

ODONATOLOGICAL ABSTRACTS

1974

- (5779) BEESLEY, C., 1974. Simulated field predation of single-prey (*Culex peus*) and alternative-prey (*Culex peus*: *Chironomus* sp. 51) by *Anax junius* Drury (Odonata: Aeschnidae). *Proc. Mosq. Cont. Assoc.* 42: 73-76. — (Contra Costa Mosquito Abatement Distr., 1330 Concord Ave., Concord, CA 94520, USA).

Simulated-field predation tests with *A. junius* were conducted in enclosed-unit fiberglass tubs, with both single and alternative prey available (*Culex peus*: *C. peus* and *Chironomus* species 51 respectively). *C. peus* egg rafts and *C. sp.* 51 egg masses were periodically introduced to sustain prey population and daily prey emergence was recorded. Predators were initially introduced at 3 densities and monitored at 2-week intervals for growth and population size. Results showed that dragonfly larvae controlled mosquito populations at all 3 densities in the single, and the 2 higher densities in the alternative prey tests. In both tests, the higher predator densities were seen to reduce prey populations in a shorter period of time. However, with subsequent mosquito reduction predator populations also declined to a few remaining large larvae. These reduced larval populations continued to maintain control of the mosquitos. With the presence of an alternative prey, predator populations still declined after mosquito reduction, but remained significantly higher than in the single-prey tests. Larvae exercised no significant control over the midge populations.

1979

- (5780) HEINE, M. & PEETERS, 1979. *Een verder onderzoek naar de terrestrische macro-fauna op de nymphaeidae waterplanten, Nymphaea alba L., Nymphaea candida Presl, Nuphar lutea (L.) Sm., Nymphoides peltata (Gmel.) O. Kuntze en Potamogeton natans L., in 1976 en 1977.* — [Further studies on the terrestrial macroinvertebrate fauna of the aquatic Nymphaeidae, *Nymphaea alba L.*, *N. candida Presl*, *Nuphar lutea (L.) Sm.*, *Nymphoides peltata (Gmel.) O. Kuntze en Potamogeton natans L.* in 1976 and 1977] — Lab. Aquat. Ecol., Kathol. Univ. Nijmegen, Toernooiveld-Nijmegen. IV + 244 pp. (Dutch, with Engl. s.). — (Lab. Aquat. Ecol., Univ. Nijmegen, Toernooiveld, NL-6525 ED Nijmegen). The work was carried out in the Ooypolder nr Nijmegen, the Netherlands. The odon. (incl. spp. lists) are discussed.
- (5781) UBUKATA, H., 1979. *Studies on population dynamics, behavior and territoriality of Cordulia aenea amurensis Selys (Odonata: Corduliidae).* D. Sci. thesis, Hokkaido Univ., Sapporo IV + 122 pp. + 44 pp. Appendix, with tabs & figs). — (Author: Dept. Sci. Educ., Kushiro Coll., Hokkaido Univ. Shiroyama I, Kushiro, 085, JA; — Copies available from: Library, Fac. Sci. Hokkaido Univ., Sapporo, 060, JA).
- The text is Engl. throughout, and it is partly based on papers listed in OA 609, 1192, 3053, 3565, 4795, 4963, 5762, 5867. The dissertation is the result of field work carried out (1970-1979) at the Hôrai-numa lake, Hokkaido. —

(1) Larval development is estimated at 4 yr, based on periodical sampling and laboratory rearing. — (2) The numbers were estimated of eggs laid, larvae per year class (yc), individuals emerged and those entering the reproductive period. Only 0.03-0.06% reached the ultimate stage (yc 1970 and 1971, resp.). The mortality (qx) was high during summer and low during the winter. — (3) The net reproductive rate (R_0) and the rate of natural increase (r) were estimated at 1.40-2.80 and 0.08-0.26/yr, resp. — (4) The behavioural patterns of imagines are described, and the impact of meteorological conditions on some behavioural features is discussed. — (5) The mechanisms of sex recognition were examined experimentally; the flight direction and the thickness of the basal part of the abdomen are the principal recognition marks. — (6) Positive correlations are demonstrated between site preference and male and female density, between female and emergence density, and between emergence density and the development of the bog mat. — (7) At low male density, the latter patrol long stretches (20 m), but the length of these decreases with increased density (min. 7 m). The smaller the patrol area becomes, the stronger the effect of the previous residence. — (8) The ratio of the number of males at the most preferred site (NE) decreased with the increase of the total number of adult males at the lake. — (9) Functions of the territory and mechanisms governing the reduction of patrol areas in *C. a. amurensis* are analyzed, and (10) The evolution of territoriality in the Odon. is discussed.

1984

- (5782) DESHPANDE, S.B., 1984. Studies on the morphological evolutionary trends of the labial muscular patterns in some biting and chewing insects. *J. Anim. Morphol. Physiol.* 31(1/2): 25-38. — (Dept Zool., Karnatak Sci. Coll., Dharwad-580001, India).
The extent to which Matsuda's interpretations are valid was studied on the Indian material, incl. *Lestes elata* and *Anax immaculifrons*. It is concluded that during the evolution of biting and chewing insects the labial musculature ex-

hibits reduction in the number of components. Intermediate stages occur in various orders, and an interesting modification is found in the Odon. These conclusions corroborate those of S. MATSUDA (1965, *Mem. Am. ent. Inst.* 4: 1-334).

- (5783) DESHPANDE, S.B., 1984. Studies on the morphological evolutionary trends of the mandibular muscular patterns in insects. *J. Anim. Morphol. Physiol.* 31(1/2): 39-52. — (Dept Zool., Karnatak Sci. Coll., Dharwad-580001, India).
Lestes elata and *Anax immaculifrons* are included in the study. The ventral mandibular muscles exhibit gradual degeneration during hexapod evolution, leading to their complete absence in the higher orders. The dorsal muscles show a tendency towards better development, by increasing their size. Intermediate conditions occur in the "generalized orders". These conclusions corroborate those of S. MATSUDA (1965, *Mem. Am. ent. Inst.* 4: 1-334).
- (5784) DESHPANDE, S.B., 1984. The thoracic functional myology of odonates. A study of the patterns as found in *Lestes elata* Hagen (Zygoptera) and *Anax immaculifrons* Rambur (Anisoptera). *J. Anim. Morphol. Physiol.* 31(1/2): 67-78. — (Dept Zool., Karnatak Sci. Coll., Dharwad-580001, India).
The thoracic muscular pattern in both sub-orders appears archaic. It characteristically lacks the usual neopterous indirect wing muscles. The exclusively occurring fifth to tenth tergopleurals, the second and third tergosternals and the first axillary muscles are responsible for flight. The only leg muscle participating in flight is the tergal promotor of the coxa and hence the legs are freely movable even during flight. The flight muscles in the pterothoracic segments of the zygopteran type function alternately to produce slow flapping flight. Contrastingly, in the anisopteran type, due to the insertion of the mesothoracic first axillary muscle on the persistent axillary process, the phase difference between wing beats is reduced, which is responsible for efficient flight.

- (5785) MÉSZÁROS, Z. & M. CSIBY, 1984. *Szita-kötők, kérészek, hangyalesők.* — [*Dragonflies, mayflies and the neuropterous insects*]. Mora Ferenc Könyvkiadó, Budapest. 64 pp. — [ISBN 963 11 37 66 X]. (Hung.).
Pocket-size booklet (12x16 cm), directed at the general reader. The odon. section (pp. 4-17, 7 col. pls incl.) covers 21 spp., with a more or less adequate general characterisation and col. drawing of each of them.

- (5786) VAN DER LAAN, N., 1984. *Libellen in de Overijsselse Vecht. Oriënterend onderzoek naar de betekenis van libellen als indicator-groep voor een integraal land- en waterbeheer.* — [*Dragonflies of the Overijsselse Vecht area. A pilot inquiry into dragonflies as indicators in integrated land- and wetlands management*]. Landbouwhogeschool, Wageningen (Verslag LH/NB 749). VI+138 pp. (Dutch).
A very detailed, but somewhat verbose study of the odon. fauna (23 spp.) of this area, Overijssel Prov., the Netherlands, with emphasis on the management of diverse local habitats. The monograph is not directed at odonatologists, but contains a number of adequately documented suggestions. Special references are made e.g. to the negative impact of large cattle populations grazing on the banks, grass mowing, reaping of aquatic vegetation, etc.

1985

- (5787) CARPENTER, F.M., 1985. Substitute names for some extinct genera of fossil insects. *Psyche* 92(4): 575-582. — (Mus. Comp. Zool., Harvard Univ., Cambridge, MA /21138, USA).
Neoligaeschna, nomen novum pro "*Oligo-aeschna* Piton & Théobald" (1939, *Mém. Soc. Sci. Nancy*, p. 6) is proposed. — (*Abstracter's Note*: In the said publication *Oligo-aeschna* rather than *Oligo-aeschna* is described. In accordance with Art. 56/b of the Code, *Oligo-aeschna* Selys and *Oligo-aeschna* Piton & Théobald are not homonyms, therefore *Neoligaeschna* is a junior synonym of the later).

- (5788) COLLINS, F.H. & R.K. WASHINO, 1985.

Insect predators. *Bull. Am. Mosquito Control Ass.* 1985(6): 25-41. — (Dept Ent., Univ. California, Davis, CA 95616, USA).

Predation of mosquitoes by arthropods is considered to be an important component of mosquito mortality. Methods of studying predation in the field and the importance of predators to the different life stages of mosquitoes are discussed in this overview. Predation of eggs by insects such as ants and carabids and of adults by spiders, Diptera and Odon. is considered to be of minor importance, whereas predators of the larval and pupal stages, including Coleoptera such as Dytiscidae, Hemiptera such as Notonectidae, Odon., Diptera and Trichoptera, have very important roles as agents of mortality. It is suggested that the general form of the immature survivorship curve among stable-state mosquito populations might provide an indication of the relative importance of various biotic mortality factors. Intraspecific competition, as well as mortality induced by pathogens and parasites, is most likely to exert an effect on the later instars, whereas predation, particularly in communities where the predator complex approaches saturation, would be expected to operate strongly over all immature stages, thus producing a survivorship curve wherein the preponderance of mortality occurred among the more abundant early instars. Spatial or temporal changes in the pattern of pre-imaginal survival might be indicative of a shift in the relative importance of these 2 sources of mortality. This conceptual framework is discussed in relation to studies of predator-prey relations in the field.

