ODONATOLOGICAL ABSTRACTS

1971

(661) HABERT, E.W. & W.H. BECKERT, 1971. Sex distinguishing chromatin in some invertebrates. Cytologia 36 (1): 190-197. – *(Dept. Biol., St. John's Univ., Jamaica, N.Y. 11432, USA).*

Representatives of Mollusca, Annelida and Arthropoda were investigated to determine the presence or absence of sex specific chromatin masses. The Feulgen technique and 2 different techniques using Biebrich scarlet and fast green FCF were used to demonstrate sex distinctive chromatin in tissue sections. No nuclear dimorphism was noted in Myriapoda and in 9 out of 11 insect orders examined. Thus in Odon. the nuclei of flight muscle, gut, epithelial and connective tissue cells of Libellula pulchella, Anax junius and Lestes uncatus had no sex distinctive masses.

1972

(662) FURTADO, J.I., 1972. The reproductive behaviour of Ischnura senegalensis (Rambur), Pseudagrion microcephalum (Rambur) and P. perfuscatum Lieftinck (Odonata, Coenagrionidae). Malaysian J. Sci. (A), 1: 57-69. – *(Ecol. Div., Sch. Biol. Sci., Univ. Malaya, Kuala Lumpur, Malaysia).*

The study was carried out in the field. The adult ♂ establishes a territory about a base perch. This territory is circular in I. senegalensis and P. microcephalum and oval in P. perfuscatum. The territory is established partly by the chase display in the three species, and by the elaborate confrontation-chase display in P. perfuscatum; it is maintained for only a short period. Mating is of long duration in the 3 spp., but is variable in P. perfuscatum; it occurs outside the territory. Oviposition is endophytic, usually in tandem and outside the territory. It occurs at the water's surface as well as under water. (Author).

(663) SCHNEIDER, E., 1972. Somatochlora alpestris Selys (Odonata) aus dem Retezat Gebirge – der zweite Nachweis aus den Rumänischen Karpathen. Stud. Muz. Brukenthal Sti. natur. 17: 273-275. (Romanian, with German s.). – *(c/o Muzeul Brukenthal, Pianta republicii 3-4, Sibiu, RU).*

Since 1956 only a single adult ♂ was known from the Romenian territory. In this article the larvae collected in July 1967 in the Retezat Mts. are brought on record.

(664) VALVASSORI, R., 1972. Correlazioni morfologiche e funzionali dei muscoli intersegmentali addominali in neanidi di odonati. Boll. Zool. 39 (4): 668-669. – *(Lab. Istol. Embriol., Ist. Zool., Univ. Milano, Milano, Italy).*

Morphological and functional correlations observed in the abdominal intersegmental muscles of the larvae of Calopteryx, Aeshna and Anax are briefly pointed out.

1973

(665) AOYANAGI, M., 1973. Observations of actions and postures of the adult damselfly Ceriagrion melanurum Selys (Odonata: Agri-

onidae). – Studies on adult behaviour of the damselfly Ceriagrion melanurum Selys. I. Kontyû 41 (2): 241-253. (Japanese, with Engl. s.). – *(c/o Ent. Soc. Japan, Dept. Med. Ent., Natl Inst. Health, 10-35 Kamiosaki, 2-chome, Shinagawa-ku, Tokyo, 141, JA).*
Field studies were carried out from 1968 through 1970 in northern Wakayama, Japan. The following features were considered: (1) nonreproductive behaviour, viz. normal resting, normal flight, feeding flight, feeding, escaping, avoiding, threatening, attack, and abdominal bobbing (all terms by the author), and (2) reproductive behaviour. Schematic diagrams for both kinds of behaviour are also presented.

(666) BARENDREGT, A. & M. van NOORDWIJK, 1973. 't Merkske. Trias 1973 (5): 3-9. (Dutch). – *(Strosteeg 45, Utrecht, NL).*
The 't Merkske is a small rivulet on the Dutch/Belgian frontier, near the town of Baarle-Nassau, Netherlands. A list is given of 16 odon. spp. recorded during 1971-1972. Of particular interest are Platycnemis pennipes, Calopteryx splendens and C. virgo, which have a very local distribution in the Netherlands and are becoming more and more scarce because of rapid destruction and pollution of the suitable biotopes.

(667) DALWIGK, H.B. von, 1973. Über die Temperaturabhängigkeit von Instinkthandlungen bei Libellenlarven (Aeschna cyanea Müll.) und Springspinnen (Salticus scenicus C.). Zool. Anz. 190 (5-6): 361-380. – *(Haus Hohencampf, D-3559 Lichtenfels-Dalwigksthal, GFR).*
In larvae of A. cyanea the effect of a prey dummy depends on both adaptation (acclimation) temperature (AT) and experimental temperature (VT). The number of prey-catching actions increases with rising AT at corresponding VT (exception: AT 20°-animals at VT 20°C). A change in VT (in AT 10°-animals towards higher temperatures, in 20°-animals towards lower temperatures) leads to an increase in prey-catching actions (S_0); the animals tire more slowly when transferred to another temperature. At 15° animals responded differently. Recovery of prey-catching reaction depends both on recovery time and on temperature during recovery time. If the rate of recovery is measured at different AT and VT (during testing of S_0 and S_T and during the interval between them, the temperature is held constant), similar curves with relatively low Q_{10} values are obtained for AT 15°- and AT 20-animals. The AT 10°-animals, however, have lower values than either. Under diel alternation of AT between 10°C and 20°C (VT 15°C), larvae show approx. twice as much alertness to prey-catching in comparison to animals at constant AT. This is attributed to a stimulation by temperature change. The recovery rate of animals exposed to alternating AT was only 50% of that of controls, however, due probably to overstimulation in the S_0 experiment. The time course of exhaustion experiments shows that all animals exhibit a high prey-catching frequency initially. Towards the end of the experiment those animals which overall do not make many attempts at prey-capture often show a swift decrease in frequency, while in animals snapping more often the frequency decreases more slowly. The abundance of food and the temperature affect the moulting cycle.

