originally presented information. In addition to a small chapter on "Dragonfly watching" (pp. 72-73), the book contains numerous references to the odon., using vernacular nomenclature throughout.

(12116) CATTANEO, A., G. GALANTI, S. GENTINETTA & S. ROMO, 1998. Epiphytic algae and macroinvertebrates on submerged and floating-leaved macrophytes in an Italian lake. *Freshw. Biol.* 39(4): 725-740. – (Second Author: Ist. Ital. Idrobiol., Largo Tonolli 50, I-28048 Pallanza).
In contiguous beds of submerged Myriophyllum spicatum, Ceratophyllum demorsum and Najas marina and floating-leaved Trapa natans vegetation in Lago di Candia (45°19'N, 7°54'E; surface 1.52 km^2, alt. 226 m), the mean abundances (ind. kg plant^{-1} DW) of "Lestes sp." and "Orthetrum sp." were 105 and 1, resp. The more varied morphology of T. natans did not result in a higher diversity of epiphytic macroinvertebrates.

(12117) CHELMICK, D.G., 1998. *The dragonflies of Cameroon: an identification key to the larvae.* Cameroon Dragonfly Project, Haywards Heath, ii+90 pp. ISBN none. – Price: UK£ 20.- net. – (31 High Beech Lane, Haywards Heath, West Sussex, RH16

1SQ, UK).
The objective of the book is to provide guidance to field workers in identifying larvae at least to the level of genus and, where possible, down to sp. In addition to the keys, descriptions and good figs, comprehensive annotations on taxonomy, ecology, etc. are provided for numerous taxa. – As the first of its kind on the African fauna, the importance of the work goes far beyond the western and central regions of the continent.

(12118) CLAUSNITZER, V., 1998. Territorial behaviour of a rainforest dragonfly Notiothemis robertsi (Odonata: Libellulidae): proposed functions of specific behavioural patterns. *J. Zool., Lond.* 245: 121--127. – (Zum Lahnberg 14, D-35043 Marburg).
The studies were carried out in the Kakamega Forest, W Kenya (Dec. 1994-Feb. 1995). 7 activities were distinguished: perching, sun-flights, patrolling, inspection, interspecific, intraspecific, and sexual flights. Two-act sequences of these behaviours were analysed and quantified to determine significant transition probabilities. Sun-flights into the tree canopies were the most common flight activity and followed any other behaviour significantly more often than expected. Coming back from a sun-flight, the ♂♂ preferentially perched or patrolled; after patrolling ♂♂ typically perched. Most of the time the ♂♂ spent perching in their territory (32% of total time in territory). Proposed functions of these territorial behavioural activities in N. robertsi are deduced from these results.

(12119) CLAUSNITZER, V. & J. LEMPERT, 1998. Preliminary comparative approach of the reproductive behaviour of African Tetratheminae (Anisoptera: Libellulidae). *J. afr. Zool.* 112(2): 103-107. – (First Author: Zum Lahnberg 14, D-35043 Marburg).
Ecological and ethological aspects of 14 spp. are compared. These mainly inhabit tropical rainforests, where they breed in small pools and in running waters. In all studied spp., the ♂♂ are territorial over long periods. The oviposition mode differs significantly between the genera.

(12120) COPELAND, R., 1998. Erratum. *Aquatic Insects* 20(3): 196.
A corrective note on the paper listed in *OA* 10965.

(12121) CZACHOROWSKI, S., P. BUCZYŃSKI, O. ALEXANDROVITCH, R. STRYJECKI & A. KURZATKOWSKA, 1998. Materiały do znajomości owadów i pajeczków rezerwatu "Las Warmiński" (Pojezierze Olsztyńskie). – Material required for knowledge of insects and arachnids of the "Warmiński Forest" Nature Reserve (The Olsztyn Lake District). *Parki narod. Rezerv. Przyr.* 17(2): 75-86. (Pol., with Engl. s.). – (Second Author: Dept Zool., Curie--Skladowska Univ., Akademicka 19, PO-20033 Lublin.
Includes a commented list of 19 odon. spp., evidenced during 1995-1996 at the Lyna R. and at various water bodies in the region, Poland.

(12122) DANIEL, B.A., 1998. *Directory of Invertebrate Conservation Network members, India, 1997-98.* Zoo Outreach Organisation, Coimbatore. 49 pp. – (Author & Publisher: 79 Bharathi Colony, P.B. 1683, Peelamedu, Coimbatore-641004, Tamil Nadu, India).
Includes addresses of Indian odon. workers, with person-wise outlines of research interests, lists of current research projects, and selected personal bibliographies.

(12123) DAVID, S. & V. JANSKÝ, 1998. Vážki (Odonata) Východoslovenské roviny. – The dragonflies (Insecta, Odonata) from Východoslovenska Rovina Plain (southeastern Slovakia). *Entomofauna carpathica* 10: 10-21. (Slovak, with Engl. s.). – (First Author: Inst. Landscape Ecol., Slovak Acad. Sci., Akademická 2, P.O. Box 23/b, SK-94901 Nitra).
Commented records of 35 spp., with a checklist of 48 spp. so far known from the region.

(12124) *DIGEST OF JAPANESE ODONATOLOGICAL SHORT COMMUNICATIONS*, No. 8 (July 1998). – Translated, edited & produced by N. Ishizawa (1644--15, Yamaguchi, Tokorozawa, Saitama, 359-1145, JA). *Ishida, S.*: The dragonfly fauna of the Bonin Islands and its present condition (pp. 1-3); – *Naraoka, H.*: A list of dragonflies in Hotokenuma Marsh, Aomori prefecture (Insecta, Odonata) (pp. 3-4); – *Ishizawa, N.*: Choice of wind direction in the tandem flight by ovipositing pairs of Sympetrum frequens (p. 4); – *Arai, Y.*: Collection of a reddened female Sympetrum risi risi in Chichibu (p. 4).

(12125) DOBSON, M., 1998. Flying ability and geographical distribution of aquatic insects in Northwest Africa. *Bull. N. Am. benthol. Soc.* 15(1): 155 [abstract only]. – (Dept Envir. & Geogr. Sci., Manchester Metropolitan Univ., Chester St., Manchester, M1 5GD, UK).
[Verbatim:] An important determinant of the geo-

graphical distribution of a spp. is its ability to cross habitat barriers. In this respect, the Maghreb of NW Africa, isolated from areas of similar humidity by desert to the S and E and by the sea to the N, provides an important case study. Following the distribution patterns shown by mammals in the region, it may be predicted that strongly flying aquatic insects (e.g. Odon.) would show strong faunal affinities with southern Europe, whereas weak fliers, (e.g. Ephemeroptera, Plecoptera) would show strongest affinities with sub-Saharan Africa. In fact, this prediction is not borne out: Ephemeroptera and Plecoptera inhabiting the Maghreb are almost exclusively derived from Europe, while the odon. fauna, although mainly European, has clear Afrotropical elements. This suggests that even weak flight can be important in determining distribution patterns - the ability to become airborne, even for very short periods, increases the chances of accidental dispersal across barriers. That dispersal is accidental and occasional is evidenced by the high degree of endemism amongst maghrebi mayfly and stonefly spp., suggesting occasional colonisation rather than continuous faunal exchange between Europe and Africa, while, in contrast, many dragonfly spp. indulge in regular intercontinental migration.

(12126) DOLE-OLIVIER, M.-J., 1998. Surface water-groundwater exchanges in three dimensions on a backwater of the Rhône river. *Freshw. Biol.* 40(1): 93-109. – (Freshw. & River Ecol. Res. Unit, Univ. Claude Bernard Lyon, 1-43 bd du 11-Novembre-1918, F-69622 Villeurbanne).
Hydrological exchange between the surface stream and the hyporheic zone is well documented in the main channel of rivers. In the present work, exchanges of water and biota in a secondary channel are reported, using a 3-dimensional framework. The list of taxa includes young instars of the Coenagrionidae. – See also *OA* 9872.

(12127) DOMMANGET, J.-L. & A. LALANNE, 1998. Les demoiselles et les forestiers. *Insectes, Opie* 109(2): 29 [abstract only]. – (First Author: 7 rue Lamartine, F-78390 Bois-d'Arcy).
The original publication has appeared in *Arborescences* 72 (Jan./Feb. 1998), but it is not available for abstracting.

