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## Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel

### Araneae: Fam. Salticidae, Genera *Aelurillus*, *Langona*, *Phlegra* and *Cyrba*

By J. Proszynski

Abstract: 7 species are recorded from Bhutan. All of them represent new records for that country and the following 4 are described for the first time: *Aelurillus wittmeri*, *Langona bhutanica*, *Phlegra samchiensis* and *Cyrba tibialis*.

The 1972 Expedition to Bhutan of the Naturhistorisches Museum in Basel, consisting of W. Wittmer, C. Baroni Urbani, O. Stemmler and M. Würmli has collected, among other, a very interesting collection of jumping spiders (Salticidae, Aranei, Arachnida). A superficial examination revealed not less than 236 adult specimens belonging to some 18 genera, as well as other 58 adult specimens which I could not identify at once to any better known genus.

The detailed study of that valuable collection presents some difficulties resulting from the generally poor knowledge of Oriental Salticidae. While there are some 699 nominal species listed from the whole Oriental Region, only 78 were reported from Indian Subcontinent, 67 from Ceylon and another 24 from various places mentioned as "Himalaya". It means that the majority of species of that area has been not yet discovered. On the other hand, even a superficial examination of the Salticidae from Bhutan reveals species known from rather distant areas like Tadjikistan in the USSR, Tibet or Indonesia, so that their ranges appear rather wide. Related species could be found in Aden, Syria, Southern China and even Japan. As a result no identification of Bhutan species could be accepted as sure without knowledge of all related species from the almost whole Asia. However, the majority of Oriental Salticidae was never revised and their original classification gives little clue to their real relationships. What more, long ago described species of this group cannot be recognised by the characters mentioned in their original descriptions, hence the types of these species should be studied at first.

The practical conclusion drawn from the above is that the study of Bhutanese Salticidae should be based on the systematic revision of each genus. This takes more time than mere descriptions, but will promote better knowledge of the systematics of the Salticidae and understanding of their zoogeography. We intend to publish the report on study of the Salticidae of Bhutan in small parts, all under the same heading. Some of these parts will be written by my collaborators.

All material studied shall be returned to and kept in the Naturhistorisches Museum, Augustinergasse 2, 4051, Basel, Switzerland.

The informations on the environment of particular species were not given on the labels, the collecting points are however described in the publication of BARONI URBANI et al., 1972.

Writing that first part of our study on Salticidae of Bhutan I wish to express my thanks to the members of the Basel Naturhistorisches Museum Expedition to Bhutan, 1972, for the very rich and very interesting material of Salticidae they have collected. I feel myself much obliged to Dr. W. Wittmer for sending me that collection for study. The comparative study of types of various Oriental species were possible owing to the kind cooperation of curators of several arachnological collections. I am particularly obliged for that to Mr. M. Hubert and Prof. M. Vachon of the Museum National d'Histoire Naturelle in Paris, Mr. F. R. Wanless of British Museum (NH) London, Prof. G. C. Varley and Mr. E. Taylor of Hope Department of Zoology, Oxford University, and to Dr. T. Kronstedt of Naturhistoriska Riksmuseet in Stockholm. I have also studied specimens from the Dr. E. M. Andreeva collection from the Tadzhik SSR, and Dr. W. Staręga has lend me some specimens from the W. Kulczyński collection kept in the Institute of Zoology in Warsaw. My study visit in Oxford was facilitated by a grant from the Organizing Committee of the VIIth International Congress of Arachnology, to whom I wish to express my particular thanks; I am particularly grateful to Dr. A. F. Millidge.

The preparation of the manuscript was facilitated by the staff members of the Instytut Biologii Stosowanej WSRP in Siedlce, especially by Mrs. E. Flanczewska who has drawn pencil sketches of my drawings in China ink, and Miss A. Szumińska who has typed the text.

#### **Systematic position of the genera *Aelurillus* Simon, 1884, *Langona* Simon, 1901 and *Phlegra* Simon, 1876**

The three genera are apparently very closely related and are characterized by a quite special and remarkably uniform type of male palpal

organ, differing mainly in the shape of the tibial apophysis. There are minor differences in the proportions and coloration of the body, and only the epigynum structure in females could give a clear generic separation. Unification of *Phlegra* and *Aelurillus* was recently suggested by HARM (1977) on the basis of similarities in three European species, but it would be better to delay decision on that until more species would become revised. The distribution of *Aelurillus* and *Phlegra* is mainly South Palaearctic, *Langona* is rather African, with one Oriental species reported heretofore. The findings reported in this paper extend the geographical distribution of these taxa.

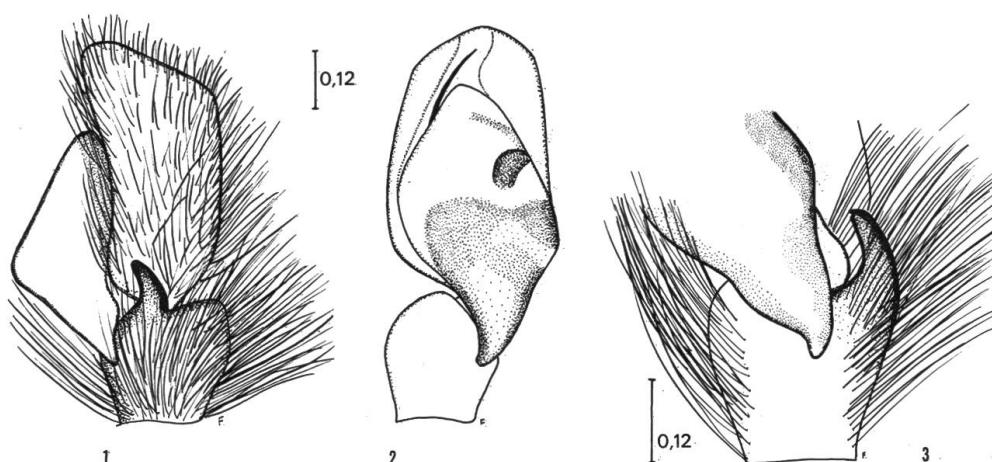
***Aelurillus wittmeri* n. sp.**

Material: 1 ♂ holotype, 3 ♂ ♂ paratypes — Bhutan: Samchi, 300 m 7–11.5, 1972. Coll. NHM — Expedition to Bhutan.