(668) DEGRANGE, C., 1973. Un odonate des eaux temporaires: Hemianax ephippiger (Burm.). Bull. Soc. Linn. Lyon 42 (No. spécial): 43-48. – *(Lab. Zool., Univ. Grenoble, Domaine Universitaire, F-38 Saint-Martin-d'Hères).*
Ecological features of adult and larval H. ephippiger are described. An attempt to breed the species in an artificial pond near Grenoble, France, has failed and the larvae brought from southern France were destructed by the heteropteran Notonectidae.

(669) GLOYD, L.K., 1973. The status of the generic names Gomphoides, Negomphoides, Progompus and Ammogomphus (Odonata: Gomphidae). Occ. Pap. Mus. Zool. Univ. Mich. 668: 1-7. – *(Mus. Zool., Univ. Michigan, Mus. Bldg, Ann Arbor, Michigan 48104, USA).*
Negomphoides Muttkowski, 1910 is considered a new synonym of Gomphoides

Selys, 1854, with Diastatomma infumatum Burmeister as its type species. Progomphus Selys, 1854 is considered a valid generic name, with P. gracilis Hagen as the type species. Ammogomphus Förster, 1914 is a new synonym of Gomphoides Selys, 1854.

(670) KOSLUCHER, D.G. & G.W. MINSHALL, 1973. Food habits of some benthic invertebrates in a northern-desert stream (Deep Creek, Curlew Valley, Idaho-Utah). Trans. Am. Microsc. Soc. 92 (3): 441-452. – *(Dep. Biol., Idaho State Univ., Pocatello, Idaho 83201, USA).*

The food-habits of invertebrates in the stream were studied on a seasonal basis. The foods eaten were quantified according to frequency of occurrence and compared with the potential foods available in the environment. The odon. spp. observed are: Argia vivida, Enallagma anna and Ophiogomphus severus.

(671) MOKRUSHOV, P.A. & V.V. ZOLOTOV, 1973. Zritel'nye stimuly v povedenii strekoz. II. Ohota i begstvo u lichinok koromysla sinego (Aeshna cyanea Müll.) (Visual stimuli in the behaviour of dragonflies. II. Hunting and escape reactions in the larvae of Aeshna cyanea Müll.). Vest. zool., Kiev 6: 75-77. (Russian). – *(Inst. Zool., Acad. Sci. Ukrain. SSR, UL. Lenina 15, 252000 Kiev, USSR).*

Visual stimuli eliciting prey hunting and escape responses were studied under laboratory conditions by means of electrophysiological registrations of reactions to models. Physiological mechanisms are discussed, and the conclusion is drawn that the binocular vision plays a role not only in the determination of the distance to an object, but also in estimation of the size of the objects that cause the flight reaction. (For part I cf. *OA* No. 335).

(672) NARAOKA, H., 1973. New habitats of Nehalennia speciosa (Odonata: Agrionidae) in Aomori pref. New Entomol. 22 (3-4): 45-46. (Japanese, with Engl. translation of the title). – *(2 Murakami apart., 252 Hiraoka-Shinjo, Aomori, Aomori Pref., 030, JA).*

A few new localities, discovered from 1971 through 1973 in the Aomori Prefecture, Japan, are brought on record. A topographic map is added.

(673) POND, C.M., 1973. Initiation of flight and pre-flight behaviour of anisopterous dragonflies Aeshna spp. J. Insect Physiol. 19 (11): 2225-2229. – *(ARC Unit Insect Physiol., Dept. Zool., Univ. Oxford, South Parks Rd., Oxford, UK).*

The start of flight of mature adult Aeshna (grandis and cyanea? /mixta?) was investigated by electrophysiological and photographic techniques. Flight begins with either an upward or a downward movement of the wings. Neuromuscular activity and wing vibrations resemble the "warm up" in Heterocera (Lepidoptera).

(674) PROVONSHA, A.V. & W.P. McCAFFERTY, 1973. Previously unknown nymphs of western Odonata (Zygoptera: Calopterygidae, Coenagrionidae). Proc. ent. Soc. Wash. 75: 449-454. – *(Dept. Ent., Purdue Univ., West Lafayette, Indiana 47907, USA).*

The previously unknown larval stages of Hetaerina vulnerata Hagen and Argia nahauna Calvert (*sic*) are described from south-western Utah, USA. A comparison with closely related spp., on the basis of larval morphology, is given for each, and differentiating characterization is indicated. Notes on observed biology and habitat data are also included. (Authors).