(12128) FOSSATI, O., P. VALLIER & M. MOSSERON, 1998. Macroinvertebrate assemblages in rivers of Nuku-Hiva, French Polynesia, before and after antisimuliid treatments. *Arch. Hydrobiol.* 142(2): 229-240. – (First Author: Lab. Ichthyol., Mus. Natn. Hist. Nat., 43 rue Cuvier, F-75231 Paris; – Other Authors: ORSTOM/ITRMLM, B.P. 30, Papeete, Tahiti, French Polynesia).
Nuku-Hiva is a small volcanic island (340 km^2; highest mountain elevation 1224 m.a.s.l.) in the Marquesas. 2 samplings have taken place in Apr.-May 1991 (before treatments) and March 1994 (1 yr after Abate application to all running waters on the island). Effects of antisimuliid treatments were not perceptible. The Lestidae were abundant in the middle reaches, the Coenagrionidae were restricted to the upper reaches. Specific names are not stated. – See also *OA* 9503, 9523, 10503.

(12129) *GRACILE* [Newsletter of Odonatology], Osaka, No. 59 (1 July 1998). (Jap., with Engl. titles). – (c/o K. Inoue, 5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545-0004, JA).
Inoue, K.: A short account of Slovene dragonflies (pp. 1-27); with Engl. s.); – *Sasamoto, A.*: Records of Ictinogomphus pertinax in the Nara Basin, Nara prefecture (pp. 28-29); – A ♂-f. esakii like specimen caught in the southern part of Kyoto prefecture (pp. 30-31); – *Anaze, N.*: Note on the odonate fauna of Mitsuike Ponds, Shioya-cho, Gobo City, Wakayama prefecture (pp. 32-33); – *Sogame, S.*: Small records of emergence of Stylurus annulatus and Stylurus oculatus in Shiga prefecture (pp. 34-35); – *Shimizu, N., T. Yagi & T. Yamamoto*: A record of Sympetrum depressiusculum at Aonogahara in Hyogo prefecture (p. 36); – *Nakatsuji, F.*: A record of dragonflies in Amami-oshima Island, Kagoshima prefecture (pp. 37-39); – *Tabata, O.*: Report of the survey trip on the odonate fauna of North Kyoto, (8), the Japan Sea Area (pp. 40-41); – *Kiauta, B.*: Congratulation message for the 100th meeting of the K.R.G.O. (pp. 42-44; Engl. & Jap.); – *Aoki, T.*: The 100th meeting of the Kansai Research Group of Odonatology (pp. 45-48); – *Tani, K. & I. Matsuda*: The Congratulation Party of the 100th meeting of the Kansai Research Group of Odonatology and Mr K. Inoue's Presidency of the S.I.O. (pp. 49-55).

(12130) HARP, G.L., 1998. Dragonflies of the tropical dry forest: 1. Costa Rica. *Bull. N. Am. benthol. Soc.* 15(1): 171 [abstract only]. – (Dept Biol. Sci., Arkansas St. Univ., State University, AR 724678, USA).
[Verbatim:] From 17 March through 27 Apr. 1996 the dragonflies of the tropical dry forest of the Area de

Conservacion Guanacaste (ACG) were surveyed under the direction of El Instituto Nacional de Biodiversidad. This area embraces the contiguous national parks of Guanacaste, Rincon de la Vieja and Santa Rosa, in Guanacaste Province. This survey is the first comprehensive study of the area's dragonflies during the dry season. Objectives included developing a species list, spatial distribution and relative abundance for the dragonflies of the ACG. Because of the dry conditions, small lotic systems were practically the only aquatic habitats available, and most specimens were collected there. However, slowly walking the various trails between streams would also flush several interesting species, which could then be netted rather easily. Of the 78 spp. collected, those commonly found include Hetaerina capitalis, Argia ulmeca, and Erythrodiplax funerea. These are also the most widely distributed spp. 11 spp. are newly reported for Guanacaste Province, and Tramea insularis is reported for the first time from Costa Rica. As one would predict, dragonfly diversity was not as great during the dry season as during the wet season.

(12131) HECKMAN, C.W., The seasonal succession of the biotic communities in wetlands of the tropical wet-and-dry climatic zone: 5. Aquatic invertebrate communities in the Pantanal of Mato Grosso, Brazil. *Int. Rev. Hydrobiol.* 83(1): 31-63. – (Inst. Hydrobiol., Zeiseweg 9, D-22765 Hamburg).
The invertebrate life cycles in the Pantanal of Mato Grosso are profoundly influenced by the annual alternations between a period of very heavy rainfall and several months with almost no rain. Here, the local Portuguese names are used for the seasons. The *enchente* is the early rainy season, generally coinciding with the spring (Sept.-Dec.), when flooding first occurs. The high water period during the late rainy season, or *cheia*, corresponds to summer (end Dec.-March). The *vazante* is the period during which the water level rapidly decreases as a result of diminished rainfall and runoff (late March-June). The dry winter season is called *seca* or *estagiam*. As the *enchente* advances, many odon. are seen depositing eggs in shallow rainwater pools on the roads. For many odon. spp., the *vazante* is a transition period, during which the adults of spp. that are active during the *seca* begin to emerge, while those active during the *cheia* can still be observed on wings. Adults of a few spp., incl. Erythrodiplax umbrata, seem to be active the year round. For ca 20 regionally common spp. (Protoneuridae, Coenagrionidae, Calopterygidae, Gomphidae, Libellulidae), the habitats, seasonal occurrence, the predators and the prey are tabulated.

(12132) HEIDEMANN, H., 1998. *El cocepto de Stylurus: notas sobre su fundamento*. SIO Iberian Regional Office, Cordoba. 13 pp., 15 figs excl. – (Available from: Dr M. Ferreras-Romero, Depto Biol. Animal/Zool., Fac. Cienc., Univ. Cordoba, Avda San Alberto Magno s/n, ES-14004 Cordoba).
Span. edn of the paper published originally in *Libellula* 8(3/4): 115-144; 1989.

(12133) HEIJERMAN, T. & H. TURIN, 1998. Rode Lijsten: zinvol of vol onzin? – The Reda Data Lists: sense or nonsense? *Ent. Ber., Amst.* 58(6): 92-104. (Dutch, with Engl. s.). – (Dept Anim. Taxon., Agric. Univ., Binnenhaven 7, NL-6709 PD Wageningen).
Red Data Lists are lists of spp. which are believed to be rare or declining and therefore at risk of (local) extinction. For The Netherlands, the Ministry of Agriculture, Nature Management and Fisheries has developed a system of classifying endangered spp., adapted from the official IUCN Red Data List approach. Red Lists serve a large number of purposes. Most important, Red List spp. are automatically selected as spp. needing special attention in nature of policy and management (target spp.). However, the Red List format - especially the definition and application of status categories - has some serious weaknesses. In this study these weaknesses and pitfalls are examined by compiling Red Lists for Dutch carabid beetles following both the official procedure and some alternative approaches. From the evaluations it is concluded that the classification into Red List categories leads to highly arbitrary results. It is also argued that the concept of rarity is not defined in a biological meaningful way and that population trends can not be assessed quantitatively on the basis of existing data. It is suggested that conservationists may not be in need of national Red Data Lists at all.

(12134) HOOGEVEEN, Y., 1998. Rode Lijsten in het Nederlandse natuurbeleid. – Red Data Lists in Dutch nature policy. *Ent. Ber., Amst.* 58(6): 86-91. (Dutch, with Engl. s.). – (Winand Staring Centrum, P.O. Box 125, NL-6700 AC Wageningen).
Red Data Lists have a dual purpose. On the one hand, they raise public awareness for the loss of biodiversity. On the other, they may serve as the basis for conservation policy and its evaluation. Especially for this latter purpose, it is essential that Red Data Lists have

an official status and are methodologically sound. This article deals with the general methodology of Red Data Lists in The Netherlands and their status within Dutch nature policy. The nature policy of the Dutch government is aimed at maintaining biodiversity through the establishment of the national ecological network. This network consists of core areas, nature development areas and ecological corridors. Regional plans and local management goals are expressed in terms of national target types. They integrate an ecosystem approach and a species approach. Both target spp. and ecological processes are used as quality parameters for the target types. The selection of target spp. is partly based on national Red Data Lists. Red Data Lists thus become an important basis for defining policy targets and evaluation of policy results. – The paper includes information on the Netherlands odon. Red List, and a statement on the current national status of Gomphus vulgatissimus.

