

JERZY PRÓSZYŃSKI and MAREK ŻABKA

REMARKS ON OLIGOCENE AMBER SPIDERS OF THE FAMILY SALTICIDAE

PRÓSZYŃSKI, J. and ŻABKA, M.: Remarks on Oligocene amber spiders of the family Salticidae. Acta Palaeont. Polonica 25, 2, 213–223, July 1980.

The relationships between amber preserved salticids and Recent genera from South-East Asia are established. The value of taxonomic characters is discussed and a new species *Eolinus tystschenko* described.

Key words: Baltic amber, spiders, Salticidae, Oligocene.

J. Prószyński, M. Żabka, Zakład Zoologii, Instytut Biologii Stosowanej, Wyższa Szkoła Rolniczo-Pedagogiczna, ul. Prusa 12, 08-100 Siedlce, Poland. Received: October 1979.

INTRODUCTION

Amber spiders were studied extensively by Petrunkevitch, who in series of papers described a number of species and made two important observations:

1) the morphology of Oligocene spiders does not differ significantly from that of the present ones, except that their genital organs are often more complicated than in Recent spiders;

2) the Oligocene spider fauna seems to be related to the Recent tropical faunae, especially to Oriental and East Ethiopian. There are 33 families and about 160 species of spiders preserved in amber (Petrunkevitch 1958).

The family Salticidae is represented in amber by 49 specimens (25 ♂♂, 9 ♀♀); 9 species are classified into 7 genera and 3 subfamilies. There are 4 additional generic and 8 specific names considered as *nomina nuda* or belonging to uncertain, unidentifiable species.

The systematic division of these species now seems to be unsatisfactory, as anticipated by Petrunkevitch himself. According to research on Recent genera of the family Salticidae done during the last 20 years (Prószyński 1972, 1976 and other papers) the basic taxonomic characters for delimitation of genera and subfamilies and for identification of species are supplied by the structure of the male and female genital organs. Unfortunately, the genital organs are seldom visible in spiders preserved in amber. Other

characters, also used by Petrunkevitch are either of limited value or entirely useless. Both, the general systematic division of the family as well as the systematics of Oriental and Ethiopian Salticidae have advanced considerably during last 20 years, which now permits the comparison of amber and Recent faunae.

The fossil material examined consists of two specimens of *Eolinus tystschenkoi* sp.n. preserved in amber: one specimen (holotype) in a piece of amber housed in the Museum of the Earth in Warsaw (abbreviated as MZ) and another one in a piece of amber which is personal property; both pieces were collected on the Baltic sea shore.