(675) ROBINSON, M.H. & B. ROBINSON, 1973. Ecology and behaviour of the Giant Wood Spider Nephila maculata (Fabricius) in New Guinea. Smithson. Contrib. Zool. 149: 1-76. – *(Smithsonian Tropical Res. Inst., P.O.B. 2072, Balboa, Canal Zone, Panama).*

Investigations of the seasonal, reproductive, and population ecology of N. maculata are reported in detail. In an investigation of feeding ecology over a one-year period, the discarded remains of the prey caught by a sample population of 10 adult ♀♀ were collected daily. These remains were identified and the accumulated weekly discards from each spider were dried and weighed. Data

from this study are analyzed, tabulated and compared with the catches from insect traps located in the study area. Among 6039 specimens caught by a single ♀ during 52 weeks there were only 12 zygopterans (0.2%).

(676) SANTOS, N.D. dos, 1973. Contribuição ao conhecimento da fauna do Estado da Guanabare e arredores. 81 – Descriçâo da ninfa de Triacanthagyna caribbea Williamson, 1923 (Odonata: Aeshnidae). (Contribution to the knowledge of the fauna of the State of Guanabara and its vicinity. 81. – Description of the nymph of Triacanthagyna caribbea Williamson, 1923 [Odonata: Aeshnidae]). Atas Soc. biol. Rio de Janeiro 16 (2-3): 53-54. (Portuguese). – *(Museu Nacional, Universidade do Brasil, Quinta da Boa Vista, Rio de Janeiro, Brazil).*
The ultimate instar larva and exuvia are described and illustrated on the basis of material from various localities in the States of Guanabara and Rio de Janeiro, Brazil. A number of adult records are also listed for the same territory. Notes on crepuscular behaviour of this and other spp. of the genus are added.

(677) SANTOS, N.D. dos, 1973. Contribuição ao conhecimento da fauna do Estade da Guanabara e arredores. 82 – Descriçâo da ninfa de Gynacantha gracilis (Burmeister, 1839) Kolbe 1888 (Aeshnidae: Odonata). (Contribution to the knowledge of the fauna of the State of Guanabara and its vicinity. 82. – Description of the nymph of Gynacantha gracilis [Burmeister, 1839] Kolbe 1888 [Aeshnidae: Odonata]). Atas Soc. biol. Rio de Janeiro 16 (2-3): 55-57. (Portuguese). – *(Museu Nacional, Universidade do Brasil, Quinta da Boa Vista, Rio de Janeiro, Brazil).*
The ultimate instar larva and exuvia are described and illustrated on the basis of material from the Tinguá Forest Reserve, Rio de Janeiro, Brazil. A few records of adult specimens from the same region are also listed.

(678) SANTOS, N.D. dos, 1973. Contribuição ao conhecimento da fauna do Estade da Guanabara e arredores. 83 – Descriçâo da ninfa de Anatya januaria Ris, 1911 (Odonata: Libellulidae). (Contribution to the knowledge of the fauna of the State of Guanabara and its vicinity. 83. – Description of the nymph of Anatya januaria Ris, 1911 [Odonata: Libellulidae]). Atas Soc. biol. Rio de Janeiro 16 (2-3): 67-69. (Portuguese, with Engl. s.). – (Museu Nacional, Universidade do Brasil, Quinta da Boa Vista, Rio de Janeiro, Brazil).
The ultimate instar larva is described and illustrated on the basis of material from the Tinguá Forest Reserve, Rio de Janeiro, Brazil, and observations on the emergence are presented. A considerable number of new records from the Brazilian Federal States of Rio de Janeiro, Espírito Santo, Bahia, Pernambuco, Sao Paulo and Paraná, extends the known range of this woodland sp. in both northward and southward direction. Its original locality is Bom Jesus de Itabapoana, Rio de Janeiro, Brazil, where it occurs in the coastal forests.

(679) SANTOS, N.D. dos, 1973. Contribuição ao conhecimento da fauna do Estade da Guanabara e arredores. 84 – Descrição da ninfa de Perithemis mooma Kirby, 1889 (Odonata – Libellulidae). Contribution to the knowledge of the fauna of the State of Guanabara and its vicinity. 84. – Description of the nymph of Perithemis mooma Kirby, 1889 [Odonata – Libellulidae]). Atas Soc. biol. Rio de Janeiro 16 (2-3): 71-72. (Portuguese, with Engl. s.). – *(Museu Nacional, Universidade do Brasil, Quinta da Boa Vista, Rio de Janeiro, Brazil).*
The ultimate instar larva is described and illustrated on the basis of a single specimen from Prata rio Soledade, Rio de Janeiro, Brazil, and a note on ecdysis is added. A list of adult records from the States of Guanabara and Rio de Janeiro and some phenological notes are also presented. Specific distinctions in the labial structure of P. electra, domitia, mooma and tenera are stated.

(680) SINGH, J.S. & P.S. YADAVA, 1973. Caloric values of plant and insect species of a tropical grassland. Oikos 24 (2): 186-194. – *(Nat. Resource Ecol. Lab., Colorado State Univ., Fort Collins, Colorado 80521, USA).*
Caloric measurements were made on plants and insects of a grassland community at

Kurukshetra, India. The insects were collected by sweeping during the monsoon season. Crocothemis sp. is the only dragonfly studied. The value obtained for it is 6122.2 cal/g dry weight.

