REPORT OF THE 8th MEETING
OF THE I.U.C.N. ODONATA SPECIALIST GROUP

N.W. Moore

Bilthoven
1994
Besides the above mentioned national-based regulations there are a series of Provincial, Municipal and even town-based regulations designed to protect particular insect species or particular habitats.

**Thailand and Philippines**

M. HÄMÄLÄINEN reported:

This report is merely an overview of the present knowledge of Thai and Philippine dragonflies. The future of those (stream) species which are dependent on intact forest biotopes looks better in Thailand than in the Philippines.

**Thailand:**

**Species diversity**

At present we have a fairly good picture of the composition of the dragonfly fauna in Thailand. ASAHINA's important series of papers, entitled "A list of the Odonata recorded from Thailand" issued in 21 parts in 1982-1990, which covers some 240 species has recently been reprinted as a book (ASAHINA 1993). ASAHINA’s work will remain a cornerstone in the knowledge of Thai Odonata. PINRATANA et al. (1988) listed a total of 267 species from Thailand. However, they included some species which were erroneously reported from Thailand by TSUDA (1986).

During the last five years Bro. AMNUAY PINRATANA and his colleagues have discovered several additions to the fauna and many foreign collectors have made their contributions. In January 1993 T.W. DONNELLY, J. MICHALSKI and the author made a collecting tour in southern Thailand. We visited nine national parks and wildlife sanctuaries and some other sites; the Thai list was increased by three species.

At present I am aware of ca 295 species (124 Zygoptera / 171 Anisoptera) to be found in Thailand. This figure includes some new species and several species which are so far identified to the genus only. Many of these (mostly females of *Idionyx* and *Macromia*) apparently represent undescribed species, but they cannot be named with confidence until males are found. After critical taxonomic studies a few species already listed from Thailand may prove to be mere synonyms. However, most likely a level of 300 species will be reached within a few years.

The fauna is an interesting mixture of Malayan, Burmese/Assamese and Indochinese elements. Inadequate knowledge of the dragonfly fauna in the surrounding countries, with the exception of Malaysia, does not yet enable us to conclude how many species are strictly endemic to the Thai territory. A
number of species are known only from Doi Inthanon and other mountains in the northern province of Chiang Mai. Mountains in northern Thailand lumped together with those in adjacent parts of Burma and Laos seem to form an outstanding centre of odonata endemism. Many species, the range of which in Thailand is restricted to the peninsular part, seem to belong either to the Tenasserim fauna or to the Malayan fauna. However, some species, like the conspicuous *Euphaea pahyapi*, are known from only within the Thai limits in the peninsula, and perhaps represent real Thai endemics.

The taxonomic and faunistic treatment of the voluminous collections of Bro. AMNUAY PINRATANA and myself (each containing several thousand specimens of some 200 species) are unfortunately not yet ready for publication. However, the database of our results combined with literature data and information from other available collections gives us an idea of the distribution pattern of Thai dragonflies. One of our goals is to produce distribution maps of all species at the accuracy of provinces (73 in Thailand).

Conservation aspects

The original forest cover has been drastically reduced from 60% in 1950 to under 20% now. Thus, most stream species have suitable biotopes only in the protected areas or in remote border areas. Luckily the network of protected areas is quite dense and scattered over all parts of the country. Until May 1991 the Thai government had gazetted 63 national parks and 32 wildlife sanctuaries and some more have been established since. Moreover there are 48 non-hunting areas and a number of other protected sites. Altogether the national parks and wildlife sanctuaries cover 11% of the land area. The largest remaining forest areas are already under protection. The area of protected land is expected to increase to 15% by the end of this decade.

Knowledge of the Thai dragonfly fauna was very poor until the 1960’s. The first national parks were established in 1962. Actually most records of Thai dragonflies, excluding those on common rice field and pond species, have been made on sites which are now protected. Typical collecting sites have been easily accessible waterfalls and streams near the headquarters of the protected areas. The paucity of early records does not enable us to conclude whether any dragonfly species have become extinct in Thailand due to extensive deforestation, although the number of suitable biotopes for most species must have been drastically reduced.

