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REVIEW OF THE ODONATA OF BELARUS

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The literature on the Belarussian Odonata is summarised and a checklist of 60 spp. is provided. The record of *Coenagrion mercuriale* is not accepted as it probably pertains to a misidentified larva. The occurrence of the listed spp. is specified for the 6 provinces of the state. The fauna contains 3 boreal elements, *Coenagrion johanssoni*, *Aeshna caerulea* and *A. crenata*. 14 spp. are listed as potential additions, some of these, almost exclusively southern spp., have been recorded so close to the border that their presence in Belarus is almost certain. Belarus is expected to be a stronghold for many spp., which are threatened in western Europe.

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SIGNAL FUNCTION OF WING COLOUR IN A POLYMORPHIC DAMSELFLY, *MNAIS COSTALIS* SELYS (ZYGOPTERA: CALOPTERYGIDAE)

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Mnais costalis ♂♂ exist in 2 forms specialised for the demands of 2 distinct strategies, territorial fighters and non-territorial sneaks, which give approximately equal fitness payoffs. Territorial ♂♂ have orange wings, whereas typical non-territorial ♂♂ are clear-winged. By simulating agonistic encounters between ♂♂ it is shown that the 2 morphs showed distinct responses to the signal from orange wings: territorial orange-winged ♂♂ always tried to enter contests, while clear-winged ♂♂ always avoided them. On the other hand, the 2 morphs showed similar responses to the signal from clear wings: both morphs tried to attack models. Also presented are 'painted clear models' which were clear-winged ♂♂ whose wings had been painted orange, and both morphs responded as if they were orange-winged models. These observations indicate that ♂♂ discriminate between fighter and sneaker morphs using the colour of wings, and shows different styles of agonistic responses toward fighter and sneaker morphs. It is likely that non-territorial sneaks may gain an advantage from non-signalling because clear wings increase crypsis on another ♂ territory, increasing their success in stealing copulations. No indication was found that clear-winged ♂♂ are ♀ mimics, or that having clear wings reduced the level of aggression directed towards them by territorial orange-winged ♂♂.

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CHANGES OF BODY TEMPERATURES IN *SYMPETRUM FREQUENS* (SELYS) REPRODUCTIVE PAIRS (ANISOPTERA: LIBELLULIDAE)

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The reproductive behaviour was divided into four phases: perching (phase I), less than 1 min from the start of copulation (phase II), more than 3 min from the start of copulation (Phase III) and more than 1 min from the start of oviposition (phase IV). The body temperature (Tb) of the ♂ was highest in phase III, while in the ♀ Tb was not significantly different among phases. The changes of Tb are different between the sexes, however, they are both influenced largely by the wind as well as by the air temperature, and particularly in the ♀ the effect seems to be larger than in the ♂, possibly because of its smaller body size.

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COLOUR VARIATION IN FEMALE *LESTES DISJUNCTUS* SELYS: A SECOND EXAMPLE OF A POLYMORPHIC LESTID (ZYGOPTERA: LESTIDAE)

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Coexistence of discrete ♀ colour morphs is a common characteristic of many odon. species. Surveys have found that for some North American and European genera, half or more of the spp. show female-limited polymorphism, while in other genera, ♀ polymorphism appears far less common among spp. One such genus is *Lestes* with reportedly only one sp. (*L. sponsa*) being polymorphic. Here are described andromorphs and heteromorphs for *L. disjunctus*. Female-limited polymorphism might be more common, even in this genus, than is perceived currently. ♀ morph frequencies were estimated for 4 consecutive yr.: andromorphs constitute approximately 16% of mature ♀♀ sampled and this proportion is fairly consistent between years. Similar to other published reports on other spp., andromorphs and heteromorphs in this study population did not differ in wing length or mass**.** Seasonal patterns in representation of different morphs suggest that further research should be done on timing of emergence of andromorphs versus heteromorphs in this and perhaps other spp.

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SHORT COMMUNICATIONS

SPATIAL DISTRIBUTION AND SEASONALITY OF *HELIOCHARIS AMAZONA* SELYS IN A CERRADO AREA OF SÃO PAULO STATE, BRAZIL (ZYGOPTERA: DICTERIADIDAE)

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The study was conducted on 2 nature reserves in NE São Paulo State, SE Brazil. *H. amazona* populations naturally occur in low densities. 25♂, 2 ♀ and 23 larvae were recorded, only at streams with riparian vegetation. All larvae were collected during the dry season and adults only during the wet season. The highest number of larvae was collected in pools having litter as substrate, but they were also found in slow and moderate velocity water. Due to their patched distribution, *H. amazona* may face high risk of local extinction and such a possibility should be taken into account in the management of both studied nature reserves.

