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A critical review of the spider genera *Apollophanes* O. P.-Cambridge, 1898 and *Thanatus* C.L. Koch, 1837 in North Asia (Araneae, Philodromidae)

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Contents

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Résumé

Deux espèces du genre *Apollophanes* et 19 espèces de *Thanatus* de la faune nord asiatique sont reconnues et revues. Les cartes de distribution et une clé de détermination pour toutes les espèces sont données. Cinq noms spécifiques sont mis en synonymie : *Thanatus albomaculatus* Kulczyński synonyme de *T. coloradensis* Keyserling, *T. kolymensis* Marusik synonyme de *T. arcticus* Thorell, *T. pallidus* Tyshchenko synonyme de *T. atratus* Simon, *Philodromus yiningensis* Hu & Wu synonyme de *Thanatus constellatus* Charitonov, et *Apollophanes lenensis* Marusik synonyme d'*A. macropalpus* (Paik). Deux nouvelles combinaisons, *Thanatus mongolicus* (Schenkel) (ex *Philodromus*) et *Apollophanes babaly* (Lyakhov) (ex *Thanatus*), sont proposées pour la première fois. Cinq nouvelles espèces sont décrites : *Thanatus lanatus* sp. n. (province de Khabarovsk), *T. ubsunurensis* sp. n., *T. tuvinensis* sp. n., *T. stepposus* sp. n. (ces trois dernières des montagnes du sud de la Sibérie) et *T. mikhailovi* sp. n. (région de l'Oural et Altaï).

Summary

Two species of the genus *Apollophanes* and 19 species of *Thanatus* are recognized and reviewed in the fauna of North Asia. Distributional maps and a key to all species are provided. Five specific names are newly synonymized : *Thanatus albomaculatus* Kulczyński with *T. coloradensis* Keyserling, *T. kolymensis* Marusik with *T. arcticus* Thorell, *T. pallidus* Tyshchenko with *T. atratus* Simon, *Philodromus yiningensis* Hu & Wu with *Thanatus constellatus* Charitonov, and *Apollophanes lenensis* Marusik with *A. macropalpus* (Paik). Two new combinations, *Thanatus mongolicus* (Schenkel) (ex *Philodromus*) and *Apollophanes babaly* (Lyakhov) (ex *Thanatus*), are proposed for the first time. Five new species are described : *Thanatus lanatus* sp. n. (Khabarovsk Province), *T. ubsunurensis* sp. n., *T. tuvinensis* sp. n., *T. stepposus* sp. n. (the three latter from the mountains of S. Siberia) and *T. mikhailovi* sp. n. (Uralsk Area and Altai).

Резюме

Дается обзор двух видов рода *Apollophanes* и 19 видов *Thanatus* в фауне Северной Азии. Даны карты распространения и определительные ключи ко всем видам. Впервые синонимизированы пять видовых названий : *Thanatus albomaculatus* Kulczyński с *T. coloradensis* Keyserling ; *T. kolymensis* Marusik с *T. arcticus* Thorell ; *T. pallidus* Tyshchenko с *T. atratus* Simon ; *Philodromus yiningensis* Hu & Wu с *Thanatus constellatus* Charitonov ; и *Apollophanes lenensis* Marusik с *A. macropalpus* (Paik). Впервые предложены две новые комбинации : *Thanatus mongolicus* (Schenkel) (ex *Philodromus*) и *Apollophanes babaly* (Lyakhov) (ex *Thanatus*). Описано пять новых видов : *Thanatus lanatus* sp. n. (Хабаровский край) ; *T. ubsunurensis* sp. n., *T. tuvinensis* sp. n., *T. stepposus* sp. n. (три последних с гор Южной Сибири) и *T. mikhailovi* sp. n. (Уральская область и Алтай).

Introduction

The genera *Apollophanes* and *Thanatus*, in my view, constitute the most complicated spider groups for identification among all the boreal philodromids. Therefore, no wonder that heretofore for northern Asia (i.e. Siberia and the Russian Far East, including Mongolia and northern provinces of Kazakhstan and China) we have only fragmentary data of these genera scattered in a number of faunistic and taxonomic papers (KULCZYŃSKI, 1885, 1901, 1908, 1916, 1926; SIMON, 1895; ODENWALL, 1901; SPASSKY & LAVROV, 1928; ERMOLAJEV, 1934; SYTSCHEVSKAJA, 1935; SAVELEYEVA, 1970, 1974, 1976; STERNBERGS, 1981; IZMAILOVA, 1989; ESKOV, 1988; MARUSIK, 1989, 1991; KOPONEN & MARUSIK, 1992; MARUSIK et al., 1992a, 1992b, 1993; LOGUNOV, 1992; LYAKHOV, 1996). Six of these works are most important (KULCZYŃSKI, 1885, 1901, 1908; SIMON, 1895; MARUSIK, 1991, and LYAKHOV, 1996), since several new species have been described in them from northern Asia: *Thanatus mediocris* Kulczyński, 1908, *T. nigromaculatus* Kulczyński, 1885, *T. sibiricus* Kulczyński, 1901; *T. cronebergi* Simon, 1895, *T. kolymensis* Marusik, 1991, *T. babaly* Lyakhov, 1996, and *Apollophanes lenensis* Marusik, 1991. Altogether 13 species of *Thanatus* and *Apollophanes* have been hitherto reported from the region at hand, of which sone findings either are in doubt or cannot be checked by the pertinent materials.

First, *T. mediocris* was recognisez to be an invalid species, as the syntypes of the species (examined!) are represented by juvenile specimens. Besides, the specimen (1 female) deposited in the Zoological Institute (St. Petersburg, Russia) and incorrectly labelled as "*T. mediocris*" does not belong to syntypes, it being in fact *T. arcticus*. Finally, the occurence of *T. mediocris* in E. Siberia has been recently reported by KOPONEN & MARUSIK (1992) and MARUSIK et al. (1993). However, a repeated examining of their specimen (1 female) showed it to be also *T. arcticus*. So, *T. mediocris* has to be excluded from the list of the Siberian *Thanatus*.

Second, two species, *T. sibiricus* described by KULCZYŃSKI (1901) from S. Siberia and *T. cronebergi* described by SIMON (1895) from Mongolia, have not been found among materials studied, since the original descriptions are insufficient to determine the species and I have been unable to examine the type specimens of them. Specimens of *T. sibiricus* are absent from the collection of the Institute of Zoology in Warszawa (Poland; checked personally in 1994). The holotype of *T. cronebergi* (1 female) has not been found in the collection of the MNHN (C. ROLLARD, personal communication), despite the fact that other species described by SIMON (1895) in the same work are deposited in the MNHN. Currently, I don't know where the type specimens of the two species could be deposited. The taxonomic status of both *T. sibiricus* and *T. cronebergi* thus calls for a special attention in the future.

Third, IZMAILOVA (1989: fig. 127) has erroneously recorded *T. pictus* L. Koch, 1881 from Irkutsk Area confusing it with either *T. nipponicus* Yaginuma, 1969 or a related species. It is known (TYSHCHENKO, 1971; PRÓSZYŃSKI & STAREGA, 1971; LYAKHOV, 1996) that the range of *T. pictus* seems to be restricted to S. Europe and Middle Asia only.

Fourth, one species, *T. rayi* Simon, 1875, hitherto reported from E. Kazakhstan area (SAVELYEVA, 1970, 1976, 1979) has not been found among materials studied. I was unable to restudy SAVELYEVA's specimens and thus the accuracy of her data remains to be seen separately.

Finally, most probably, the records of *T. sabulosus* (Menge, 1874) from Irkutsk Area and Transbaikalia (STERNBERGS, 1981; IZMAILOVA, 1989; question-marked circles on map 6) should belong to *T. coreanus*, as the distribution of *T. sabulosus* seems to be limited in the east by the Yenisei biogeographical barrier (presented data, see map 6).

Thus, the purposes of the present paper are: 1, to describe or redescribe and diagnose all N. Asian species from the genera *Thanatus* and *Apollophanes*, 2, to provide a key to all species of these genera found in the studied region, and 3, to propose several new synonyms and combinations recognized during the study.

Material and methods

A total of 782 specimens collected from about 81 localities of Siberia were used for this study. All specimens have been borrowed from or have been housed in the following museums:

AMNH: American Museum of Natural History, New York, U.S.A., N. PLATNICK.

CNC: Canadian National Collection, Ottawa, Canada, C. DONDALE.

ISE: Zoological Museum, Institute for Systematics and Ecology of Animals, Novosibirsk, Russia, D.V. LOGUNOV.

IZW: Institute of Zoology, Warszawa, Poland, W.B. JEDRYÇKOWSKI.

MNHN: Museum national d'Histoire naturelle, Paris, France, C. ROLLARD.

PSU: Chair of Zoology, Perm State University, Perm, Russia, S.L. ESYUNIN.

SMNH: Swedish Museum of Natural History, Stockholm, Sweden, T. KRONESTEDT.

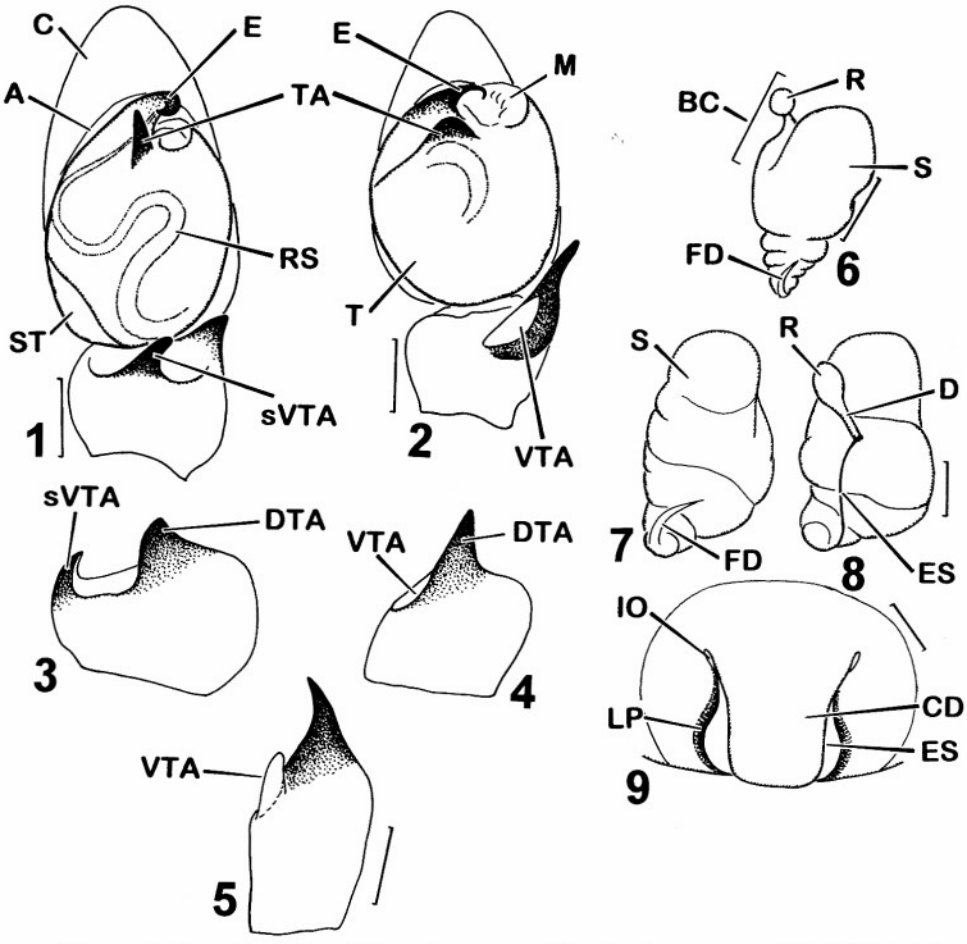
UT: University of Turku, Turku, Finland, M. SAARISTO and S. KOPONEN.

ZIS: Zoological Institute, St. Petersburg, Russia, V.I. OVTSHARENKO.

ZMMU: Zoological Museum of the Moscow State University, Moscow, Russia, K.G. MIKHAILOV.

The following abbreviations have been accepted in the text and figures:

A: alveolus
AME: anterior medial eye
ap: apically
BC: bursa copulatrix
C: cymbium
CD: central division
D: duct of receptaculum
d: dorsally
DTA: dorsal tibial apophysis
E: embolus
ES: epigynal suture
FD: fertilisation duct
Fm: femur
IO: intromittent orifice
LP: lateral guide pocket
M: membranous area
MPC: membranous philodromid conductor
Mt: metatarsus
pr: prolaterally
Pt: patella
R: receptaculum
RS: receptaculum seminis
rt: retrolaterally
T: tegulum
TA: tegular apophysis
Tb: tibia
S: spermatheca
ST: subtegulum
sVTA: secondary VTA
v: ventrally
VTA: ventral tibial apophysis.



Figures 1-9. — Genitalia of *Thanatus* spp. and *Apollophanes* spp. – **1** & **3**, *T. striatus*, male palpus. – **2** & **4**, *T. arcticus*, male palpus. – **5**, *A. macropalpus*, male palpal tibia. – **6**, *T. arenarius*, spermatheca. – **7** & **8**, *T. arcticus*, spermathecæ. – **9**, ditto, epigyne. — Scale: 1, 2, 6-9: 0.1 mm; 3-5: 0.25 mm. Abbreviations explained in the text.

For leg spination, the system adopted is that used by ONO (1988). All measurements are in millimetres.

Only important taxonomic works are cited under each species. Relevant faunistic data are reported in the section "Distribution".

Morphological terms and the nomenclature for the genitalia accepted in the text are chiefly those used by SCHICK (1965), with three exceptions: 1, the term "receptaculum" (sensu JARVI, 1912) substitutes for "spermathecal organ"; 2, the term "tegular apophysis" substitutes for VBA; and 3, the term "membranous philodromid conductor" (MPC; figs 30, 59 & 73) substitutes for "conductor". The MPC in fact is not homologous to that in other spider groups. Moreover, it can usually be seen only when the palp is partially expanded (cf. figs 28 and 29). So, most probably,

the MPC should be considered a homologue to the distal hæmatodocha. The details of terminology are illustrated in figs 1-9.

Synopsis

New taxa described:
Thanatus lanatus sp. n. (Khabarovsk Province);
Thanatus tuvinensis sp. n. (Tuva, Khakassia);
Thanatus stepposus sp. n. (Tuva);
Thanatus ubsunurensis sp. n. (Tuva);
Thanatus mikhailovi sp. n. (Uralsk Area, Altai).
New synonyms (valid name right):
Apollophanes lenensis Marusik, 1991 = *A. macropalpus* Paik, 1979;
Thanatus kolymensis Marusik, 1991 = *T. arcticus* Thorell, 1872;
Thanatus albomaculatus Kulczyński, 1908 = *T. coloradensis* Keyserling, 1880;
Thanatus pallidus Tyshchenko, 1965 = *T. atratus* Simon, 1875;
Philodromus yiningensis Hu & Wu, 1989 = *Thanatus constellatus* Charitonov, 1946.
New combinations:
Apollophanes babaly (Lyakhov, 1996) (ex *Thanatus*);
Thanatus mongolicus (Schenkel, 1936) (ex *Philodromus*).
Species excluded from the list:
Thanatus pictus L. Koch, 1881;
Thanatus mediocris Kulczyński, 1908;
Thanatus rayi Simon, 1875.

Survey of species

Genus *Apollophanes* O. P.-Cambridge, 1898

Generic synonymy: see DONDALE & REDNER (1975: 1176).
Type species: *Tibellus punctipes* O. P.-Cambridge, 1891.

Remarks

The definition and diagnosis of *Apollophanus* have been adequately provided by SCHICK (1965) and DONDALE and REDNER (1975). Both presence of the protruded membranous ventral tibial apophysis (figs 12, 18) and lateral position of the receptaculum in the spermatheca (fig. 23) allow me to assign two Siberian species to the genus *Apollophanes*, namely *A. macropalpus* (Paik, 1979) and *A. babaly* (Lyakhov, 1996), their descriptions being given below. It is very likely that two other species, *Thanatus fornicatus* Simon known from Pakistan, Israel and Sinai (LEVY, 1977, 1991) and *T. pictus* L. Koch from S. Europe and Middle Asia (PRÓSZYŃSKI & STAREGA, 1971; LYAKHOV, 1996), should be assigned to the genus *Apollophanes* as well. This problem needs to be considered separately.

Key to N. Asian species of *Apollophanes*

1 — Tegular apophysis conspicuous (fig. 11), dorsal tibial apophysis short and wide (fig. 12), cardial mark on dorsum present (fig. 15), epigyne and spermathecæ as in figs 13-14 ..... *babaly*

(1) — Tegular apophysis inconspicuous (fig. 19), dorsal tibial apophysis long and narrow (fig. 18), cardial mark on dorsum absent (figs 16-17), epigyne and spermathecæ as in figs 21-24 ..... *macropalpus*

Apollophanes babaly (Lyakhov, 1996) comb. n.
(figs 10-15, map 1)

Material: – NOVOSIBIRSK Area: 2 males (ISE, 2262, 2263), Karasuk Distr., Krotovaya Lyaga Lake, 24.08-17.09.1981, V.V. Dubatolov. – ALTAI: 2 females (ZIS, 288-911), Zmeinogorsk Town, Novenskoye, 10.11.1909, coll.?

Diagnosis: see the key to species.

Distribution: Southern steppic regions of Western Siberia.

Habitat: meadows and dry steppes.

Description

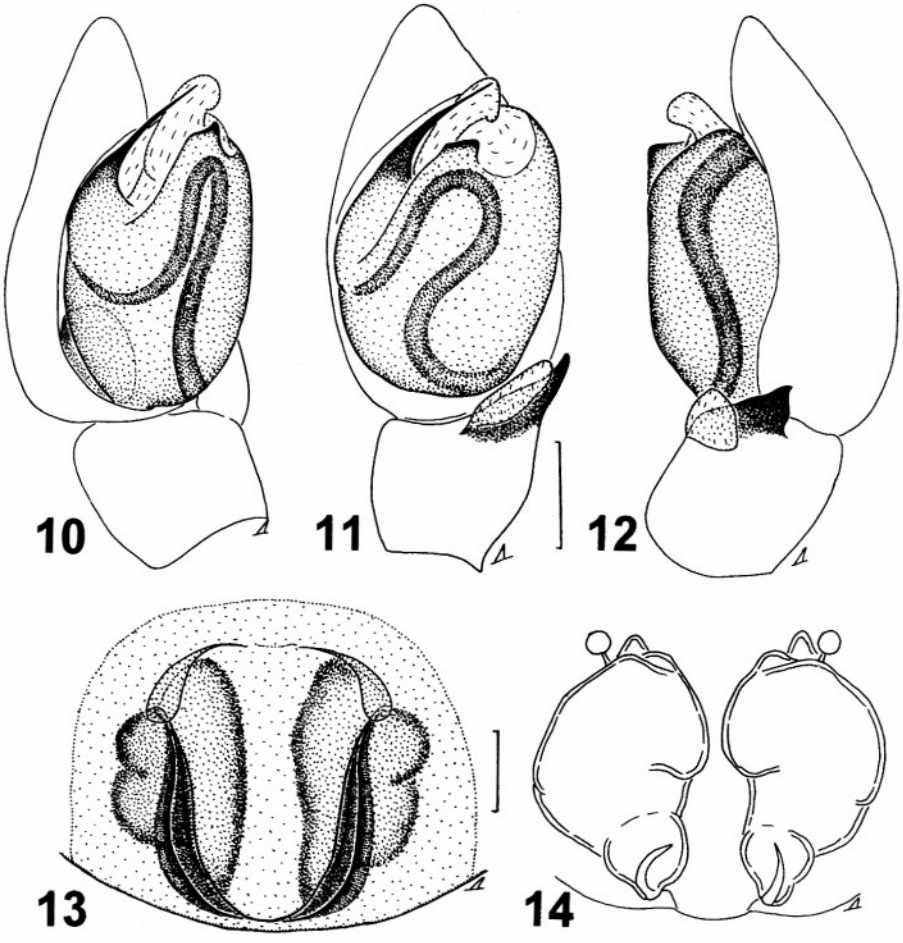
Male. Measurements. Carapace 2.40 long and 2.25 wide. Abdomen 3.13 long and 1.15 wide. Distances between eyes: AME-AME 0.13, AME-ALE 0.04, PME-PME 0.19, PME-PLE 0.21. Median ocular area: MOA-WA 0.29, MOA-WP 0.37, MOA-L 0.43. Clypeal height 0.33. Cheliceral length 0.80. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.53	1.13	2.03	1.75	1.50
Leg II	2.65	1.20	2.43	2.10	1.63
Leg III	2.83	1.15	2.25	2.03	1.48
Leg IV	3.33	1.15	2.75	2.75	1.75

Spination of leg I: femur d 0-1-1, pr 0-1-1-1; tibia pr 0-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration. Carapace yellow with pair of wide brown allatal stripes reaching anteriorly to clypeus. Clypeus brown. Thoracic suture area brown. Sternum yellow. Maxillae, labium and chelicerae sandy coloured. Abdomen: dorsum with brown cardiac mark (fig. 15), sides brownish, venter greyish with pair of yellow longitudinal stripes. Book-lung covers yellow. Spinnerets brownish yellow. All legs and palp sandy coloured. Palpal structure as in figs 10-12.

Female. Measurements. Carapace 2.73 long and 2.58 wide. Abdomen 3.95 long and 2.20 wide. Distances between eyes: AME-AME 0.17, AME-ALE 0.09, PME-PME 0.25, PME-PLE 0.27. Median ocular area: MOA-WA 0.34, MOA-WP 0.45, MOA-L 0.43. Clypeal height 0.43. Cheliceral length 0.93. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.65	1.18	2.03	1.60	1.20
Leg II	3.08	1.15	2.30	1.83	1.38
Leg III	2.73	1.08	2.08	1.58	1.18
Leg IV	3.13	2.40	1.20	2.08	1.10



Figures 10-14. — *Apollophanes babaly*. **10**, male palpus, median view. **11**, ditto, ventral view. **12**, ditto, lateral view. **13**, epigyne. **14**, spermathecæ. – Specimens: 10-12, Novosibirsk Area. 13-14, Altai. — Scale: 10-12, 0.2 mm; 13-14, 0.1 mm.

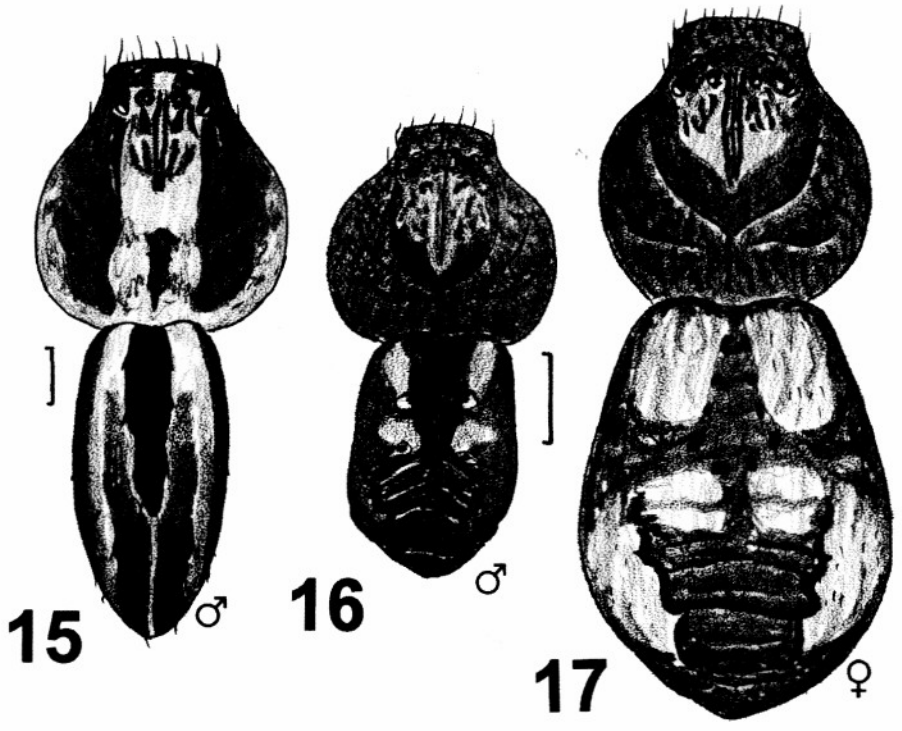
Spination of leg I: femur d 0-1-0, pr 0-1-1; tibia pr 0-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration as described for male. Epigyne and spermathecæ as in figs 13 & 14.

Apollophanes macropalpus (Paik, 1979)
(figs 5, 16-25, map 1)

Thanatus macropalpus Paik, 1979, Journal of Graduation School Education (Kyungpook National University), **11**: 120, figs 11-20 (male & female type serie, not examined).

Apollophanes macropalpus: Marusik, 1991, [Zoological Journal], **70** (10): 53 (from *Thanatus*).

Apollophanes lenensis Marusik, 1991, [Zoological Journal], **70** (10): 52-53, figs 2.2-4, 4.5 (male & female, type serie, examined). **New synonymy.**



Figures 15-17. — Body colouration of *Apollophanes* spp. – **15**, *A. babaly*, Novosibirsk Area. – **16** & **17**, *A. macropalpus*, Tuva. — Scale: 15, 0.5 mm; 16-17, 1 mm.

Material: – TUVA: 1 male, 3 females (ISE), Chagytai Lake, 1100 m elev., 28.06-1.07.1989, D.V. Logunov. – YAKUTIA: 2 males (ZMMU, holotype and paratype of *T. lenensis*), Zhigansk, July 1989, K.Y. Eskov; 1 female (ZMMU, paratype of *T. lenensis*), Adan River, 20 km NW of Meshhko-Adan, 5.08.1981, Kaimuk; 2 males (ZMMU, paratypes paratype of *T. lenensis*), Ust-Aldanskiy Distr., Alas Aalakh, 29.07.1987, coll.? – BURYATIA: 2 females (ISE), Selenga Distr., Tayozhniy, 1-7.08.1984, P.Y. Ustyuzhanin. – MARITIME PROVINCE: 1 male (ISE), Ussuri Distr., Gornotayozhnoe, 9-19.07.1990, A.V. Tanasevitch.

Diagnosis. This species is closely related to the North American species *A. margareta* Lowerie & Gertsch, 1955, but can be easily separated by the longer and curved anteriorly tibial apophysis in males and by the situation and shape of the lateral epigynal pockets. Differences from *A. babaly* are given above in the key.

Distribution. This species has been found in Tuva, Yakutia, the Russian Far East and Korea (PAIK, 1979) (map 1).

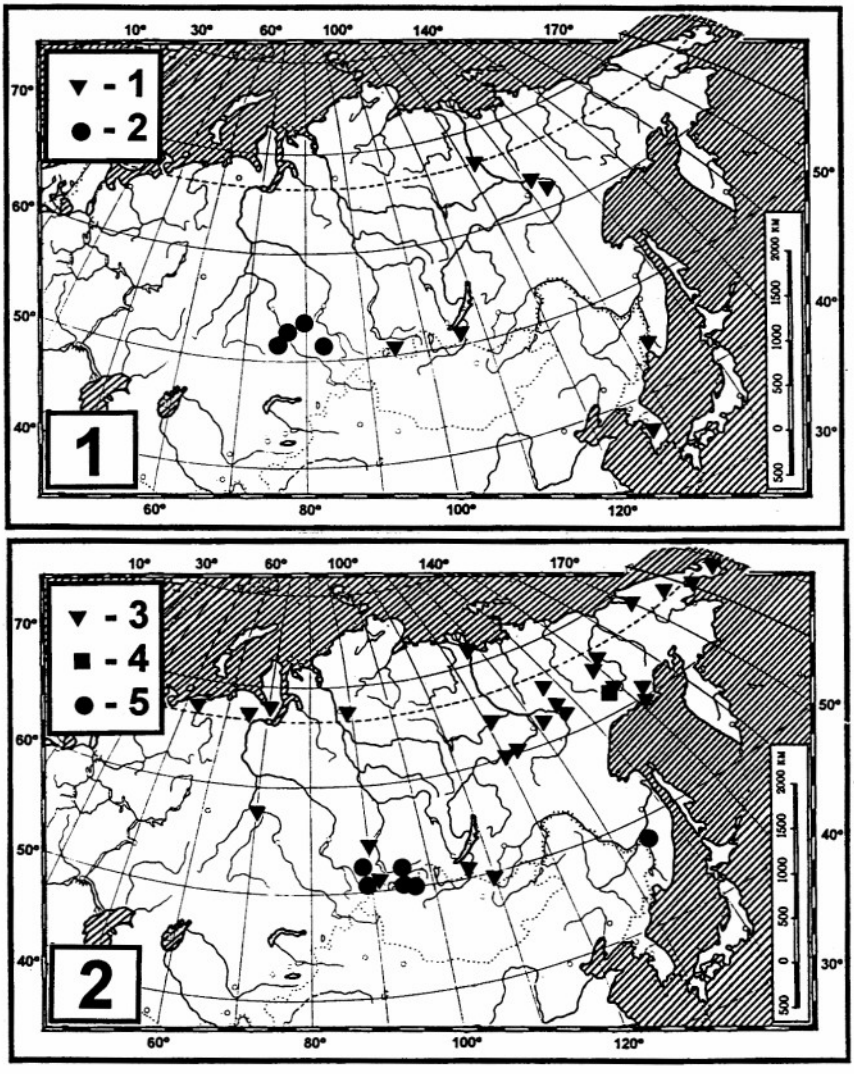
Habitat. The species can be collected by shaking of the crowns of coniferous (*Pinus*) trees and by sweeping the grass on clearings in the mixed forests.