Conservation action should now be focused on surveys of the composition of dragonfly fauna in different national parks and wildlife sanctuaries. Bro. AMNUAY PINRATANA and the author have published preliminary species lists for Khao Yai national park, Khao Soi Dao wildlife sanctuary and Doi Suthep-Pui national park. A preliminary list for Doi Inthanon is in preparation. Moreover we have data from over 20 other parks or sanctuaries in different parts of the country.
The number of parks and sanctuaries is so high that it is impossible to study all of them. Some areas have so far remained little explored. It would be essential to study Thailand's two largest parks and sanctuaries along the Burmese border - Thung Yai Naresuan in northern Kanchanaburi/Tak and Kaeng Krachan in Phetchaburi/Prachuap Khiri Khan. Another area worth studying is Dong Phaya Yen mountain range, which extends southwards from Laos to the central part of the country. Many parks and sanctuaries, for instance Phu Luang, Phu Kradung, Nam Nao and Phu Khieo, are within this mountain range. With the exception of Phu Khieo wildlife sanctuary in Chaiyaphum province their dragonfly fauna is poorly known. My two-day visit to a few streams and ponds in Phu Khieo in June 1984 yielded over 50 species, and I must have only scratched the surface.

The political situation still prevents visits to the Phanom Dong Rak mountain range along the Cambodian border. However, it might be possible to study the Phu Chong Nayoi national park in the eastern part of the mountain range in the corner bordering both Cambodia and Laos. As far as I know there are no records of dragonflies from this mountain range so far.

Some parks and sanctuaries in northern Thailand are still wholly unstudied for dragonflies, and even the best known areas like Doi Intanon, Doi Suthep-Pui and Doi Chiang Dao still conceal surprises. Doi Inthanon, the highest mountain in Thailand (2565 m), is an El Dorado for odonatists. Each visit, even if only 1-2 days long, has already yielded novelties to the Thai fauna or to the science, and nobody has yet studied the more remote parts of the mountain. However, difficulties in obtaining collecting permits hampers the activity at Doi Inthanon as well as in many other parks, especially in northern Thailand.

Considering the priorities which are being established in the Action Plan for conservation of dragonflies, it is quite certain that the protected mountains in Chiang Mai province in northern Thailand house many special, taxonomically isolated species: all three known species of Caliphaeinae, Philoganga loringae and Onychothemis testacea. Moreover, the highly interesting Schmidtiphaea schmidi (Euphaeidae) has a refuge there.

If the original forests in the protected areas remain intact and the mountain streams unpolluted, the diversity of Thai dragonfly fauna may still remain quite rich in the future. However, there is strong pressure by the growing population to encroach on the remaining forests and wildlife. Very limited numbers of underpaid rangers does not make the situation better. Whether the increasing influence of the conservation movement in Thailand can oppose demands caused by the recent boom of the economy remains to be seen.
Philippines:

Species diversity

The first literature records of Philippine dragonflies date from the 1850s. At the beginning of this century some 80 species were known from the Philippines. NEEDHAM & GYGER (1937, 1939 and 1941) dealt with some 150 species. Thereafter our knowledge increased mainly through publications by LIEFTINCK and ASAHINA. If mere synonyms and obvious errors are excluded ca 180 species were reported from the country up till 1985.

The recent rapid increase in our knowledge of the Philippine dragonflies is mainly due to the outstanding efforts of ROLAND MÜLLER to explore the fauna in the last remaining forest areas of the country. ROLAND MÜLLER collected his first dragonflies in the Philippines in 1985. Since then he and the group of collectors organized and financed by him have so far amassed nearly 20,000 specimens from some 300 sites in 30 different islands. The value of this collection, undoubtedly the largest ever made in the Philippines, is much increased by the fact that most of the sites visited are streams in forest areas. In fact the whole material contains only a few specimens from rice fields and other cultivated areas. The material includes over 200 species, of which more than 50 represent undescribed species when found; an amazing proportion! Most of these new species still await description.

The author and ROLAND MÜLLER maintain a database of Philippine dragonflies, with collecting localities and dates. Besides the MÜLLER collection and published data, it also includes data from some museums (Leiden, Senckenberg) and private collections. No serious attempt has so far been made to search all available collections. The former RIS collection, now at Senckenberg Museum, contains thousands of specimens collected in many islands in the 1910's. Only a small part of this material has been treated in publications (RIS, SCHMIDT). The inclusion of all this material in our database is in progress. From the conservation point of view, collecting the data as soon as possible is very important. It will enable us to see whether some species have already disappeared from the islands.