(12135) HUTCHINSON, R., 1998. Découverte de Boyeria grafiana Williamson (Odonata: Aeshnidae) en Gaspésie. *Fabreries* 23(1): 22-23. – (12 ch. de la Savane, app. 12, Gatineau, QC, J8T 1P7, CA).
1 ♂, Lac à Hector, nr St Alphonse, Quebec, Canada; 13-IX-1997.

(12136) INOUE, T., 1998. The inhabitive state of a Tiny Dragonfly, Nannophya pygmaea Rambur, after the transfer to another area together with the soil of its original habitat. *Jap. J. environ. Ent. Zool.* 9: 1-7. (Jap., with Engl. s.). – (Insect Mus., Insect Preserv. Assoc., Tsurata, Utsunomiya, Tochigi, 320-0047, JA).
During 3 yr, more than 150 individuals were kept under continuous observation in the new area. It is concluded that the population transfer, coupled with the transfer of the soil, is perfectly effective. Statistical data on the new population, and its phenology and behaviour are presented.

(12137) JACOBSEN, D. & A. ENCALADA, 1998. The macroinvertebrate fauna of Ecuadorian highland streams in the wet and dry season. *Arch. Hydrobiol.* 142(1): 53-70. – (First Author: Freshw. Biol. Lab., Univ. Copenhagen, 51 Helsingørsgade, DK-3400 Hillerød; – Second Author: Depto Cien. Biol., Pontif. Univ. Catól. Ecuador, Apdo 17-01-2184, Quito, Ecuador).
6 specimens of "Aeshnidae" are listed from 3 stream localities in the Central Valley, Andes (alt. 2600-2650 m), N Ecuador, taken during the wet and dry seasons. Physical and chemical data on the localities are also provided, but the spp. are not named and the records are not discussed.

(12138) KARUBE, H., 1998. A new species of the genus Oligoaeschna (Odonata, Aeschnidae) from northern Vietnam. *Gekkan-Mushi* 330:2-5. (Jap. & Engl.). – (3573-142, Kayama, Odawara-shi, Kanagawa, 250--0852, JA).
O. niisatoi sp. n. is described and illustrated. Holotype ♂, 3 ♂ paratypes: Mt Piaoac, Cao Bang prov., N Vietnam, 23-V-1998; all deposited in Kanagawa Prefect. Mus. Nat. Hist., Odawara. The new sp. is probably related to O. kashiana, from Khasia Hills, NE India, from which it differs in the structure of inferior and superior appendages.

(12139) KOHL, S., 1998. *Anisoptera-Exuvien (Grosslibellen-Larvenhäute) Europas: Bestimmungsschlüssel.* Kohl, Uster. 27 pp. – (Seestr. 107, CH-8610 Uster).
A nicely produced and well illustrated identification key, with comprehensive instructions on the preparation of an exuviae collection.

(12140) KOPERSKI, P., 1998. Feeding in epiphytic, carnivorous insects: resource partitioning and the avoidance of intraguild predation. *Arch. Hydrobiol.* 142(4): 467-483. – (Dept Hydrobiol., Univ. Warsaw, Banacha 2, PO-02-097 Warszawa).
The gut contents of larval Enallagma cyathigerum, Cyrnus flavidus (Trich.), and Ablabesmyia monilis (Chironomidae) feeding in nature and in experimental aquaria, were analysed. The diet of C. flavidus overlapped greater with the diet of A. monilis than with that of E. cyathigerum. Feeding intensity and diet composition in C. flavidus and A. monilis were different in experimental aquaria with and without E. cyathigerum. Weights of their food and mean weights of their prey were lower in the presence of the latter when compared with the control, while the number of prey items was not. The proportion of active prey items in diets of C. flavidus and A. monilis were higher in the presence of E. cyathigerum but the numbers of such prey items were higher in the diet of C. flavidus only. These differences are probably caused by reduced predator mobility during feeding, not by a behavioural response from prey. Induced changes in feeding activity are considered an effect of a behavioural defence mechanism reducing the risk of intraguild predation.

(12141) KOPERSKI, P., 1998. Predator-prey interactions between larval damselflies and mining larvae of Glyptotendipes gripekoveni (Chironomidae): reduction in feeding activity as an induced defence. *Freshw. Biol.* 39(2): 317-324. – (Dept Hydrobiol., Univ. Warsaw, Banacha 2, PO-02-097 Warszawa).
The feeding methods and intensity of predation by larval Erythromma najas on leaf-mining larvae of G. gripekoveni were examined in artificial habitats differing in complexity. The experiments assessed the influence of chemical stimuli from the predator, light and the concentration of suspended food on the feeding activity of G. gripekoveni inside and outside of the mine. E. najas preyed upon G. gripekoveni as the latter grazed outside mines. The intensity of this predation decreased significantly at night in a habitat offering alternative prey. When the food concentration for the chironomid was high, it significantly reduced both filtering activity and activity outside mines in response to the kairomone produced by E. najas. Feeding activity did not change when food was scarce. The induced reduction in filter-feeding and deposit-feeding activity probably reduced predator success by reducing the probability of long-distance detection of a mine and location of the chironomid's hole. The predator can detect and catch mining prey in either the light (visually) or dark (mechanically). This may explain the lack of diel periodicity in the chemically induced differences in prey activity. Reduced feeding activity of mining larvae in the chemically simulated presence of a larval damselfly can be explained as an induced antipredator behaviour, illustrating the trade-off between feeding demands and predation risk in a poorly known link of the littoral foodweb.

(12142) LEEPER, D.A. & B.E. TAYLOR, 1998. Insect emergence from a South Carolina (USA) temporary wetland pond, with emphasis on the Chironomidae (Diptera). *Jl N. Am. benthol. Soc.* 17(1): 54-72. – (Savannah Riv. Ecol. Lab., Univ. Georgia, Drawer E, Aiken, SC 29802, USA).
At Rainbow Bay, a 1.5-ha temporary wetland pond (maximum depth 1.0 m) in Barnwell Co., 115 taxa, representing 7 orders were collected using emergence traps, March 1992-June 1993. Depression wetlands of this kind, which dry during summer, may be unavailable as oviposition site for many odon. spp. Nonetheless, 3 odon. taxa were considered in the present work.

(12143) LEMPERT, J., 1998. Zum Fortpflanzungsverhalten von Libellen (Odonata) im tropischen Regenwald von Liberia. *In*: K.G.Gaida, [Ed.], Zeitvertrieb, Vol. 2, pp. 71-79, Salon-Verlag, Köln. ISBN 3-932189-63-9. – (Vereinsstr. 41, D-20357 Hamburg).
16 field photographs, with explanatory captions, but no other text.

(12144) *LIBELLULA*. Mitteilungsblatt der Gesellschaft deutschsprachiger Odonatologen (GdO), Vol. 17(1/2) (June 1998). – (c/o Mrs U. Krüner, Gelderner Str. 39, D-41189 Mönchengladbach).
Wildermuth, H.: Ethologische und ökologische Beobachtungen an Larven von Cordulia aenea (Linnaeus) (Anisoptera: Corduliidae) (pp. 1-24); – *Schiel, F.-J. & R. Buchwald*: Aktuelle Verbreitung, ökologische Ansprüche und Artenschutzprogramm von Leucorrhinia pectoralis (Charpentier) (Anisoptera: Libellulidae) in baden-württembergischen Alpenvorland (pp. 25-44); – *Wildermuth, H.*: Verlängerte Flugzeiten von Somatochlora flavomaculata (Vander Linden) und S. arctica (Zetterstedt): Folge ungewöhnlicher Wetterverhältnisse? (Anisoptera: Corduliidae) (pp. 45-58); – *Schütte, C.*: Uberwinterung der Eier von Gomphus flavipes (Charpentier) und Ophiogomphus cecilia (Fourcroy) (Anisoptera: Gomphidae) (pp. 59-70); – *Fliedner, H.*: Johann Franz Christian Heyer (1777-1864) und sein Beitrag zur Kenntnis der Libellen. 1. Teil (pp. 71-90); – *Malkmus, R.*: Frühjahrsbeobachtungen von Libellen in Portugal (pp. 91-96); – *Kuhn, J.*: Ein neuer Fund von Lestes macrostigma (Eversmann) in Bayern (Zygoptera: Lestidae) (pp. 97-101); – *Brockhaus, T.*: Terrestrische Eiablage durch Sympetrum vulgatum (Linnaeus) (Anisoptera: Libellulidae) (pp. 103-105); – *Jödicke, R.*: Indizien für gelegentliches Abtauchen weiblicher Lestes virens vestalis Rambur bei der Eiablage (Zygoptera: Lestidae) (pp. 107-108); – *Lempert, J.*: Erythromma viridulum (Charpentier) und Sympetrum fonscolombii (Selys) auf Helgoland (Anisoptera; Libellulidae; Zygoptera: Coenagrionidae) (pp. 109-112); – *Reder, G.*: Herbstfunde von Somatochlora metallica (Vander Linden) (Anisoptera: Corduliidae) (pp. 113-115).