- (5789) D'ANTONIO, C. & G. DE FILIPPO, 1985. Dati preliminari sul popolamento odonatologico dell'Oasi di Serre Persano (Campania) (Odonata). *Bol. Ass. romana Ent.* 39(1/4): 19-24. (With Engl. s.) — (Ist. & Mus. Zool., Univ. Napoli, Via Mezzocannone 8, I-80134 Napoli). 15 spp. are listed from the Serre Persano Reserve (Salerno prov., southern Italy). *Aeshna affinis* and *Sympetrum depressiusculum* were not previously recorded from Campania.

- (5790) ENGELHARDT, E., 1985. *Libellen. Insekten-*

kurier 1985(6): 21-29. — (Author's address not stated).

Review of dragonfly postal stamps, arranged in systematic sequence of the spp. figured, and showing a reproduction of each stamp.

- (5791) LIESER, M. & K. VALERIUS, 1985. Libellenbeobachtungen aus dem Regierungsbezirk Trier. *Dendrocopos* 12: 82-116. — (First Author: Trierer Str. 51, D-5561 Bausendorf, FRG).

A very thorough account of the fauna (37 spp.) of the District of Trier, FRG, with a list of odonatologically particularly important localities and their fauna.

- (5792) PONOMARENKO, A.G., 1985. Fossil insects from the Tithonian "Solnhofener Plattenkalke" in the Museum of Natural History, Vienna. *Annln naturh. Mus. Wien* (A) 87: 135-144. (With Germ. s.). (Palaeontol. Inst., USSR Acad. Sci., Profsoyuznaya 123, USSR-117868 Moscow).

The fossil insects from Solnhofen and Eichstatt (Lowermost Tithonian, Bavaria, FRG, incl. 12 odon spp., referable to 7 fam., are listed and their systematic position discussed. Malmagrion is a possible protomyrmeleontid.

- (5793) STERNBERG, K. & M. STERNBERG, 1985. Hochmoore — Zeugen und Erben der Eiszeit. In: H. Höflinger & T. Lehrer, [Eds.], *Der Feengarten: vom Zauber der Hochmoore*, pp. 9-11, 27-32, Schillinger, Freiburg/Br. [ISBN 3-89155-014-6]. — (Inst. Biol. I, Zool., Univ.Freiburg, Albertstr. 21a, D-7800 Freiburg/Br, FRG).

An excellent account of the origin, evolution, abiotic and biotic features of the bogs and peat moors (rised bogs), with clear-cut definitions and brief characterisation of the peculiar floristic and faunal structure (incl. the Odon., but the German common names are stated only). — (*Abstracter's Note*: This text, with some minor modifications, should be strongly recommended for inclusion in a university-level text book on the subject).

- (5794) WIRJOATMODOJO, S. & A.H. ATMOWIDJOJO, 1985. Komunitas serangga air di

sungai hutan Ketambe, Taman Nasional Gunung Leuser, Aceh. — Insect community of stream ecosystem of Ketambe forest, Gunung Leuser National Park, Aceh. *Berita Biologi* 3(3): 111-115. (Indones., with Engl. s.). — (Museum Zoologicum Bogoriense, LBN-LIPI, Bogor, Java, Indonesia).

A non-strictly seasonal study of the insect community was undertaken from Sept. 1980 to Feb. 1983, with the aim of providing base line data of the local stream ecosystem. 32 benthic insect spp. were recorded, incl. 8 odon. genera (spp. not specified). The number of spp. found was higher during the beginning of the dry than that of the rainy season.

1986

- (5795) ARAI, Y., 1985. Drought resistance in eggs of red dragonfly, *Sympetrum frequens*. *Insectarium, Tokyo* 23(6): 194-195. (Jap., with Engl. title). — (1233-2, Oaza Sueno, Yorii-machi, Osato-gun, Saitama Pref., 369-12, JA). [Abstract not available].

- (5796) BEUTLER, H., 1986. Beiträge zur Libellenfauna Ostbrandenburgs — eine erste Übersicht (Insecta, Odonata). *Faun. Abh.* 14(5): 51-60. (With Engl. s.). — (Frankfurter Str. 23b, DDR-1230 Beeskow, GDR).

The odon. fauna (59 spp.) of the "Ostbrandenburgische Heide- und Seengebiet", GDR, is reviewed, with references to autochthony and general status of all taxa, and with emphasis on particularly important breeding areas and on biogeographically interesting records.

- (5797) BRYANT, R.M., 1986. Factors influencing age related dispersal in the nymphal odonates *Ischnura barberi* (Currie), *Pachydiplax longipennis* (Burm.) and *Erythemis simplicicollis* (Say). *Hydrobiologia* 139(1): 41-48. — (Dept Zool., Oklahoma St. Univ., Stillwater, Oklahoma 74078, USA).

Size related spatial patterns were observed in larvae of the 3 dominant odon. taxa in a man-made marsh. These patterns were correlated with various physical and chemical parameters, the vegetation gradient, and prey avail-

lability using linear and curvilinear regressions. I. barberi and P. longipennis larvae increased linearly in head capsule width from the marsh center to the marsh edge. Increasing larval size correlated with changes in vegetation. Additionally, the spatial patterning of P. longipennis was correlated with decreasing submerged plant surface area as naiad size increased. The head capsule width of E. simplicicollis increased from the marsh center to the marsh edge, then continued to increase towards the marsh center. This complex dispersal pattern did not correlate with any of the measured physical or chemical parameters or the vegetation gradient. However, the dispersal pattern of E. simplicicollis correlated with increases in consumable prey densities along the migratory path. No correlation existed between consumable prey and the dispersal pattern of I. barberi or P. longipennis.

- (5798) BUCHWALD, R., 1986. Die Libellenfauna. In: E. Jauch & A. Benzing, [Eds], Das Schwenninger Moos — Ein naturkundlicher Führer, pp. 146-152. Führer Natur- u. Landschaftsschutzgebiete Bad.-Württ., Landesanstalt für Umweltschutz, Karlsruhe [ISBN 3-88251-100-1]. — (Author: Oberlinden 4, D-7800 Freiburg/Br., FRG; — Publishers: Inst. Ökol. & Naturschutz, Postfach 210752, Bannwaldallee 32, D-7500 Karlsruhe-1, FRG).

Annotated list of 15 spp. from the Schwenninger Moos Nature Reserve, Baden-Württemberg, incl. *Lestes virens* and *L. sponsa*, which are rather rare in SW Germany, and *Leucorrhinia dubia*, which is among the threatened taxa in Germany.

- (5799) BULLETIN OF HOKKAIDO ODONATOLOGICAL SOCIETY, Vol. 1, No. 2 (Dec.26, 1986). — (c/o Dr H. Ubukata, Dept Sci. Educ., Kushiro Coll., Hokkaido Univ. Educ., Shiroyama 1-15, Kushiro, 085, JA).

Nakatani, M.: Eleven odonate species from Ochiishi, Nemura District (p. 32); — Takahashi, T.: Some new records of odonates in Sorachi, Shiribeshi, Iburi and Rumoi Districts (33); — Yamaguchi, H.: Three dragonfly species from Tokachi District (34); — Ubukata, H.: Recent studies on the distribution

and morphology of the Hokkaido population of the genus *Mnais* (35); — The distribution table of the Odonata of Hokkaido, 2 (36-39); — Miscellanies (39, 41, 42, 43); — Letters from members of H.O.S. (32, 33, 34, 35, 39, 40); — The list of new members of H.O.S. (41); — Koyama, T.: Notice of the First Annual Meeting of H.O.S. (42). — (All papers are in Jap., with Engl. contents table).

- (5800) BYREN, B.A. & B.R. DAVIES, 1986. The influence of invertebrates on the breakdown of *Potamogeton pectinatus* L. in a coastal marina (Zandvlei, South Africa). *Hydrobiologia* 137(2): 141-151. — (Freshw. Res. Group, Zool. Dept, Univ. Cape Town, Rondebosch-7700, SA).

The influence of invertebrates upon the decomposition of *P. pectinatus* in a coastal marina system was examined over 112 days using litter bags. Invertebrate inclusion bags (2 mm mesh, 5 mm holes) registered a dry mass loss of 1% d⁻¹, while exclusion litter bags (80 µm mesh) produced a 0.4% mass loss d⁻¹ (a 2.5 fold difference). Losses of ash and N from inclusion bags were greater than those from exclusion bags ($p < 0.05$). There was a three fold difference between the two treatments in the time taken for litter to breakdown to half the initial stock: T_{12} for inclusion bags = 43 d, for exclusion bags = 130 d. In both treatments, minerals showed an expected rapid loss, due to leaching, with a subsequent slow increase relative to the dry material remaining. A total of 9 invertebrate taxa was recorded from inclusion bags, with a peak biomass of 64 mg g⁻¹ dry mass *Potamogeton* bag⁻¹ reached at 64 days after immersion. Grazing amphipods, *Melita zeylanica* and *Austrochiltonia subtenuis*, numerically dominated the litter bag fauna, while *M. zeylanica* and larvae of *Ischnura senegalensis* formed most of the biomass. Scanning Electron Microscopy indicated heavy grazing of micro-organisms by invertebrates, with major qualitative differences occurring 112 days after immersion. Invertebrates significantly accelerated the rate of litter breakdown through their feeding activities, assisting fragmentation and thus contributing to plant losses and also by increasing the surface area

for microbial colonisation and attack.

- (5801) COSTA, J.M., 1986. A especiação em *Mnesarete pudica* (Hagen in Selys, 1853) Cowley, 1934 com a descrição de uma nova subespécie (Odonata: Agrionidae). *Bol. Mus. nac. Rio de Janeiro* (Zool.) 311: 1-72, 1 col. pl. incl. (With Engl. s.) — (Depto Ent., Mus. Nac., Univ. Fed. Rio de Janeiro, Quinta da Boa Vista, BR-20970 Ria de Janeiro).

