Acta Arachnologica, 56(1): 29–58, June 30, 2007

Spiders from Laos with descriptions of new species (Arachnida: Araneae)

Peter Jäger

Arachnology, Research Institute Senckenberg, Senckenberganlage 25, D-60325 Frankfurt am Main, Germany; Peter.Jaeger@Senckenberg.de

Abstract — A total of 58 spider species is reported from material mainly collected on three recent expeditions to Laos. Out of these, five species are described as new: Psechridae — *Psechrus khammouan* sp. nov. (male, female), *Psechrus luangprabang* spec. nov. (male, female), Liocranidae — *Sesieutes thakek* spec. nov. (male), Zodariidae — *Storenomorpha anne* spec. nov. (male, female), Sparassidae — *Pseudopoda houaphan* spec. nov. (female). The males of *Caerostris sumatrana* Strand, 1915 (Laos; first record for Asia) and *Eurychoera quadrimaculata* Thorell, 1897 (Singapore) are described for the first time. Copulatory organs of the latter species are illustrated for both sexes to facilitate identification of *Eurychoera banna* Zhang, Zhu & Song, 2004. New records of species formerly known from Laos are listed: *Heteropoda dagmarae* Jäger & Vedel, 2005, *H. maxima* Jäger, 2001, *H. tetrica* Thorell, 1897, *H. venatoria* (Linnaeus, 1767), *Rhitymna verruca* (Wang, 1991), *R. plana* Jäger, 2003.

Key words — Taxonomy, biodiversity, spiders, Indochina, Luang Prabang Prov., Khammouan Prov., Luang Nam Tha Prov., Houaphan Prov., Vientiane Prov.

Introduction

The spider fauna of Laos was neglected in the past. Although there are partly extensive collections for instance in the Museum National d'Histoire Naturelle Paris (MNHN), only few publications on and very few descriptions of taxa from this part of Indochina exist. To show a relative frequency of countries treated in taxonomic publications the number of appearance of each country in the World Spider Catalog compiled by Platnick (2006) may be useful: Laos (5), Cambodia (8), Bangladesh (48), Bhutan (105), Singapore (108), Nepal (221), Thailand (236), Vietnam (253), Malaysia (292), Myanmar (436), India (1266), China (2428). Four of the five species from Laos listed in the catalog are described from material collected by P. Jäger in 2003 and 2004, one additional species was described by P. Jäger (Jäger 2001, Huber, 2005a, Jäger & Vedel 2006). Even from small countries such as Nepal more species are described if extensive material was collected (here: by Jochen Martens) and distributed to specialists.

In 2000 it was one species found by the author in the Zootheque in the MNHN, which raised his interest for Laos. It was a giant huntsman spider (Sparassidae) from caves in Khammouan province with a leg span of up to 30 centimetres, which was described as *Heteropoda maxima* (Jäger 2001). Expeditions were conducted in the following years (2003, 2004, 2006) to explore the spider fauna in Laos. Spiders and other arthropods were collected so far in four provinces (Fig. 1): Khammouan Prov. (2003, 2004), Vientiane Prov. (2004), Luang Prabang Prov. (2004, 2006), Luang Nam Tha Prov. (2004). Minor material was available from Houaphan Prov.

One special geological feature of Laos are the limestone caves in the karstic regions. Besson et al. (2001) distinguish five main karstic regions: Khammouan, Xiangkhouang, Vang Vieng, Luang Prabang, and Muang Ngoy. In all regions but Xiangkhouang spiders were collected in caves by the author. Additional material was made available by Helmut Steiner (Frankfurt, Germany). Claude Mouret (Derdères, France) made about 20 speleological expeditions to Laos with various teams and gave an introduction as well as notes on the geology for the first 10 years (Mouret 2001, Mouret et al. 1997) and compiled data of the usage of caves by humans in Laos (Mouret 1997).

Some of the material others than spiders could already be identified by specialists. Among this are two large sized species from cave habitats, namely *Typopeltis magnificus* Haupt 2004 (Arachnida: Uropygi) described from Tham Payat (Khammouane Prov.; Haupt 2004) and a yet undescribed *Thereuopoda* sp. from caves in Khammouan Prov. (Wuermli, pers. comm.). Reptilia and Amphibia species could be identified by Thomas Ziegler from photographs made by the author: *Triceratolipidophes sieversorum* Ziegler, Herrmann, David, Orlov & Pauwels 2000 as third record for this genus and second record for Laos from a cave close to Ban Kouanphavang (L31). Moreover *Leptobrachium* sp., *Limnonectes* sp. and *Philautus* sp. were recorded from Ban Keng Koung (L15), *Elaphe taeniura* (Cope 1861), *Cyrtodactylus* sp. and *Calotes* sp. from Vang Vieng (L17–23), *Microhyla pulchra* (Hallowell 1861) and *Dendrelaphis ?pictus* (Gmelin 1789) from Ban Tham (L35),

and *Trimeresurus* sp. from Ban Kouanphavang (L32). These records point to the importance of the Laos terrritory as one main part of the Indo-Burman Hotspot.

So far, exclusively Pholcidae (Huber 2005a) and Sparassidae (Jäger 2001, Jäger 2003, Jäger & Vedel 2005, Eusemann & Jäger 2006, Jäger et al. 2006, Eusemann & Jäger submitted) were treated as groups of the Araneae in various papers. In the present paper new species of Araneae are described, and records for Laos are listed as far as these could be identified by the author or specialists. The identified material is mainly restricted to groups which were revised in recent times (e.g. Tetragnathidae, Psechridae). Most of the species recorded may represent new records for this country. Due to the scarce literature definite statements concerning this respect are possible only in few cases. Further, unidentified material of various spider families as well as other groups such as Chilopoda, Diplopoda, Crustacea and various groups of Insecta is deposited in the Research Institute Senckenberg (SMF) and may be requested from specialists. The present paper aims to give a state of the art of the knowledge of the spider fauna in Laos and trigger the research on spiders of this species-rich country.

Material and methods

Material was examined and is preserved in 70% ethanol. Epigyna and internal duct systems were partly treated with 96% lactic acid. Leg mesaurements are given as: total length (femur, patella, tibia, metatarsus, tarsus). All measurements are in millimetres. Arising points of tegular appendages in males are described as clock-positions of the left pedipalpus. As in Sparassidae (Jäger 2005: 88), slit sense organs close to the epigynum are illustrated if present as at least descriptive character. Moreover, they might have diagnostic value, help to identify additional differences between taxa in question and give hints, whether a female is adult or just subadult with pre-epigynal structures. In *Storenomorpha anne* spec. nov., for instance, slit sense organs of both, premature (Fig. 90) and mature (Fig. 87) specimens, exhibit similar distances between the right and left half. But only in the adults they are close to the epigynal field as in most other species (e.g., in Sparassidae: *Heteropoda* [not figured in this paper; Jäger 2005], Araneidae: Fig. 13, Pisauridae: Figs. 18, 39–40). Slit sense organs may be separated wider from the epigynal field as, for instance, in Psechridae (Figs. 52, 57).

Deposition of material: Types of *Eurychoera quadrimaculata* Thorell 1897 are deposited in the Natural History Museum Stockholm (NHRS), additional material of the same species including the male which was used for the first description in this paper in the Raffles Museum of Biodiversity Research Singapore (RMBR), types of *E. banna* Zhang, Zhu & Song 2004 in the museum of Hebei University Baoding, China (MHU), and additional material of other species in the Museum National d'Histoire Naturelle Paris (MNHN). If not stated otherwise all other material is deposited in the Research Institute Senckenberg, Frankfurt am Main, Germany (SMF).

Publications used for identification are cited in the text. If not stated otherwise material was determined by the author. Material is sorted in the text by provinces and from North to South. Styles of description of particular species are different according to different spider taxa.

Abbreviations used in the text: AME — anterior median eyes, ALE — anterior lateral eyes, AW — anterior width of dorsal shield of prosoma, OL — length of opisthosoma, OS — opisthosoma, OW — width of opisthosoma, PJ — subsequent number of Sparassidae, examined by P. Jäger, PME — posterior median eyes, pl — prolateral, PL — length of dorsal shield of prosoma, PLE — posterior lateral eyes, PS — prosoma, pv — proventral, PW — width of dorsal shield of prosoma, rl — retrolateral, RTA — retrolateral tibial apophysis, rv — retroventral. I, II, etc. — leg I, leg II, etc.

Localities (Figs. 1–5)

Laotian localities where spiders were collected are listed here from North to South in order of the particular provinces. Numbers (L xx) are given in the "material examined" section of each species listed. Cave names in Laos have been written in different spellings and with different names. Those for Northern Laos are provided according to Dreybrodt & Laumanns (2005).

Luang Nam Tha Province

Muang Sing

L1 Muang Sing, N 21º11.422′, E 101º9.45′, 639 m altitude, agricultural fields, hedge, beside street, by day and night, by hand, P. Jäger & V. Vedel leg. 3.XI. 2004.

L2 10.3 air km ESE Muang Sing, Nam Det, N 21º10. 193′, E 101º14.445′, 821–1097 m altitude, secondary forest, along path, soil and vegetation, by day, by hand, P. Jäger & V. Vedel leg. 6.XI.2004.

L3 8.7 air km SE Muang Sing, Nam Ha Protected Area, N 21º8.075′, E 101º11.991′, 745 m altitude, secondary forest, slope at street, bank at stream, vegetation close to stream, by day and night, by hand, sieving, sweeping, P. Jäger & V. Vedel leg. 4.+6. XI.2004.

L4 11.3 SW Muang Sing, Nam Ma, N 21º6.148′, E 101º5.571′, 801 m, secondary forest, by day, sieving and sweeping, P. Jäger & V. Vedel leg. 5.XI.2004.

Luang Nam Tha

L5 5 km N of Luang Nam Tha, N 21º1.201′, E 101º 24.632′, 597 m altitude, secondary forest, vegetation, rocks, soil, beside road, by night, by hand, sweeping, P. Jäger & V. Vedel leg. 7.+8.XI.2004.

L6 7.8 air km ESE Luang Nam Tha, Ban Tavan, N 20º 58.702′, E 101º28.686′, 581–657 m altitude, disturbed primary forest, by day, by hand, sieving, sweeping, P. Jäger & V. Vedel leg. 9.XI.2004.

Luang Prabang Province

Nong Khiao (＝Nong Khiaw/＝Muang Ngoy, 90 air km NNE Luang Prabang, Nam Ou)

L7 Tham Pathok, N 20º33.082′, E 102º37.925′, 373 m altitude, inside and outside cave, paddy fields, banana plantation, by day and night, by hand, sweeping, P. Jäger & J. Altmann leg. 10.＋11.III.2006. (Fig. 2)

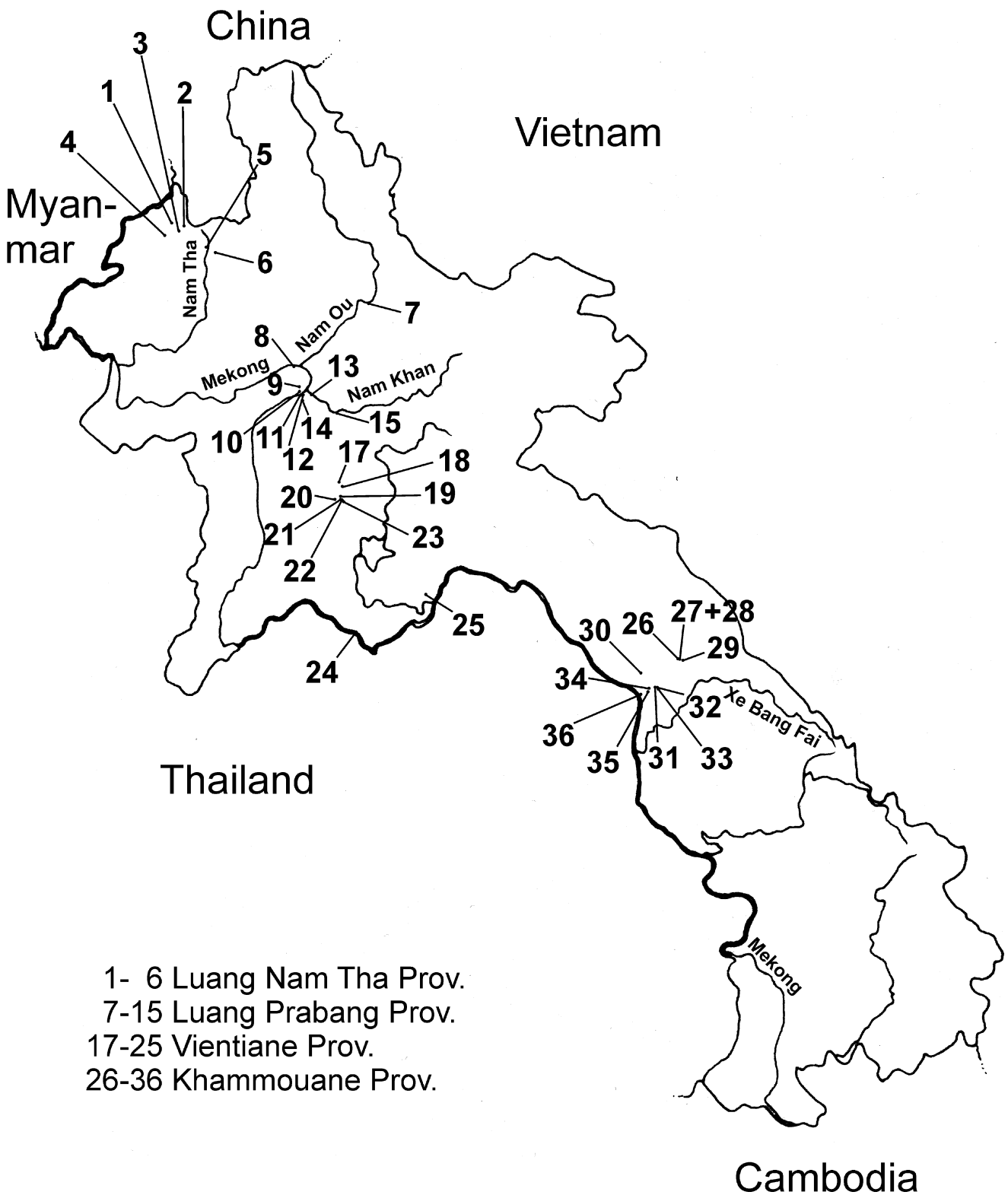


Fig. 1. Collecting sites in Laos (with main rivers). Numbers are referred to in the "Material and Methods" paragraph.

Figs. 2–5 Habitats in Laos. 2 Karst rocks close to Nong Khiao (L7), with numerous caves and a narrow belt of (semi)natural habitats close to the rocks. 3 Hills at Nam Khan river (between L13 and L15), due to new settlements agricultural fields are built higher on the mountains and slash and burn cycles decreased approximately from 8 to 3 years. 4 Cave Tham Keng Koung, about 200 m above Nam Khan river (L15). 5 Forest at the waterfall That Se (L13), water is present in pools and upstream during the entire dry season.

Pak Ou (19.2 air km NNE Luang Prabang)

L8 Mekong, Tham Phun, N 20º02′57.60″, E 102º12′33.48″, inside and outside cave, secondary forest, by day, by hand, sweeping, P. Jäger & V. Vedel leg. 12. XI.2004.

Luang Prabang

L9 Chompet district, N Luang Prabang, North bank of

Mekong, Ban Xiang Men, Tham (Wat) Xiang Men (=Tham Khou Ha Sackalin), N 19º54.143′, E 102º 08.527′, 273 m altitude, inside and outside cave, vegetation, by hand, sweeping, P. Jäger & V. Vedel leg. 14.XI.2004.

L10 Luang Prabang, Phou Si, N 19º53.39′, E 102º 8.061′, 299 m altitude, disturbed forest, by day and night, by hand, P. Jäger & V. Vedel leg. 12.XI.2004; P. Jäger & J. Altmann leg. 4.+9.III.2006

L11 4.5 air km S Luang Prabang, Ban Don Khang, N 19º 50.871′, E 102º08.512′, 309 m altitude, marginal vegetation in agricultural fields, by hand and sweeping, P. Jäger & V. Vedel leg. 14.XI.2004.

L12 5.7 air km SE Luang Prabang, Ban Hao, N 19º 51.118′, E 102º10.513′, 453 m altitude, vegetation beside street, shrubs, small trees, bamboo leaf litter, by day, by hand, sieving, sweeping, P. Jäger & V. Vedel leg. 14.XI.2004

L13 9.5 air km ESE Luang Prabang, Ban Ean, Nam Khan, That Se, N 19º50.562′, E 102º13.118′, 304 m altitude, waterfall, along stream, secondary forest, by day and night, by hand, sieving, sweeping, P. Jäger & J. Altmann leg. 4.+5.III.2006. (Fig. 5)

L14 10 air km SSE Luang Prabang, Ban Mout, That Mout N 19º47.919′, E 102º10.21′, 330 m altitude, waterfall, along stream, secondary forest, by day, by hand, sieving, sweeping, P. Jäger & J. Altmann leg. 6.III.2006.

Ban Keng Koung (29 air km SE of Luang Prabang, Nam Khan, Xiang Ngeun District)

L15 N 19º40.963′, E 102º18.442′, 372 m altitude, along stream, disturbed forest, cultivated land, by day and night, by hand, sweeping, P. Jäger & J. Altmann leg. 7.+8.III.2006. (Figs. 3–4)

Houaphan Province

L16 Muong You, Vitalis de Salvaza leg. 17.XI.–8.XII.1918 (MNHN) [not mapped]

Vientiane Province

Vang Vieng

L17 13.2 air km N Vang Vieng, Tham Hoi, N 19º 02.354′, E 102º25.455′, 258 m altitude, by day, inside cave, P. Jäger & V. Vedel leg. 18.XI.2004.

L18 10 air km N Vang Vieng, Ban Phoxay, N 19º0.731′, E 102º26.766′, 260 m altitude, shrubs, small trees, herb layer, by day and night, by hand, P. Jäger & V. Vedel leg. 17.XI.2004.

L19 2.94 air km NNW Vang Vieng, Tham Done, N 18º 56′47.32″, E 102º26′2.39″, inside and outside cave, trees, shrubs, by hand, sweeping, P. Jäger & V. Vedel leg. 19.XI.2004.

L20 5.2 air km W Vang Vieng, Tham Pou Kham, N 18º 55.549′, E 102º23.734′, 260 m altitude, inside and outside cave, by hand, sweeping, P. Jäger & V. Vedel leg. 17.XI.2004.

L21 1 air km W Vang Vieng, Tham Phadeng, N 18º 55.486′, E 102º26.143′, 282 m altitude, cave and surroundings, at night, by hand, P. Jäger & V. Vedel leg. 19.XI.2004

L22 Vang Vieng, N 18º55.490′, E 102º26.950′, 239 m altitude, Nam Song, stone wall close to river, by hand, P. Jäger & V. Vedel leg. 16.XI.2004

L23 1.6 air km SE Vang Vieng, N 18º54.698′, E 102º 27.35′, 229 m altitude, river in agricultural fields, gravel banks and vegetation, by hand, P. Jäger & V. Vedel leg. 16.XI.2004.

Vientiane

L24 Vientiane, N 17º58.052′, E 102º36.394′, 190 m altitude, on walls and in buildings, by hand, P. Jäger leg 3.–5.III.2003

L25 Ban Pakngum Distr., c 60 km NE Vientiane, Ban Houaylaokha, by hand from tree trunk beside street, P. Jäger & V. Vedel leg. 1.XI.2004.