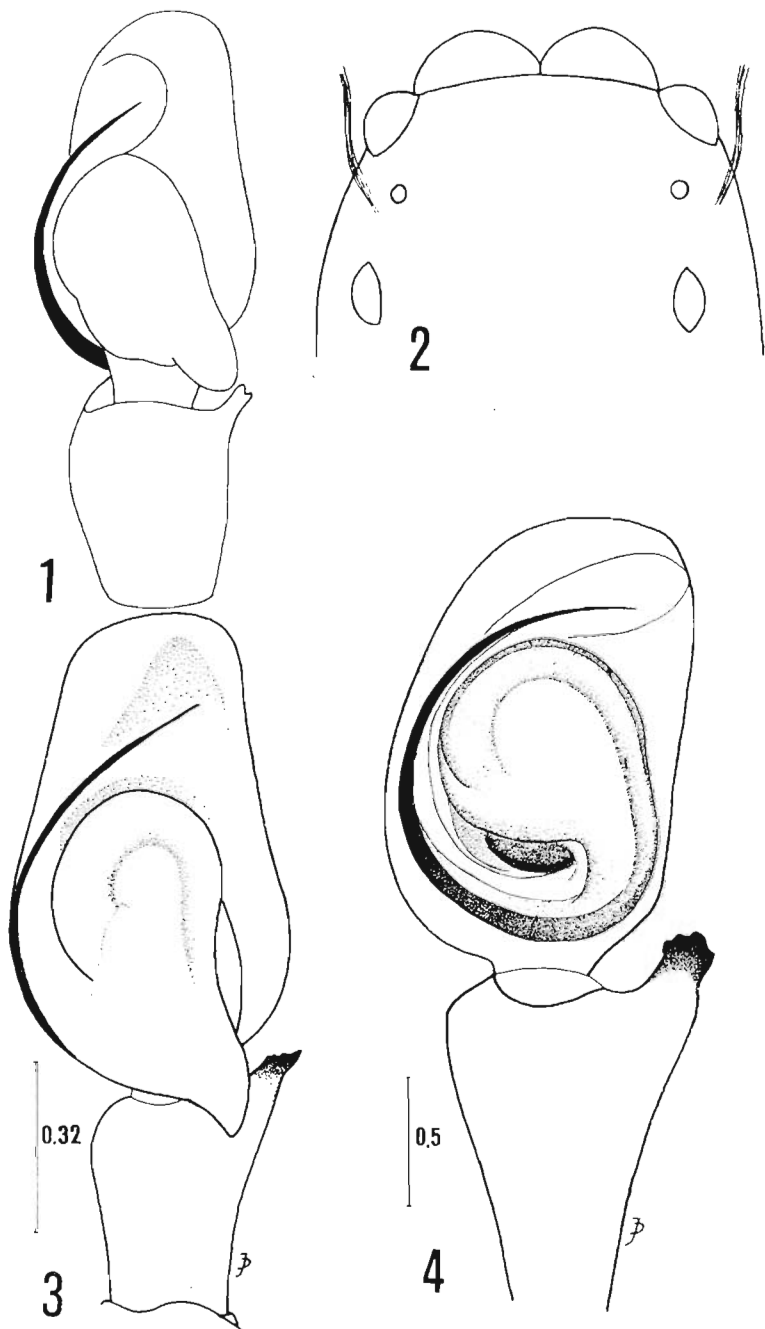
Recent material of spiders discussed: collections of South East Asian and West African Salticidae in the Muséum National d'Histoire Naturelle in Paris (MNHN) and in the Naturhistoriska Riksmuseet (NRM) in Stockholm.

RELATIONSHIPS OF BALTIC AMBER SALTICIDS

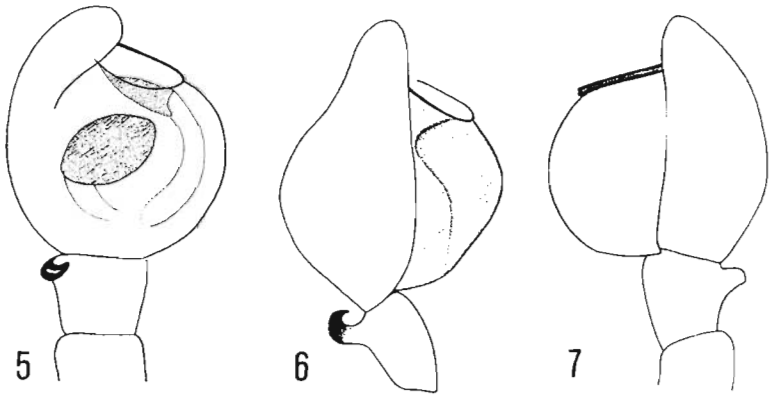
The first representative of the Baltic amber salticids, *Parevophrys succini* Petrunkevitch, 1942, is, according to its palpal organ (= genital organ) structure (figs 1, 2), closely related to the Recent genus *Hyllus* C. L. Koch, 1846, for example to *Hyllus pudicus* Thorell, 1885 from Birma, "*Sandalodes*" *semicupreus semicupreus* (Simon, 1885) from India (fig. 3) and "*Viciria*" *thoracica* Thorell, 1899 from West Africa (fig. 4). Therefore *Parevophrys* has little in common with the subfamily Heliophaninae Petrunkevitch, 1928 and should be rather classified into the subfamily Hyllinae Simon, 1901. The characteristic bunches of long setae, located beneath eyes II in *Parevophrys succini* are reminiscent of the Recent genus *Thyene* Simon, 1885, whose relationship to *Hyllus* remains unknown to us. *Thyene* resembles *Hyllus* in eye location and proportions and also in the shape of its laterally swollen cephalothorax. Its palpal organ differs from that in *Hyllus*, but could be, perhaps, derived from it.