Description

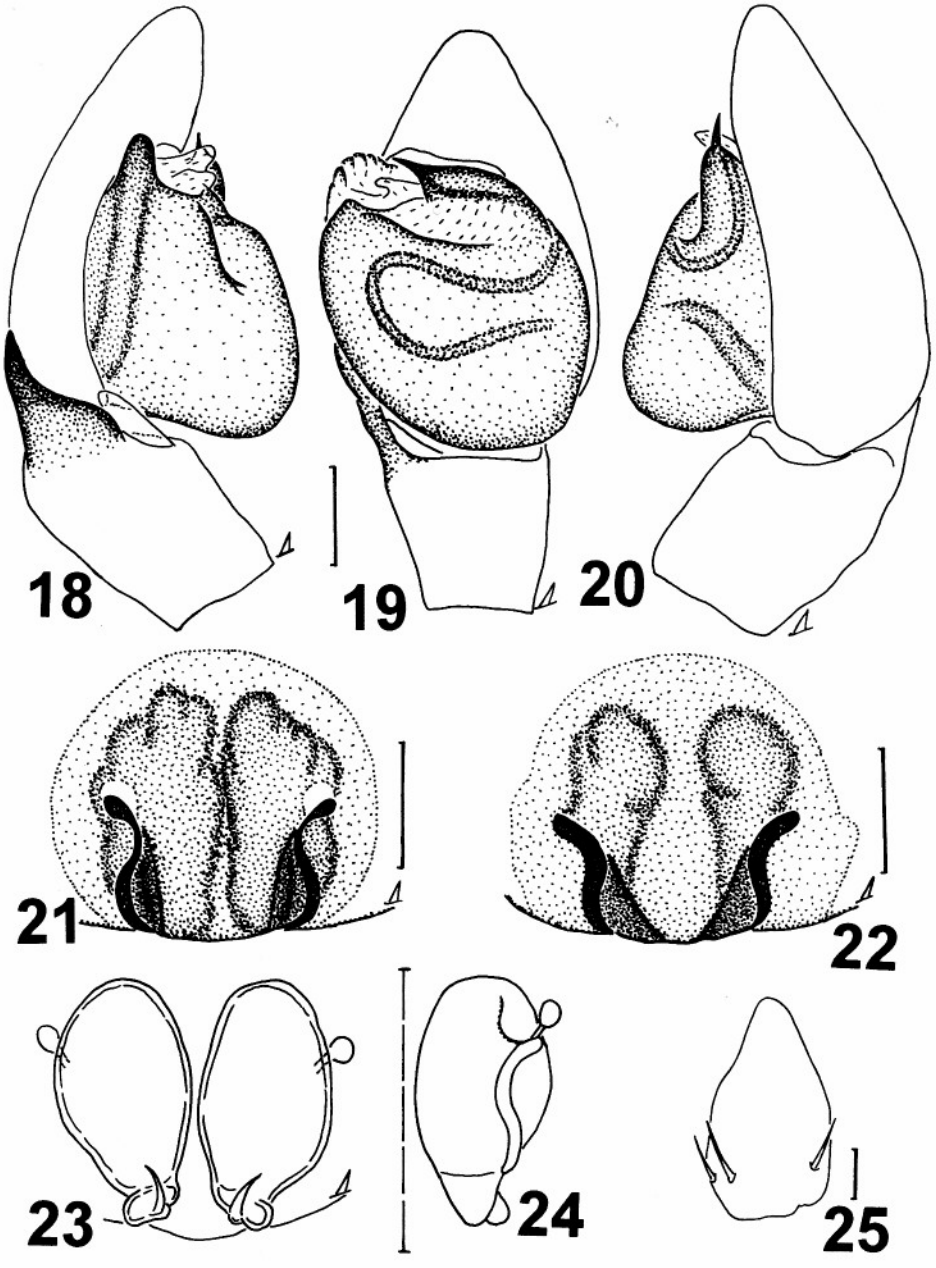
Male. Measurements. Carapace 2.70 long and 2.50 wide. Abdomen 2.88 long and 1.95 wide. Distances between eyes: AME-AME 0.14, AME-ALE 0.09, PME-PME

0.34, PME-PLE 0.19. Median ocular area: MOA-WA 0.34, MOA-WP 0.50, MOA-L 0.50. Clypeal height 0.40. Cheliceral length 0.85. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	3.60	1.38	3.28	2.90	1.98
Leg II	4.25	1.44	3.95	3.33	2.25
Leg III	3.55	1.45	3.85	3.35	2.23
Leg IV	3.60	1.08	2.68	2.38	1.68



Maps 1-2. — Distribution of *Apollophanes* spp. and *Thanatus* spp. – 1, *A. macropalpus*; 2, *A. babaly*; 3, *T. arcticus,* form A; 4, *T. arcticus*, form B; 5, *T. arcticus*, form C.



Figures 18-25. — *Apollophanes macropalpus*, from Tuva. – **18**, male palpus, lateral view. **19**, ditto, ventral view. **20**, ditto, median view. – **21-22**, epigynes. – **23-24**, spermathecæ. – **25**, male palpal cymbium. — Scale: 18-24, 0.25 mm; 25, 0.5 mm.

Spination of leg I: femur d 1-1-1, pr and rt 0-1-1-1; patella pr 0-1 or 0; tibia d 0-1-1, pr and rt 1-1-1, v 2-2-2ap; metatarsus pr and rt 1-1, v 2-2-0. Colouration. Carapace yellowish brown with dirty brown tinge. Sternum, maxillae, labium and chelicerae dirty brown. Abdomen: dorsum dark grey, practically without colour markings (fig. 16); venter grey-yellow. Book-lung covers yellow. Spinnerets brownish. All legs yellow with numerous brown patches. Palpal structure as in figs 18-20 & 25.

Female. Measurements. Carapace 3.45 long and 3.25 wide. Abdomen 5.05 long and 3.80 wide. Distance between eyes: AME-AME 0.21, AME-ALE 0.13, PME-PME 0.46, PME-PLE 0.28. Median ocular area: MOA-WA 0.50, MOA-WP 0.67, MOA-L 0.56. Clypeal height 0.50. Cheliceral length 1.38. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	3.40	1.55	2.85	2.05	1.65
Leg II	3.95	1.65	3.40	2.75	1.83
Leg III	3.30	1.40	2.65	2.25	1.50
Leg IV	3.35	1.28	2.65	2.40	1.50

Spination of leg I: femur d 1-1-1-1, pr and rt 0-1-1-0; tibia d 0-1, pr and rt 1-1-1, v 2-2-2ap; metatarsus pr and rt 1-1, v 2-2-0. Colouration as described for male, but dorsum with colour markings (fig. 17). Epigyne and spermathecae as in figs 21-24.

Genus *Thanatus* C.L. Koch, 1837

Generic synonymy: see BONNET (1959: 4397).
Type species: *Araneus formicinus* Clerck, 1757.

Remarks

The definition and diagnosis of the genus *Thanatus* have been provided by DONDALE et al. (1964), SCHICK (1965) and LEVY (1977). Until recently, eight species of *Thanatus* have been recorded or described from Siberia (MARUSIK, 1991), of which two, *T. kolymensis* and *T. albomaculatus* are synonymized herein for the first time. Nineteen species, of which 5 are new to science, are treated below.

The genus *Thanatus* was herein recognised to consist of at least four well-defined groups which may be represented by the following species: 1, *formicinus* Clerck, 2, *bungei* Kulczyński, 3, *striatus* C.L. Koch, and 4, *sabulosus* Menge. All these species groups are defined and diagnosed below, all species included being arranged alphabetically within each group.

Key to North Asian species of *Thanatus*

1 — Secondary ventral tibial apophysis (sVTA) present 2
(2) — Secondary ventral tibial apophysis absent 9

2 — Embolus long and apically thread-like (figs 106-118) 3
(2) — Embolus short with a massive base (figs 191, 208) 4

3 — The apical membranous lobe of the tegulum swollen (fig. 119), female genitalia as in figs 122-123 ..... *constellatus*
(3) — The apical membranous lobe of tegulum depressed (fig. 107), female genitalia as in figs 114-117 ..... *bungei*

4 — Dorsal tibial apophysis (DTA) rounded at tip (fig. 192) 5
(4) — Dorsal tibial apophysis sharpen at tip (fig. 209) 6

5 — Tegular apophysis rounded, embolar base relatively thin (fig. 191), central division of epigyne not constricted (figs 198 & 201) ..... *atratus*
(5) — Tegular apophysis sharpen, embolar base relatively wide (fig. 196), central division of epigyne constricted (fig. 204) ..... *vulgaris*

6 — Dorsal tibial apophysis (DTA) wide and massive (fig. 229), epigynal suture and lateral guide pocket adjoining (fig. 231) ..... *striatus*
(6) — Dorsal tibial apophysis thin and rather long (figs 209 & 220), epigynal suture and lateral guide pocket separated (fig. 212) 7

7 — Tegular apophysis square (fig. 235), female genitalia as in figs 239-241. ..... *tuvinensis*
(7) — Tegular apophysis oblong (fig. 208), female genitalia different 8

8 — Embolus strongly widened at base, its tip very short, tegular apophysis sharpen (fig. 219), female genitalia as in figs 222-226 ..... *mikhailovi*
(8) — Embolus relatively little widened at base (fig. 208), tegular apophysis not sharpen, female genitalia as in figs 212-214 ..... *lanatus*

9 — Dorsal tibial apophysis (DTA) flat and strongly curved backwards, ventral tibial apophysis (VTA) bulge-shaped (fig. 97), female genitalia as in figs 100-102, body colouration as in figs 180-181 ..... *ubsunurensis*
(9) — Dorsal tibial apophysis otherwise, ventral tibial apophysis flat or not developed 10

10 — Dorsal tibial apophysis (DTA) with extremely swollen base (fig. 93) .. .. *nipponicus*
(10) — Dorsal tibial apophysis otherwise 11

11 — Dorsal tibial apophysis (DTA) flat, triangular and often bifurcated (figs 126 & 129), epigyne anteriorly with pair of black spots (fig. 132), bursa copulatrix prominent (fig. 135) ..... *arenarius*
(11) — Dorsal tibial apophysis and female genitalia otherwise 12

12 — Tegular apophysis not prominent (figs 88 & 139) 13
(12) — Tegular apophysis prominent 14

13 — Dorsal tibial apophysis (DTA) wedge-shaped (fig. 88) ... *mongolicus*
(13) — Dorsal tibial apophysis stiletto-shaped (fig. 185), female genitalia as in figs 187-189 ..... *miniaceus*

14 — Dorsal tibial apophysis (DTA), at least its apical half, tube-like (fig. 139) 15
(14) — Dorsal tibial apophysis as a rose thorn (fig. 166) 16

15 — Dorsal tibial apophysis (DTA) widened at base (fig. 139), bursa copulatrix hidden under spermathecæ in dorsal view (fig. 148), body colouration as in figs 158-159 ..... *coreanus*

(15) — Dorsal tibial apophysis not widened at base (fig. 145), bursa copulatrix not hidden in dorsal view (fig. 154), body colouration as in figs 156-157 .. .. *sabulosus*

16 — Embolus extremely long, thread-like (figs 58-60), dorsal tibial apophysis (DTA) keel-shaped (figs 62-63), female genitalia as in figs 68-72 .... *coloradensis*

(16) — Embolus, dorsal tibial apophysis and female genitalia otherwise (figs 160-175) 17

17 — Dorsal tibial apophysis (DTA) at marked angle to retrolateral face of tibia, embolar tip short (fig. 161), epigynal sutures tipped toward each other (figs 167 & 171) ..... *stepposus*

(17) — Dorsal tibial apophysis more nearly parallel to retrolateral face of tibia, embolar tip rather long (figs 27 & 74), epigynal sutures subparallel (figs 32 & 81) 18

18 — Tegular apophysis as a chitinous scale (fig. 74), female genitalia as in figs 79-83, body colouration as in fig. 105 ..... *formicinus*

(18) — Tegular apophysis as a bulge (fig. 27), female genitalia as in figs 32-39, body colouration various (figs 40-44) ..... *arcticus*

The *formicinus* species group

Male palpus: secondary tibial apophysis absent, ventral tibial apophysis developed as a pale hump on ventrobasal face of dorsal tibial apophysis or not distinct; dorsal tibial apophysis well developed, usually strongly sclerotized; tegular apophysis poorly developed or not distinct. Female genitalia: spermathecæ large, rather strongly sclerotized, with well developed transverse seams.

Eleven species are included in the group, of which seven are recorded in North Asia: *T. arcticus, T. coloradensis, T. formicinus, T. mongolicus, T. nigromaculatus, T. nipponicus* and *T. ubsunurensis*. Also included: *T. imbecillus* L. Koch from the Caucasus and Middle Asia (CHARITONOV, 1932; LYAKHOV, 1996), *T. kitabensis* Charitonov from Middle Asia (CHARITONOV, 1946; LYAKHOV, 1996), *T. meronensis* Levy from Israel (LEVY, 1977), and *T. rubicellus* Mello-Leitão from the cool temperate regions of USA and Canada (DONDALE et al., 1964). Of these species *T. imbecillus* and *T. meronensis* are included provisionally, as male palpi of these species differ from other members of the group in the peculiar folded and bidentate dorsal tibial apophysis (s. LEVY, 1977: fig. 55).

Thanatus arcticus Thorell, 1872
(figs 2, 4, 7-9, 26-57, map 2)

Thanatus arcticus Thorell, 1872, Öfvers. Kongl. Vet. Akad. Förhandl., **29** (2): 157 (immature female).

Thanatus arcticus : Holm, 1958, Arkiv för Zool. Utg. Kungl. Svensska Vet., Ser. 2, **11** (3): 530, figs 6-8 (male).

Thanatus arcticus: Holm, 1967, Meddr. Grønland, **184** (1): 81, figs 97-101 (male, female).

Thanatus arcticus: Marusik, 1991, [Zoological Journal], **70** (10): 49, 50, 56, figs 1.5, 4.3-4 (male, female).

Thanatus kolymensis Marusik, 1991, [Zoological Journal], **70** (10): 48-51, figs 1.1-4, 4.1-2 (males, females; type serie, examined). **New synonymy.**

Material.

Form A (true *T. arcticus*). – TYUMEN AREA: the North Urals: 1 male, 2 females (PSU), Nereika, 25.06.1989, Y.I. Korobeinikov; 7 males, 5 females (UT), the Polar Urals, Krasniy Kameno, 30.06-17.07.1994, S. Koponen; 1 female (PSU), same locality, 17.08.1997, coll.?; Yamal Peninsula: 1 male, 2 females (PSU), the middle flow of the Khadyta-Yakha River, July 1981, S.L. Esyunin. – KEMEROVO AREA: 1 male, 2 females (ISE), about 50 km S of Belogorsk, Kuznetskiy Alatau Mt Range, Tchemodan Mt, 27.08.1994, N.B. Demidenko. – TUVA: 6 males, 4 females (ISE), 8-9 km East of Mugur-Aksy, Tsagan-Shibetu Mt Range, 2700 m elev., 22.07.1993, D.V. Logunov; 1 male (ISE), 30-35 km SE of Mugur-Aksy, Mongun-Taiga Mt, 3100-3300 m elev., 23.07.1993, D.V. Logunov. – BURYATIA: 1 male, 1 female (ISE), Selenga Distr., Tayozhniy, 30.07.1984, B.P. Zakharov. – CHITA AREA: 7 males, 1 female (ISE), 60-65 km SW of Kyra, Sokhondo Reserve, 1300-1600 m elev., 11.06-3.07.1991, D.V. Logunov & S.E. Tchernyshov. – YAKUTIA: 1 female (ZIS, determined as *T. mediocris*), Jana [69°5'E-70°5' N], Domulakh River, 23.07-11.08.1885, coll.?; 1 female (UT, determined as *T. mediocris*), Ljampeshka, Lena valley, 15.07.1977, S. Koponen. – MAGADAN AREA: 7 males, 1 female (ISE), Vetrenniy, 20.07-3.08.1987, V.V. Tcheitva; 1 female (PSU), Magadanskiy Reservation, 5.07.1987, O.Y. Mosina. – U.S.A.: 1 male, 2 females (AMNH), Alaska, 25.05-28.08.1948, M.H. Tohnson & N.A. Weber; 1 female (CNC), same locality, 26.06.1959, R.K. Leech. – CANADA: 7 males, 1 female (CNC), N.W.T., Involutus Hills, 20-28.06.1980, L. Humble.

Form B (*T. kolymensis*). – MAGADAN AREA: 1 male (holotype of *T. kolymensis*), 1 female (paratype), the upper flow of Kolyma River, Kyuneballakh spring basin, 1000 m elev., 15.06.1988, Y. M. Marusik; 10 females (paratypes), same locality, 1986-1987, Y.M. Marusik; 1 male (paratype), same locality, Itrikan river basin, summer 1987, S.P. Bukhkalo; 1 female (ISE), the upper reaches of Kolyma River, Bolshoi Annachag Mt Range, Sibit-Tyellakh, 16.08.1985, Y.M. Marusik; 1 male (ISE), same locality, summer 1992, D.I. Berman; 2 males (ISE), same locality, summer 1987, Y.M. Marusik; 1 male (ISE), middle reaches of Kolyma River, Konokovaya River, June-July 1987, E.I. Khlebosolov.

Form C. – TUVA: 21 males, 26 females (ISE), environs of Mugur-Aksy, 1700-2700 m elev., 19.05-11.06.1990, 22.07.1993, D.V. Logunov & O.V. Lyakhov; 18 males[?], 10 females (ISE), 3-5 km N of Kyzyl-Khaiya, Mogen-Buren River, 15.06.1989, D.V. Logunov; 26 males, 13 females (ISE), environs of Kyzyl,

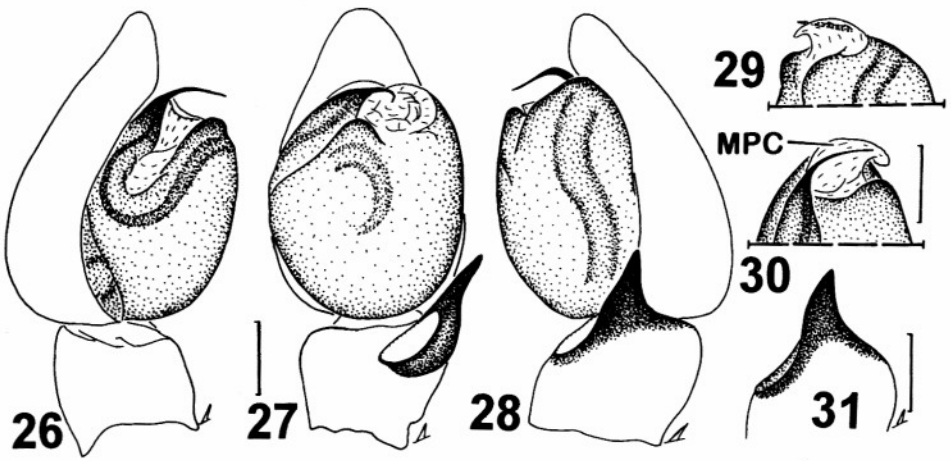
800-900 m elev., 3.07.1989, 1.06-1.07.1990, D.V. Logunov; 24 males, 34 females (ISE), environs of Erzin, 1000-1100 m elev. (50°14'N, 95°09'E), 23-24.05.1990, D.V. Logunov; 3 males (ISE), same locality, 9.06.1995, D.V. Logunov; 3 males, 3 females (ISE), 25-30 km W of Erzin, Ontchalaan Mt Range, 1200-1300 m elev., 21.05.1989, 25.05.1990, D.V. Logunov & O.V. Lyakhov; 2 females (ISE), 5-7 km NW of Seserlig, 1200-1400 m elev., 29.06.1990, D.V. Logunov; 1 female (ISE), 5 km SW of Khovu-Aksy, 4.05.1990, D.V. Logunov; 2 females (ISE), 30 km NW of Khol-Oozhu, Kara-Khol Lake, 5.07.1989, D.V. Logunov; 1 male, 5 females (ISE), 4-5 km N of Tcherbi, 900-1000 m elev., 1.07.1990, D.V. Logunov. – ALTAI: 2 females (ISE), Altaiskiy Reservation, Tchulyshman Plateau, 5.06.1990, S. Rudenko. – KHABAROVSK PROVINCE: 1 female (ISE), 20-25 km SE of Khabarovsk, Bolshekhekhtsyskiy Reservation, 19.07.1987, D.V. Logunov.

Comparative material of *Thanatus rubicellus*. – U.S.A.: 3 males (AMNH), Texas, 8 miles NE of Sinton, 26.05.1960, H.E. Laughlin; 3 females (AMNH), Kansas, 10 miles NE of Ellsworth, 27.06.1975, R. Carter. – CANADA: 1 male, 1 female (CNC), Manitoba, 4 km W of Clear L., 11.07.1979, D.B. Lyons.

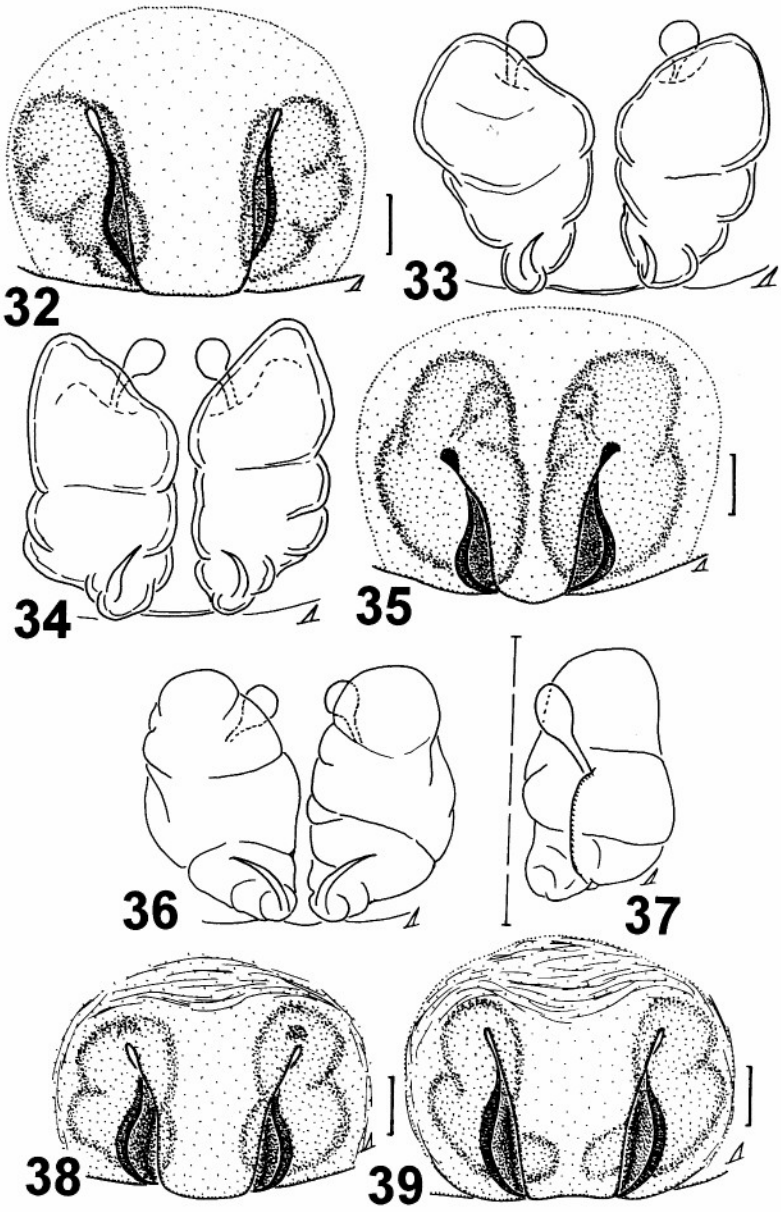
Diagnosis. *T. arcticus* is closely related to *T. formicinus*, but can be separated by the stronger tibial apophysis with a wider base (cf. figs 28 and 75), the shape of the tegular apophysis (figs 27 & 74), the greater number of cymbial spines (cf. figs 45-57 and 77), the less wrinkled spermathecae (figs 33-34 and 80 & 82) and the body colouration (figs 40-44 and 105).

Distribution. The species displays a holarctic (circumboreo-alpine) pattern of distribution. Localities in Siberia (separately for the tree forms) are shown in map 2. Previously recorded from Tobolsk environs (KULCZYŃSKI, 1916), the Polar Urals (ESYUNIN & EFIMIK, 1995), Central Siberia (ESKOV, 1985, 1988), Yakutia and Magadan Area (MARUSIK, 1989, 1991, 1993; MARUSIK et al., 1992a, 1992b, 1993).

Comments. *T. arcticus* is hereby defined as a polytypic, multi-raced, species. Three distinctive colour and dimensional morphs were recognized (figs 40-44), whereas no differences in the genitalic structure have been found between them.



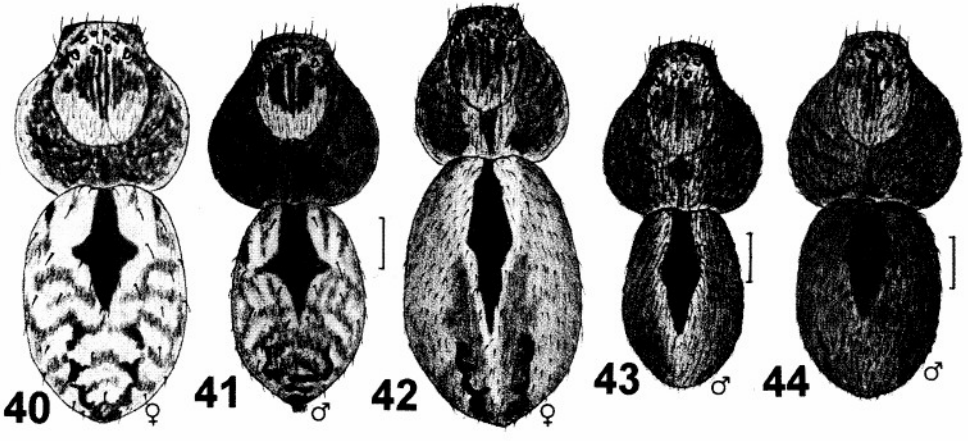
Figures 26-31.— *Thanatus arcticus,* male genitalia. **26**, male palpus, median view. **27**, ditto, ventral view. **28**, ditto, lateral view. **29**, apical division of the bulb, ventral view. **30**, ditto, dorsal view. **31**, male palpal tibia. – Specimens: 26-30: Chita Area; 31: Tuva. — Scale: 0.1 mm..



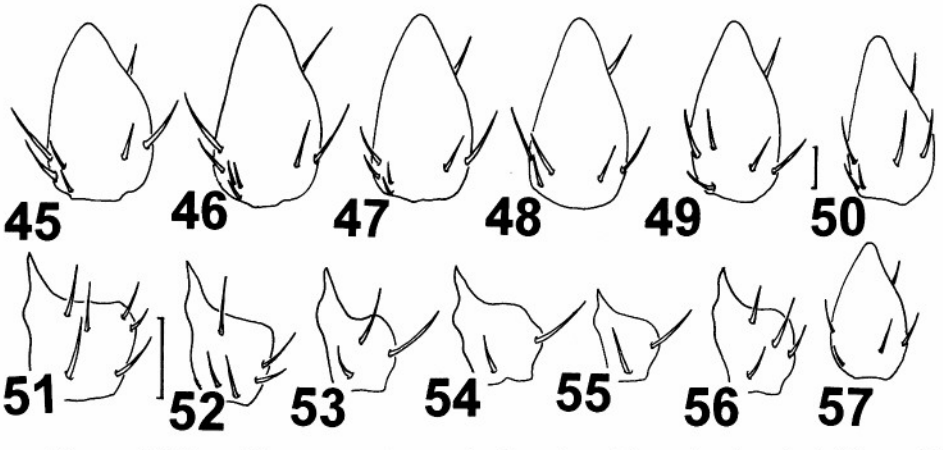
Figures 32-39. — *Thanatus arcticus*, female genitalia. **32, 35, 38** & **39**: epigynes. **33, 34, 36** & **37**: spermathecæ. – Specimens: 32, 33: Yamal Peninsula; 34, 35: Chita Area; 36, 39: Tuva. — Scale: 0.25 mm.

Contrary to MARUSIK's (1991) opinion, I should attach no taxonomic significance to the spination of the cymbium and palpal tibia, as well as to differences in size, for there are no differences in the genitalia. As can be seen from figs 45-57, the number of spines on the palp tibia, including their sizes, vary over wide limits (most probably, each separate race could exhibit its own pattern of spination and colouration). So, *T. kolymensis* is herein considered as a junior synonym of *T. arcticus*.

It is not unlikely that the North American species *T. rubicellus* can also be treated as a geographic race of *T. arcticus*. While examining the comparative materials of *T. rubicellus*, I could not find any visible morphological differences in the genitalia from *T. arcticus* in a manner like DONDALE et al. (1964). The latter authors have



Figures 40-44 — *Thanatus arcticus*, colour morphs. **40-41**, from C, Tuva. **42-43**, form A, Yamal Peninsula. **44**, form B, Magadan Area. – Scale: 1 mm.



Figures 45-57. — *Thanatus arcticus*, spination of cymbiæ and male palpal tibiæ. – **45-50, 57**: cymbiæ; **51-56**: tibiæ. – Specimens: 45, 46, 53 & 56: Chita Area; 47: Yamal Peninsula; 48-49: Polar Urals; 50: U.S.A., Texas; 57: Canada, Manitoba; 54: Tuva, Mongun-Taiga Distr.; 55: Tuva, Kyzyl; 51-52: Magadan Area. — Scale: 0.5 mm.

arbitrarily separated these species based on the assumption that *T. arcticus* is a low arctic species while *T. rubicellus* belongs to the cool temperate region.