Khammouan Province

Ban Thathot

L26 4.6 air km WNW Ban Thathot, Tham Deua, N 17º 38.058′, E 105º6.279′, 169 m altitude, entrance area and inside cave, P. Jäger leg. 21.II.2003

L27 2.5 air km WNW Ban Thathot, primary forest between street and limestone cave Tham Kamouk, 17º 37.897′, E 105º07.502′, 200 m altitude, P. Jäger leg. 19.II.2003

L28 2.5 air km WNW Ban Thathot, Tham Kamouk, cave entrance N 17º37.897′, E 105º7.502′, cave exit N 17º37.994′, E 105.07195′, 200 m altitude, entrance area and inside cave, by hand, P. Jäger leg. 19.+20. II.2003

L29 Ban Thathot, N 17º37.471′, E 105º8.797′, 180 m altitude, village and surroundings, by hand, sweeping, P. Jäger leg. 17.–25.II.2003

Thakek

L30 15.5 air km N Thakek, Tham Payat, N 17º32.954′, E 104º48.754′, 165 m altitude, inside and outside cave, leaf litter, shrubs, by hand, sweeping, P. Jäger leg. 1.III.2003

L31 13.9 air km ENE Thakek, Ban Kouanphavang, N 17º27.390′, E 104º55.435′, 176 m altitude, inside and outside cave, P. Jäger leg. 28.II.2003; P. Jäger & V. Vedel leg. 29.–30.X.2004

L32 15.4 air km ENE Thakek, Ban Kouanphavang, N 17º27.150′, E 104º56.321′, 180 m altitude, cave, by hand, P. Jäger leg. 28.II.2003; P. Jäger & V. Vedel leg. 29.–30.X.2004

L33 16 air km ENE Thakek, Tham En, N 17º26.672′, E 104º56.921′, 171 m altitude, inside and outside cave, by hand, sweeping, P. Jäger leg. 28.II.2003

L34 8.7 air km (9.5 car km) NE Thakek, N 17º26.936′,

E 104º52.499′, 159 m altitude, foot caves and surroundings, by hand, sieving, sweeping, P. Jäger leg. 27.II.2003; P. Jäger & V. Vedel leg. 30.X.2004, V. Vedel leg. 8.XII.2005

L35 6.9 air km ENE Thakek, Ban Tham, N 17º25.799′, E 104º51.906′, 161 m altitude, inside and outside cave, by hand, sieving, sweeping, Jäger leg. 27.II. 2003; P. Jäger & V. Vedel leg. 31.X.2004

L36 Thakek, N 17º23.764′, E 104º48.158′, 160 m altitude, buildings, trees, by hand, P. Jäger leg. 17.II.–3.III.2003

Results

Sicariidae Keyserling 1880

Loxosceles rufescens (Dufour 1820)

Material examined. 1 male, 3 females, 3 subadult males, 3 juveniles (SMF 56663), L8, cave, by hand. **1 male** (SMF 56658), L9, cave, by hand, P. Jäger & V. Vedel leg. 17.XI.2004.

Specimens were identified after Gertsch & Ennik (1983). The species was found in two caves only (spiders were collected in more than twenty cave systems). The upper cave at Pak Ou (Tham Phun) is a rather dry cave, small and open for tourism due to buddhism relics. Specimens were collected from the soil under stones and in crevices in the cave walls. Tham Sieng Mang, in comparison to other caves, is rather warm and not as rich as other caves in respect of its cave fauna. It is also a touristic cave and close to Luang Prabang, which may explain the presence of a cosmopolitan species which is most likely introduced by man in these habitats.

Pholcidae C.L. Koch 1851

This spider family was extensively revised by Bernhard A. Huber (e.g. Huber 2005a, b). Some species could not yet be identified to species level, e.g. *Belisana* spp. and *Pholcus* spp., both diverse genera in SE Asia. Most likely, many species of those genera are undescribed taxa (Huber, pers. comm.).

Crossopriza lyoni (Blackwall 1867)

Material examined. 1 juvenile (SMF 56160), L3, by hand, 6.XI.2004, B. Huber det. 2005. **1 female** (SMF 56161), L8, secondary forest, outside cave, by hand, B. Huber det. 2005. **1 female** (SMF), L13. **1 male, 3 females, 5 juveniles** (SMF 56159), L24, B. Huber det. 2005. **2 females** (SMF 56157), L29, by hand; B. Huber det. 2005. **3 males, 1 female, 1 juvenile** (SMF 56158), L36, B. Huber det. 2005. **2 females, 5 juveniles** (SMF), L36, B. Huber det. 2006.

Khorata Huber 2005

This genus was described for four species from Laos and Thailand (Huber 2005a). Type species is *Khorata khammouan* Huber 2005 from a remote cave (Tham Deua, L26) in the East of Khammouan Province. Additional material of the same species was reported from two caves in the vicinity of Thakek (Tham Payat, L30, and Ban Tham, L35). *Khorata jaegeri* Huber 2005 was exclusively found in Tham Deua and *Khorata bangkok* Huber 2005 was collected from two forest habitats north and east of Luang Nam Tha (L5, L6).

Khorata schwendingeri Huber 2005

Material examined. 3 males, 2 females (SMF), L7, B. Huber det. 2006.

Although the identification is preliminary (type material was not directly compared to material from Laos), this first record of this species from Laos is here included. The unknown female will be described later by Bernhard Huber.

Micropholcus fauroti (Simon 1887)

Material examined. 1 female (SMF), L9, B. Huber det. 2006. **1 male, 1 female, 1 juvenile** (SMF), L36, B. Huber det. 2006. **4 females** (SMF), L36, B. Huber det. 2006.

Physocyclus globosus (Taczanowski 1874)

Material examined. 9 males, 9 females (SMF 56162), L8, cave, by hand, B. Huber det. 2005.

Smeringopus pallidus (Blackwall 1866)

Material examined. 1 female (SMF), Nong Khiao, N 20º34.263′, E 102º36.832′, guesthouse, toilet, Jäger leg. 10.III.2006, B. Huber det. 2006. **?3 juveniles** (SMF), L15, B. Huber det. 2006. **1 female** (SMF), L36, B. Huber det. 2006.

Hersiliidae Thorell 1870

The family was revised by Baehr & Baehr (1993) for the Oriental region. From this region, 26 *Hersilia* species, 9 species of other genera and 9 doubtful species are known so far.

Hersilia Audouin 1826

Hersilia asiatica Song & Zheng 1982

Fig. 6

Material examined. 3 females (SMF 56414), L7, by night, tree trunk, by hand, 10.III.2006. **1 male, 1 female** (SMF 56398), L13, tree trunk, by hand, 5.III.2006. **1 male** (SMF 40629), L28, H. Steiner leg. (041/03−3), 20.II.2003, S. Foord det. 2005.

So far, the species was known from Thailand, Taiwan and China. The present specimens represent the first records of this species for Laos. The habitus is shown in photographs for the first time (Fig. 6). Spiders were caught from larger tree trunks (That Se, Tham Pathok) and from cave walls in the entrance area (Tham Kamouk).

Hersilia baliensis Baehr & Baehr 1993

Material examined. 1 female, 1 juvenile (SMF 40630), L1, by night, S. Foord det. 2005. **1 female** (SMF 40631),

L2, S. Foord det. 2005.

This species was described from Bali (Baehr & Baehr 1993). This first record for Laos extends the distribution range of the species considerably northwards and thus the species can be expected in other countries of former Indochina, too.

Theridiidae Sundevall 1833
Steatoda Sundevall 1833

Steatoda cingulata (Thorell 1890)

Material examined. 1 female (SMF 56717), L29, A.V. Gromov. det. 2003.

The species was known before from China, Korea, Japan, Sumatra and Java (Platnick 2006). The female represent the first record for Laos and closes a gap between southern and northern East Asian countries.

Tetragnathidae Menge 1866

Guizygiella Zhu, Kim & Song 1997

The genus was described by Zhu et al. (1997). Zhu et al. (2003) include four species in this genus. Here, two species are recorded from Laos for the first time. Wunderlich (2004) placed the genus in the Zygiellidae. A free sector in the orb web as typical for Zygiellidae sensu Wunderlich could not be observed. Therefore, the family status of this genus remains uncertain. Representatives appear to live in disturbed habitats (trees in towns, hedges along streets, riversides in agriculatural fields) and were —only rarely— collected from natural habitats.

Guizygiella guangxiensis (Zhu & Zhang 1993)
Figs. 8–9

Material examined. 1 male (SMF 56335), **1 female** (SMF 56337), L1. **2 females (one with scapus)** (SMF 56371), L10, 12.XI.2004. **2 females** (SMF 56715), L13, 5.III.2006. **1 female** (SMF 56380), **1 female** (SMF 56381), L23. **2 females (both with scapus)** (SMF 56321), L29, 17.II.2003. **1 female** (SMF 56327), L29, 23.II.2003. **1 female (scapus broken off)** (SMF 56328), L36, 26.II.–1.III.2003.

This species is widely distributed in Laos. In some female specimens a knob-shaped scapus is present (Figs. 8–9). Specimens without this scapus exhibit a hardly recognisable insertion area, which is not illustrated in Zhu & Zhang (1993) or Zhu et al. (2003). It seems to be a predetermined breaking point, as very low pressure causes a break-off of the scapus.

Guizygiella nadleri (Heimer 1984)

Material examined. 3 males, 1 female (SMF 56338), **2 males, 2 females** (SMF 56336), L1. **1 female** (SMF 56370), L10, 12.XI.2004. **1 male** (SMF 56311), L18. **1 female** (SMF 56716), L23.

So far, this species is recorded only from the northern provinces. It was described by Heimer (1984) from Vietnam and later recorded from China (Zhu et al. 2003 and references herein). Heimer (1984: fig. 4) shows a "flat hook" at the median plate of the epigynum. This is absent in Lao specimens. The posterior margin of this median plate can be rather semi-circled.

Leucauge White 1841

Leucauge tesselata (Thorell 1887)

Material examined. 1 male, 1 female (SMF 56342), L1. **2 females** (SMF 56671), L19.

This species is widespread in southern Asia. Copulatory organs of the present specimen coincide clearly with illustrations of this species provided by Zhu et al. (2003). The dorsal opisthosomal colouration is very similar to that of *L. subtesselata* Zhu, Song & Zhang 2003, described from Taiwan. This difference, the presence of two prolateral spines on female tibia IV and minor differences in the internal duct system are considered intraspecific variation. Only males from Taiwan, type locality of *L. subtesselata*, can show, whether this is a valid species or probably a synonym of *L. tesselata.*

Orsinome Thorell 1890

Orsinome vethi (Hasselt 1882)

Material examined. 3 males, 2 females, 1 subadult male, 3 juveniles (SMF 56678), L13, 5.III.2006. **2 males, 8 females, 1 subadult male, 4 subadult females** (SMF 56682), L14. **1 male** (SMF 56683), L15, 7.III.2006. **1 subadult female** (SMF 56688), L15, 8.III.2006.

This species show considerable size variation, especially in males combined with a strong allometric growth of the chelicerae, which are in large specimens extraordinary bulgy at their frontal side. Male copulatory organs appear uniform, whereas female epigyna tend to vary in appearance of the epigynal folds posterior to the central epigynal pit.

Tetragnatha Latreille 1804

Tetragnatha geniculata Karsch 1891

Material examined. 2 males, 2 females (SMF 56685), L15, 7.III.2006.

Copulatory characters as well as colouration and shape of the opisthosoma correspondend almost without variation with those illustrated in Zhu et al. (2003).

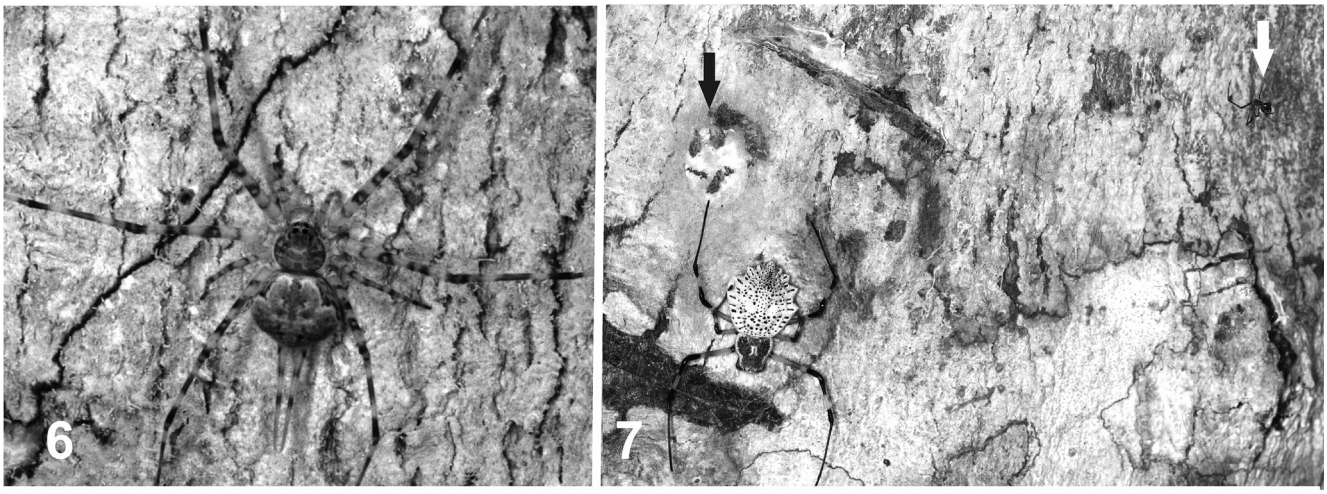
Tetragnatha mandibulata Walckenaer 1842

Material examined. 1 male (SMF 56640), L1.

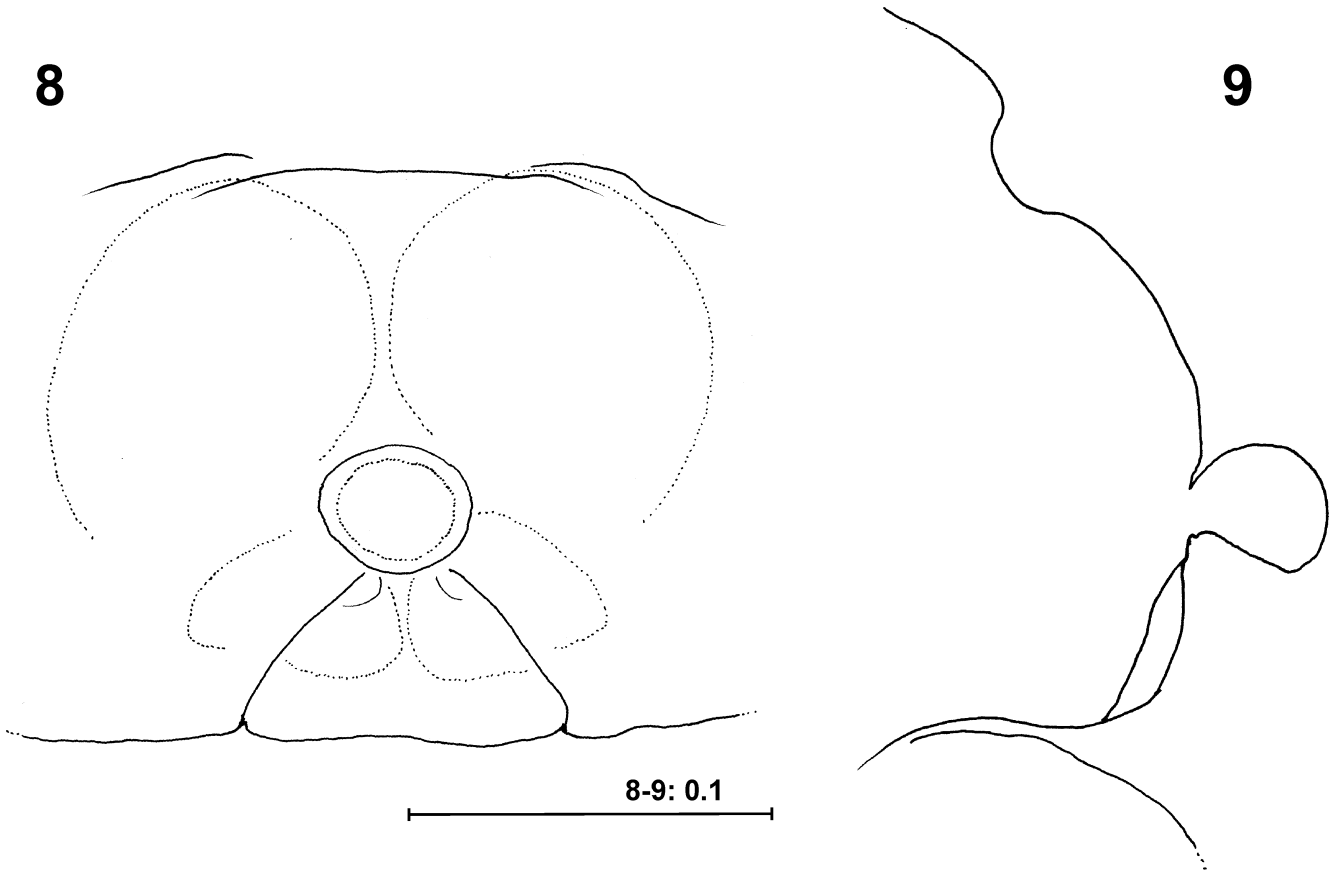
Tylorida Simon 1894

Tylorida sp. cf. *mengla* Zhu, Song & Zhang 2003

Material examined. 1 female (SMF 56402), L15, 7. III. 2006.



Figs. 6–7. 6 *Hersilia asiatica* Song & Zheng 1982, female from That Se (L13). 7 *Herennia multipuncta* (Doleschall 1859), female from Tham Done (L19) with egg-sac (black arrow; partly camouflagued) and *Argyrodes* specimen in the web (white arrow).



Figs. 8–9. *Guizygiella guangxiensis* Zhu & Zhang 1993. Female from Ban Thathot (L29, SMF 56321). Epigynum (8 ventral view, 9 lateral view).

The single female cannot assigned unambigously to this species. General epigynal structure and colouration point to conspecifity with *T. mengla*. Males should confirm species identification.

Nephilidae Simon 1894

Herennia Thorell 1877

Kuntner (2005) revised the genus *Herennia*. According to this work the species diversity of *Herennia* in the islands of SE Asia is high, whereas *H. multipuncta* (Doleschall 1859) is an invasive species and widely distributed from India to Eastern Indonesia.

Herennia multipuncta (Doleschall 1859)
Fig. 7

Material examined. 1 juvenile (SMF 56641), L1. **1 female, 1 juvenile** (SMF 56692), L7, 10.III.2006. **1 male, 2 juveniles** (SMF 56700), L7, 11.III.2006. **1 male** without pedipalpi (SMF 56687), **2 females** (SMF 56222), L15, single trees, 8.III.2006. **3 females, 2 juveniles** (SMF 56672), L19, tree bark. **1 female** (SMF 56332), L25.

The specimens from Laos represent the first record for this country. Moreover, it is firstly shown (Fig. 7) that specimens of *Argyrodes* sp. live in webs of *Herennia multipuncta*. In Singapore, only one of about 100 webs of *Herennia multipuncta* (most were juvenile) contained an *Argyrodes* specimen (Kuntner & Court, pers. comm. in 2007).

Nephila Leach 1815

Nephila laurinae Thorell 1881

Material examined. 7 females (SMF 56630), Laos, Vientiane Prov., 30 km E of Muang Pak Lay, 100 km W of Vientiane, 20 km N of Mekong river, W. Thielen leg. VIII.1988.