The palpal organ in *Gorgopsina frenata* (Koch et Berendt, 1854) known from Baltic amber (figs 5—7), shows embolus coiled apically on bulbus, which is typical for a number of genera which I have proposed (J.P.) to unite into the subfamily Euophrydinae Simon, 1901 (*sensu* Prószyński 1976). Other details seen on Petrunkevitch's drawings (1942: figs 25, 27—28) are more difficult to interpret; a structure called conductor possibly seems to be a mistake. I think that we should retain Petrunkevitch's proposed subfamily Gorgopsininae for the time being, but suspected relationships with Euophrydinae should be studied again on new material.

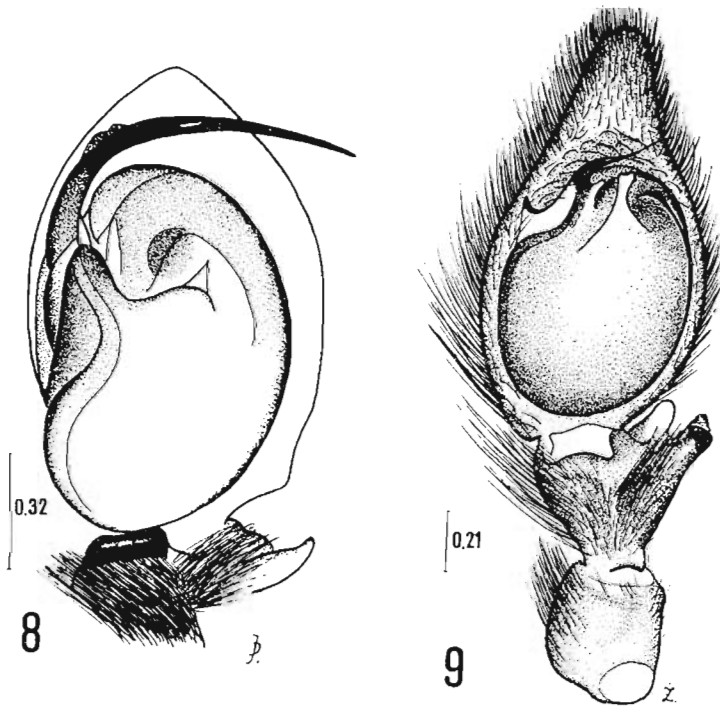
The subfamily Boethinae Simon, 1901 contains, according to Petrunkevitch, salticids having large eyes II, which are usually much reduced in other representatives of the family. The structure of the genital organs



Figs. 1—4. Fossil *Parevophrys succini* Petrunkevitch, 1942 and its Recent relatives. 1, 2 palpal organ and tufts of setae in *P. succini*; 3, 4 palpal organs in "*Viciria*" *thoracica* Thorell, 1899 (from Camerun, type specimen in NRM) and "*Sandalodes*" *semicupreus* (Simon, 1885) (from India, coll. Simon, MNHN). 1, 2 from Petrunkevitch, 1942, 3, 4 original).



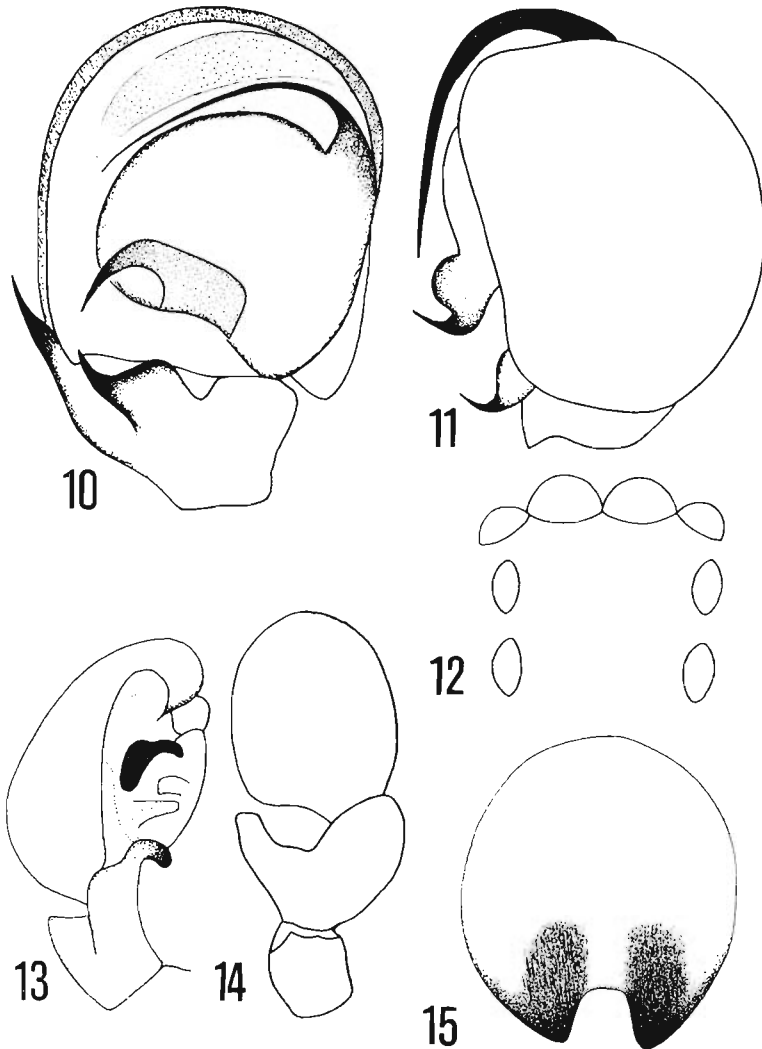
Figs. 5—7. Fossil *Gorgopsina frenata* (Koch et Berendt, 1854). Palpal organ resembling some Recent *Euophrys*, with coiled embolus. However, wedge shaped dark spot beneath the tip of embolus resembles rather of internal seminal receptacle canals than conductor, as was originally suggested. (From Petrunkevitch 1942).



