1st December 2019

In memoriam Wolfgang Schneider (1953–2019)

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Abstract. Personal recollections of a life-long friendship with Wolfgang Schneider and a brief outline of his life and scientific career are presented.

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Morphological variability of *Cordulegaster trinacriae* in Italy (Odonata: Cordulegastridae)

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Abstract. This paper describes the most helpful features for field identification of *C. trinacriae* and the relevant morphological variability encountered. In *C. trinacriae* the yellow frons was without a dark horizontal marking in about 70 % of the sample or showed a barely patterned frons, while the remaining 30 % showed a more or less defined dark smudge, though always narrower and less bold than in *C. boltonii*. The percentage of unmarked *versus* marked frons was similar throughout the distributional range of *C. trinacriae* except in Sicily, where the unmarked yellow frons was much more common (87 %) and in Campania, where individuals with a dark mark on the frons were slightly more common than unmarked ones. In *C. trinacriae* the occipital triangle was almost always yellow with no or almost no dark markings, cleaner, and purer yellow than in *C. boltonii* from central Italy. The appendages of *C. trinacriae* always showed the characteristic form except for a few individuals, which might be hybrids. In *C. boltonii* they were found to be rather variable, especially on individuals from the southern part of its distributional range in central Italy, where intermediates and hybrids occur. Here, the appendages were sometimes similar (but not identical) to *C. trinacriae,* and therefore, this character is considered of limited use in the field. Individuals of *C. trinacriae* can be distinguished in areas of sympatry from intermediate *C. boltonii* and from hybrids when they show the following characters: i) unmarked yellow frons; ii) bright yellow, almost unmarked occipital triangle; ii) typical deeply notched lower appendages and long, sinuous upper appendages.

Further key words. Dragonfly, Anisoptera, frons pattern, occipital triangle, field identification

1st December 2019

Successful breeding by *Pantala flavescens* in Germany (Odonata: Libellulidae)

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Abstract. On 06-vii-2019 a single male of *Pantala flavescens* was recorded in the early post-mining landscape of Lower Lusatia, south-eastern Brandenburg, Germany. This was the first record of this migratory species in Germany not attributable to human transportation. On 17-viii-2019 an exuviae and a single adult in late teneral condition were found at the same site. According to current knowledge this is the first confirmed record of a successful breeding of *P. flavescens* in Europe.

Further key words. Dragonfly, Anisoptera, Wandering glider, Europe, dragonfly migration

1st December 2019

Death feigning in sexual conflict between dragonflies (Odonata): does it exist?

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Abstract. Death feigning, sometimes designated as thanatosis, reflex immobilization, tonic immobility or faking death is generally assumed a last-resort antipredator defence, attempting to avoid being killed and consumed. Recently, faking death has also been claimed to exist with respect to sexual conflict in Odonata. Here we review a number of published cases in Anisoptera that describe how non-receptive females during oviposition escape male harassing by fleeing, plunging into vegetation, freezing immediately and remaining motionless in random body position, no longer being noted by the male hovering nearby. We argue that this reaction of the female does not match the definition of death feigning and propose a new term for it: 'drop and stop' behaviour. In this context it is reasoned how and under what circumstances males, if at all, are able to recognize immobile females and react to them. The adaptive value of 'drop and stop' is discussed and it is suggested that this behaviour in sexual conflict could have evolved from a predator avoiding tactic.

Further key words. Thanatosis, reflex immobilization, tonic immobility, catalepsy, playing possum, female recognition, review

1st December 2019

Slow and steady wins the race: Life cycle and seasonal regulation of *Gomphus lucasii* (Odonata: Gomphidae)

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Abstract. We investigated the emergence and life cycle of the endangered Maghrebian endemic *Gomphus lucasii* at the Seybouse River in north-eastern Algeria. Starting in mid-April, their emergence, typical of spring species, was highly synchronized and was achieved within two to three weeks. EM_{50} was reached in three days. Larval sampling indicated that the synchrony was achieved through larvae overwintering in the F-0 stage. Noteworthy was the concomitant presence of a junior cohort throughout the year demonstrating that the species completes a generation in two years. Thus, contrary to what has been reported previously, we argue that *G. lucasii* is a semivoltine species with a 'slow' developmental rate congruent with its distribution in high-risk permanent habitats. This finding has important conservation implications for this threatened endemic species which is facing severe anthropogenic pressures in the context of global changes.