The statistic and geographic analysis of material in the Museu Nacional collections revealed the polytypic nature of *M. pudica*. The complex consists of 2 almost allopatric ssp., showing some hybridisation in the small areas of sympatry. *M. pudica phryne* ssp. n. (holotype ♂: Areal, Rio de Janeiro; long series of both sexes from various states) is described and figured. Interspecific and intergeneric relationships are discussed, and a tentative hypothesis on the patterns of the geographic distribution of the Calopterygidae is presented.

- (5802) DONATH, H., 1986. *Sympetrum depressiusculum* (Selys 1841) in Brandenburg (Odonata, Libellulidae). *Novius* 5: 59-64. — (Hauptstr. 36/37, DDR-7960 Luckau, GDR).

The known localities of *S. depressiusculum* in Brandenburg, GDR are reviewed, notes are presented on its phenology, ecology and behaviour, its local status is stated, and some protective measures are suggested.

- (5803) EGLĪTE, G. [Compiler & translator], 1986. *Zāles ēna spāres ēna*. [The shadow of grass, the shadow of dragonfly]. Liesma, Riga. 184 pp. (Latvian).

This is a selection of Japanese haiku, compiled and translated from Japanese; 2 of these with a dragonfly motif (pp. 45, 140).

- (5804) ERIKSEN, C.H., 1986. Respiratory roles of caudal lamellae (gills) in a lestid damselfly (Odonata: Zygoptera). *J.N. Am. benthol. Soc.* 5(1): 16-27. — (Joint Sci. Center, Joint Sci. Bldg, 11th & Dartmouth Aves. Claremont, CA 91711, USA).

The 3 caudal lamellae in Zygoptera are often considered to be gills, but this viewpoint is not universally held. It is demonstrated that caudal

lamellae in *Lestes disjunctus* can function as gills whatever their other roles. They meet all gill criteria: they are large and thin, possess little metabolizing bulk, and are moist, vascular and sometimes ventilated. Lamellae are normally responsible for 20-30% of O₂ intake. As the dissolved O₂ concentration (DO) falls and temperature rises, gills account for more and more O₂ intake and do so up to their proportion of total body surface area (~70%). With sufficient DO and at low temperatures (< 10° C), the respiratory function of gills appears unimportant. Larvae do not regulate O₂ intake well due to their mediocre ventilatory mechanism ("pull-downs"), nor do gills affect larval ability to regulate O₂ intake. Another effect of weak ventilation is that low-O₂ critical points are rather high (2.5-5.5 mg/l at ~ 12-25° C). The importance of gills in obtaining DO is further demonstrated by the positive correlation between survival at low DO concentrations and the amount of gill surface area present (0, 1, 2 or 3 gills). With any given amount of gill surface, larvae die at increasingly higher DO concentrations as temperatures rise. At any given temperature the reduction of gill surface results in more DO being required for survival.

- (5805) GAEDIKE, R., 1986. Bibliographie der Bestimmungstabellen europäischer Insekten (1979-1983). *Beitr. Ent., Berl.* 36(1): 261-319. (With Engl. & Russ. s's) — (Abt. Taxon. d. Insekten, Inst. Pflanzenschutzforschung, Schocklerstr. 5, DDR-1300 Eberswalde-Finow-1, GDR).

Combined with the earlier parts in this series (cf. OA 1621, 3729), this is an impressive work. As far as the Odon. are concerned, however, it is hardly worth mentioning. Only 2 works are listed for the 1979-1983 period (OA 2633, 2121), whereas even such important publications as e.g. those of Carchini (OA 4025, 4291), Diehl (OA 3300, 3960), Conesa García (OA 4618), Stobbe (OA 2655), etc. are missing — to mention just a few of those published in book form. It is regrettable that the author of such a pretentious bibliography did not approach S.I.O. to furnish data.

- (5806) HAMILTON, L.D., 1986. *Lifetime mating success and the opportunity for sexual selection in a tropical damselfly*. M. Sc. thesis, Queen's Univ., Kingston, VIII+96 pp. — (Dept Biol., Queen's Univ., Kingston, Ont., CA).
[Original not available for inspection; — verbatim author's abstract]: The effects of natural and sexual selection on lifetime mating success (LMS) of the territorial *Argia chelata* were examined. An individually marked population in Monteverde, Costa Rica was monitored for 103 days in 1985 and mating histories and demography for 624 individuals were obtained. There were no significant sexual differences in either longevity or survivorship, and mortality rate was age-independent. The operational sex ratio (males/total) of all individuals present at the stream each day was 0.87 ± 0.01 , biased towards males. The sex ratio of the resident population (individuals seen on at least one day after marking) alive each day was 0.88 ± 0.01 , also towards males. Variance in LMS (number of copulations in lifetime) was greater in females than males (1.73 vs 1.09). However, when the effects of natural selection (longevity and number of days spent at the stream) were removed, the unexplained variance in LMS of males (0.80) exceeded that of females (0.03). This emphasizes the importance of removing variation resulting from natural selection prior to drawing conclusions about the opportunity for sexual selection. The opportunity for sexual selection ($I_s = \text{variance}/\text{mean}^2$, where variance and mean refer to the number of copulations in each individual's lifetime) was calculated using the residual variance after the effects of natural selection were removed; in males $I_s = 1.07$ and in females $I_s = 0.01$. Male LMS was positively correlated with the number of days a male spent territorial at the stream and appears to be related to overall male vigour. Experiments revealed that males are under greater food stress than females and it is suggested that superior foraging efficiency by vigorous males may decrease the amount of time spent foraging away from the breeding area. Thus, any increase in time spent at the breeding area increases mating success.
- (5807) HAND, R., 1986. Neufunde der Kleinen Zangenlibelle — *Onychogomphus forcipatus* (Linné, 1758) — im Sauer-Our-Flusssystem. *Dendrocopos* 13: 81-84. — (Koppbach 17, D-5501 Trierweiler, FRG).
A significant number of individuals is recorded from 5 localities in the Sauer-Our river system, Germany, in the Germany-Belgium-Luxembourg area. The ecology of the habitats is described in considerable detail.
- (5808) MAIBACH, A., 1986. J. d'Aguilar et al., Guide des libellules d'Europe et d'Afrique du Nord. *Bull. romand Ent.* 4(2): 203-204. — (Mus. zool., C.P. 448, CH-1000 Lausanne-17). Book review of the volume listed in OA 5041. (For the modified Engl. edition of this book cf. OA 5650).
- (5809) MATSUKI, K., 1986. Description of the possible larva of *Gynacantha hyalina* Selys from Taiwan (Odonata: Aeschnidae). *Gekkan Mushi* 182: 26-27. (Jap., with Engl. title & fig. captions). — (5/F I, Lane 83, Tienmou E. Rd, Taipei, Taiwan, R.O. China).
The ultimate instar is described, figured, and compared with *G. japonica*.
- (5810) MATSUKI, K. & K. KITAGAWA, 1986. Description of the possible larva of *Zygonyx iris malayanus* (Laidlaw) from Thailand (Libellulidae; Odonata). *Gekkan Mushi* 183: 24-25. — (Jap., with Engl. title & fig. captions). — (First Author: 5/F I, Lane 83, Tienmou E. Rd, Taipei, Taiwan, R.O. China).
The ultimate instar (exuviae) is described, figured, and compared with *Z. takasago*.
- (5811) MATSUKI, K. & S. OBANA, 1986. Description of the larva of *Somatochlora japonica* Matsumura from Japan (Corduliidae). *Gekkan Mushi* 188: 30-31. (Jap., with Engl. title & fig. captions). — (Second Author: Kinyō-chō 3-4-10, Sakai-shi, Osaka, 590, JA).
The ultimate instar (exuviae) is described and figured.
- (5812) McCULLOCH, D.L., 1986. Benthic macroinvertebrate distributions in the riffle-pool communities of two east Texas streams. *Hydrobio-*

- logia* 135(1/2): 61-70. — (Dept Biol., Austin St. Univ., Nacogdoches, Texas 75962, USA). The pools in the Alazan Creek and in Bernaldo Bayou were sampled monthly, and 8 odon. genera (incl. the enigmatic "Agrion") are also considered. A cluster analysis based on similarity indicates that like habitats between streams were more similar to each other than were adjacent riffle-pool complexes within streams.
- (5813) NEWMAN, D.J.S. & R.J. WOOTTON, 1986. An approach to the mechanics of pleating in dragonfly wings. *J. exp. Biol.* 125: 361-372. — (Dept Biol. Sci., Univ. Exeter, UK). A structural engineering approach to the pleated wings of Odon. has been developed during a functional study of wing morphology in the group. The wing can be regarded as a folded plate structure within which each pleat-side acts as a deep plate-girder. Small cross-veins act as stiffeners within the girders, allowing the membrane to carry web shearing forces as pure tension, through a stressed-skin effect. Bending experiments confirm that the membrane significantly increases the rigidity of wing components. The properties of the membrane are unknown. It lacks birefringence, is very thin, and may be pure epicuticle. The advantages of stressed-skin construction are discussed, and possible modes of structural failure considered. The wing seems adapted to yield reversibly to unpredictable heavy loads.
- (5814) QUARTAU, J.A., 1986. An overview of the paranotal theory on the origin of the insect wings. *Publçoes Inst. Zool. "Dr. Augusto Nobre"* 194: 1-42. — (Depto Zool. & Antrop., Fac. Ciê., Univ. Lisboa, PT-1200 Lisboa). The paranotal theory is re-examined, types of evidence are analysed, the selective value of the paranotal lobes is discussed, and the theory is assessed and compared with alternative hypotheses, i.e. the tracheal gill theory and the "pleural appendage" theory. The monophyletic vs polyphyletic origin of wings is discussed, and reference is made to related areas badly in need of research.
- (5815) ROHLINGER, H., 1986. Nachweise des Südlichen Blaupfeils (*Orthetrum brunneum*) im Saarland. *Dendrocopos* 13: 85-86. — (Forsthaus, D-5509 Züsch, FRG). Records (1985) from 7 localities in Saarland, FRG are presented and the ecology of the local habitats is discussed. The sp. inhabits man-made ponds, with sparse or lacking vegetation, and slowly running streams. At one place, the eggs were deposited in a shallow, sandy locality.
- (5816) SAVARD, M., 1986. La saison de vol des odonates dans le Québec meridional. *Fa-breries* 12(3/4): 49-55. — 184 av. Eymard Nord, Alma, Qué. G8B 5H9, CA). The first seasonal records are stated for 28, and the last ones for 11 spp. in southern Quebec, Canada. *Anax junius* (30-IV-1977) and *Libellula quadrimaculata* (14-V-1977) are the first to appear on the wing, several *Aeshna* and *Sympetrum* spp. were recorded in the mid of Oct., the latest seasonal record is that of *S. vicinum* (Nov. 6).
- (5817) SCHMIDT, E. & M. WOIKE, 1986. Rote Liste der in Nordrhein-Westfalen gefährdeten Libellen (Odonata). *SchrReihe Landesanst. Ökol. Nordrhein-Westf.* 4: 199-204. — (First Author: Biol. Didaktik, Pädag. Fak., Univ. Bonn, Römerstr. 164, D-5300 Bonn-1, FRG). This is a revised Red List for Nordrhein-Westfalen, FRG, the first edition of which was published in 1979 (cf. OA 2694). The number of threatened spp. increased from 38 (62%) to 42 (69%). No sp. could be removed from the list, while *Platycnemis pennipes*, *Cercion lindenii*, *Coenagrion puchellum* and *Aeshna juncea* had to be added. The number of autochthonous spp. remains 61, but *Coenagrion ornatum*, *Anax parthenope*, *Crocothemis erythraea* and *Sympetrum pedemontanum* were recorded as new, locally breeding immigrants.
- (5818) SCHNEIDER, W., 1986. *Systematik und Zoogeographie der Odonaten der Levante unter besonderer Berücksichtigung der Zygoptera*. PhD thesis Univ. Mainz. Vol. 1: XII+202 pp. (text), Vol. 2: II+547 figs, Vol. 3: II+151 maps. — (Inst. Zool., Univ. Mainz, Saarstr. 21, D-6500 Mainz-1, FRG).