Figs. 8—9. Palpal organs in Recent Boethinae: *Portia labiata* (Thorell, 1887) (8) and the undescribed yet *Portia* sp. from Vietnam (9). Note similarity of the general layout of the organ shown on fig. 8 to *Eolinus* (figs. 10—11, 25), the white protuberances in anterior part of the bulbs may be homologous vestiges of the robust bulbus apophysis of *Eolinus* (cf. figs. 10—11, 25). Note also strong development of tibial apophyses, rather rare in recent Salticidae. (Original).

of males and a female in genus *Eolinus* Petrunkevitch, 1942 (figs 10—15), as well as in a new species described below, do confirm the opinion on the resemblance and relationship of these spiders to the Recent genus *Linus* Peckham, 1885. The latter, according to the newest paper of Wanless (1978) is identical with another Recent genus *Portia* Karsch, 1878. It is also closely related to another Recent genus *Cyrba* Simon, 1876, which, however, has eyes II much reduced. This reduction of eyes II in closely related groups of species seems of prime importance, and calls for some caution in drawing very far reaching phylogenetical conclusions.

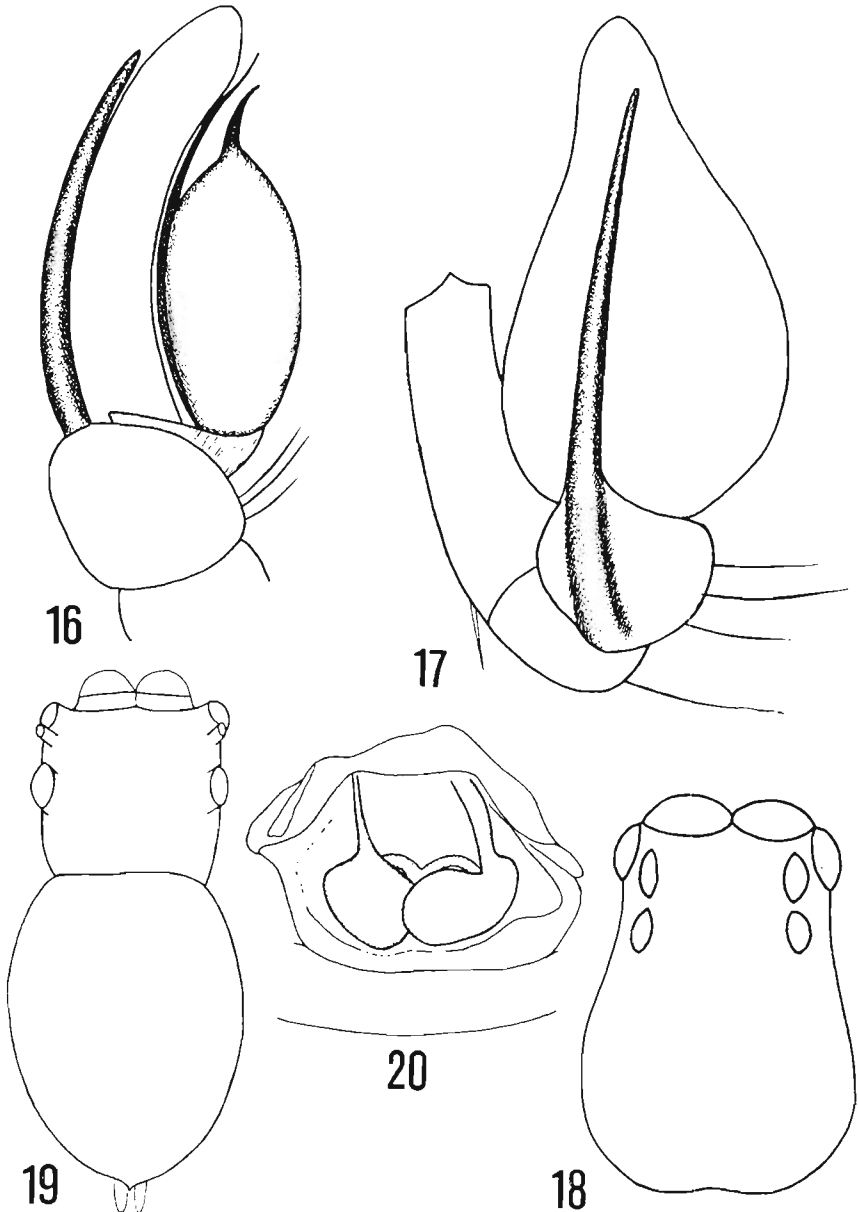
Some of the newly discovered Recent *Portia* species from Vietnam (Žabka, in preparation) have some vestiges of apophysis on the bulbus