Description of male: Dorsal appearance. Cephalothorax uniformly blackish brown, with the lower half of the lateral surfaces covered with a broad belt of dense, adpressed white setae. Abdomen dorsally greyish or whitish in appearance, covered uniformly with whitish adpressed setae.

Frontal appearance. Clypeus brown, covered with a dense fur of long white setae. A similar white fur on the anterior surfaces of the brown chelicerae, yellow pedipalps, and on the pale yellow femora I and II, which are also covered dorsally and ventrally by long white mane.

Ventral appearance. Femora III–IV somewhat more greyish than I–II. Patellae — tarsi I–IV yellowish grey with brownish darkenings on some segments. Coxae pale yellow with long white setae. Maxillary plates and



Figs. 1–3. *Aelurillus wittmeri* n. sp., palpal structure.

labium blackish brown, pale tipped, also the sternum blackish brown with white setae. Abdomen greyish, ventral spinnerets greyish yellow.

Length of cephalothorax 2.60 mm. Length of abdomen 2.40 mm.

The species can be defined and recognized by the appearance of its palpal organ (figs. 1–3) and especially by the single, vertical, and rather long tibial apophysis (fig. 1), which is clearly different from all other species of *Aelurillus* known to me.

#### *Langona bhutanica* n. sp.

Material: 1 ♂ holotype, 2 ♂♂ paratypes Bhutan: Thimphu, 21.V.1972, 1 ♂ paratype Bhutan: Phuntsoling, 125 km von Thimphu, 24.V.1972; 1 ♂ paratype Bhutan: "Sinthoka Dzong, 6 km von Thimphu, 2300 m", 30.VI.1972. All specimens coll. NHM-Basel.

Comparative material studied: ♂ *Aelurillus tartaricus* (Charitonov, 1946) [= *Langona tartarica* (Charitonov 1946) comb.n.] Tadjik SSR, Dushanbe, coll. Andreeva, 1 ♂ — *Langona redii* (Sav., Aud., 1825) — coll. Simon, MNHN-Paris.

Description of male: Dorsal aspect. Cephalothorax dark brown with eye field blackish. Two parallel lines of white setae from eyes III to the end of cephalothorax. Abdomen dorsally black, covered with black, broad and long setae. A median, longitudinal white line of white adpressed setae. Lateral surfaces of abdomen whitish.

Frontal aspect. Clypeus brownish grey beneath eyes I median, and somewhat paler fawn beneath eyes I lateral. Chelicerae covered with black setae, devoid of any mixture of white setae.

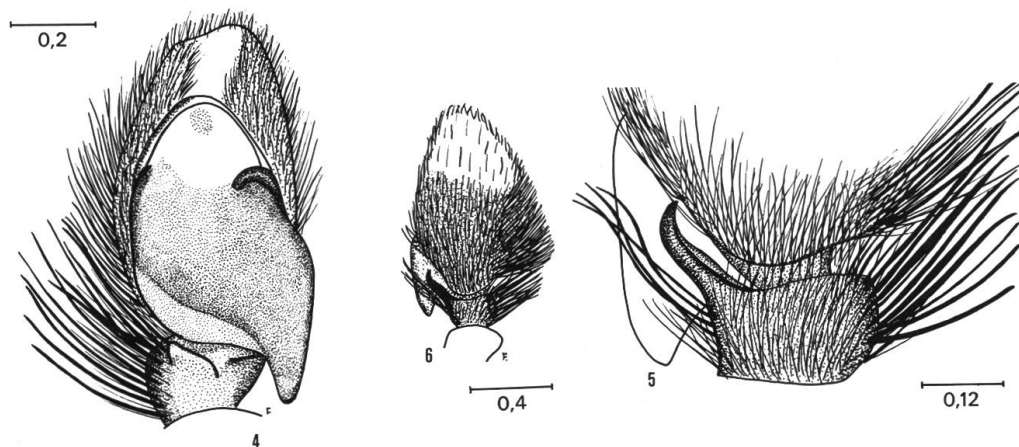


Fig. 4–6. *Langona tartarica* (Charitonov, 1946), palpal organ structure.

Legs pale brownish grey. A dark brown line on the prolateral surface of femur I. The ventral surfaces of patella, tibia and metatarsus I are similarly coloured; these darkening are located on a rather dark background and therefore are not very conspicuous.

