

**THE RESPONSE TO ROTATING OBJECTS  
BY *ANOTOGASTER SIEBOLDII* (SELYS) MALES, Pt 2  
(ANISOPTERA: CORDULEGASTRIDAE)**

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It has been reported that the response to rotating objects by *A. sieboldii* ♂♂ indicates recognition of the objects as ♀♀. The influences of colour, size and rotation velocity (RV) of discs on hovering ratio (HVR) were studied with experiments using a small electric rotating device. Among the rotating discs with white, yellow, orange, red, green, or blue alternating with black, the one with green elicited the highest HVR (98%), whereas the HVR to the yellow/black disc was lowest (32%). This suggests that yellow has a role as a warning coloration against predators rather than being involved in intraspecific recognition. — In the relationship of the HVR to RV of the green/black disc, the HVR reached a peak around 20-25 Hz. In relation of HVR to the size of the disc, the larger the diameter of the disc, the higher was the HVR, and when different sizes of discs were put side by side, *A. sieboldii* ♂♂ had a tendency to respond to the larger disc of the pair.

## WESTERN RANGE LIMITS AND ISOLATES OF EASTERN ODONATE SPECIES IN SIBERIA AND THEIR PUTATIVE ORIGINS

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*Macromia amphigena*, *Shaogomphus postocularis*, and *Sympetrum croceolum*, ranging in NE China, Korea and Japan, have isolates at the NE margins of the Altai-Sayan mountain system: all 3 in SE West Siberia, *M. amphigena* and *S. postocularis* also in southern Central Siberia and *M. amphigena* in E Kazakhstan and W Mongolia. *Ophiogomphus obscurus*, *Nihonogomphus ruptus*, and *Calopteryx japonica* have continuous ranges protruding to the West from E. Asia to the Ob' River basin and to 60° N latitude. *Coenagrion ecornutum* has a similar range but extends N in Siberia to 65° N and has an isolate in the S Ural Mts. *C. lanceolatum*, *C. hylas* and *Somatochlora graeseri* reach 70° N and also extend westward to the Ob' River basin, but *C. hylas* has isolates in the Polar Urals and Bavaria, while *S. graeseri* is probably isolated in the Ural Mts. Of 4 other eastern spp. in Siberia, 2 reach 70° N, but *Somatochlora exuberata* extends westwards only to the sources of the Yenisey River and *Coenagrion glaciale* to Lake Baikal, while *Cercion v-nigrum* and *Anisogomphus maacki* just penetrate into SE Transbaikalia. Thus, 11 eastern odon. spp. have their western limits in Siberia (defined in a narrow sense, not including the Far East). In addition, 4 have more westerly isolates, 3 in the Urals and 1 in Bavaria. Siberia also includes the eastern limits of 21 western spp. 24 transpalaeartic spp. spread far to the N and 10 spp. occupy S Siberia only (or just occur locally), 2 Central Asian spp. barely penetrate into S. Siberia. *Aeshna viridis* is a doubtful amphipalaeartic species. Numerous palaeopalinological reconstructions suggest that during the Holocene climatic optimum, a continuous belt of broad-leaved forest was restored in Siberia, providing conditions for a recolonization of Siberia by Odon. Westward migrations of eastern spp. were favoured by the optimum occurring earlier in the east than in the west. Hence, many western spp. had no time to occupy all of Siberia and today the eastern limits of their ranges lie within the region. *M. amphigena*, *S. postocularis* and *S. croceolum* perhaps were the most stenotopic of those E. Asian spp. that colonized Siberia during the Holocene, and after the optimum, their ranges shrank to the peri-Altaian refugium. Their isolates there should be dated no earlier than 5-6 thousand yrs ago. *C. v-nigrum* and *A. maacki* are perhaps the least mobile of the eastern spp. in Siberia.

**FIVE NEW *ERPETOGOMPHUS* HAGEN IN SELYS LARVAE  
FROM MEXICO, WITH A KEY TO THE KNOWN SPECIES  
(ANISOPTERA: GOMPHIDAE)**

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The final instars of *Erpetogomphus bothrops* Garrison, *E. elaps* Selys, *E. eutainia* Calvert, *E. liopeltis* Garrison, and *E. viperinus* Selys are described and illustrated. Most of these are similar in many features, except *E. eutainia* which is notoriously different. A key for the separation of all known *Erpetogomphus* larvae is included.