Habitat. Form **A**: moss-stony tundra, mountain stony tundra (goltsy). Form **B**: on screes (from MARUSIK, 1991). Form **C**: dry steppe with *Nanophyton erinaceus* and *Artemisia-Stipa* steppes, mountain stony meadows, sloping stony steppes and wet meadows.

Description

Male. Measurements. Carapace 2.33-3.93 long and 2.20-3.60 wide. Abdomen 2.78-4.00 long and 1.70-2.70 wide. Distances between eyes: AME-AME 0.13-0.21, AME-ALE 0.06-0.14, PME-PME 0.23-0.33, PME-PLE 0.20-0.34. Median ocular area: MOA-WA 0.31-0.48, MOA-WP 0.40-0.60, MOA-L 0.47-0.59. Clypeal height 0.39-0.53. Cheliceral length 0.84-1.20. Length of segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.03-3.90	0.93-1.75	1.59-3.25	1.38-2.90	1.00-1.80
Leg II	2.40-4.50	1.05-2.00	1.88-3.90	1.55-3.40	1.08-2.00
Leg III	2.28-4.20	0.98-1.70	1.70-3.35	1.57-2.90	1.05-1.78
Leg IV	2.50-4.25	0.93-1.65	2.05-3.65	2.05-3.30	1.25-1.80

Spination of leg I: femur d 0-1-1-1 or 0-1-1-1-1, pr and rt 0-1-1-1; patella d 2ap or 0, pr 1-1 or 0, rt 1-0; tibia d 1-1, pr and rt 1-1-1, v 2-2-2ap (in form B tibia with some 28-30 spines); metatarsus pr and rt 1-1 or 0, v 2-2-0. Colouration. General colouration yellow brownish to brown. Colour markings varying over wide limits (figs 40-44). Palpal structure as in figs 2, 4 & 26-31.

Female. Measurements. Carapace 2.23-3.40 long and 1.95-3.30 wide. Abdomen 3.20-4.85 long and 2.15-3.25 wide. Distances between eyes: AME-AME 0.14-0.20, AME-ALE 0.08-0.10, PME-PME 0.21-0.35, PME-PLE 0.21-0.29. Median ocular area: MOA-WA 0.30-0.45, MOA-WP 0.39-0.58, MOA-L 0.45-0.60. Clypeal height 0.33-0.70. Cheliceral length 0.90-1.20. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.78-3.05	0.88-1.50	1.30-2.50	1.20-2.05	0.95-1.55
Leg II	2.05-3.45	0.95-1.65	1.57-2.90	1.33-2.30	1.03-1.63
Leg III	1.93-3.30	0.85-1.50	1.33-2.63	1.20-2.60	0.93-1.55
Leg IV	2.13-3.60	0.85-1.35	1.63-3.00	1.60-2.10	1.05-1.60

Spination of leg I: femur d 0-1-1 or 0, pr 0-1-1-1, rt 0-1-0 or 0; tibia pr and rt 1-1-1 or 0, v 2-2-2ap; metatarsus v 2-2-0. Colouration as described for the male. Epigyne and spermathecæ as in figs 7-9 & 32-39.

Thanatus coloradensis Keyserling, 1880
(figs 62-72, 84-85, map 3)

Thanatus coloradensis Keyserling, 1880. Die Spinnen Amerikas, Laterigradae: 199, 206, pl. 5 fig. 113 (male, holotype, not examined).

Thanatus coloradensis: Dondale, Turnbull & Redner, 1964, Canadian Entomologist, **96**: 643-644, figs 22-24, 38-40 (male, female).

Thanatus coloradensis: Schick, 1965, Bulletin of the American Museum of Natural History, **129** (1): 97-99, map 19, figs 141, 143 (male, female).

Thanatus albomaculatus Kulczyński, 1908, Mém. Acad. Sci. Petersb., **18** (7): 4, 65-66, Tab. II, fig. 69 (female, holotype, not examined). **New synonymy.**

Thanatus alpinus Kulczyński, 1887, Rozpr. spraw. wydz. mat. przyrod Akad. Umiej., **16**: 304, figs 13-14 (female). Synonymized with *T. coloradensis* by Gertsch (1934).

Thanatus alpinus: Heimer & Nentwig, 1991, Spinnen Mitteleuropas: Ein Bestimmungsbuch: 464, fig. 1226 (male, female).

Material. – TYUMEN AREA: 1 female (PSU), Priural'skiy Distr., the lower reaches of Sob' Riber, 18.08.1977, N.M. Pakhorukov. – ALTAI: 1 female (PSU), mountains N of Ongudai, 13.07.1939, coll.? – TUVA: 1 male, 1 female (ISE), environs of Khol-Oozhu, 1400-1800 m elev., 5-14.07.1989, D.V. Logunov; 3 females (ISE), same locality, 1800-1900 m elev., 16.07.1993, D.V. Logunov; 1 male (ISE), 3-8 km N of Samagaltai, 10.07.1993, D.V. Logunov; 4 females (ISE), 13-15 km N of Khandagaity, Kham-Dag River, 25.07.1993, D.V. Logunov; 2 female (ISE), 3-5 km N of Balgazyn, 19-20.07.1993, D.V. Logunov; 4 females (ISE), 5-7 km NW of Seserlig, 1200-1400 m elev., 29.06.1990, D.V. Logunov; 1 female (ISE), 8-9 km NE of Mugur-Aksy, Tsagan-Shybetu Mt Range, 2700 m elev., 22.07.1993, D.V. Logunov. – CHITA AREA: 1 male, 3 females (ISE), 60-65 km SW of Kyra, Sokhondo Reserve, 1200-1500 m elev., 21-28.06.1991, D.V. Logunov. – YAKUTIA: Lena River, Sangar, 23-25.08.1989, K.Y. Eskov; 1 female (UT), 5 km W of Oktemtsy, 10.07.1977, S. Koponen. – MAGADAN AREA: 1 male, 1 female (ISE), valley of Duktcha River, 800 m elev., 28.06.1986, Y.M. Marusik; 1 male (ZMMU), the upper Kolyma River, Vetrenniy, 5.07.1987, Y.M. Marusik; 6 males, 2 females (ZMMU), same locality, Sibit-Tyellakh, summers 1983-1986, Y.M. Marusik & S.P. Bukhkalo. – UNCERTAIN LOCALITIES : 1 male (PSU), Siberia, Aleksandrovskiy [= Kirghizskiy] Mt Range, Marx River, 3000 m elev., 12.07.1939, N. Olenev.

Comparative material. – CHINA: 2 females (MNHN, 138), "Kansu, Lan-wasja (Lowacheng) am Sining ho", 19.04.1885; 1 female (MNHN, 142), "Kansu, Chantschuan am Siningho", 22.04.1885. – CANADA: 2 males (CNC), Alberta, Bow Island, 14.05-18.06.1963, A.L. Turnbull; 1 female (CNC), Saskatchewan, Swift Current, 18.08.1970, P.W. Riegert; 1 female (CNC), Alberta, Purple Springs, 8.07.1963, A.L. Turnbull; 2 males, 3 females (ISE), Yukon T., Kluane L., Cultus Bay, 1500-2000 m elev., 10-23.07.1993, D.I. Berman; 1 female (ZMMU), same locality, Christmas Bay, 800 m elev., 22.07.1993, Y.M. Marusik. – U.S.A.: 3 females (AMNH), Wyoming, Yellowstone Lake, 20.06.1938, W. Ivie; 2 males (AMNH), Colorado, Rocky Mt National Park, 22.06-7.07.1967, R. Schmoller; 1 male (AMNH), North Dakota, Bittineau, 29.08.1967, J. Stein.

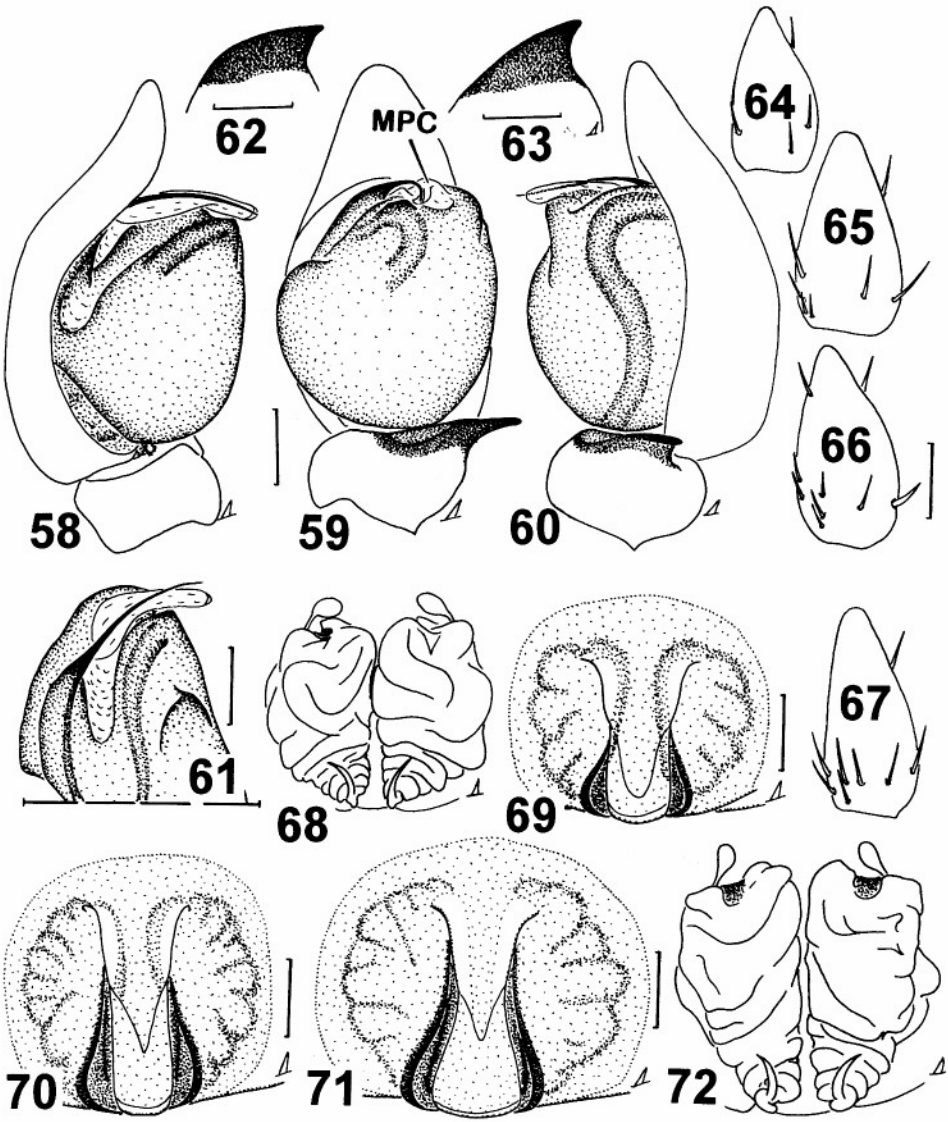
Diagnosis. Separable from all the North Asian species by the keel-shaped tibial apophysis (figs 62-63), very long embolus (fig. 59) and strongly wrinkled spermathecæ (figs 68, 72). Colour markings as in figs 84-85.

Distribution. A holarctic boreo-alpine distributional pattern. The species has been repeatedly recorded in North Asia under the name *T. albomaculatus* from Yakutia and Magadan Area (KULCZYŃSKI, 1908; MARUSIK, 1991; KOPONEN & MARUSIK, 1992; MARUSIK et al., 1992a, 1992b, 1993) and also from Altai (MARUSIK et al., 1996) (map 4).

Habitat. The species can be usually taken from meadow steppes and sloping shrub-steppes, sometimes from screes and mountain tundra.

Description

Male. Measurements. Carapace 2.95-3.10 long and 2.70-2.95 wide. Abdomen 3.15-3.30 long and 1.85-2.00 wide. Distances between eyes: AME-AME 0.18, AME-



Figures 58-72. — *Thanatus coloradensis*. – **58**, male palpus, median view. **59**, ditto, ventral view. **60**, ditto, lateral view. **61**, ditto, apical view.– **62-63**, dorsal tibial apophysis. – **64-67**, cymbiae, dorsal view. – **68** & **72**, spermathecæ – **69-71**, epigynes. — Specimens: 58-61, 63, 66, 68 & 69: Tuva; 62: Canada, Alberta; 64: U.S.A., Dakota; 65: Canada, Yukon Territory; 67, 71-72: Magadan Area; 70: Chita Area. — Scale: 58-63, 0.25 mm; 64-67, 0.5 mm; 68-72: 0.25 mm.

ALE 0.10, PME-PME 0.30, PME-PLE 0.40. Median ocular area: MOA-WA 0.36, MOA-WP 0.48, MOA-L 0.50. Clypeal height 0.48-0.55. Cheliceral length 0.95-1.25. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	3.00-3.30	1.20-1.40	2.40-2.85	2.05-2.45	1.60-190
Leg II	3.35-3.90	1.50-1.55	2.75-3.30	2.30-2.90	1.50-2.10
Leg III	3.15-3.65	1.35-1.60	2.45-2.85	2.15-2.45	1.40-1.75
Leg IV	3.35-3.90	1.35-1.45	2.90-3.30	3.10-3.50	2.05-2.60

Spination of leg I: femur d 0-1-1 or 0-1-1-1, pr and rt 0-1-1-1; patella d 1-1 or 0, pr 0-1-0; tibia d 1-1-1 or 0, pr and rt 1-1-1, v 2-2-2ap; metatarsus pr 1-1 or 0, v 2-2-0. Colouration. Carapace yellowish red, with pair of wide brown allatal stripes and brown mesodiscus (fig. 84). Sternum yellowish reddish. Labium, maxillæ and chelicerae yellowish brown. Abdomen: dorsum as shown in fig. 84; venter yellow-grey with pair of thin longitudinal brown lines, densely covered with short grey hairs; sides yellow-grey with wide brown longitudinal band. Palp and leg femora brown, but ventrally dark brown. Remaining segments brown-yellow. Palpal structure as in figs 58-67.

Female. Measurements. Carapace 3.25-4.00 long and 2.85-3.45 wide. Abdomen 5.00-7.20 long and 2.50-5.20 wide. Distances between eyes: AME-AME 0.20, AME-ALE 0.08, PME-PME 0.33, PME-PLE 0.30. Median ocular area: MOA-WA 0.39, MOA-WP 0.50, MOA-L 0.58. Clypeal height 0.58. Cheliceral length 0.95. Length of leg:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.95-3.80	1.35-1.70	2.35-2.95	1.80-2.40	1.40-1.65
Leg II	3.30-4.35	1.50-1.90	2.60-3.30	2.05-2.65	1.55-2.05
Leg III	2.70-3.90	1.30-1.55	2.35-3.00	1.85-2.40	1.45-1.75
Leg IV	3.40-4.40	1.25-1.70	2.55-3.45	2.35-3.10	1.60-1.90

Spination of leg I: femur d 0-0-1-0 or 0-1-1-1, pr 0-0-1-1-1; tibia pr 1-1 or 0, v 2-2-2ap; metatarsus v 2-2-0. Colouration as described for the male. Epigyne and spermathecæ as in figs 68-72.

Thanatus formicinus (Clerck, 1757)
(figs 73-83, 86, 87 & map 3)

Araneus formicinus Clerck, 1757, Svenska Spindlar: 134, pl. 6 fig. 2 (female).

Thanatus formicinus: C.L. Koch, 1837, Übersicht des Arach., Heft1: 28 (from *Araneus*).

Thanatus formicinus: Kaston, 1948, Spiders of Connecticut: 438, pl. 85, figs 1593-1594 (male, female).

Thanatus formicinus: Dondale, Turnbull & Redner, 1964, Canadian Entomologist, **96**: 644-647, figs 28-30 & 35-37 (male, female).

Thanatus formicinus: Schick, 1965, Bulletin of the American Museum of Natural History, **129** (1): 96, map 19, figs 139-140 & 142 (male, female).

Thanatus formicinus: Vilbaste, 1969, [Spiders of Estonia]: 117-120, figs 99-100 (male, female).

Thanatus formicinus: Zhang, 1987, [Farm spiders from Hubei Province]: 221, figs 193.1-4 (male, female).

Thanatus formicinus: Izmailova, 1989, [Fauna of spiders of South part of Eastern Siberia]: 134, fig. 126 (female).

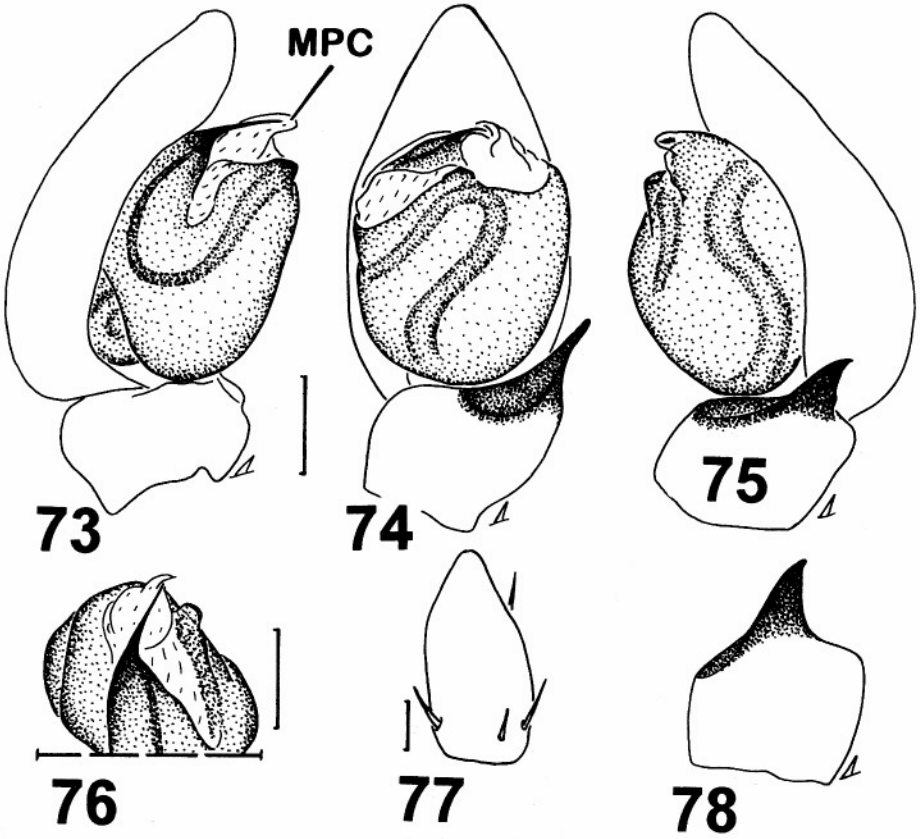
Thanatus formicinus: Chen & Gao, 1990, [The Sichuan farmland spider in China]: 166, figs 211a-b (male, female).

Thanatus formicinus: Heimer & Nentwig, 1991, Spinnen Mitteleuropas: Ein Bestimmungsbuch: 464, fig. 1225 (male, female).

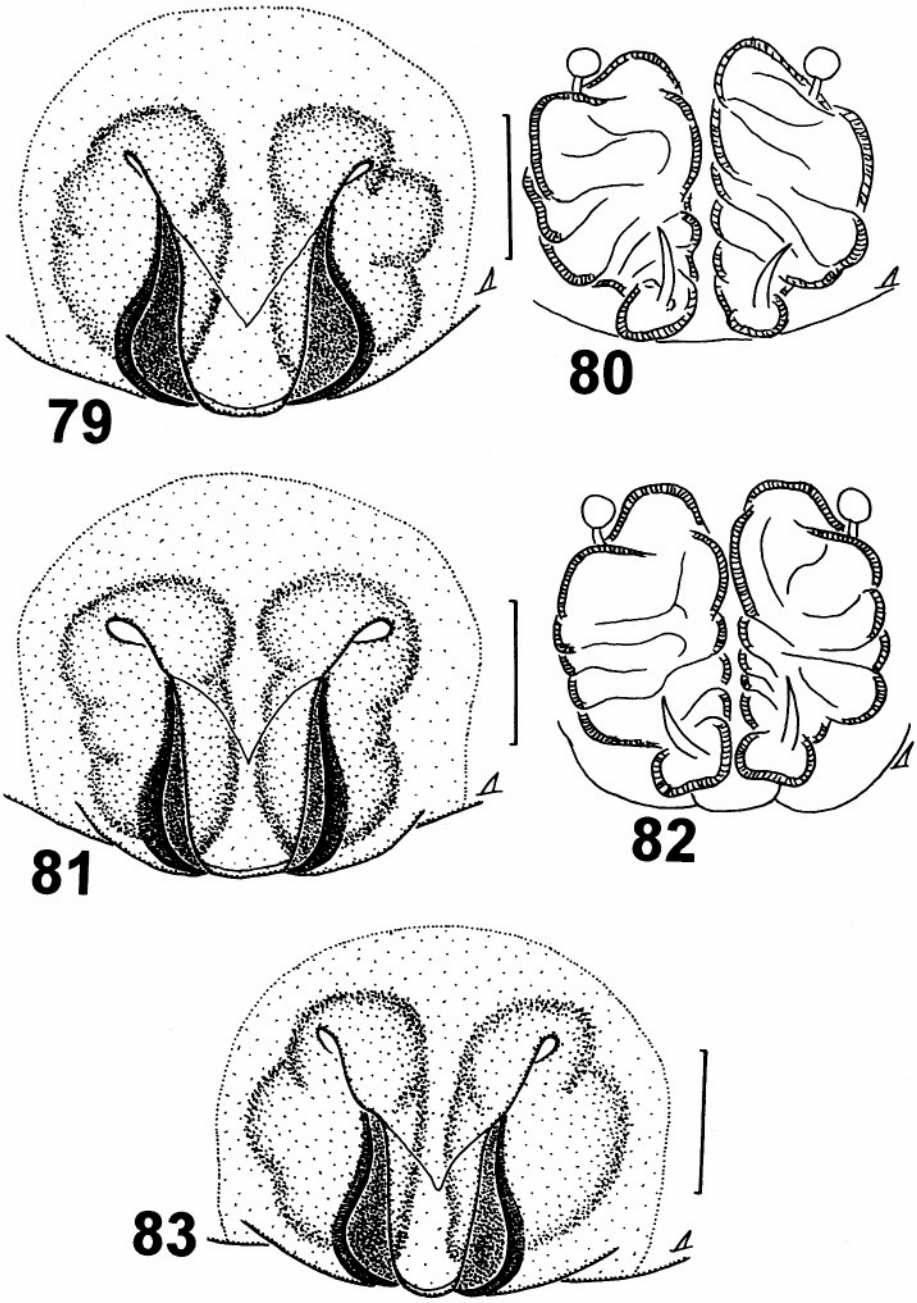
Thanatus lycosoides: Emerton, 1892, Transactions of the Connecticut Academy of Arts and Sciences: **8**: 379, pl. 32, figs 6-6c (male, female). Synonymized with *T. formicinus* by Dondale et al. (1964).

Thanatus canadensis Gertsch, 1933, American Museum Novitates, **636**: 3, figs 7, 49 (male, female). Synonymized with *T. formicinus* by Dondale et al. (1964).

Material. – MARI-EL: 1 male (ISE), Yalchik, 14-28.05.1988, V.N. Matveev.– PERM AREA: 3 males, 1 female (PSU), environs of Perm City, 6.09.1989, S.L. Esyunin; 2 males, 1 female (PSU), Kungursk Distr., "Spasskaya Gora" Reserve, 13.07.1989, S.L. Esyunin. – CHELYABINSK AREA: 2 females (PSU), Troitskiy Zakaznik, 2-5.07.1984, Ryabinina; 1 female (PSU), Ilmenskiy Reservation, 3.08.1991, S.L. Esyunin. – BASHKORKOSTAN: 2 females (PSU), Burzyanskiy Distr., Bashkirskiy Reserve, 10.06.1985, V.E. Efimik. – SVERDLOVSK AREA: 1 female (PSU), Vitim-



Figures 73-78. — *Thanatus formicinus*, male genitalia. – **73**, male palpus, median view. **74**, ditto, ventral view. **75**, ditto, lateral view. **76**, ditto, apical view. – **77**, cymbium. – **78**, dorsal tibial apophysis. — Specimens: 73-77, Perm Area; 78, Novosibirsk Area. — Scale: 73-76 & 78, 0.25 mm; 77, 0.50 mm.



Figures 79-83. — *Thanatus formicinus*, female genitalia. – **79, 81, 83**: epigynes. **80, 82**: spermathecæ. — Specimens: 79, 80, Novosibirsk Area; 81, 82, Perm Area; 83, North Kazakhstan. — Scale: 0.25 mm.

skiy Reservation, summer 1985, N.L. Ukhova. – NOVOSIBIRSK AREA: 1 female (ISE), 30-35 km E of Novosibirsk, Koltsovo, 29.05.1988, D.V. Logunov; 1 female (ISE), Sherstobitovo Distr., 7.08.1992, V.V. Dubatolov; 1 female (ISE), Chany Lake, Kazantsevskiy Peninsula, 15.08.1992, V.V. Dubatolov. – ALTAI: 1 female (PSU), right shore of Inya River, 23.07.1939, coll.? – KAZAKHSTAN: 1 female (ISE), N-Kazakhstan Area, Sokolvskiy Distr., B-Malyshka, 13.06.1986, D.V. Logunov.

Comparative material. – SWITZERLAND: 1 male, 1 female (SMNH, 1192a), Niesky, Zimmermann det. – U.S.A.: 3 females (AMNH), Kansas, Geary Co., Milford, 17.11.1975, D.T. Jennings; 1 male (AMNH), Michigan, Ingham, E. Lansing, MSU, 26.04.1968, coll.?; 1 female (ISE), Alaska, 25 miles E of Fairbanks, Moose Ck., 3.07.1993, Y.M. Marusik. – CANADA: 1 female (CNC), N.B., Fredericton, 25.08.1967, T.R. Renault; 2 males (CNC), Ontario, Muskoka Distr., Dwight, 16-19.05.1975, W. Maddison; 1 male (CNC), Manitoba, Lake Audy, Riding Mountain National Park, 15.08.1979, J.H. Redner.

Diagnosis. See comments in "Diagnosis" under *T. arcticus*.

Distribution. A holarctic temperate species. The earlier records in Siberia have been made from Borovoye (SPASSKY & LAVROV, 1928), Verkhneudinsk (ODENWALL, 1901), Tomsk (ERMOLAJEV, 1934) and Kamtchatka (KULCZYŃSKI, 1926; SYTSHEVSKAYA, 1935). Recently, the species has been repeatedly reported from the Polar Urals (TANASEVITCH, 1985), Transbaikalia (IZMAILOVA, 1972; IZMAILOVA & ALEKSEEVA, 1979; STENBERGS, 1981), Yakutia, Magadan Area (MARUSIK, 1991; MARUSIK et al., 1992a, 1993), Maritime Province (OLIGER, 1984) and Sakhalin (MARUSIK et al., 1992b) (map 3).

Habitat. Meadows and clearings within deciduous and mixed forests, including sloping shrub steppes.

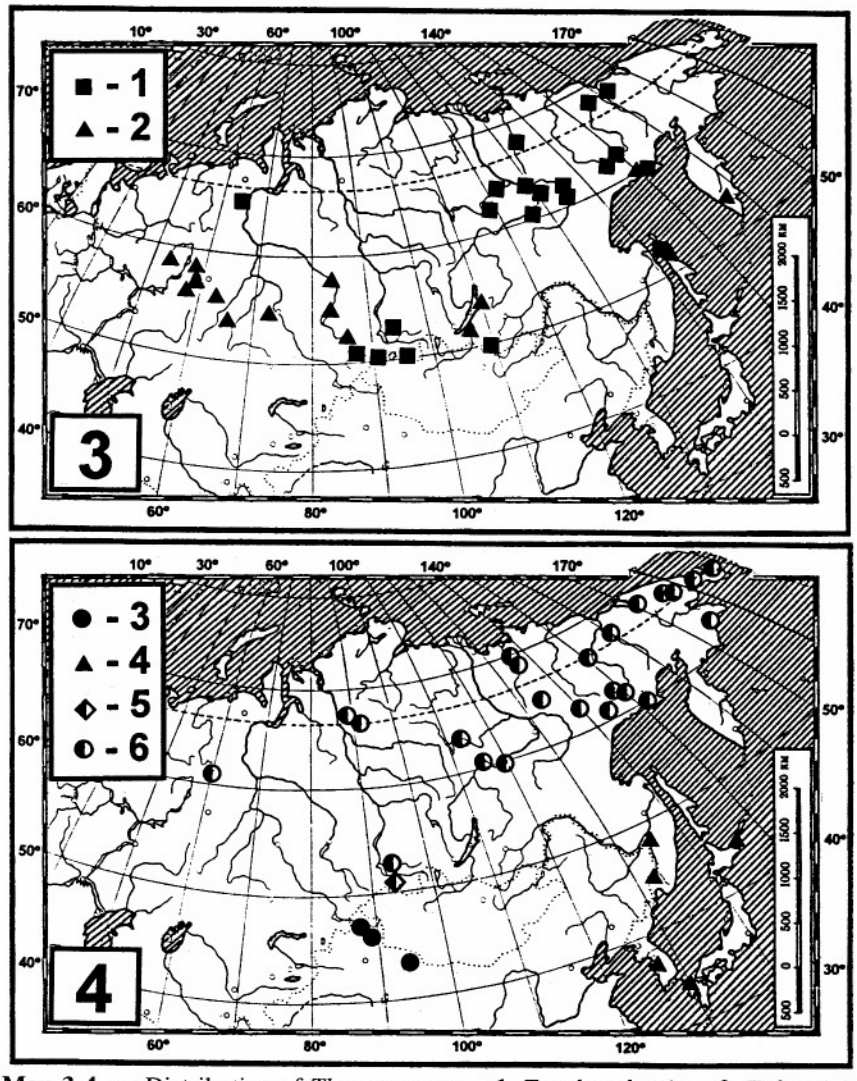
Description

Male. Measurements. Carapace 3.20 long and 2.85 wide. Abdomen 3.60 long and 2.00 wide. Distances between eyes: AME-AME 0.19, AME-ALE 0.08, PME-PME 0.29, PME-PLE 0.29. Median ocular area: MOA-WA 0.34, MOA-WP 0.47, MOA-L 0.47. Clypeal height 0.50. Cheliceral length 1.08. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.80	1.35	2.28	2.03	1.39
Leg II	3.13	1.43	2.50	2.13	1.80
Leg III	3.08	1.15	2.28	2.18	1.50
Leg IV	3.23	1.00	2.25	2.63	1.85

Spination of leg I: femur d 0-0-1-1, pr and rt 0-1-1-1; tibia pr and rt 1-1, v 2-2-2-2ap; metatarsus v 2-2-0. Colouration. Carapace brownish yellow, with pair of wide longitudinal brown bands. Eye field often yellow. Sternum, maxillæ, labium and chelicerae brownish yellow. Abdomen yellow-brown, dorsum with clear cardiac spot (fig. 86). Book-lung covers and spinnerets brownish yellow to brownish. Legs and palp yellow-brown. Palpal structure as in figs 73-78.