The odon. fauna of the Levant (92 spp. and sspp., 16 of which endemic) is revised and its origin and biogeography are discussed. — All taxa are described; figured, keyed, and discussed in detail. The complete synonymy is worked out, and the inventory is presented of all known regional material, incl. that harboured in the collections of 14 Nat. Hist. Museums. — The distribution patterns and the high degree of endemism suggest a Syrian primary centre of origin, with Levantine and Mesopotamian secondary centra. The colonisation of the Levant occurred in several waves, during the Pleistocene pluvials and in the humid Holocene periods. An early immigration of Afrotropical elements took place in the Pleistocene, along the wadi systems running parallel to the Red Sea coastline, while the Nile-Sinai road was followed during the Holocene immigration. On the basis of its Odonata fauna, southwestern Arabia is assumed to represent an independent (relict) centre of distribution

- (5819) SMITH, I.M. & D.R. OLIVER, 1986. Review of parasitic associations of larval water mites (Acari: Parasitengona: Hydrachnida) with insect hosts. *Can. Ent.* 118: 407-472. (With Fr. s.). — (Biosyst. Res. Inst., Agric. Canada, Ottawa, Ont., K1A 0C6, CA).
Historical and recently published information on the parasitic associations of larval water mites with insect hosts is critically reviewed and summarized. The Odon. are associated with the fam. Limnocharidae, Hydryphantidae, and Arrenuridae. A number of problematical published host records are either confirmed or rejected, and many newly discovered associations are reported. Associations of parasitic larvae with insect hosts are confirmed for species of water mites representing 70 of the nearly 300 described genera, in 28 of the 45 currently recognized families, and all 7 superfamilies. Life history, behavioral, ecological, and phylogenetic data on water mites of genera with known larvae are summarized to provide the basis for interpreting the evolutionary significance of observed host associations. Previously established hypotheses are evaluated in the light of a greatly expanded list of verified

observations.

- (5820) SMITH, J.D., 1986. Seasonal transmission of *Raphidascaris acus* (Nematoda), a parasite of freshwater fish, in definitive and intermediate hosts. *Environ. Biol. Fishes* 16(4): 295-308. — (1114 Checkers Rd, Ottawa, Ont. K2C 2S4, CA).
The seasonal transmission of *R. acus* was studied in 2 small lakes on Manitoulin Is., Ontario, Canada. The odon. and trich. larvae (spp. not stated), acting as paratenic hosts, contained second-stage larvae. Several fishes, including percids and cyprinids, were intermediate hosts with second, third, and fourth-stage larvae in the liver. *Perca flavescens* was the most important of these. Intensities were up to 928 and increased with length and age of the perch; prevalence was 100%. Abundance of *R. acus* tended to be higher in females but was not related to condition of the perch. Second-stage larvae were acquired from invertebrates in summer and developed to the fourth stage by Nov. They became surrounded by fibrous capsules during the next summer but remained alive for at least another year. The longevity of larvae in the intermediate host may ensure survival of the parasite through periods of low host abundance after winterkill. *Esox lucius* was the definitive host. Abundance of *R. acus* tended to be greater in larger pike but was not related to sex or condition of the fish. The parasite was acquired in late fall. Prevalence was 100% and mean intensities were over 200 in winter and spring, declining to 64 (100% and less than 15, respectively), in summer. Mature worms were present from early spring through summer. Seasonality infection in the definitive hosts is not attributable to seasonal availability of larvae in perch. Instead it may be controlled by timing of predation on perch and rate of development and longevity of the parasite. Transmission to pike apparently continues in summer. Low intensity may result from low recruitment rate and rapid turnover of the parasite population.
- (5821) STEINMANN, H., 1986. The Odonate fauna of the Kiskunság National Park. *Fauna Kiskunság natn. Park* 1: 85-91. — (Zool. Dept,

Hung. Nat. Hist. Mus., Baross u. 13, HU-1088 Budapest).

44 spp. are listed from the Kiskunság Natn. Park, Hungary. Among these, *Epallage fatime* is new to Hungary (1 ♂, June 6; figs of terminalia and venation), *Aeshna grandis* has been previously known only from one other locality in Hungary (Kunfehértó), and *Hemianax ephippiger* is a rare immigrant (figs of ♂ app. and genitalia).

- (5822) STÖCKEL, G., 1986. Nachtrag zur Verbreitung von *Sympetrum pedemontanum* Alioni (Odonata) in der DDR. *Ent. Nachr. Ber.* 30(2): 90. — (Rudower Str. 22, DDR-2080 Neustrelitz, GDR).

With reference to the paper listed in OA 4648, additional records are given for 6 districts in the GDR.

- (5823) VOGT, T.E., J.E. McPHERSON & W.T. McDOWELL, 1986. Odonata at a small woodland pond in southern Illinois. *Great Lakes Ent.* 19(4): 235-237. — (Dept Zool., Southern Illinois Univ., Carbondale, IL 62901, USA).

24 spp., collected during 1983-1984 at a pond in Pope Co., Illinois, USA, are listed and the fauna is briefly discussed.

- (5824) VOLKER, M., 1986. Regenwasserrückhaltebecken: Beispiel für die Betreuung eines künstlich geschaffenen Gewässers. *Libellen. Naturk. Beitr. DJN* 17: 46-52. — (Julius-Leber-Weg 58, D-7900 Ulm, FRG).

The odon. fauna of a rainwater accumulation basin on the northern outskirts of the city of Hamburg, FRG was studied during 1979-1985. The basin (surface 2.2 ha) was set up in 1978. In all, 27 spp. were recorded; their number was increasing until 1982, and it was decreasing since then. The succession, composition and population biology of the fauna are discussed.

- (5825) WASSCHER, M., 1986. Enige floristische aantekeningen uit Zuidoost Brabant. — [Some floristic notes from southeastern Brabant]. *Natura* 83(7): 197-201. (Dutch). — (Minstraat 13 bis, NL-3582 CA Utrecht).

The Beekloop, the Keunisloop and the Princenloop are the only 3 rivulets in the Noord Brabant prov., the Netherlands, where *Calopteryx splendens* and *C. virgo* are known to co-occur. These are also the only streams with the *Apium nodiflorum* vegetation, and they are characterized by a relatively low water temperature.

- (5826) WITTMER, M., 1986. NSG Kl. Arbersee, Bayer. Wald: Gewässerversauerung in der Bundesrepublik Deutschland am Beispiel des Kl. Arbersees sowie eine Untersuchung der Odonatenfauna. *Naturk. Beitr. DJN* 17: 3-12. — (Habichtweg 18, D-6908 Wiesloch-2, FRG).

A comparison is made between the 1964 and the 1983-1985 odon. records (12 spp., of which 8 autochthonous) from the Kleine Arbersee (alt. 918 m), Bavarian Forest, FRG. No significant effect of the substantial acidification in the past 2 decades could be ascertained.

- (5827) ZETTELMEYER, W., 1986. Populationsökologische Untersuchungen an der Kleinlibelle *Lestes sponsa* Hans. in einem Moorgebiet der Egge, Nordrhein-Westfalen. — Ein Beitrag zur Bestandsdokumentation im Hinblick auf eine geplante Wiedervernässung. *Telma* 16: 113-130. — (Abt. Tierökol., Univ. Paderborn, An der Wilhelmshöhe 44, D-3470 Höxter, FRG). Population biology of *L. sponsa* was studied at the Schwarze Bruch (alt. 442 m), Paderborn Distr., Eggegebirge, FRG. Sex ratio was in favour of the males, 46:54 (exuviae) and 60:40 to 90:10 (adults). Adult longevity was estimated at 50 days. Seasonal population development and the mobility of individuals are discussed.

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- (5728) ASAHINA, S., 1987. [Odonatological works published in 1986. (International publications)]. *Gekkan Mushu* 192: 27-31. (Jap.). — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 160, JA).

Highlights of odonatological literature published in 1986, mostly by the S.I.O., showing

also facsimiles of the title page or cover of some of the S.I.O. national newsletters, etc.

