

## Critical species of Odonata in the Philippines

Matti Hämäläinen

Department of Applied Biology, P.O.Box 27, FI-00014 University of Helsinki, Finland.  
<matti.hamalainen@helsinki.fi>

Key words: Odonata, dragonfly, IUCN, critical species, conservation, Philippines.

### ABSTRACT

The Philippine odonate fauna is characterized by a high percentage of endemic species, especially in Zygoptera, most of which have a very limited range. Due to the continuing loss of forests and other habitat destruction, a majority of the 300 plus known species could be red-listed, but only a few critical species are evaluated here. *Risioenemis seidenschwarzi* is added to the Red List. The need of further field surveys and taxonomic work is briefly emphasized and the present difficulties faced by field workers in the Philippines are discussed.

### REGIONAL DEFINITION

The Philippines are an extensive island group lying between Borneo and Sulawesi in the south and Taiwan in the north. Of a total of 7,107 islands ca 500 are larger than 1 km<sup>2</sup> in size. The total land area is 299,404 km<sup>2</sup>, of which 95% is contributed by the 11 largest islands: Luzon, Mindanao, Samar, Negros, Palawan, Panay, Mindoro, Leyte, Cebu, Bohol and Masbate. A good, recent introduction to the nature and biodiversity of the Philippines is provided in Gaulke's (2001) guide book for travelling naturalists.

### FAUNAL LISTS AND STUDIES ON BIODIVERSITY AND TAXONOMY

Hämäläinen & Müller (1997) presented a synopsis of the Philippine odonates and provided data on the diversity of 40 different islands. A total of 224 named species and ca 70 still undescribed or unidentified species were listed. From the two largest islands Luzon and Mindanao, 140 and 126 spp. were recorded. The recent illustrated regional odonate guide books, Wang (2002) and Orr (2003) are also quite useful in identifying Philippine odonates, especially the common libellulids.

About 10 additional species, most of them undescribed, have been found from the Philippines after the synopsis was published. Thus, well over 300 odonate species are known to occur in the region. Recent publications include the revision

of the subgenus *Risiocnemis* (*Igneocnemis*) by Gassmann & Hämäläinen (2002), which contains the description of five new species. A new *Risiocnemis* species and a new *Drepanosticta* species were described by Hämäläinen (2000) and by van Tol & Müller (2003), respectively.

## CRITICAL SPECIES

### Species previously listed

For the Philippines only two species have been listed (IUCN 2003):

as endangered [EN]:

*Rhinocypha hageni* Krüger, 1898 and *R. latimacula* Lieftinck, 1974.

*R. hageni* is known only by the type series collected in Jolo over 100 years ago. The interior of Jolo has long been a haunt of insurgents and criminals. Thus collectors and researchers have been kept out of the mountains and no further records of *R. hageni* are available. The western hostage drama in April-September 2000 brought the media to the mountains of Jolo; some forest streams shown on TV news looked suitable habitats for a chlorocyphid species. Possibly, *R. hageni* habitats have remained safer in hide-outs of insurgents than in hands of settlers and farmers. *R. latimacula* is known only from Tawi-Tawi and Bongao islands. The former island (592 km<sup>2</sup>) is still partly covered by dense forests, but does not include any protected areas.

Only a few Philippine taxa were presented as priority species in Moore (1997). Some of them are not threatened.

### Taxonomically isolated species

*Devadatta basilanensis* Laidlaw, 1934, *D. filipina* Needham & Gyger, 1939 and *Onychothemis abnormis* Brauer, 1868. Both *Devadatta* names in fact represent a single species: *D. basilanensis*, which is not uncommon in the Mindanao subregion. *O. abnormis* is a rare, but a more widespread species; most of the recent records come from Mindoro.

### Species of monotypic genera confined to one country

The genus *Cyrano* should not be listed here, since two species are known (Hämäläinen 1989). Also the genus *Asthenocnemis* is not monotypic (K.-D.B. Dijkstra and D. Gassmann unpubl.). *Cyclophaea cyanifrons* Ris, 1930 is quite common in Palawan and *Heteronaias heterodoxa* (Selys, 1878) is common and very widespread in the Philippines. *Moroagrion danielli* Needham & Gyger, 1939 is known only by the holotype male (Needham & Gyger 1939), labelled as coming from "Guara, P.I., 10.VII.1903", a place I have not been able to locate.

One more species, not listed in Moore (1997), should be added to this category: *Heterophaea barbata* (Martin, 1902) (syn. *ruficollis*), a remarkable, large-sized euphaeid species, confined to central and northern Luzon.

## Species to be considered

In conservation circles the Philippines have always been included in the “mega-diversity countries” also called “the hottest of hotspots”. This is also true of the odonates, especially the Zygoptera. Of the known ca 190 zygopteran taxa about 90% are endemic, while ca 40% of the anisopteran taxa are endemic. In addition within the Philippines there exists clear regional endemism, six regions are usually recognized (Vane-Wright 1990). The genera *Risio cnemis* (Platycnemididae), *Drepanosticta* (Platystictidae) and *Amphicnemis* (Coenagrionidae) are very speciose, over half of the known Philippine Zygoptera belong to these three genera. All species seem to be endemic to a single region within the archipelago, many species are endemic to a single island, including islands as small as 100 km<sup>2</sup> in size. In case of the largest islands Luzon and Mindanao, most species occur only in a limited area within the island. These zygopterans include many of the most threatened odonates in the Philippines. A few examples of endangered taxa with a very limited range are presented below.