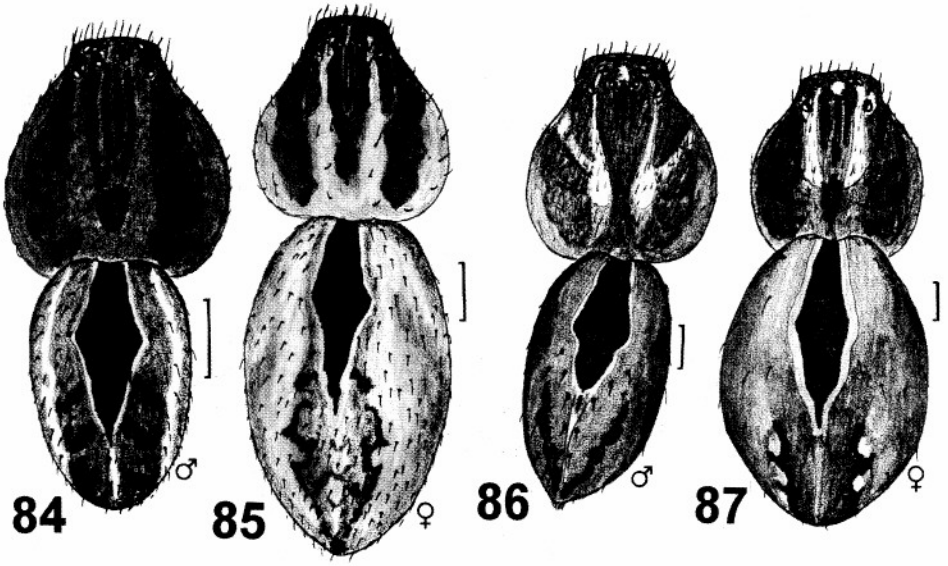
Female. Measurements. Carapace 3.15 long and 2.95 wide. Abdomen 4.05 long and 2.50 wide. Distance between eyes: AME-AME 0.21, AME-ALE 0.09, PME-PME 0.36, PME-PME 0.36, PME-PLE 0.29. Median ocular area: MOA-WA 0.39, MOA-WP 0.53, MOA-L 0.51. Clypeal height 0.50. Cheliceral length 1.07. Length of leg segments:



Map 3-4. — Distribution of *Thanatus* spp. – **1**, *T. coloradensis*. – **2**, *T. formicinus* – **3**, *T. mongolicus*. – **4**, *T. nipponicus*. – **5**, *T. ubsunurensis*. – **6**, *T. bungei*.

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.50	1.38	1.90	1.60	1.20
Leg II	2.63	0.93	2.25	1.58	1.25
Leg III	2.53	1.09	2.00	1.63	1.02
Leg IV	2.70	1.05	2.13	1.83	1.25

Spination of leg I: femur d 0-1-0, pr 0-1-1; tibia pr 0-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration as described for the male (fig. 87). Epigyne and spermathecæ as in figs 79-83.



Figures 84-87.— Body colouration of *Thanatus* spp. – **84, 85**, *T. coloradensis*, from Tuva. – **86, 87**, *T. arenarius*, female from Perm Area, male from Novosibirsk Area. — Scale: 84, 85 1 mm; 86, 87 0.5 mm.

Thanatus mongolicus (Schenckel, 1936) comb. n.
(figs 88-90, map 4)

Philodromus mongolicus Schenckel, 1936, Arkiv für Zool., **29**A (1): 278-280, figs 93a-b (male, holotype, examined).

Philodromus mongolicus: Hu & Wu, 1989, [Spiders from agricultural regions of Xinjiang...]: 320, figs 255.1-4 (male, female).

Material. 1 male (SMNH, holotype), "Wen-tsong-haitze, Sumpf am Berg Bainbogdo am obern Estingol, Bamboe Camp, 22.06.1929, G. Soderbom".

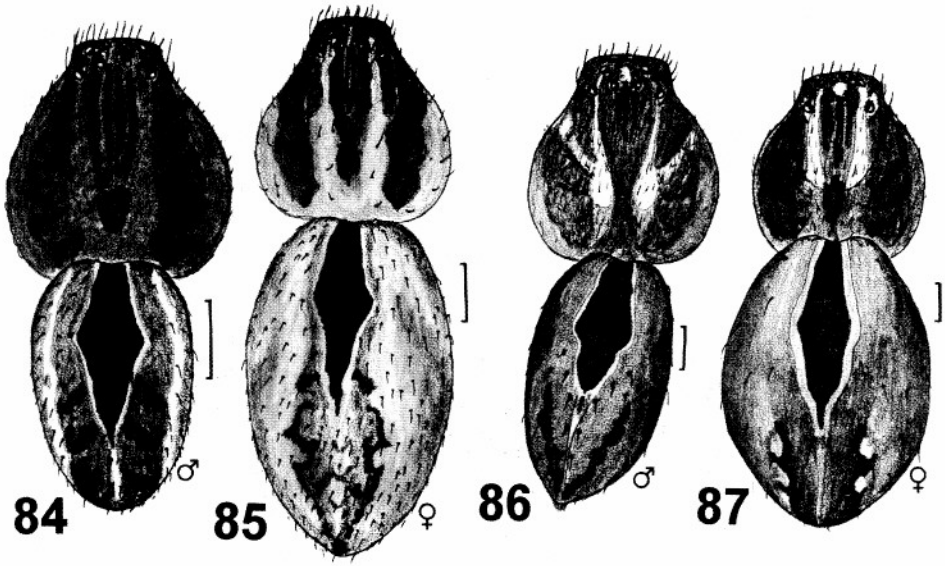
Diagnosis. Separable from all the North Asian species by the wedge-shaped dorsal tibial apophysis (fig. 88).

Distribution. China, Xinjiang (SCHENKEL, 1936; HU & WU, 1989) (map 4). Most probably the species occurs in South Siberia as well, but it was not found yet.

Description

Male. Measurements. Carapace 1.58 long and 1.68 wide. Abdomen strongly wrinkled and destroyed. Distances between eyes: AME-AME 0.14, AME-ALE 0.05, PME-PME 0.23, PME-PLE0.21. Median ocular area: MOA-WA 0.30, MOA-WP 0.35, MOA-L 0.28. Clypeal height 0.23. Cheliceral length 0.53. Length of segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.05	0.83	1.65	1.55	1.10
Leg II	2.55	0.85	2.20	1.95	1.30
Leg III	absent				
Leg IV	2.03	0.70	1.53	1.45	0.90



Figures 84-87.— Body colouration of *Thanatus* spp. – **84, 85**, *T. coloradensis*, from Tuva. – **86, 87**, *T. arenarius*, female from Perm Area, male from Novosibirsk Area. — Scale: 84, 85 1 mm; 86, 87 0.5 mm.

Thanatus mongolicus (Schenckel, 1936) comb. n.
(figs 88-90, map 4)

Philodromus mongolicus Schenckel, 1936, Arkiv für Zool., **29**A (1): 278-280, figs 93a-b (male, holotype, examined).

Philodromus mongolicus: Hu & Wu, 1989, [Spiders from agricultural regions of Xinjiang...]: 320, figs 255.1-4 (male, female).

Material. 1 male (SMNH, holotype), "Wen-tsong-haitze, Sumpf am Berg Bainbogdo am obern Estingol, Bamboe Camp, 22.06.1929, G. Soderbom".

Diagnosis. Separable from all the North Asian species by the wedge-shaped dorsal tibial apophysis (fig. 88).

Distribution. China, Xinjiang (SCHENKEL, 1936; HU & WU, 1989) (map 4). Most probably the species occurs in South Siberia as well, but it was not found yet.

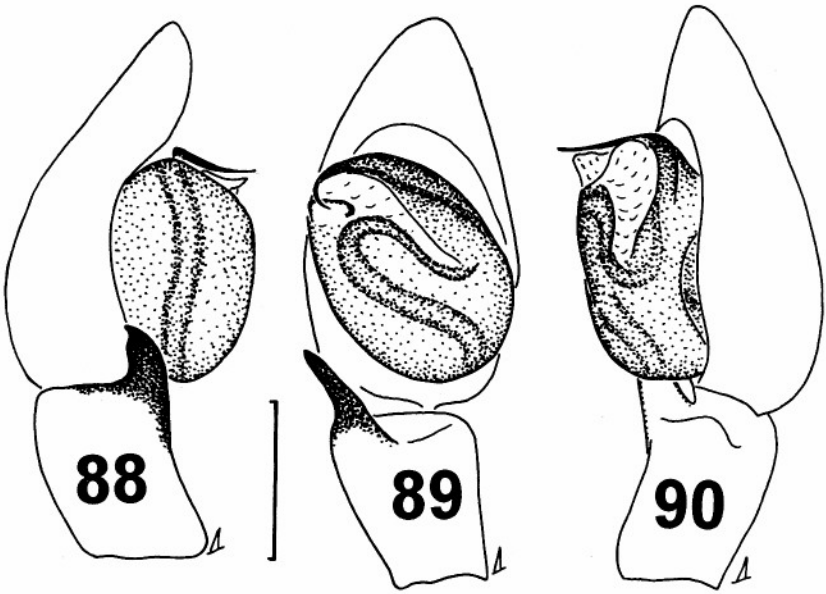
Description

Male. Measurements. Carapace 1.58 long and 1.68 wide. Abdomen strongly wrinkled and destroyed. Distances between eyes: AME-AME 0.14, AME-ALE 0.05, PME-PME 0.23, PME-PLE0.21. Median ocular area: MOA-WA 0.30, MOA-WP 0.35, MOA-L 0.28. Clypeal height 0.23. Cheliceral length 0.53. Length of segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.05	0.83	1.65	1.55	1.10
Leg II	2.55	0.85	2.20	1.95	1.30
Leg III	absent				
Leg IV	2.03	0.70	1.53	1.45	0.90

Spination of leg I: femur d and pr 0-1-1-1; patella pr 0-1-0; tibia d 0-1-1, pr and rt 1-1-1, v 2-2-2ap; metatarsus pr and rt 1-1-1, v 2-2-0. Colouration. The holotype is strongly destroyed and faded, and hence fresh specimens are needed to describe adequately the specific colouration. For the moment, the only available redescription of this species has been made in Chinese language (HU & WU, 1989). Male palp as in figs 88-90.

Female. See HU & WU (1989).



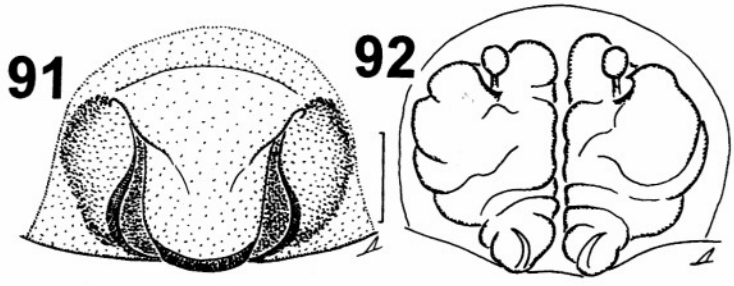
Figures 88-90. — *Thanatus mongolicus*, holotype (from NW China), male palpus. **88**, lateral view. **89**, ventral view. **90**, median view. — Scale: 0.25 mm.

Thanatus nigromaculatus Kulczyński, 1885
(figs 91, 92, map 8)

Thanatus nigromaculatus Kulczyński, 1885, Pamietn. Akad. Krak,: 16, 49-50, pl. XI, fig. 29 (female, holotype, examined).

Material. 1 female (IZW, holotype), "Kamczatka: nad iz. Kamczatka, leg. B. Dybowski".

Comments. A restudy of the holotype of *T. nigromaculatus* from Kamczatka showed it having a shorter septum of the epigyne in comparison with that of *T. coloradensis* (cf. figs 91 and 69, 71), while the spermathecal structure is practically identical to that of the latter species. However, the difference in the septum shape may turn out to be insignificant, when a greater number of specimens are studied. If so, *T. nigromaculaus* should be treated as a junior synonym of *T. coloradensis*. New material on *T. nigromaculatus* need to prove or reject correctly the above proposal.



Figures 91-92. — *Thanatus nigromaculatus*, holotype (from Kamtschatka). –**91**, epigyne. **92**, spermathecæ. — Scale: 0.1 mm.

Thanatus nipponicus Yaginuma, 1969
(figs 93, 94, map 4)

Thanatus nipponicus Yaginuma, 1969, Mem. natn. Sci. Mus. Tokyo, **2**: 87, figs 1-2 (male, holotype, not examined).

Thanatus nipponicus: Yaginuma, 1986, Spiders of Japan in color, new edition: 215, fig. 120, pl. 57.5 (male).

Thanatus nipponicus: Paik, 1979, Journal of Graduated School Education (Kyungpook Nat. Univ.), **11**: 122, figs 21-26 (male).

Thanatus nipponicus: Logunov, 1992, [Siberian Biological Journal], **4**: 57, figs 2a-b (male).

Material. – KHABAROVSK PROVINCE: 1 male (ISE), 20-25 km S.E. of Khabarovsk, Bolshekhekhtsyrskiy Reserve, July-August 1987, C.V. Ivanov. – MARITIME PROVINCE: 1 male (ZIS, 55-09), Kamen'-Rybolov, 1.09.1908, coll.?

Diagnosis. *T. nipponicus* can be easily distinguished from all the Siberian congeners of the genus *Thanatus* by the extremely swollen base of the dorsal tibial apophysis (fig. 93).

Distribution. The Russian Far East (map 4; LOGUNOV, 1992), Japan: Honshu, Tsushima Islands (YAGINUMA, 1970), and Korea (PAIK, 1979).

Description

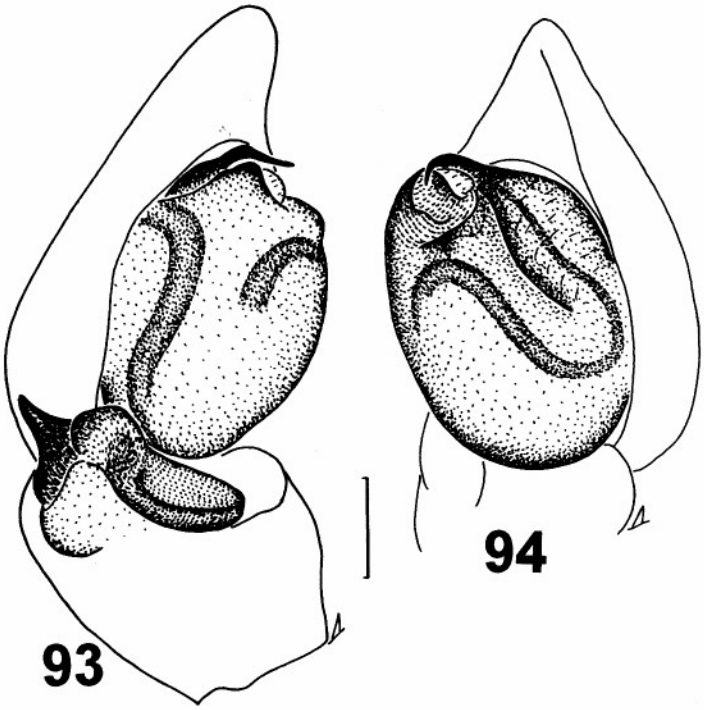
See LOGUNOV (1992). Female of this species is unknown for me.

Thanatus ubsunurensis sp. n.
(figs 95-102, 180-181, map 4)

Material. 1 male (holotype; ISE, 3682), N.E. bank of Ubsu-Nur Lake, 750 m elev. (50°40'N, 92°58'E), 18.07.1993, D.V. Logunov. Paratypes: 8 males, 16 females (ISE, 3683), together with holotype; 6 males, 3 females (MNHN), same locality, 14.06.1995, D.V. Logunov & Y.M. Marusik.

Diagnosis. *Thanatus ubsunurensis* can be easely distinguished from all the Siberian congeners of the genus *Thanatus* by the flat curved tibial apophysis (fig. 97), the shape of the spermathecæ (fig. 101) and the body colouration (figs 180-181).

Distribution. Type locality only (map 4).



Figures 93-94. — *Thanatus nipponicus*, from Khabarovsk Province, male palpus. **93**, ventro-lateral view. **94**, ventro-median view. — Scale: 0.2 mm.

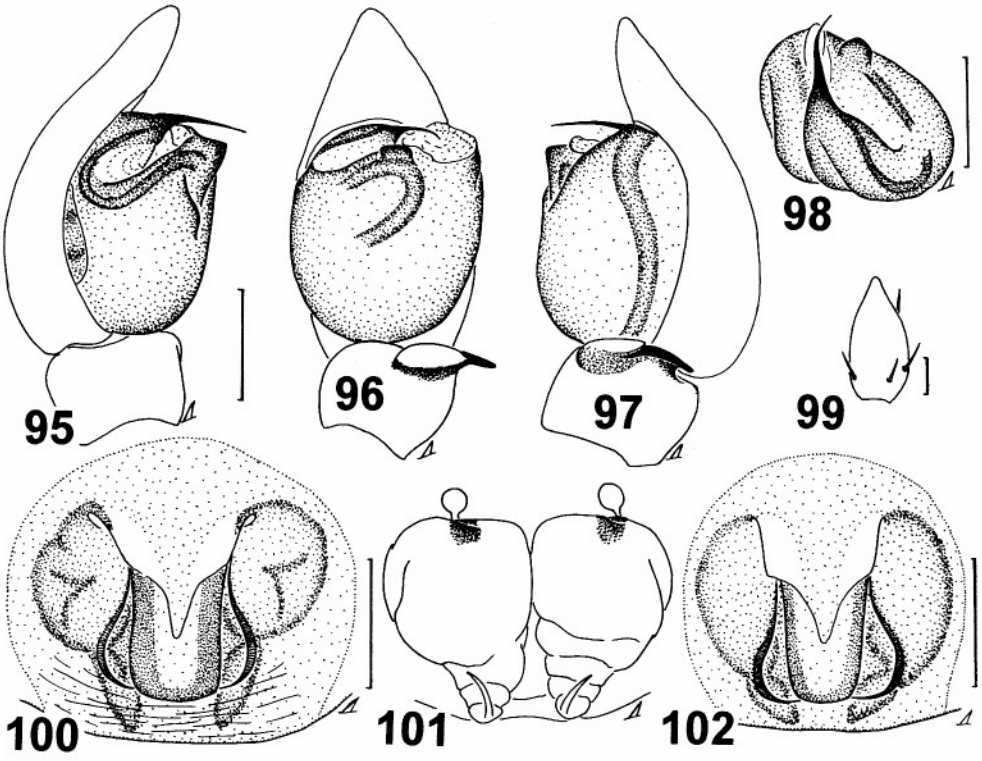
Habitat. Dry stony steppe with *Nanophyton erinaceus*.

Description

Male. Measurements. Carapace 2.03 long and 1.94 wide. Abdomen 2.51 long and 1.49 wide. Distance between eyes: AME-AME 0.12, AME-ALE 0.06, PME-PME 0.21, PME-PLE 0.21. Median ocular area: MOA-WA 0.30, MOA-WP 0.37, MOA-L 0.44. Clypeal height 0.31. Cheliceral length 0.83. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.40	0.98	2.10	1.79	1.35
Leg II	2.88	1.03	2.28	2.30	1.43
Leg III	2.68	0.98	2.38	2.10	1.23
Leg IV	2.95	0.95	2.65	2.60	1.53

Spination of leg I: femur d 0-0-1-1 or 0-1-1-1, pr and rt 0-0-1-1-1; patella pr 1-1, rt 1-0; tibia d 0-1, pr and rt 1-1-1, v 2-2-2ap; metatarsus pr 1-1, rt 1-0, v 2-2-0. Colouration. Carapace brownish red, covered with light and dark hairs. Eye field often red. Eyes surrounded by black. Sternum, maxillæ, labium and cheliceræ yellowish with red tinge. Dorsum brown-yellow, its forepart with lanceolate black spot and pair of rounded yellow spots (fig. 180). Venter and sides of abdomen yellow. Book-lung covers and spinnerets yellow. Legs yellow, but coxæ, femora and patellæ strongly tinged with red. Palp yellowish red, with brown tibial apophysis and tegulum. Palpal structure as in figs 95-99.



Figures 95-102. — *Thanatus ubsunurensis*, from Tuva. – **95**, male palpus, median view. **96**, ditto, ventral view. **97**, ditto, lateral view. **98**, ditto, apical view. **99**, male palpal cymbium, dorsal view. – **100, 102**, epigynes. **101**, spermathecæ. — Scale: 95-98, 100-102 0.25 mm; 99 0.5 mm.

Female. Measurements. Carapace 1.88-2.58 long and 1.75-2.50 wide. Abdomen 3.80-4.90 long and 1.49-3.15 wide. Distances between eyes: AME-AME 0.15-0.18, AME-ALE 0.06-0.09, PME-PME 0.20-0.26, PME-PLE 0.16-0.29. Median ocular area: MOA-WA 0.31-0.37, MOA-WP 0.38-0.51, MOA-L 0.43-0.54. Clypeal height 0.29-0.47. Cheliceral length 0.77-1.07. Length of leg segments:

	femur	patella	tibia	metarsus	tarsus
Leg I	1.95-2.68	0.85-1.08	1.53-1.25	1.25-1.88	0.83-1.28
Leg II	2.10-2.75	0.76-1.05	1.60-2.28	1.33-1.88	0.88-1.34
Leg III	2.18-2.83	0.80-0.98	1.68-2.33	1.40-1.98	0.93-1.18
Leg IV	2.13-3.20	0.84-1.13	1.90-2.65	1.63-2.45	1.03-1.45

Spination of leg I: femur d 0-1-1, pr 0-1-1-1, rt 0-1-1 or 0; tibia pr 1-1-1, rt 0-1-1 or 0-1, v 2-22-2ap; metatarsus v 2-2-0. Colouration as described for male, but lighter. Epigyne and spermathecæ as in figs 100-102.

Etymology. The specific name is taken from the name of Ubsu-Nur hollow, where the type series has been collected.

The *bungei* species group

Male palp: secondary ventral tibial apophysis (sVTA) present; primary ventral tibial apophysis developed as impressed membranous area between dorsal tibial apophysis and sVTA; tegular apophysis appearing like a bulge; embolus very long, thread-shaped. Female genitalia: spermathecæ smooth; the receptaculum lacks a distinct duct, since it is grown together with the spermatheca.

Only two North Asian species are included in the group: *T. bungei* and *T. constellatus*.

Thanatus bungei (Kulczyński, 1908) (figs 103, 104, 106-116, map 4)

Philodromus bungei Kulczyński, 1908, Mem. Acad. Sci. Petersburg, **13** (7): 62-65, T. II, figs 68, 75, 76 (male, female).

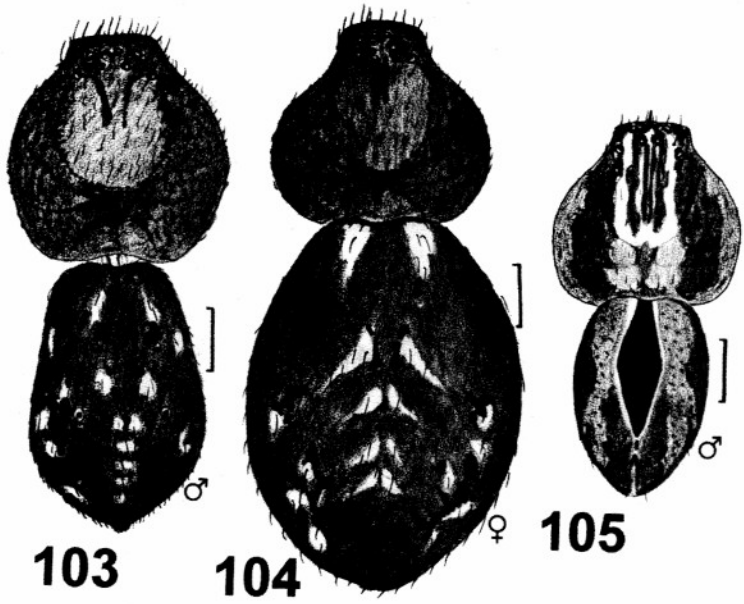
Thanatus bungei: Marusik, 1989, [Zoological Journal], **68** (4): 144 (male, female, from *Philodromus*).

Thanatus bungei: Esyunin, 1992, [Zoological Journal], **71** (11): 35-36, figs 1.6-7, 3.1-2 (male, female).

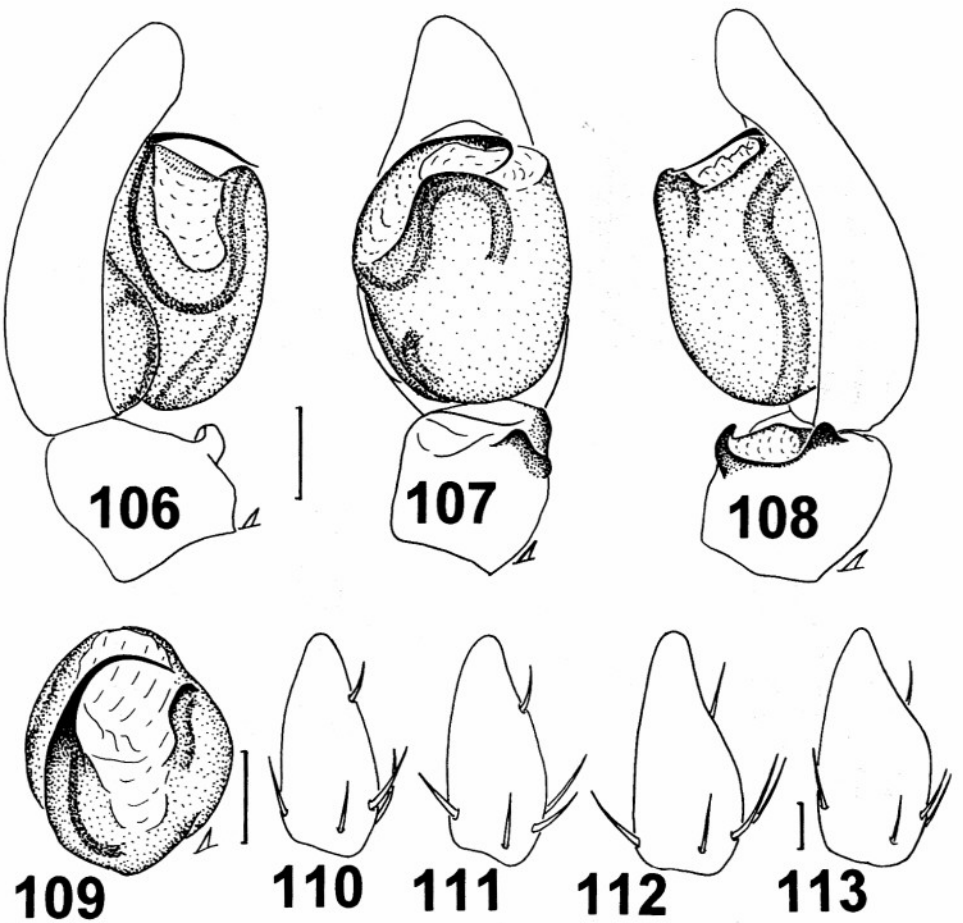
Apollophane patricia Lowrie & Gertsch, 1955, American Museum Novitates, **1736**: 18, figs 25, 26, 28 (male, female).

Thanatus sp. Levi & Levi, 1955, Canadian Field-Naturalist, **69** (2): 39, figs 24-25 (male, female).

Thanatus patriciae: Dondale, Turnbull & Redner, 1964, Canadian Entomologist, **96**: 654-655, figs 1, 2, 31, 32 (male, female, from *Apollophanes*). Synonymized with *T. bungei* by Marusik (1989).