Nephila pilipes (Fabricius 1793)

Material examined. 2 males, 1 female (SMF 56649), L2. **1 male, 1 female** (SMF 56642), L3, 4.XI.2004. **3 males, 1 female** (SMF 56657), L6. **1 female** (SMF 56669), L20, at hut for bicycles, by sweep net, P. Jäger & V. Vedel leg. 17.XI.2004. **1 female** (SMF 40605), L33, at hut (restaurant).

Although widely distributed in SE Asia these specimens represent the formal first record for Laos. As in the previous species, *Argyrodes* sp. and one to three *Nephila* males were found in webs of the females.

Nephilengys L. Koch 1872

The genus was revised by Kuntner (2006), who decreased available species names from 23 to four valid names. In Indochinese countries only the following species occurs.

Nephilengys malabarensis (Walckenaer 1842)

Material examined. 1 male, 1 female, 1 subadult male, 7 juveniles (SMF 56643), L3, 4.XI.2004. **1 male, 3 subadult females** (SMF 56645), L3, 6.XI.2004. **1 subadult female, 1 juvenile** (SMF 56693), L7, rock surface, 10.III. 2006. **3 juvenile females** (SMF 56694), L7, cave, at night, by hand, 10.III.2006. **1 male, 1 female, 1 subadult male, 1 subadult female, 1 juvenile** (SMF 56697), L7, rock surface, at night, by hand, 11.III.2006. **1 subadult male** (SMF 56696), L7, cave, at night, by hand, 11.III.2006. **1 female** (SMF 56664), L8, cave, by hand, 12.XI.2004. **1 juvenile** (SMF 56665), L8, jungle close to Tham Phun, by hand.

Araneidae Simon 1895

Argiope Audouin 1826

Argiope versicolor (Doleschall 1859)

Material examined. 1 female (SMF 56339), L1. **3 females, 1 juvenile** (SMF 56350), L5, 7.XI.2004. **1 female** (SMF 56365), L6. **1 male** (SMF 56367), L9, surroundings, by hand. **1 female** (SMF 56677), L10, at night, by hand, 4.+9.III.2006. **1 female** (SMF 56674), L13, 4.III.2006. **1 subadult female** (SMF 56675), L13, 5.III.2006. **1 female** (SMF 56384), L20, outside cave, sweeping. **1 female** (SMF 56383), L23. **2 males** (SMF 56316), L29, by hand, 18.–19.II.2003. **1 male, 1 female, 1 subadult male, 2 juveniles** (SMF 56324), **1 female** (SMF 56325), L29, sweeping, 23.II.2003. **1 female** (SMF 56329), L33. **1 female** (SMF 56331), L34, surroundings, sweeping, 30.X.2004.

Males could be clearly identified according to drawings of Levi (1983). Copulatory organs of females are rather variable as shown in Yin et al. (1997). The species occurred in various open habitats.

Caerostris Thorell 1868

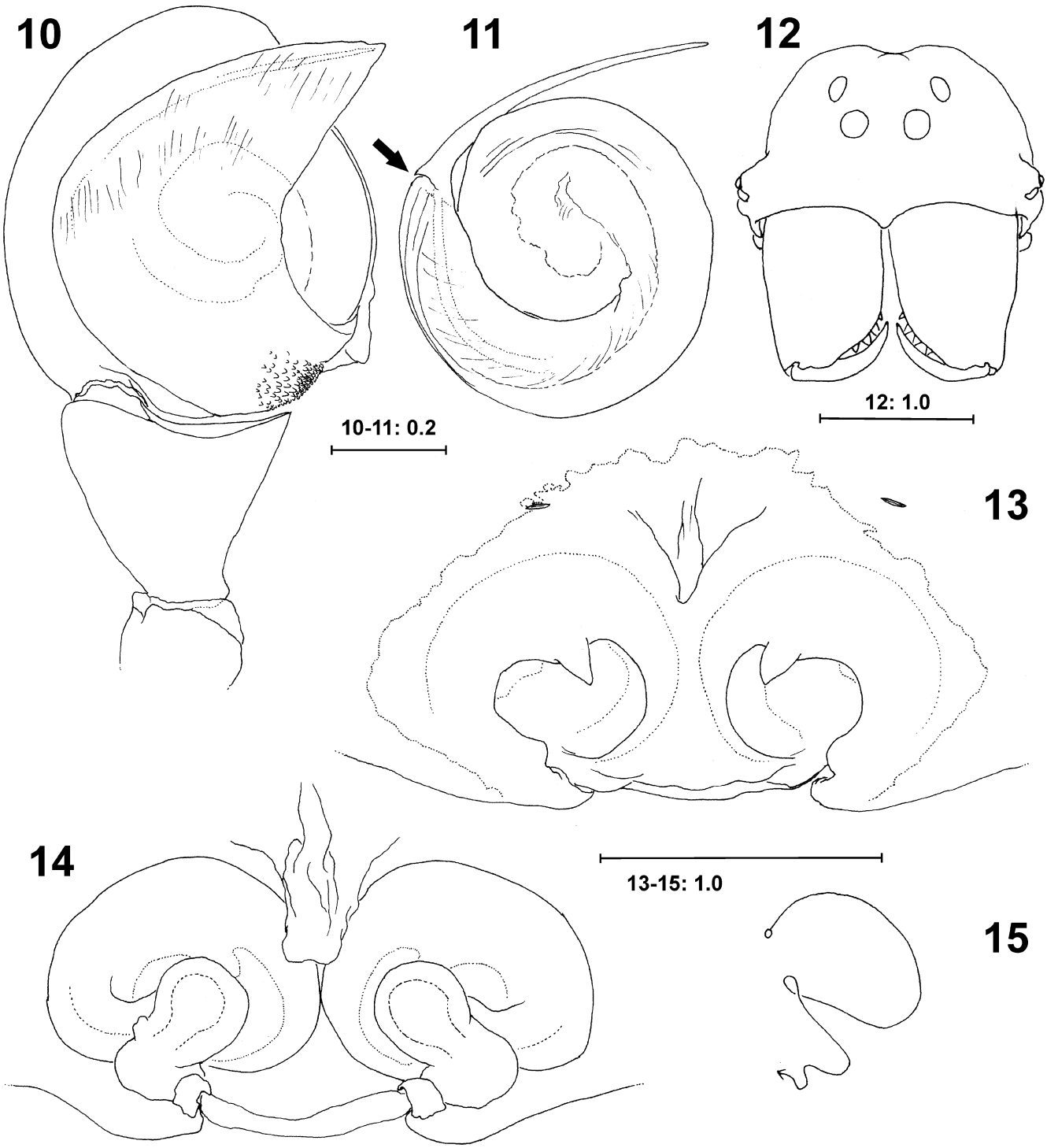
The genus is known from Africa (9 species) and Asia (2 species). Grasshoff (1984) revised all species and illustrated copulatory organs and somatic characters. He illustrated a third Asian species from Sri Lanka without describing it formally as new. However, no males were known until today from Asia. Present females from Laos are conspecific with the types of *C. sumatrana*. Differences in copulatory organs and shape of prosoma and opisthosoma are considered the result of intraspecific variation. As the male was found in the vicinity of the locality where females were collected and due to similarities in colouration and sculpturation it is considered conspecific and is described below as male of this species.

Caerostris sumatrana Strand 1915
Figs. 10–17

Material examined. 2 females, 3 juvenile females (SMF 56333), L1, M. Grasshoff det. 2006. **1 male** (SMF 56352), L3, 4.XI.2004, M. Grasshoff det. 2006.

Additional material examined for comparison. 1 female (SMF 3635), syntype of *C. sumatrana* Strand 1915, Indonesien, Sumatra, Bandar Kwala, A. v. Auer leg. 1908. **1 female** (SMF 4419), Indonesien, Java, Buitenzorg, Roewer det. 1935 sub *C. mitralis* (Vinson), Grasshoff (1984) det. sub *C. sumatrana*.

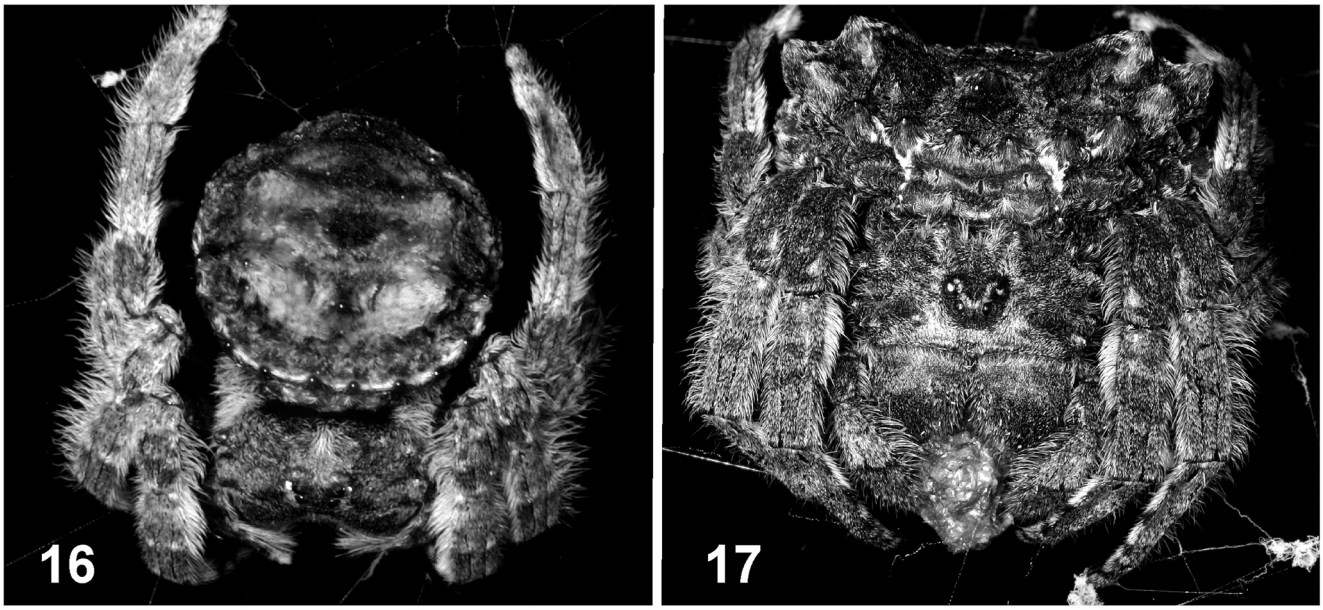
Description. Male (Figs. 10–12, 16). Total length 4.0. Cymbium roughly circular; Conductor ("blattflache Apophyse" sensu Grasshoff 1984) large, pointed, membranous, at its base with a restricted field of dense granulation. Embolus with tip strongly sclerotised and separated from the basal part by a small crack (=?predetermined breaking point, see arrow in Fig. 11; unique among *Caerostris* males presently known); basal part of embolus with outer margin sclerotised and inner margin membranous. Prosoma without humps as present in females.



Figs. 10–15. *Caerostris sumatrana* Strand 1915. Male (10–12) from Nam Ha (L3), female (13–15) from Muang Sing (L1). 10 Right male pedipalpus, ventral view, mirrored; 11 tegulum with embolus, ventral view (conductor removed; embolar crack indicated by arrow); 12 male prosoma, frontal view; 13 epigynum, ventral view; 14 internal duct system, dorsal view; 15 schematic course of internal duct system, dorsal view.

Female (Figs. 13–15, 17). Total length 15.2–17.6. Additionally to the descriptions given by Strand (1915) and Grasshoff (1984) slit sense organs were observed and illustrated (Fig. 13), one close to the epigynal field, one included therein. The internal duct system consists of a first part with a circular coil, a mediad part leading to spherical receptacula and subsequently a posteriorad part followed by the fertilisation duct. The lamellar spines ("Lamellenborsten") on femur IV are mainly wider than those illustrated by Grasshoff (1984: fig. 48).

Variation. Epigyna of specimens from Laos show differences to those from Indonesia: epigynal pits are slightly



Figs. 16–17. *Caerostris sumatrana* Strand 1915. Male (16) from Nam Ha (L3), female (17) from Muang Sing (L1), feeding (in original habitat).

larger and rather circular (smaller and oval in Indonesian females). Opisthosomal humps are smaller in Laos material. Both is considered the result of intraspecific variation. Yin et al. (1997: figs. 130 b–c) show an epigynum without hooks (sub *C. paradoxa*) and the internal duct system with only the most dorsal part (receptacula and fertilisations ducts) shown clearly.

Distribution. India, China, Laos, Indonesia (Sumatra, Java), Borneo(?).

Cyclosa Menge 1866

Cyclosa sp. cf. *cucurbitoria* (Yin, Wang, Xie & Peng 1990)

Material examined. 2 females (SMF 56318), L29, by hand, P. Jäger 18.–19.II.2003.

According to the present material the female epigynum seems to have a strong variation in the shape of the epigynal plate. Only one female fits the illustration shown in Yin et al. (1997: fig. 144 d). The other epigynum exhibits a roughly triangular rather than a distinctly waisted plate. However, shape of opisthosoma and arrangements of posterior humps coincide with the illustrations of Yin et al. (1997). Males and further material should be included in a revision concerning the variation within this species.

Cyrtophora Simon 1864

Cyrtophora citricola (Forskål, 1775)

Material examined. 4 females (SMF 56334), L1. **2 females** (SMF 56353), L3, 4.XI.2004. **2 males, 3 females** (SMF 56375), between L11 and L12, by hand. **1 female** (SMF 56330), L36, 1.–3.III.2003.

Cyrtophora moluccensis (Doleschall 1857)

Material examined. 1 female, 1 juvenile (SMF 56362), L6. **1 female, 4 juveniles** (SMF 56376), L23.

Cyrtophora unicolor (Doleschall 1857)

Material. 1 female (SMF, foto), L31, in vegetation, in front of cave, Jäger vid. 29.X.2004.

Eriovixia Archer 1951

Among the material collected in Laos three different species can be distinguished. Until a revision of this genus including material from the whole genus range is done no final statements on the identity of all the species can be drawn.

Eriovixia sp. cf. *laglaizei* (Simon 1877)

Material examined. 1 male, 5 females, 1 subadult male (SMF 56305), L5, 7.XI.2004. **2 females** (SMF 56306), L5, 8.XI.2004.

Illustrations made by Zhu et al. (1994) repeatedly published in Yin et al. (1997) show some slight differences in structures of the male copulatory organ, especially in the distal complex of apophyses. Females of Laos do not exhibit the long flagellum-like outgrowth of the posterior opisthosoma, but instead a small hump, which is even completely absent in some specimens.

Gasteracantha Sundevall 1833

Gasteracantha hasselti C.L. Koch 1837

Material. 1 female (SMF 56653), L5, 8.XI.2004, Fotos 6379–6382, N. Scharff det. **1 female** (SMF 56400), L10, at night, by hand, P. Jäger & J. Altmann 4.+9.III.2006. **3 males, 2 females** (SMF 56666), L12, sweeping, Fotos 6550–6551, N. Scharff det.

Gasteracantha kuhli C.L. Koch 1837

Material. 2 females (SMF 56650), L2. 1 **juvenile, 1 juvenile male** (SMF 56644), L3, 4.XI.2004. **1 female** (SMF 56661), L10, 12.XI.2004. **1 female** (SMF 56676), L10, 4.+9.III.2006. **1 female** (SMF 56667), L23, Fotos 6607–6609, N. Scharff det.

Gasteracantha sturi (Doleschall 1857)

Material examined. 1 female (SMF 56710), L5, 7.XI. 2004, N. Scharff det. **2 females** (SMF 56714), L7, vegetation close to rocks, at night, sweeping, 10.III.2006, N. Scharff det. **2 females** (SMF 56712), L13, sweeping, 4.III.2006, N. Scharff det. **1 juvenile** (SMF 56713), L13, sweeping, 5.III.2006, N. Scharff det. **1 juvenile** (SMF 56711), L20, outside cave, by hand, N. Scharff det. **1 female** (SMF 56326), L29, evening and night, by hand, 23.II.2003, N. Scharff det.

Macracantha Simon 1864

Macracantha arcuata (Fabricius 1793)

Material examined. 1 female (SMF 56651), L2, by hand, N. Scharff det. **1 female** (SMF 56556), L6.

Parawixia F.O.P-Cambridge 1904

Parawixia dehaani (Doleschall 1859)

Material examined. 1 female (SMF 56344), L1. **1 female, 1 subadult female, 2 juveniles** (SMF 56347), L5, 7.XI.2004. **1 female** (SMF 56307), L5 8.XI.2004. **1 female, 1 juvenile** (SMF 56363), L6. **1 female, 1 juvenile** (SMF 56400), L10, 4.+9.III.2006. **1 female** (SMF 56317), L29, by hand, 18.–19.II.2003. **1 female** (SMF 56323), L29, bushes, by hand, 20.II.2003.

Pisauridae Simon 1890

Dolomedes Latreille 1804

Dolomedes mizhoanus Kishida 1936
Figs. 18–20

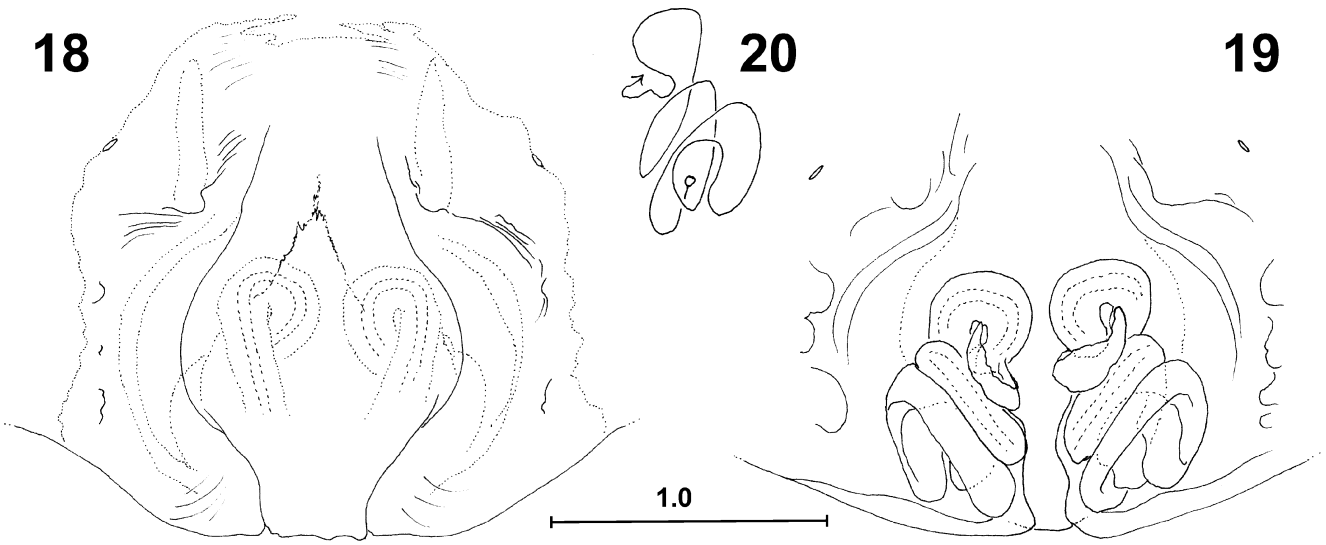
Material examined. 1 female (SMF 56211), L15, by hand, 8.III.2006.