(681) SNYDER, A.W., 1973. Structure and function of the fused rhabdom. J. Comp. Physiol. 87 (2): 99-135. – *(Inst. Adv. Stud., Res. Stn. Phys. Sci., Canberra 2600, AU).*
Since all rhabdomeres are joined tightly together, the possibility of optical and electrical coupling between retinula cells is greatly enhanced. The extent and consequences of this coupling were studied in order to understand the functional significance of fused rhabdoms. The methods included both theory and intracellular recordings. In Odon. the polarization sensitivity of the retinula cell depends on wavelength and shows both optical and electrical coupling. The fused rhabdom cannot be considered as a loose collection of photoreceptors, sharing the same dioptic apparatus. It must be viewed as an integrated unit. Its evolution is a significant advance in the evolution of the arthropod visual system, allowing high absolute sensitivity to be combined with colour vision and acuity. (Cf. also *OA* No. 648).

(682) VAAJAKORPI, H.A. & I. SALONEN, 1973. Bioaccumulation and transfer of ^{14}C-DDT in a small pond ecosystem. Ann. Zool. Fenn. 10 (4): 539-544. – *(Dep. Zool., Univ. Helsinki, P. Rautatiekatu 13, SF-00100 Helsinki-10).*
500 mg of ^{14}C-labelled DDT, with inactive carrier DDT, was pumped into a small (500 m^3) pond. During the next 2 months the bio-accumulation and transfer of DDT were observed in filtered water, suspended material, sediment and animals (Pisces, Urodela, Isopoda, Insecta) and plants. DDT was determined quantitatively by liquid scintillation counting. An applied combustion technique was used for all samples except the filtered water, before transfer to the scintillation liquid. In larval Odon., the maximum accumulation (MA) (0.54 ppm) was reached at 14 days; at 30 days the level had fallen again (0.20 ppm). In larval Trich. (removed from cases) MA (1.71 ppm) was at 4 days; the average concentrations were 6 times those of larval Odonata. In Notonecta sp (Hem., Het., Notonectidae), MA (0.30 ppm) was at 4 days; the average concentration was the lowest for all the Insecta studied. Re-dissolution of DDT apparently occurred from sediment to water, the level remaining relatively stable over the whole period of study.

(683) WISE, K.A.J., 1973. A list and bibliography of the aquatic and water-associated insects of New Zealand. Rec. Auckland Inst. Mus. 10: 143-187. – *(Auckland Inst. and Mus., Auckland, NZ).*
A list of the New Zealand aquatic, semi-aquatic, and some closely associated insects follows a general introduction and discussion by orders. A bibliography covering the past 20 years is given. On pp. 149-150 is a list of 12 odon. spp., all from New Zealand, Chatham Islands and Karmadec Islands.

(684) WITSACK, W., 1973. Zur Biologie und Ökologie in Zikadeneiern parasitierender Mymariden der Gattung Anagrus (Chalcidoidea, Hymenoptera). Zool. Jb. Syst. 100 (2): 223-299. – *(Sekt. Biol. Ökol., Fraunhoferstrasse 6, DDR-69 Jena, GDR).*
The results of field and laboratory studies on the 3 European representatives of the macro-species A. atomus, viz. atomus, incarnatus and ensifer, are presented. The morphology, behaviour and ecology of different developmental stages are described, and emergence, locomotion, feeding, mating, oviposition and longevity are discussed. Location of host eggs by the ♀ involves tapping the surface of plant tissue with the antennae. There is no evidence for olfaction being involved, but parasitism only occurs if the host eggs are surrounded by living turgid plant tissue, and if the dorsal closure of the host embryo is not yet complete. The host spectrum is thus confined to insect spp. which lay their eggs in suitable plant material, including endophytically ovipositing Odon.

1974

(685) AIDA, M., 1974. Behaviour of Anisogomphus maackii (Selys) at the reproductive site. Tombo 16 [1973] (1-4): 13-15. (Japanese, with Engl. s.). – *(7-15, Sakae 1 chome, Ichinomyia, Aichi, 491, JA).*
Non-sexual and sexual behaviour has been studied at two localities in Gifu Prefecture, Japan. The ecdysis takes place in June and July, and the mature insects reappear at breeding sites from mid August to early September. During the morning hours the ♂♂ patrol 10-50 cm above the water surface over an area of 20-30 m along the river. Clashes are not violent. The territorial behaviour seems primitive. In the afternoon the ♂♂ are alighting on the rocks along the waterside, but few ♀♀ are observed there. No mating takes place near the water. Oviposition occurs in the late morning hours over open, calm water surface.

(686) ASAHINA, S., 1974. Records of two Taiwanese Odonata, a correction. Tombo 16 [1973] (1-4): 10. – *(Totsuka III-123, Shinjuku-ku, Tokyo, 160, JA).*
The Taiwanese locality data for Trithemis pallidinervis and Tramea "limbata" (= T. transmarina propinqua Lieft.) are stated. (Cf. *OA* No. 410).

(687) ASAHINA, S., 1974. Discovery of Erythromma najas in Japan (Agrionidae). Tombo 16 [1973] (1-4): 11-12. (Japanese, with Engl. s.). – *(Totsuka III-123, Shinjuku-ku, Tokyo, 160, JA).*
In 1972 and 1973 Erythromma najas baicalensis Belyshev was discovered at the Chimikeppu Lake, Kitami, Hokkaido, Japan. The subspecific identification is provisional only. A ♀ of the same sp. was taken in 1973 also in the Kushiro area, Japan. Photographs of specimens and drawings of ♂ appendages are added.