- (5829) BAKER, R.L., 1987. Dispersal of larval damselflies: do larvae exhibit spacing behaviour in the field? *J. N. Am. benthol. Soc.* 6(1): 35-45. — (Dept. Zool., Erindale Coll., Univ. Toronto, Mississauga, Ont. L5L 1C6, CA). Under laboratory conditions larvae of *Enallagma ebrium* and *Ischnura verticalis* exclude conspecifics from patches of prey. The author analysed dispersal of larvae to artificial substrates in a pond in southern Ontario to test the hypothesis that larvae of these species exhibit spacing behaviour under field conditions. In contrast to predictions of the spacing hypothesis, there was little evidence to suggest that dispersing larvae were smaller or behaviourally subordinate compared with the larval population as a whole. Also, dispersal rate was not positively correlated with an index of food limitation. Lack of evidence for spacing behaviour may reflect a lack of discrete, persistent patches of prey.
- (5830) BELLE, J., 1987. *Phyllocycla baria*, a new species from Venezuela (Odonata: Gomphidae). *Ent. Ber., Amst.* 47(3): 49-50. — (Onder de Beumkes 35, NL-6883 HC Velp). A description and illustrations are given, based on a single male (Territorio Federal Amazonas, Depto Rio Negro, Bajo Caño Ocuene, 24-VI/11-VII-1984), deposited in the Inst. Zool. Agric., Maracay, Venezuela, Type No. 7699). The new sp. resembles most closely *P. ophis* (Sel.) and *P. modesta* Belle.
- (5831) BIEDERMANN, J., 1987. Libellenarten der offenen Teiche und Weiher. *Bergheimat, Liechtenstein* 1978: 50-51. — (Blachastr.78, FL-9494 Planken, Liechtenstein). This is a preliminary note on the Odon. of the Nature Reserve "Schwabbrünnen Aescher" in the Rhine Valley of Liechtenstein, with reference to the locally autochthonous *Coenagrion mercuriale*, *Ischnura pumilio*, *Cordulegaster bidentatus*, *Libellula depressa* (col. phot.), *Orthetrum brunneum* and *O. coerulescens*.
- (5832) *CONTACTBLAD NEDERLANDSE LIBELLENONDERZOEKERS* — [Newsletter of the Dutch Dragonfly Workers], No. 13 (March, 1987). (Dutch). — (c/o Miss K. Verspui, Westerkade 27 bis, NL-3511 HC Utrecht). In addition to the usual news items, the issue contains the program of the Twelfth Colloquium of Dutch Dragonfly Workers (Nijmegen, March 28, 1987), a paper on the distribution of *Aeshna viridis* in the Netherlands (*M. Wasscher*, pp. 5-7, with a map), the Netherlands odonatol. bibliography for 1984-1986 (*M. Wasscher*, pp. 8-11), exhaustive book review of the work by H.P.J. Peters et al., listed in OA 5633 (*L. Beukeboom*, pp. 11-13), and a complete address list of the members of the Association.
- (5833) [CORBET, P.S.], 1987. Meeting and mating in dragonflies. *Antenna* 11(1): 22-24. — (The Old Manse, 45 Lanark Rd, Edinburgh, EH14 1TL, Scotland, UK). Extensive summary of Prof. Corbet's address, given for the Royal Ent. Soc. of London, Oct. 1, 1986.
- (5834) CROWLEY, P.H., P.M. DILLON, D.M. JOHNSON & C.N. WATSON, 1987. Intraspecific interference among larvae in a semivoltine dragonfly population. *Oecologia* 71: 447-456. — (First Author: T.H. Morgan Sch. Biol. Sci., Univ. Kentucky, Lexington, KY 40506, USA). This study focuses on ways that the size distribution of individuals influences the types and intensities of competitive interactions within a population of aquatic arthropod predators. Three field experiments and one laboratory experiment were designed to test for feeding interference, interference mortality, and dispersal effects within and between larval size classes of the primarily semivoltine *Tetragonia cynosura* in Bays Mountain Lake, Sullivan C., Tennessee. One field experiment documented the temporal pattern of colonization of large-mesh cylinders by the small, first-year-class larvae during a 30-day period; the results are consistent with passive (density-independent) colonization. A second field experiment examined the effect of large, second-

-year-class larvae at densities of 1 or 3 per cylinder (14 or 42 m²) on colonization by small larvae; this colonization was inhibited at the high density of large larvae. In the laboratory experiment, when larvae of the two size-classes were together in the same aquarium, small larvae moved around less than when by themselves (dispersal inhibition). Thus the inhibition of colonization observed in the field may result from interference mortality, rather than from a flight response to the presence of larger conspecifics. — To evaluate this interpretation, the third field experiment measured the in-situ functional response of large larvae to each other and to their small conspecific prey. Results suggest a type-I (linear) functional response, with feeding interference among large larvae. Moreover, the interference mortality inflicted by large larvae on smaller conspecifics was apparently more intense on larger individuals within the small size-class. Taken together, the 3 field experiments and a statistical power analysis show how colonization and interference interact to determine the local density of small larvae, and why such interference effects are difficult to detect experimentally in the field. — (Authors).

- (5835) DOMMANGET, J.-L., 1987. *Etude faunistique et bibliographique des odonates de France*. Mus. Natn. Hist., Paris (Inventaires de faune et de flore, Vol. 36), 283 pp. [ISSN 0246-3881]. (With Engl. & Germ. s's). — Price: fFr. 140.-. — (Available also from the S.I.O. Central Office, Bilthoven, The Netherlands). The book (A4 size) is essentially a synthesis of what is known on the odon. fauna of France (97 spp. & sspp.). It is organised into 3 main sections, viz. a systematic part (pp. 15-154), a bibliographic section (pp. 157-244) and (5) appendices (pp. 245-281). — The systematic part is divided into 4 chapters. In the "Catalogue" information is presented on synonymy, habit and habitat, status, phenology, larval habitat and on the general range of each sp. The chapter on "Distribution" contains 90 maps, showing the distribution in France of all spp., specified for the periods prior to 1900, 1900-1960, and from 1960 onwards. The chapter on the "Threatened taxa" contains the Red List

and comments. It is followed by an account on the "Breeding habitats" and their conservation. — The bibliographic part contains 800 references pertaining to the French fauna, arranged alphabetically and cross-indexed per (administrative) Département and per subject (key words). — The Appendices are dealing with the current distribution schemes in France, some information is presented on the national newsletter "Martinia" and on the SIO, and a "Code of ethics for odonatologists" is proposed. — Non-regional references and a taxonomic index conclude the work. — Since there are numerous other works giving morphological descriptions, structural figs and keys pertaining to the taxa concerned, these are rightly omitted in the present publication. Even so, this is an indispensable handbook on the odon. fauna of France, ranking among the most excellent treatises of the national faunas in Europe. Its concise style and strict organisation of the text make it all the more legible. It is also reassuring to see a monumental work of this scope produced in this "sober", but perfectly adequate way, without the ever repeating colour photographs of well known spp., which often make the price of the modern books prohibitive to young workers.

- (5836) DONATH, H., 1987. Die Besiedlung von Gewässern im rekultivierten Gebiet des ehemaligen Tagebaues Schlabendorf-Nord (Bezirk Cottbus) durch Odonaten. *Ent. Nachr. Ber.* 31(1): 37-43. (With Engl. & Russ. s's) — (Hauptstr. 36/37, DDR-7960 Luckau, GDR). The odon. colonization of habitats left over upon termination of open cast mining, is exemplified by the case of the Schlabendorf-Nord mine, Cottbus Distr., GDR. The faunal composition and succession are compared with those recorded in other open cast mining areas (cf. e.g. OA 4518), and an attempt is made to tentatively define the development of the odon. populations in such situations.
- (5837) DONNELLY, T.W., 1987. Structural variation of *Ophiogomphus mainensis*: description of a new subspecies and relationship to sibling species (Odonata: Gomphidae). *Proc. ent. Soc. Wash.* 89(2): 205-214. — (2091 Partridge

- Lane, Binghamton, New York 13903, USA). *O. m. mainensis* Packard, new status, consists of a large, stable population (New England and adjacent parts of New Jersey, Pennsylvania, New York, Quebec, and New Brunswick) and a disjunct population in the high mountains of North and South Carolina. An allopatric population in central Pennsylvania and West Virginia is named as a new ssp. *fastigiatus*. Structurally intermediate specimens from the vicinity of the boundary of the two ranges have been found in Pennsylvania and New York. *Ophiogomphus incurvatus* Carle may have been derived from *O. m. fastigiatus* ssp. n. (holotype ♂, allotype ♀: Loyalsock Cr., Sullivan Co., Pennsylvania; 4-VII, 19-VI-1983), with the ssp. *O. i. alleghaniensis* Carle the bridging taxon. *Ophiogomphus acuminatus* Carle occurs southwest of these two species, its relation to the other two species is uncertain. The geographic pattern of variation of *O. mainensis* ssp. is unusual for odonates of the eastern United States, and is reminiscent of "leapfrog" variation of Andean birds.
- (5838) EDA, S., 1987. Chronicle of Japanese odonatology in 1986, with supplemental notes of 1985. *Nature & Insects* 22(3): 19-26. (Jap., with Engl. title). — (3-4-25 Sawamura, Matsumoto, Nagano, 390, JA).
A comprehensive review. For 1985 cf. *OA* 4978.
- (5839) FRICKHINGER, K.A., 1987. Der kurze schöne Traum. *Fossilien* 4(2): 77-78. — (Author's address not stated).
The author purchased a collection of Brazilian fossil insects, incl. an exceptionally beautiful libellulid. As it appears, the latter was a fake. The name and the address of the supplier are not stated.
- (5840) FURSOV, V.N. & V.V. KOSTYUKOV, 1987. Novye vidy roda *Tetrastichus* (Hymenoptera, Eulophidae) — parazity yaic strekoz i zhukov-plavuncov. — New species of the genus *Tetrastichus* (Hymenoptera, Eulophidae), egg parasites of damselflies and dragonflies and of predaceous diving beetles. *Zool. Zh.* 66(2): 217-228. (Russ., with Engl. s.). — (First Author: Inst. Zool., Acad. Sci. Ukrainian SSR, Lenin Str. 15, USSR-252000 Kiev-30, USSR).
Tetrastichus rimskykorsakovi sp. n. is described from zygoteran eggs, *T. zerovae* sp. n. occurs in Zygotera and Anisoptera (Aeshnidae), and *T. natans* sp. n. is parasitizing in odon. and aquatic beetles. *T. dytisciarum* sp. n. occurs in dytiscid eggs only. Some data on the ecology and biology are presented, and the known *Tetrastichus* spp. are keyed.
- (5841) GEURTS, M.H.J. & T.G. GIESEN, 1987. Een late waarneming van de libel *Sympetrum striolatum* (Charpentier, 1840). — Eine späte Beobachtung der Libelle *Sympetrum striolatum* (Charpentier, 1840). — *Natuur Land-schap Achterhoek* 1987(1): 14. (Dutch, with Germ. s.). — (Van Roggenstraat 8, NL-7011 GE Gaanderen).
Nov. 1 and Nov. 10, 1984, ovipositing pairs of *S. striolatum* were seen in Gaanderen, the Netherlands.
- (5842) HARITONOVA, I.N., 1987. Pervyy sluchay obnaruzhdeniya ginandromfnoy ravno-krylnoy strekozy. — [The first case of a gynandromorph in Zygotera]. In: A. I. Cherepanov, [Ed.] *Ekologiya i geografiya chlenostonogih Sibiri* [Ecology and geography of Siberian arthropods], pp. 119-120, Nauka, Novosibirsk. (Russ.). — (Biol. Inst., Siberian Sect. USSR Acad. Sci., Ul. Frunze 11, USSR-630091 Novosibirsk).
A gynandromorphic specimen of *Ischnura fontanei* (Karasevo Lake, 2-VIII-1978) was discovered in a series of some 500 specimens of this sp. from the Syrdar'ya R. Basin, Soviet Central Asia. It resembles a male, with female genitalia. The specimen is described and discussed.
- (5843) HINNEKINT, B.O.N., 1987. Population dynamics of *Ischnura e. elegans* (Vander Linden) (Insecta: Odonata) with special reference to morphological colour changes, female polymorphism, multiannual cycles and their in-