(12145) *LINDENIA*. Notiziario dell'Ufficio nazionale italiano della Società odonatologica internazionale, Napoli, No. 28 (21 June 1998). – (c/o Dr C. D'Antonio, Via A. Falcone 386/b, I-80127 Napoli).
With the present issue, Dr C. D'Antonio has assumed the editorial and production responsibilities. Prof. C. Utzeri continues heading the SIO National Office in

Italy and has also assumed the responsibilities of the SIO Secretary General. – All traditional sections in the newsletter are retained, incl. the sections, "Archivio Hemianax" and "Distribuzione regionale degli odonati in Italia" (with bibliography).

(12146) MARTINEZ, B., J. VALESCO, M.L. SUÁREZ & M.R. VIDAL-ABARCA, 1998. Benthic organic matter dynamics in an intermittent stream in South--East Spain. *Arch. Hydrobiol.* 141(3): 303-320. – (Dept Ecol. & Hydrol., Fac. Biol., Univ. Murcia, Campus de Espinardo, ES-30100 Murcia).
Contains information on mean densities (ind/m^2) of 6 odon. spp. in the Chicamo stream, Murcia, SE Spain. The highest densities were reached by Coenagrion scitulum, followed by Orthetrum brunneum and O. chrysostigma.

(12147) *MARTINIA*. Revue scientifique de la Société Française d'Odonatologie, Vol. 14, No. 1 (March 1998), No. 2 (June 1998). (Most papers with Engl. s's; all papers with Engl. translation of the title). – (c/o J.-L. Dommanget, 7 rue Lamartine, F-78390 Bois-d'Arcy).
With the present volume, the previous A5 size of the journal has been increased to 17×24 cm, and the layout modified. – [No. 1]: *Klein, J.-P. & J.-P. Berchtold*: Les odonates de réserves naturelles d'Erstein, d'Offendorf et de Rhinau (Bas-Rhin, France): statut et menaces (pp. 3-18); – *Prot, J.-M.*: Reproduction d'Hemianax ephippiger (Burmeister, 1839) dans le département du Jura (Odonata, Anisoptera, Aeshnidae) (pp. 19-22); – *Le Calvez, V. & C. Bernier*: Observations d'odonates lors des VIIèmes rencontres internationales des clubs CPN (Frouville, département du Val-d'Oise) (p. 22); – *Storck, F.*: Etude odonatologique de l'espace naturel de la plaine de Sorques: saison 1997 (département de la Seine-et--Marne) (pp. 23-29); – *Male-Malherbe, E.*: Confirmation de la présence d'une population d'Epitheca bimaculata (Charpentier, 1825) dans le département de l'Indre (Odonata, Anisoptera, Corduliidae) (p. 30); – *Dommanget, J.-L., A. Kohn & B. Verbeck*: Trois nouvelles espèces d'odonates pour le Bois de Bajolet (commune de Forges-les-Bains, département de l'Essonne) (pp. 30-31); – *Dommanget, J.-L.*: Analyse et commentaires relatifs au "Catalogue des libellulidées des environs de Besançon" de M. Léandre Pidancet (1856) (pp. 31-36); – *Pidancet, L.*: Catalogue des libellulidées des environs de Besançon (pp. 37-44; facsimile reprint of the 1856 publication in *Mém. Soc. Émul. Doubs* [II] 7: 1-7). – [No. 2]: *Gavory, L. & J.-L. Dommanget*: redécouverte de Leucorrhinia rubicunda (L., 1758) en France (Odonata, Anisoptera, Libellulidae) (pp. 47-52); – *Laurent, S. & M. Papazian*: Les odonates des lagunes de l'île de Porquerolles (département du Var) (pp. 53-55); – *Dommanget, J.-L.*: Microhabitats refuges pour les larves d'Aeshna cyanea (Müller, 1764) lors de l'assèchement du milieu (Odonata, Anisoptera, Aeshnidae) (p. 56); – *Elder, J.-F. & P. Fouillet*: Inventaire des odonates du département de la Manche (pp. 57-74); – *Papazian, M.*: Chronique de l'insolite. 1. Crocothemis erythraea (Brullé, 1832) et la chenille; Sympetrum striolatum (Charpentier, 1840) et la pluie (pp. 75-76).

(12148) MATSUKI, K., 1998. [Rediscovery of Somatochlora clavata in Chiba prefecture]. *Nature & Insects* 33(7): 45. (Jap., with taxonomic nomenclature). – (1575-14, Hazama 3-chome, Funabasi, Chiba pref., 274-1822, JA).
A larva was taken at Funatsu, 13-IV-1997. The last previous record from the prefecture was published by Asahina (1954) and Wakana & Eda (1956). The labial and abdominal structural features are illustrated.

(12149) MATSURA, T., K. NOMURA & K. KOMATSU, 1998. Ecological studies of odonate larvae living in artificial ponds in an urban area: occurrence of larval Sympetrum striolatum imitoides and its life history in primary school swimming pools. *Jap. J. Ecol.* 48(1): 27-36. (Jap., with Engl. s.). – (First Author: Dept Biol., Kyoto Univ. Educ., Fushimi-ku, Kyoto, 612-0863, JA).
During 4 yr, the larval odon. fauna of the Kyoto primary school outdoor swimming pools was systematically surveyed. 11 spp. were encountered, S. s. imitoides is dominant. The dominance of the sp. is believed to be due to some peculiarities in its ecology and life history. The latter was studied in detail and it is described here.

(12150) MAY, M.L., 1998. A phylogeny of the damselfly genus Enallagma (Odonata: Zygoptera: Coenagrionidae). *Bull. N. Am. benthol. Soc.* 15(1): 217-218 [abstract only]. – (Dept Ent., Cook Coll., Rutgers Univ., P.O. Box 231, New Brunswick, NJ 08903-0231, USA).
[Verbatim:] As currently recognized, the genus Enallagma comprises about 70 spp., mostly in N America but with some 20 representatives in Africa

and a few in the Palearctic and Oriental regions. Based on a set of 47 morphological characters, I constructed a series of phylogenies for the genus using PAUP, making various alternative assumptions about character weighting. A total of 9 coenagrionid spp. outside Enallagma, including ischnurines and non-ischnurines, were included in the analysis to polarize characters. All cladograms were rooted using a single sp., Chromagrion conditum, thought to be the one most distantly related to Enallagma. Although numerous polytomies remain unresolved, several important conclusions are supported under all or most assumptions: (1) N american spp. form a monophyletic clade that also includes Palearctic spp. of the cyathigerum group; – (2) African and Oriental spp. are paraphyletic with respect to the N American clade and among themselves; – (3) species groups 1 (cyathigerum) and 3 (signatum) of Walker (1953) are supported, but group 2 (exsulans) may well be paraphyletic.

(12151) McPEEK, M.A. & B.L. PECKARSKY, 1998. Life histories and the strengths of species interactions: combining mortality, growth, and fecundity effects. *Ecology* 79(3): 867-879. – (First Author: Dept Biol. Sci., Dartmouth Coll., Hanover, NH 03755, USA).
Interactive effects of one sp. on another may simultaneously influence mortality, growth and fecundity. To quantify the strength of an interaction between 2 spp., techniques must be used that integrate these various responses into estimates of overall effect. Demographic models of populations provide such a framework. Here is developed a demographic model describing the life history of a hemimetabolous insect to evaluate the relative importance of predator effects on mortality and growth of Enallagma boreale in fishless ponds and mayflies, Baetis bicaudatus, in trout streams. – Previous experiments have shown that dragonfly predators in fishless ponds inflict direct mortality and cause reduced growth rates in Enallagma damselflies. Parameterization of the demographic model from these data show, however, that only the direct mortality effects of dragonflies should significantly influence damselfly population dynamics. This is because damselfly size at emergence does not influence adult ♀ fecundity, so the effects of Anisopt. on Zygopt. larval growth do not influence adult fecundity. Likewise, both trout and stonefly predators inflict mortality on larval Baetis and cause decreases in growth rates. However demographic analyses indicate that the growth effects of both predators should dominate the population-dynamic effects on Baetis. This is because size at emergence translates directly into adult fecundity in mayflies. Data are also presented suggesting that developmental responses to changes in environmental conditions (e.g. predator abundances, resource availabilities) differ between spp. depending on these same life history parameters. – The biological significance of lethal vs sublethal predator impacts must be evaluated in a demographic framework to identify whether alterations in growth rate, and the timing of and size at metamorphosis, significantly influence population dynamics. The demographic model used for any particular organism must be tailored to its life history, but the various impacts of interactions with other spp. can all be integrated into estimates of projected population growth that can then be readily compared among spp. with different life histories.

