

The fauna of orthognathous spiders (Araneae: Mesothelae, Mygalomorphae) in Thailand

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The fauna of orthognathous spiders (Araneae: Mesothelae, Mygalomorphae) in Thailand. - The records of orthognathous spiders from Thailand are summarized; 34 species in 19 genera and 9 families are listed. Missing taxa and zoogeographical relations are discussed.

Key-words: Mesothelae - Mygalomorphae - Thailand - species list - zoogeography.

INTRODUCTION

As Thailand was never under colonial rule, it has been greatly neglected by western collectors in former times, who otherwise profusely supplied European museums with specimens. The catalogue of ROEWER (1942) mentions only three species of orthognathous spiders from this country: *Haplopehna albostriatum* Simon, *Chilobrachys paviei* Simon (both Theraphosidae), *Calommata obesa* Simon (Atypidae). No additional entries were given in the catalogue of BRIGNOLI (1983), but in their revision of the genus *Cyclocosmia*, GERTSCH & PLATNICK (1975) mentioned *C. ricketti* (Pocock) (Ctenizidae) to occur in China and Thailand. BRISTOWE (1975) reported *Liphistius* from northern Thailand but erroneously attributed it to *L. birmanicus* Thorell. PLATNICK & SEDGWICK (1984), however, correctly described it as a new species, *L. bristowei*, together with *L. trang* from southern Thailand.

Such was the poor state of knowledge of the orthognathous spiders in Thailand when I started research on these animals for my doctoral thesis at Chiang Mai University in 1985 (SCHWENDINGER 1988, 1990a). After completion, I had the opportunity to return to this country several times in the course of the "University Partnership Network, Austria - Southeast Asia". Results obtained by various colleagues and myself during the last 10 years have substantially extended our knowledge of this fauna. A brief summary is given in the following.

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SPECIES LIST

LIPHISTIIDAE

Liphistius (18 spp.): *Liphistius bristowei* Platnick & Sedgwick, *L. trang* Platnick & Sedgwick (PLATNICK & SEDGWICK 1984), *L. yamasakii* Ono, *L. jarujini* Ono, *L. bicoloripes* Ono, *L. schwendingeri* Ono, *L. niphanae* Ono (ONO 1988a, b), *L. owadai* Ono & Schwendinger, *L. ochraceus* Ono & Schwendinger, *L. ornatus* Ono & Schwendinger (ONO & SCHWENDINGER 1990), *L. tham* Sedgwick & Schwendinger (SEDWICK & SCHWENDINGER 1990), *L. lannaianus* Schwendinger, *L. marginatus* Schwendinger, *L. thaleban* Schwendinger, *L. albipes* Schwendinger, *L. castaneus* Schwendinger, *L. fuscus* Schwendinger, *L. rufipes* Schwendinger (SCHWENDINGER 1990b, 1995). *Liphistius rufipes* occurs also in peninsular Malaysia, all other species listed are known solely from Thailand. Eight new species from western and eastern Thailand will be described soon (Schwendinger, in preparation). Distribution see Fig. 1.

ATYPIDAE

Calommata obesa, described from Bangkok (SIMON 1886; type specimen examined), appears identical with *C. sundaica* (Doleschall, 1837), distributed in Java and Sumatra. Additional localities were found in northern and northeastern Thailand.

Atypus (3 spp.): *Atypus dorsualis* Thorell was described from the Karen State, eastern Burma and later found in northern Thailand (SCHWENDINGER 1989). More populations have become known from the northeast; one male from there probably belongs to a new species. *Atypus suthepicus* Schwendinger and *A. lannaianus* Schwendinger are known from northern Thailand (SCHWENDINGER 1989).

HEXATHELIDAE

Macrothele spp: Two distinct species are present, one in the north, the other (probably *M. maculata* Thorell, described from eastern Burma) in almost all parts of Thailand.

DIPLURIDAE

Phyxioschema suthepium Raven & Schwendinger was described from northern Thailand, further populations were later found in the western, central and southeastern regions (RAVEN & SCHWENDINGER 1989, 1995).

Leptothele bencha Raven & Schwendinger occurs in southern Thailand (RAVEN & SCHWENDINGER 1995).

IDIOPIDAE

Idiops pylorus Schwendinger is known from northern and western Thailand (SCHWENDINGER 1991); a further species was discovered in the northeast.

