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A Preliminary Comparison of the Neuroptera of Australia and New Guinea

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ABSTRACT

The Neuroptera of Australia and New Guinea are compared and discussed. Several of the families found in Australia appear to be absent from New Guinea, but others not yet recorded are likely to be found there with further collecting. The affinities of the two faunas are briefly discussed, and a list of described New Guinea Neuroptera appended to indicate general lack of knowledge of the fauna of that area.

1. INTRODUCTION

Australia and New Guinea may be grouped together as a single geographical region, sometimes referred to as 'Meganesia', and were united by an extensive land bridge across what is now Torres Strait as recently as 6500-8000 years ago. Many elements of their faunas therefore show rather recent fragmentation, and there is little need to postulate recent long-distance dispersal to interpret present day distribution patterns of many groups of insects. The two areas are conventionally viewed as separate evolutionary centres, each with characteristic biota which extend to varying degrees into the other region. Certain southern groups of insects (and others) more characteristic of Australia - often those which have evolved there in semiarid conditions - occur in the lower southern altitudes of New Guinea, and much of the southern savannah areas support insects having clear Australian affinities. Additionally, representatives of some older and more humid-adapted Bassian insect groups extend as isolated, sometimes montane, elements to New Guinea. Conversely, indo-papuan faunal elements of New Guinea - perhaps especially of Papua New Guinea - characteristically adapted to lowland rain forest environments may extend to Australia, particularly to parts of the north east. Cape York Peninsula (Fig. 1) is well-known to support a number of rain forest insects having Papua New Guinean relationships, and as a region of faunal interchange (KIKKAWA et al. 1981). In general, whereas there has been little penetration of New Guinea rain forests by recent Australian insect stocks (and that rain forest fauna is therefore almost entirely Papuan with Oriental affinities), Australian rain forests on Cape York support a range of 'outliers' of the main New Guinea fauna which do not occur elsewhere in Australia.

For Neuroptera, as for most other insects, it is unlikely that Torres Strait constitutes any major barrier to dispersal.

In this note, a preliminary comparative assessment of the Neuroptera of Australia and New Guinea is attempted. The lacewing fauna of Australia is now

Fig. 1. Australia and New Guinea, with the edge ot the continental shelf in the Torres Strait area shown as a broken line. Cape York Peninsula is shaded. Pleistocene sea levels extended to about -200m from present-day levels.

relatively well-known: that of New Guinea is not. The information presented here is derived from the literature, augmented by my recent examination of much of the available material in collections and my recent fieldwork. Inferences may change substantially as our knowledge of the New Guinea fauna increases, but I want to comment briefly on most families as they are at present known, to highlight aspects which seem to be important in considering the origins and affinities of the two faunas.

Generally, there are few species, but many genera, common to both sides of Torres Strait. Detailed distribution patterns can not as yet be given for any species of Neuroptera from New Guinea: many of the early records merely cite the collection locality as 'New Guinea', and a number of the species have apparently not been re-collected since they were described. Very few species have been described specifically from Irian Jaya, and the fauna of that little-known area is undoubtedly very rich.

2. SYSTEMATIC APPRAISAL

Several families of Neuroptera in Australia have not yet been found in New Guinea, and exemplify the common interpretive dilemma of how to assess 'absences' in biogeography. Some of them appear likely to be genuinely absent, but lack of others is undoubtedly due to insufficient collecting.

The former include (i) Ithonidae, including 14 Australian species with most species being known from the south and east (RIEK 1974); (ii) Nemopteridae, a small group in Australia, and composed wholly of species frequenting dryer areas, and (iii) Psychopsidae. The distribution of this family, known from southern and eastern Australia, South Africa, Burma, Taiwan and Tibet, suggests that it could well occur in New Guinea, but as the species are generally large and conspicuous, it is highly likely that they would by now have been detected there. The family is apparently also absent from parts of Indonesia which have been more intensively surveyed.

The second category of absences includes (i) Neurorthidae, known from Australia and Taiwan in the Pacific area; (ii) Berothidae, which include a number of endemic Australian forms and single species described from the Solomon Islands and Indonesia, and (iii) Sisyridae, known from Australia, several parts of the Oriental Region and Fiji. More tenuously, it is possible that the oriental Rapismatidae, which are diverse in eastern Malaysia, could also extend to New Guinea, but they are unlikely to be found in Australia. Likewise, Dilaridae are not known from either area, but extend to the eastern Palaearctic, with representatives in Japan, Taiwan and Borneo.

The families known to be present in both Australia and New Guinea are:

2.1. Coniopterygidae. Both MEINANDER (1972) and TJEDER (1973) have commented on relationships between the coniopterygids in these areas. **Heteroconis** Enderlein is largely limited to this region, and many of the records from New Guinea are from relatively high altitudes. The subgenus **Drepanoconis** Tjeder is a highly specialised and probably endemic New Guinea taxon.