The species was described from Taiwan (Kishida 1936). Later it was recorded from four southern provinces in China: Hunan, Hainan, Guangxi, and Yunnan (Zhang et al. 2004). The single female from the Nam Khan river in Ban Keng Koung represents the first record for Laos. The animal was sitting on a wooden boat, ambushing for prey during day time.

Although the present specimen (total length 23 mm) is dictinctly larger than those mentioned for China (total length 10–14 mm) and some details of the internal duct system are differing (i.e. relatively larger anterior loops, larger fertilisation ducts), it is considered conspecific with specimens from China (Zhang et al. 2004: figs. 19–20) as general shape of epigynum and epigynal field (e.g. anterior bands included in the field) as well as course and shape of the internal duct system and body colouration are congruent.

Eurychoera Thorell 1897

This genus remained monotypic for a long time with its type species *E. quadrimaculata* Thorell 1897 described from two females from Singapore, until a second species was described fom Yunnan Province in China (Zhang et al. 2004). Syntype females of the type species are illustrated and the male is described and illustrated here for the first time. It should facilitate comparisons with other records from countries between China, Laos and Singapore.



Figs. 18–20. *Dolomedes mizhoanus* Kishida 1936. Female from Ban Keng Koung (L15). 18 Epigynum, ventral view; 19 internal duct system, dorsal view; 20 schematic course of internal duct system, dorsal view.

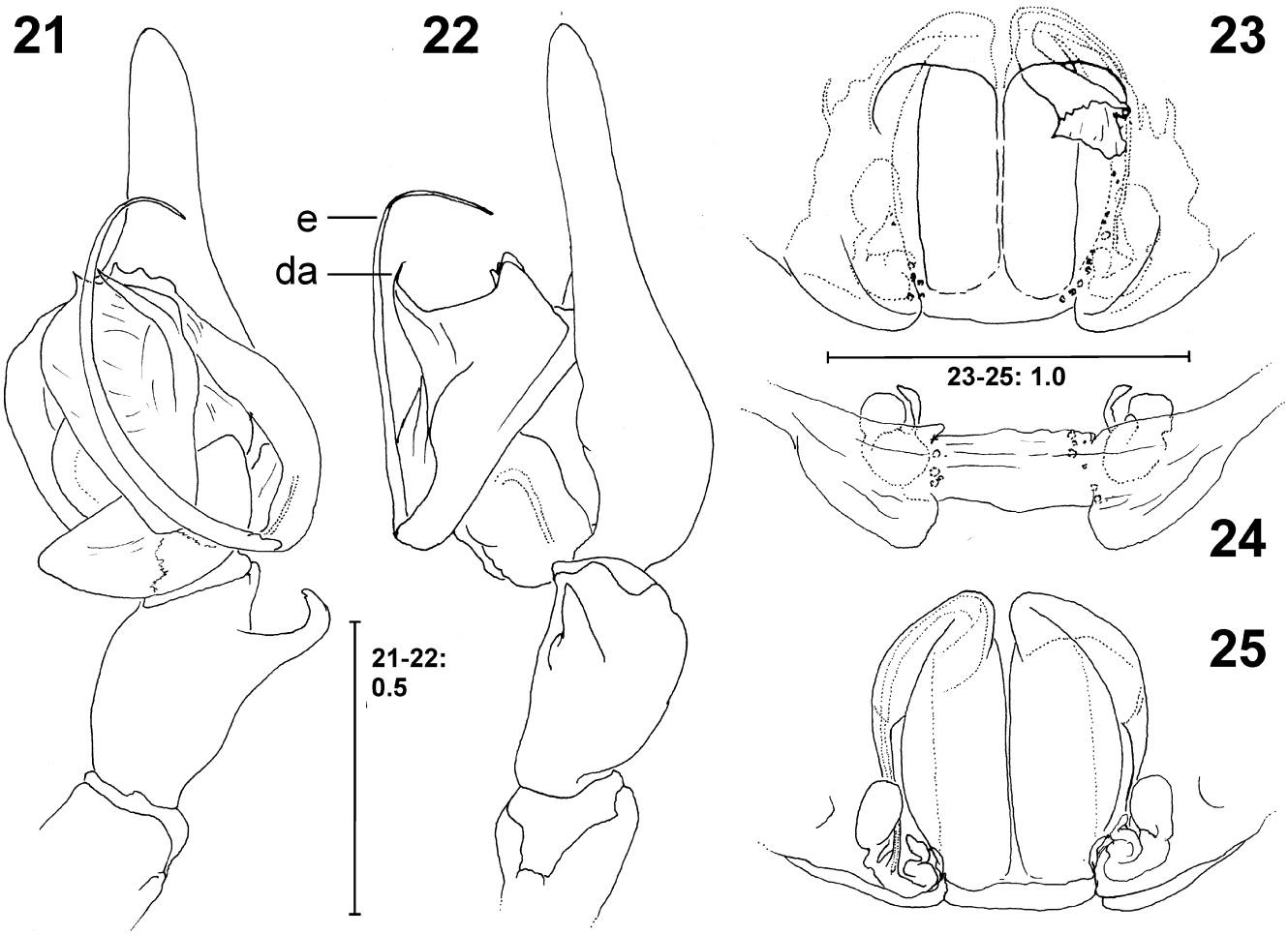
Eurychoera banna Zhang, Zhu & Song 2004
Figs. 21–25, 35–38

Material examined. 1 subadult female (SMF 56681), L13, sweeping, 5.III.2006. **1 juvenile** (SMF 56225), L14, sweeping. **5 females, 4 immatures** (SMF 56204), L15, overhanging branches over the stream, at night, 7.III.2006. **1 male, 5 immatures** (SMF 56203), L15, overhanging branches over the stream, at night, 8.III.2006.

Extended diagnosis: The species may be recognised by the following combination of characters: Males (Figs. 26–28) – 1. Embolus long and semi-circular, extending to the proximal half of bulbus (embolus distinctly shorter in *E. quadrimaculata*, extending exclusively in distal half of bulbus); 2. Distal apophysis (sensu Zhang et al. 2004) short and sharply pointed, its tip not reaching tip of embolus (longer and blunt in *E. quadrimaculata*, its tip reaching/extending slightly beyond tip of embolus); 3. RTA slender at its base in ventral view, slightly bent, i.e. its tip pointing more distad (RTA broader, strongly bent, i.e. its tip pointing more prolaterad in *E. quadrimaculata*). Females (Figs. 29–34) – 1. Median margins of lateral lobes ("lateral margins of lateral lobes" in Zhang et al. 2004) almost straight and running parallel (slightly to strongly undulating and posteriorly more widely separated than anteriorly in *E. quadrimaculata*); 2. Mesal longitudinal ridge of median field (sensu Zhang et al. 2004) extending to the posterior margin of epigynum (ending in anterior half of median field or rarely extending into posterior half, but never reaching posterior margin of epigynum in *E. quadrimaculata*).

Description: See Zhang et al. (2004). Colour pattern of living specimens see Figs. 35–37.

This species was described from Yunnan, Menglun (Xishuangbanna N.P.). There are slight differences between the present specimens and those illustrated by Zhang et al. (2004): the present male exhibits four teeth at the distal margin of the tegulum, whereas the males from China have only one (Zhang et al. 2004: figs. 68, 70). The shape of the distal apophysis is slightly different. In the internal duct system the anterior parts of the copulatory ducts are broader in the females from Laos. Inspite these differences the specimens are considered conspecific. Thus, the specimens from Luang Prabang Prov. represent the first record for Laos. In



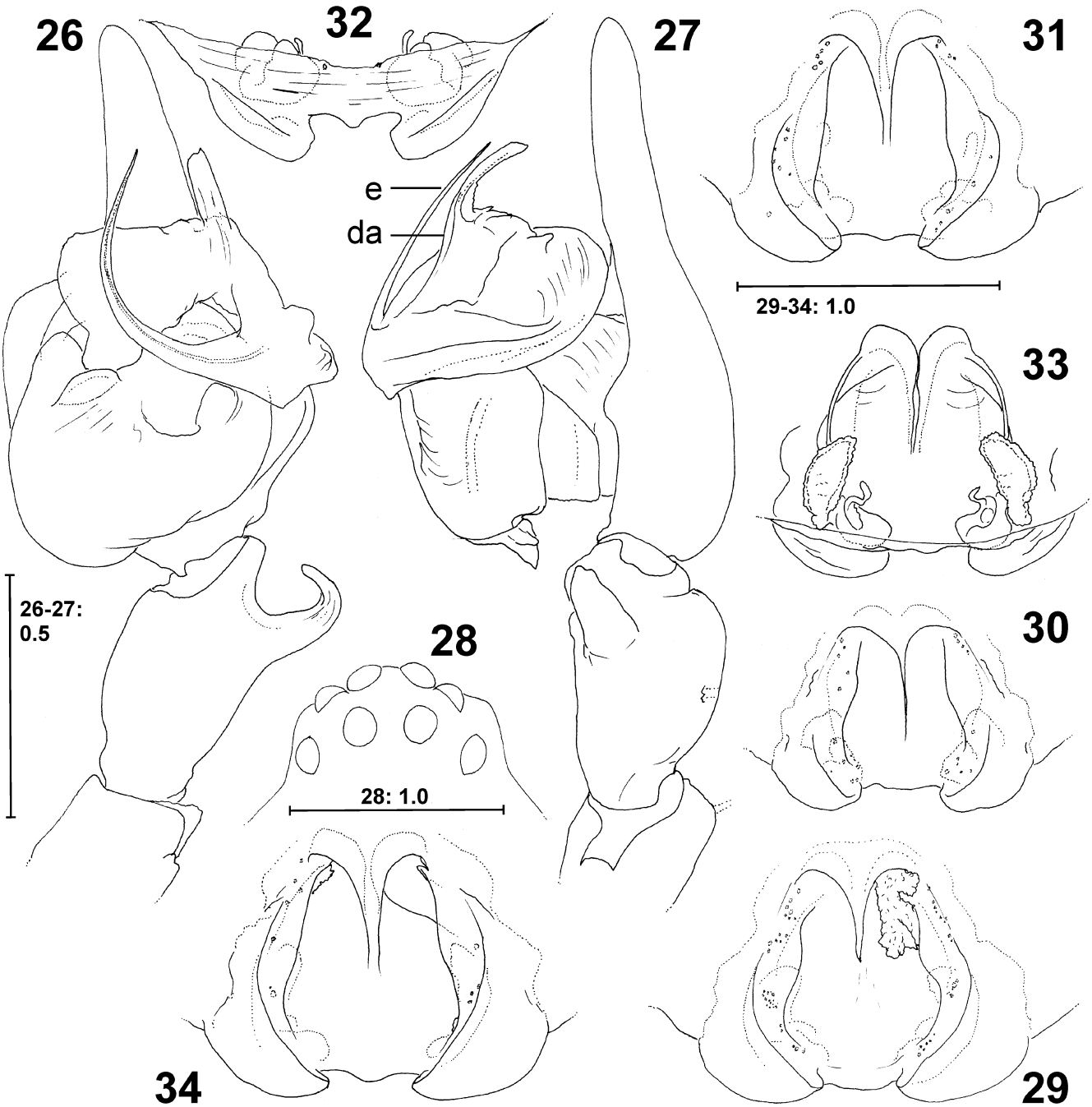
Figs. 21–25. *Eurychoera banna* Zhang, Zhu & Song 2004. Male (21–22) and female (23–25) from Ban Keng Koung (L15). 21–22 Male pedipalpus (21 ventral, 22 retrolateral view); 23–24 epigynum (23 ventral view, 24 posterior view); 25 internal duct system, dorsal view. da — distal apophysis, e — embolus.

epigyna broken emboli were found on one side (Fig. 23) as well as on both sides.

Specimens were sitting in rolled leafs in the centre of their webs (Fig. 38), holding just the legs outside even in the dawn and at night. One female was fed in the field and it was running under the web to the prey (Fig. 36). This is the first observation in this regard and may be the first evidence for a Pisauridae hanging and running under its sheet web.

Eurychoera quadrimaculata Thorell 1897
Figs. 26–34

Material examined. 2 female, 1 immature, syntypes, Singapore, Workman ded., No. 1409, Collection T. Thorell, 823, 829, 790 (NHRS Stockholm). **1 male** (RMBR), Singapore, Mac Ritchie Reservoir, web over jungle stream, Coll. Joseph K.H. Koh 81.05.01.0002 (body and pedipalpus in separate vials). **1 female** (RMBR), same data as for male except 81.05.01.0001. **1 female** (RMBR), Singapore, Lower



Figs. 26–34. *Eurychoera quadrimaculata* Thorell 1897. Male (26–28) and females (29–34) from Singapore (26–29: Mac Ritchie Reservoir; 30: Peirce Reservoir; 31–33, 34: syntypes, not specified). 26–27 male pedipalpus (26 ventral, 27 retrolateral view); 28 eye arrangement, dorsal view; 29–30, 31–32, 34 epigynum (29–30, 31, 34 ventral view, 32 posterior view); 33 internal duct system, dorsal view. da — distal apophysis, e — embolus.

Peirce Reservoir, 2ºforest along boardwalk, Coll. Joseph K.H. Koh 3.XI.06.0001

Diagnosis. See (differential) diagnosis in *E. banna*.

Description. Male (n＝1). PL 2.2, PW 1.8, AW 1.0, OL 2.6, OW 1.4. Leg I 10.8 (2.8, 1.0, 2.8, 2.7, 1.5). AME 0.18, ALE 0.15, PME 0.17, PLE 0.19. Chelicerae with 3 anterior and 3 posterior teeth, without denticles in the cheliceral furrow.

Colour (in ethanol). Prosoma reddish brown. Opisthosoma and legs yellowish brown. Dorsal opisthosoma with dark median band and white patches along its lateral margin. Ventral opisthosoma dark with white patch close behind epigastric furrow.

Female (n＝2). PL 2.6–4.2, PW 2.2–3.4, OL 4.5–5.4, OW 2.4–3.0.

Distribution. Known so far from Singapore and Malaysian peninsular (Thorell 1897, Koh 1989, Murphy & Murphy 2000).

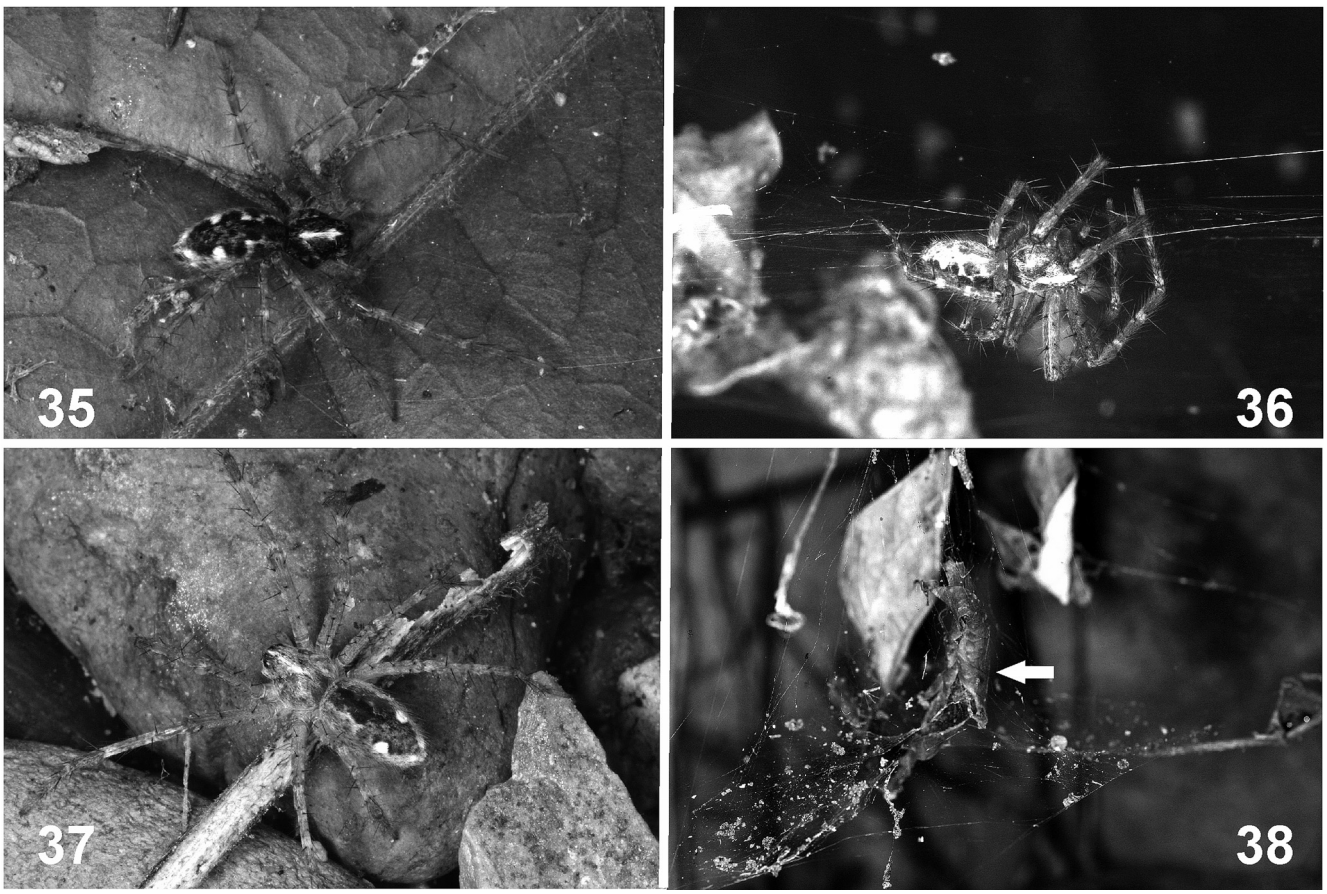
Biology. Specimens were seen in rolled leaf retreats and in nearby branches with legs stretched. Females with egg sacs in their chelicerae were observed walking around in the foliage and on branches outside the web (Koh, pers. comm.).

Polyboea Thorell 1895

Polyboea zonaformis Wang 1993
Figs. 39–43

Material examined. 1 female (SMF 56217), between L11 and L12. **1 female** (SMF 56220), L3, by day, sweeping, 6.XI.2004.