(688) ASAHINA, S., 1974. The labium of the second and third instar larvae of Epiophlebia superstes. Tombo 16 [1973] (1-4): 22. (Japanese). – *(Totsuka III-123, Shinjuku-ku, Tokyo, 160, JA).*
Description and illustrations based on the material referred to in the paper listed in *OA* No. 714).

(689) ASAHINA, S., 1974. The Second International Symposium of Odonatology. Tombo 16 [1973] (1-4): 26-27. (Japanese). – *(Totsuka III-123, Shinjuku-ku, Tokyo, 160, JA).*
A brief report on the Symposium, held at Karlsruhe, German Federal Republic, during October 20-23, 1973. A reproduction of the Symposium Emblem is added. (Cf. *OA* Nos. 512, 530, 531).

(690) ASAHINA, S. & K. INOUE, 1974. Descriptions of two new geographical races of Davidius moiwanus (Gomphidae). Tombo 16 [1973] (1-4): 2-10. – *(Totsuka III-123, Shinjuku-ku, Tokyo, 160, JA).*
D. moiwanus taruii ssp. n. (♂ holotype, ♀ allotype: Katsuragawa, Shiga Pref., Japan) and D. m. sawanoi ssp. n. (♂ holotype, ♀ allotype: Yawata-kogen, 700 m alt., Hiroshima Pref., Japan) are described and illustrated. A considerable number of paratypes of both new ssp. are in the authors' collection. They originate from 8 and 4 prefectures respectively. D. moiwanus moiwanus is redescribed and notes on variation of landmark characters, habitats and geographic distribution of the 3 ssp. are added.

(691) BICK, G.H. & L.E. HORNUFF, 1974. New records of Odonata from Montana and Colorado. Proc. Ent. Soc. Wash. 76: 90-93. – *(Biol. Dept. Biol., Saint Mary's Coll., Notre Dame, Indiana 46556, USA).*
For the first time 20 taxa are recorded from Montana and 14 from Utah, USA. Among the new Montana records, 12 fill distributional gaps, 3 are near or extend ranges eastward, 4 westward, 1 northward. For Colorado, 6 records fill distributional gaps, 2 are near or extend ranges eastward, 5 westward, 1 southward. East-West distribution limits are given for Enallagma antennatum, E. hageni, Ischnura verticalis, I. cervula. In Colorado, Coenagrion resolutum and Enallagma boreale were most frequent odon. above 8000 ft. (Authors).

(692) BOOLE, M.S., C.L. HAMRUM & M.A. ANDERSON, 1974. The Minnesota species of Aeshna with notes on their habits and distribution (Odonata: Aeshnidae). Great Lakes Ent. 7: 19-22. – *(Biol. Dept., Gustavus Adolphus Coll., Saint Peter, Minnesota 56082, USA).*
A key and explanatory figures for the 7 Minnesota spp. are presented along with a discussion of identification problems and notes on distribution, habits and ecology.

(693) CONSIGLIO, C., R. ARGANO & L. BOITANI, 1974. Osservazioni ecologiche sugli odonati adulti di uno stagno dell'Italia centrale. Fragm. Ent., Roma 9 (4): 263-281. – *(Inst. Zool., Univ. Roma, Città Universitaria, I-00100 Roma).*
An adult odon. association (14 spp.) has been examined at a pond near Rome, Italy, and the following features were studied per species: season and daily scheme of reproduction, territoriality, reproductive behaviour, and the choice of oviposition substrate. Each sp. is distinct from the other in at least one of these features, save for Orthetrum cancellatum and Crocothemis erythraea that appear nearly identic.

(694) DEGRANGE, C. & M.-D. SEASSAU, 1974. Sur la régénération du masque (= labium) des larves des Odonates Anisoptères Anax imperator Leach et Aeschna cyanea (Müller). C.R. Acad Sc. Paris (D) 278: 281-284. – *(Lab. Zool., Univ. Grenoble, Domaine Universitaire, F-38 Saint-Martin-d'Hères).*
The regeneration shows the heterogeneous nature of the odon. labium, consisting of an appendicular and a sternal part.

(695) EDA, S., 1974. Hovering Aeschna mixta ♂. Tombo 16 [1973] (1-4): 1. – *(Dept. Oral Pathol., Matsumoto Dental Coll., 1780 Gobara, Hirooka, Shioziri, Nagano, 399-07, JA).*
A frontispiece photograph.

(696) EDA, S., 1974. Females of Gomphus postocularis preparing a big egg-mass just before their oviposition. Tombo 16 [1973] (1-4): 17-18. (Japanese, with Engl. s.). – *(Dept. Oral Pathol., Matsumoto Dental Coll., 1780 Gobara, Hirooka, Shioziri, Nagano, 399-07, JA).*
A note on a observation carried out in Hokkaido, Japan. A photograph is added.

(697) EDA, S., 1974. Mortonagrion hirosei in Tokyo and its vicinity. Tombo 16 [1973] (1-4): 18. (Japanese, with Engl. s.). – *(Dept. Oral Pathol., Matsumoto Dental Coll., 1780 Gobara, Hirooka, Shioziri, Nagano, 399-07, JA).*
3 localities are brought on record: 1 from Tokyo and 2 from Chiba Prefecture, Japan. A (Japanese) topographic map is added.