(12152) McWILLIAM, H.A. & R.G. DEATH, 1998. Arboreal arthropod communities of remnant podocarp-hardwood rainforest in North Island, New Zealand. *N. Z. Jl. Zool.* 25(2): 157-169. – (First Author: Taranaki Reg. Council, Private Bag 713, Stratford, NZ).
Taxonomic composition and abundance of the canopy invertebrate fauna was studied between June 1995 and May 1996 in 3 forest remnants in the Manawatu-Wanganui region, using omnidirectional window traps. The odon. were caught in small numbers, in 2 localities, in Dec. and Jan. only. No species names are stated.

(12153) *MEGANEURA*. Palaeoentomological newsletter. No. 2 (Summer 1998), 32 pp. – (For other details and order address see *OA* 11866).
[Signed articles containing odonatol. information:] *Jarzembowski, E.*: Visit to fossil insect collection, Vienna Natural History Museum (pp. 14-15); – *Azar, D. & A. Nel*: Lebanese Lower Cretaceous amber (pp. 18-20); – *Petrulevicius, J.F.*: Paleogene insects from Northwest Argentina (pp. 22-23). – The issue also contains a current bibliography (pp. 24-31), fossil insects website addresses (pp. 10-11), etc.

(12154) MITRA, A., 1998. Notes on the emergence behaviour of Trithemis festiva (Rambur) (Odonata: Anisoptera) under laboratory condition. *Ann. Forestry, Dehra Dun* 6(1): 72-78. – (North. Regn. Stn, Zool. Surv. India, 218 Kaulagarh Rd, Dehradun-248195, India).
A detailed record of the emergence events, based on 15 larvae. All but 2 individuals emerged during the

late night or early morning hours.

(12155) MIZELL, R.F., L.R. MIZELL & C. MANASA, 1998. Newspapers present entomology to the public. *Fla Ent.* 81(2): 243-251. – (First Author: NFREC-Monticello, Rt 4 Box 4092, Univ. Florida, Monticello, FL 32344, USA).
A commented survey of 132 articles, representing 30--50% of the total in 50 reputable US newspapers (1990--1996), does not include a single dragonfly title.

(12156) MOSTERT, K., 1998. Libellen in het landelijke gebied van Zuid-Holland. – Dragonflies (Odonata) in the agricultural landscape of South Holland. *Levende Nat.* 99(4): 142-149. (Dutch, with Engl. s.; vernacular nomenclature only). – (Palamedesstraat 74, NL-2612 XS Delft).
During the 1994-1997 summer seasons, the adults (28 spp.) were counted systematically along the transects, specified as grasslands, arable land, nature reserves, recreational and urban areas. 8 spp. made up 98% of the total number of the individuals sighted, while Ischnura elegans was in 40% of the transects the sole sp. encountered. A thorough quantitative analysis of the results is presented, but the vernacular nomenclature used in species lists significantly diminishes the legibility of the evidence; – Zuid-Holland prov., the Netherlands.

(12157) *NATURE AND INSECTS*, Vol. 33, No. 10: *Threatened dragonflies*, (Sept. 1998). – ISSN 0023--3218. (Jap., with Engl. titles; mostly vernacular nomenclature only).
Matsuki, K.: Threatened dragonfly species in Japan (pp. 2-3); – *Someya, T.*: The present state of the damselfly Mortonagrion hirosei (pp. 4-8); – *Ohsawa, N.*: Habitats and their present condition of Nehalennia speciosa (pp. 9-13); – *Matsuhira, K.*: The decrease in number of dragonflies in the mainland of Kagoshima prefecture (pp. 14-17); – *Aoki, T.*: A report from Hyogo prefecture on the reduction of population size of Sympetrum maculatum (pp. 18-20); – *Usui, T.*: Endangered dragonflies in Saitama prefecture, Honshu, Japan (pp. 21-25); – *Ehira, K.*: On the present situation of rare species Odonata in the Amami islands (pp. 26-29).

(12158) NEL, A., G. BECHLY, E. JARZEMBOWSKI & X. MARTINEZ-DELCLÒS, 1998. A revision of the fossil petalurid dragonflies (Insecta: Odonata: Anisoptera: Petalurida). *Paleont. lombarda* (N.S.) 10: 1-68. (With Fr. & Ital. s's). – (First Author: Lab. Ent., Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris).
Cretapetalura brasiliensis gen. n., sp. n. (Cretapetaluridae fam. n.) is described from the Lower Cretaceous Santana Formation, Araripe Basin, Brazil; Pseudocymatophlebia hennigi gen. n., sp. n. (Pseudocymatophlebiinae sfam. n. in Aktassiidae) is described from the Lower Cretaceous Weald Clay of England; and Aktassia pritykinae sp. n. from the Lower Cretaceous of Mongolia. The new material makes possible the revision of the phylogenetic position of a number of genera and the designation of neotypes for Protolindenia wittei and Mesuropetalia koehleri. Aeschnogomphus buchi (Hag.) is synonymised with A. charpentieri (Hag.). Mesuropetalia, formerly considered a petalurid, is regarded a basal Aeshnoptera; and Protolindenia, formerly considered a gomphid, is transferred to the Petalurida, as most basal member of the stem-group of Petaluridae. The phylogenetic positions of Mesuropetalia auliensis Prit., M. costalis Prit., Protolindenia aktassica Prit. (in Kazakhophlebiella gen. n.) and P. deichmuelleri Prit. (in Pritykiniella gen. n.) are discussed. A phylogenetic analysis of the fossil and extant Petalurida is presented. The Petalurida are identified as a sister-group of all remaining extant Anisoptera (Euanisoptera). New phylogenetic definitions of the taxon names of Petalurida are proposed, and the evolution and historical biogeography of Petalurida are discussed.

(12159) *NIEUWSBRIEF VAN DE NEDERLANDSE VERENIGING VOOR LIBELLENSTUDIE*, Vol. 2, No. 2 (June 1998), No. 3 (Sept. 1998). (Dutch). – (c/o W.J. Hoeffnagel, Krekelmeent 72, NL-1218 ED Hilversum).
[No. 2:] Notes and considerations on various projects, etc. *A. Wieland* reports on oviposition of Sympetrum sanguineum in brackish water (p. 8). – [No. 3:] *Goudsmids, K.*: Gomphus flavipes in the Netherlands again (p. 2); – *Dijkstra, K.-D.*: Invasion of Anax parthenope? (p. 3); – *Kalkman, V.*: A new breeding site of Sympetrum pedemontanum (p. 3); – *Dijkstra, K.-D.*: Along French streams, pt. 1 (pp. 4-5); – *Hoeffnagel, W.-J.*: Dragonfly phenology in 1998 (pp. 6-7); – *Van Grunsven, R.*: Some noteworthy dragonfly records from the Encigroeve nr Maastricht (p. 8).

(12160) O'ROURKE, J., 1998. Saving a bug makes 14 mining jobs extinct. *Sun-Herald, Sydney*, issue of 29 March.
Backed by 7 government agencies, and upon the de-

mands of local conservation groups, the State Government has placed a (peat) mining ban on the Wingecarribee Swamp nr Robertson, 150 km S of Sydney, Australia. Its objective is the protection of the threatened Petalura gigantea population. This has cost the jobs of 14 men and "may cost many more". In the past 31 yr, ca 3% of the swamp area were affected by peat mining, and the licenced company had plans to mine another 5% of the 410 ha swamp until 2012.

(12161) OTT, J. & W. PIPER, 1998. [Rote Liste gefährdeter Tiere Deutschlands:] Rote Liste der Libellen (Odonata) (Bearbeitungsstand: 1997). *SchrReihe LandschaftsPfl. NatSchutz* 55: 260-263. – (First Author: L.U.P.O., Friedhofstr. 28, D-67705 Trippstadt; – Second Author: Biola, Gothenstr. 4, D-20097 Hamburg).
Out of the 80 spp. so far known from Germany, 53 spp. (66%) are listed in various IUCN categories.