Zhang et al. (2004) note as diagnostic characters for males the lobate carina (straight in *Polybaea vulpina* Thorell 1895, cf. Sierwald 1997: fig. 88) and the small anterior depression (＝fossa; larger in *P. vulpina*). Both specimens from Laos show a distinct variation of both characters: The carina is distinctly lobate in the specimen from Luang Prabang (Fig. 40) while the female from Muang Sing (Fig. 39) exhibits only a slight lobe. Moreover, the anterior depression is in both specimens larger, especially the fossae vary strongly in shape and size (Figs. 39–40). One diagnostic character for distinguishing between the two species could be the missing median fold between the lateral lobes in the posterior half of the epigynum. It is present in *P. vulpina* (cf. Sierwald 1997: fig. 88), both lobes seem to be fused in *P. zonaformis*. In both Lao specimens only one slit sense organ was present at the right half of the epigynum,



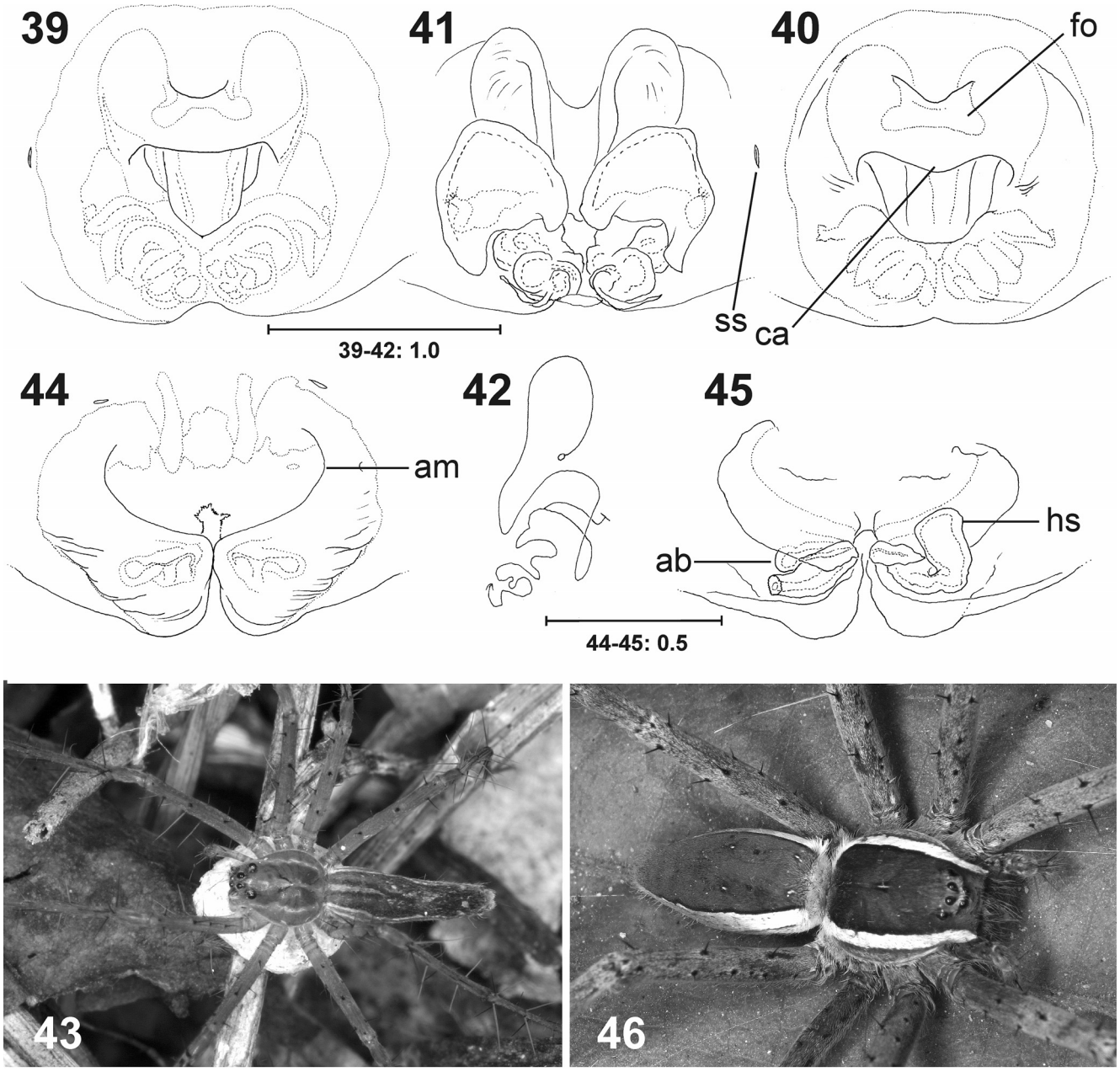
Figs. 35–38. *Eurychoera banna* Zhang, Zhu & Song 2004 from Ban Keng Koung (L15). 35 Immature; 36 female catching prey, hanging on underside of the web; 37 adult female; 38 rolled leaf as retreat (white arrow) with additional fallen leaves in the web (all in original habitat).

laterally close to the epigynal field (Figs. 39–40). Further material should show, whether these characters are stable or vary as those listed above.

Thalassius Simon 1885

Thalassius sp. cf. *paralbocinctus* Zhang, Zhu & Song 2004
Figs. 44–46
Material examined. 1 female (SMF 56219), L23.

The specimen could not be identified unambiguously due to variation in comparison to types of *T. paralbocinctus* as shown in Zhang et al. (2004): Accessory bulbs extending not beyond the head of spermathecae laterally (Fig. 45; extending clearly beyond the head of spermathecae in *T. paralbocinctus* cf. Zhang et al. 2004: fig. 166), anterior margin of lateral lobes building almost a proper semi-circle (Fig. 44; forming a flat semi-circle in *T. paralbocinctus*, Zhang et al. 2004: fig. 165). In contrast to *T. albocinctus*



Figs. 39–45. 39–42 *Polyboea* sp. cf. *zonaformis* Zhang, Zhu & Song 2004 from Muang Sing (L3). 39–40 Epigynum, ventral view (variation); 41 internal duct system, dorsal view; 42 schematic course of internal duct system, dorsal view; 43 female carrying egg-sac (in original habitat). 44–46 *Thalassius* sp. cf. *paralbocinctus* Zhang, Zhu & Song 2004 from Vang Vieng (L23). 44 Epigynum, ventral view; 45 internal duct system, dorsal view (left side partly broken off); 46 female (in original habitat, in foliage about 1 m above ground). ab — accessory bulb, am — anterior margin of lateral lobe, ca — carina, fo — fossa (pits on carina), hs — head of spermathecae, ss — slit sense organ.

(Doleschall 1859) both specimens from China and Laos have a dark margin of the two lateral white bands of the dorsal shield of prosoma and no white patch in the anterior half of the dark median band (Fig. 46, Zhang et al. 2004: fig. 163; cf. Sierwald 1987: fig. 140). Moreover, their heads of spermathecae are more compact than those of *T. albocinctus* (Fig. 45, Zhang et al. 2004: fig. 166; more slender in *T. albocinctus* cf. Sierwald 1987: fig. 133). Slit sense organs close to the epigynal field are shown for the first time. The female was sitting on a leaf of a shrub about one meter above the ground.

Oxyopidae Thorell 1870

Hamataliwa Keyserling 1887

The genus is distributed in all continents but Europe (Platnick 2006). 59 species are currently described, 2 from Australia, five each from Africa and Asia, the rest from America.

Hamataliwa sp. cf. *sikkimensis* Tikader 1970
Fig. 47

Material examined. 1 female (SMF 56360), L3, 1 m above the ground, by hand, 4.XI.2004. **1 female** (SMF 56369), L10, by hand, 12.XI.2004.

Zhang et al. (2005) revised Chinese species of the genus. Copulatory organs of females from Laos were slightly different to illustrations shown in the revision, whereas colour pattern was similar to that shown in Zhang et al. (2005). Conspecific males from Laos are necessary to make final statements on species identity of the two females.

Fig. 47. *Hamataliwa* sp. cf. *sikkimensis* Tikader 1970 from Muang Sing (L3). Female guarding egg-sac, dorsal view (in original habitat).

Psechridae Simon 1890

Immature, unidentified specimens of *Fecenia* Simon 1887 were observed and collected in a degraded forest at the Phou Si hill in Luang Prabang.

Psechrus Thorell 1878

The genus was revised by Levi (1982) and by Wang & Yin (2001) for China. Later, two additional species were described by Chen et al. (2002: *P. xinping*) and Yang et al. (2003: *P. triangulus*). From the material collected in Laos two new species were recognised and are described below. Two female specimens from Tham Seua, Luang Prabang Prov. and Tham Pasat Thia, Luang Nam Tha Prov. (ex coll. H. Steiner) could not be identified. Males are necessary to make statements on their taxonomic status.

Psechrus luangprabang spec. nov.
Figs. 48–53, 68–72

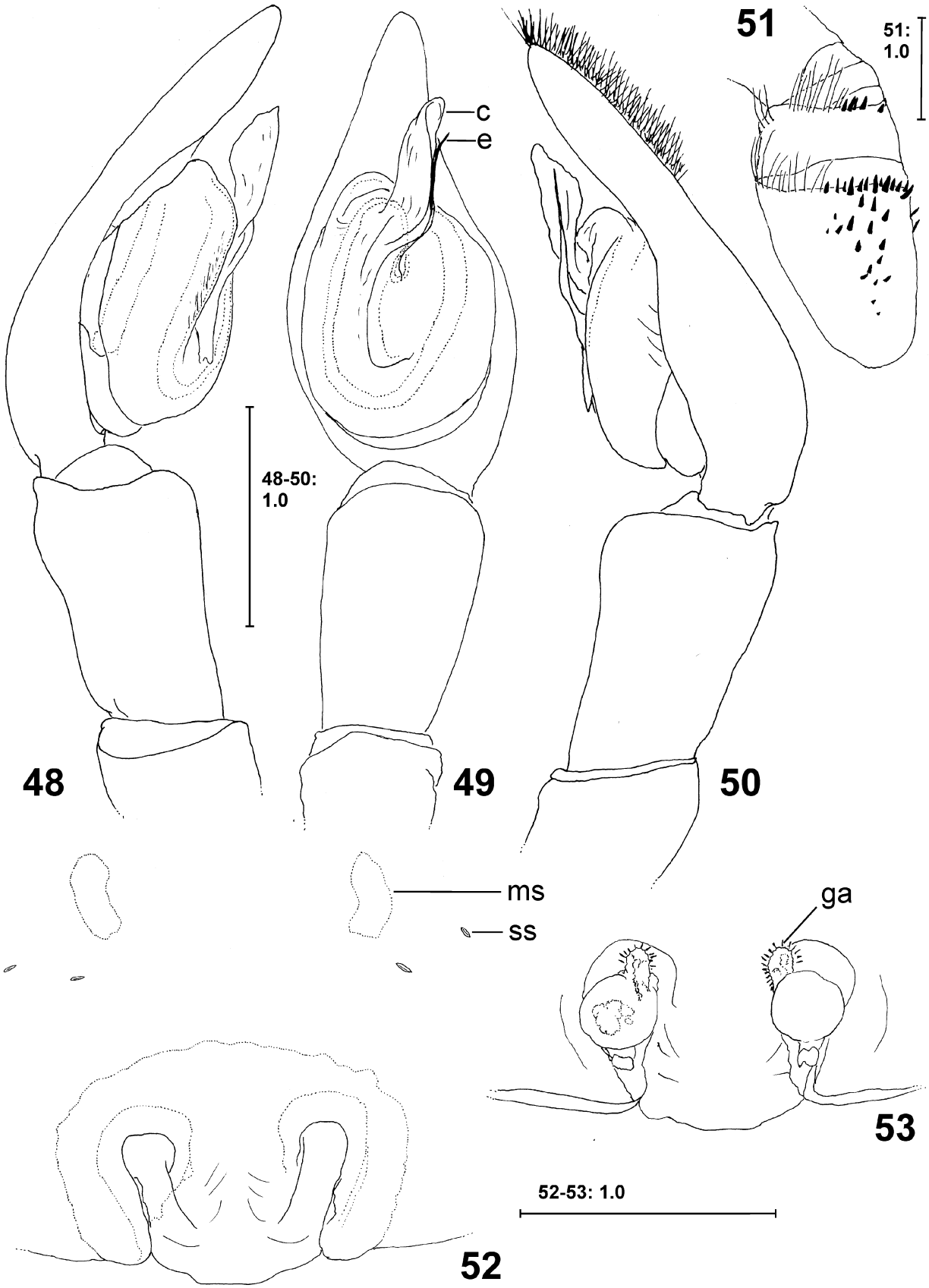
Type material. Male holotype (SMF 56389), Laos, Luang Prabang Prov., SE Luang Prabang, Nam Khan, Ban Keng Koung (L15), 372 m altitude, N 19º40.963′, E 102º 18.442′, along stream, disturbed forest, cultivated land, between rocks, at night, by hand, P. Jäger & J. Altmann leg. 7.III.2006. **1 male paratype, 1 female paratype** (SMF 56390), same data as holotype. **1 female paratype** (SMF 56392), same data as holotype. **1 male paratype** (SMF 56391), same data as holotype, but 8.III.2006.

Further material examined. 1 female (SMF 56394), Laos, Luang Prabang Prov., S Luang Prabang, Ban Ean, That Se (L13), 304 m altitude, N 19º50.562′, E 102º13. 118′, waterfall, along stream, secondary forest, in rock crevice, at night, by hand, P. Jäger & J. Altmann leg. 5.III.2006. **1 subadult male** (SMF 56393), same data as holotype.

Etymology. The species is named after Luang Prabang Province, noun in apposition.

Diagnosis. Males (Figs. 48–51, 68–72) similar to those of *P. himalayanus* Simon 1906 in position of embolus and conductor as well as course of sperm duct and presence of short, pointed macrosetae on coxae I, but embolus in the new species longer and distinctly bent (slightly s-shaped; Fig. 49), and with additional ridge at its base. Dorsal cymbial scopula covering only the distal third (Fig. 50; distal half in *P. himalayanus*). Females similar to those of *P. marsyandi* Levi 1982 and *P. ghecuanus* Thorell 1897 in shape of internal duct system, but distinguished from those species by having spermathecae closer to each other (Fig. 53) and epigynal furrows diverging anteriorly (Fig. 52; parallel in *P. marsyandi* and *P. ghecuanus*).

Description. Male (n = 3). PL 5.3–6.0, PW 4.0–4.8, AW 2.0–2.5, OL 7.0–9.0, OW 2.8–3.8. Leg II: 35.5–39.7 (9.6–10.9, 2.2–2.6, 9.6–10.7, 9.5–10.7, 4.6–4.8). Coxae I with 25–43 short, pointed macrosetae retrolatero-ventrally, 0–5 macrosetae also present at the distal margin of trochanter (Fig. 51); such macrosetae absent in subadult male. Sperm duct running 1.5 windings before entering embolus; conductor sheath-like; embolus arising from about the centre of the



Figs. 48–53. *Psechrus luangprabang* spec. nov., male holotype and female paratype from Ban Keng Koung (L15). 48–50 Male pedipalpus (48 prolateral, 49 ventral, 50 retrolateral view); 51 male right coxa I, retrolatero-ventral view; 52 epigynum, ventral view; 53 internal duct system, dorsal view. c — conductor, e — embolus, ga — glandular appendage, ms — muscle sigillum, ss — slit sense organ.

tegulum, running in a distinct bend retrolaterally, then straight distally and ending with a slight bend retrolatero-distad (Fig. 49).

Female (n=2). PL 7.9–8.2, PW 5.8–5.9, AW 3.5–3.6, OL 10.5–11.1, OW 4.5–4.8. Leg II: 38.6–40.0 (10.7–11.2, 3.1–3.3, 10.6–11.1, 9.6–9.8, 4.6). Coxae I without short, pointed macrosetae. Epigynal field appearing as rounded trapezoid; muscle sigillae anterior to epigynal field kidney-shaped, separated from the field about 1.5 their length; two pairs of slit sense organs close to sigillae; epigynal furrows building a trapezoid, ending as semi circles at their anterior end; posterior margin of median septum with slight median protuberance (Fig. 52); internal duct system with spherical spermathecae, the latter with glandular appendages in an antero-median position (Fig. 53).

Colour (in ethanol). (Figs. 68–71) Dorsal shield of prosoma with dark median band, this with bright median patches and serrated lateral margins. Sternum with broad lateral bright bands in its posterior half, dark triangle almost not touching posterior margin. Dorsal opisthosoma dark with bright heart patch and darker transversal markings in its posterior half. Ventral opisthosoma dark, with white median line interrupted in front of spinnerets. Legs annulated and with distinct dark spine patches. Colour pattern of living specimens see Fig. 72.

Distribution. Known so far only from Luang Prabang Province from two places SE of Luang Prabang: Ban Keng Koung (L15) and That Se waterfall (L13).

Psechrus khammouan spec. nov.
Figs. 54–67

Type material. Male holotype (SMF 56386), Laos, Khammouan Prov., 9.5 km NE Thakek (L34), 159 m altitude, N 17º26.936′, E 104º52.499′, foot cave and surroundings, by hand, P. Jäger & V. Vedel leg. 30.X.2004. **1 female paratype** (SMF 56388), Laos, Khammouan Prov., 2.5 km WNW Ban Thathot (L27), 200 m altitude, cave entry 17º 37.897′, E 105º07.502, cave exit N 17º37.994′, E 105.07195′, primary forest between street and limestone cave Tham Kamouk, P. Jäger leg. 19.II.2003. **1 female paratype** (SMF 56387), Laos, Khammouan Prov., 2.5 km WNW Ban Thathot (L28), 200 m altitude, cave entry 17º 37.897′, E 105º07.502, cave exit N 17º37.994′, E 105.07195′, Tham Kamouk, entrance hall and in the cave, P. Jäger leg. 19.II.2003.

Etymology. The species is named after Khammouan Province, noun in apposition.

Diagnosis. Small *Psechrus* species (12.2–14.5 body length). Males similar to those of *P. singaporensis* sensu Levi (1982: fig. 42) in course of sperm duct, arising point and shape of embolus and basal white patch ('window') on tegulum, but having embolus and conductor longer, tibia and cymbium more elongated and arising point of conductor closer to the centre of tegulum (Figs. 54–56, 60–61). Females similar to those of *P. singaporensis* sensu Levi (1982: figs. 44, 46) in the general course of internal duct system, but distinguished by the antero-median position of the glandular appendages (Figs. 58, 63).

Description. Male. PL 5.0, PW 3.5, AW 1.9, OL 7.2, OW 2.7. Leg II: 37.7 (10.2, 2.0, 10.6, 10.7, 4.2). Embolus arising roughly in a 12-o'clock-position, bent prolatero-distad, with thin and pointed tip. Conductor longer than embolus, becoming broader distally (Figs. 55, 60). Dorsal cymbial scopula extending in the distal third to half (Fig. 56). Distal tibia with two brushes of long bristles ventrally (Figs. 60–61), a short apophysis retrolatero-dorsally (Figs. 54, 56), and a retrolateral tibial spine as long as bulb (Fig. 60).

Female. PL 5.3–6.2, PW 3.5–4.2, AW 2.1–2.4, OL 7.7–8.3, OW 3.1–3.3. Leg II: 30.7–34.3 (8.6–9.6, 2.0–2.3, 8.8–10.0, 7.8–8.7, 3.5–3.7). Epigynal field semicircular; muscle sigillae longer then in *P. luangprabang* spec. nov., separated from the field about 1.0 their length; two pairs of slit sense organs close to sigillae; epigynal furrows slightly undulated, forming roughly a trapezoid; posterior margin of median septum straight (Figs. 57, 62); internal duct system with lateral copulatory openings, running first mediad, then turning latero-posteriorad, passing two loops before ending in fertilisation ducts; anterior turning point with two glandular appendages on each side (Figs. 58–59, 63).

Egg-sac: diameter 10.0–11.0; contained 71 pre-larvae.