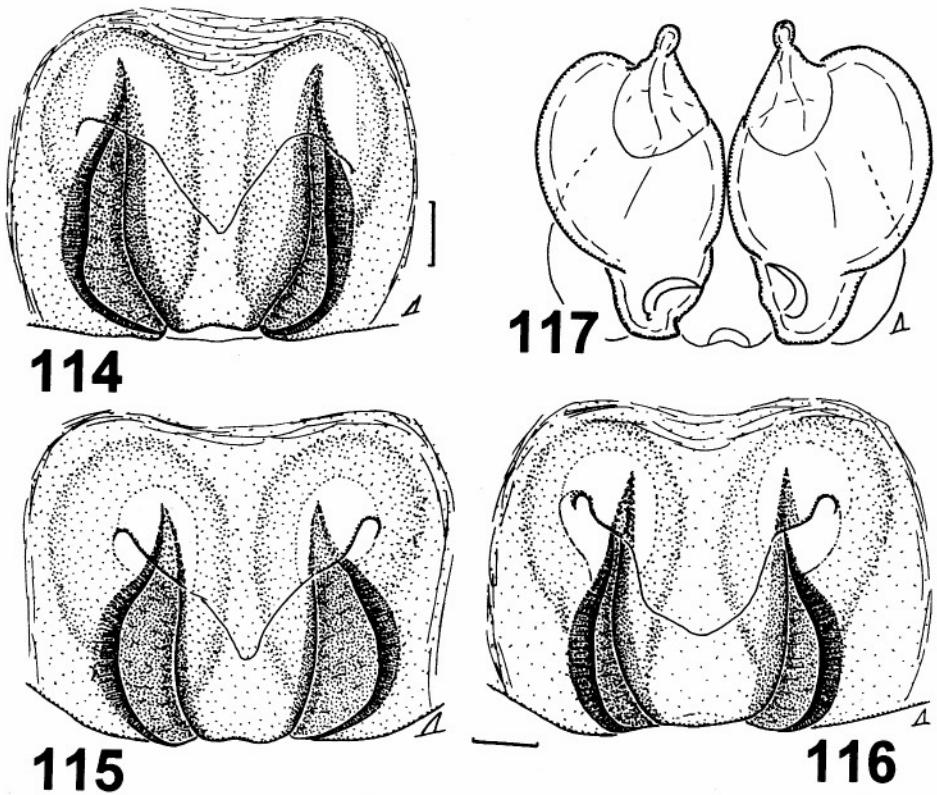


Figures 103-105. — Body colouration of *Thanatus* spp. – **103-104**, *T. bungei*, Chita Area. – **105**, *T. formicinus*, Perm Area. — Scale: 1 mm.



Figures 106-113. — *Thanatus bungei*, male genitalia. – **106**, palpus, median view. **107**, ditto, ventral view. **108**, ditto, lateral view. **109**, ditto, apical view. – **110-113**, cymbiæ. — Specimens: 106-109, Chita Area; 111, Magadan Area; 112, S.-Urals; 113, USA, Montana. — Scale: 106-109, 0.25 mm; 110-113, 0.5 mm.

Material. – PERM AREA: 1 male (PSU), the S.-Urals, Iremen', July 1986, A. Polyanin; 2 females (ISE), Basegi Reserve, Severniy Baseg Mt, 29.07-12.08.1986, S.L. Esyunin. – CHITA AREA: 4 males, 3 females (ISE), 60-65 km S-W of Kyra, Sokhondo Reserve, 1700-1750 m elev., 19-22.06.1991, S.E. Chernyshov. – YAKUTIA: 1 male (ISE), 232 km of the road Khandyga-Madagan, 6.07-6.08.1985, A.V. Barkalov. – MAGADAN AREA: 1 male, 1 female (ISE), the upper flow of Kolyma River, valley of Kyunebellakh spring, 13.07.1987, Y.M. Marusik. – KRASNOYARSK PROVINCE: 3 females (ISE), W Sayany Mts, Oiskiy Mt. Range, nearly 20-30 km N of Aradan, 1600 m elev., 9.07.1990, D.V. Logunov.



Figures 114-117. *Thanatus bungei*, female genitalia. – **114-116**, epigynes. **117**, spermathecæ — All specimens from Chita Area. — Scales: 0.1 mm.

Comparative material of *T. patriciae*. – U.S.A.: 1 male (AMNH), Montana, Carbon Co, E. Rosebud Plat, 2800 m elev., 20.06.1961, B. Vogel & S. Sutton. – CANADA: 1 male (CNC), Yukon Territory, km 155, Dempster Hwy, 1600-1700 m elev., 25-27.06.1982, G. & M. Wood; 1 female (CNC), Yukon Territory, British Mountains, 1-4.07.1984, D. & M. Wood.

Diagnosis. Dorsal and ventral tibial apophysis present, as in the congeners of the *striatus* species group (fig. 108), yet the embolus is thin and long, as in *T. coloradensis*. Spermathecæ with uncommonly wide ducts in comparison with small receptacles (fig. 117). Colour markings without a cardial mark (figs 103-104). The synonymy of *T. bungei* with *T. patriciae* has been first recognized by MARUSIK (1989). I confirm this conclusion as well, after examining comparative specimens of *T. patriciae* from North America.

Distribution. Siberia (map 4), North America (DONDALE et al., 1964: as *patriciae*). In Siberia, previously recorded from the Central and Southern Urals (ESYUNIN, 1992), Central Siberia (ESKOV, 1988), Yakutia and Magadan Area (MARUSIK, 1989, 1991, 1993; MARUSIK et al., 1992a, 1992b, 1993) (map 4).

Habitat. Tundra, mountain tundra and stony debris.

Description

Male. Measurements. Carapace 3.25 long and 3.00 wide. Abdomen 3.60 long and 2.30 wide. Distances between eyes: AME-AME 0.18, AME-ALE 0.10, PME-PME 0.38, PME-PLE 0.26. Median ocular area: MOA-WA 0.41, MOA-WP 0.60, MOA-L 0.48. Clypeal height 0.50. Cheliceral length 1.06. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	4.30	1.75	4.25	3.90	2.25
Leg II	5.35	1.80	5.40	4.80	2.58
Leg III	4.50	1.10	4.25	3.70	1.80
Leg IV	4.75	1.35	4.00	3.95	1.65

Spination of leg I: femur d, pr and rt 0-1-1-1; patella pr 1-1; tibia d, pr and rt 1-1-1, v 2-2-2ap; metatarsus pr and rt 1-1-0, v 2-2-0. Colouration. Carapace yellowish brownish, sometimes with large yellow rounded spot. Carapace covered with black and pale hairs. Sternum yellow. Maxillæ, labium and chelicerae grey-yellow. Abdomen: dorsum greyish with dark brown and small white spots (fig. 103); venter yellow. Book-lung covers yellow. Spinnerets brown-yellow. Palp yellow, with brownish tegulum. Palpal structure as in figs 106-113.

Female. Measurements. Carapace 3.50 long and 3.30 wide. Abdomen 6.20 long and 4.25 wide. Distances between eyes: AME-AME 0.18, AME-ALE 0.15, PME-PME 0.38, PME-PLE 0.31. Median ocular area: MOA-WA 0.40, MOA-WP 0.63, MOA-L 0.55. Clypeal height 0.58. Cheliceral length 1.43. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	4.35	1.80	3.85	3.45	2.00
Leg II	5.30	2.10	5.05	3.90	2.40
Leg III	4.30	1.65	3.75	3.20	1.85
Leg IV	4.50	1.55	3.73	3.30	1.65

Spination of leg I: femur d and pr 0-1-1-1; patella pr 1-1; tibia d, pr and rt 1-1-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration as described for male. Epigyne and spermathecæ as in figs 114-117.

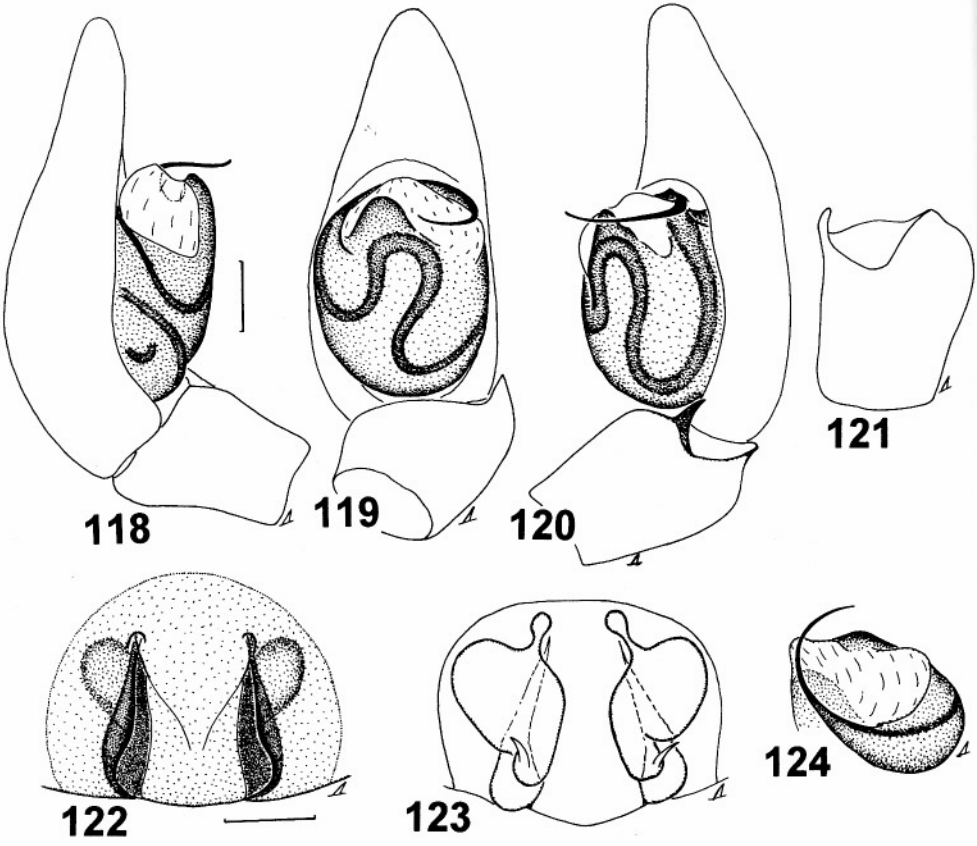
Thanatus constellatus Charitonov, 1946
(figs 118-124, 183a, map 5)

Thanatus constellatus Charitonov, 1946, [Reports on National-History Institute of the Molotov's State University], XII (3): 28, figs 50, 51 (male, female, syntypes, examined).

Philodromus yiningensis Hu & Wu, 1989, [Spiders from agricultural regions of Xinjiang...]: 324-326, figs 258.1-2 (male holotype, not examined). **New synonymy**.

Philodromus yiningensis: Hu & Wu, 1990, Journal of Shandong University, **25**: 111, figs 4-5 (male).

Material. – RUSSIA, BASHKORKOSTAN: 1 female (PSU), Meleuzovskiy Distr., Syrtlanovo, 7.08.1991, V.E. Efimik. – ORENBURG AREA: 9 females (PSU), 5 females (ISE, 3696), environs of Orenburg, summer 1927, P.L. Vorontsovskiy. – KAZAKHSTAN: 1 male, 1 female (ZMMU), Uralsk Area, Dzhanybek, 4.06.1982, K.G. Mikhailov; 1 female (ZMMU), same locality, 13.06.1982, K.G. Mikhailov; 1 female (PSU),



Figures 118-124. — *Thanatus constellatus*. – **118**, male palpus, median view. **119**, ditto, ventral view. **120**, ditto, lateral view. **121**, male palpal tibia, lateral view. – **122**, epigyne. **123**, spermathecæ. – **124**, male bulb, apical view. — Specimens: 118-121, 124, Uralsk Area, Dzhanybek. 122-123, Orenburg. — Scale: 0.1 mm.

same area, Temirskoye field, 25.06.1914, E. Martynov; 1 male (ISE, 3697), Zhambyl Area, Moiynkumskiy Distr., 6 km E.-S.-E. of Khantau, Khantau Mts, 9-11.06.1990, A.A. Feodorov & A.A. Zyuzin; 4 males (ISE, 3698), same area, Krasnogorskiy Distr., 8 km N of Kenen, Tchu-Iliyskie Mts, 15.06.1990, A.A. Feodorov & A.A. Zyuzin.

Comparative material. – UZBEKISTAN: 1 male, 1 female (PSU, lectotype and paralectotype of *T. constellatus*), Bukhara Area, Yakkabag Distr., Ugunskiy and Kola-Bulatkul' Sovkhoz, 7-14.07.1942, D.M. Fedotov.

Diagnosis. *T. constellatus* is very similar to *T. bungei*, but can be separated by the swollen membranous lobe of the tegulum, the sharpen secondary ventral tibial apophysis, position of the embolus (figs 118-121, 124) and the structure of the spermathecæ (fig. 123).

Distribution. Southern steppic regions of Western Siberia (ESYUNIN & EFIMIK, 1995), Middle Asia (Kyzylkum Desert; ZYUZIN et al., 1994) and western regions of China (Xinjiang; HU & WU, 1989, as *P. yiningensis*) (see map 5).

Habitat. *Caragana*-shrub steppe and steppe-like meadows.

Description

Male. Measurements. Carapace 1.50 long and 1.43 wide. Abdomen 1.88 long and 1.20 wide. Distances between eyes: AME-AME 0.11, AME-ALE 0.06, PME-PME 0.19, PME-PLE 0.18. Median ocular area: MOA-WA 0.24, MOA-WP 0.30, MOA-L 0.28. Clypeal height 0.21. Cheliceral length 0.60. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	3.20	0.95	2.70	2.43	1.50
Leg II	4.25	1.05	4.13	3.63	2.10
Leg III	2.83	0.70	2.18	1.98	1.10
Leg IV	3.25	0.78	2.60	2.48	1.18

Spination of leg I: femur d, pr and rt 0-1-1-1; patella pr 0-1; tibia d 0-1, pr and rt 1-1-1, v 2-2-2ap; metatarsus pr and rt 1-1-0, v 2-2-0. Colouration. Carapace yellow with sparse small dark spots. Sternum, maxillæ and labium yellow. Abdomen white. Dorsum with grey lanceolate spot anteriorly and numerous small dark spots (fig. 183a). Book-lung covers yellow. Spinnerets brownish yellow. Legs yellow with small dark spots. Palp yellow, its structure as in figs 118-121 & 124.

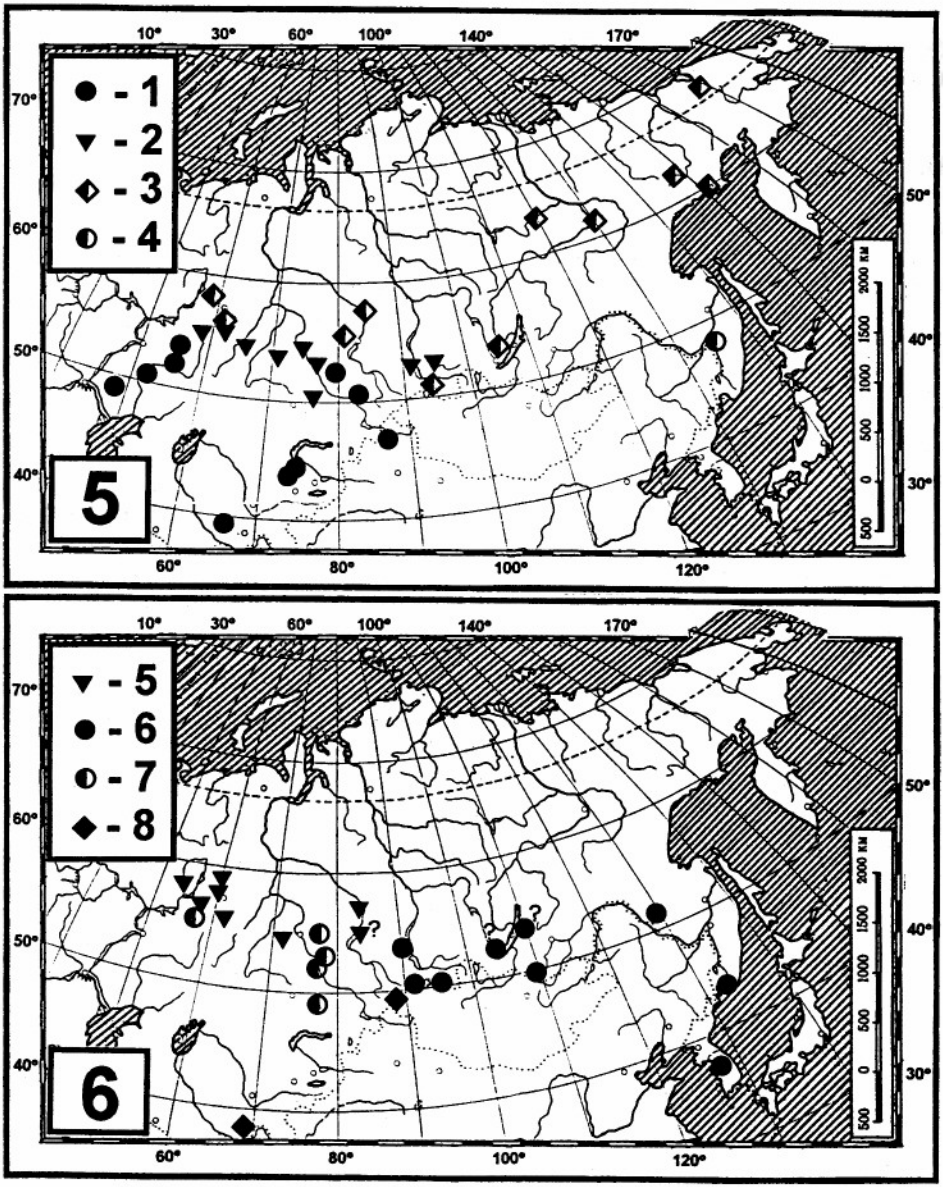
Female. Measurements. Carapace 2.15 long and 2.13 wide. Abdomen 4.38 long and 2.25 wide. Distance between eyes: AME-AME 0.16, AME-ALE 0.10, PME-PME 0.27, PME-PLE 0.20. Median ocular area: MOA-WA 0.30, MOA-WP 0.41, MOA-L 0.36. Clypeal height 0.34. Cheliceral length 0.81. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	3.18	1.05	2.80	2.30	1.38
Leg II	3.88	1.33	3.65	3.10	1.80
Leg III	2.88	0.95	2.25	2.00	1.08
Leg IV	3.32	1.03	2.70	2.30	1.13

Spination of leg I: femur d, pr and rt 0-1-1-1; tibia pr and rt 1-1-1, v 2-2-2ap; metatarsus pr 1-1-0, v 2-2-0. Colouration as described for male. Epigyne and spermathecæ as in figs 122-123.

The *sabulosus* species group

Male palpus: secondary ventral tibial apophysis absent; ventral tibial apophysis either invisible, or poorly developed as a pale hump on ventrobasal face of dorsal tibial apophysis (DTA); DTA long, usually sharpen at tip; embolus short (its tip nail-shaped), with wide base; tegular apophysis usually distinct (except for *T. fabricii*) and like a poorly sclerotized protuberance. Female genitalia: spermathecæ large, smooth except for apical parts where 3-4 seams usually occur; ducts of receptaculæ often strongly developed; lateral guide pockets shorter than central division and appearing as a pair of adjoined lateral arcs.



Maps 5-6. — Distribution of *Thanatus* spp. — **1**: *T. constellatus*. **2**: *T. arenarius*. **3**, *T. striatus*. **4** : *T. lanatus*. **5**: *T. sabulosus*. **6**: *T. coreanus*. **7**: *T. atratus*. **8**: *T. vulgaris*.

Eight species are included in the group, of which four occur in the North Asian fauna: *T. arenarius, T. coreanus, T. sabulosus* and *T. stepposus*. Also included: *T. altimontis* Gertsch, from U.S.A. (DONDALE et al., 1964) (figs 165, 166, 173-175), *T. fabricii* (Audouin), reported from Sahara to Middle Asia (LEVY, 1977; LYAKHOV, 1996), *T. lesserti* (Rœwer), from the Near East (LEVY, 1991), and *T. miniaceus* Simon, from N.-E. China and Korea (CHEN & ZHANG, 1991; PAIK, 1979) (figs 184-189).

Thanatus arenarius L. Koch in Thorell, 1872
(figs 6, 86, 87, 125-135, map 5)

Thanatus arenarius L. Koch in Thorell, 1872, Remarks on synonyms of European spiders, part III, Upsala: 269, 270.
Thanatus arenarius: Miller, 1971, Pavouci-Araneida. Klic zvířeny CSSR, **4**: 130, pl. XVII, figs 22-23 (male, female).
Thanatus arenarius: Heimer & Nentwig, 1991, Spinnen Mitteleuropas: Ein Besimmungsbuch: 446, fig. 1228 (male, female).

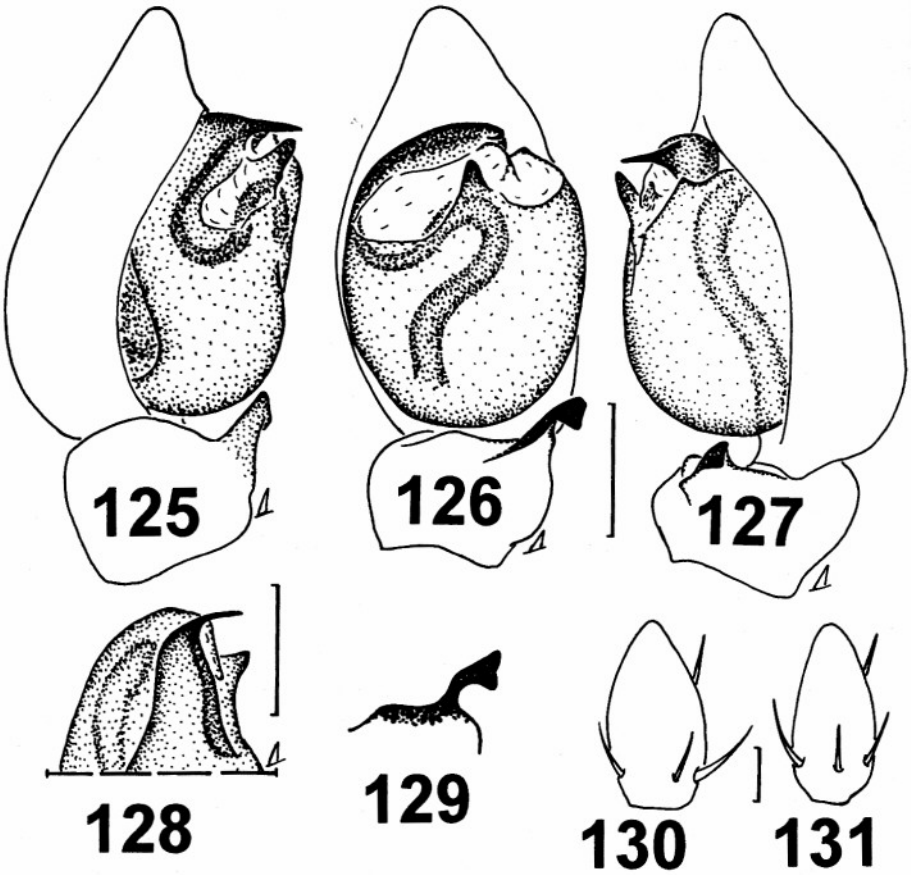
Material. – CHELYABINSK AREA: 7 males, 2 females (ISE), Troitskiy Zakaznik, 9.06.1992, P.V. Durmanov; 1 male, 1 female (PSU), Bashkiria, Momusovskiy Distr., Syrlanovo, 10.07-22.08.1990, V.E. Efimik. – NOVOSIBIRSK AREA: 23 males (ISE), Karasuk Distr., Troitskoye, Krotovaya Lyaga Lake, 9-12.06.1988, A.E. Kozlov; 1 male, 1 female (ISE), 30 km W of Novosibirsk, 5 km W of Chik, 5.05.1994, S.E. Tschernyshev; 1 female (ISE, 2915), Tchistozerniy Distr., 12 km W of Novokrasnoe, Zolotaya Griva, 21-22.06.1994, I. Lyubetchanski; 1 female (UT), Bugotakskie Sopki, 14.06.1983, H. Hippa; 1 male (UT), environs of Novosibirsk, Akademgorodok, Ob-joen Island, 16.06.1983, H. Hippa. – KHAKASSIA: 1 male (ISE, palp only), Askiz Distr., 8 km E of Biriktchul, 18.07.1990, D.V. Logunov. – TUVA: 4 males, 1 female (ISE), Piy-Khemskiy Distr., confluence of Uyuk and Biy-Khem (= Yenisei) Rivers, 670 m elev. (52°04'N, 94°22'E), 3-5.06.1995, D.V. Logunov. – KAZAKHSTAN: 1 male, 3 females (ISE), N-Kazakhstan Area, Sokolovo Distr., B-Malyshka, 12-18.06.1986, D.V. Logunov; 1 female (ISE, 3706), Pavlodar Area, Bayanaul Distr., Kyzyl-Tau, 11.06.1991, O.V. Lyakhov.

Comparative material. – CAUCASUS: 1 male (ISE), Azerbaijan, 30 km N.-E. of Shemakha, Pirkulinskiy Reserve, 1000-1100 m elev., 23.05.1984, D.V. Logunov. – GERMANY: 1 male, 1 female (SMNH, 11916), Nürnberg. – SWEDEN: 1 male, 1 female (SMNH), Öland, Gärdby, 14.06.1978, T. Kronestedt.

Diagnosis. The tibial apophysis with a wide and bilobate tip (figs 126, 129), the rounded central division of epigyne (figs 132, 134, 136) and the spermathecæ with long clearly visible bursa copulatrix (figs 133, 135) are characteristics.

Distribution. Euro-Siberian subboreal distributional pattern, the eastward distribution being probably limited by the Yenisei biogeographical barrier ("Johannsen's line") (map 5). Previous localities are: Omsk (SPASSKY & LAVROV, 1928), Tyumen area (SHLYKOV, 1978), Akmolinsk (SYTSCHEVSKAYA, 1935) and Amurskaya area (AZHEGANOVA & STENTCHENKO, 1977).

Habitat. Different steppic habitats: sloping shrub-stony steppes, steppe meadows, salt-marshes.



Figures 125-131. — *Thanatus arenarius*, male genitalia. **125**, palpus, median view. **126**; ditto, ventral view. **127**, ditto, lateral view. **128**, apical division of bulb, apical view. **129**, DTA. **130-131**, cymbiæ. — Specimens: 125-128, 130, Novosibirsk Area; 129, 131, Chelyabinsk Area. — Scale: 125-129 0.25 mm; 130, 131 0.5 mm.

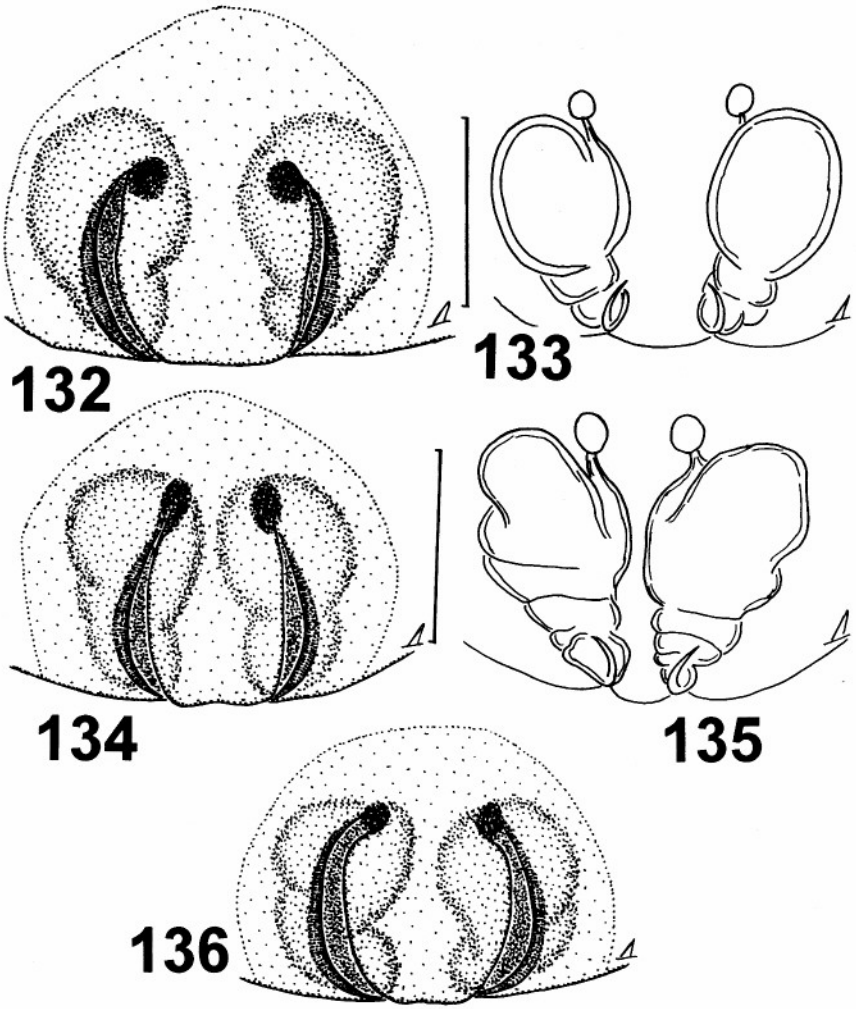
Description

Male. Measurements. Carapace 2.25-2.75 long and 2.08-2.35 wide. Abdomen 2.60-3.38 long and 1.53-1.85 wide. Distances between eyes: AME-AME 0.13-0.15, AME-ALE 0.07, PME-PME 0.21-0.23, PME-PLE 0.21-0.23. Median ocular area: MOA-WA 0.28-0.31, MOA-WP 0.37-0.43, MOA-L 0.40-0.41. Clypeal height 0.34-0.41. Chelicer-al length 0.85-0.97. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.05-2.30	0.88-1.05	1.50-1.78	1.40-1.60	1.13-1.38
Leg II	2.40-2.75	1.05-1.20	1.75-2.10	1.63-1.88	1.23-1.38
Leg III	2.13-2.58	1.03-1.13	1.60-1.90	1.53-1.75	1.08-1.18
Leg IV	2.55-2.83	0.93-1.13	1.98-2.48	1.93-2.43	1.15-1.58

Spination of leg I: femur d, pr and rt 0-1-1-1; tibia pr and rt 1-1-1 or 1-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration. Carapace yellow to brown, with median yellow markings. Carapace covered with dark hairs. Sternum, maxillæ, labium and cheliceræ yellow to brown. Abdomen brownish yellow to grey-brown. Dorsal colour markings as in fig. 86. Book-lung covers and spinnerets yellow to yellow-brown. Legs yellow to yellow-brown. Palp yellow-brown, its structure as in figs 125-131.