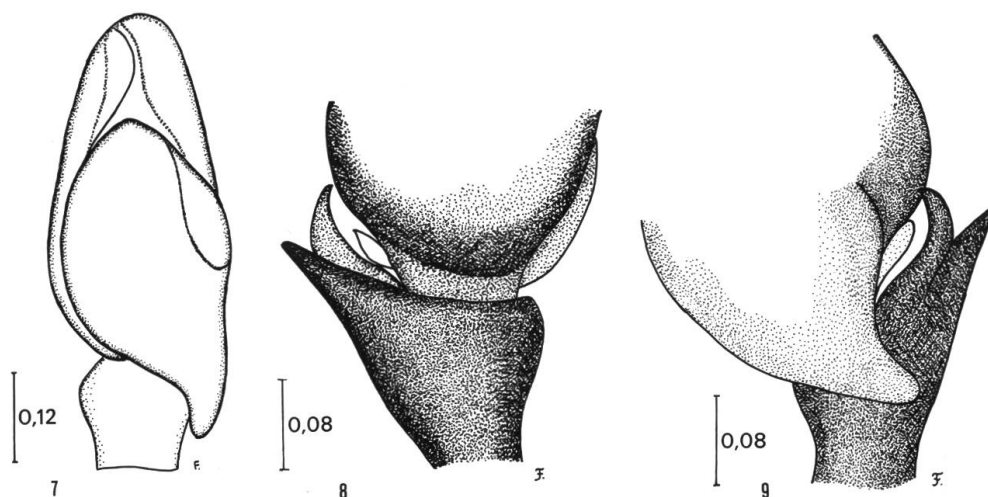
Dorsal surface of pedipalpal femur blackish brown, with patella paler. Length of cephalothorax 2.52–2.96, length of abdomen 2.40–2.80.

Female unknown. This species could be recognized from *Langona tartarica* (Charitonov, 1946) by its generally darker coloration and fine details of pedipalpal organ structure. The striking characters of *L. tartarica*, lacking in *L. bhutanica*, which apparently are diagnostic are: 1) white setae framing the black area on anterior surface of chelicerae, located in the upper part of chelicerae, just beneath the clypeus, and along the external edges of the chelicerae; the upper limit of the black area is rounded; 2) a conspicuous, narrow black line along the prolateral surface of femur, patella, tibia and metatarsus I, contrasting with the yellowish background; 3) the yellowish fawn pedipalpal femur.

I have received from Miss H. Aruldas two more species of *Langona*, yet undescribed and collected somewhere in the Madras area in India. So the general distribution of the genus is wider than it was known.

#### *Phlegra particeps* (O. Pickard-Cambridge, 1872)?

Material: 1 ♂ Bhutan: Punakha 1560 m, 8. VI. 1972. Coll. NHM-Expedition. Comparative material: 1 ♂ — *Phlegra particeps* (O.P.-C.)



Figs. 7–9. *Phlegra particeps* (Pickard-Cambridge, 1872) ?, palpal organ and details of tibial apophyses; dorsal and lateral views.

from "Palestine", presumably type, in the O. Pickard-Cambridge collection, kept in the Hope Dept. of Zoology, Oxford University; ♂♂, ♀♀ (presumably types) *Phlegra chrysops* Simon, 1890 — "Aden 10757 coll. Simon MNHM-Paris."

Description of male: Cephalothorax dark brown, eye field blackish brown, eyes I surrounded with white setae. Clypeus dark brown covered sparsely with long white setae. Anterior surface of chelicerae blackish brown with a thin belt of white setae just below the clypeus. Anterior (dorsal) aspect of pedipalps brownish black, cymbium with white tip. Anterior appearance of legs brownish black. Abdomen dorsally much damaged with soft tissues contracted and separated from the chitinous "skin". It appears that the natural coloration of the abdomen could be uniformly brown.

Legs blackish brown, with proximal half of tarsi I-II greyish yellow. Pedipalpal femur blackish without any particularly conspicuous white setae.

The structure of the palpal organ is shown on figs 7–10. The diagnostic character is the thin structure of both tibial apophyses which could be properly examined only after separation of tibia from cymbium; because of the dark coloration they are almost invisible on the blackish background of the lateral surface of cymbium.

Length of cephalothorax 1.64, length of abdomen 1.64.

This species is identified by its general resemblance to *P. particeps*, especially by the shape of the tibial apophyses, which appeared quite peculiar to me at the time of study of the O. Pickard-Cambridge collection.