2.2. Osmylidae. Kempyninae (NEW 1983a) and some small subfamilies are southern, and do not extend nothwards from Australia. The dominant group of osmylids in New Guinea is the Spilosmylinae, and the single Australian species (found only in northern Queensland) is clearly related to that fauna. Many of the New Guinea species are known from few individuals, and a number of them appear to be subalpine.

2.3. Mantispidae. Rather diverse in both regions. Generic placement of many of the Australian species will shortly be revised (LAMBKIN, in press), and that study will form a very sound basis for assessment of the numerous New Guinea species. HANDSCHIN's (1961) account suggests considerable affinity between the two faunas.

2.4. Hemerobiidae are geographically one of the more complex families in the region. Some Australian genera, such as **Drepanacra** Tillyard, are not known from New Guinea, and there is a greater number of northern Australia/New Guinea taxa having strong oriental affinities. Examples are species of **Annandalia** Needham and **Zachobiella** Banks. **Megalomima** Banks is known only from Papua New Guinea and Queensland, and very closely related species of **Zachobiella** occur on each side of Torres Strait. One species each of **Annandalia** and **Micromus** Rambur occurs in both areas, the latter as part of a much broader distribution in the Old World. About 30 species of the family are known from New Guinea, and a similar number from Australia.

2.5. Chrysopidae. This family is also complex. The eastern 'Oriental fringe' is one centre for diversification of the Apochrysinae. In Papua New Guinea, **Nobilinus** Navás is not uncommon in lowland southern savannah areas, and the related **Oligochrysa** Esben-Petersen is apparently endemic to Australia and Norfolk Island and occurs at intervals along the east coast of Australia (NEW 1983b). Nothochrysinae have not yet been found in New Guinea.

Chrysopinae are diverse but, with the exception of a number of small genera limited either to Australia (**Calochrysa** Banks, **Nothancyla** Navás) or to New Guinea, speculation on affinities is difficult. **Italochrysa** Principi, **Ankylopteryx** Brauer and **Semachrysa** Brooks are more diverse in New Guinea, and **Sencera** Navás has not been confirmed from Australia. Several Australian species of **Italochrysa** represent a group which is widely distributed in Papua New Guinea.

In general, the chrysopids of southern Australia show little, if any, evidence of recent relationships with New Guinea, although the genera tend to be globally widespread. Species in common include **Mallada basalis**(Walker) and **Chrysopa ramburi** Schneider, both as part of a broader pacific distribution (ADAMS 1959). Probably, about 100 species of Chrysopidae will be found in New Guinea, about twice as many as occur in Australia.

2.6. Nymphidae, in contrast to many other Myrmeleontoidea, tend to be characteristic of heavily vegetated areas. They are a southern group, with 20 described species in Australia and very few known from elsewhere. The two New Guinea species, both of which are widely-distributed on the main island, represent the primitive genera **Osmylops** Banks and **Myiodactylus** Brauer, which are otherwise predominantly east Bassian. Both these species are closely related to Australian forms, and are presumed to be northern outliers of the Australian group.

2.7. Myrmeleontidae. This, the dominant family of lacewings in Australia, appears to have only 10-20 New Guinea representatives, and several of the more unusual of these are clearly derived from Australian stocks. A species of **Periclystus** Gerstaecker (Dendroleontini) known from near Port Moresby, represents a genus otherwise known only from three species in Australia. The spectacular **Episalus zephyrinus** Gerstaecker is widely distributed in New Guinea, including New Ireland and New Britain, but does not occur in Australia. Closely related species of **Hagenomyia** Banks and **Myrmeleon** L. are found on each side of Torres Strait.

2.8. Ascalaphidae, with 36 species in Australia, are also not diverse in New Guinea, and most are closely related to Australian forms. **Suphalacsa** Lefebvre, for instance, is represented by several lowland species in southern Papua New Guinea savannahs. One anomaly is **Haploglenius novoguineensis** Navás, described from New Guinea but representing a genus otherwise known only from South America. I have not yet seen this or any related species from New Guinea, and suspect that the type locality may have been erroneously cited.

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APPENDIX: A checklist of the nominal species of Neuroptera described or recorded from New Guinea. Several apparent synonyms are included, and the generic placement of many species has not been critically checked. The more numerous species recorded from nearby areas such as Java, Sumatra, and the New Hebrides are likely to be found in New Guinea.

Coniopterygidae

Coniopteryx biroi ENDERLEIN, 1906, Zool. Jb. Abt. Syst., 23: 203.
C. ralumensis ENDERLEIN, 1906, Zool. Jb. Abt. Syst., 23: 203.
Cryptoscenea novaeguineensis MEINANDER, 1972, Acta Zool. Fenn., 136: 109.
Heteroconis candida TJEDER, 1973, Ent. Tidskr., 93: 201.
H. dahli ENDERLEIN, 1906, Zool. Jb. Abt. Syst., 23: 228.
H. flavicornuta TJEDER, 1973, Ent. Tidskr., 93: 188.
H. fumipennis TJEDER, 1973, Ent. Tidskr., 93: 198.
H. iriana TJEDER, 1973, Ent. Tidskr., 93: 194.
H. toxopei TJEDER, 1973, Ent. Tidskr., 93: 191.
H.(Drepanoconis) amoena TJEDER, 1973, Ent. Tidskr., 93: 204.