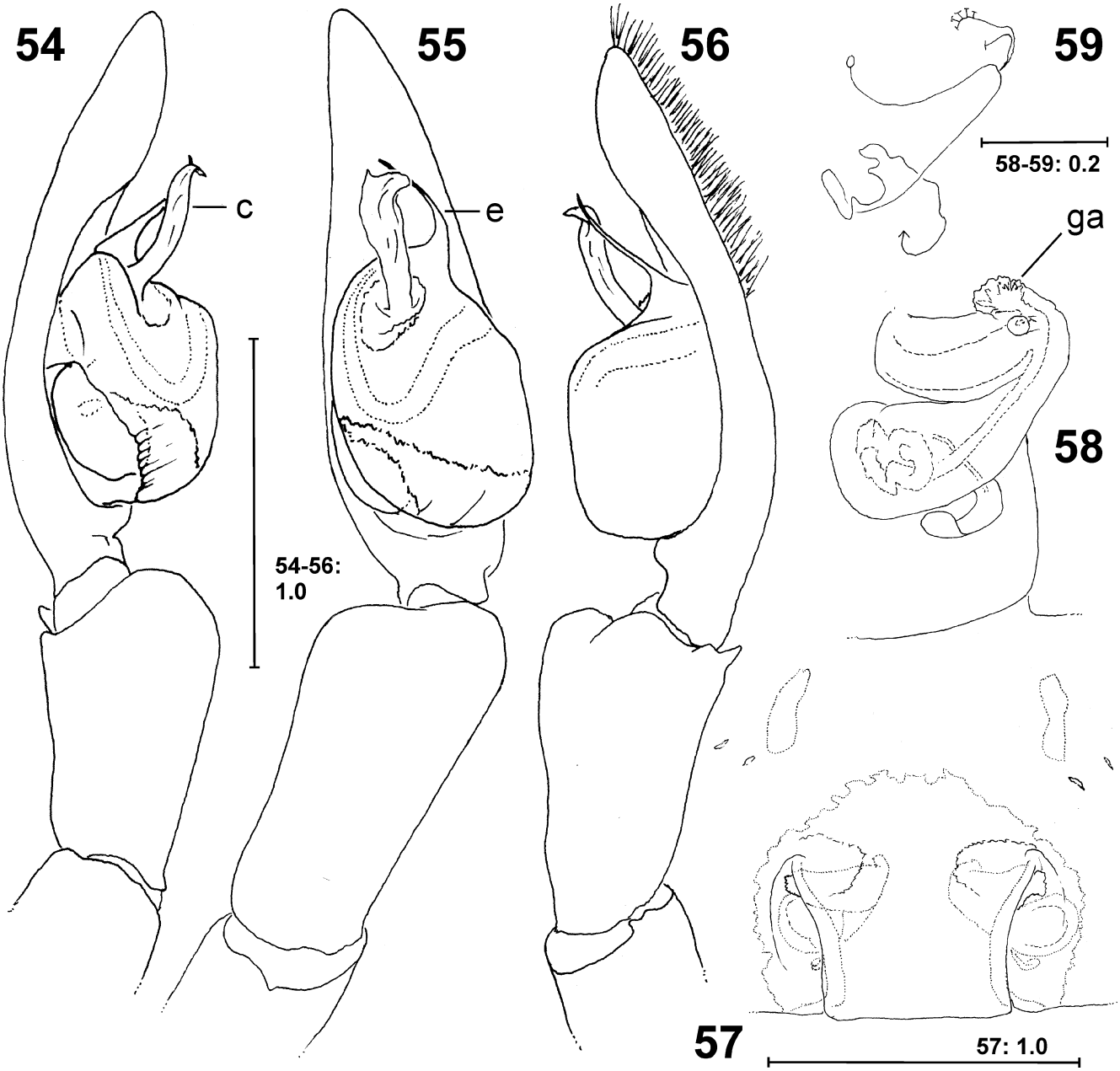
Colour (in ethanol). (Figs. 64–67) Dorsal shield of prosoma with two dark longitudinal bands, these with darker radial markings and distinct and smooth margins; bright median band widening anteriorly, having two faint patches in its anterior part between eyes and fovea. Sternum with distinct bright lateral bands, reaching not the anterior margin of sternum; dark v-shaped patch reaching posterior margin of sternum, patch with only slight brightening in its centre. Dorsal opisthosoma bright with pairs of dark patches, mainly in posterior half. Ventral opisthosoma with thin median line, diverging on epigastric furrow and in direction of petiolus, without bright patch or interruption in front of spinnerets. Legs annulated and with dark spine patches. Ventral leg coxae with white patches, on coxae I largest.

Distribution. Known so far only from Khammouan Province from two places: Ban Thathot (L27–28) and vicinity of Thakek (L34).

Liocranidae Simon 1897

Only few specimens of this family were collected so far from Laos. Among these are a juvenile from Thakek (L34) belonging to the monotypic genus *Pranburia* Deeleman-Reinhold 1993 and a female of *Orthobula* Simon 1897 collected in Muang Sing (L3).

N.B.: The genera mentioned above belong to the subfamily Phrurolithinae, which is placed by Deeleman-Reinhold (2001) and Platnick (2006) in the Liocranidae. Other authors transfer this subfamily to the Corinnidae (Bosselaers & Jocquè 2002, Wunderlich pers. comm.).



Figs. 54–59. *Psechrus khammouan* spec. nov., male holotype from Thakek (L34), female paratype from Tham Kamouk (L27–28). 54–56 Male pedipalpus (54 prolateral, 55 ventral, 56 retrolateral view); 57 epigynum, ventral view; 58 left half of internal duct system, dorsal view; 59 Schematic course of internal duct system, dorsal view. c — conductor, e — embolus, ga — glandular appendage.

Sesieutes Simon 1897

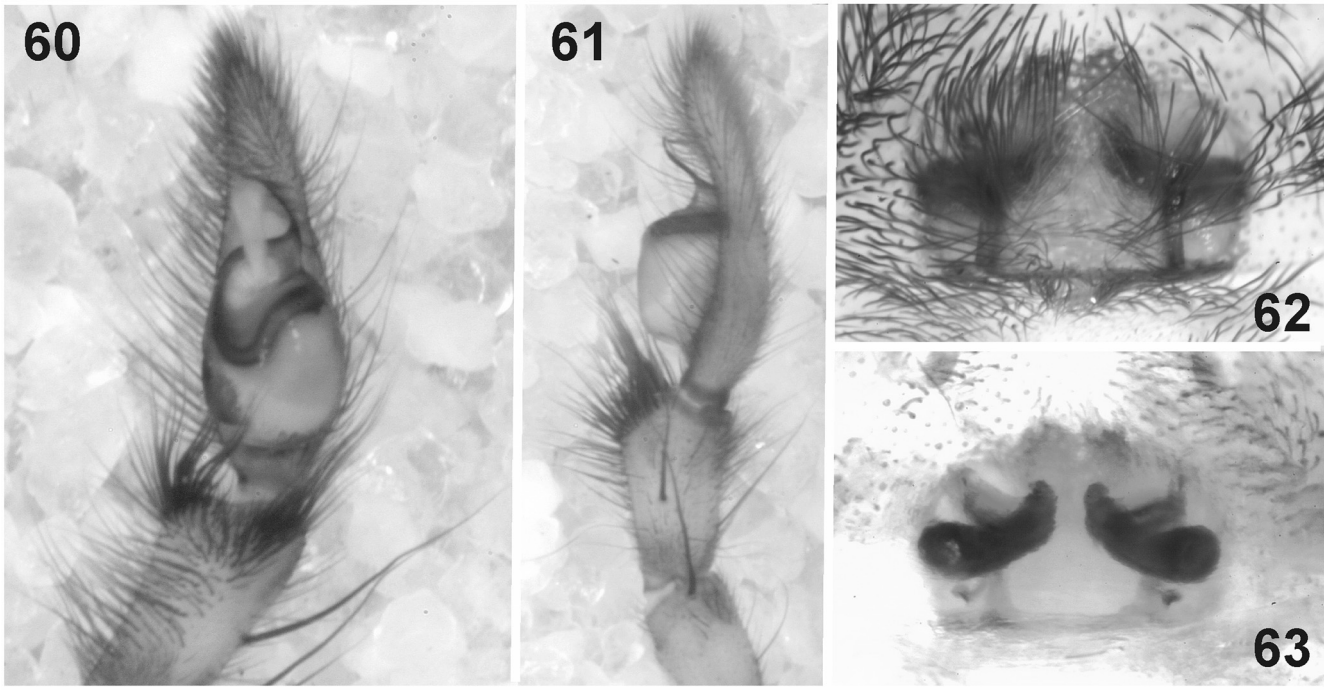
The genus was revised by Deeleman-Reinhold (2001) with illustrating all species including eight new species. The single male from Khammouan Prov. belongs to a new species and is described below.

Sesieutes thakek spec. nov.
Figs. 73–82

Type material. **Male holotype** (SMF 56635), Laos, Khammouan Prov., 9.5 km NE Thakek (L34), 159 m altitude, N 17º26.936′, E 104º52.499′, leaf litter in front of cave, by sieving, P. Jäger & V. Vedel leg. 30.X.2004.

Etymology. The species is named after the province capital Thakek (＝Muang Khammouan), closely situated to the type locality, noun in apposition.

Diagnosis. Medium sized *Sesieutes* species (5.2 mm body length). Male similar to that of *S. schwendingeri* Deeleman-Reinhold 2001 (figs. 771–772) according to general arrangement of copulatory organ and colouration, but having base of embolus broader and bent dorsad (Fig. 73; narrower and bent basad in *S. schwendingeri*), tegulum distinctly pear-shaped (Fig. 74; not that wide basally in *S. schwendingeri*), and ventral prosomal granulations restricted to the central part of the sternum (Fig. 80; dense granulation



Figs. 60–63. *Psechrus khammouan* spec. nov., male holotype from Thakek (L34), female paratype from Tham Kamouk (L27–28). 60–61 Male pedipalpus, showing 2 ventral hair-brushes on apical tibia (60 ventral, 61 retrolateral view); 62 epigynum, ventral view; 63 internal duct system, dorsal view.

in sternum, labium and gnathocoxae in *S. schwendingeri*).

Description. Male. PL 2.6, PW 1.9, AW 1.05, OL 2.6, OW 1.5. Leg II: 8.95 (2.45, 0.85, 2.4, 2.05, 1.2). Spination: femur I 2 pl; tibia I 9 pv, 9 rv, II 8 pv, 7rv, III 1 pv, 1 rv, 1 rl, IV 3 pv, 2 rv, 1 rl; metatarsus I 5pv, 6 rv, II 5 pv, 5 rv, III 1 pl, 1 pv, 1 rv, 1 rl, IV 2 rv, 1 rl; Femoral spines with small basal tooth and with large, toothed socket (Figs. 81–82). Leg claws with 4–5 teeth. Dorsal scutum 0.5 OS length. Chelicerae with three promarginal and 2 small retromarginal teeth (Fig. 80).

Embolus arising in 10-o'clock-position, running first distad, then dorsad (Fig. 73), finally ending in a distal coil, with its plane transverse to that of the alveolus; tip of embolus running semi-circular, becoming narrower distally (Fig. 77). Functional conductor short, slightly bent, arising in a 11-o'clock-position (Fig. 74). Tip of embolus resting in conductor in unexpanded pedipalpus (Fig. 77). Subtegulum visible in prolateral view (Fig. 73). Sperm-duct on retrolateral side (Fig. 75) in similar position as in *S. schwendingeri*. Pedipalpal tibia with retrolateral blunt distal hump and retrolateral basal apophysis, the latter with distinct ridge (Fig. 76). Cymbial scopula similar as in *S. schwendingeri*, i.e. extending in the distal third to quarter of dorsal cymbium (Fig. 75). Ventral scutum of OS with small bent rim in front of genital opening (Fig. 78).

Colour and granulation (in ethanol). Dorsal shield of PS dark reddish brown, with dense and distinct granulations, fovea small, circular, striae less distinct. Sternum brighter reddish brown, with slight radial striae and granulations in the centre, these fading marginally (Fig. 80). Labium and gnathocoxae bright redbrown, with striae and very sparse and small granulations; legs and ventral scutum of OS yellowish brown, with fine granulations, on distal segments less distinct, femora darker. Petiolus anteriorly with ventral median keel. Dorsal OS dark grey with reddish brown scutum, behind that with two white lateral patches, behind those with 4 slightly recurved white chevrons and white patch in front of spinnerets. Ventral OS generally brighter than dorsal side, with lateral rows of small bright patches. Spinnerets with apical segment white, basal segments grey. Female. unknown.

Distribution. Known only from the type locality

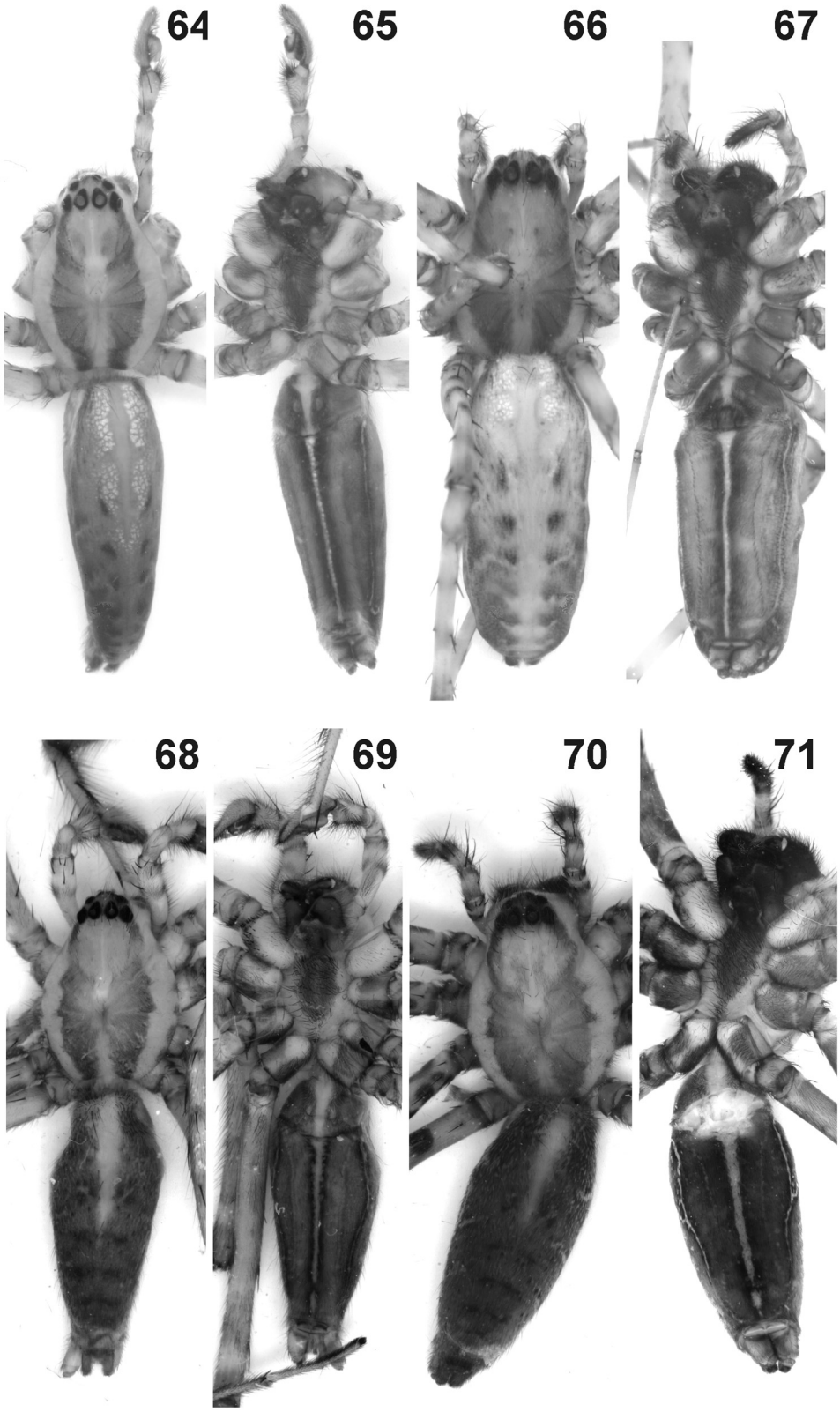
Zodariidae Thorell 1881

Most specimens collected were identified as belonging to *Asceua* Thorell 1887 and *Mallinella* Strand 1906 (Dankittipakul, pers. comm.). One striking species (Fig. 92) was collected in Luang Prabang on the hill in the city, the Phou Si. It belongs to the southern Asian genus *Storenomorpha* Simon 1884 and is described below as a new species.

Storenomorpha Simon 1884

Storenomorpha anne spec. nov.
Figs. 83–92

Type material. Male holotype (SMF 56395), Laos, Luang Prabang Prov., Luang Prabang, Phou Si (L10), 299 m altitude, N 19º53.390′, E 102º08.061′, disturbed forest, on the ground, at night, by hand, P. Jäger & J. Altmann leg. 4.



Figs. 64–71. 64–67 *Psechrus khammouan* spec. nov., male holotype and female paratype from Ban Keng Koung (L15). 64–65 Male (64 dorsal, 65 ventral view); 66–67 female (66 dorsal, 67 ventral view). 68–71 *Psechrus luangprabang* spec. nov., male holotype from Thakek (L34), female paratype from Tham Kamouk (L27–28). 68–69 Male (68 dorsal, 69 ventral view); 70–71 female (70 dorsal, 71 ventral view); all in ethanol.

Fig. 72. *Psechrus luangprabang* spec. nov. Male holotype from Ban Keng Koung (L15), habitus (in original habitat).

+9.III.2006. **6 male paratypes, 1 female paratype** (SMF 56396), same data as holotype.

Further material examined. 1 subadult male, 1 subadult female, 1 juvenile (SMF 56397), same data as holotype.

Etymology. The species is named in honour of Anne Gaëlle Verdier (Heritage House, Luang Prabang) for her steady support during my Laos expeditions; noun (name) in apposition.

Diagnosis. Males can be recognised by having both, tegular apophysis and conductor, sharply pointed, extending beyond the retrolateral margin of cymbium and pointing in the same direction, i.e. being retrolatero-basad (Figs. 83–84). Females may be recognised by having both, anterior and posterior parts of internal duct system coiled (Fig. 88) and the shape of the median septum of epigynum (Fig. 87).