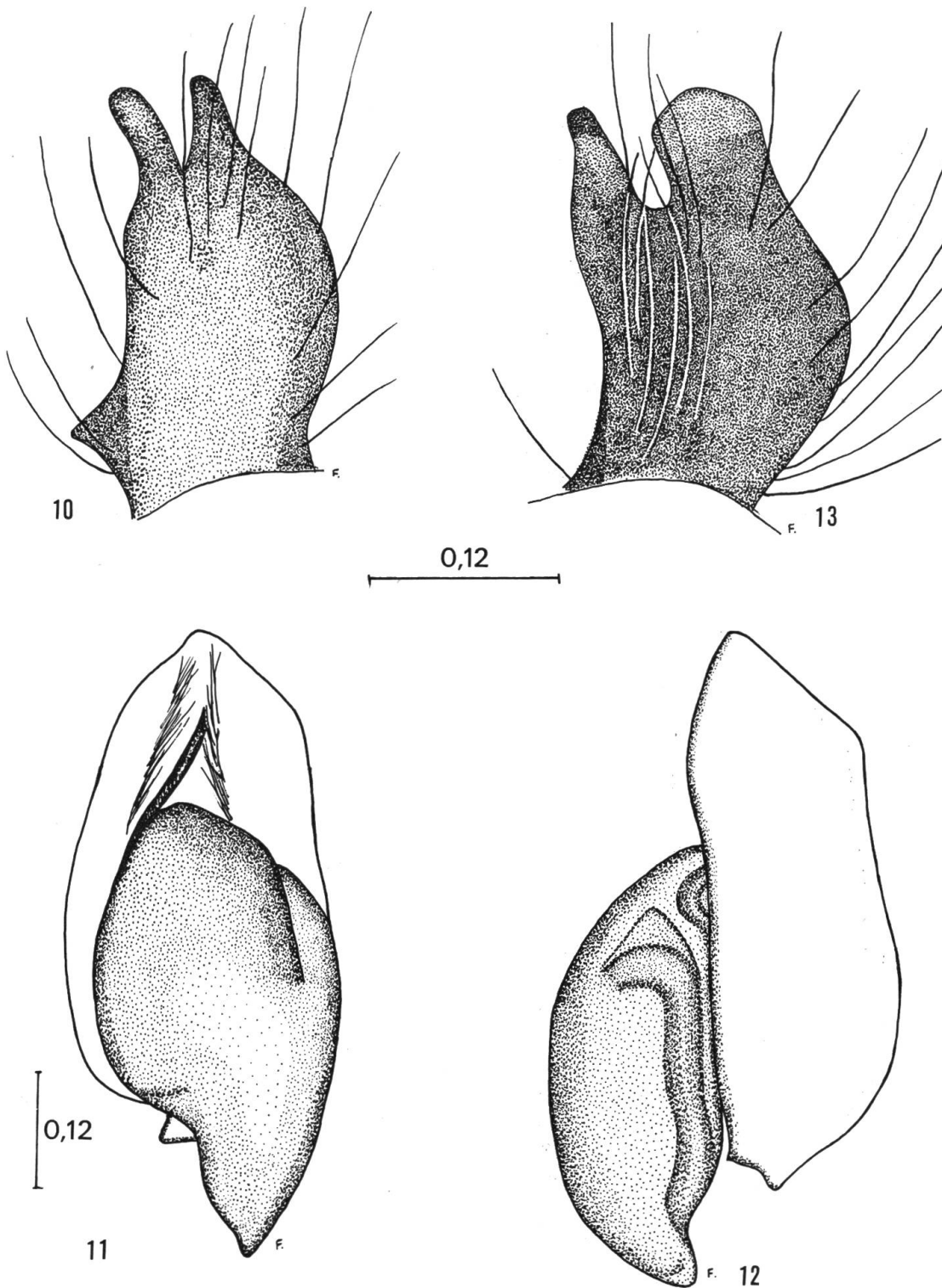
Recent comparison of E. Simon types revealed that an obscure species, *P. chrysops*, collected only once, some 90 years ago in Aden, has a quite similar type of tibial apophyses. It differs, however, in coloration and various other details. It appears therefore, that an exact definition of the species belonging to this group should be deferred until more material will be available.

Female unknown.

#### ***Phlegra samchiensis* n. sp.**

Material: 1 ♂ holotype Bhutan, Samchi, 300 m, 7–11.V.1972, Coll. NHM Basel.

Description of male: Cephalothorax as in the previous species. Clypeus pale fawn, even paler below eyes I lateral, covered densely with long and rather adpressed white setae, much denser than in the previous species. Anterior surface of chelicerae pale brown, covered over the



Figs. 10–13. *Phlegra samchiensis* n.sp., palpal organ: ventral (11), lateral (12) views and lateral view of tibia (13). 10 *Phlegra particeps* — lateral view of tibia.



whole surface with sparse, adpressed white setae. Anterior aspect (dorsal) of pedipalpal cymbium and tibia brown. Pedipal femur dorsally with a mane of long white setae; these cover also the dorsal surface of the patella, the lateral outer surface of the tibia and the basal part of that surface of cymbium. This white pattern on dark pedipalps shows a conspicuous difference with the previous species. Cymbium dorsally white tipped. Anterior appearance of legs brown.

Abdomen dorsally reddish brown, with a lateral line of dense white setae and with traces of a thin longitudinal median paler line. Legs rather uniformly pale brown, with tarsi I–II colored identically as other segments. Tarsi III–IV yellow, much paler than other segments on the respective legs.

The structure of the palpal organ is shown on figs 11–13; the shape of bulb and thicker embolus appears different than in the previous species, the characters particularly striking are the distinctly broader dorsal apophysis on the tibia and the white setae on its lateral surface (fig. 13). Length of cephalothorax 1.80, length of abdomen 1.76.

Female unknown.