(698) EDA, S., T. USUI & M. OKUMA, 1974. Further observations on the triple-connection of Odonata. Tombo 16 [1973] (1-4): 16-17. – *(Dept. Oral Pathol., Matsumoto Dental Coll., 1780 Gobara, Hirooka, Shioziri, Nagano, 399-07, JA).*
Observations and photographs on Trigomphus melampus and Lestes sponsa are presented.

(699) GOODMAN, L.J., 1974. The insect dorsal ocellus. Proc. Roy, ent. Soc. Lond. 39 (2): 7-8. – *(Dept. Zool., Queen Mary Coll., Univ. London, London, E1. UK).*
This is the abstract of a paper presented at a meeting of the Society. It includes staining of odon. ocellar nerves by the cobalt ionophoretic technique. The evidence indicates that these nerves project to 3 main areas of the brain. Furthermore there are 2 distinct groups of associated dendritic fields on the dorsal surface of both sides of the protocerebrum.

(700) HASHIMOTO, A., 1974. Anax guttatus in Shizuoka Prefecture, 1973 record. Tombo 16 [1973] (1-4): 26. (Japanese, with Engl. s.). – *(Shizuoka Univ. Residence No. 116, Ohtani, Shizuoka, 420, JA).*
11 ♂ of this tropical migrant were captured at 2 localities in Shizuoka Prefecture, Japan. It is not known whether or not the sp. is autochthonous in this area.

(701) HATTON, A., 1974. Dragonflies: the beauty of the beast. Realites 1974 (281): 55-61. – *(Author's address unknown).*

A popular article dealing primarily with life history and larval feeding. 7 excellent large scale photographs of adults are included.

(702) INOUE, K., 1974. S.I.O. Executive member from Japan. Tombo 16 [1973] (1-4): 27. (Japanese). – *(5-9, Fuminosato 4 chome, Abeno-ku, Osaka, 545, JA).*
At the invitation of the Second International Symposium of Odonatology (Karlsruhe, October 20-23, 1973) the Society of Odonatology, Tokyo, has appointed Mr. K. Inoue to respresent the Japanese odonatology in the Executive of the International Odonatological Society (S.I.O.).

(703) KAISER, H., 1974. Die tägliche Dauer der Paarungsbereitschaft in Abhängigkeit von der Populationsdichte bei den Männchen der Libelle Aeschna cyanea (Odonata). Oecologia 14: 375-387. – *Zool. Inst., Univ. Köln, Weyertal 119, D-5000 Köln-41, GFR).*
The population density dependence of the daily duration of mate seeking activity was studied in A. cyanea. Males pay several visits per day to a suitable pond in search of mates. The influence of the population density upon the daily duration of presence of single dragonfly males was investigated by means of multiple regression analysis. Several environmental factors were also considered. Population density was defined in terms of the total number of males attending the pond per day. It could be shown that the total daily length of male visits is dependent upon air temperature but not significantly upon population density. This fact is surprising since the duration of a single visit is strongly dependent upon the number of individuals present at a pond at the same time. Nevertheless the daily presence does not vary with population density because the males compensate for the shorter duration of single visits by attending the pond more often per day when population density is high. Thus, the number of males present at a pond at the same time varies less than would be expected by their random arrivals. (Author).

(704) KAJI, T., 1974. A hybrid specimen of Sympetrum risi risi X S. eroticum eroticum taken from Toyama prefecture. Tombo 16 [1973] (1-4): 18. (Japanese, with Engl. s.). – *(9-14, Naka-shinminato, Shinminato, Toyama, 934, JA).*
The specimen was taken at Kami-ichi-machi, Toyama Prefecture, Japan. At the same locality S. darwinianum, S. eroticum and S. baccha matutinum are common. Illustrations are not given. (Cf. also *OA* No. 650).

(705) KIAUTA, B., 1974. Introduction to insect cytotaxonomy. Lectures delivered at the Tribhuvan University, Kathmandu. Vol. 1. Nepal Research Center, Kathmandu. XII + 81 pp. – (Author's address: *Inst. Genet., Univ. Utrecht, Opaalweg 20, Utrecht, NL;* Publisher's address: *Nepal Research Center, Thyssen House, c/o G.B. Kalikote, P.O.Box 180, Kathmandu, Nepal*).
The booklet presents a review of cytogenetic and cytotaxonomic conditions met with in the 28 hitherto insect orders. It was prepared for the students and staff of the Kathmandu University, Nepal, therefore special reference is made to the Indian and Nepalese fauna. Introductory chapters, outlining the concepts and scope of cytotaxonomy, are followed by a systematic account of orders (Odon. pp. 19-23). To the treatment of each order a bibliographic list is appended with general references and one with those of papers to cytotaxonomy of the Indian and Nepalese species. At appropriate places the chromosome numbers are listed of all insects so far studied cytologically from the Nepalese territory, including 41 odon. spp., among which the following 25 are new to cytotaxonomy (♂ n in brackets): Calicnemia nipalica Kimmins (13), C. pulverulans Selys (13), C. sp. (13), Coeliccia renifera (Selys) (13), Cercion malayanum (Selys) (14), Ceriagrion azureum (Selys) (14), C. cerinomelas Lieftinck (14), Ischnura aurora (Brauer) (14), I. forcipata Morton (14), I. rufostigma annandalei Laidlaw (14), Megalestes major Selys (13), Lestes dorothea Fraser (13), Rhynocypha unimaculata Selys (12), Neurobasis chinensis (L.) (12), Anisogomphus occipitalis (Selys) (12), Onychogomphus bistrigatus (Hagen) (12),