Figs. 10—15. Key characters of *Eolinus theryi* Petrunkevitch, 1942. Female epigyne (15) resembles recent genera *Cyrba* and *Portia*. (From Petrunkevitch 1942).

(fig. 9), so striking in the case of *Eolinus*; it would be very interesting if these structures could be homologized.

The tibial apophysis is strongly developed in both *Eolinus* Petrunkevitch, 1942 and *Paralinus* Petrunkevitch, 1942. The eyes II are particularly large in *Almolinus* Petrunkevitch, 1958, which has also large apophysis on pedipalpal femur. The genus *Prolinus* Petrunkevitch, 1958 contains single female of uncertain systematic position.



Figs. 16—20. Key characters of *Paralinus crosbyi* Petrunkevitch, 1942 (16—18) and *Cenattus exophthalmicus* Petrunkevitch, 1942 (19—20). (From Petrunkevitch, 1942)

The species *Cenattus exophthalmus* Petrunkevitch, 1942, the only known representative of the genus *Cenattus* Petrunkevitch, 1942, has a female genital plate — epigyne (figs. 19—20), which resembles some Recent *Icius* Simon, 1876 (*sensu* Prószyński 1976). As this type of epigyne, with simple spermathecae and short straight copulatory canals, well visible through the semitransparent wall of the epigyne, could occur in other groups of the family Salticidae, it is difficult to decide now on the systematic position of that genus. This should be checked on new male specimens, however, it is possible that location of eyes on trunks could be less important than assumed by Petrunkevitch.

Summing up the above it appears that genital organs in amber preserved salticids are as important as in Recent genera. These are structures of prime importance, so generic and specific identification of immature specimens seems to be pointless, just as in the case of Recent fauna. The genital organs of amber salticids in comparison with Recent ones show difference in the magnitude found among related Recent genera. None of the amber salticids could be classified directly into any Recent genus, however this possibility may become a reality when both Recent tropical and amber salticid fauna become better known. In order to achieve this more efforts should be given to study of Recent Oriental and Ethiopian faunae of the family Salticidae.

DESCRIPTION

Family **Salticidae** Blackwall, 1841
Subfamily **Boethinae** Simon, 1901
Genus *Eolinus* Petrunkevitch, 1942

Eolinus tystschenkoi sp.n.
(figs. 21, 22, 23, 25, 26)

Holotype: Male specimen with destroyed abdomen, No MZ 14928; figs. 22, 23, 25, 26.

Other material (not allotype): Immature female in a piece of amber, personal property of Prof. V. P. Tystschenko, University of Leningrad; fig. 21.