#### ***Phlegra thibetana* Simon, 1901.**

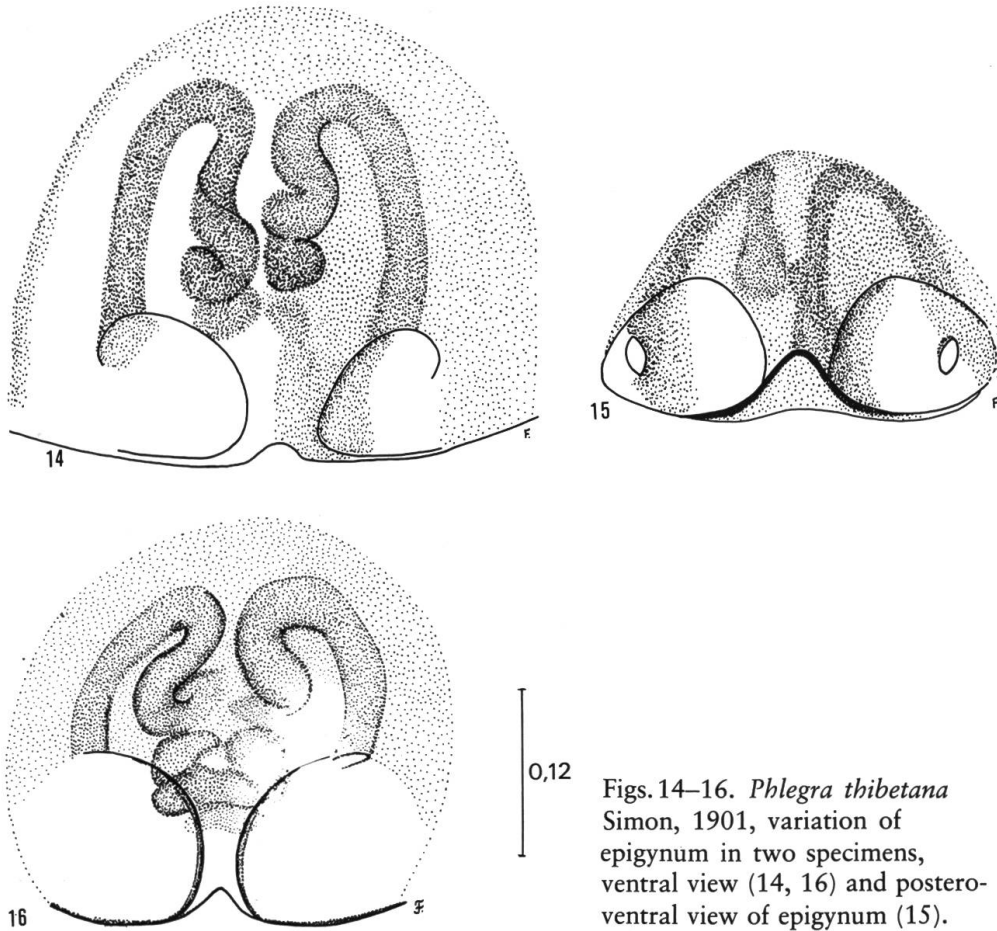
Material: ♀♀ — Bhutan; Wangdi Phodrang, 1300 m, 7.VI.1972. Coll. NHM-Basel. 1 ♀ holotype — “*Phlegra thibetana* ES. 3969 Thibet chinoise Waga” — coll. E. Simon, MNHN-Paris.

Description of female: Cephalothorax greyish brown with blackish eye field and two parallel yellowish lines, extending from eyes III towards the posterior margin of carapace. This pattern is in agreement with the palaeartic *Phlegra* species. Abdomen dorsally greyish brown, divided into two halves by a longitudinal yellow stripe with a thin brown line in its middle. In one specimen the dividing median line is reduced to faint traces of the thin dark brown line, without contrasting yellow background. A thin yellow line runs also around the dorsal surface of the abdomen, separating it from the lateral surfaces. This colour pattern is also well visible on the holotype.

Frontal aspect. Clypeus yellow, chelicerae brownish yellow, pedipalps yellow. Legs yellow with brownish or greyish shade.

Ventral aspect. Sternum, coxae and femora pale yellow. Ventral surface of the abdomen whitish.

The epigynum (figs 14–15) has two round or oval depressions posteriorly, separated by a narrow ridge. Copulatory openings in the outer anterior parts of the depressions, the copulatory canals run ante-

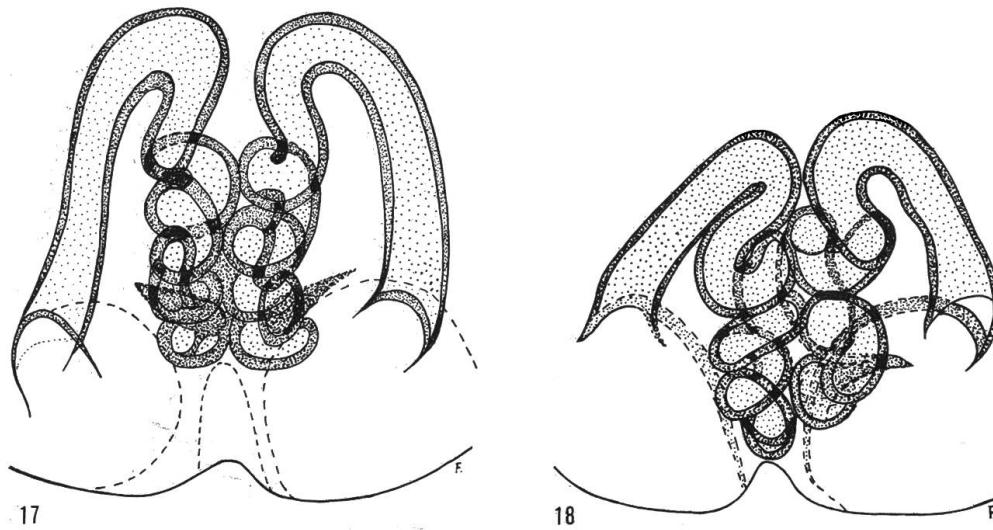


Figs. 14–16. *Phlegra thibetana* Simon, 1901, variation of epigynum in two specimens, ventral view (14, 16) and postero-ventral view of epigynum (15).

riorwards (figs 16–18), bend medially and then run posteriorwards, passing through several entangled coils. They are rather well visible through the epigynum wall, and resemble the canals of the palaeartic *Aelurillus festivus* (C.L. Koch, 1834) in their general plan, which could be also compared with similar structures in the typical *Phlegra*. Length of cephalothorax 1.60–1.80. Length of abdomen 2.00–2.60. Male unknown. Because of certain resemblance in epigynum of *Ph. thibetana* and *Ph. chrysops*, one may expect to find parallel resemblances between the males of these species, and consequently to *Ph. particeps*, described above.