Prothemienops siamensis Schwendinger was described from the northeast (SCHWENDINGER 1991); several undescribed species of this genus were found in all parts of Thailand, except in the south. A population from the southeastern region was seen heavily infected by the pathogenic fungus *Nomuraea atypicola* (Yasuda) Samson (Deuteromycotina).

CTENIZIDAE

Cyclocosmia ricketti was reported from northeastern (GERTSCH & PLATNICK 1975) and northern Thailand (HUBER 1995); a second species occurs in the northeast.

Conothele spp: Several undescribed species occur in all parts of the country.

Latouchia sp. was collected at few localities in the south and east.

CYRTAUCHENIIDAE

Angka hexops Raven & Schwendinger is present in northern Thailand (RAVEN & SCHWENDINGER 1995).

NEMESIIDAE

Damarchus spp: Several undescribed species occur in all parts of the country.

Atmetochilus sp. was collected at two localities in the west and northeast.

Sinopesa maculata Raven & Schwendinger was recently described from northern Thailand, together with a congeneric species from southeastern China (RAVEN & SCHWENDINGER 1995).

THERAPHOSIDAE

Haplopelma (2 spp.): *Haplopelma minax* (Thorell), known from eastern Burma, is common in northern, western and southern Thailand (conspecific?). *Haplopelma albostriatum*, described from the "provinces de Vatena et de Zabin, Siam" (SIMON 1886; probably today's Watthana Nakhon, Sa Kaeo Province, and Kabin Buri, Prachin Buri Province, both in southeastern Thailand), is widespread in the central and eastern regions.

Cyriopagopus sp. (probably *C. paganus* Simon, reported from eastern Burma) was collected in northern and western Thailand.

Chilobrachys paviei was described from "Vatena" (= Watthana Nakhon) (SIMON 1886). The spiders I collected in northern Thailand apparently belong to *C. pococki* (Thorell), known from eastern Burma.

Phlogiellus spp: Several undescribed species were found to be common everywhere in Thailand.

At present 34 described species and 19 genera from 9 families (system according to RAVEN 1985) of orthognathous spiders are known from Thailand. The above list,