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HETERAGRION TIRADENTENSE SPEC. NOV. FROM THE STATE OF MINAS GERAIS, BRAZIL (ZYGOPTERA: MEGAPODAGRIONIDAE)

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The new sp. (holotype ♂: Brazil, Minas Gerais, Tiradentes, 1-XI-1999) is described and illustrated. It belongs in the group 1 of E. de SELYS-LONGCHAMPS (1862, *Bull. Acad. Belg.* [II] 14: 5-44) and differs from the other spp. of the group by its small size and by the color, shape and size of its mesepisternal spot.

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DESCRIPTION OF THE FEMALE AND LARVA OF *PHYLLOGOMPHOIDES JOAQUINI* RODRIGUES CAPITULO, 1992 (ANISOPTERA: GOMPHIDAE)

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The ♀ and last larval instar are described and illustrated based on specimens from Argentina (Buenos Aires province). The ♀ is unique in the possession of a subapical tooth on each lobe of the vulvar scale, and it can be besides distinguished from *P. andromeda*, the only other *Phyllogomphoides* sp. found in Argentina, by the pterothoracic colour pattern. The larva differs from all known South American *Phyllogomphoides* larvae by the crenate inner margin of the labial palp.

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THE LARVA OF *MACROMIA CINCTA* RAMBUR, WITH A KEY TO THE KNOWN *MACROMIA* LARVAE OF THE MALAYSIAN PENINSULA (ANISOPTERA: MACROMIIDAE)

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A ♀ final instar larva (reared) from the Malaysian Peninsula is described and illustrated in detail. A comparison to other larvae of the genus inhabiting this Peninsula is made, and a key is provided. The unique features in the larva of *M. cincta* are: premental setae 4+2 or 4+3, dorsal protuberances on abdominal segments 3-10, increasing gradually to the rear but suddenly reduced on 10, and the presence of a basal tubercle on the inner margin of the galeolacinia.

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OPEN AND BANDED WINGS: HYPOTHESES ON DAMSELFLY WING POSITION (ZYGOPTERA)

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Zygoptera spp. either perch with their wings open or closed. The alternatives do not appear to be phylogenetically constrained, as there are sexual differences in *Ecchlorolestes peringueyi,* and population variation and individual variation in *Pseudagrion sublacteum.* Open wings would appear to be more conspicuous to predators (Shiny Wing Hypothesis). Yet there is a difference between clear and coloured, banded wings in *Chlorolestes* spp. Clear wings appear to be associated with crypsis, either in open or forest habitats. For spp. that have banded wings (and banded bodies), those individuals that are banded are aggressively territorial to clear-winged conspecifics and are sexually more attractive to ♀♀. Open-winged perching behaviour is associated with perching on tips of shoots and rapid escape from ground predators, supporting the Quick Takeoff Hypothesis. Conspicuous open-winged perching for banded-wing individuals appears to be a tradeoff between territorial superiority on the one hand and predation from aerial predators, particularly birds, on the other. Predation however, appears to be minor relative to the advantages gained by conspicuousness.

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TWO NEW SPECIES OF *NOSOSTICTA* HAGEN *IN* SELYS FROM PAPUA NEW GUINEA (ZYGOPTERA: PROTONEURIDAE)

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N. conifera sp. n. (holotype ♂: Gulf prov., Lakekamu, Ivimka Camp adjacent Sapoi R., 1-XII-1996) and *N. smilodon* sp. n. (holotype ♂: Gulf prov., Dark-End Lumber, 5-X-1999) are described. The holotypes are deposited in South Australian Museum, Adelaide. Diagnostic characters of the adults are illustrated and the affinities of both species are discussed.

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FUKIENOGOMPHUS CHOIFONGAE SPEC. NOV. FROM HONG KONG AND A NEW RECORD OF *CEPHALAESCHNA KLOTSI* ASAHINA (ANISOPTERA: GOMPHIDAE, AESHNIDAE)

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The new sp. is described from NE New Territories of Hong Kong. (Holotype ♂: Wu Kau Tang, Hong Kong, 14-IV-2004; deposited with the Biodiversity Conservation Division, Agriculture, Fisheries and Conservation Department, Hong Kong). It is compared with the congeners, and notes on larval habitat are given. New records and illustrations of both sexes and exuviae of *C. klotsi* are provided from Ng Tung Chai, central Hong Kong.