#### Genus *Cyrba* Simon 1876

The position of this genus needs reconsideration in view of similarities in the general plan of male palpal organ with several species of *Linus* (*L. fimbriatus* Doleschall, *L. africanus* Simon, *L. albimanus* Simon). The



Figs. 17–18. *Phlegra thibetana* Simon, 1901, variation in internal structure of epigynum.

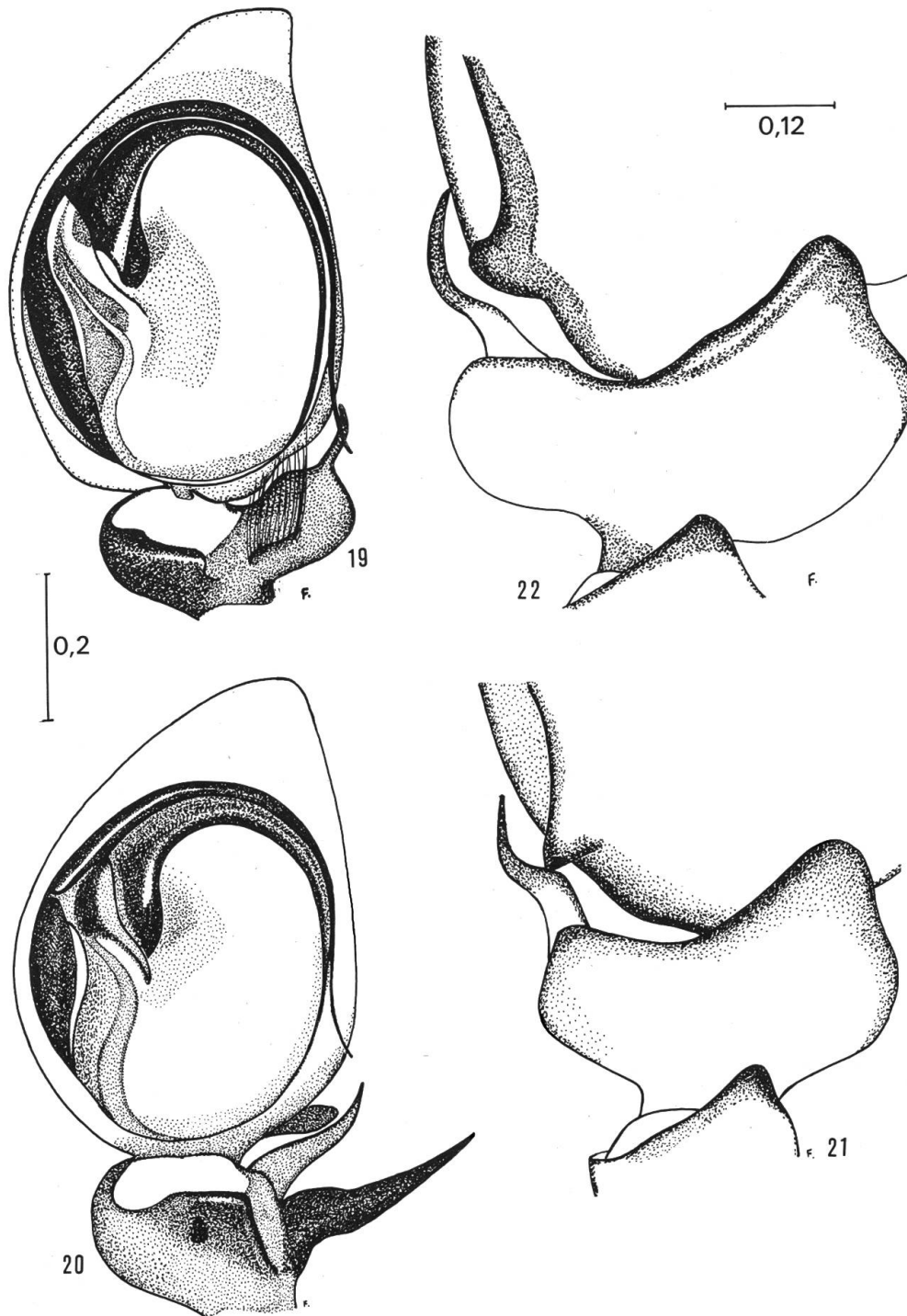
differences are only in length of embolus and structure of tibial apophyses. This may concern also species put into the genus *Portia* Karsch, 1878, which, according to a personal communication from Mr. F. R. Wanless, is identical with *Linus*. While waiting for further arguments, I can confirm the resemblances in palpal organ structure of *Portia adonis* (Simon, 1900) to the above mentioned *Linus* species. However, Simon classified these genera into different groups of genera which now are placed in two different subfamilies: Boethinae (*Linus*, *Portia*) and Thiodinae (*Cyrba*). It appears now that all these genera are closely related.

#### *Cyrba micans* Simon, 1885.

Synonyms: *Cyrba flavimana* Simon, 1899, *syn. n.*  
*Cyrba tadjhika* Andreeva, 1969, *syn. n.*

Material: 1 ♂ Bhutan: Wangdi Phodrang, 1300 m, 7. VI. 1972, coll. Exped. NHM-Basel; 1 ♀ Bhutan: Samchi, 300 m, 7.–11. V. 1972, coll. Exped. NHM-Basel.