Including well over 30 still-undescribed species and excluding some obvious synonyms and errors in the literature, we know that at present some 260-265 dragonfly species (ca 155-160 Zygoptera, ca 105 Anisoptera) occur in the Philippines. These figures are somewhat tentative due to lack of taxonomic revisions of some genera with many unnamed species, for instance *Amphicnemis*, *Drepanosticta* and *Oligoaeschna*. Especially in *Amphicnemis* it is difficult to say yet which taxa should be considered species and which only subspecies.
Endemism

The Philippines are an outstanding centre of odonate endemism. Over 65% of the species are endemic. In Zygoptera the rate of endemic species is much higher (85%) than in Anisoptera (36%). In fact the proportion of endemic species becomes higher when our knowledge of the fauna increases, since most additions are certainly endemic and each has a very restricted range.

Several genera are endemic to the Philippines: *Cyrano*, *Cyclophaea*, *Heterophaea*, *Moroagrion*, *Astheneocnemis*, *Risiocnemis* and *Heteronaias*. All Philippine species in the large genera *Drepanosticta*, *Amphicnemis* and *Teinobasis* are endemic to the Philippines. Even in the libellulids there are several endemic species.

In fact there are six distinct areas of endemism in the Philippines (see VANE-WRIGHT, 1990): Luzon region, Mindoro region, West Visayan region, Mindanao region (divided to Mindanao subregion and East Visayan subregion), Palawan region and the somewhat anomalous Sulu region. The known distribution pattern of many Philippine dragonflies, especially those of the "rather sedentary" forest dwelling damselflies, like *Risiocnemis*, *Drepanosticta* and *Amphicnemis* illustrates well the phenomenon of regional endemism. None of the 31 known species of *Risiocnemis* occur in the Palawan and Sulu regions. Luzon region has 14 species, Mindoro region 3 species, West Visayan region 3 species and Mindanao region 14 species. According to present knowledge only three *Risiocnemis* species are known to occur in two different regions, two in Luzon and Mindoro and one in Luzon and Mindanao regions.

A preliminary report on the present knowledge of Philippine dragonflies will be published in *Odonatologica* soon. The publication will contain lists of known species from different islands and a brief characterization of each island with comments on the state of the original forest biotopes in the islands.

At present we are aware of dragonfly records from less than 40 islands. Out of the total of 7,107 islands in the Philippines, some 500 islands are larger than 1 sq km, and most of these may contain some dragonfly populations. The largest 11 islands account for over 95% of the total land area. Even some of these, like Panay, are still very inadequately known as regards their dragonflies. The largest islands Luzon (125 spp.) and Mindanao (106 spp.) have the most abundant faunas. Further material is badly needed, especially from the southwestern and northernmost provinces of Luzon. Several islands which are large, enough to have endemic species/subspecies, remain without studies of their dragonfly fauna.

Conservation aspects

The speed of destruction of forests in the Philippines is very rapid. In small islands the disappearance of the last forest patches is very detrimental to their endemic dragonfly faunas. In some cases ROLAND MULLER came to survey
the remnants of original forests at the last moment of their existence. The small Homonhon island (104 sq km), east of Leyte had still 2-3 sq km original forest left when MÜLLER visited it in 1988. Now what remained has been disturbed, and it is not known how many of the 48 dragonfly species recorded in the island have vanished. Two species of *Amphicnemis* occurred there, one of them, probably a new subspecies of *A. lestoides*, was so far known only from Homonhon. Similarly MÜLLER was probably the first dragonfly collector in Sibutu island, the outermost islands of Sulu Archipelago towards Borneo. During his visit in 1990, there were only 1-2 sq km rainforest left, but even this remnant has now been destroyed. Some of the 26 dragonfly species recorded in 1990, including *Amphicnemis circularis*, may have disappeared from the island.

Considering the number of islands and the complex pattern of endemism in them, the present coverage of protected areas in the Philippines is inadequate to protect all its endemic dragonflies. Unfortunately gazetting an area as a national park or wildlife sanctuary does not seem to prevent encroachment on it from occurring. This is well shown, for instance, at Mt Apo national park in Mindanao. Many more protected areas should be gazetted to rescue (or at least to slow up the destruction of) the remaining patches of rain forest in various islands. Minimum requirement should be at least one protected forest area in all major islands. As far as we know there are no protected forest areas in Panay, Bohol and Masbate. From the odonatological viewpoint, some forest areas should also be protected in many of the smaller islands, like Polillo, Catanduanes, Sibuyan, Panaon, Dinagat, Basilan, Jolo and Tawi Tawi. The last two islands have each an endemic species of *Rhinocypha*, *R. hageni* in Jolo (known only by type series collected over 100 years ago) and *R. latimaculata* in Tawi Tawi. In practice the activity of insurgents in the forested mountains of these islands may temporarily protect the forests from encroachment by settlers. These two *Rhinocypha* species could be added to the IUCN list of threatened species.