Female. Measurements. Carapace 2.55-3.05 long and 2.25-2.53 wide. Abdomen 3.75-5.60 long and 2.00-3.80 wide. Distances between eyes: AME-AME 0.14, AME-ALE 0.08, PME-PME 0.26, PME-PLE 0.26. Median ocular area: MOA-WA 0.33, MOA-WP 0.46, MOA-L 0.44. Clypeal height 0.33. Cheliceral length 0.80. Length of leg segments:



Figures 132-136. — *Thanatus arenarius*, female genitalia. **132**, **134**, **136**: epigynes. **133**, **135**: spermathecæ. — Specimens: 132, 133, N-Kazakhstan; 134-136, Chelyabinsk Area. — Scale: 0.25 mm..

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.13-2.38	0.93-1.18	1.53-1.83	1.38-1.60	1.20-1.33
Leg II	2.30-2.83	1.13-1.25	1.93-2.10	1.55-1.80	1.28-1.40
Leg III	2.25-2.60	1.00-1.13	1.65-1.90	1.45-1.63	1.20-1.25
Leg IV	2.45-2.85	0.93-1.08	2.23-2.30	1.83-1.88	1.25-1.43

Spination of leg I: femur d 0-0-1-1, pr 0-1-1-1; tibia pr 1-1, rt 0-1 or 0, v 2-2-2ap; metatarsus v 2-2-0. Colouration as described for the male, except as follows: carapace yellow with pair of brown wide bands on sides and median brown longitudinal spot (fig. 87). Epigyne and spermathecæ as in figs 6 & 132-135.

Thanatus coreanus Paik, 1979
(figs 137-142, 146-152, 158-159, map 6)

Thanatus coreanus Paik, 1979, Journal of Graduation School Education (Kyungpook National University), **11**: 118, figs 1-10 (male, female).

Material. – KHAKASSIA: 1 male, 2 females (ISE), Askiz Area, 8 km E of Biriktchul', 18.07.1990, D.V. Logunov. – TUVA: 1 male (palp only), 2 females (ISE), 5-12 km S-W of Mugur-Aksy, 1750-2000 m elev., 1-8.06.1990, O.V. Lyakhov; 1 male (ISE), 5 km E. of Khol'-Oozhu, 1300 m elev., 15-16.07.1993, D.V. Logunov; 1 male (ISE), 20 km N-W of Erzin, near Tes-Khem River, 4.06.1989, D.V. Logunov; 1 male (ISE), 4-5 km E of Khol'-Oozhu, Aryskannyg-Khem River, 1250-1350 m elev. (50°45'N, 94°29'E), 16-18.06.1995, D.V. Logunov; 2 females (ISE), 30-35 km W of Erzin, Yamaalyg Mt. Range, 1300-1500 m elev., 11.07.1993, D.V. Logunov; 1 male (ISE), 3-5 km N of Balgazyn, 19-20.07.1993, D.V. Logunov. – CHITA AREA: 4 males, 5 females (ISE), 60-65 km S-W of Kyra, Sokhondo Reserve, 1200-1300 m elev., 14-15.06.1991, D.V. Logunov. – AMUR AREA: 1 male (PSU), Dep. River (left tributary of Zeya River), July-August 1991, P. Rippas. – MARITIME PROVINCE: 1 female (ZIS, 641-1929), Vinogradovka, 16.06.1929, A. Djakonov; 1male (PSU), uncertain locality, 10-24.07.1913, V.K. Soldatov.

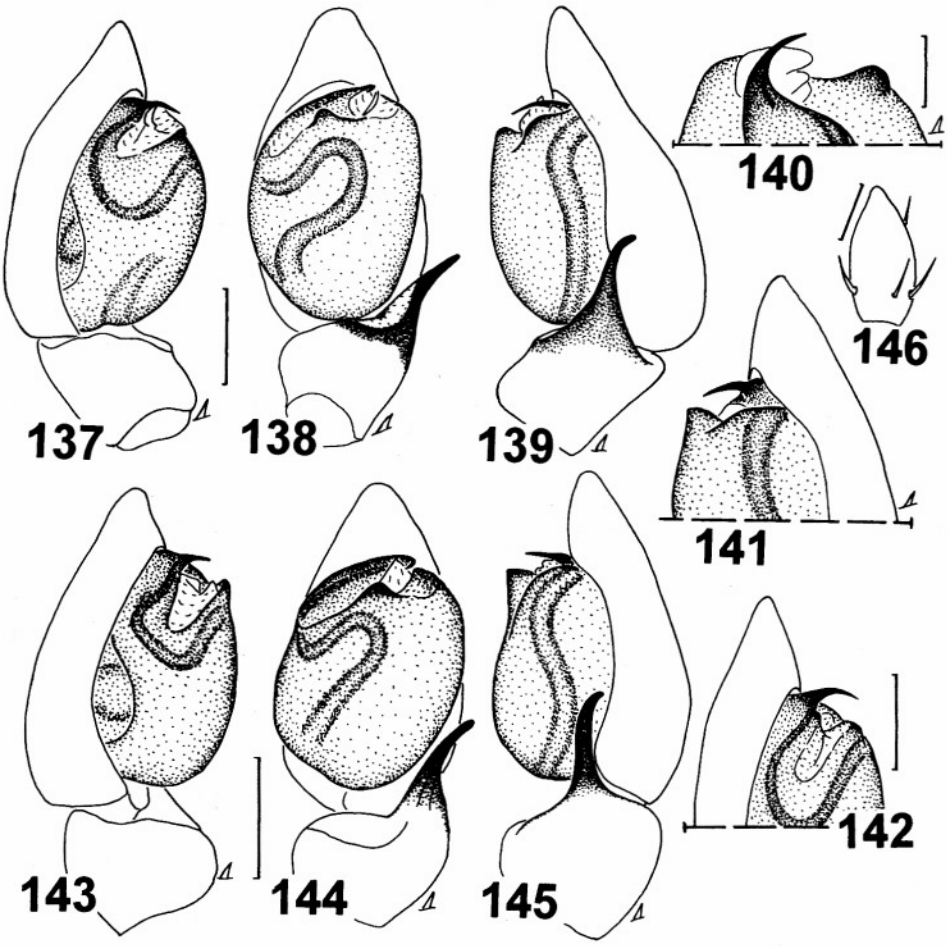
Diagnosis. *T. coreanus* is closely related to *T. sabulosus*, but can be distinguished by the wider tibial apophysis base in males (fig. 139) and the position of the receptacle (figs 148, 151). Body colouration (figs 158-159) and the larger size of the genitalia in *T. coreanus* can be also used as reliable distinguishing characters in the case.

Distribution. From southern regions of Central Siberia (presented data) eastward to Korea (PAIK, 1979) (map 6).

Habitat. Different steppic biotopes: sloping stony steppes, meadow steppes, mountain steppes.

Description

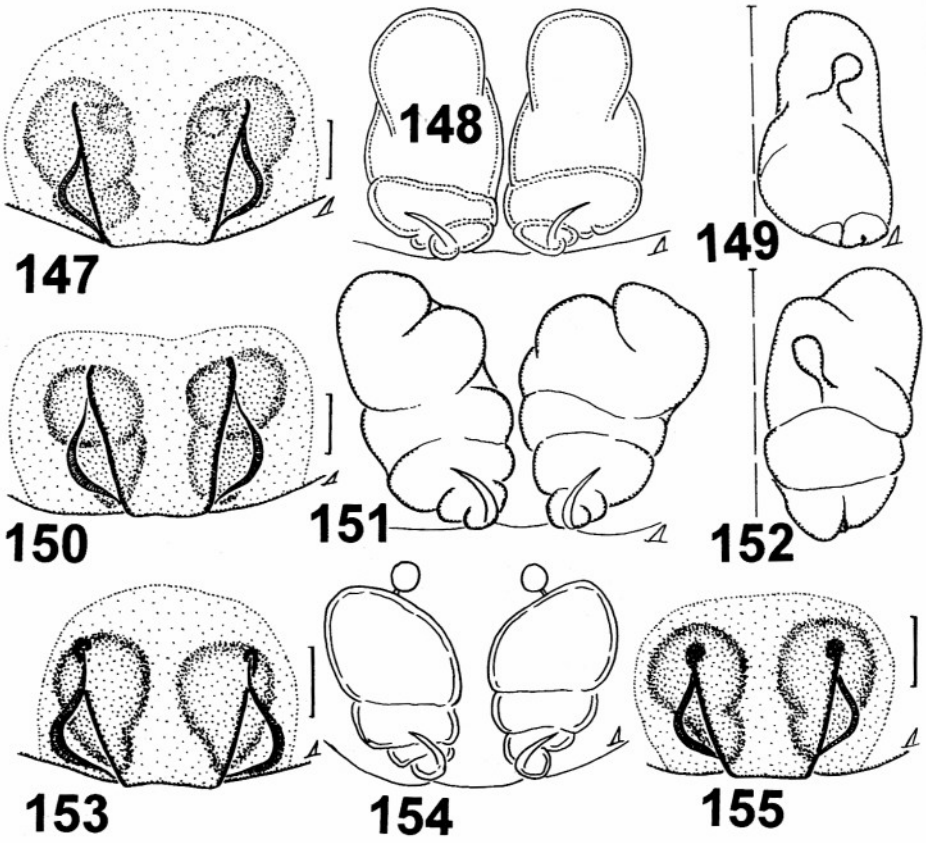
Male. Measurements. Carapace 2.20-2.68 long and 2.00-2.38 wide. Abdomen 2.60-2.75 long and 1.70-1.75 wide. Distances between eyes: AME-AME 0.16-0.26, AME-ALE 0.09, PME-PME 0.26-0.31, PME-PLE 0.26-0.28. Median ocular area: MOA-WA 0.27-0.33, MOA-WP 0.40-0.46, MOA-L 0.30-0.41. Clypeal height 0.33-0.36. Chelicer al length 0.79-0.88. Length of leg segments:



Figures 137-146. — Male genitalia of *Thanatus coreanus* and *T. sabulosus*. — **137-142, 146**: *Thanatus coreanus*, from Tuva. **137**, palpus, median view. **138**, ditto, ventral view. **139**, ditto, lateral view. **140-142**, apical division of bulb. **146**, cymbium. – **143-145**: *Thanatus sabulosus*, from Chelyabinsk Area. **143**, palpus, median view. **144**, ditto, ventral view. **145**, ditto, lateral view. — Scale: 137-145 0.25 mm; 146 0.5 mm.

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.88-2.25	0.85-1.10	1.40-1.83	1.20-1.55	1.03-1.30
Leg II	2.00-2.58	0.98-1.28	1.70-2.13	1.48-1.83	1.05-1.25
Leg III	1.78-2.52	0.83-1.10	1.48-1.88	1.78-2.03	0.93-1.15
Leg IV	2.20-2.65	0.85-1.03	1.78-2.15	1.75-2.20	1.08-1.38

Spination of leg I: femur d and pr 0-0-1-1, rt 0-1-1 or 0-1-0; patella pr 0-1-0 or without spines; tibia pr and rt 1-1-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration. Carapace with median yellow band and brownish yellow sides. Sternum, maxillae, labium and chelicerae yellow. Abdomen yellow, dorsum with colour marking (fig.



Figures 147-155. — Female genitalia of *Thanatus coreanus* and *T. sabulosus*. — **147-152**, *Thanatus coreanus*, from Tuva. **147** & **150**, epigynes. **148-149** & **151-152**, spermathecæ. — **153-155**, *Thanatus sabulosus*, from Chelyabinsk Area. **153, 155**, epigynes. **154**, spermathecæ. — Scale: 0.1 mm.

158). Book-lung covers and spinnerets yellow. Legs: femora brownish yellow, remaining segments yellow. Palp yellow, its structure as in figs 137-142 & 146.

Female. Measurements. Carapace 2.38-2.88 long and 2.18-2.65 wide. Abdomen 3.15-4.00 long and 1.83-2.65 wide. Distances between eyes: AME-AME 0.16-0.21, AME-ALE 0.07-0.11, PME-PME 0.30-0.33, PME-PLE 0.24-0.29. Median ocular area: MOA-WA 0.35-0.38, MOA-WP 0.45-0.49, MOA-L 0.43-0.46. Clypeal height 0.40-0.50. Cheliceral length 0.86-1.25. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.08-2.63	1.00-1.25	1.65-2.03	1.33-1.63	1.08-1.15
Leg II	2.53-2.90	1.15-1.35	1.85-2.33	1.53-1.83	1.08-1.25
Leg III	2.18-2.68	0.90-1.15	1.65-2.00	1.38-1.65	0.98-1.13
Leg IV	2.43-2.45	0.90-0.98	1.88-2.00	1.75-1.90	1.05-1.23

Spination of leg I: femur d 0-0-1-1, pr 0-1-1-0; tibia pr 0-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration as described for the male (fig. 159). Epigyne and spermathecæ as in figs 147-152.

Thanatus sabulosus (Menge, 1875)
(figs 143-145, 153-157, map 6)

Philodromus sabulosus Menge, 1875, Schk. Naturf. Ges. Danzig, N.F., **3**: 411.
Thanatus sabulosus: Heimer & Nentwig, 1991, Spinnen Mitteleuropas: Ein Bestimmungsbuch: 464, fig. 1227 (male, female).
Thanatus sabulosus: Esyunin, 1992, [Zoological Journal], **71** (11): 33-35, figs 1.1-5, 2.1 (male, female).

Material. – PERM AREA: 3 males, 1 female (ISE), Bardymskiy Distr., Sarashy, July 1991, S.L. Esyunin; 1 male (PSU), Preduralje leskhoz, 9.06.1992, S.L. Esyunin; 1 female (PSU), same locality, 18.08.1993, S.L. Esyunin; 1 male (PSU), environs of Perm, 7.07.1987, S.L. Esyunin; 1 male (PSU), Spasskaya Gora, 17.06.1989, S.L. Esyunin. – MARI-EL: 1 male (ISE), Yaltsik, 28.07.1988, V. Matveev. – CHELYABINSK AREA: 1 male, 2 females (PSU), Troitskiy zakaznik, 15.06.1984, Ryabikova. – BASHKORKOSTAN: 1 male (PSU), Burzyanskiy Distr., Sargaya, Bashkirskiy Reserve, 17.07.1985, V.E. Efimik; 1 female (PSU), Bashkiria, Masin Mt, 21.08.1989, V.E. Efimik. – NOVOSIBIRSK AREA: 2 males, 1 female (UT), Novosibirsk, Akademgorodok, 16.06-4.08.1983, H. Hippa. – NORTH-KAZAKHSTAN AREA: 1 male (ISE), Sokolovskiy Distr., B-Malyshka, 11.06.1986, D.V. Logunov.

Comparative material. – AUSTRIA: 1 male (IZW, sub 628), W. Kulczyński coll. – SWITZERLAND: 1 male, 1 female (SMNH, 1193, det. as *T. gratiosus*), Alpes, Simon det. – POLAND: 1 female (SMNH, 1196), Krakau [=Krakow], Kulczyński det.

Diagnosis. See comments in "Diagnosis" under *T. coreanus*.

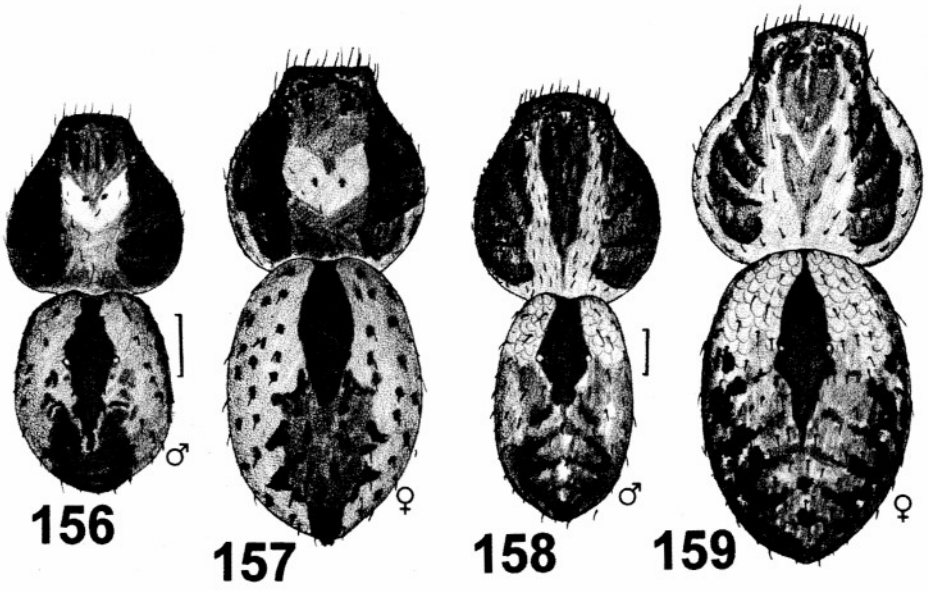
Distribution. Europe to southern regions of Western Siberia (map 6). Previously reported from the Tomsk environs (ERMOLAJEV, 1934), the Southern Urals (ESYUNIN, 1992), Irkutsk area (IZMAILOVA, 1989) and Transbaikalia (Barguzinskiy Reservation; STERNBERGS, 1981).

Habitat. Deciduous and mixed forests, where the species occurs on meadows, clearings or in tree crowns.

Description

Male. Measurements. Carapace 1.46-1.86 long and 1.38-1.73 wide. Abdomen 1.60-2.05 long and 1.15-1.63 wide. Distances between eyes: AME-AME 0.12-0.16, AME-ALE 0.06, PME-PME 0.17-0.26, PME-PLE 0.19-0.23. Median ocular area: MOA-WA 0.25-0.29, MOA-WP 0.32-0.39, MOA-L 0.33-0.38. Clypeal height 0.24-0.31. Cheliceral length 0.56-0.62. Length of leg segments (the largest specimen lacks the second leg):

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.33-1.78	0.63-0.73	1.08-1.43	0.95-1.25	0.73-0.88
Leg II	1.56	0.65	1.29	1.08	0.78
Leg III	1.38-1.53	0.54-0.60	1.03-1.20	0.95-1.09	0.73-0.79
Leg IV	1.58-1.75	0.44-0.65	1.25-1.33	1.15-1.28	0.80-0.83



Figures 156-159. — Body colouration of *Thanatus* spp. – **156-157**, *T. sabulosus*, from Chelyabinsk Area. – **158-159**, *T. coreanus*, from Tuva. — Scale: 0.5 mm.

Spination of leg I: femur d and pr 0-1; tibia pr 0-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration. Carapace: brown to dark brown on sides, with wide median yellow to brownish yellow band. Sternum yellow to brownish yellow. Maxillae, labium and chelicerae brown to yellow-brown. Abdomen yellow to brownish yellow, with dorsal colour markings as shown in fig. 156. Legs: femora brown to dark brown, remaining segments yellow to brownish yellow. Palp brownish, its structure as in figs 143-145.

Female. Measurements. Carapace 1.69 long and 1.50 wide. Abdomen 2.44 long and 1.68 wide. Distances between eyes: AME-AME 0.14, AME-ALE 0.06, PME-PME 0.21, PME-PLE 0.18. Median ocular area: MOA-WA 0.27, MOA-WP 0.39, MOA-L 0.33. Clypeal height 0.24. Cheliceral length 0.56. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.29	0.60	1.00	0.91	0.67
Leg II	1.43	0.59	1.21	0.96	0.79
Leg III	1.37	0.59	0.99	0.91	0.61
Leg IV	1.50	0.56	1.17	1.07	0.69

Spination of leg I: femur d 0-0-1; tibia v 2-2-2ap; metatarsus v 2-2-0. Colouration as described for male (fig. 157). Epigyne and spermathecae as in figs 153-155.

Thanatus stepposus sp.n.
(figs 160-164, 167-172, 176-177, map 7)

Material. Holotype: 1 male (ISE, 3677), Tuva, nearly 10 km W of Ak-Tsyraa, Irbitei River, 1000-1050 m elev. (50°44'N, 93°08'E), 13-16.06.1995, D.V. Logunov & Y.M. Marusik.

Paratypes: 8 males, 8 females (ISE, 3678), 2 males, 1 females (MNHN), together with holotype; 5 males, 5 females (ISE, 3679), 2 males (MNHN), 15-45 km W of Oo-Shinaa, 1000 m elev., 17-19.07.1993, D.V. Logunov; 1 male (ISE, 3680), N-E bank of Ubsu-Nur Lake, 750 m elev.(50°40'N, 92°58'E), 18.07.1993, D.V. Logunov; 17 males, 7 females (ZMMU), same locality, 14.06.1995, D.V. Logunov & Y.M. Marusik; 1 female (ISE, 3681), Tandinskiy Distr., environs of Chagytai Lake, 1100-1200 m elev., 21.06.1990, D.V. Logunov.

Comparative material of — 1. *T. altimontis*. USA: 2 males, 1 female (CNC), Wyoming, Lincoln Co., Fossil, 30.07.1964, B. & C. Durden; 1 male (AMNH), California, Yosemite Park, July 1935, coll.?; 1 male (AMNH), Oregon, Baker, 1280 m elev., 12.08.1958, J. Baker; 1 female (AMNH), Idaho, Big Wood River, 19 miles North of[?] Ketchum, 25.08.1941, Chamberlin & Piemebil; 1 female (AMNH), Peavine, Sierra Co., 29.05.1940, W.M. Pearce. — 2. *T. miniaceus*. CHINA: 1 male, 1 female (MNHN, 2804, syntypes), "Peking" (Coll. of E. Simon).

Diagnosis. The species is closely related to the North American species *T. altimontis* (figs 165-166, 173-175) and the East Asian species *T. miniaceus* (figs 184-189), but can be separated from them by the shorter and more massive embolus, the shape of the tibial apophysis (figs 160-163) and the structure of spermathecæ (figs 168-170, 172, 175).

Distribution. S-E Tuva (map 7).

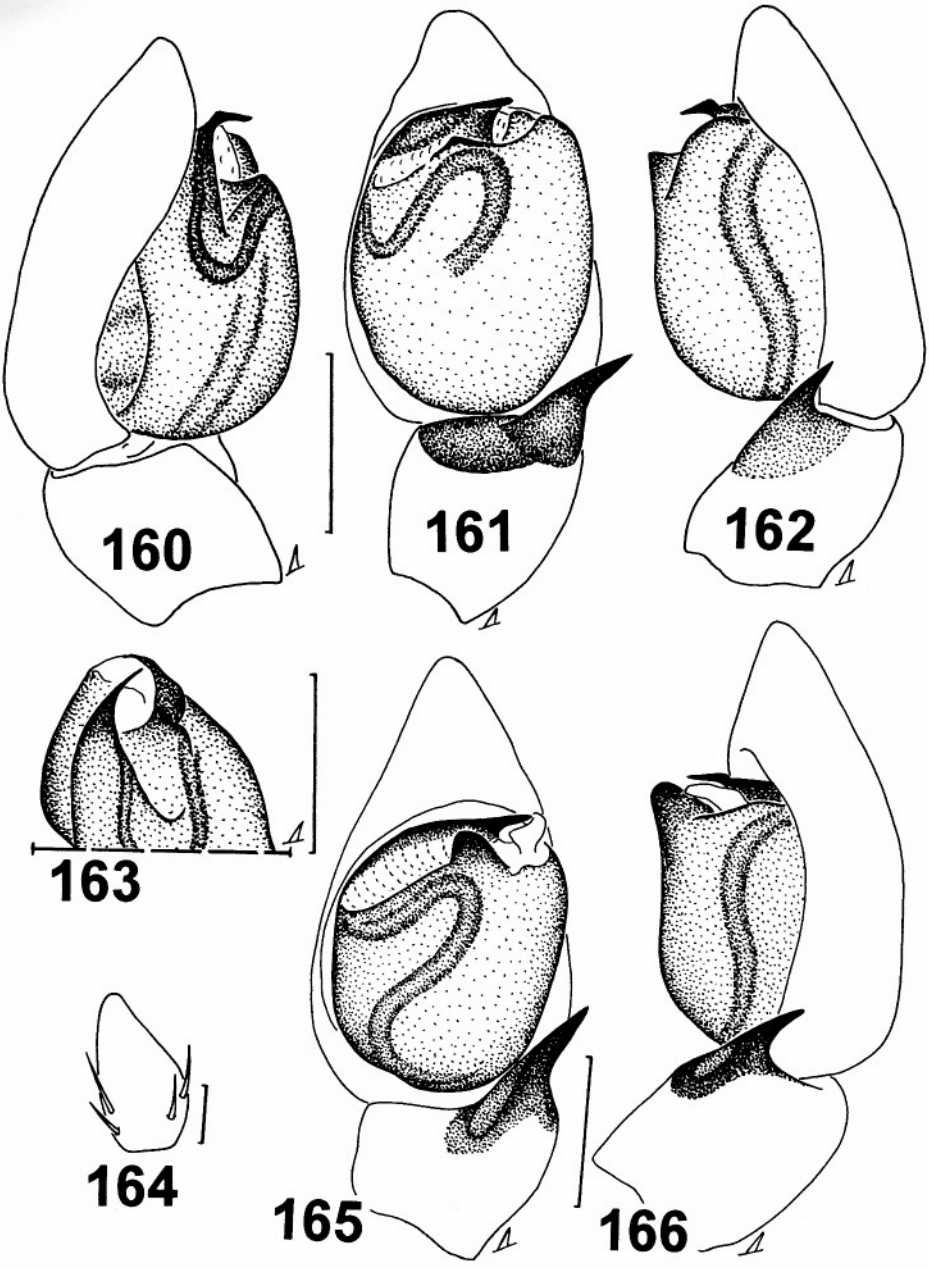
Habitat. Dry stony steppe with *Nanophyton erinaceus* and sloping stony steppes.

Description

Male. Measurements. Carapace 1.77 long and 1.66 wide. Abdomen 2.01 long and 1.21 wide. Distances between eyes: AME-AME 0.10, AME-ALE 0.05, PME-PME 0.18, PLE-PLE 0.17. Median ocular area: MOA-WA 0.25, MOA-WP 0.35, MOA-L 0.36. Clypeal height 0.29. Cheliceral length 0.67. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.76	0.70	1.45	1.28	0.93
Leg II	2.05	0.75	1.68	1.49	1.05
Leg III	1.85	0.64	1.45	1.35	0.88
Leg IV	2.10	0.70	1.70	1.65	0.95

Spination of leg I: femur d 0-1-1, pr and rt 0-1-1-1; patella pr 0-1; tibia pr 1-1-1, rt 1-1-1 or 1-1, v 2-2-2ap; Metatarsus pr 1-1 or 0, v 2-2-0. Colouration. Carapace dark brown, with wide median band composed of white hairs. Sternum brown to yellowish brown. Labium and chelicerae brown. Maxillæ yellow. Dorsum as in fig. 177. Sides and venter of abdomen yellow to brownish yellow. Book-lung covers brown to yellow-brown. Spinnerets brownish yellow. Legs: femora dark brown; patellae light brown; remaining segments yellow to red-yellow. Palp dark brown, its structure as in figs 160-163.

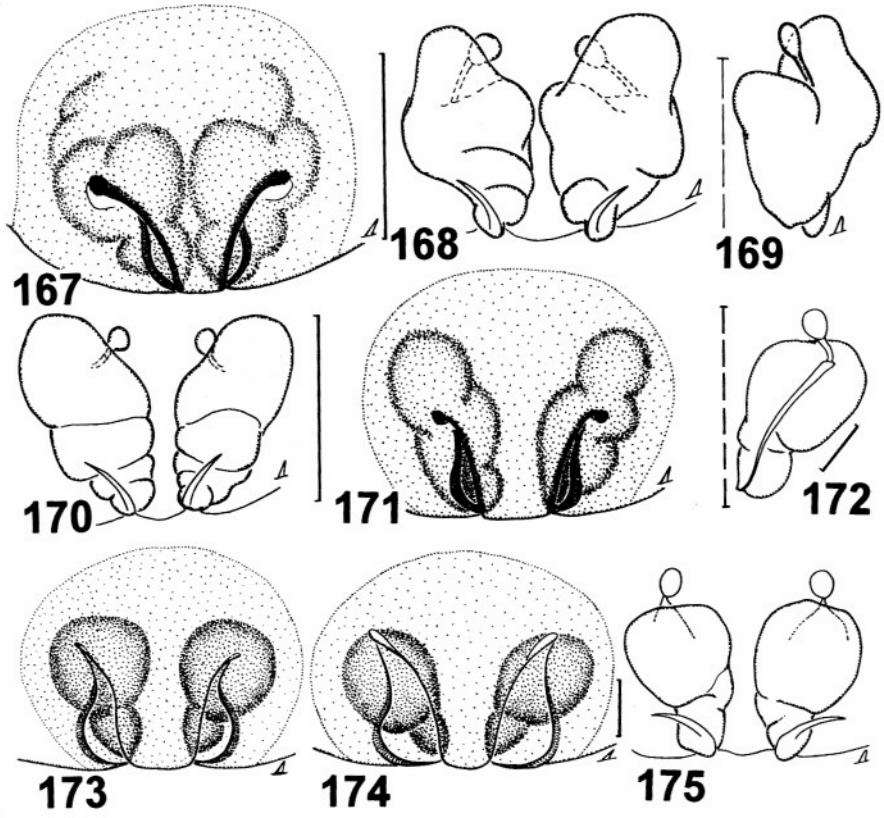


Figures 160-166. — Male genitalia. – **160-164**, *Thanatus stepposus* from Tuva. **160**, palpus, median view. **161**, ditto, ventral view. **162**, ditto, lateral view. **163**, apical division of bulb, apical view. – **165-166**, *Thanatus altimontis*, from USA, Wyoming. **165**, palpus, ventral view. **166**, ditto, lateral view. — Scale: 160-163 & 165-166, 0.25 mm; 164, 0.5 mm.