(12162) *PANTALA*. The international journal of odonatology. Vol. 1, No. 1 (Oct. 1998). ISSN 1388-7890. Published & copyright owned by Backhuys Publishers, Leiden. Edited for the Worldwide Dragonfly Association by Prof. Dr H.J. Dumont. Subscription price for 2 semiannually published issues of ca 96 pp. each: NLG 165.- net (= US $ 91.50 net). – (Subscription orders to: Backhuys Publishers, P.O. Box 321, NL-2300 AH Leiden; – *or* through any subscription agent).
Dumont, H.J.: Pantala flies ... (Editorial; p. i); – *May, M.L.*: Body temperature regulation in a late-season dragonfly, Sympetrum vicinum (Odonata: Libellulidae) (pp. 1-13); – *Sakamoto, K., T. Seki, S. Koseki, T. Kashiwagi & E. Eguchi*: Comparative studies on the compound eyes of larvae and adults of an aeschnid dragonfly, Anax nigrofasciatus nigrofasciatus, I: Dorsal part (pp. 15-31); – *Bechly, G.*: New fossil damselflies from Baltic Amber, with description of a new species, a redescription of Litheuphaea carpenteri Fraser, and a discussion on the phylogeny of Epallagidae (Zygoptera: Caloptera) (pp. 33-63; Litheuphaea ludwigi sp. n.); – *Schorr, M., W. Schneider & H.J. Dumont*: Ecology and distribution of Lindenia tetraphylla (Insecta, Odonata, Gomphidae): a review (pp. 65-88); – *Paulson, D.R.*: The distribution and relative abundance of the sibling species Orthemis ferruginea (Fabricius, 1775) and O. discolor (Burmeister, 1839) in North and Middle America (Anisoptera: Libellulidae) (pp. 89-93); – *Prendergast, E.D.V.*: A few Odonata from Ethiopia (pp. 94-96); – *Silsby, J.*: Tetrathemis polleni, its reproductive behaviour and preferred habitat (pp. 96-97).

(12163) PAULSON, D.R., N. MINAKAWA & R.I. GARA, 1998. Recent collections of Odonata from the Kuril Islands. *Species Diversity* 3: 75-80. – (First Author: Slater Mus. Nat. Hist., Univ. Puget Sound, Tacoma, WA 98416, USA).
17 spp. were collected in 1994-1996 from 21 localities. Mnais pruinosa, Aeshna nigroflava, Cordulia aenea, and Pseudothemis zonata are the first records from the archipelago; the last sp. represents a significant range extension from Honshu. Enallagma belyshevi is synonymized with E. circulatum, which is considered a full sp. rather than a ssp. of E. boreale.

(12164) PAVLYUK, R., 1998. Eine Bestandsaufnahme der Parasitenfauna der Odonaten in der Ukraine (Odonata; Sporozoa, Trematoda, Cestoda, Nematoda, Acari). *Opusc. zool. flumin.* 164: 1-23. (With Engl. s.). – (Zool. Mus., Fac. Biol., St. Univ. Lvov, Grushevskogo 4, UKR-290005 Lvov).
An annotated review is presented of the parasite fauna, identified during 1965-1992 in 18160 adult and 500 immature Zygopt. and Anisopt. individuals. The extent, the average and the maximal intensity of infestation are stated, and host specificity is tentatively indicated, where appropriate. The endoparasitic Gregarinidae (Sporozoa) and the ectoparasitic Arrenuridae (Acari) seem to be rather peculiar to certain odon. groups, while the host-parasite specificity appears poorly developed in the 5 evidenced fams of the endoparasitic Trematoda.

(12165) PIRNAT, A., 1998. *Favna in ekologija kačjih pastirjev (Odonata) Ljubljanskega Barja. – Fauna and ecology of dragonflies (Odonata) at Ljubljana Moor.* M.Sc. thesis, Dept Biol., Biotech. Fac., Univ. Ljubljana, Lubljana. ix+92 pp. (Slovene, with Engl. s.). – (Publisher: Večna pot 111, SI-1000 Ljubljana; – Author: Vošnjakova 4a, SI-1000 Ljubljana).
Ljubljana Moor, central Slovenia, has a surface of ca 160 km^2, and is the largest of its kind in central Europe. Since the late 18th century, over 300 km of drainage ditches of various types were constructed, functioning at present as secondary dragonfly habitats, harbouring 32 spp., of which at least 27 breed locally. Based on thorough studies at 126 localities of this secondary aquatic system, the local ecology of all spp. is monographed, the odon. communities are described, the faunal value of the area is assessed, and some appropriate management measures are suggested. The

latter include the creation of 2 nature reserves, harbouring a particularly rich and characteristic odon. fauna, and which should be included in the projected Ljubljana Moor Landscape Park.

(12166) RETTIG, K., 1998. Der Schlupf der Blaugrünen Mosaikjungfer (Aeshna cyanea) an unseren Gartenteichen. *Beitr. Vögel-Insektenwelt Ostfrieslands* 120: 8-9. – (Danziger Str. 11, D-26725 Emden).
178 individuals emerged from Author's garden ponds at Emden, between 27 June and 17 Aug. 1998, as follows: June 8, July 115, Aug. 55. The frequency of exuviae on 10 plant spp. is also stated.

(12167) RETTIG, K., 1998. Vorkommen und Flugzeiten der Libellen und Tagfalter Ostfrieslands. *Beitr. Vögel-Insektenwelt Ostfrieslands* 121: 2-20. – (Danziger Str. 11, D-26725 Emden).
Distribution maps and statements of the first and last adult record for 49 odon. spp.; Ostfriesland, Germany. No text. – cf. also *OA* 10045, 11474.

(12168) SATORIUS, C., 1998. Die wunderbare Welt der Libellen. *Badische neuste Nachr.* (Sonntagsbeil.) 53(193): 6; issue of 23 Aug.
General, with col. phots, in a regional daily, the Karlsruhe edn.

(12169) SCHMUDE, K.L., M.J. JENNINGS, K.J. OTIS & R.A. PIETTE, 1998. Effects of habitat complexity in macroinvertebrate colonization of artificial substrates in north temperate lakes. *Jl N. Am. benthol. Soc.* 17(1): 73-80. – (First Author: Lake Superior Res. Inst., Univ. Wisconsin-Superior, Superior, WI 54880, USA).
The purpose of this study was to determine the effects of substrate complexity on community structure of macroinvertebrates in littoral zones of lakes. Artificial substrates were used to simulate characteristics of structures commonly placed on the lake bed along shorelines. Cement balls in a wire basket simulated rock riprap, whereas concrete patio blocks simulated retaining walls; the samplers had nearly equal surface areas. Samplers were placed in the littoral zones of 3 dissimilar lakes in Wisconsin, and in front of 3 types of shorelines: rock riprap, vertical retaining wall, and natural shorelines. Colonization periods were 40-45 d starting immediately after ice-out. Significantly greater numbers of organisms colonized basket samplers (1947 ± 155/m^2, mean ± 1 SE) than block samplers (951 ± 73/m^2). Taxa richness was significantly higher on baskets (31 ± 1) versus blocks (22 ± 1). Hydra, Turbellaria, Oligochaeta, Crustacea, Ephemeroptera, and Odon. were significantly more abundant on baskets than on blocks. Mollusca, Hydrachnida, and Chironomidae showed a strong trend toward greater abundance on baskets. Only Trichoptera was equally abundant on both samplers. Neither abundance nor richness differed significantly among shoreline types, but a trend of higher values for both variables was observed along rock riprap. The results were consistent with the hypothesis that the more complex, 3-dimensional artificial substrate, with its greater substrate heterogeneity, surface complexity, and interstitial space, will support a more diverse and abundant macroinvertebrate community in lakes compared to the less complex, 2-dimensional artificial substrate. Shoreline management practices that reduce habitat complexity may reduce local invertebrate diversity.