Many other endemic Philippine species also fit the threatened species categories, but it is best to delay their inclusion until the regional endemism pattern of Philippine dragonflies is thoroughly analyzed.

Our knowledge of the dragonfly fauna of the Philippine wildlife sanctuaries, national parks and other protected areas is still rather meagre. The best known protected area is likely to be Makiling Forest Reserve near Los Banos in Luzon. However, only literature data are known to me. There is also recent material from there (as well from other Philippine parks) at the UPLB Museum at Los Banos. This material should be studied urgently. Many of the 65 or more species reported from "Mt Maquiling", "Forestry Experiment Station, Los Banos", "College Laguna, Los Banos", "Los Banos, Molawin Creek" or simply "Los Banos" may have been collected within or near the present reserve. This area is the type locality of several endemic species in the Philippines, for instance the problematic *Idionyx salva*, discovered in 1931. The oldest defined records from "Los Banos" are from the 1910's. This area requires a thorough survey to see whether its dragonfly fauna has been depauperated. Especially the existence
there of a problematic *Devadatta* species related to *D. agrioides* should be confirmed.

The literature contains some stray records from other protected areas, like Mt Banahaw, Quezon and Mt Isarog in Luzon, Mt Apo in Mindanao and Mt Mantalingajan in south Palawan. The MÜLLER collection has also some specimens from Mt Banahaw, Mt Apo and Mt Malindang (in Mindanao). MÜLLER and I have also collected a long series of specimens in areas near Mt Mantalingajan, but not within the park limits. MÜLLER's collection contains also 24 species from St Paul's national park in north Palawan, which represent nearly 1/3 of the known species in the whole island. Out of the 35 species recorded from Negros, 30 are known to occur in Mt Canlaon national park or its close vicinity. *Neurobasis luzoniensis subpicta*, known only from Negros, is very abundant in the national park.

Some endemic species/subspecies of Philippines dragonflies may already have become extinct before they were even discovered. However, there are still many species to be rescued. But how can this be accomplished? ROLAND MÜLLER belongs to many of those who have a rather pessimistic view of the fate of the remaining forests. Certainly some forest patches here and there may remain as a memory of a lost paradise, but will this be enough?

How can a casually visiting foreign naturalist protect insects in a country where the great majority of over 60 million people live at a bare subsistence level in miserable conditions and where the birth rate is high? The best he can do is carry a net and try to collect us much as is still possible. At least future generations will know what was lost. For dragonflies the emphasis should be put on surveying the forests which still remain in islands of 100 sq km or larger, where no material yet exists.

Literature cited:

North America

S. DUNKLE reported:

New information on North American Odonata species of concern is as follows:

ZYGOPTERA

Coenagrionidae

1. *Argia rhoadsi*. S. DUNKLE, J. DAIGLE and others have found this species common on some rivers of eastern Mexico, but no one has looked for it recently in southern Texas.

2. *Argia* n.sp. 1. T. DONNELLY collected in the Hill Country of Texas in 1992 but did not find this species. The similar *A. nahuana* was common.

3. *Argia* n.sp. 3. R. GARRISON has decided that a species similar to *A. lacrimans* is an undescribed species. It is known so far only from the same streams in Arizona as *Argia* n.sp. 2 which he is also describing. The primary locality for both of these species is well protected.

ANISOPTERA

Gomphidae

1. *Gomphus (Gomphurus) gonzalezi*. Was described by S. DUNKLE in *Odonatologica* in 1992. It was listed in the 7th Report of the IUCN as *G. (Gomphurus)* n.sp.

2. *Ophiogomphus australis*. Was described by F. CARLE in *Odonatologica*. It was listed in the 7th Report of the IUCN as *O. incurvatus* n.ssp. As suggested, it might be a subspecies of *O. incurvatus*.

Cordulegastridae

1. *Cordulegaster sayi*. Still present as both adults and larvae at the Gainesville, Florida, site in 1993 (W. MAUFRAY, M. WESTFALL). H. LOHMANN has recently classified this species in a new genus, but acceptance of this by North American odonatists remains to be seen.

Corduliidae

1. *Somatochlora brevicincta*. T. DONNELLY and T. VOGT found a few more specimens near the type locality in Quebec in 1992.

2. *S. hineana*. According to T. DONNELLY and O. FLINT in the May 1993 issue of *Argia*, a garbage compacting and hauling facility was scheduled to be built near a habitat of this species in Wisconsin. Apparently as a counter-move the United States Fish and Wildlife Service has proposed listing the species as Federally Endangered.