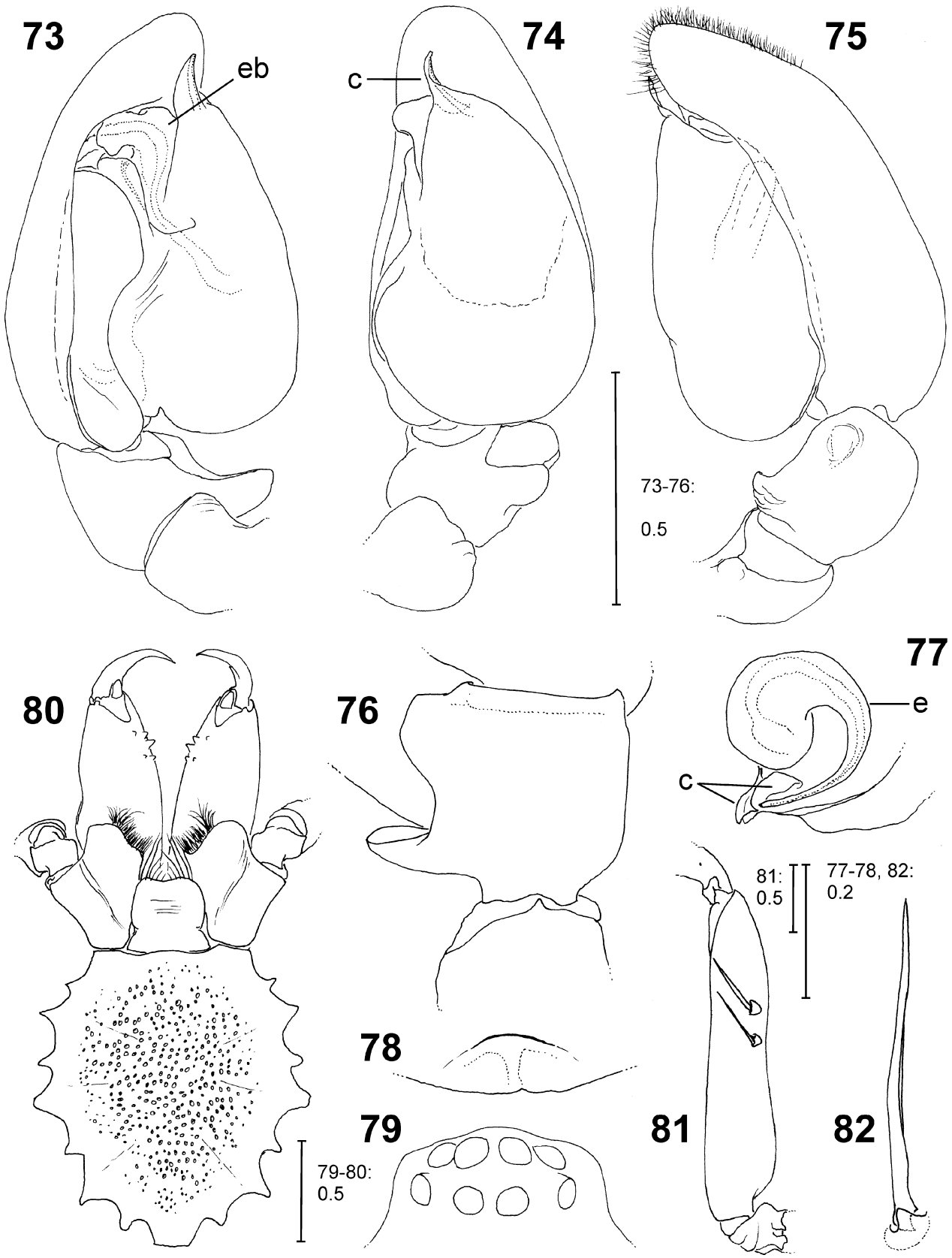
Description. Male (holotype). PL 5.4, PW 3.9, OL 5.6, OW 3.4, sternum length 2.4, sternum width 1.7, chelicerae length 1.35. Eye diametres: AME 0.27, ALE 0.29, PME 0.23, PLE 0.27. Eye interdistances: AME–AME 0.05, AME–ALE 0.11, PME–PME 0.10, PME–PLE 0.54, AME–PME 0.12, ALE–PLE 0.52, clypeus AME 0.79, clypeus ALE 0.53. Leg and pedipalpus measurements: pedipalpus 5.4 (1.9, 0.9, 0.6, -, 2.0); leg I 14.8 (4.3, 2.1, 3.9, 2.8, 1.7); leg II 13.1 (3.8, 1.9, 3.4, 2.5, 1.5); leg III 10.6 (3.2, 1.7, 2.7, 1.8, 1.2); leg IV 13.5 (4.0, 1.8, 3.6, 2.7, 1.4). Leg spination (all ventral): Tibia: I+III 2 short distal spines, II 1 retrolateral distal spine/1 prolateral distal spine, one prolateral subdistal spine, IV 1 prolateral short distal spine; Metatarsus: I–II 8–10 cusps, 2 short distal spines; III–IV 2–3 subdistal cusps, 4 short distal spines (left III additional ventral cusp).

Pedipalpus with massive semicircular conductor, arising in a 6-o'clock-position from tegulum, with distinct scultpure in its marginal part. Embolus very thin, filiform, arising in a 5-o'clock-position, passing into conductor's groove in a 6-o'clock-position (Fig. 83). Palpal tibia with one sharp, pointed apophysis, hook-shaped in a retrolateral view (Fig. 84).

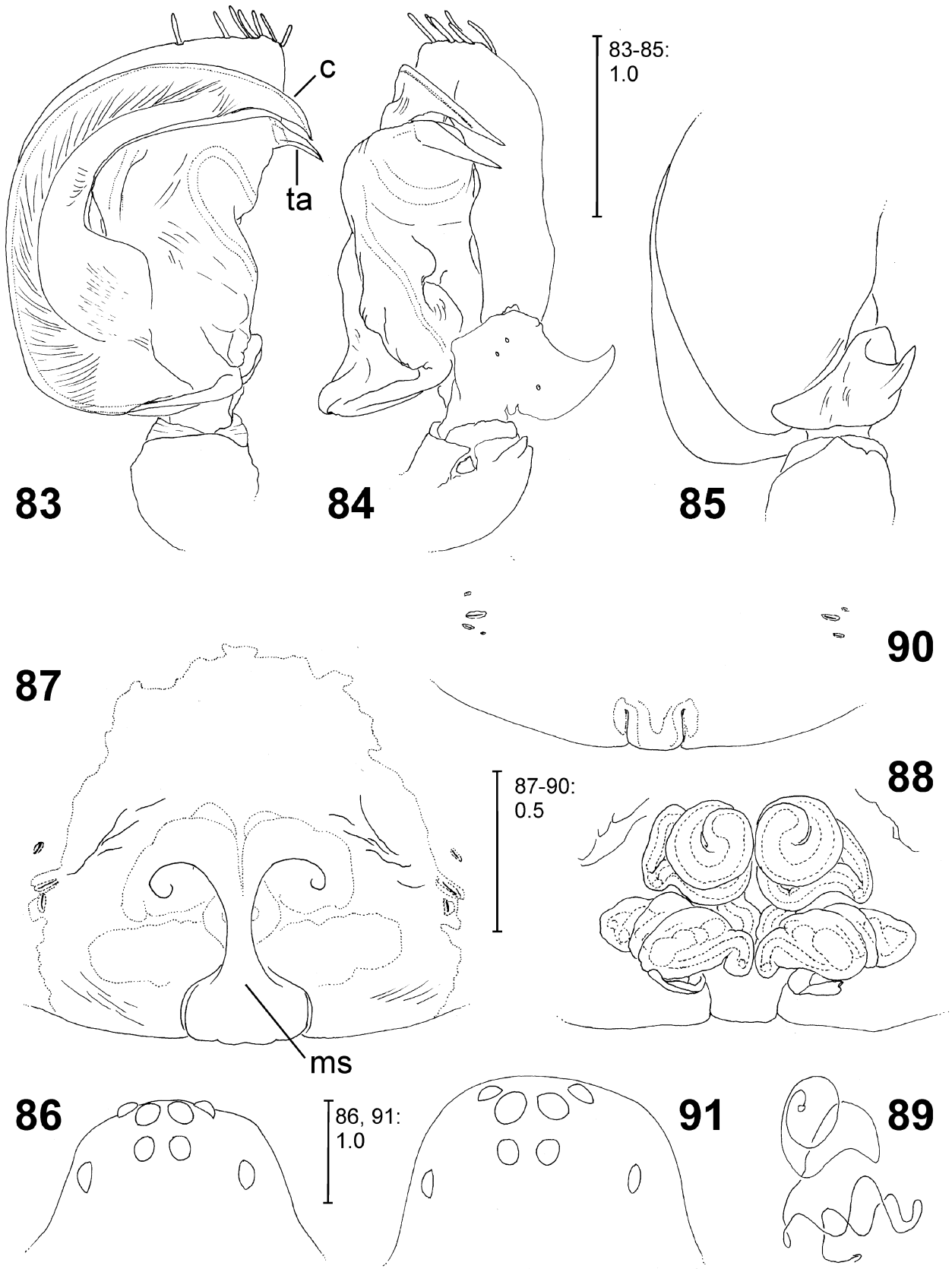
Female. PL 6.1, PW 4.1, OL 9.5, OW 6.9, sternum length 2.5, sternum width 1.8, chelicerae length 1.60. Eye diametres: AME 0.31, ALE 0.31, PME 0.26, PLE 0.29. Eye interdistances: AME–AME 0.10, AME–ALE 0.15, PME–PME 0.16, PME–PLE 0.65, AME–PME 0.20, ALE–PLE 0.72, clypeus AME 0.90, clypeus ALE 0.61. Leg and pedipalpus measurements: pedipalpus 4.7 (1.8, 1.0, 0.8, -, 1.1); leg I 12.8 (4.0, 2.0, 3.5, 2.0, 1.3); leg II 12.6 (3.7, 2.1, 3.2, 2.2, 1.4); leg III 10.7 (3.2, 1.8, 2.5, 1.9, 1.3); leg IV 13.7 (4.0, 2.0, 3.6, 2.6, 1.5). Leg spination (all ventral): Tibia: I–III 2 short distal spines, IV 1 prolateral short spine; Metatarsus: I–II 8–9 cusps (right I 3 cusps), 2 short distal spines; III–IV 4 subdistal cusps (left IV additional subdistal cusp), 4 short distal spines.

Epigynum with median septum having a broader posterior part and a narrow anterior part with diverging margins both, anteriorly and posteriorly. Copulatory openings lateral to anterior septum, coiled. Epigynal field as long as wide, rounded; with three slit sense organs on each side, two of them included in the field, one separated with 1–2 of its length from the field (Fig. 87). Internal duct system with two coils in the anterior half, following copulatory openings; posterior part as laterad coil; anterior and posterior part connected by ducts running para-median (Fig. 88). Subadult female with pre-epigynum (Fig. 90), resembling epigyna of adults (*S. arboccoae* Jocqué & Bosmans 1989, *S. paguma* Grismado & Ramirez 2004), and 3–4 slit sense organs on each side distinctly separated from the quadrangular epigynal field.

Colour in ethanol. PS and legs reddish brown to yellowish brown; sternum almost uniformly reddish brown; femur slightly darker than patella and tibia, turning into olive; metatarsus and tarsus darker than patella and tibia, reddish brown. OS dark brown. Pattern: contrasting bright pattern consisting of white, flattened hairs. PS with broad median band and narrow marginal bands; dorsal OS with median band above heart, reaching into posterior half; OS with lateral bands, these passing into patches posteriorly;



Figs. 73–82. *Sesieutes thakek* spec. nov. Male holotype from Thakek (L34). 73–75 Pedipalpus (73 prolateral, 74 ventral, 75 retrolateral views); 76 pedipalpal tibia, dorsal view; 77 embolus, apical view; 78 genital plate, ventral view; 79 eye arrangement, dorsal view; 80 sternum, labium, gnathocoxae, chelicerae, ventral view; 81 right Femur I, prolateral view; 82 prolateral spine of femur I, enlarged. c — conductor, e — embolus, eb — base of embolus.



Figs. 83–91. *Storenomorpha anne* spec. nov. Male holotype (83–86) and female paratype (87–91) from Phou Si (L10). 83–85 Male pedipalpus (83 ventral, 84 retrolateral, 85 dorsal view); 86 eye arrangement, dorsal view; 87 epigynum, ventral view; 88 internal duct system, dorsal view; 89 schematic course of internal duct system, dorsal view; 90 pre-epigynum, ventral view. c — conductor, ms — median septum, ta — tegular apophysis.

Fig. 92. *Storenomorpha anne* spec. nov. Male from Phou Si, Luang Prabang, habitus (in original habitat).

ventral OS with two lateral bands, separated distinctly in the anterior half, passing into patches in posterior half. For colour pattern of living specimen see Fig. 92.

Variation. Males: PL 5.2–6.3, PW 3.9–4.6, OL 4.8–5.9, OW 3.2–4.0. Pedipalpal cylindriform hairs: 7 on left and right pedipalpus (n=3), 7 and 8, respectively, on each side (n=3). Spination: Tibia short distal spines: I–IV 2 (n=1); I–III 2, IV 1 prolateral/2 (n=2); I–III 2, IV 1 prolateral (n=3).

Natural history. *Storenomorpha* spp. have been known as foliage dwelling spiders (Jocqué & Bosmans 1989, Grismado & Ramirez 2004). According to a note of C. and R. Deeleman spiders "live in grasslands and hide during the day in rolled up leaves of standing herbs". In Luang Prabang they were collected during the night, while both sexes were running on the ground of a degraded forest with leaf litter and only few herbs and shrubs.

Distribution. Known only from the type locality.

Sparassidae Bertkau 1872

The material of Laotian Sparassidae is only partly described (Jäger 2001, 2003, Jäger & Vedel 2005a, b, Jäger et al. 2006, Eusemann 2006, Eusemann & Jäger submitted). Some genera needs revision before single specimens can be identified. This is true for specimens of the genera *Pandercetes* L. Koch 1875, *Gnathopalystes* Rainbow 1899, *Olios* Walckenaer 1837, *Sinopoda* Jäger 1999 and partly for *Heteropoda* Latreille 1806.

Heteropoda Latreille 1806

Heteropoda dagmarae Jäger & Vedel 2005

Material examined. 1 male (SMF 56655), L6, sweeping, PJ 2418 (pedipalpi in formol). **2 females** (MNHN), L16, PJ 2337–2338. **1 female** (SMF 56699), L7, banana plant, in bent leaf, at night, by hand, 10.III.2006, PJ 2504, SD 514.

The female specimens represent the first records for the provinces Luang Prabang and Houaphan. It seems that the species occurs also in degraded habitats as banana plantations and do not have special ecological needs except for a more or less rich foliage layer in shrubs and trees.

Heteropoda maxima Jäger 2001

Material examined. 1 female (SMF 56573), L31, cave, 28.II.2003, PJ 2509. **1 female with egg sac** (SMF, in exhibition), L31, cave, 28.II.2003. **1 female** (SMF 56638), L31, cave, by hand, 30.X.2004, PJ 2507, SD 111. **1 juvenile** (SMF 56632), L32, cave, by hand, 28.II.2003, PJ 1844. **1 juvenile** (SMF 56633), L32, cave, by hand, 28.II.2003, PJ 1845. **1 male** (PJ 2510), **1 female** (PJ 2511, SD 110) (SMF 56634), L32, cave, by hand, 29.X.2004. **1 male** (PJ 2512), **1 female** (PJ 2513) (SMF 56533), L34, cave, by hand, 29.X.2004, PJ 2508, SD 118. **1 female** (SMF 56637), L34, cave, by hand, 30.X.2004, PJ 2508, SD 118. **1 female with egg sac** (SMF 56572), L35, cave, by hand, 27.II.2003, PJ 1838. **1 female with egg sac** (PJ 2514), **4 juveniles** (SMF 56574), L35, cave, by hand, Jäger leg. 27.II.2003.

Expeditons in 2003 and 2004 showed that the species is abundant in a number of caves. Spiders were observed in the entrance area with the impact of sunlight and in dark places deep in the caves. As potential prey cave crickets and cave centipedes (Scutigeromorpha: genus *Thereuopoda*) were observed. *Thereuopoda* specimens were directly

observed as prey of *Heteropoda maxima* and vice versa, *H. maxima* as prey of *Thereuopoda* sp. Additional material of large-sized cave dwelling specimens belonging to the same species-group as *H. maxima* from eastern Khammouan Province (Ban Thathot and caves west of this village) and from Vang Vieng needs thorough revision before statements about species identidy can be made.

Heteropoda tetrica Thorell 1897

Material examined. 1 female (SMF 56698), L7, between banana plants on the ground, at night, by hand, 11.III.2006, PJ 2485. **1 female** (SMF 56680), L13, gravel along stream, at night, by hand, 5.III.2006, PJ 2506, SD 504. **1 female** (SMF 56684), L15, by hand, 7.III.2006, PJ 2503, SD 507. **1 male** (SMF 56690), L15, by hand, 8.III.2006, PJ 2501, SD 414. **1 male** (SMF 56691), L15, by hand, 8.III.2006, PJ 2500, SD 415. **1 female** (SMF 56689), L15, by hand, 8.III.2006, PJ 2505, SD 509.

Further material see Eusemann & Jäger (submitted). The species was subject of a taxonomic revision (Eusemann 2006). It seems to be the most abundant huntsman spider species in Laos besides *H. venatoria* (Linnaeus 1767). It occurs in natural as well as in disturbed habitats close to human settlings. In contrast to *H. venatoria*, it was not recorded from houses yet.

Heteropoda venatoria (Linnaeus 1767)

Material examined. 1 female (SMF 56639), L1, toilet in guest house, at night, by hand, PJ 2364, SD 119. **1 male** (SMF 56647), L3, by night, by hand, 6.XI.2004, PJ 2499, SD 128. **1 male** (SMF 56652), L5, by hand, 7.XI.2004, PJ 2489, SD 133. **1 male** (SMF 56662), L8, jungle close to Tham Phun, in cavity of tree, by hand, PJ 2638, SD 138. **1 male** (SMF 56659, PJ 2361, SD 139), **1 female** (SMF 56660, PJ 2362, SD 140), L10, by night, by hand, 12.XI.2006. **1 female** (SMF 56679), L13, by night, by hand, 5.III.2006, PJ 2502, SD 503. **1 male** (SMF 56668), L22, adult: V.2005, dead: 14.VI.2005, PJ 2514, SD 195, fotos 8351–8388 (fotos 8454–8472). **1 female** (SMF 56670), L21, PJ 2388. **1 male** (SMF 56673), L34, cave, by hand, 8.XII.2005, PJ 2496. **1 female** (PJ 2491), **1 juvenile female** (SMF 56631), L29, by hand, 24.II.2003.

This species occurs likewise in natural and man-made habitats. In natural habitats it is found together with the similarly sized *H. tetrica* (s. above). Both species exibit a clear sexual colour dimorphism with males having a high-contrast pattern on their dorsal shield of prosoma, whereas females are almost uniformly brown. *H. venatoria* tends to be a bit brighter than *H. tetrica*, especially in females, but due to variation in both species the examination of copulatory organs is recommended for proper identification.

Pseudopoda Jäger 2000

The genus was described from specimens mainly from Nepal, Myanmar, Thailand and China. Recent records in Vietnam (Jäger & Vedel 2005) and Laos (Jäger et al. 2006) completed the image of its distribution range. As found in other countries, representatives live in habitats with high humidity, such as riversides of streams in forests. The following three species were recently described as first records of this genus for Laos (Jäger et al. 2006): *Pseudopoda confusa* Jäger, Pathoumthong & Vedel 2006, *Pseudopoda gemina* Jäger, Pathoumthong & Vedel 2006, *Pseudopoda namkhan* Jäger, Pathoumthong & Vedel 2006. In material from the Museum National d'Histoire Naturelle, Paris one single female was located, which is described below as new species.

Pseudopoda houaphan spec. nov.

Figs. 93–95

Type material. Female holotype (MNHN), Laos, Houaphan Prov., Muong You (L16), Vitalis de Salvaza leg. 17.XI.–8.XII.1918, PJ 2343.

Etymology. The species is named according to its type locality, Houaphan Province; noun in apposition.

Diagnosis. Female similar to that of *P. namkhan* (Jäger et al. 2006: figs. 25–27). The new species may be recognised by having a broader epigynum, by the shorter anterior bands (Fig. 93), by the distinctly wound section situated (functionally) before fertilisation ducts (Fig. 95) and by longer fertilisation ducts (Fig. 94).

Description. Female (holotype). PL 5.6, PW 5.2, AW 2.9, OL 6.1, OW 3.7. Eye diametres: AME 0.30, ALE 0.35, PME 0.31, PLE 0.37. Eye interdistances: AME–AME 0.19, AME–ALE 0.09, PME–PME 0.34, PME–PLE 0.43, AME–PME 0.41, ALE–PLE 0.35, clypeus AME 0.45, clypeus ALE 0.43. Leg and pedipalpus measurements: pedipalpus 7.9 (2.3, 1.2, 2.0, -, 2.4); leg I 23.7 (6.5, 2.7, 6.9, 5.6, 2.0); leg II 24.9 (7.1, 2.8, 7.1, 5.8, 2.1); leg III 18.9 (5.7, 2.3, 5.1, 4.3, 1.5); leg IV 21.5 (6.7, 2.0, 5.5, 5.5, 1.8). Leg formula: 2143. Leg spination: pedipalpus: 131, 101, 2121, 1014; femur: I–III 323, IV 321; patella: 101; tibia: 2126; metatarsus: I–II 1014, III 2024 (+additional short ventral, distal, median spine), IV 3036 (+additional short ventral, distal, median spine). Epigynal field transversally oval. Lateral lobes with posterior median indentation, their anterior margins slightly undulated (Fig. 93).