Further key words. Dragonfly, Anisoptera, voltinism, North Africa, Algeria

1st December 2019

Effects of rice field winter flooding on hibernating eggs of *Sympetrum frequens* and *S. infuscatum* (Odonata: Libellulidae)

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Abstract. *Sympetrum frequens* and *Sympetrum infuscatum* are known to deposit their eggs on the dry or damp ground in rice paddy fields during non-flooded periods to pass the winter. However, the effects of winter flooding on overwintering eggs of *Sympetrum* spp. are unknown. We therefore conducted laboratory experiments to determine the effects of the duration of inundation on the hatching of overwintering eggs. We found that the synchronized hatching coefficients of *S. frequens* and *S. infuscatum* exposed to flooding on 20-x-2014, 30--x-2014, 10-xi-2014, 20-xi-2014, 30-xi-2014, and 10-xii-2014 were significantly lower than that of the control. There was no significant difference in the hatching rate of *S. frequens* eggs between the control and any of the inundation treatments. The hatching rate of *S. infuscatum* eggs in the October 20 treatment was significantly lower than that of the control. The hatching rate of *S. frequens* at water temperature treatments of 20°C, 25°C, and 30°C were 16 ± 6.9 %, 42 ± 12.2 %, and 21.3 ± 4.2 %, respectively. Our results based on laboratory experiments indicate that modifications in water regime – *e.g.*, delayed midsummer drainage or the construction of depressions with longer water coverage within the rice paddy fields – are necessary to stabilize populations of *S. frequens* and *S. infuscatum* in winter flooded rice fields.

Further key words. Dragonfly, Anisoptera, inundation period, diapause, Japan

1st December 2019

Revision of the status of *Anaciaeschna donaldi* and *A. martini*, with allied species, and distributional notes (Odonata: Aeshnidae)

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Abstract. The taxonomic status of four Asian *Anaciaeschna* species, *viz. A. donaldi*, *A. kashmirense*, *A. martini*, and *A. montivagans*, has not yet been fully settled. Each of them is often treated as a good species in the major catalogues of World Odonata. However, the taxonomic relationship especially of *A. donaldi* and *A. martini* remains problematic, *i.e.*, the attribution of Indian and Nepalese populations is still confusing. This even includes museum collections which have used different references for identification. In this paper we review the complex background of the taxonomical history of *A. donaldi*, including *A. martini*, with distributional notes, and present the first record from Bhutan. A morphological comparison was made based on specimens from Nepal and Japan, including photographical analysis of *A. donaldi* type specimens from India. To support our morphological analysis, we also analysed nuclear and mitochondrial DNA from Japanese and Nepalese material. Our results showed there are no significant in morphological or molecular genetic differences between *A. donaldi* and *martini*; therefore we conclude that *A. donaldi* is a junior synonym of *A. martini*. Additionally, we confirmed the status of *A. montivagans*, once wrongly synonymised with *A. martini*, as a valid species.

Further key words. Dragonfly, Anisoptera, Nepal, Bhutan, India, Sri Lanka, Japan, junior synonym, *montivagans*

1st December 2019

Reproductive behaviour of Chlorocyphidae. Part 1. Genus *Sclerocypha* Fraser, 1949 (Odonata)

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Abstract. The reproductive behaviour of the damselfly *Sclerocypha bisignata* (Chlorocyphidae) was studied in various fast flowing streams in mountainous regions of Central Sulawesi. Using high speed cinematography males were shown to exhibit protracted threatening flights with a stationary display of the fore wings. In steady threatening flight the abdomen was held horizontally and the stroking of the hind wings paused briefly and regularly every 2–5 wing beats. These flights were interrupted periodically by short bursts of increased intensity were males arched their abdomens upwards and the hind wing beat was continuous. This flight style differs in several respects from any chlorocyphid species yet studied. During courtship the males presented all three pairs of legs; as courtship intensified they briefly raised their abdomen and presented stationary fore wings. Oviposition took place with the female completely submerged. Unlike most Chlorocyphidae, oviposition sites and male display sites were well separated and ovipositing females were unguarded.

Further key words. Zygoptera, *Sclerocypha bisignata*, *Libellago*, threat display, courtship, stationary wing display, mating systems, Sulawesi

1st December 2019

Nosoticta purari sp. nov., a new damselfly from Papua New Guinea (Odonata: Platycnemididae)

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Abstract. A new species of damselfly, *Nosoticta purari* sp. nov., is described from the Purari River basin in Gulf Province, southern Papua New Guinea. It most closely resembles the geographically remote *N. kaizei* Theischinger & Richards, 2015, a species known only from Japen Island off the north coast of Indonesian New Guinea. *Nosoticta purari* sp. nov. is the 84th known member of this speciose platycnemidid genus, and is currently known only from the type locality where it lives along small, slow-flowing streams in swampy lowland rainforest.

Further key words. Dragonfly, Zygoptera, *Nosoticta kaizei*, New Guinea, Melanesia