Type locality: Unknown locality on the Baltic Sea shore.

Derivation of the name: In honour of Professor Victor P. Tystschenko of the University of Leningrad.

Diagnosis. — A typical salticid spider, with large eyes II, in males with forked tibial apophysis and robust process on the bulbus, as shown in figs. 25 and 26.

Description of holotype (dimensions in mm). — Dorsal aspect: Cephalothorax brownish-grey, covered with numerous scale-shaped grey setae and brown bristles. Eyes II almost as large as the III ones. Width of eyes I 1.23, width of eyes III 1.11.

Frontal aspect: Clypeus grey, covered with small, grey setae and brown bristles, some of which overhanging the bases of chelicerae. Chelicerae and maxillae brown.

Pedipalps brownish-grey, covered densely with light grey setae and brown bristles dorsally on tibia and cymbium. Palpal organ (figs. 25—26) with broadly oval and anteriorly truncated cymbium, bulbus with a robust apophysis in the form of a bent sclerotized plate with a narrowing and somewhat undulating tip. Embolus broad and single, arising anterolaterally, parallel to the anterior margin of the bulbus (fig. 25). Tibia with strongly developed apophyses, the ventral one short and stump, apparently supporting bulbus, the lateral one long and forked, with bent rami and pointed tips.

Legs resemble pedipalps in coloration and setae, with brown spines on femur, tibia and metatarsus. Length of legs: I $0.34 + 1.46 + 0.73 + 0.50 + 1.00$, II $0.46 + 0.65 + 0.57 + 1.26$. Legs III and IV invisible. Abdomen destroyed.

Comparison.—The general structure and eyes size resemble related *Eolinus* species, from which it differs in apophysis size and shape of the bulbus process (compare figs. 10—14 with 25—26).

Description of the immature specimen tentatively assigned to the species.—Dorsal aspect (fig. 21): Cephalothorax dark brown, near eyes and posteriorly most black. Covered with long, dark brown and also white setae, the latter more dense