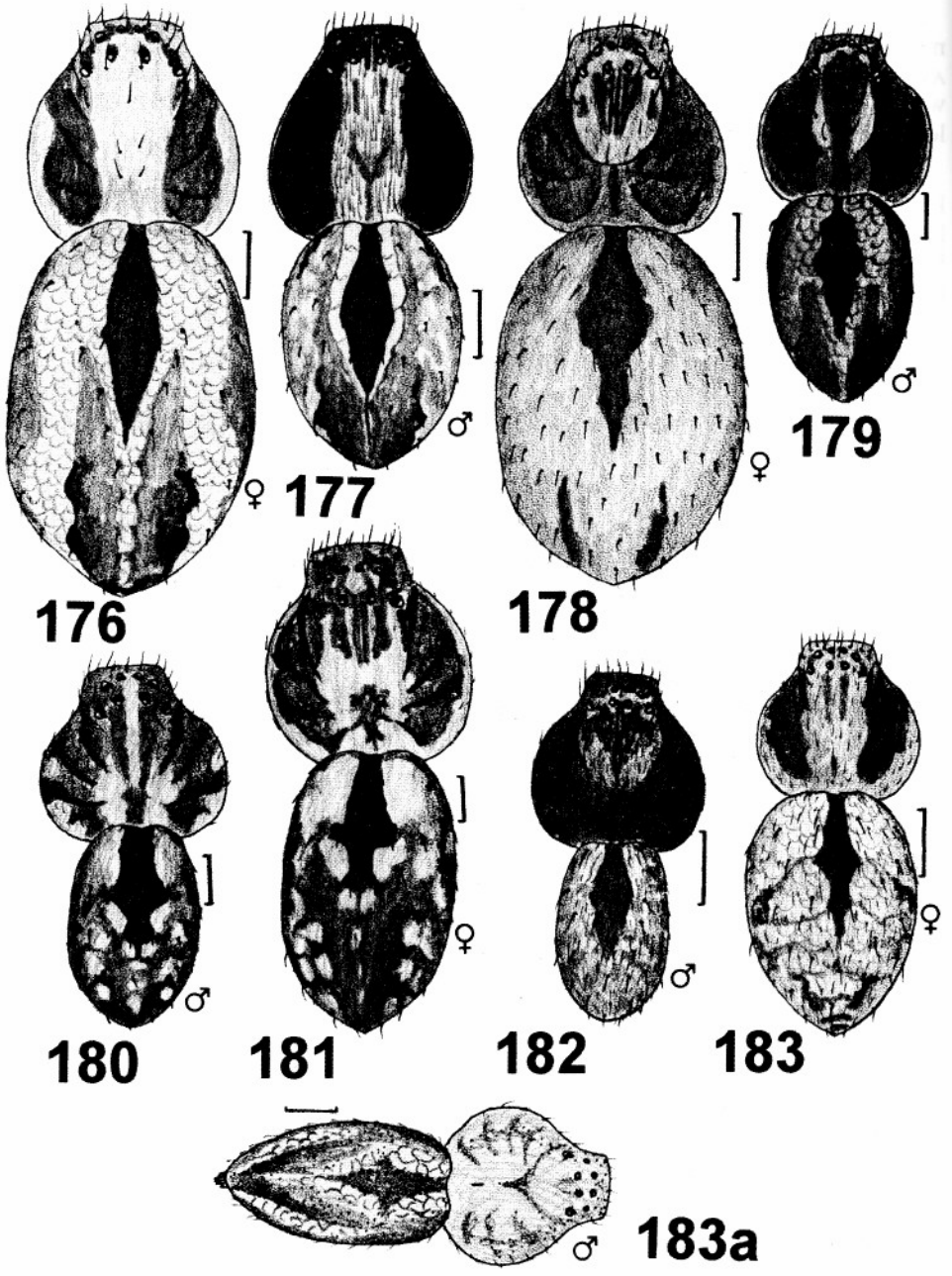
Female. Measurements. Carapace 1.63-1.98 long and 1.16-1.64 wide. Abdomen 3.03-3.90 long and 1.95-2.55 wide. Distances between eyes: AME-AME 0.13, AME-ALE 0.05-0.06, PME-PME 0.20-0.22, PME-PLE 0.20-0.22. Median ocular area: MOA-WA 0.27-0.30, MOA-WP 0.38-0.39, MOA-L 0.37-0.41. Clypeal height 0.31. Cheliceral length 0.61-0.70. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.50-1.78	0.68-0.78	1.20-1.50	0.95-1.10	0.79-0.90
Leg II	1.78-1.88	0.75-0.88	1.36-1.58	1.05-1.28	0.85-0.93
Leg III	1.53-1.75	0.665-0.70	1.05-1.43	0.90-1.15	0.73-0.85
Leg IV	1.75-2.00	0.66-0.78	1.33-1.40	1.29-1.45	0.85-0.93

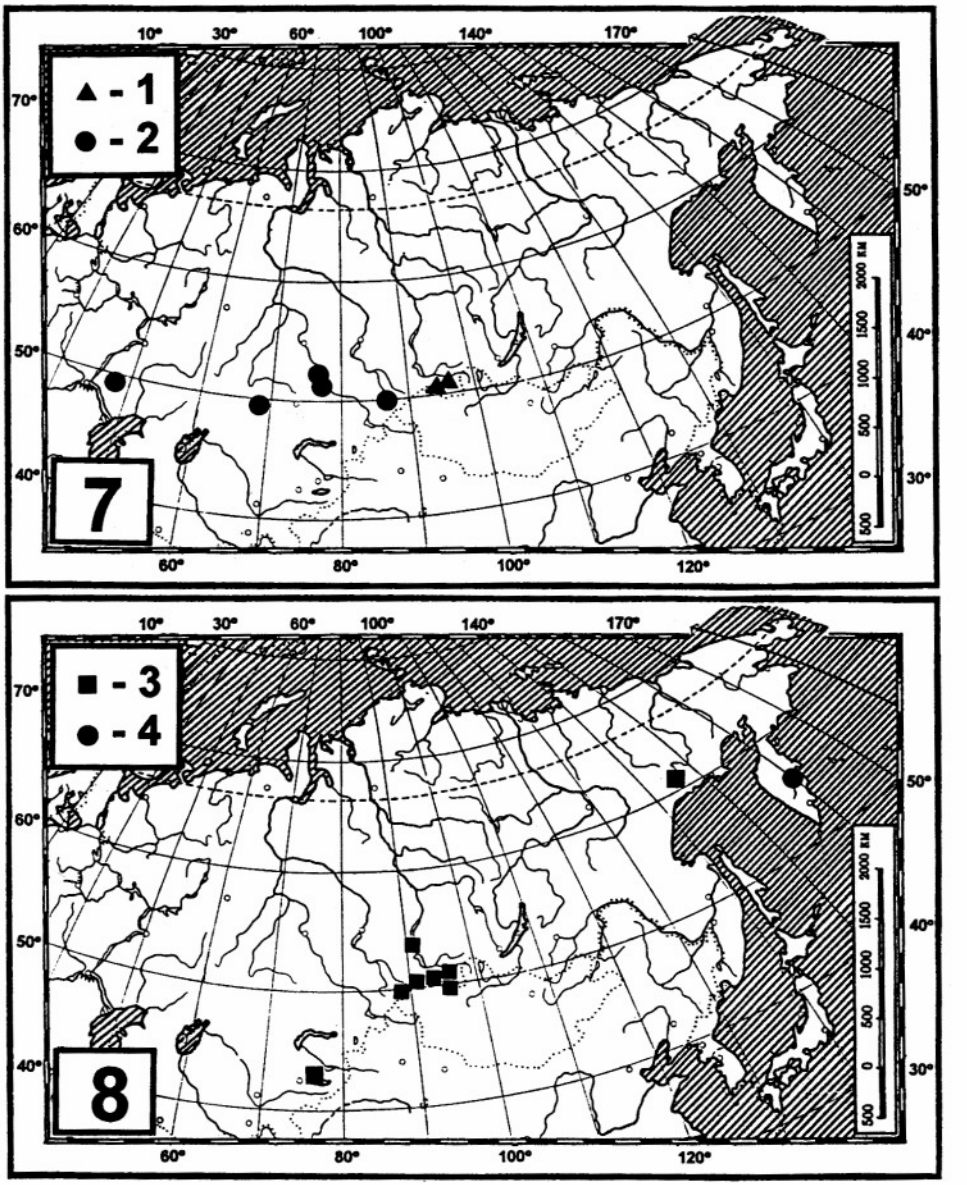
Spination of leg I: femur d 0-1-1 or 0, pr 0-1-1 or 0-1-1-1; tibia pr 0-1, v 2-2; metatarsus v 2-2-0. Colouration lighter than that in male. Carapace yellow, with pair of wide brown bands on sides. Sternum yellow, but dotted with red small spots. Labium, maxillæ and chelicerae yellow. Abdomen yellow, with dorsal colour mar-



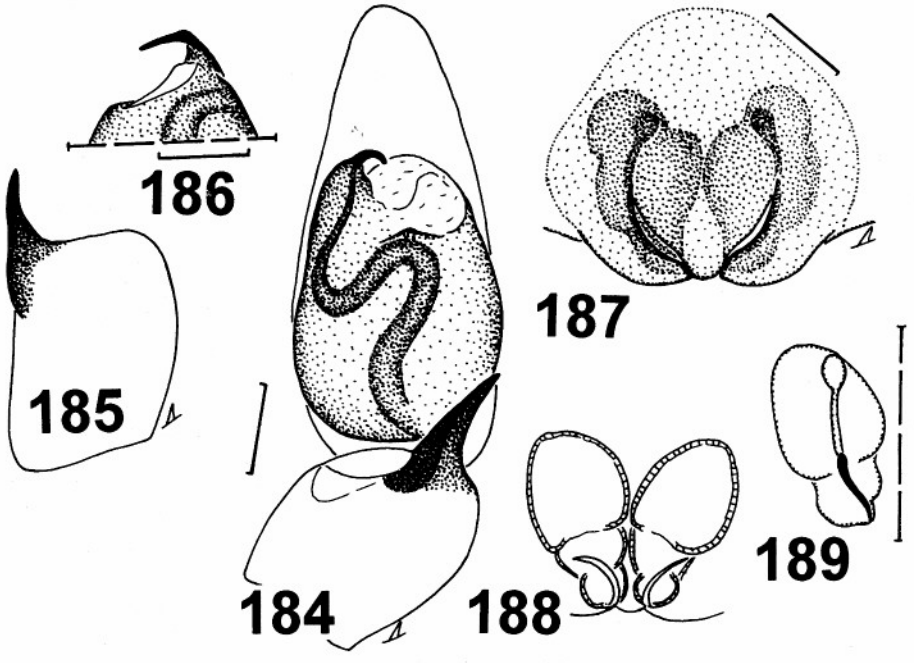
Figures 167-175. — Female genitalia. – **167-172**, *Thanatus stepposus*, from Tuva. **167** & **171**, epigynes. **168-170** & **172**, spermathecæ. – **173-175**, *Thanatus altimontis*. **173-174**, epigynes. **175**, spermathecæ. 173 from USA, Wyoming; 174-175 from USA, Idaho. — Scale: 167-172, 0.25 mm; 173-175, 0.1 mm.



Figures 176-183. — Body colouration of *Thanatus* spp. – **176-177**, *T. stepposus* from Tuva. – **178-179**, *T. atratus*, from Novosibirsk Area. – **180-181**, *T. ubsunurensis*, from Tuva. – **182-183**, *T. tuvinensis*, from Tuva. – **183a**, *T. constellatus*, from Kazakhstan, Kenen. — Scale: 176-177, 179-181, 183a, 0.5 mm; 178, 182-183, 1 mm.



Maps 7-8. — Distribution of *Thanatus* spp. – **1**: *T. stepposus*. **2**: *T. mikhailovi*. **3**: *T. tuvinensis*. **4**: *T. nigromaculatus*.



Figures 184-189. — *Thanatus miniaceus*, from China, Peking. **184**, male palpus, ventral view. **185**, DTA. **186**, apical division of bulb, lateral view. **187**, epigyne. **188-189**, spermathecæ. — Scale: 0.1 mm.

kings as in fig. 176. Book-lung covers and spinnerets yellow. Legs yellow, but femora, patellæ and tibiæ dotted with red small spots on their sides. Palp yellow. Epigyne and spermathecæ as in figs 167-172.

Etymology. The specific name reflects the steppic habitats in which the species lives.

The *striatus* species group

Male palpus. Secondary ventral tibial apophysis (sVTA) present; ventral tibial apophysis developed as impressed area between sVTA and dorsal tibial apophysis; embolus short and curved, usually with swollen base; tegular apophysis prominent and often strongly sclerotized. Female genitalia: spermathecæ very simple, like a smooth small elongated chamber ended apically by an easily visible receptacle; the duct of receptacle is sometimes well developed and appears a rather wide and long tube.

Eight species are included in the group, of which six are found in Northen Asia: *T. atratus, T. lanatus, T. mikhailovi, T. striatus, T. tuvinensis* and *T. vulgaris*. Also included: *T. setigerus* (O. P.-Cambridge) from Israel and Libya (LEVY, 1977) and *T. peninsulanus* from southwestern areas of USA (SCHICK, 1965).

Thanatus atratus Simon, 1875
(figs 178, 179, 190-193, 198-200, map 6)

Thanatus atratus Simon, 1875, Les Arachnides de France, Paris, 2: 318. (male, female, syntypes, examined).
Thanatus atratus: Kronestedt, 1983, Ent. Tidskr., **104**: 195, figs 5, 6. (male, female).
Thanatus pallidus Tyshchenko, 1965, [Entomological Review], **44** (3): 698, fig. 3. (female holotype, examined). **New synonymy.**

Material. – BASHKORKOSTAN: 1 female (PSU), Burzyanskiy Distr., Bashkirskiy Reserve, 6-15.08.1988, V.E. Efimik. – NOVOSIBIRSK AREA: 4 males (ISE), 20-30 km S-W of Karasuk, 30.06.1990, V.P. Pekin; 1 female (ISE, 2914), Tchistozerniy Distr., 12 km W of Novokrasnoe, Zolotaya Griva, 21-22.06.1994, I. Lyubetchanski. – KAZAKHSTAN: 1 female (ZIS, holotype of *T. pallidus*), Karaganda Area, Kent Mts., 25.06.1957, V.P. Tyshchenko; 1 female (ISE, 3707), 35 km N of Pavlodar, Sytchevka, valley of Irtysh River, 20.06.1994, O.V. Lyakhov; 1 female (ISE, 3705), Pavlodar Area, Lebyazhie Distr., Malybai Lake, 16.05.1991, O.V. Lyakhov.

Comparative material. 8 males, 7 females (MNHN, 669, syntypes of *T. atratus*), "Alpes"; 1 male, 2 females (SMNH), Sweden, Öland Island, Gärdby, 14.06.1978, T. Kronestedt; 2 males (SMNH), Öland Island, Resmo, 11.07.1978, Coll.?; 1 male (SMNH), Czech Republic, N-Böhmen, Čičov, June 1964, J. Buchar.

Diagnosis. *T. atratus* is most closely related to *T. vulgaris* and *T. tuvinensis*. The most reliable distinguishing characters of males are: the shape and size of the tegular apophysis (cf. figs 191 and 196), the shape of the embolus (it can be especially well seen from the apical view, figs 193, 194). Females differ in having the more narrow and not depressed central division of epigyne in comparison with that of *T. vulgaris* and also in shape of the bursa copulatrix (cf. figs 198, 202 and 204).

Distribution. From central Europe and Scandinavia (KRONESTEDT, 1983), eastward to N-Kazakhstan and West Siberia (map 6). Hitherto recorded from N-Kazakhstan by TYSHCHENKO (1965: *T. pallidus*), Altai (MARUSIK et al., 1996) and from E-Kazakhstan by SAVELYEVA (1976, 1979: *T. pallidus*).

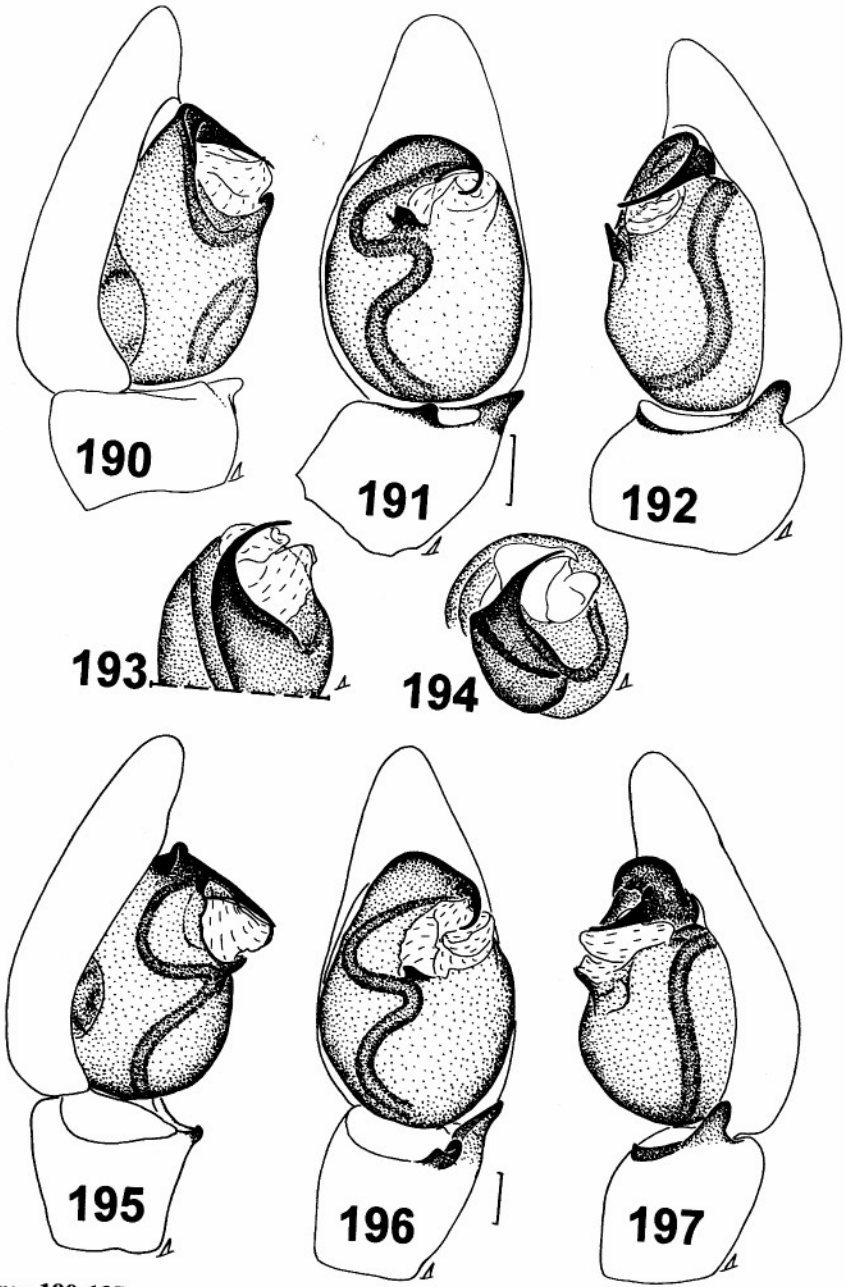
Habitat. Specimens have been collected in the mountain steppe in Bashkorkostan, meadow steppe in Novosibirsk Area (presented data) and dry stony meadow and sandy areas in Sweden (s. KRONESTEDT, 1983).

Description

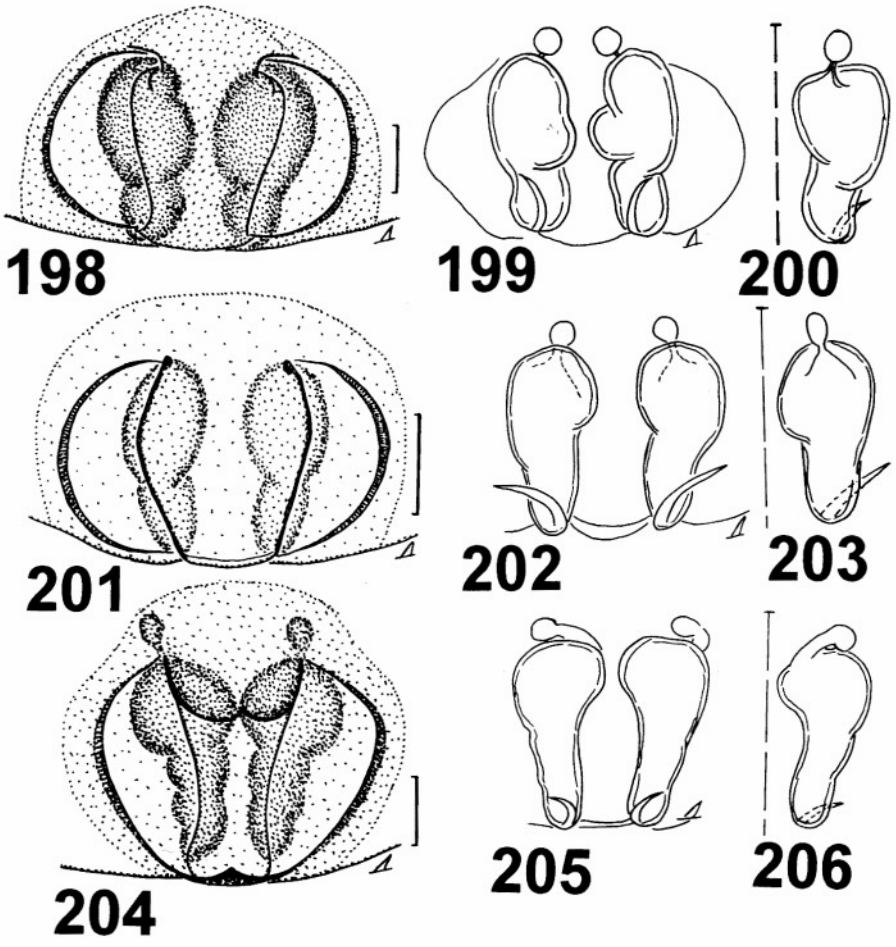
Male. Measurements. Carapace 2.05 long and 1.84 wide. Abdomen 2.45 long and 1.63 wide. Distances between eyes: AME-AME 0.13, AME-ALE 0.09, PME-PME 0.21, PME-PLE 0.19. Median ocular area: MOA-WA 0.27, MOA-WP 0.38, MOA-L 0.41. Clypeal height 0.31. Cheliceral length 0.78. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.05	0.83	1.68	1.40	1.13
Leg II	2.43	1.00	2.03	1.83	1.23
Leg III	2.18	0.83	1.68	1.60	1.06
Leg IV	2.50	0.80	1.90	2.08	1.28

Spination of leg I: femur d, pr and rt 0-1-1-1; patella pr 0-1-0; tibia pr and rt 1-1-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration. Carapace pale, yellow brownish,



Figures 190-197. — Male genitalia. – **190-193**, *Thanatus atratus*, from Novosibirsk Area. **190**, palp, median view. **191**, ditto, ventral view. **192**, ditto, lateral view. **193**, apical division of bulb, apical view. – **194-197**, *Thanatus vulgaris*, from Tajikistan. **194**, apical division of bulb, apical view. **195**, palpus, median view. **196**, ditto, ventral view. **197**, ditto, lateral view. — Scale: 0.1 mm.



Figures 198-206. — Female genitalia. – **198-200**, *Thanatus atratus*, from Novosibirsk Area. **198**, epigyne. **199-200**, spermathecæ. – **201-203**, *Thanatus tuvinensis*, from Magadan Area. **201**, epigyne. **202-203**, spermathecæ. – **204-206**, *Thanatus vulgaris*, fromMagadan Area. **204**, epigyne. **205-206**, spermathecæ. — Scale: 0.1 mm.

with pair of yellow longitudinal stripes (fig. 179). Edges of carapace bordered by white hairs. Sternum, maxillæ, labium and cheliceræ yellow to yellow brownish. Abdomen greyish yellow. Dorsum with pale cardial mark (fig. 179). Book-lung covers yellowish. Spinnerets yellowish to yellow brownish. All legs unicoloured, yellow-brown to brown. Palpal structure as shown in figs 190-193.

Female. Measurements. Carapace 1.85 long and 1.75 wide. Abdomen 3.34 long and 2.12 wide. Distances between eyes: AME-AME 0.17, AME-ALE 0.09, PME-PME 0.26, PME-PLE 0.18. Median ocular area: MOA-WA 0.30, MOA-WP 0.39, MOA-L 0.37. Clypeal height 0.30. Cheliceral length 0.77. Length of leg segments:

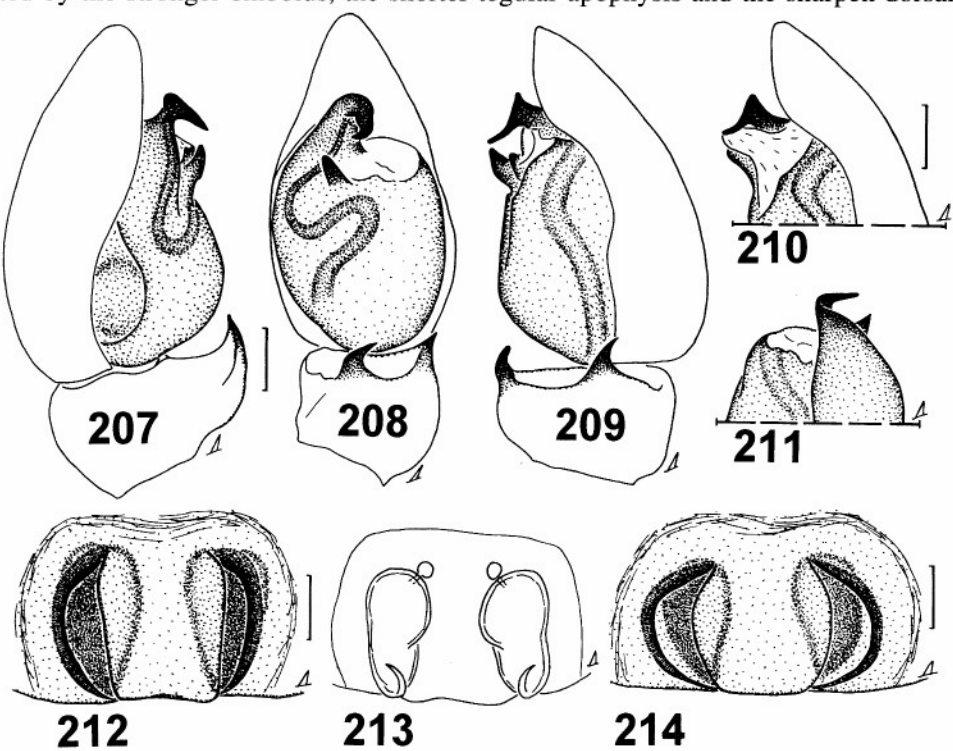
	femur	patella	tibia	metatarsus	tarsus
Leg I	2.04	1.25	1.61	1.31	0.59
Leg II	2.40	1.00	1.92	1.61	1.12
Leg III	2.08	0.82	1.54	1.30	0.58
Leg IV	2.25	0.88	1.76	1.56	0.93

Spination of leg I: femur d 0-0-1-1, pr 0-1-1-1; tibia pr 1-1-1, rt 1-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration as described for the male, but paler (fig. 178). Epigyne and spermathecæ as in figs 198-200.

Thanatus lanatus sp.n.
(figs 207-214, 216, 217, map 5)

Material. Holotype: 1 male (ISE, 1687), Khabarovsk Province, 20-25 km SE of Khabarovsk, Bolshekhekhtsyrkiy Reserve, 100-940 m elev., 8-17.06.1987, D.V. Logunov. Paratypes: 1 male, 5 females (ISE, 1688-1691), together with the holotype.

Diagnosis. *T. lanatus* sp.n. is closely related to *T. striatus*, but can be separated by the stronger embolus, the shorter tegular apophysis and the sharpen dorsal



Figures 207-214. — *Thanatus lanatus*, from Khabarovsk Province. **207**, male palpus, median view **208**, ditto, ventral view. **209**, ditto, lateral view. **210**, apical division of bulb, lateral view. **211**, ditto apical view. **212, 214**, epigynes. **213**, spermathecæ. — Scale: 0.1 mm.

tibial apophysis in males (cf. figs 208, 209 and 228, 229), as well as by a wider area between the epigynal suture and the lateral guide pocket (cf. figs 212 and 231).

Distribution. Type locality only (map 5). Previously erroneously reported from the same locality under the name *T. striatus* (LOGUNOV, 1992).