Comparative material: 1 ♂ “7671 *Cyrba micans* E.S. 7671, India: collegial”, coll. E. Simon, MNHN-Paris; 6 ♀♀, 4 ♂♂, 1 juv. “22151 *Cyrba micans* E.S. Ann [am = Vietnam]: Phuc — Son (Pr)” coll. E. Simon MNHN-Paris. 1 ♂ “22194 *Cyrba flavimana* ES. Java (Kulczyński)” coll. E. Simon, MNHN-Paris; 1 ♀ “16271 *Cyrba flavimana* ES. Sumatra (W)”, coll. E. Simon, MNHN-Paris; ♂♂, ♀♀ “*Cyrba flavi-*



Figs. 19–22. Comparison of palpal organ structure in *Cyrba micans* Simon, 1885 (19) from Bhutan and *Cyrba algerina* (Lucas, 1846) (20) from Tadjikistan, note the difference in tibial apophyses. 21–22 Comparison of tibiae of pedipalps in two specimens of *C. micans*, from Kagok, Java, and from Bhutan (22).

*mana* Simon, 1899, Kagok [Java, Indonesia]" coll. W. Kulczyński, IZ PAN-Warsaw; 1 ♂, 1 ♀ *Cyrba tadjhika* Andreeva, 1969, USSR: Tadjikistan, coll. det. Andreeva. 1 ♂ "*Cyrba algerina*, Canarial, F. 527" coll. W. Kulczyński, IZ PAN-Warsaw; 1 ♂ *Cyrba algerina* (Luc.) USSR: Tadjikistan coll. det. Andreeva.

Description of male: Cephalothorax dark brown, with paler areas in the posterior part of eye field and anterior thorax. A thin white line behind the fovea. Surroundings of lateral eyes black.

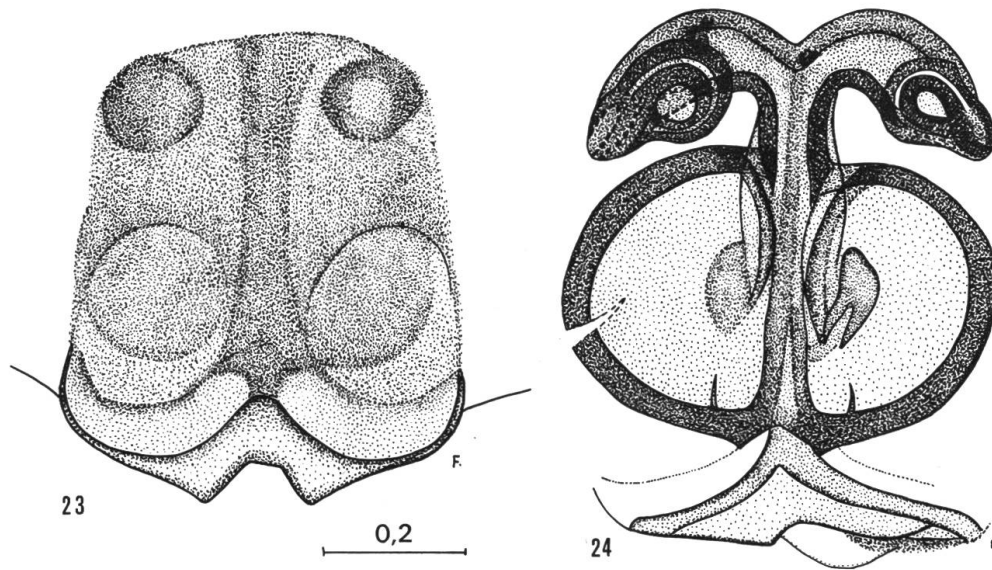
Abdomen elongated and narrow, brownish, covered with adpressed setae, dark brown mixed with colourless but gleaming ones. Conspicuous white setae on the anterior tip of the abdomen; there are also white setae on the posterior tip of the abdomen, on the dorsal surface of the spinnerets and on the anal cone. The dorsal surface of the abdomen is hardened and forms a scutum. Ventral surface of the abdomen greyish yellow.

Sternum and coxae greyish yellow, maxillary plates and labium pale fawn, whitish tipped. Pedipalps dark brownish grey, with the dorsal femoral surface covered by short white setae. General appearance of the legs dull yellowish grey, with tarsi and metatarsi somewhat paler. The tibia I darker with two contrasting transversal white spots on the prolateral surface. The dorsal surface of femora lighter, with a mixture of inconspicuous whitish setae. The paler area on femur I is limited to the proximal part of the segment, on femora III–IV reduced to the paler edges of the dorsal surface. There is no trace of any special brush or clump of setae on legs I, which could be compared with that of several species of *Linus*.

The palpal organ structure of *C. micans* specimens from Bhutan and Java, as well as that in *C. algerina* from Tadjikistan is shown on figs. 19–22. Measurements: length of cephalothorax 2.60, length of abdomen 2.96.

Description of female: Resembles the male in general appearance, but more dull. — Abdomen uniformly brownish grey without any patches of white setae and any traces of scutum. Tibia I devoided of contrasting white spots.

The epigynum forms a simple shield (fig. 23) without any distinct external structure. Copulatory openings (not perforated in the studied specimen) in the anterior part of epigynum, short and simple. The thick walled copulatory canals lead to large, spherical and thick walled spermathecae (fig. 24). Measurements. Length of cephalothorax 2.52, length of abdomen 3.00.



Figs. 23–24. *Cyrba micans*, epigynum and its internal structure.

The distribution of the species appears now to be rather wide — from Java to Vietnam and to Tadjikistan, the Bhutan and the known to me Nepal collecting localities fit well into that range.

#### *Cyrba tibialis* n. sp.

Material: 1 ♂ holotype Bhutan: Phuntsholing, 21.IV.1972. Coll. Exped. NHM-Basel.