## ODONATA AS INDICATORS OF HABITAT QUALITY AT LAKES IN LOUISIANA, UNITED STATES

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Larval Zygoptera and Anisoptera were sampled at 3 lakes. Environmental variables such as chemical composition, water current, turbidity, and vegetation cover were measured. Cross Lake had the most spp. and greater diversity of spp. than Chaplin's and Sibley lakes. Most Zygoptera spp. were found at Cross Lake where carbon availability was highest. Classification and ordination analysis produced similar species groups, providing strong evidence for species assemblages being determined by the measured environmental variables. Tolerant spp. included *Enallagma civile*, *Erythemis simplicicollis* and *Plathemis lydia*. Spp. only present at Cross Lake (incl. *Argia sedula*, *Enallagma basidens*, *Ischnura hastata*, *I. kellicotti*, *Celithemis eponina*, *Erpetogomphus designatus*, *Libellula luctuosa*, *L. pulchella*, *Nasiaeschna pentacantha*) were associated with lower levels of ammonia, conductivity, pH, and higher levels of oxygen and increased vegetation. Cross Lake provided habitat that could support more spp. and was important for spp. that were less tolerant of ammonia and anoxia. This study provides baseline data for future monitoring and conservation management of these lakes.

**THORACIC TEMPERATURE IN *SYMPETRUM INFUSCATUM* (SELYS)  
IN RELATION TO HABITAT AND ACTIVITY  
(ANISOPTERA: LIBELLULIDAE)**

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The thoracic temperature of adults in a forest-paddy field complex in the cool temperate zone of Japan was measured. After emergence, individuals moved into the forest gaps, where all sexually immature adults remained on perches. Both ♂♂ and ♀♀ controlled their thoracic temperatures against a radiant heat load in a similar manner. After maturation, some of the individuals were seen to fly in tandem over the rice paddy fields under direct sunlight for oviposition. This study evaluated the impact of the thermal environment on the perching behaviour in the forest gaps and flying behaviour in tandem in the rice paddy fields. Mean thoracic temperatures of adults were consistently higher than ambient temperatures. The difference between the high thoracic and low ambient temperature was lower among flying individuals in the rice paddy fields than in perching individuals living in the forest gaps. The control of thoracic temperature in response to ambient and radiant temperature in perching mature adults was similar to that in immature adults. In the rice paddy fields, the flying in tandem resulted in a smaller difference between thoracic over radiation temperature in females than in males in tandem. The high degree of thermoregulation clearly allowed mature adults to be active under direct sunlight. The role of perching in the forest gaps is discussed with regard to thermoregulation.

SHORT COMMUNICATIONS

***DAVIDIUS MONASTYRSKII* SPEC. NOV.,  
A NEW DRAGONFLY FROM NORTHERN VIETNAM  
(ANISOPTERA: GOMPHIDAE)**

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The ♂ of the new sp. is described, illustrated and compared with the closely related *D. fruhstorferi* Martin. Holotype ♂: Vietnam, Bac Can prov., Ba Be, IV-1997; deposited in Zoology Collection, Vietnam National University, Hanoi

**ODONATA FROM THE ENNEDI AND OUNIANGA REGIONS  
OF NORTHERN CHAD, WITH A NOTE OF THE STATUS  
OF *ORTHETRUM KOLLMANNSPERGERI* BUCHHOLZ,  
AND A CHECKLIST OF SPECIES CURRENTLY KNOWN  
FROM THE REPUBLIC OF CHAD**

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A hydrobiological survey of scarce permanent aquatic environments in the Ennedi and Ounianga regions of northern Chad yielded a small collection of 7 odon. spp. It adds 3 new spp. to the known fauna of Chad: *Ischnura senegalensis*, *Pseudagrion hamoni*, and *Orthetrum sabina*. The presence of *O. sabina* at Ounianga represents the westernmost record of this oriental sp. in N. Africa. Another oriental element, *O. taeniolatum*, may not exist in Africa W. of the Nile, possibly being replaced there by the closely related *O. kollmannspergeri* Buchholz. The 44 spp. hitherto reported from the Republic of Chad likely represent only a third or less of those to be expected in the country.

***NEOCORDULIA MATUTUENSIS* SPEC. NOV. FROM BRAZIL  
(ANISOPTERA: CORDULIIDAE)**

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The new sp. (♂ holotype: Aiuruoca, Minas Gerais, Brazil, 30-XII-1999; deposited in A.B.M. Machado collection) is described. It differs from all the congeners by having the sternal protuberance of segment 8 conical whereas in other spp. it is either absent or biconical.



**DESCRIPTION OF THE LAST LARVAL INSTAR  
OF *ISCHNURA ULTIMA* RIS  
(ZYGOPTERA: COENAGRIONIDAE)**

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The description is based on a ♀ specimen from Argentina (Mendoza prov.) and the morphology is compared with the other *Ischnura* larvae known from Argentina, viz. *I. capreola* (Hag.) and *I. fluviatilis* Sel. In addition *I. ultima* is reported here for the first time from Chile.

**TWO NEW SPECIES OF *DREPANOSTICTA* LAIDLAW  
FROM PAPUA NEW GUINEA  
(ZYGOPTERA: PLATYSTICTIDAE)**

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*D. antilope* sp. n. (holotype ♂: East New Britain, Wanui Camp, 17-III-2000) and *D. taurulus* sp. n. (holotype ♂: Eastern Highlands prov., Herowana, 13-XI-2001) are described. The holotypes are deposited in South Australian Museum, Adelaide. Diagnostic characters of the adults are illustrated and the affinities of both spp. are discussed.