(12170) SCHNEIDER, W. & H.J. DUMONT, 1998. Checklist of the dragonflies and damselflies of Soqotra island (Insecta: Odonata). *In*: H.J. Dumont, [Ed.], Soqotra, Vol. 1, pp. 219-231, UN Publs, New York. ISBN 90-804341-1-6. – (Second Author: Inst. Anim. Ecol., Univ. Gent, Ledeganckstraat 35, B-9000 Gent).
A review of the 18 hitherto known Soqotra spp., Yemen. Enallagma granti is the sole endemic, all the others are also known from the mainland Yemen and/or from Africa. With 11 representatives, the Afro-tropical faunal elements prevail in the odon. fauna of the island. Considering the geographical position and physiography, and the relatively high number of spp. recorded from the neighbouring countries (Somalia 55, Yemen 33), it is expected a systematic search would significantly increase the Soqotran odon. list.

(12171) SEKIGUCHI, N., 1998. [Epitheca bimaculata sibirica recorded from northern Nagano prefecture]. *Nature & Insects* 33(7): 10, with a phot. (Jap.). – (2603-2, Iiyama, Nagano, JA).
4 ♂, from 3 localities; 1/5-VI-1997.

(12172) SIH, A., G. ENGLUND & D. WOOSTER, 1998. Emergent impacts of multiple predators on prey. *Trends Ecol. Evol.* 13(9): 350-355. – (Cent. Ecol., Evol. & Behav., Morgan Sch. Biol. Sci., Univ. Kentucky, Lexington, KY 40506-0225, USA).
Although almost all prey live with many types of predators, most experimental studies of predation have examined the effects of only one predator at a time. Recent work has revealed new insights into the emer-

gent impacts of mutliple predators on prey. These studies suggest 2 main types of emergent effect: (1) risk reduction caused by predator-predator interactions, and (2) risk enhancement caused by conflicting prey responses to multiple predators. Some theory and generalities are beginning to emerge concerning the conditions that tend to produce these 2 outcomes. – The paper also includes an annotated review of odonatol. studies that examined multiple predator effects of prey survival and/or mortality.

(12173) STOKS, R., 1998. Indirect monitoring of agonistic encounters in larvae of Lestes viridis (Odonata: Lestidae) using exuviae lamellae status. *Aquat. Insects* 20(3): 173-180. – (Dept Biol., Univ. Antwerp, Groenenborgerlaan 171, B-2020 Antwerpen).
Differences in interference competition between L. viridis larvae were examined using caudal lamellae status of exuviae. Exuviae from a small, temporary, fishless pond nr Antwerp, where this was the sole odon. sp. present, were studied. No lamellae loss during the emergence was seen. Therefore, the lamellae status of the exuviae reflects that of the final instar larvae. The deviations of the distribution of the number of missing lamellae per individual suggests that these are not always lost separately, or that some animals are more prone to agonistic encounters. No differences in agonistic encounters was found between sexes. In accordance with the hypothesis of C.L. Pierce et al. (cf. *OA* 5518), the interference competition was higher in the lestid sp. inhabiting small, temporary, fishless ponds than in the coenagrionid Ischnura posita, inhabiting large, permanent, fish containing water bodies (cf. *OA* 8000).

(12174) *SULZBACH-ROSENBERGER LIBELLEN-RUNDBRIEFE*, No. 7 (Sept. 1998). – (c/o R. Seidenbusch, Klenze Str. 5, D-92237 Sulzbach-Rosenberg).
Seidenbusch, R.: The importance of ratios within larval descriptions (pp. 1-4); – Annotations on the structures of the vulvifer and the postocellar ridge in females of Gomphus and its importance for determination (pp. 5-6).

(12175) *SYMPETRUM, GRENOBLE*, No. 11 (1998). – (c/o C. Deliry, Beauséjour 62, Chef-lieu, F-73610 Aiguebelette-le-Lac).
Deliry, C.: Editorial: de la complexité des messages et de la censure involontaire (pp. 1-2); – *Bal, B.*: Prospection odonatologique en Haute-Savoye: bilan du début de l'année 1996 (pp. 3-5); – *Grand, D.*: Calopteryx haemorrhoidalis & Oxygastra curtisii dans le Rhône suivi d'autres observations sur ce département (pp. 7-10); – *Faton, J.M., J.C. Villaret & C. Deliry*: Observations complémentaires dans les Hautes-Alpes: découverte de Coenagrion coerulescens (Fonscolombe, 1838) sur ce département (pp. 11-16); – *Grand, D.*: Confirmation de la reproduction de Trithemis annulata en France & observations odonatologiques diverses (pp. 17-23); – *Deliry, C.*: Matériel pour une liste rouge des libellules du département de l'Ain (pp. 25-33); – *Faton, J.M.*: Les libellules (Odonata) de la Réserve Naturelle des Ramières du Val de Drôme: inventaire et suivi des peuplements (pp. 35-45); – *Deliry, C.*: Compte-rendu d'étude: Les libellules de la Chute de Brégnier-Cordon (Ain, Isère et Savoie) (pp. 47-75).

(12176) TAKETO, A., 1998. [Four dragonfly species from the Ishikawa and Fukui prefectures.] *Nature & Insects* 33(7): 38. (Jap.). – (1-1-19, Ishibiki, Kanazawa, Ishikawa, 920, JA).
Cordulia aenea amurensis is recorded from Ishikawa, and Aeschnophlebia anisoptera, Anisogomphus maackii and Onychogomphus viridicostus from Fukui; all Japan.

(12177) TUXHORN, C. & D. McSHAFFREY, 1998. Flight velocities of Odonata measured using video techniques. *Bull. N. Am. benthol. Soc.* 15(1): 152 [abstract only]. – (Biol. Dept, Marietta Coll., Marietta, OH 45750, USA).
[Verbatim:] We determined the flight velocity, based on over 2,800 flight segments of individuals of 4 spp. near Marietta, Ohio. A Panasonic Palmsight PV-1557 16x Optical Zoom camcorder was used to record flight of individuals at a pond on 3 dates in 1997. Recording was done between 1-4 pm. Distances on the monitor were determined by reference to mean lengths of individuals caught at the time of filming. The distance a specimen flew between frames was calculated by measuring the on-screen distance and dividing by the magnification factor. This distance was then multiplied by the time between video frames (0.03 sec) to determine velocity. Average flight velocity for all flight segments of the 4 spp. was 1.9 ms^{-1} ($n = 2844$, $\sigma_- = 0.59$). Mean velocities were: Libellula luctuosa 1.7 ms^{-1} ($n = 737$, $\sigma_- = 0.48$), L. lydia 2.0 ms^{-1} ($n = 1963$, $\sigma_- = 0.49$), Pachydiplax longipennis 1.5 ms^{-1} ($n = 59$, $\sigma_- = 0.53$), Tramea lacerata 2.5 ms^{-1} ($n = 85$, $\sigma_- = 0.85$). Significant differences (t-test, $\alpha = 0.05$) were found between the flight velocities of all 4 spp. A positive

correlation exists between the length of the species and average flight velocity.

(12178) [VAN BERKEL, A.], 1998. Vrijwilligers tellen tien jaar lang libellen. – [Volunteers are to count dragonflies during a period of ten years]. *Utrechts Nieuwsblad*, issue of 8 Aug., p. 17. (Dutch). – (Akkerwinde 9, NL-4102 JJ Culemborg).
A regional daily's abridged text of the article, listed in *OA* 12179.

(12179) [VAN BERKEL, A.] DE GRUIJL, D., 1998. Libel, een prachtig en imposant dier. – [Dragonfly, a magnificent and impressive animal]. *Rivierenland*, issue of 8 Aug., p. 17. (Dutch). – (c/o Mrs A. van Berkel, Akkerwinde 9, NL-4102 JJ Culemborg).
A regional daily's interview with one of the collaborators of the Netherlands odon. monitoring program. At present, the odon. communities are monitored at 150 localities, but this is to increase for another 250 sites in the near future. Van Berkel's col. portrait is also included.

(12180) [VAN BERKEL, A. & K. VELING], 1998. Libel als levende graadmeter voor natuur. – [Dragonfly as a living environment graduator]. *Gelderlander* (Tiel/Neder-Betuwe), issue of 13 Aug., p. 1. (Dutch). – (First Author: Akkerwinde, 9, NL-4102 JJ Culemborg).
A regional daily's interview on dragonfly biology, with a statement on the current trend towards some improvement in the condition of the Netherlands odon. fauna.