Colour in ethanol. [Colouration is only hardly visible in this badly preserved specimen] Yellowish brown. Sternum, labium, coxae brighter yellowish brown, without pattern. Dorsal OS with irregular pattern.

Male. Unknown

Distribution. Known only from the type locality.

Rhitymna Simon 1897

The genus *Rhitymna* was revised and recognised as an exclusively Asian genus by Jäger (2003). Eleven African species were transferred to other genera (e.g., *Olios, Damastes*) and new Asian *Rhitymna* species were described. In total fourteen species are presently known from Sri Lanka to the Philippines and from China (Yunnan) to Indonesia (Java).

Rhitymna verruca (Wang 1991)

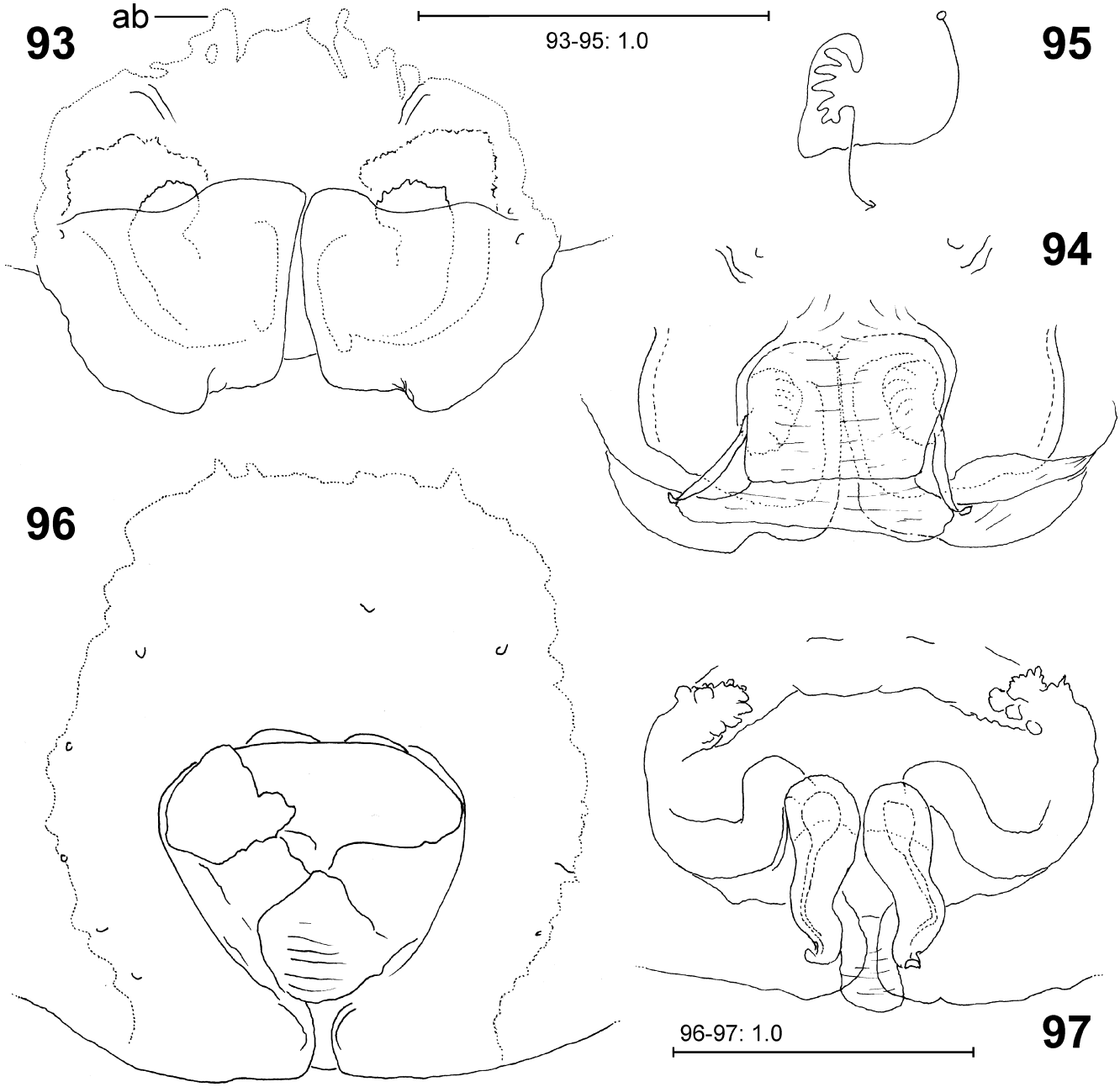
Material examined. 1 male (PJ 2497, SD 129), **1 female** (PJ 2498) (SMF 56646), L3. **1 male** (SMF 56654), L5, 8.XI.2004, PJ 2488.

Further material from Laos (between Vientiane and Luang Prabang) see Jäger (2003). The present specimens represent the first records for the Luang Nam Tha Prov. This species lives in the foliage of shrubs and trees in forests. In the same habitat *Thelcticopis severa, Heteropoda dagmarae* and *Olios* spp. were found.

Rhitymna plana Jäger 2003
Figs. 96–97

Material examined. 1 female (PJ 2341, MNHN), **1 female** (PJ 2342, SMF 56629), L16.

The female from Laos (between Vientiane and Luang Prabang) illustrated in Jäger (2003: figs. 80–82) shows distinct differences in the female copulatory organ in comparison to the holotype female from Vietnam. Therefore it could not be identified unambiguously to species level. Both females examined for the present paper show that differences are part of intraspecific variation and form a con-



Figs. 93–97. 93–95 *Pseudopoda houaphan* spec. nov. Female holotype from Muong You (L16). 93 Epigynum, ventral view; 94 internal duct system, dorsal view; 95 schematic course of internal duct system, dorsal view. 96–97. *Rhitymna plana* Jäger 2003. Female from Muong You (L16). 96 Epigynum, ventral view; 97 internal duct system, dorsal view. ab — anterior bands of epigynal field.

tinuous cline with a gradual change of certain characters. This concerns external morphology of the epigynum (shape and structure of median plate; ratio of median plate length to length of anterior part of epigynal field) as well as the internal duct system: globular structures (functionally in front of fertilisation ducts) are situated closer to each other than in other specimens examined (Fig. 97), copulatory ducts (functionally in front of globular structures) extending anteriorly beyond globular structures. The specimens examined connect the two extremes shown in Jäger (2003) as intermediate forms. According to this new results, I suggest that all animals belong to one species with a strong variation. The two females represent the first record for Houaphan Prov.

Thelcticopis severa (L. Koch 1875)

Material examined. 1 female (SMF 56648), L2, PJ 2495. **1 male** (SMF 56636), L34, in front of cave, beaten from foliage, 30.X.2004, PJ 2490.

This species lives in the foliage of shrubs and trees (see note under *Rhitymna verruca*). Specimens were beaten or collected by sweep net. They represent the first record for Laos.

Salticidae Blackwall 1841

Harmochirus Simon 1885

Harmochirus brachiatus (Thorell 1877)

Material examined. 1 female (SMF 40616), between L11 and L12, D.V. Logunov det. 2005.

According to Platnick (2006) the species is recorded from India, Bhutan to Taiwan, Indonesia. Most likely this specimen represents the first record for Laos.

Plexippus C.L. Koch 1846

Plexippus paykulli (Audouin 1826)

Material examined. 1 female, 6 juveniles (SMF 56686), L15, 7.III.2006, D.V. Logunov det. 2005.

Plexippus petersi (Karsch 1878)

Material examined. 1 female (SMF 56695), L7, 10.III. 2006, D.V. Logunov det. 2005.

Acknowledgments

My expeditions to Laos were supported financially by the Eduard Rüppell Expeditionsfond of the Senckenbergische Naturforschende Gesellschaft, Frankfurt, and a grant by the EU (PARSYST) which enabled me to examine valubale material in the Zootheque of the MNHN from Laos, further through help and assistance by Julia Altmann (SMF), Anne Gaëlle Verdier (Heritage House, Luang Prabang; International River and Heritage Institute, Tours), Bounnam Pathoumthong (Lao University, Vientiane), Helmut Steiner (Hanau), Claude Mouret (Derdères) and his caver team, and Vincent Vedel (Galway). Pakawin Dankittipakul (Chiang Mai), Stefan Foord (Venda), Alexander Gromov (Almaty), Bernhard Huber (Bonn), Dmitri Logunov (Manchester), and Nicolaj Scharff (Copenhagen) identified spider species from the material treated in this paper. Manfred Grasshoff (Frankfurt) examined and identified the specimens of *Caerostris* and confirmed conspecifitiy of male and females. Moreover, he made preliminary sketches of male copulatory organs noting important details. Rudy Jocqué confirmed that the specimens of *Storenomorpha* belonged to an undescribed species. Torbjorn Kronestedt (NHRS) sent the type material of *Eurychoera quadrimaculata*, Joseph Koh (Brunei Darusalam) additional specimens including the male described in this paper. I thank all persons and institutions for their support.

References

Baehr, M. & Baehr, B. 1993. The Hersiliidae of the Oriental Region including New Guinea. Taxonomy, phylogeny, zoogeography (Arachnida, Araneae). Spixiana (Suppl.) 19: 1–96.

Besson, J. P., Deharveng, L. & Brehier, F. 2001. Laos. In: Juberthie, C. & Decu, V. (eds) Encyclopaedia Biospelologica 3: 1883–1889.

Bosselaers, J. & Jocquè, R. 2002. Studies in Corinnidae: cladistic analysis of 38 corinnid and liocranid genera, and transfer of Phrurolithinae. Zoologica Scripta 31 (3): 241–270.

Chen, H.-M., Zhang, J.-X. Song, D.-X. & Kim, J.-P. 2002. A new species of the genus *Psechrus* from China (Araneae: Psechridae). Korean Arachnology 18 (1): 9–12.

Deeleman-Reinhold, C. L. 2001. Forest spiders of South East Asia. With a revision of the sac and ground spiders (Araneae: Clubionidae, Corinnidae, Liocranidae, Gnaphosidae, Prodidomidae and Trochanterriidae). Brill, Leiden, Boston, Köln, 591 pp.

Dreybrodt, J. & Laumanns, M. 2005. The unknown North of Laos (Karst and caves of the provinces Luang Phrabang and Luang Nam Tha). Berliner Höhlenkundliche Berichte 16: 1–115.

Eusemann, P. 2006. Taxonomische Revision von *Heteropoda tetrica* Thorell 1897 (Arachnida: Araneae: Sparassidae) mit Anmerkungen zu Variabilität und geographischer Verbreitung. Unpublished Diploma Thesis, Biological Department, Johannes Gutenberg University Mainz, Germany, 67 pp.

Eusemann, P. & Jäger, P. 2006. *Heteropoda schwendingeri* Jäger 2005 (Araneae: Sparassidae) — first description of female with notes on intraspecific variation and evidences supporting species status. In: Jäger, P., Päckert, M. & Schwendinger, P. (eds) Ornithology, Arachnology and Asian mountain ranges — A tribute to the work of Prof. Dr Jochen Martens. Zootaxa 1325: 327–334.

Eusemann, P. & Jäger, P. submitted. *Heteropoda tetrica* Thorell, 1897 — variation and biogeography with emphasis on copulatory organs (Arachnida: Araneae: Sparassidae). Contributions of Natural History.

Gertsch, W. J. & Ennik, F. 1983. The spider genus *Loxosceles* in North America, Central America, and the West Indies (Araneae, Loxoscelidae). Bulletin of the American Museum of Natural History 175 (3): 264–360.

Grasshoff, M. 1984. Die Radnetzspinnen-Gattung *Caerostris* (Arachnida: Araneae). Revue de Zoologie Africaine 98 (4): 725–765.

Grismado, C. J. & Ramirez, M. J. 2004. A new species of the genus *Storenomorpha* from Vietnam (Araneae, Zodariidae). Zootaxa 453: 1–7.

Haupt, J. 2004. A new species of whipscorpion from Laos (Arachnida, Uropygi, Thelyphonidae). Senckenbergiana biologica 83 (2): 151–155.

Heimer, S. 1984. A new species of *Zygiella* from Vietnam

(Arachnida, Araneae, Araneidae). Reichenbachia 22 (12): 95–97.
Huber, B. A. 2005a. Revision of the genus *Spermophora* Hentz in southeast Asia and on the Pacific islands, with descriptions of three new genera (Araneae: Pholcidae). Zoologische Mededelingen 79: 61–114.
Huber, B. A. 2005b. High species diversity, male-female coevolution, and metaphyly in southeast Asian pholcid spiders: the case of *Belisana* Thorell 1898 (Araneae, Pholcidae). *Zoologica* 155: 1–126.
Jäger, P. 2001. A new species of *Heteropoda* (Araneae: Sparassidae: Heteropodinae) from Laos — the largest huntsman spider? Zoosystema 23(3): 461–465.
Jäger, P. 2003. *Rhitymna* Simon 1897: an Asian, not an African spider genus. Generic limits and description of new species (Arachnida, Araneae, Sparassidae). Senckenbergiana biologica 82 (1/2): 99–125.
Jäger, P. 2005. New large-sized cave-dwelling *Heteropoda* species from Asia, with notes on their relationships (Araneae: Sparassidae: Heteropodinae). Revue Suisse de Zoologie 112 (1): 87–114.
Jäger, P. & Vedel, V. 2005. *Heteropoda dagmarae* sp. nov. from Laos — a close relative of *Heteropoda javana* (Simon 1880) from Indonesia (Arachnida: Araneae: Sparassidae). Zootaxa 1044: 17–26
Jäger, P., Pathoumthong, B. & Vedel, V. 2006. First record of the genus *Pseudopoda* in Laos with description of new species (Arachnida, Araneae, Sparassidae). Senckenbergiana biologica 86 (2): 1–9.
Jocqué, R. & Bosmans, R. 1989. A revision of *Storenomorpha* Simon (Araneae, Zodariidae). Spixiana (12 (2): 125–134.
Kishida, K. 1936. A synopsis of the Japanese spiders of the genus *Dolomedes*. Acta arachnologica 1: 114–127.
Koh, J. K. H. 1989. A guide to common Singapore spiders. Singapore Science Centre, Singapore, 160 pp.
Kuntner, M. 2005. A revision of *Herennia* (Araneae: Nephilidae: Nephilinae), the Australasian 'coin spiders'. Invertebrate Systematics 19: 391–436.
Kuntner, M. 2006. A monograph of *Nephilengys*, the pantropical 'hermit spiders' (Araneae, Nephilidae, Nephilinae). Systematic Entomology 32 (1): 1–41 [online; accessed: 22.11.2006]
Levi, H. W. 1982. The spider genera *Psechrus* and *Fecenia* (Araneae: Psechridae). Pacific Insects 24 (2): 114–138.
Levi, H. W. 1983. The orb-weaver genera *Argiope, Gea*, and *Neogea* from the Western Pacific region (Araneae: Araneidae, Argiopinae). Bulletin of the Museum of Comparative Zoology 150 (5): 247–338.
Mouret, C. 1997. L'utilisation des grottes par l'homme au Laos. In: Mouret, C., Brouquisse, F. & Vacquie, J.-F. (eds) Explorations spéléologiques au Laos 1991–1996. Rapport de presentation des resultats. 21 pp.
Mouret, C. 2001. Le karst du Khammouane au Laos central — Dix ans de recherches spéléologiques. Spelunca 84 (4): 7–32.
Mouret, C., Collignon, B. & Vacquie, J.-F. 1997. Giant underground rivers in Central Laos. In: Mouret, C., Brouquisse, F. & Vacquie, J.-F. (eds) Explorations spéléologiques au Laos 1991–1996. Rapport de presentation des resultats. 5 pp.
Murphy, F. & Murphy, J. 2000. An introduction to the spiders of South East Asia with notes on all the genera. Malaysian Nature Society, Kuala Lumpur, 625 pp. +32 pl.
Platnick, N. I. 2006. The World Spider Catalog, Version 7.0. American Museum of Natural History. Online: http://research.amnh.org/entomology/spiders/catalog/ (accessed: 22.11.2006)
Sierwald, P. 1987. Revision der Gattung *Thalassius* (Arachnida, Araneae, Pisauridae). Verhandlungen des naturwissenschaftlichen Vereins in Hamburg (NF) 29: 51–142
Sierwald, P. 1997. Phylogenetic analysis of pisaurine nursery web spiders, with revisions of *Tetragonophthalma* and *Perenethis* (Araneae, Lycosoidea, Pisauridae). The Journal of Arachnology 25 (3): 361–407.
Strand, E. 1915. Indoaustralische, papuanische und polynesische Spinnen des Senckenbergischen Museums, gesammelt von Dr. E. Wolf, Dr. J. Elbert u. a. In: Wissenschaftliche Ergebnisse der Hanseatischen Südsee-Expedition 1909. Abhandlungen der senckenbergischen naturforschenden Gesellschaft 36 (2): 179–274.
Thorell, T. 1897. Araneae paucae Asie australis. Bihang till Kongl. Svenska Vetenskap-Akademiens Handlingar 22 (6): 1–36.
Wang, X.-P. & Yin, C.-M. 2001. A review of the Chinese Psechridae (Araneae). The Journal of Arachnology 29 (3): 330–344.
Wunderlich, J. 2004. The fossil spiders (Araneae) of the families Tetragnathidae and Zygiellidae n. stat. in Baltic and Dominican amber, with notes on higher extant and fossil taxa. Beiträge Araneologie 3: 899–955.
Yang, Z.-Z., Zhang, J.-X., Zhu, M.-S. & Song, D.-X. 2003. A new species in the genus *Psechrus* from China (Araneae: Psechridae). Journal of the Agricultural University Hebei 26 (2): 43–45.
Yin, C.-M., Wang, J.-F., Zhu, M.-S., Xie, L.-P., Peng, X.-J. & Bao, Y.-H. 1997. Araneidae. Fauna Sinica 35. Science Press, Beijing. 460 pp.
Zhang, J.-X., Zhu, M.-S. & Song, D.-X. 2004. A review of the Chinese nursery-web spiders (Araneae, Pisauridae). The Journal of Arachnology 32 (3): 353–417.
Zhang, J.-X., Zhu, M.-S. & Song, D.-X. 2005. Revision of the spider genus *Hamataliwa* Keyserling from China (Araneae: Oxyopidae). Zootaxa 1017: 1–17.
Zhu, M.-S., Kim, J.-P. & Song, D.-X. 1997. On three new genera and four new species of the family Tetragnathidae (Araneae) from China. Korean Arachnology 13 (2): 1–10.
Zhu, M.-S., Song, D.-X. & Zhang, J.-X. 2003. Tetragnathidae. Fauna Sinica 35. Science Press, Beijing. 402 pp. +16 plates.
Zhu, M.-S., Song, D.-X., Zhang, Y.-Q. & Wang, X.-P. 1994. On some new species and new records of spiders of the family Araneidae from China. Journal of the Hebei Normal University (Natural Science Edition) 1994 (Suppl.): 25–52.
Zhu, M.-S. & Zhang, Y.-Q. 1993. [Record of some spiders of the family Araneidae from Guangxi, China (Arachnida: Araneae)]. Journal of Guangxi Agricultural University 12 (1): 36–43 [in Chinese with English abstract]

Received December 8, 2006 / Accepted May 18, 2007