### *Risio cnemis seidenschwarzi* Hämäläinen, 2000

The research team from San Carlos University, headed by Franz Seidenschwarz, discovered this new species, most likely endemic to Cebu Island, at Tabunan forest in Central Cebu in November 1998 (Hämäläinen 2000). Tabunan forest, totalling only some 145 ha, is situated near Mt. Manunggal, at the altitude of 480-930 m, and is one of the few remaining original forest patches in Cebu. *R. seidenschwarzi* was found to occur in low numbers only at one small stream, along a single strip of ca 30 m, situated less than 50 m below the edge of Tabunan forest (part of Central Cebu national park). Just outside this strip, the land is converted to pasture. The numbers of *R. seidenschwarzi* remained quite steady until July 2000, when some local farmers came to wash pesticide containers in the stream. Thereafter only a single male has been observed and photographed by F. Seidenschwarz in early March 2001. In 2003 a new house was build on the left side of the creek and on the right side is a plantation of Ampalaya. So the only known habitat of *R. seidenschwarzi* is lost. However, attempts to find the species from some other streams in the steep and rocky terrain in Central Cebu are still being carried out. If not found, the species can be considered extinct.

### *Drepanosticta* spp.

No species of this genus was known from Cebu, until two new taxa were found at Kawasan falls (near Badian) by the research team headed by F. Seidenschwarz in August 1999 and February 2001, respectively. The former belongs to the difficult *halterata*-group (see Hämäläinen & Müller 1997: 277) and the other appears to be related to “*Drepanosticta* sp. n. [13]” (Hämäläinen & Müller 1997: 258), known to occur at least in Panay, Negros and Sibuyan. All platystictids are forest stream dwellers. Consequently, if the species are Cebu endemics, they are very endangered. Kawasan falls do not belong to a protected area yet, but the local nature tourism business may help to keep the area forested.

*Amphicnemis* spp.

So far 10 species have been described from the Philippines, but at least 15-17 other new taxa have been recognized. No fewer than three species (*A. cantuga* and two undescribed taxa) were found in the small Homonhon island (107 km<sup>2</sup>) by Roland Müller and his team in 1988. These were found in the only remaining forest patch (2-3 km<sup>2</sup>) on the island. Already by 1993 this forest was badly disturbed. One of the undescribed taxa has not yet been found elsewhere. If endemic to Homonhon, it may already be extinct. Reagan Villanueva found a new *Amphicnemis* species in the small Camiguin Island (240 km<sup>2</sup>) north of Mindanao. A small population inhabits a small (less than 500 m<sup>2</sup> remaining) Nipa swamp at coast in Lilib (Villanueva 2004). According to the data received from F. Seidenschwarz, there are only two known *Amphicnemis* populations (Camp 7 and Hagnum forest) left in Cebu, belonging to an undescribed species and known also to occur in other West Visayan islands (Hämäläinen & Müller 1997).

### CRITICAL SITES, CONSERVATION PRIORITIES AND RECOMMENDATIONS

Unfortunately, since my own field experience in the Philippines is very limited, I am unable to contribute anything relevant in these vital matters. However, a look at the list of national parks and other reserves (Department of Environment and Natural Resources & United Nations Environment Programme 1997) indicates that in many smaller island, known to harbour endemic species, no protected areas have been gazetted. Even in the sixth largest island, Samar, where several endemic odonate species occur, very little dipterocarp forest is protected. Hence, unfortunately, the present system of protected areas helps to protect only a fraction of the endangered odonates. Unfortunately also the protected areas suffer from encroachment from the steadily growing human population. Undoubtedly a majority of the endemic Philippine species confined to forest streams, at least species from smaller islands, could be included in the Red List. However, since this hardly would have any practical influence on saving the rapidly decreasing forest habitats and since many threatened species are still waiting to be formally described and named, I propose only adding one species to the Red List: the platycnemidid *Risiocnemis seidenschwarzi*. This species is at the verge of extinction in Cebu (see above).

### RESEARCH PRIORITIES

Taxonomy of the Philippine odonates is still inadequately known. Many new species in different collections await description. From the conservation point of view, a complete revision of the Philippine taxa of the genus *Amphicnemis*, with many endemic species – all restricted to the remaining forests – should have the highest priority.