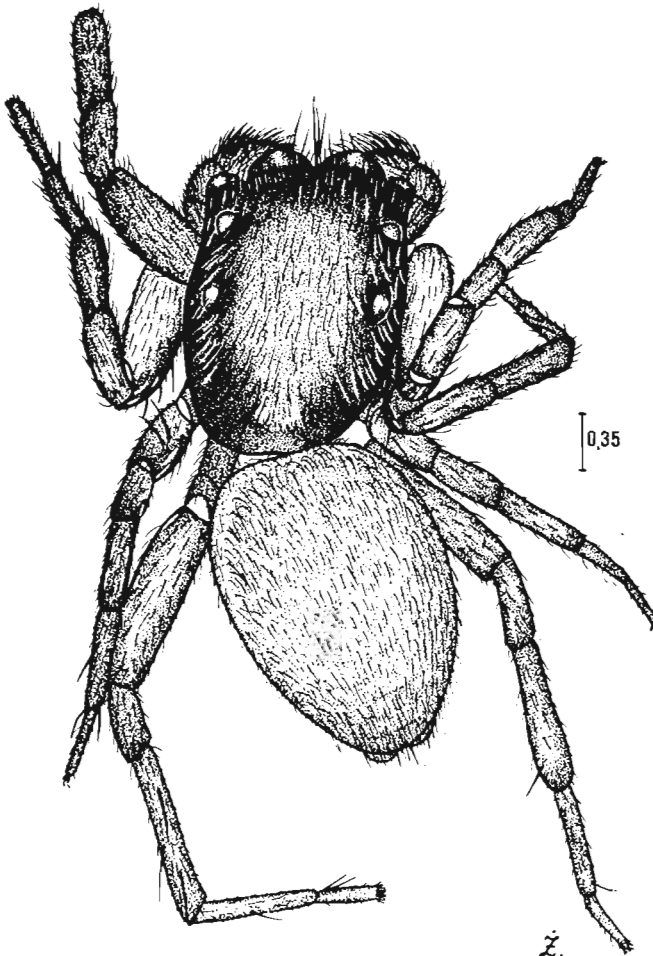
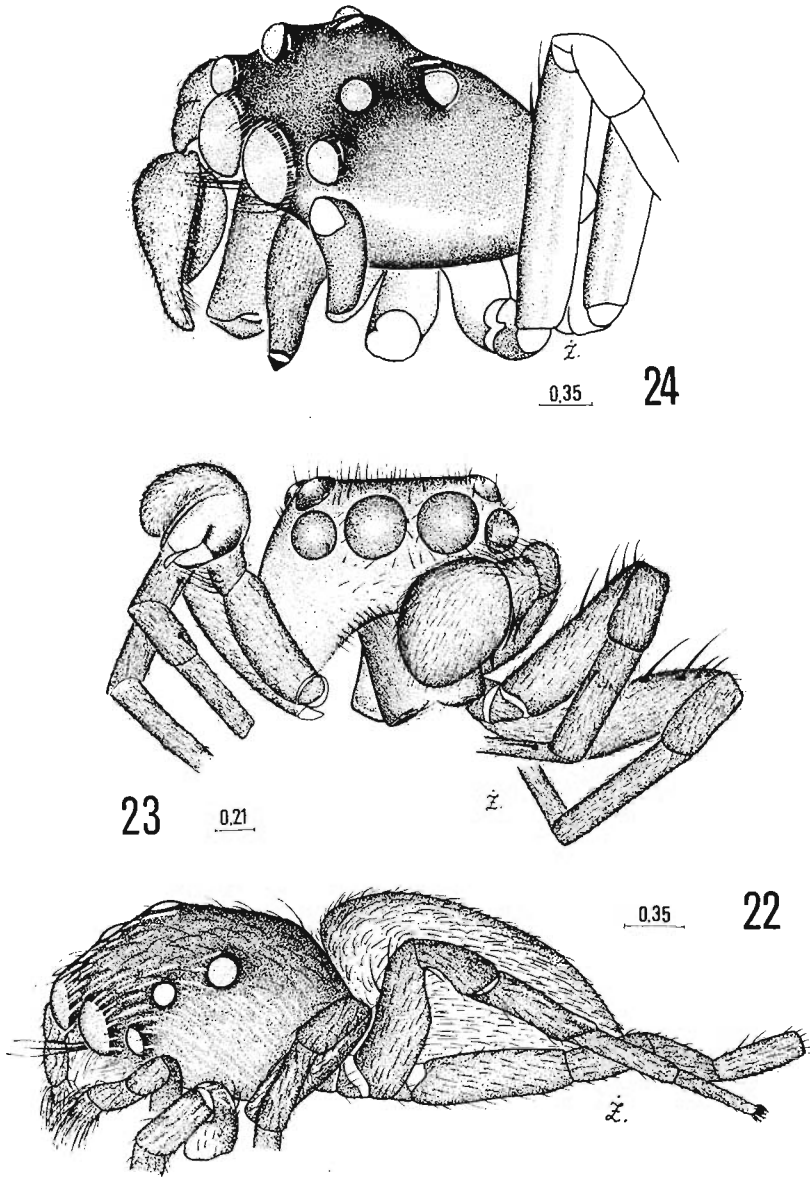
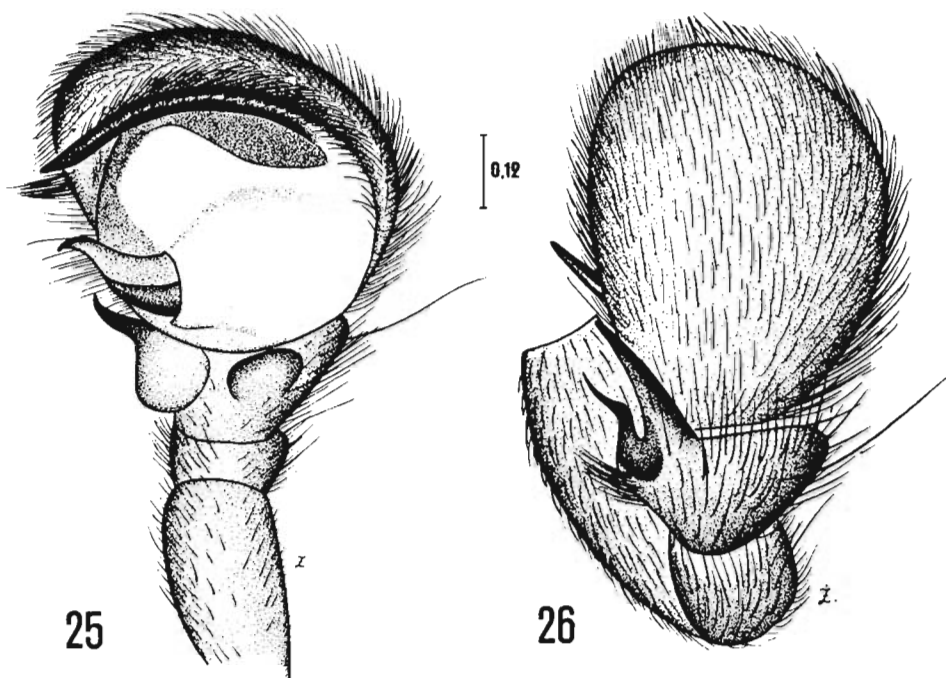