Paragomphus lineatus (Selys) (12), Anax nigrofasciatus nigrolineatus Fraser (14), Neurothemis fulvia (Drury) (13), N. intermedia intermedia (Rambur) (13), Orthetrum japonicum internum Mac Lachlan (13), O. luzonicum (Brauer) (13), Palpopleura sexmaculata sexmaculata (Fabr.) (13), Pseudotramea prateri Fraser (13), and Trithemis festiva (Rambur) (13). (Author). (*Abstracter's note*: only a limited number of copies is available from the author. The booklets can be obtained from the Publishers at the price of RsN 20.–, postage extra).

(706) KITAWAKI, W., 1974. Odonata from South Brodino Island located to the east of Okinawa Island. Tombo 16 [1973] (1-4); 19-20. (Japanese, with Engl. s.). – (*137, Katsuyama-dori, 2 chome, Tennoji-ku, Osaka, 543, JA*).
A list of 15 spp. collected during August 3-7, 1973. The more interesting are Zyxomma obtusum and Macrodiplax cora which both seem to be autochthonous on the Island.

(707) KRUYT, W., 1974. Over de kleur der libellen. (On the colour of dragonflies). Natura 71 (5): 80-86. (Dutch). – (*Leeghwaterstraat 12, Haarlem, NL*).
A popular narrative on the ecological significance and physiological nature of dragonfly coloration, with a note on colour preservation in museum specimens.

(708) MANI, M.S., [Ed.]. 1974. Ecology and biogeography of India. Junk, The Hague. X + 775 pp., 163 figs., 2 folding maps – (Author's address: *Sch. Ent., St. John's Coll., Agra Univ., Agra, India*; – Publisher's address: *van Stolkweg 13, The Hague, NL*).
The book summarizes nearly 4 decades of studies and field explorations by the well-known editor, and is completed in collaboration with a number of specialists in geology, meteorology, botany, zoology, ecology and anthropology. An outstanding publication it is a first attempt at a comprehensive monograph on ecology and biogeography of the Indian region. The beginnings of India's biogeographical evolution must be sought in Madagascar, Indo-China and Malaya. Not only the areas within the republic of India are discussed, but also Pakistan with Beluchistan and parts of Afghanistan, and Tibet, Nepal, Sikkim, Bhutan, Bangladesh, Burma, Ceylon and the Maladive and Seychelles Islands. Defined in this manner the area covered stretches E-W nearly 3800 km and about 3000 km S-N, and is mainly tropical. Nevertheless, the variety in elevation and local climate is extremely great and includes transitions from the rainless deserts of Sind to the rainiest place on earth in Assam, from Jacobabad, the hottest place on earth, to the alpine and arctic conditions on the Himalaya, from the geologically stable and ancient areas of the peninsula to the geologically unstable and recent areas of the Himalaya. The ecology of nearly the whole of India is dominated by the rhythm of the monsoon-rainfall climate supporting a tropical flora and fauna, but containing also numerous remarkable pockets of temperate floras and faunas. The central concept throughout the book is that the biogeographical evolution of India constitutes an integral whole, and the flora and fauna and the distributional patterns that we observe today represent a dynamic phase of this complex evolution. The monograph is certainly indispensable to any odonatologist working in the region, though the substantial odonatological information is mainly limited to the list of endemic genera confined to the southern parts of peninsular India and/or Ceylon, evaluation of affinities of Seychelles odon. fauna (related more to the Oriental than to African and Malagasy Regions), the list of Eastern Borderlands' genera of Indo-Chinese and Malayan fauna, and the list of mediterranean genera and species extending up to Kashmir. It is unfortunate that in the Subject Index the order name is not listed. (Cf. also *OA* No. 712). (*Abstracter's note*: the book can be obtained from the Publishers at the price of Hfl. 190.–).

(709) MORI, A. & Y. WADA, 1974. The hourly activity of the larvae of three species of dragonflies in feeding on mosquito larvae.

Trop. Med., Nagasaki 16 (1): 41-44. – (*Dept. Med. Zool., Sch. Med., Nagasaki Univ., Nagasaki, JA*).
The hourly feeding activities of larval Sympetrum striolatum imitoides, Pantala flavescens and Anax guttatus, were studied in the laboratory under natural lighting. The larvae were put individually in a laboratory dish of 10 cm diameter containing 200 ml water with 20 or 40 fourth instar mosquito larvae. At 3 hr intervals each larva was placed in a new dish with the same number of mosquito larvae. From the change in the number of mosquito larvae fed by the odon. larva as recorded every 3 hours, it appears that the larvae of S. striolatum imitoides and P. flacescens feed mainly at night. In A. guttatus no tendency was observed to feed actively at a certain time of day, however, this sp. may also feed in the field chiefly at night, since the wandering behavior, which is said to be associated with the feeding, seemed to be limited mostly to the night. (Authors).