The knowledge of the odonate diversity in different National Parks and reserves in the Philippines is still rather limited. The best recorded reserves in this respect

include Mount Makiling in Luzon, Mount Apo in Mindanao, Mount Canlaon in Negros and the forest remnants in the Central Cebu National Park, although no species lists from these areas have yet been published. Prospects of increasing our knowledge of the diversity in the Philippine parks in the near future are not promising. Political unrest prevents or seriously hampers field work in the southern part of the country. Moreover, the Philippines belong to that group of developing countries – steadily increasing in numbers – where collection and export of all animal and plant specimens are forbidden without a complicated and often time-consuming and expensive permit bureaucracy to be completed well in advance of field work. At the same time, while adding “red tape” which inhibits collecting, the same governments emphasize and urge the importance of biodiversity studies. In most developing countries the number of local entomologists qualified to identify species properly is very limited and they suffer from the chronic lack of taxonomic expertise, adequate literature and reliable reference collections. So far much of the knowledge of tropical insect fauna – including odonates – has been based on (often voluntary non-paid) work done by foreign entomologists. Putting a stop to their activities, or simply forcing them to commit illegal acts, is a short-sighted strategy with a negative effect on the biodiversity studies. Records based solely on sighting and photo documenting increase. In tropical odonates only a minority of species can confidently be identified from field photos. In many smaller sized insect groups this is completely impossible. If the governments are unable to save the habitats, at least the museum samples can document the lost diversity for the future generations.

## CURRENT ACTIVITIES

The very extensive Roland Müller collection of the Philippine odonates was placed in the National Museum of Natural History Naturalis (Leiden) in 1998. It will be kept as a separate unit. Curatorial and taxonomic work on it is in progress. A partial revision of the Philippine *Drepanosticta* species, including descriptions of several new taxa, is at a final stage of preparation by Jan van Tol. Dirk Gassmann is continuing his studies on Philippine platycnemidids in the scope of a phylogenetic study of the Malesian Calicnemiinae, and together with Klaas-Douwe Dijkstra he works on a revision of Philippine *Coelicia* and *Asthenocnemis* species. Haruki Karube is in progress revising the *Chlorogomphus* taxa. Matti Hämäläinen works on some open questions in the taxonomy of the Philippine *Caloptera* taxa. Franz Seidenschwarz and his team from San Carlos University (Cebu City) continue to monitor the threatened fauna in Central Cebu National Park and elsewhere in Cebu. They are also conducting a comparative study of the habitats of the endangered species in order to support any future habitat restoration efforts. So far, the results are rather discouraging and underline the important need to preserve the existing habitats. It is not clear why, as in the case of the *Risicnemis seidenschwarzi* habitat, only a short stretch of the creek was inhabited by the species and not the full length, which has the same vegetation and water quality. Similar observations were made for *Amphicnemis* sp.: only one creek was inhabited by the

species, but not a neighbouring creek, apparently with the same geology, water chemistry and vegetation type. However, these two habitats have a similar shrub vegetation, but differ in their tree composition.

Local entomologists investigating the odonate diversity in the Philippines include Victor Gapud (Los Banos) and Reagan Villanueva (Davao City).

## REFERENCES

- Department of Environment and Natural Resources & United Nations Environment Programme, 1997. Philippine biodiversity – an assessment and action plan. Bookmark Inc., Makati City.
- Gassmann, D. & M. Hämäläinen, 2002. A revision of the Philippine subgenus *Risio cnemis* (*Igneocnemis*) Hämäläinen (Odonata: Platycnemididae). Tijdschrift voor Entomologie 145: 213-266.
- Gaulke, M., 2001. Philippinen Naturreiseführer. Natur und Tier, Münster.
- Hämäläinen, M., 1989. Revision of the Philippine genus *Cyranus* Needham & Gyger (Odonata, Chlorocyphidae). Annales Entomologici Fennici 55: 121-127.
- Hämäläinen, M., 2000. *Risio cnemis seidenschwarzi* spec. nov., an endangered damselfly from Tabunan forest in Cebu, the Philippines (Odonata: Platycnemididae). Entomologische Berichten, Amsterdam 60: 46-49.
- Hämäläinen, M. & R.A. Müller, 1997. Synopsis of the Philippine Odonata, with lists of species recorded from forty islands. Odonatologica 26: 249-315.
- IUCN, 2003. 2003 IUCN Red List of threatened species. <[www.redlist.org/](http://www.redlist.org/)>.
- Moore, N.W., 1997. Dragonflies – status survey and conservation action plan. IUCN/SSC Odonata Specialist Group. IUCN, Gland & Cambridge.
- Needham, J.G. & M.K. Gyger, 1939. The Odonata of the Philippines. Philippine Journal of Science 70: 239-314, pls 11-22.
- Orr, A.G., 2003. Dragonflies of Borneo. Natural History Publications, Kota Kinabalu.
- Vane-Wright, R.I., 1990. The Philippines – key to the biogeography of Wallacea? In: Knight, W.J. & J.D. Holloway (eds) "Insects and the rain forests of South East Asia (Wallacea)", Royal Entomological Society of London, London, pp. 19-34.
- van Tol, J. & R.A. Müller, 2003. Forest damselflies of the Philippines, their evolution and present status, with the description of *Drepanosticta moorei* spec. nov. from Luzon (Zygoptera: Platystictidae). Odonatologica 32: 39-45.
- Villanueva, R.J., 2004. Odonate fauna in Camiguin Island, The Philippines. Notulae Odonatologicae 6: in press.
- Wang, L.-J., 2002. Dragonflies of Taiwan. Jemjen Calendar Co., Taipei.