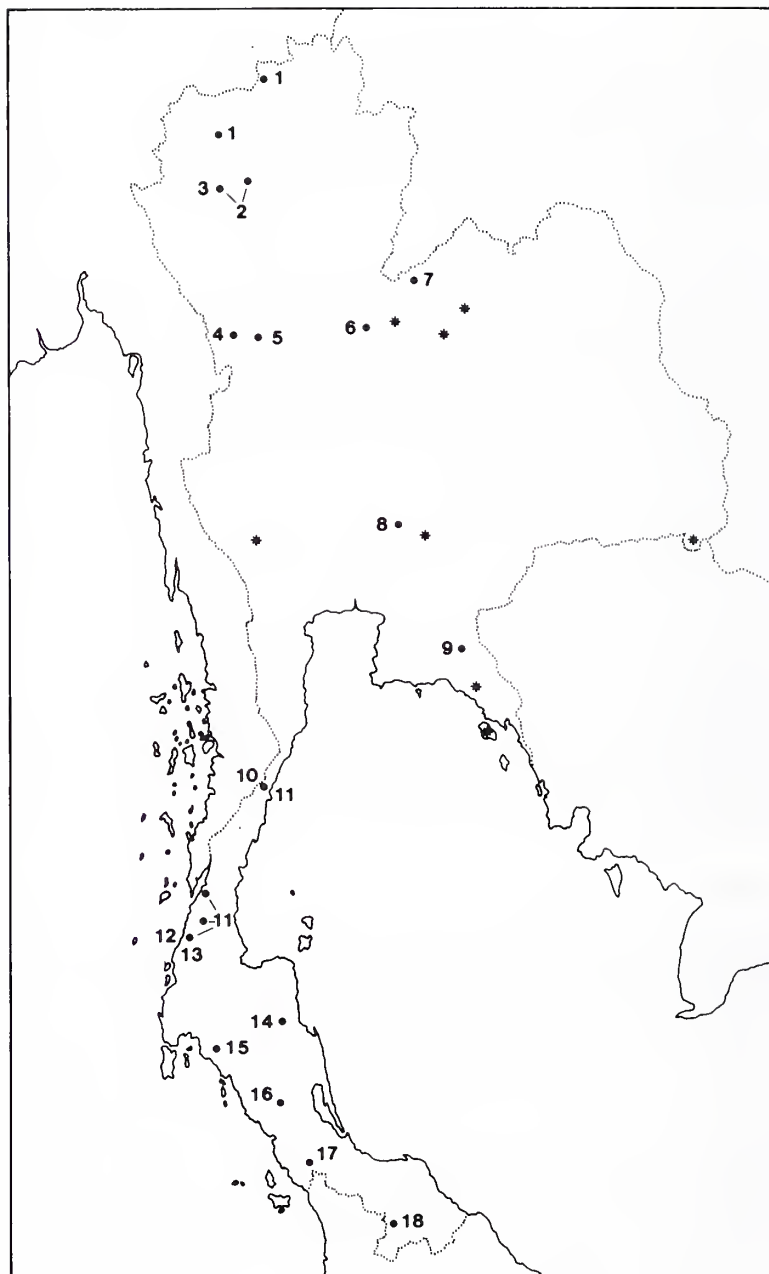


FIG. 1

Distribution of *Liphistius* in Thailand. 1 - *L. lanaiianus*, 2 - *L. bristowei*, 3 - *L. yamasakii*, 4 - *L. jarujini*, 5 - *L. marginatus*, 6 - *L. owadai*, 7 - *L. ochraceus*, 8 - *L. tham*, 9 - *L. ornatus*, 10 - *L. albipes*, 11 - *L. bicoloripes*, 12 - *L. castaneus*, 13 - *L. schwendingeri*, 14 - *L. niphanae*, 15 - *L. fuscus*, 16 - *L. trang*, 17 - *L. thaleban*, 18 - *L. rufipes*. Asterisks show localities of new species (Schwendinger, in preparation).

however, is far from complete. In several genera, species cannot be determined; extensive taxonomic studies need to be done and many unnamed species await description. Moreover, some taxa are not yet known from Thailand, which can be expected to be present. The most obvious gap is the apparent lack of the Barychelidae, of which four species are known from Southeast Asia. *Rhianodes atratus* Thorell occurs on Penang Island and Maxwell Hill (Taiping, Perak), in the north of peninsular Malaysia (RAVEN 1994; Maxwell Hill erroneously listed in Singapore), as well as in Singapore (conspecific?). *Sipalolasma ophiriensis* Abraham, *S. aedificatrix* Abraham and *Idioctis litoralis* Abraham were described from Singapore and Johore, in the south of peninsular Malaysia (ABRAHAM 1924). These or related species may also live in the rain forests of southern Thailand.

Presumably more theraphosid genera are present than listed above, which reflects my general neglect towards this family. *Ornithoctonus*, *Selenocosmia*, *Coremiocnemis*, *Lampropelma* and *Lyrognathus* were all reported from areas adjacent to Thailand (POCOCK 1900; ABRAHAM 1924; SMITH 1988).

ZOOGEOGRAPHY

Thailand lies in the centre of mainland Southeast Asia, stretching about 1600 km in north-south direction. It encloses tropical regions with climatic conditions from seasonally dry to perhumid, as well as a wide range of habitats populated by orthognathous spiders, e.g. savannas, pinewoods, dry dipterocarp forests, rain forests, evergreen montane forests, cloud forests, mangroves and limestone caves. Furthermore, climatic and floristic changes during the Pleistocene have presumably led to a series of allopatric speciations in spiders with poor dispersal capabilities, as will be discussed for *Liphistius* (Schwendinger, in preparation). Such conditions are favourable for the development of a diverse spider fauna, which is as yet largely unknown. The preliminary list of orthognathous spiders presented here gives a first impression of what is present.

Few genera of orthognathous spiders seem to be restricted to the Indochinese Subregion within the Oriental Region. These are *Atmetochilus* (Burma, Thailand), *Sinopesa* (southeastern China, Thailand) and *Prothemenops*. The latter is hitherto known only from Thailand (not in the south), but probably also occurs in neighbouring countries (Burma, Laos, Cambodia). Surprisingly the closest relatives of *Prothemenops* are members of the endemic Australian tribe Aganippini (Arbanitinae) and not of the Genysinae from India and Madagascar. A similar remarkable relationship with the Australian spider fauna was shown between *Angka* from northern Thailand and the Australian relict genus *Kiama* (RAVEN & SCHWENDINGER 1995).