(710) NEEDHAM, A.E., 1974. The significance of zoochromes. Springer, Berlin-Heidelberg-New York. 430 pp. – (*Dept. Zool., South Parks Road, Oxford, UK*).
The sole reference to Odon. is made in the chapter on the distribution and state of zoochromes in the body, where it is stated that the ommochrome of odon. flight muscle may be endogenous and very readily binds to muscle tissue in the course of laboratory extraction procedures.

(711) SCHALLER, F. & A. DEFOSSEZ, 1974. Inhibition de la métamorphose de larves d'Aeshna cyanea Müll. (Insecte, Odonate) par un mimétique de l'hormone juvénile. Wilh. Roux Arch. 174: 20-32. – (*Lab. Biol. gén., Univ. L. Pasteur, 12 rue de l'Université, F-67 Strasbourg*).
The inhibition of metamorphosis in A. cyanea by a juvenile hormone-mimicking compound was studied. The injection of farnesyl methyl ether into last instar larvae results in preventing metamorphosis completely (production of a supernumerary larva) or partially (production of adultoids). The degree of this inhibition depends on both dose and moment of injection of the juvenile hormone-mimicking compound. A critical period beyond which the injection will be without effect on the larvae was determined. The external morphology of several organs (mask, wing sheaths, legs, tergites and anal appendages) is described, on supernumerary larva as well as on different types of adultoids. All these organs show various degrees of sensitivity to juvenile hormone-mimicking substance. These results are discussed on the basis of both "prothoracotropic" and juvenile hormone activity of farnesyl methyl ether. (Authors).

(712) SEN-SHARMA, P.K., 1974. Ecology and biogeography of the termites of India. In: M.S. Mani, [Ed.], Ecology and biogeography of India. Junk, The Hague. pp. 421-472. – (*Div. Ent., Indian Forest Res. Inst., Dehra Dun, U.P., India*).
The paper represents Chapter XIV of the book listed in *OA* No. 708. Pantala flavescens is referred to prey in Dehra Dun, India, on the swarming adults of the following termite spp.: Odontotermes assmuthi, O. feae, O. obesus and O. parvidens. (Cf. also *OA* No. 73).

(713) SPURIS, Z., 1974. Die Odonaten im Urstromtal des Flusses Gauja bei Sigulda. Latv. Ent. 16: 33-46. (Latvian, with Ruysian and German ss.). – (*Inst. Biol., Latvian Acad. Sci., 229021 Salaspils, Latvian SSR, USSR*).
32 odon. spp., were recorded in the nature reserve of the ice-marginal valley of the Gauja River, near the town of Sigulda, Latvia, USSR. The survey was carried out during 1968-1971.

(714) TABARU, N., 1974. Confirmation of the early three instars of Epiophlebia superstes. Tombo 16 [1973] (1-4): 21-22. (Japanese, with Engl. s.). – (*1029, Shiromotocho, Hitoyoshi, Kumamoto, 868, JA*).
It is believed that there are 14 larval instars in E. superstes, the pronymphal stage excluded. The 2nd and 4th instar, however, have never been described and attempts to obtain the 2nd instar from the newly hatched 1st, have been so far unsuccessful. The author

succeeded now in obtaining the 2nd and 3rd instars by breeding an egg-batch at 15°C. The latter originated from a mountain stream in Hitoyoshi, Kumamoto Prefecture (June, 1973), where in October, 1973 the two instars were also found in nature. The photographs are produced and the measurements are stated. (Cf. also *OA* No. 688).

(715) TAKETO, A., 1974. New locality records of two dragonfly species in Ishikawa Prefecture. Tombo 16 [1973] (1-4): 15. (Japanese, with Engl. s.). – (*Dept. Biochem., Medical Sch. Kanazawa Univ., Kanazawa, 920, JA*). New locality records are presented for Coenagrion lanceolatum and Aeschnophlebia longistigma. The record of A. anisoptera is the first for Ishikawa Prefecture, Japan.

(716) WATANABE, K., 1974. Instant adhesive utilized to observe the connection of dragonflies. Tombo 16 [1973] (1-4): 25. (Japanese, with Engl. s.). – (*Ishigaki Middle School, 307, Shinkawa, Ishigaki, 907, JA*). In order to observe the details of tandem grasp a commercial instant adhesive was applied to the ♀ prothorax.

(717) YAMAGUCHI, M., 1974. Dragonfly-fauna encountered at an artificially made pond. Tombo 16 [1973] (1-4): 24-25. Japanese, with Engl. s.). – (*2-13, Kasuga-cho, Nerima-ku, Tokyo, 176, JA*).
At a pond excavated in August 1972 (surface 2000 m sq., depth less than 1 m) near the Iruma River, Saitama Prefecture, Japan, from April through October, 1973, 19 odon. spp. were recorded. 14 of these seem to have been already autochthonous.

(718) YAMAMOTO, Y., 1974. Ceriagrion nipponicum biting a spider. Tombo 16 [1973] (1-4): 23. (Japanese, with Engl. s.). – (*Inafune Bldg, 1-2, Inafune-dori, Chikusa-ku, Nagoya, 464, JA*).
A ♀ of C. nipponicum was observed devouring a spider, Tetragnatha praedonica. There was an empty web at a distance of about 90 cm. Although not actually seen, it is supposed that the spider was caught by the dragonfly while it was sitting in the net.