fluence on behaviour. *Hydrobiologia* 146(1): 3-31. — (Merestraat 32, B-9430 Aalst/Nieuwerkerken).

Laboratory and field experiments on adult *I. elegans* provide correction techniques for the estimation of population parameters based only on capture-recapture data. Thus it is demonstrated that male and female longevity are identical and that their sex ratio is 0.5 (= male fraction). — Longevity, measured at the water, erroneously appears to differ between sexes, and sex ratio is also biased. This bias is a function of population density, which causes a different distribution of males and females, matures and immatures, andro- and heteromorphic females, and is regulated by aggressive, territorial and mating behaviour of individuals. The female maturation period exceeds that of the male. Female polymorphism is an adaptation to population density, high density favouring andromorphs. This polymorphism is determined by single allelic autosomal inheritance with a sex-linked expression. — In crowded populations, visual interactions between individuals cause their juvenile hormone level to rise. This shortens maturation time, the period of morphological colour changes, and life span. This mechanism counteracts crowding, and synchronises maturation and development of sexual behaviour. — In the course of their life, individuals undergo a number of colour changes. The development of the colours after eclosion coincides with spermatogenesis and oogenesis. The morphological colour change at sexual maturity is due to neutralisation of waste products of the protein metabolism. The colour changes in old age are partly due to dehydration.

- (5844) JARZEMBOWSKI, E.A., 1987. The Surrey dragonfly. *Antenna* 11(1): 12-13. — (Dept Ent., Brit. Mus. Nat. Hist., Cromwell Rd, London, SW7 5BD, UK).

A note on the gomphaeschnine specimen recently recovered from the Early Cretaceous of the English Weald, UK, with photographs of the fossil.

- (5845) *JOURNAL OF THE BRITISH DRAGONFLY SOCIETY*, Vol. 3, No. 1 (Apr., 1987).

— (c/o R.H. Dunn, 4 Peakland View, Darley Dale, Matlock, Derbyshire, DE4 2GF, UK). *Drake, C.M.*: Dragonflies on the Gwent and Somerset levels and moors (1-4); — *Savage A.A.*: Hatchmere — a clue in the search for sites of special scientific interest (5-7); — *Clements, D.*: Dragonfly conservation and the National Trust (8-9); — *Shennan, N.M.*: Odonata of a Buckinghamshire/Middlesex lakeland site: an overview of the years 1978-1986 (10-14); — *Paul, J.*: The coexistence of *Coenagrion hastulatum* (Charpentier) and *C. puella* (L.) at a site in Perthshire (14); — *Pickess, B.P.*: How far will larvae of *Orthetrum cancellatum* (L.) travel for their emergence? (15-16); — *Jenkins, D.K.*: A population study of *Coenagrion mercuriale* (Charpentier) at a New Forest site. Part 3. Diurnal variation (17-20).

- (5846) JUNCK, C. & F. SCHOOS, 1987. Vergleichende Untersuchung der Libellenfauna in fünf durch Biotopmanagement entstandenen Gewässern. *Paiperlek* 9(1): 1-12. (With Fr. s.). — (Mouvement Ecologique West, 67 rue de Leudelage, L-8079 Bertrange).

The odon. fauna of 5 man-made ponds in Luxembourg is described and discussed. *Orthetrum brunneum* and *Sympetrum danae* were not previously recorded from Luxembourg.

- (5847) JURZITZA, G., 1987. Libellen — nimmer-satte Räuber. *NaturMag. Draussen* 48: 48-63, col. frontispiece. — (Bot. Inst. I, Univ. Karlsruhe, Kaiserstr. 2, D-7500 Karlsruhe-1, FRG).

Excellent "introduction" into dragonflies, with emphasis on the German fauna, and with numerous top-quality col. photographs by H. Bellmann and (mostly) by the author. These include the "portraits" of *Diastatops obscura* and *Planiplax phoenicura*.

- (5848) KOENIG, W.D. & S.S. ALBANO, 1987. Lifetime reproductive success, selection, and the opportunity for selection in the white-tailed skimmer *Plathemis lydia* (Odonata: Libellulidae). *Evolution* 41(1): 22-36. — (First Author: Hastings Reservation & Mus. Vertebrate Zool., Univ. California, Carmell Valley,

CA 93924, USA).

The estimates of lifetime reproductive success in the territorial *P. lydia* are presented. The opportunity for selection is partitioned into multiplicative episodes, and selection is measured on several morphological and behavioural characters. For both sexes, variance in survivorship was the largest contribution to variance in lifetime reproductive success. Covariance effects were also strong for both sexes, suggesting considerable non-independence of episodes. Opportunity for selection, calculated on a daily basis, did not approximate analogous values determined from lifetime reproductive success. — The phenotypic characters for which the selection was investigated included body mass, hind wing length, first date of reproduction, and (for males) an index of territorial aggressiveness. No significant direct targets of selection were found either in males or in females. However, the combined effects of direct and indirect selection on early reproduction were significant for males, acting primarily through increased survivorship and increased time per day spent at the pond. Similarly, females present earlier in the season had shorter interclutch intervals. Partitioning of selection acting on male hind wing length and on aggressiveness reveals relationships between selective episodes, possibly indicative of phenotypic trade-offs between natural and sexual selection through male-male competition for females. — Division of selection into episodes is a useful technique for identifying the source of selection. However, ordering effects can bias results, except when episodes occur in strictly chronological sequence. A method for circumventing this difficulty is offered.

- (5849) *MALANGPO*. Newsletter of the Thai National Office of the International Odonatological Society, Vol. 3 (May 30, 1987). — (Edited by Bro. A. Pinratana, St Gabriel's College, 565 Samsen Rd, Bangkok-10300, Thailand). With the present issue, the editorship has been taken over by Dr Pinratana (as above), and the lay-out and typographic quality were entirely changed. The text is Engl. throughout. The newsletter is printed (in blue print) on extra

quality (shining) paper, enabling excellent production of photographs. — Contents: *Pinratana, A.*: A short history of Thai dragonflies (pp. 1-3); — *Hämäläinen, M.*: Dragonfly collecting in Thailand. I. October-November 1982 (3-6); — *Eakamruay, P.*: Why so little interest is paid to dragonflies and how to promote the study and collection of the [se] insect[s] (7); — *Ubukata, H.*: Hokkaido Odonatological Society was established (7); — *Addresses of Thai members of S.I.O.* (1987) (8). — (Abstracter's Note: Only 2 issues of the newsletter were previously published. These are marked as "Year 1, No. 1" and "Year 1, No. 2". Consequently, "Vol. 2" has never been published).