Leptothele from southern Thailand (with a similar form recently discovered in northern Malaysia) appears to be Sundaic. Thailand, south of the Isthmus of Kraburi, is considered to be part of the Sundaic Subregion.

An Indochinese – Sundaic distribution is seen in *Haplopelma* [Burma, Thailand, Vietnam (von WIRTH 1991), peninsular Malaysia], *Cyriopagopus* (Burma,

Thailand, peninsular Malaysia) and *Liphistius* (Burma, Thailand, peninsular Malaysia, Sumatra). The known distribution of *Liphistius* on mainland Asia lies west of the Mekong. As *Heptathela tonkinensis* (Bristowe) is known from northern Vietnam, presumably other *Heptathela* species can be found east of the Mekong in Laos and Cambodia too. Reports from these countries are awaited with anticipation.

Cyclocosmia has a disjunct trans-Pacific distribution, occurring in the Indochinese Subregion (Thailand, southeastern China) and in the Nearctic Region (southern USA, Mexico) (GERTSCH & PLATNICK 1975). Another disjunction is apparent for *Phyxioschema*: *Phyxioschema suthepium* is present in Thailand, *P. raddei* Simon in Palearctic Turkmenistan and Afghanistan (RAVEN & SCHWENDINGER 1989). However, since both species are small and inconspicuous, they may have been overlooked in the intervening area.

Chilobrachys is widely distributed in the Indian (Sri Lanka, India) and Indochinese Subregion (Burma, Thailand, China, Vietnam). *Damarchus* is found almost all over the Oriental Region, from India to Sumatra. *Calommata* and *Macrothele* range over parts of the Oriental, southern Palearctic and Ethiopian regions. *Atypus* is Holarctic and Oriental in distribution. The species in Thailand show relations to southern (*A. dorsualis* closest to *A. javanus* Thorell from Java and Sumatra) and northeastern taxa (*A. suthepicus* closest to *A. suiningensis* Zhang from southeastern China and to *A. karschi* Dönitz from Japan and Taiwan; SCHWENDINGER 1990c). *Idiops* is distributed in tropical and subtropical Asia, Africa and America. However, species outside America possibly have to be placed in the genus *Titanidiops*, now in synonymy (WUNDERLICH 1991: 280). Though distributed around the globe, *Atypus* and *Idiops* do not occur east of the Wallace Line. Only few genera present in Thailand range across this zoogeographical landmark: *Conothele* and *Phlogiellus* are distributed from China and Burma to Australia.

As can be expected, the fauna of orthognathous spiders in Thailand is composed of mostly Oriental and southern Palearctic forms. Few genera are also found in the Ethiopian (*Calommata*, *Macrothele*, *Idiops*), the Australian (*Conothele*, *Phlogiellus*) and the Nearctic Region (*Atypus*, *Cyclocosmia*). In contrast to results on linyphiid spiders by MILLIDGE (1995), very little congruence is evident between the mygalomorph spiders (the more ancient of both taxa) of Thailand and the Neotropic Region. Only *Idiops* (*Idiops* - *Titanidiops*?) is present in both areas. MILLIDGE'S (1995) hypothesis that a part of Southeast Asia was attached or adjacent to South America before the break-up of Gondwanaland, therefore, cannot be supported.

Zoogeographical connections with the Nearctic and the Australian Region are interpreted as a result of vicariance and dispersal. The essentially continuous Australasian distribution of *Conothele* and *Phlogiellus* is probably due to a southward migration via land-bridges and stepping stones in the Malayan Archipelago during periods of lowered sea level in the Pleistocene (cf. MAIN 1981a, b). *Phlogiellus* (as also the widely distributed *Selenocosmia*, which ranges from India to Australia) has relatively good powers of dispersal. *Conothele*, which builds trapdoor nests in depressions on tree trunks and burrows in dead wood, may have rafted on logs or dispersed on gossamer (MAIN 1957).

Three cases of trans-continental relationships are remarkable. The trans-Pacific disjunction of *Cyclocosmia* is presumably a relict of a Palearctic or Asiatic (PLATNICK 1976) distribution in the Mesozoic. *Prothemmenops* and *Angka* from Thailand are taxonomically closer to the Australian Aganippini and *Kiama* respectively than to any mygalomorph spiders from Asia. They presumably are vicariant sister groups, each pair originating from a common ancestor in the pre-Jurassic, when parts of Southeast Asia were attached to northeastern Gondwanaland (AUDLEY-CHARLES 1987).

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