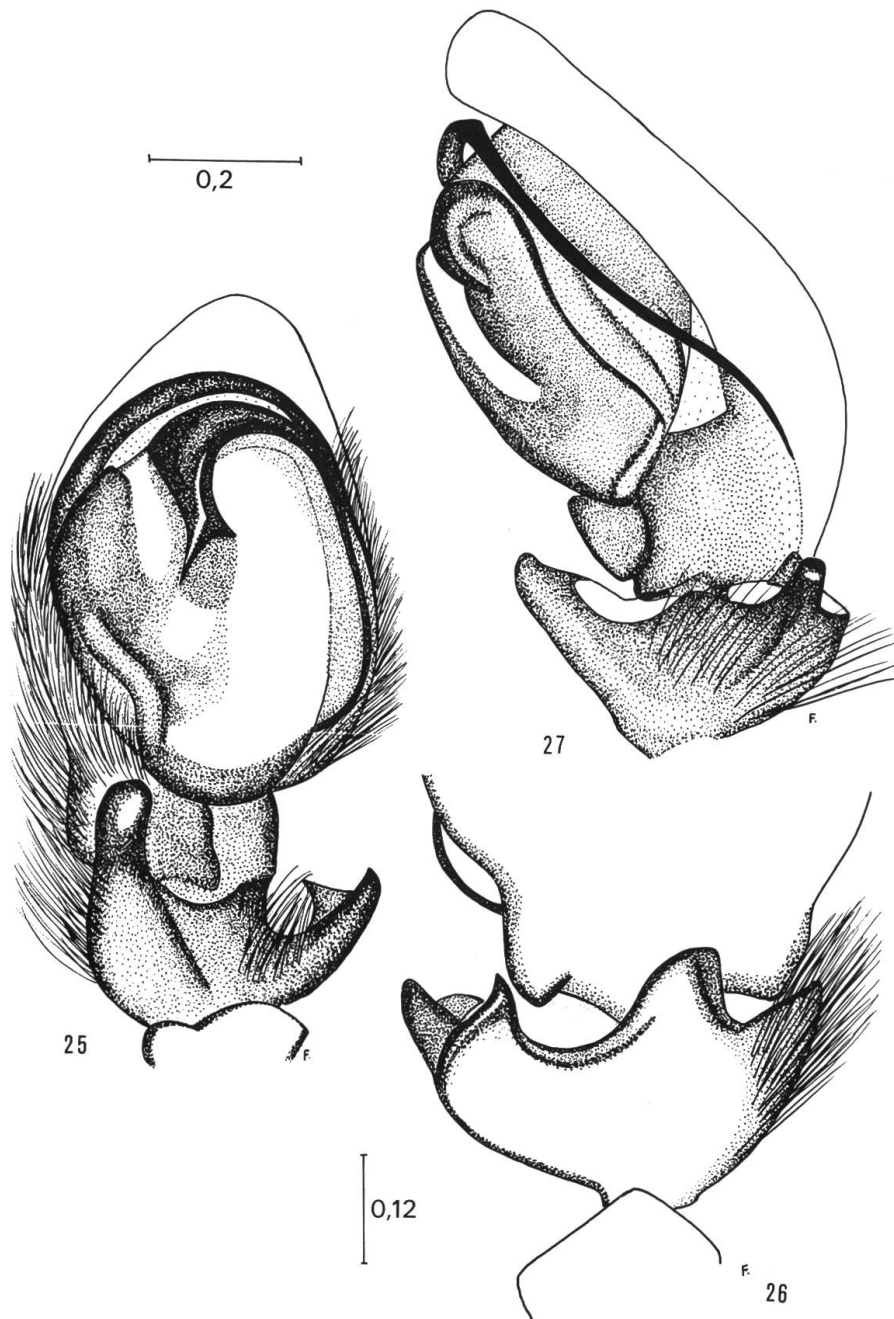
Description of male: Cephalothorax rather broad, brownish grey, with eye field paler, surrounding of eyes lateral black, forming an irregular broad lateral bordering line of the eye field.

Abdomen short, flattened dorsally and broadened posteriorly, with hardened surface. Colour greyish brown, with a blackish triangle in front of the pale yellowish spinnerets. A brush of short grey and blackish setae protruding on the anterior edge of the abdomen. Remnants of gleaming, colourless scales and some adpressed white setae on the dorsal surface.

Sternum, coxae, labium and maxillary plates whitish yellow, abdomen ventrally greyish. Chelicerae yellowish.

Pedipalpal femur yellowish with a mane of blackish and greyish setae dorsally and anterolaterally. Patella yellowish, tibia and broad cymbium dark brownish dorsally, with a yellowish tip of cymbium. The shape of the pedipalpal organ and tibia are characteristic and shown on

figs.25–27. Legs I and distal part of tarsus whitish, remaining part of tarsus, metatarsus and tibia dark brown; the latter with a white dorsal spot of setae distally ; patella and femur pale fawn. There is a characteristic brush of long and stout grey and black brownish setae ventrally



Figs.25–26. *Cyrba tibialis* n.sp. Palpal organ, ventral and lateral views, and details of pedipalpal tibia.

on tibia I and a clump of similar setae proximally on the ventral surface of femur. The opposite position of these two groups of setae suggests that they may cooperate in catching or holding the prey between these segments. Remaining legs II–IV whitish with a pattern of contrasting blackish grey rings on femora III–IV and metatarsus I. The rings on retrolateral surface of femur II are connected by a longitudinal dark line. That pattern varies to some extent on the prolateral and retrolateral surfaces of the respective segments. Measurements. Length of cephalothorax 1.48, length of abdomen 1.40.

Female unknown.

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