- (5850) *MARTINIA*. Bulletin de liaison des Odonatologues de France. No. 5 (March, 1987). — (c/o J.-L. Dommanget, 7 rue Lamartine, F-78390 Bois d'Arcy).
Anonymous: La vie du Bulletin (p. 1); — *Coutanceau, J.-P. & J.C. Robert*: Nouvelles captures de *Cercion lindenii* Selys en Picardie (2); — *Cloupeau, R., M. Levasseur & F. Boudier*: Clé pour l'identification des exuvies des espèces Ouest-Européennes du genre *Gomphus* Leach, 1815 (Anisoptères: Gomphidae (3-12); — *Papazian, M.*: Trois nouvelles espèces pour la Corse (13-17); — *Dommanget, J.-L.*: Renouvellement de l'opération "Lac de Grand-Lieu" (18); — *Petite annonce* (18); — *Heidemann, H.*: Attroupeement de libellules en Camargue (19-20); — *Boudot, J.-P. & G. Jacquemin*: Note sur l'identification et la répartition de *Onychogomphus forcipatus unguiculatus* (Vander Linden) en France (Anisoptères: Gomphidae (21-25); — *Loose, D. & C. Deliry*: Les libellules dans les Alpes du Nord (26-27); — [Analyses d'ouvrages] *Légrand, J.*: Dragonflies and damselflies of Britain and northern Europe, par B. Gibbons (28); — *Machet, P.*: Étude faunistique et bibliographique des Odonates de France, par J.-L. Dommanget (28-30); — *Machet, P.*: Nouvelles philatéliques (30-32).
- (5851) *MAZOKHIN-PORSHNYAKOY, G.A. & G.I. RYAZANOVA*, 1987. Poisk ubezhishcha lichinkami strekozy *Calopteryx splendens*

- (Harris) (Zygoptera). — Refuge searching behavior in *Calopteryx splendens* (Harris) (Zygoptera) damselfly larvae. *Zh. obshch. Biol.* 48(2): 248-253. (Russ., with Engl. s.). — (Katedra Ent., Fac. Biol., Lomonosov St. Univ., Moscow, USSR).
Laboratory experiments indicate that *C. splendens* larvae are able to find shelter by using a complex of (more or less) interchangeable orientation stimuli, such as light, current and the last route. In the latter 2 cases, tactile and chemical orientation are possible, and proprioceptive memory could also not be excluded. The orientation value of light increases with larval growth.
- (5852) NARAOKA, H., 1987. Ecological observations of a large damselfly, *Cercion plagiolum* Needham (Coenagrionidae, Odonata) (I). *Gekkan Mushi* 194: 20-21. (Jap., with Engl. title). — (Fukunoda, Itayanagi-machi, Kitatsugaru-gun, Aomori 038-36, JA). [Abstract not available].
- (5853) NEL, A., 1987. Sur une nouvelle espèce fossile du genre *Lestes* Leach, 1815, du calcaire Stampien de Cereste (Alpes-de-Haute-Provence) (Odonata Lestidae). *Entomologiste* 43(2): 113-116. — (8 av. Gassion, F-13600 La Ciotat).
L. irenea sp. n. is described and figured (holotype ♂, allotype ♀) from the calcareous Stampien (Oligocene) of Cereste, France. Contrary to contemporaneous *L. ceresti* (cf. *OA* 2158) the new sp. shows affinities to extant palaearctic members of the genus.
- (5854) NEWSLETTER [OF THE] BRITISH DRAGONFLY SOCIETY, No. 11 (Spring, 1987). — (c/o R.H. Dunn, 4 Peakland View, Darley Dale, Matlock, Derbyshire, DE4 2GF, UK).
70 new members have joined during the winter 1986/1987, bringing the current BDS membership close to the 500 mark. The 1987 Indoor Meeting will be held on Oct. 31 at the Univ. Leeds, and the program is given of 7 Field Meetings. Among the remaining 6 news items, there is an appeal from the Publicity Officer, a note on Dragonfly Larvae Survey Forms, and a letter from the Field Meeting Organiser, relative to the study of horizontal vs vertical emergence of *Gomphus vulgatissimus*.
- (5855) ROWE, R.J., 1987. Predatory versatility in a larval dragonfly, *Hemianax papuensis* (Odonata: Aeshnidae). *J. Zool., Lond.* 211(2): 193-207. — (Dept Zool., Univ. Canterbury, Christchurch-1, NZ).
Larvae of the large *H. papuensis* used 4 disparate, prey-specific predatory behaviours. Arthropod prey moving on a substratum were stalked and then attacked from a distance. Arthropod prey moving in the water column or at the water surface were approached using jet propulsion and then attacked from a distance. Snails, an unusual prey for an arthropod, were stalked; then the larva manoeuvre about them until a specific orientation was achieved before an attack was made from close range. Dead snails were scavenged, using tactics very similar to those used with live snails, but non-snail carrion was rarely taken. There was no evidence that the possession, by *H. papuensis*, of specialized behaviours for an atypical prey — snails — lowered its success when attacking other types of "typical" prey.
- (5856) ROZE, J., 1987. Par putniem, spārēm un odonatologiju. [On birds, dragonflies and odontology]. *Skolotāju Avīze* 1987 (April 4), p. 8. (Latvian). — (c/o Dr Z. Spuris, Miera iela 19-6, USSR-229021 Salaspils, Latvian SSR). An interview with Dr Z. Spuris (portrait incl.), published in the Latvian "Teacher's Gazette" on the occasion of the appearance of his popular bird book. Références are made to the foundation of the S.I.O. in 1971 [his open letter to the participants in the First European Symp. of Odonatol. was read in the Charter Meeting], and to his membership of the IUCN Species Survival Commission, Specialist Group Odonata.
- (5857) RU[PF, P.], 1987. In Flums erscheint naturwissenschaftliche Zeitschrift über Kleintier-Fauna "Opuscula zoologica fluminensia". *Sarganserländer* 115(90): 13. — (Sarganserländer, Marktstr., CH-8890 (Flums)).
A detailed correspondent's report in a regional

Swiss daily on the said periodical, with a review of some of the first 12 issues, and with special emphasis on the publication on the regional odon. fauna, incl. an enumeration of the localities (cf. *OA* 5316, 5774).

- (5858) SAHLÉN, G., 1987. A new site for somatochlora sahlbergi Trybom in Inari Lapland (Odonata, Corduliidae). *Notul. entomol.* 67: 3-4. — (Bellmansgatan 24, S-754 28 Uppsala). The sp. was collected (14-VII-1986) at Utsjoki, Kevo, Inari Lapland, Finland, at a small tarn. The habitat is described, some notes on male behaviour are provided, and it is suggested that a systematic search is likely to bring to light many more breeding sites in the Inari Lapland.
- (5859) SAHLÉN, G., 1987. Landskapsförteckning över norra Sveriges trollsländor. — [Provincial catalogue of the dragonflies of northern Sweden]. *Natur i Norr* 6: 35-38. (Swedish). — (Bellmansgatan 24, S-754 28 Uppsala). A tabular review is presented of the occurrence of 28 spp. in the 6 northern provinces and the 4 Lapp districts of Sweden. The richest odon. fauna is that of the Norrbotten prov., but inadequate evidence is available for some provinces and for most of the Lapp districts. — This is a preliminary review, and the author would appreciate receiving any information on the odon. fauna of northern Sweden.
- (5860) SAHLÉN, G. & L. MEDQUIST, 1987. Flicksländan *Ischnura pumilio* (Charp.) på Gotland. — A population of *Ischnura pumilio* (Charp.) on the island of Gotland (Odonata: Coenagrionidae). *Ent. Tidskr.* 108: 58-59. (Swedish, with Engl. title). — (First Author: Bellmansgatan 24, S-754 28 Uppsala). 3 ♂ and 1 ♀ were collected in gravel pits at Träkumla, Gotland, Sweden, June 22, 1985. During subsequent visits it was confirmed that the local population consisted in 1985 of several hundreds of individuals. Since 1934 (K. Ander, *Ent. Tidskr.* 55: 67) this is the first record of this sp. from Sweden. It is suggested that a systematic search, particularly in southern coastal Sweden, could be rewarding.
- (5861) SCHNEIDER, W., 1987. Der Holotypus van *Paragomphus genei* (Selys, 1841) (Odonata: Anisoptera: Gomphidae). *Ent. Z. Frankfurt/Main* 97(10): 129-132. (With Engl. s.) — (Inst. Zool., Univ. Mainz, Saarstr. 21, D-6500 Mainz, FRG). The holotype is a female from Sicily, deposited in Museo ed Istituto di Zoologia Sistemica, Univ. Torino, Torino, Italy. It is in a perfect condition, but was so far thought to be lost. Here it is redescribed and figured, and a brief account is given of the complicated synonymy of this sp.
- (5862) SCHNEIDER, W., 1987. Die Verbreitung von *Onychogomphus macrodon* Selys, 1887, mit der Beschreibung des bisher unbekannten Weibchens und einer Wiederbeschreibung des Männchens (Odonata: Gomphidae). *Opusc. zool. flumin.* 13: 1-12. (With Engl. s.) — (Inst. Zool., Univ. Mainz, Postfach 3980, Saarstr. 21, D-6500 Mainz, FRG). Information on the distribution and on the biogeographic features of *Onychogomphus macrodon* are provided. The adult female is described and figured for the first time, and a redescription and figs are produced of the male. The structural characters indicate that *O. assimilis* (Schneider, 1845) is a sister taxon of *O. macrodon*.
- (5863) SELYSIA. Newsletter of the Societas Internationalis Odonatologica and the U.S. National Office, Vol. 16, No. 1 (March 1, 1987). — (c/o D.M. Johnson, Dept Biol. Sci., East Tennessee St. Univ., Box 23590A, Johnson City, Tennessee 37614-0002, USA). With the current issue the editorship has been taken over by Dr D.M. Johnson, the lay-out modified, and the typographic reproduction improved. — *Johnson, D.M.*: New Editor for Selysia (p. 1); — *Hilton, F.J./D.D. Smith*: Protodonate endothermy immortalized in verse (1); — *Pritchard, G.*: Report of S.I.O. Council election (1); — *Lucas, M.J.*: Folklore requested (2); — *Sternberg, K.*: Faunistic information requested (2); — *Daigle, J.J.*: 1987 U.S. Collector's Gathering (2); — *Garrison, R.W.*: Wanted: Hetaerina species for identification (2); — *Siva-Jothy, M.T.*: Abstract of doctoral dissertation: Sperm competition in