Fig. 21. *Eolinus tystschenkoi* sp.n., an immature female specimen from Leningrad, general view. (Original).



Figs. 22—24. *Eolinus tystschenkoi* sp.n., holotype (22, 23), coll. MZ 14928, compared with the undescribed Recent *Portia* sp. from Vietnam (24). (Original).

around eyes, posteriorly and on lateral surfaces. Eyes II large, almost as large as eyes I lateral. Length of cephalothorax 2.65, length of eye field 0.84, width of eyes I 1.19, width of eyes III 1.03. Dorsal surfaces of legs almost uniformly dark brown, with well visible greyish-brown setae and spines, also with white setae. Length of segments of legs: I $0+0+0.50+0.34+0.80$; II $0.38+0.50+0.61+0.42+1.03$; III $0.38+0.65+0.61+0.46+1.00$; IV $0.42+0.84+0.88+0.53+1.19$. Abdomen brownish-grey, posteriorly darker, with lateral surfaces paler, covered densely with grey and greyish-brown setae. Length of abdomen 1.96 mm.



Figs. 25—26. *Eolinus tystschenkoi* sp.n., holotype coll. MZ 14928, palpal ventral and dorsal views. (Original).

Frontal aspect: Clypeus pale brown, covered with grey setae, between eyes I median three long protruding setae, similar single setae beneath eyes I. Chelicerae invisible. Pedipalps greyish-brown, paler than legs, tarsus covered with numerous light setae.

Ventral aspect: Sternum, coxae and trochanters greyish-brown, ventral surfaces of remaining setae paler than the dorsal ones. Abdomen yellowish-grey, covered with grey setae, these are somewhat longer and darker near the epigastric furrow. Epigyne not yet fully developed, the specimen being presumably the penultimate instar. Anterior spinnerets short, with rounded tips.

REFERENCES

- PETRUNKEVITCH, A. 1942. A study of amber spiders. — *Trans. Conn. Acad. Arts Sci.*, **34**, 119—464.
- 1955. Arachnida. In: R. C. Moore (ed.), *Treatise of Invertebrate Paleontology*, Part P, 181 pp. Geological Society of America and University of Kansas Press, Lawrence.
- 1958. Amber spiders in European collections. — *Trans. Conn. Acad. Arts Sci.* **41**, 97—400.

- PRÓSZYŃSKI, J. 1972. Problems of classification of Salticidae (Aranei). Proc. 5th Int. Congr. Arachn., Brno, 213—220.
- 1976. Studium systematyczno-zoogeograficzne nad rodziną Salticidae (Aranei) regionów Palearktycznego i Nearktycznego. — *Rozprawy WSP, Siedlce*, 6, 260.
- WANLESS, F. R. 1978. A revision of the spider genus *Portia* (Araneae: Salticidae). — *Bull. Brit. Mus. (Nat. Hist.), London*, 34, 83—124.
-

JERZY PRÓSZYŃSKI i MAREK ŻABKA

UWAGI O OLIGOCENSKICH PAJĄKACH RODZINY SALTICIDAE
Z BURSZTYNU

Streszczenie

Autorzy ustalają pokrewieństwo gatunków rodziny Salticidae z bursztynu bałtyckiego do współczesnych rodzajów, występujących przede wszystkim w Azji południowo-wschodniej, omawiają użyteczność taksonomiczną cech, oraz przedstawiają opis *Eolinus tystschenkoi* sp.n. z bursztynu bałtyckiego.

Praca była wykonana w ramach problemu MR II-6 finansowanego przez Polską Akademię Nauk.