(12181) VAN BUSKIRK, J. & K.L. YUREWICZ, 1998. Effects of predators on prey growth rate: relative contributions of thinning and reduced activity. *Oikos* 82(1): 20-28. – (Dept Biol., Univ. Michigan, Ann Arbor, MI 48109, USA).
Predators affect individual growth rates of surviving prey in 2 conflicting ways. First, predation acts to increase growth rate by thinning the density of prey populations, which releases survivors from competition. At the same time, predators intimidate prey into decreasing their feeding activity and increasing refuge use, causing prey to grow more slowly. Both processes are known to affect individual growth rates in many systems, but their relative importances and interactive effects have not been measured. An experiment was designed to estimate the separate and joint effects of thinning and activity suppression, using Rana sylvatica tadpoles reared in 1100-L outdoor artificial ponds. The experiment manipulated the perceived risk of predation (using caged Anax larvae) independently from the loss rate (by manually removing tadpoles every other day according to a predetermined "mortality schedule"). The presence of predators caused tadpoles to decrease time spent feeding and swimming, verifying that the conditions for behaviorally-mediated growth suppression were satisfied. During the first half of the experiment, when tadpoles were small and not yet competing for food, growth declined sharply with predation risk but was unaffected by thinning. During the second half of the experiment, when tadpoles were much larger and had presumably depleted food resources, growth rate increased under thinning but was unaffected by predation risk. Overall, there was an interaction among treatments because activity suppression was only important at low density, while thinning was especially important in the absence of predation risk. The results suggest that the numerical effects of predators on prey will predominate in communities composed of strongly interacting species with resource depletion (e.g., communities with clear keystone predator effects), whereas growth costs of predator avoidance may quantitatively affect species interactions in communities with less severe exploitative competition.

(12182) [VAN VELZEN, J.W.], 1998. Spectaculaire voortplanting libellen in Amsterdamse Waterleidingduinen. – Spectacular dragonfly breeding in the Water Supply Dunes of Amsterdam]. *Natuuronderzoek* 8(2): 12. (Dutch). – (Struyckenlaan 5, NL-2105 RB Heemstede).
Records of 7 spp.; Amsterdam, the Netherlands. – Cf. also *OA* 12183.

(12183) WASSCHER, M.T. & J.W. VAN VELZEN, 1998. *Voorlopige atlas van de libellen in de Amsterdamse Waterleidingduinen.* – [*Preliminary atlas of dragonflies in the water supply dunes of Amsterdam*]. Gemeentewaterleidingen Amsterdam, Vogelenzang, iv+64 pp., loose overlay. ISBN none. (Dutch). – Price: NLG 5.- net. (Orders to: Sect. Ecologie, Afd. Procesontwikkeling, Gemeentewaterleidingen Amsterdam, Vogelenzangseweg 21, NL-2114 BA Vogelenzang).
Attractive book; 30 spp. (evidenced 1995-1997), with maps, comprehensive annotations and discussions. – For a previous work on the same subject see *OA* 10907.

(12184) WIEDENBRUG, S., U. NOLTE & N.L. WÜRDIG, 1997. Macrozoobenthos of a coastal lake

in southern Brazil. *Arch. Hydrobiol.* 140(4): 533-548. – (First Author: Zool. Staatssammlung, Münchhausenstr. 21, D-81247 München).
3 odon. fams are mentioned from the coastal Lake Emboaba, nr Tramandai, Rio Grande do Sul, without any annotations or discussion.

(12185) WILDERMUTH, H., 1998. Dragonflies recognize the water of rendezvous and oviposition sites by horizontally polarized light: a behavioural field test. *Naturwissenschaften* 85: 297-302. – (Haltbergstr. 43, CH-8630 Rüti).
Based on 2 Zygoptera and 5 Anisoptera spp., studied in the cantons of Grisons, St Gall and Zürich, Switzerland (1993-1997).

(12186) *WILLIAMSONIA*, Vol. 2, No. 3 (Aug. 1998). Published by the Michigan Odonata Survey. – (c/o M.F. O'Brien, Insect Div., Mus. Zool., Univ. Michigan, Ann Arbor, MI 48109-1079, USA).
[Signed articles:] *Weichsel, J.I.*: Hetaerina titia is in Michigan (p. 1); – *Bright, E.*: MOS field trip, 24 May 1998 (pp. 1-2); – *O'Brien, M.*: Berrien/Cass county MOS (pp. 3-4); – Preserving adult specimens for the MOS (pp. 4-5); – *Kielb, M.*: Identification criteria of dragonflies of the genus Sympetrum occurring in Michigan (p. 6; from the paper listed in *OA* 11385). – The issue also contains a "Checklist of Michigan Odonata", and several editorial and other notes.

(12187) WONG, A.H.K., D.D. WILLIAMS, D.J. McQUEEN, E. DEMERS & C.W. RAMCHARAN, 1998. Macroinvertebrate abundance in two lakes with contrasting fish communities. *Arch. Hydrobiol.* 141(3): 283-302. – (First Author: Div. Life Sci., Univ. Toronto, 1265 Military Trail, Scarborough, ON, M1C 1A4, CA).
The study draws comparisons between the benthic invertebrate populations in 2 Canadian Shield lakes, with similar physical and chemical characteristics, but contrasting fish communities, viz. Mouse Lake and Ranger Lake, in the Haliburton region, Ontario. It is suggested that high rates of prey consumption by the small-bodied planktivore-benthivores could have accounted for the lower in-shore benthic biomasses found in Mouse Lake. From the 2 lakes, 13 odon. spp. are listed (10 spp. per lake), and mean individual wet weights, mean densities and mean biomasses are order-wise stated for June, July and August 1992 samples. The contribution of benthos in fish diets varied between 20.9 and 41.1% of total biomass of prey eaten. Chironomids were the predominant benthic prey consumed by most spp. Pumpkinseed also consumed Ephem. and Trich., while odon. were present in higher proportions in the diets of largemouth and smallmouth bass. Seasonal means (% weight) per lake are shown for prey groups and fish spp.

(12188) WOODWARD, G. & A.G. HILDREW, 1998. Invasion of a stream food web by a new top predator. *Bull. N. am. benthol. Soc.* 15(1): 141 [abstract only]. – (Sch. Biol. Sci., Queen Mary & Westfield Coll., Univ. London, London, E1 4NS, UK).
[Verbatim:] Broadstone Stream, an acidic spring-fed tributary of the River Medway in southern England, has been studied intensively since the early 1970s, and the food web has been extremely well-characterised. Research examined a recent invasion by a new top predator, the larva of Cordulegaster boltonii. Food web complexity (e.g. connectance, omnivory) increased markedly following the invasion. These changes were related to Cordulegaster's opportunistic mode of feeding, large larval size range and ontogenetic dietary shifts. Enclosure/exclosure experiments in the field showed that the invader could suppress the abundance of a previous top predator, Plectrocnemia conspersa (Trichoptera) and a detritivorous stonefly, Nemurella pictetii (Nemouridae). No other taxa showed significant changes in abundance in response to the invader. Nemurella and Plectrocnemia are preyed upon selectively by Cordulegaster, due to their high mobility and large size. These results will be related to long-term survey data, which charts changes in the benthos from 1974 onward. Climate change is suggested as the driving force behind the invasion.

(12189) WRANIK, W., 1998. Faunistic notes on Soqotra island. *In*: H.J. Dumont, [Ed.], Soqotra, Vol. 1, pp. 135-198. UN Publs, New York. ISBN 90-804341-1-6. – (FB Biol., Univ. Rostock, Freiligrathstr. 7/8, D-18051 Rostock).
Includes a checklist of 14 odon. spp., recorded 1982-1996, and a col. phot. of the endemic Enallagma granti; – Soqotra, Yemen.

(12190) YEH, W.-C., 1998. [*The spirits at the water edge*]. Tomato, Taipei. 48 pp. ISBN 957-8688-39-3. – Price NT $ 300.- net. (Chin., with vernacular nomenclature). – (Author: Taiwan Forest Res. Inst., Div. Forest Prot., 53 Nan-Hai Rd, Taipei, Taiwan, R.O.C.; – Orders to: Tomato Publ. Co., 234 5F-1, Nan-Ching East Rd, Taipei, Taiwan, R.O.C.).

A splendidly illustrated picture book (hardcover, 26.5×19.5 cm), directed at young readers, and presenting 49 of the Taiwanese spp., arranged per respective habitats. A brief outline of dragonfly morphology, reproductive behaviour and life history is also included. Many of the ca 90 species portraits and habitat photographs are absolutely superb. Only the Chinese vernacular names are stated, but an Engl. translation of all captions and incl. taxonomic nomenclature was provided by the Author and is available from the Eds of *Odonatologica*.