- the Odonata (2); — Müller, R.: S.I.O. Field Meeting in the Philippines: preliminary information and inquiry (3); — Daigle, J.J.: 1986 collecting trips in the USA (3); — Belle, J.: Odonata collecting in Costa Rica (3-4); — Dunkle, S.W.: Trek to Trinidad (4-5); — Anselin, A.: First meeting of Belgian Dragonfly Study Group (5); — Ubukata, H.: Hokkaido Odonatological Society was established (5); — Kiauta, B.: The First All-Union Symposium on Odonatology in the USSR (5-6); — Announcements from the Central Office: Mutations in the S.I.O. National Offices, — New publications of the S.I.O. National Office in India, — Sales of the Hamada & Inoue handbook on the dragonflies of Japan, — Brief announcements related to financial matters (6-7); — Additions and changes to List of S.I.O. members (8); — Cannings, R.A.: [Scribe]: Minutes of the Business Meeting of the Societas Internationalis Odonatologica (S.I.O.) (8-10).
- (5864) SIVA-JOTHY, M.T., 1987. Variation in copulation duration and the resultant degree of sperm removal in *Orthetrum cancellatum* (L.) (Libellulidae: Odonata). *Behav. Ecol. Sociobiol.* 20: 147-151. — (Sch. Agric., Nagoya Univ., Chikusa, Nagoya, 464, JA).
O. cancellatum showed 2 distinct copulation durations at a study site in southern France. These are correlated with different degrees of sperm displacement from the female sperm stores; long copulations (894 ± 142 s) resulting in almost 100% sperm removal, and short copulations (21.0 ± 13.5 s) resulting in 10-15% removal. The difference in copulation duration is also related to the site of copulation and to the relative age of the copulating males. At oviposition sites males who gained copulations were relatively old and copulated for a short period. At feeding sites males who gained copulations were relatively young and copulated for long periods. The difference in the duration of copulation and the degree of sperm removal is discussed with reference to the female habit of ovipositing before remating during oviposition episodes, and the possibility of differences in the rate at which males encounter receptive females at the 2 sites.
- (5865) SMIRNOVA, G.A. & A. Yu. HARITONOV, 1987. Strekozy basseyna ozera Chany. — [Dragonflies of the Chany Lake Basin]. In: A.I. Cherepanov, [Ed.], *Ekologiya i geografiya chlenostonogih Sibiri* [Ecology and geography of Siberian arthropods], pp. 96-97, Nauka, Novosibirsk. (Russ.). — (Second Author: Biol. Inst., Siberian Sect. USSR Acad. Sci., Ul. Frunse 11, USSR-630091 Novosibirsk).
The odon. fauna of the Chana Lake, Western Siberia, consists of 35 spp. (not listed), incl. 8 non-abundant and 5 very local spp. The fauna has an entirely western character, without any eastern taxa.
- (5866) TAAPKEN, J., 1987. Groeneveld. *Wijde Blik* 4(1): 19-24. (Dutch). — (Bilderdijklaan 25, NL-3743 HR Baarn).
Contains a brief reference to the inadequate management of the pond's banks on the Groeneveld Estate, the Netherlands, resulting in the disappearance of a number of odon. spp. (names not stated).
- (5867) UBUKATA, H., 1987. Mating system of the dragonfly *Cordulia aenea amurensis* Selys and a model of mate searching and territorial behaviour in Odonata. In: Y. Itô, J.J. Brown & J. Kikkawa, [Eds.], *Animal societies: theories and facts*, pp. 213-228, Japan Sci. Soc. Press, Tokyo. — (Dept Sci. Educ., Kushiro Coll., Hokkaido Univ., Shiroyama 1, Kushiro, 085, JA).
The behaviour and the mating system of *C. a. amurensis* are reviewed, and a model for the mate searching behaviour of odon. patrolling on a straight line is proposed. The main assumptions of the model are: (1) a male with a fixed length of visual range (D) patrols with a constant velocity (V) on a straight line; (2) he turns to the opposite direction at two fixed points (distance = L); (3) female arrival probability is even in both spatial and temporal dimensions; (4) the females stay at the arrival point for a fixed time (C); (5) if a male discovers a female he copulates with her without fail and leaves the pond. — From the model the following is predicted: if $D > (\sqrt{2-1}) CV$, the species (type 1) has an optimal length of patrol range even if female arrival is

- random; if D is smaller than the right hand section (type 2), mating probability becomes higher as the patrol range increases, provided male density is very low. — On the basis of the above model, the length of "unusurpable territory" is defined at a given time since the start of the patrolling of a resident. Larger territories than the unusurpable territory can be invaded by other males and oblige the resident to waste time in defence. Thus the model predicts that there is an optimal territory length when male density is high, which agrees with the data from *C. a. amurensis*. Finally, the model was discussed in comparison with other models.
- (5868) *WALKERIA*. Newsletter of the Canadian National Office of the International Odonatological Society, Vancouver, Vol. 2, No. 1 (June 1, 1987). — (c/o Dr. S. Cannings, Dept Zool., Univ. British Columbia, 6270 University Blvd, Vancouver, B.C., V6T 2A9, CA).
With the present issue, the editorship of the newsletter and the management of the SIO Canadian National Office were taken over by Dr S. Cannings. — Contents: *Cannings, S.*: The rebirth of Walkeria (p. 1); — *Mathavan, S.*: Ninth International Symposium of Odonatology (1); — *Lyons, R.*: The Odonata of Backus Woods, Norfolk County, Ontario (2); — *Cannings, S.*: Dragonflying in northwestern Canada, July-August 1986 (3); — *Hilton, D.F.J.*: Canadian odonatology (3); — *Requests*, by S. Cannings, B. Anholt, R. Cannings and D.F.J. Hilton (4).
- (5869) WASSCHER, M., 1987. Over de bedreiging en bescherming van de groene glazenmaker (*Aeshna viridis*) — [On the threats to and the conservation of *Aeshna viridis*]. *Natura* 1987(4): 88. (Dutch). — (Minstraat 15 bis, NL-3582 CA Utrecht).
A. viridis is the sole strict vegetation specialist (*Stratiotes aloides*) in Europe. Though the biogeographic optimum of the *Stratiotes* vegetation is in the Netherlands, the sp. is there more rare than expected. The threats to *Stratiotes* vegetation are briefly outlined and some protective measures are suggested.
- (5870) WASSCHER, M., 1987. Nieuwe boeken over libellen. — [New dragonfly books]. *Natura* 1987(4): 94-95. (Dutch). — (Minstraat 13 bis, NL-3582 CA Utrecht).
Book review of volumes listed in *OA* 5234, 5545, 5566 and 5650.
- (5871) WASSCHER, M. & H. SCHOBEN, 1987. Libellen in de Weerribben en het Vledderveld. — [Dragonflies of the Weerribben and the Vledderveld]. *Natura* 1987(2): 35-38. (Dutch). — (First Author: Minstraat 15 bis, NL-3582 CA Utrecht).
Notes on the abundance and microdistribution of 15 spp. at 2 ecologically different localities in southwestern Drenthe, the Netherlands, recorded during May 30-June 3, 1984, are given, and brief comments on the individual morphological variation of some taxa are presented. Also included are observations on infestation of *Coenagrion pulchellum* by *Arrenurus* larvae.
- (5872) WATSON, J.A.L. & G. THEISCHINGER, 1987. *Anax georgius* Selys, 1872 (Odonata: Aeshnidae) rediscovered, in Australia. *J. Aust. ent. Soc.* 26: 67-71. — (First Author: Div. Ent., C.S.I.R.O., P.O. Box 1700, Canberra City, A.C.T. 2601, AU).
A. georgius is an Australian and, perhaps, Timorese sp., not African. The male is redescribed and figured, and the final instar larva exuviae described. Adults of the Australian spp. of *Anax* Leach are keyed.
- (5873) WELLBORN, G.A. & J.V. ROBINSON, 1987. Microhabitat selection as an antipredator strategy in the aquatic insect *Pachydiplax longipennis* Burmeister (Odonata: Libellulidae). *Oecologia* 71: 185-189. — (First Author: Dept Biol., Univ. Texas, UTA Box 19498, Arlington, TX 76019, USA).
An investigation of the larval dragonfly fauna associated with the plant *Sagittaria platyphylla*, was conducted in a small pond. Despite the presence of several larval anisopteran spp. in the pond, only *P. longipennis* larvae were found on *Sagittaria* plants. A study of the microspatial distribution of *P. longipennis* larvae on *S. platyphylla* indicated that larvae use the various regions of a plant in a highly

non-random fashion. Larvae show a strong preference for the leaf axil area. A generalized predator, the bluegill sunfish (*Lepomis macrochirus*), was allowed to selectively eat either of two larvae placed in various plant regions. This experiment indicated that larvae in a leaf axil are significantly less susceptible to bluegill predation than larvae positioned in other plant regions. The microspatial distribution of starved larvae revealed that larvae with high hunger levels occupied the leaf axil area significantly less than did well fed larvae, suggesting (1) larvae do not use these regions as feeding sites, (2) high hunger levels may induce a behavioral shift in habitat use, with starved larvae forced into areas of high predation risk by the need to fulfil nutritional requirements.

- (5874) WILDERMUTH, H., 1987. Fundorte und Entwicklungsstandorte von *Somatochlora arctica* (Zetterstedt) in der Schweiz (Odonata: Corduliidae). *Opuscul. zool. flumin.* 11: 1-10. (With Engl. s.) — (Mythenweg 20, CH-8620 Wetzikon).

All known Swiss localities (61) are mapped, described and briefly discussed with reference to the horizontal and vertical distribution in Switzerland. In addition to earlier evidence (H. Wildermuth, 1986, *Odonatologica* 15: 185-202), some new data are given on the ecology of larval habitats. It is suggested that in bright

sunshine the pattern of sparkling reflections of the uneven water surface, caused by vegetation, is essential for the adults in finding the oviposition site.

- (5875) ZAIKA, V.V. & O.E. KOSTERIN, 1987. Структура насeleniya i etologicheskie aspekty strekoz Manzherokskogo ozera (Altay). — [Structure and ethological aspects of the Manzherokskoe Lake (Altai)]. In: A.I. Cherepanov, [Ed.], *Ekologiya i geografiya chlenostonogih Sibiri* [Ecology and geography of Siberian arthropods], pp. 73-74, Nauka, Novosibirsk. (Russ.). — (Dept Ent., Tomsk Univ., 36 Lenin Ave., USSR-634010 Tomsk). The fauna (34 spp.) is listed and briefly analyzed.

- (5876) ZHU, H. & J. WU, 1987. Odonata (Insecta). III. A survey of the Natural enemy insect resources in Shanxi (2). *J. Shanxi Univ. (nat. Sci.)* 1987(1): 90-92. (Chin., with Engl. s.). — (Dept Biol., Univ. Shanxi, Taiyuan, Shanxi, P.R. China).

Notes are presented on 8 spp., of which *Mesopodagrion tibetanum*, *Megalestes distans*, *Bayadere melanopteryx*, *Sinogomphus suen-soni*, *Anax n. nigrofasciatus*, *Sympetrum ruptum* and *S. haematoneura* are new to northern China. — For the earlier parts of this series cf. *OA* 4555, 4716.