Osmylidae

Spilosmylus majalis NAVAS, 1924, Rev. Acad. Sci., Zaragosa, 9: 32.

Mantispidae

Austromantispa manca GERSTAECKER, 1884, Mitt. vorpommern., 16: 39.
(=**papuana** VAN DER WEELE 1909).
Eumantispa araucariae HANDSCHIN, 1961, Nova Guinea Zool., 15: 295.
E. taeniata STITZ, 1913, Mitt. Mus. Berl., 7: 31.
Mantispa stenoptera GERSTAECKER, 1888, Mitt. vorpommern., 19: 115.
M. melanocera NAVAS, 1913, Mem. Ac. Barcelona, 10 (24): 26.
M. pasteuri NAVAS, 1909, Mem. Ac. Barcelona, 7 (10): 12.
M. radiata NAVAS, 1914, Rev. Ac. Madrid, 12: 649.
Necyla extrema NAVAS, 1914, Rev. Ac. Madrid, 12: 481.
N. leopoldi NAVAS, 1931, Mem. Mus. Hist. nat. Belg., 4 (3): 9.
Stenomantispa ilsae STITZ, 1913, Mitt. Mus. Berl., 7: 48.
S. reinhardi STITZ, 1913, Mitt. Mus. Berl., 7: 24.
Tuberonotha strenua (GERSTAECKER), 1893, Mitt. vorpommern., 26: 150.

Hemerobiidae

Micromus loriana (NAVAS), 1929, Ann. Mus. Genova, 53: 374.
(=**Tanca loriana** NAVAS).

M. timidus (HAGEN), 1853, Ber. Verh. K. Preuss Akad. Wiss. Berlin,: 481.
M. navigatorum BRAUER, 1867, Zool. Bot. Ges. Wien, 17: 508.

Chrysopidae

Chrysopa adnea NAVAS, 1929, Ann. Mus. Genova, 53: 357.
C. beccarii NAVAS, 1929, Ann. Mus. Genova, 53: 358.
C. caprae NAVAS, 1929, Ann. Mus. Genova, 53: 366.
C. dahli NAVAS, 1924, Rev. Ac. cienc., Zaragosa, 9:21.
C. gestroi NAVAS, 1929, Ann. Mus. Genova, 53: 360.
C. innotata WALKER, 1853, Cat. neur. Ins. Brit. Mus.:254.
C. loriae NAVAS, 1929, Ann. Mus. Genova, 53: 359.
C. loriana (NAVAS), 1929, Ann. Mus. Genova, 53: 365.
(=**Scoliochrysa loriana** NAVÁS).
C. nea NAVAS, 1912, Broteria, 10: 106.
C. ruficeps McLACHLAN, 1875, Tidschr. Ent., 18: 2.
C. thieli NAVAS, 1929, Bol. Soc. ent. Esp., 12: 73.
Mallada basalis (WALKER), 1853, Cat. neur. Ins. Brit. Mus.: 239.
Italochrysa jubilaris (NAVAS), 1925, Rev. Ac. cienc., Zaragosa, 9: 29.
I. nesobrittanica (NAVAS), 1913, Mem. Ac. Barcelona, 10 (24): 24.
I. chloromelas (GIRARD), 1862, Ann. Soc. ent. Fr.,(4) 2: 607.
Sencera scioneura NAVAS, 1924, Rev. Ac. cienc., Zaragosa, 9: 27.
Semachrysa papuensis BROOKS, 1983, Bull. Brit. Mus. Nat. Hist. (Ent.), 47 (1): 12.
S. **wallacei** BROOKS, 1983, Bull. Brit. Mus. Nat. Hist. (Ent.), 47 (1): 24.
Nobilinus albardae (McLACHLAN), 1875, Tidschr. Ent., 18:18.

Nymphidae

Myiodactylus nebulosus McLACHLAN, 1877, Entomol. mon. Mag., 14: 85.

Myrmeleontidae

Distoleon bistrigatus (RAMBUR), 1842, Hist. nat. Ins. Neur.: 391.
D. polymitus NAVAS, 1913, Mitt. ent. Ges. Munch., 4: 12.
Episalus zephyrinus GERSTAECKER, 1884, Mitt. vorpommern., 16: 20.
Hagenomyia sagax papuensis VAN DER WEELE, 1910, Notes Leyden Mus., 31: 32.
Myrmeleon acer WALKER, 1853, Cat. neur. Ins. Brit. Mus.: 348.
M. capito NAVAS, 1912, Mitt. ent. Ges. Munch., 3: 90.
M. pictifrons GERSTAECKER, 1885, Mitt. vorpommern., 16: 96.
Nomes lorianus NAVAS, 1914, Rev. Ac. Madrid, 13: 234.

Ascalaphidae

Haploglenius neoguineensis NAVAS, 1913, Rev. Russe Ent., 13: 424.

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