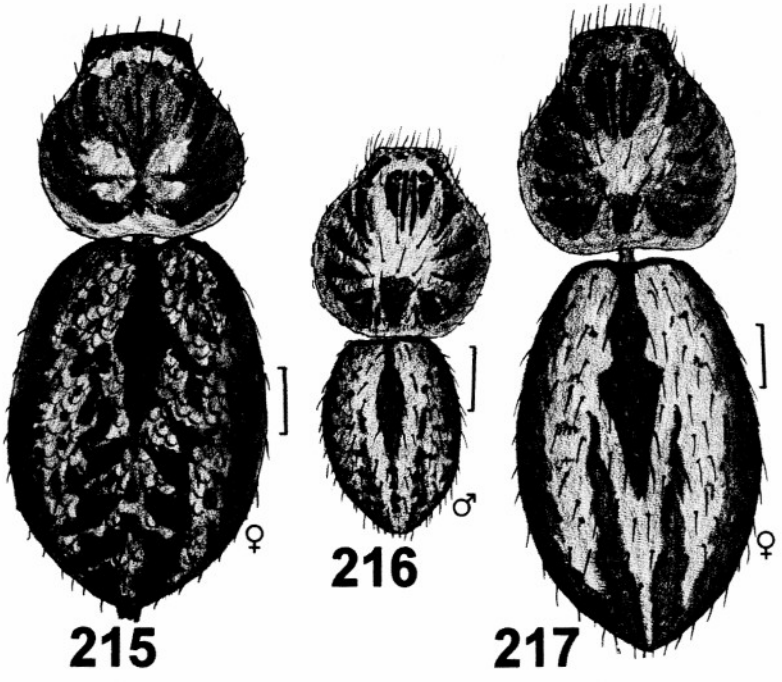
Habitat. Sweeping in mixed and coniferous forests.

Description

Male. Measurements. Carapace 1.47 long and 1.36 wide. Abdomen 1.67 long and 1.15 wide. Distances between eyes: AME-AME 0.09, AME-ALE 0.04, PME-PME 0.17, PME-PLE 0.19. Median ocular area: MOA-WA 0.20, MOA-WP 0.30, MOA-L 0.30. Clypeal height 0.19. Cheliceral length 0.53. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.26	0.59	0.98	0.78	0.63
Leg II	1.43	0.65	1.15	0.96	0.66
Leg III	1.33	0.55	0.98	0.83	0.63
Leg IV	1.40	0.58	1.08	1.03	0.68

Spination of leg I: femur d 0-0-1-1, pr 0-1-1-1; tibia pr 0-1, rt 1-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration. Carapace sandy coloured, tinged with brown. Eyes surrounded with black. Abdomen grey-yellow, with pale lanceolate spot on dorsum (fig. 216). Dorsum covered with long erected hairs. Remaining parts of body sandy coloured. Palp with brown tegulum, its structure as in figs 207-211.



Figures 215-217. — Body colouration of *Thanatus* spp. – **215**, *T. striatus*, from Chelyabinsk Area. – **216-217**, *T. lanatus*, from Khabarovsk Province. — Scale: 0.5 mm.

Female. Measurements. Carapace 1.55 long and 1.55 wide. Abdomen 2.60 long and 1.88 wide. Distances between eyes: AME-AME 0.13, AME-ALE 0.04, PME-PME 0.20, PME-PLE 0.19. Median ocular area: MOA-WA 0.26, MOA-WP 0.37, MOA-L 0.34. Clypeal height 0.21. Cheliceral length 0.60. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.24	1.10	0.93	0.83	0.66
Leg II	1.36	0.69	1.06	0.91	0.67
Leg III	1.34	0.56	0.90	0.76	0.61
Leg IV	1.41	1.03	1.06	0.96	0.61

Spination of leg I: femur d and pr 0-0-1-1; tibia v 2-2-2; metatarsus v 2-2-0. Colouration as described for the male, but paler (fig. 217). Epigyne and spermathecæ as in figs 212-214.

Etymology. The specific name is derived from the Latin word "lanatus" meaning "fur-bearing".

Thanatus mikhailovi sp.n.
(figs 218-226, map 7)

Material. Holotype: 1 male (ZMMU), NW-Kazakhstan, Uralsk Area, Dzhanybek, 11-14.06.1982, K.G. Mikhailov. Paratypes: ALTAI: 8 females (ISE, 3701), Muzdo-Bulak Lake, 25.06.1988, M. Safronov – KAZAKHSTAN: 1 male, 14 females (ZMMU), nearly 25 km E-S-E of Pavlodar, 30.06.1990, O.V. Lyakhov; 1 male, 2 females (ISE, 3704), Pavlodar Area, Lebyazhie Distr., Malybai Lake, 16.05.1991, O.V. Lyakhov; 2 males, 2 females (ISE, 3703), Akmola Area, Kokshetau Mt., 12.06.1957, V.P. Tyshchenko.

Diagnosis. This species is closely related to *T. atratus, T. vulgaris* and *T. tuvinensis*, but differs in the shape of the tegular apophysis, dorsal tibial apophysis, the embolus and the epigyne (figs 218-226).

Distribution. Southern steppic areas of Western Siberia (map 7).

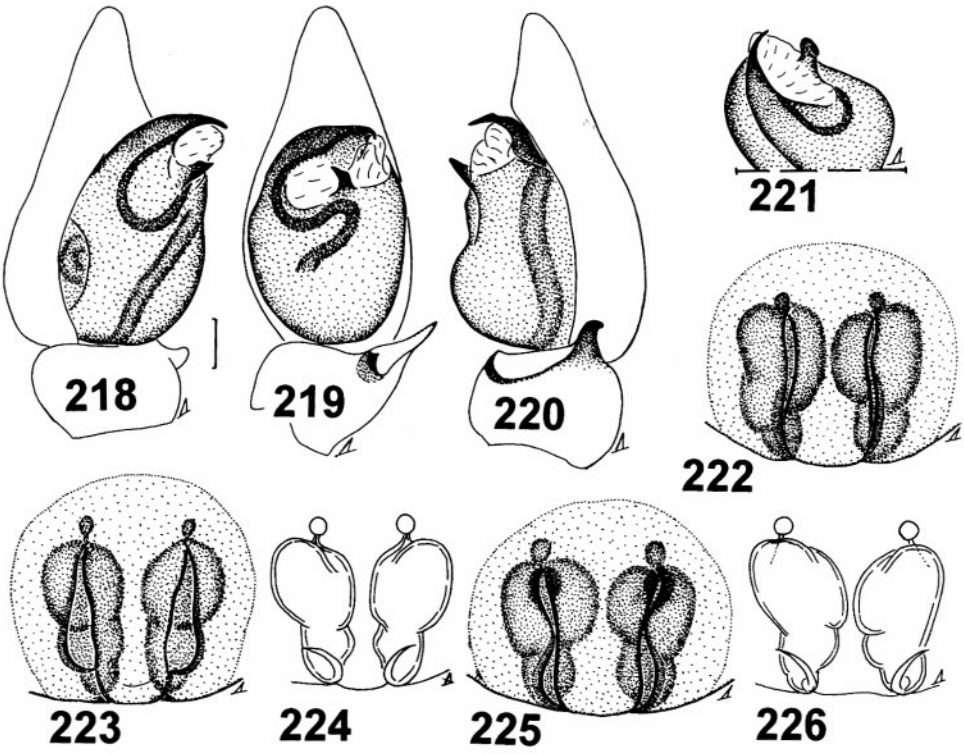
Habitat. It is a typical resident of *Stipa-Artemisia* and meadow steppes.

Description

Male (holotype). Measurements. Carapace 2.10 long and 1.83 wide. Abdomen 2.50 long and 1.75 wide. Distances between eyes: AME-AME 0.09, AME-ALE 0.09, PME-PME 0.19, PME-PLE 0.19. Median ocular area: MOA-WA 0.25, MOA-WP 0.34, MOA-L 0.41. Clypeal height 0.33. Cheliceral length 0.75. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.95	0.90	1.68	1.43	1.00
Leg II	2.35	0.98	1.90	1.75	1.03
Leg III	2.00	0.60	1.68	1.60	1.08
Leg IV	2.43	0.88	2.00	2.08	1.28

Spination of leg I: femur d, pr and rt 0-1-1-1; tibia pr and rt 1-1-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration. Carapace yellow with the 3 longitudinal brown stripes. Sternum yellow with sparse dark spots. Maxillaæ, labium and cheliceraæ yellow. Abdomen yellow with dorsal colour markings being similar (practically indis-



Figures 218-226. — *Thanatus mikhailovi*. **218**, male palpus, median view. **219**, ditto, ventral view. **220**, ditto, lateral view. **221**, apical division of bulb, apical view. **222, 223** & **225**, epigynes. **224** & **226**, spermathecæ. — Specimens: 218-221, Uralsk Area; 222, 225, 226, Altai; 223, 224, Akmola Area. — Scale: 0.1 mm.

tinguishable) to that of *T. atratus*. Book-lung covers yellow. Spinnerets yellow, but tinged with grey. Legs yellow with small brown spots. Palpal structure as in figs 218-221.

Female. Measurements. Carapace 2.03-3.10 long and 1.93-2.88 wide. Abdomen 3.83-6.10 long and 2.43-3.90 wide. Distances between eyes: AME-AME 0.16-0.18, AME-ALE 0.09-0.10, PME-PME 0.24-0.30, PME-PLE 0.24-0.31. Median ocular area: MOA-WA 0.29-0.39, MOA-WP 0.41-0.54, MOA-L 0.39-0.54. Clypeal height 0.34-0.54. Cheliceral length 0.79-1.25. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.73-2.90	0.80-1.58	1.29-2.40	1.06-2.00	0.78-1.30
Leg II	1.95-3.30	0.95-1.40	1.48-2.70	1.31-2.05	0.85-1.40
Leg III	1.78-3.05	0.81-1.25	1.25-2.20	1.10-2.05	0.83-1.20
Leg IV	2.05-3.25	0.80-1.30	1.50-2.70	1.40-2.40	0.88-1.30

Spination of leg I: femur d 0-0-1-1, pr 0-1-1-1; tibia pr 1-1-1, rt 0-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration as described for the male, but paler. Epigyne and spermathecæ as in figs 222-226.

Etymology. The new species is named after the well-known Russian arachnologist, Dr. K.G. Mikhailov, the curator of the ZMMU, who collected the holotype.

Thanatus striatus C.L. Koch, 1845
(figs 1, 3, 215, 227-233, map 5)

Thanatus striatus C.L. Koch., 1845, Die Arachniden, Bd 12: 92, pl.417, fig. 1022. (female).
Thanatus striatus: Kaston, 1948, Spiders of Connecticut: 438, pl. 85, figs 1595-1597 (male, female).
Thanatus striatus: Dondale, Turnbull & Redner, 1964, Canadian Entomologist, **96**: 640-643, figs 19-21, 33, 34 (male, female).
Thanatus striatus: Schick, 1965, Bulletin of American Museum of Natural History, **129** (1): 94, map 19, figs 121-123 (male, female).
Thanatus striatus: Vilbaste, 1969, [Spiders of Estonia]: 120, fig.101 (male, female).
Thanatus striatus: Heimer & Nentwig, 1991, Spinnen Mitteleuropas: Ein Bestimmungsbuch: 464, fig. 1224 (male, female).
Thanatus walteri Gertsch, 1933, American Museum Novitates, **636**: 6, figs 6, 47 (male, female). Synonymized with *T. striatus* by Emerton (1930).

Material. – PERM AREA: 1 male (PSU), Spasskaya Gora, 11.06.1988, S.L. Esyunin; 1 female (PSU), Preduralie leskhoz, 19.06.1983, E.O. Khaitmatova. – CHELYABINSK AREA: 1 male, 2 females (PSU), Troitskiy Zakaznik, Kukai Lake, 3.06.1992, P.V. Durmanov. – KURGAN AREA: 1 female (ISE), Ukrainets, 25.05.1990, Smirnov & Maiorov. – TYUMEN AREA: 1 female (ZMMU), S-Yamal Peninsula, 17.07-7.08.1980, coll.? – TOMSK AREA: 1 female (ISE), Tomsk Distr., Voronovo near Petukhovo, 3.07.1992, S.Y. Rakov. – NOVOSIBIRSK AREA: 1 female (ISE), environs of Tchany Lake, 26.05.1990, V.P .Pekin. – ALTAI: 1 male (UT), SW Altai, 10 km S-E of Katanda, 2000 m alt., 10-14.07.1983, H. Hippa; 1 male (UT), Bertkum, 2000 m elev., 12.07.1983, H. Hippa. – TUVA: 4 females (ISE), Ovyurskiy Distr., N-E bank of Ubsu-Nur Lake, 740 m elev., 18.07.1993, D.V. Logunov; 1 female (ISE), Tes-Khemskiy Distr., 5-7 km E of Khol'-Oozhu, 14.07.1989, D.V. Logunov.

Diagnosis. See comments in "Diagnosis" under *T. lanatus*.

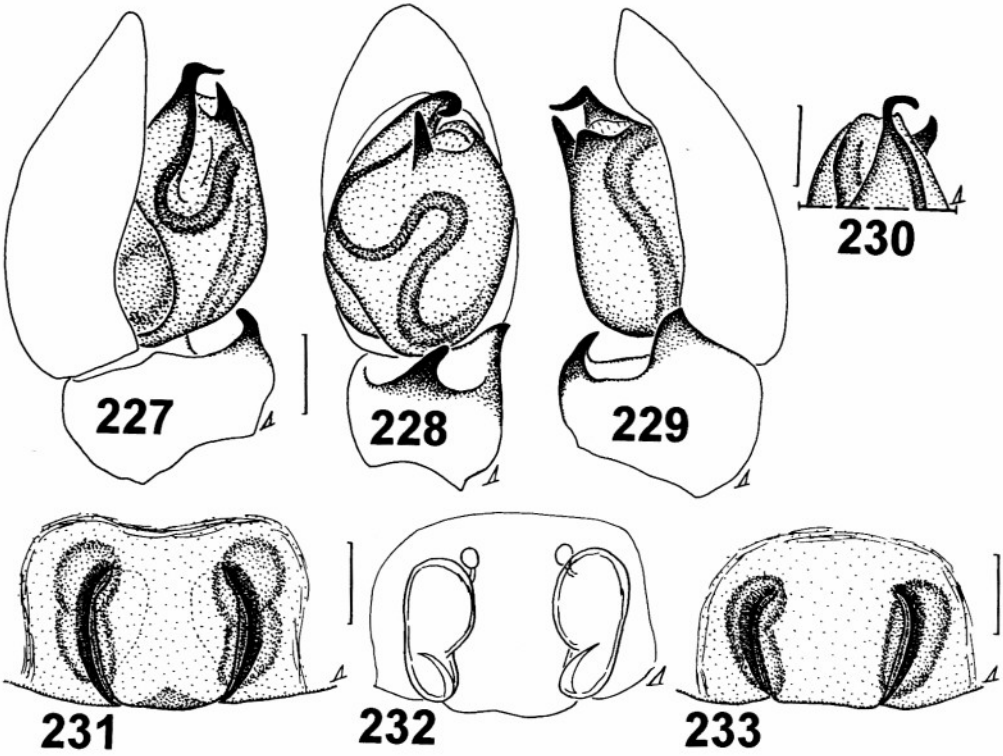
Distribution. A holarctic temperate species. Localities in which the species was found in Siberia are shown in map 5. Previously recorded from the Southern Urals (AZHEGANOVA, 1951 ; PAKHORUKOV & EFIMIK, 1988), Altai (MARUSIK et al., 1996), Irkutsk Area (IZMAILOVA, 1989), Yakutia and Magadan Area (MARUSIK, 1991; MARUSIK et al. 1992a, 1992b, 1993).

Habitat. Steppes, valley meadows, wet meadows near water and even tundra habitats (in Altai).

Description

Male. Measurements. Carapace 1.48-1.65 long and 1.38-1.58 wide. Abdomen 1.68-1.85 long and 1.13-1.20 wide. Distances between eyes: AME-AME 0.09, AME-ALE 0.07, PME-PME 0.19, PME-PLE 0.16. Median ocular area: MOA-WA 0.21, MOA-WP 0.30, MOA-L 0.30. Clypeal height 0.16-0.20. Cheliceral length 0.47-0.60. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.23-1.45	0.60-0.68	1.00-1.13	0.90-1.04	0.65-0.78
Leg II	1.48-1.65	0.65-0.75	0.75-1.08	1.00-1.10	0.75-0.90
Leg III	1.26-1.50	0.53-0.90	0.95-1.08	0.88-0.98	0.63-0.78
Leg IV	1.33-1.53	0.58-0.63	1.08-1.29	1.01-1.20	0.65-0.88



Figures 227-233. — *Thanatus striatus*, from Chelyabinsk Area. **227**, male palpus, median view. **228**, ditto, ventral view. **229**, ditto, lateral view. **230**, apical division of bulb, apical view. **231, 233**, epigynes. **232**, spermathecæ. — Scale: 0.1 mm.

Spination of leg I: femur pr and rt 0-0-1-1-1; tibia pr and rt 1-1, v 2-2-2ap; metatarsus v 2-2-0. Colouration. The whole of body and all legs sandy coloured, with brownish tinge and numerous spots. Colour markings as in female. Palpal structure as in figs 1, 3, 227-230.

Female. Measurements. Carapace 1.77-2.50 long and 1.73-2.35 wide. Abdomen 3.25-4.25 long and 2.20-2.75 wide. Distances between eyes: AME-AME 0.18-0.20, AME-ALE 0.06-0.11, PME-PME 0.25-0.35, PME-PLE 0.19-0.30. Median ocular area: MOA-WA 0.30-0.35, MOA-WP 0.43-0.48, MOA-L 0.39-0.41. Clypeal height 0.23-0.35. Cheliceral length 0.70-0.90. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.40-2.15	0.73-1.05	1.04-1.70	0.85-1.45	0.65-1.00
Leg II	1.48-2.50	0.75-1.15	1.23-2.00	1.03-1.65	0.60-1.15
Leg III	1.28-2.05	0.68-0.95	1.00-1.60	0.90-1.30	0.63-0.65
Leg IV	1.30-2.20	0.65-0.90	1.13-1.75	1.10-1.55	0.65-0.95

Spination of leg I: femur d 0-1, pr 0-2; tibia v 2-2-2ap; metatarsus v 2-2-0. Colouration. The whole of body and all legs sandy coloured to yellow. Sometimes

metatarsi and tarsi brownish. Dorsal colour markings as in fig. 215. Epigyne and spermathecæ as in figs 231-233.

Thanatus tuvinensis sp.n.
(figs 182, 183, 234-241, map 8)

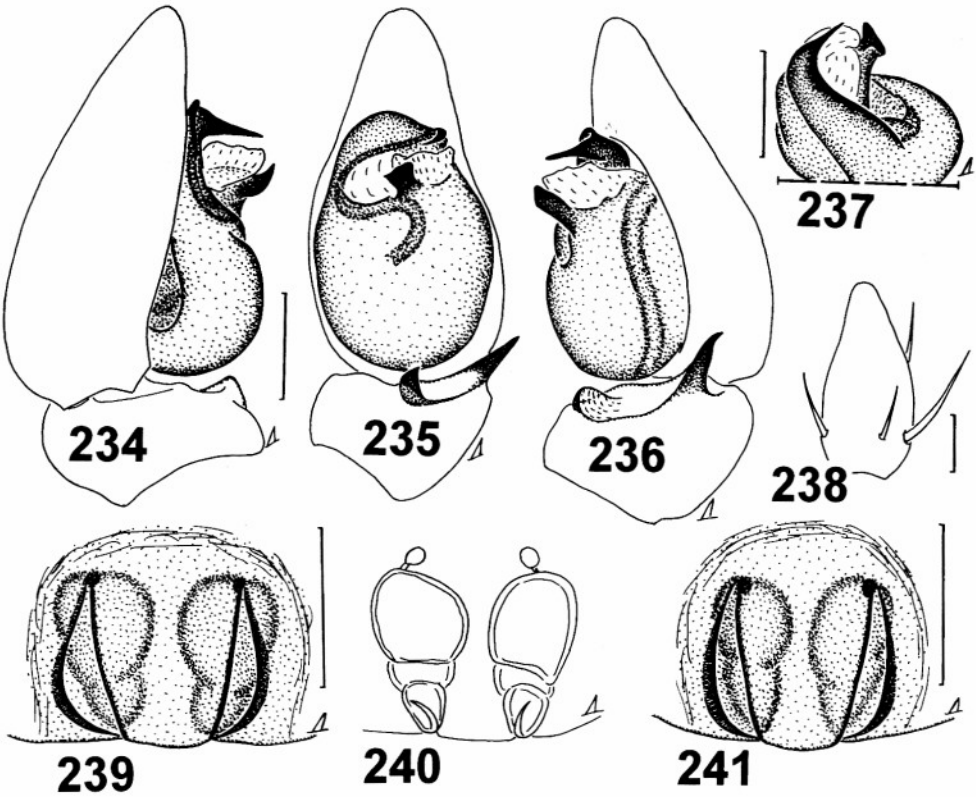
Material. Holotype: 1 male (ISE, 3684), Tuva, N-E bank of Ubsu-Nur Lake, 750 m elev. (50°40'N, 92°58'E), 14.05.1995, D.V. Logunov & Y.M. Marusik. Paratypes: – TUVA: 8 males, 8 females (ISE, 3685), together with holotype; 7 males, 12 females (ISE, 3887), same locality, 12.06.1989, D.V. Logunov; 1 female (ZMMU), same locality, 18.07.1993, D.V. Logunov; 2 male, 2 female (ISE, 3686), 1 male (ZMMU), 20 km S-W of Erzin, Ontchalaan Mt Range, 1300 m elev., 25.05-1.06.1990, D.V. Logunov & O.V. Lyakhov; 2 male (ISE, 3694), 5 males (ZMMU), 20-25 km N-W of Erzin, Tes-Khem River Valley, 900 m elev., 31.05-4.06.1989, D.V. Logunov; 1 male, 1 female (ISE, 3690), Tandinskiy Distr., environs of Chagytai Lake, 21.06.1989, D.V. Logunov; 5 male, 10 female (ISE, 3691), 5-8 km E of Khol'-Oozhu, Aryskannyg-Khem River Valley, nearly 1300 m elev. (50°45'N, 94°29'E), 15-16.07.1993, D.V. Logunov; 11 males, 8 females (MNHN), same locality, 1100-1300 m elev., 14.07.1989, D.V. Logunov; 1 female (ISE, 3695), 3 km N-E of Sagly, 24.07.1993, D.V. Logunov; 4 males, 3 females (ZMMU), 40-45 km W of Oo-Shinaa, Irbitei River, 1000-1050 m elev. (50°44'N, 93°08'E), 18-19.07.1993, D.V. Logunov; 3 males, 2 females (MNHN), same locality, 13-16.06.1995, D.V. Logunov; 5 males, 1 female (ISE, 3693), 2 males, 1 female (ZMMU), 10-12 km S-E of Mugur-Aksy, 2000 m elev., 8.06.1990, O.V. Lyakhov. – KHAKASSIA: 1 male, 2 female (ZMMU), Shyra Distr., Itkul' Lake, 21.07.1990, S.E. Tchernyshov; 2 males, 3 female (ZMMU), 25-27 km N-E of Askiz, 5.07.1990, D.V. Logunov. – ALTAI: 5 males, 1 female (ISE, 3692), Kuraiskiy Mt. Range, Kosh-Agatch, June 1970, D.I. Berman; 1 male (ISE, 3699), same locality, 2500 m elev., 6.07.1971, A.P. Kononenko; 3 males, 4 females (ISE, 3700), Tyagun Vill., 20-25.05.1990, Y. Lavrinenko. – BURYATIA: 1 female (ISE, 3689), Selenga Distr., Tayozhniy, 19.07.1984, B.P. Zakharov. – MAGADAN AREA: 1 female (ISE, 2871), the upper reaches of Kolyma River, Kulu, 24.04.1985, S.P. Bukhkalo. – KIRGHIZSTAN: 23 males (ISE, 3688), Kungei-Alatoo Mt. Range, Toru-Aigyr, 16.05.1970, A.P. Kononenko.

Diagnosis. *T. tuvinensis* is closely related to *T. vulgaris, T. atratus* and *T. mikhailovi*, but can be easily separated from them by the structure of the male genitalia, e.g. the wider square tegular apophysis and the dorsal tibial apophysis sharpen at tip (figs 235, 236). Females of *T. tuvinensis* can be distinguished from those of *T. vulgaris* by the wider central septum of the epigyne (figs 239, 241), but they cannot be surely separated from those of *T. atratus* (cf. figs 198-200 and 201-203) or *T. mikhailovi*. The only distinctive character in the latter case is the body colouration (figs 182, 183).

Distribution. Tuva, Khakassia, Magadan Area, Altai and Kirghizstan (map 8).

Habitat. Sloping stony steppe, mountain stony steppe, *Artemisia-Stipa-Caragana* shrub steppe, dry stony steppe with *Nanophyton erinaceus*.

Note. This species has been erroneously reported by LYAKHOV (1996) from Altai as *T. striatus* (Lyakhov's specimens examined) and from E-Siberia (MARUSIK, 1991; MARUSIK et al., 1992a, 1992b) as *T. vulgaris* (Marusik's specimens examined).



Figures, 234-241. — *Thanatus tuvinensis*, from Tuva. **234**, male palpus, median view. **235**, ditto, ventral view. **236**, ditto, lateral view. **237**, apical division of bulb, apical view. **238**, cymbium. **239, 241**, epigynes. **240**, spermathecæ. — Scale: 0.25 mm.

Description

Male. Measurements. Carapace 1.64-2.60 long and 1.57-2.35 wide. Abdomen 1.66-2.53 long and 1.11-1.75 wide. Distances between eyes: AME-AME 0.13-0.14, AME-ALE 0.07, PME-PME 0.22-0.26, PME-PLE 0.19-0.26. Median ocular area: MOA-WA 0.20-0.30, MOA-WP 0.36-0.44, MOA-L 0.36-0.49. Clypeal height 0.20-0.41. Chelicéral length 0.71-0.87. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	1.43-2.63	0.68-1.10	1.13-2.15	1.10-1.88	0.78-1.25
Leg II	1.58-2.78	0.70-1.23	1.33-2.50	1.25-2.23	0.91-1.38
Leg III	1.53-2.75	0.65-1.05	1.23-2.35	1.15-2.05	0.80-1.23
Leg IV	1.75-2.93	0.60-1.10	1.13-2.63	1.15-2.55	0.65-1.40

Spination of leg I: femur d, pr and rt 0-1-1-1; patella without spines or pr 0-2 and rt 1-0; tibia d 1-0 or 0, pr and rt 1-1-1, v 2-2-2ap; metatarsus pr 1-0 or 0, v 2-2-0. Colouration. Carapace yellowish brownish, densely covered with dark hairs. Sternum, maxillæ and labium yellowish brownish. Cheliceræ brownish. Abdomen

yellow, densely covered with grey long and short hairs. Dorsum with uneven cardiac spot (fig. 182). Book-lung covers yellow. Spinnerets yellow-brown. Legs: femora and patellæ dirty brown; remaining segments yellow. Palp yellowish brown, its structure as in figs 234-238.

Female. Measurements. Carapace 2.25-3.05 long and 2.13-2.83 wide. Abdomen 3.88-6.00 long and 3.13-4.30 wide. Distances between eyes: AME-AME 0.12-0.17, AME-ALE 0.07-0.11, PME-PME 0.26-0.29, PME-PLE 0.21-0.28. Median ocular area: MOA-WA 0.29-0.36, MOA-WP 0.46-0.54, MOA-L 0.40-0.56. Clypeal height 0.30-0.44. Cheliceral length 0.68-1.30. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.08-2.80	1.00-1.20	1.63-2.35	1.30-1.85	0.98-1.30
Leg II	2.35-3.33	1.05-1.45	1.95-2.75	1.60-2.30	1.00-1.35
Leg III	2.15-3.05	0.93-1.38	1.70-2.40	1.48-2.08	0.83-1.25
Leg IV	2.25-3.33	0.83-1.15	1.93-2.68	1.78-2.45	1.01-1.15

Spination of leg I: femur d 0-0-1-1, pr 0-1-1-1, rt 0-0-1 or 0-1-0; tibia d 1-1 or 0-1, pr and rt 1-1-1 or 1-1, v 2-2-2ap; metatarsus pr 1-0 or 0, v 2-2-0. Colouration as described for male, but lighter (fig. 183). Epigyne and spermathecæ as in figs 239-241.

Etymology.The specific name is an adjective made from Tuva, the country where the most specimens have been collected.

Thanatus vulgaris Simon, 1870
(figs 194-197, 204-206, map 6)

Thanatus vulgaris Simon, 1870, Mem. Soc. Roy. Sci. Liège, **3**: 328.

Thanatus vulgaris: Dondale, Turnbull & Redner, 1964, Canadian Entomologist, **96**: 653-654, figs 3, 4, 41, 42 (male, female).

Thanatus vulgaris: Dondale & Redner, 1976, Canadian Entomologist, **108**: 155.

Thanatus vulgaris: Levy, 1977, Isr. J. Zool., **26**: 214-218, figs 40-47 (male, female).

Thanatus vulgaris: Paik, 1979, Journal of Graduation School Education (Kyungpook National University), **11**: 122, figs 27-32 (male, female).

Thanatus vulgaris: Hu & Wu, 1989, [Spiders from agricultural regions of Xinjiang...]: 326, figs 260.1-6 (male, female).

Thanatus vulgaris: Heimer & Nentwig, 1991, Spinnen Mitteleuropas: Ein Bestimmungsbuch: 466, fig 1229 (male, female).

Thanatus retentus Chamberlin, 1919, Journal of Entomology and Zoology of Pomona College, Claremont, **12**: 9, pl. 6, fig. 5 (female).

Philodromus thorelli O.P.-Cambridge, 1872, Proceeding Zoological Society London: 309. (male, female). Synonymized with *T. vulgaris* by Levy (1977).

Thanatus purcelli Simon, 1910, Araneae, *in*: L. Schulze, Denkschr. med-naturw. Ges., **16**: 196 (male). Synonymized with *T. vulgaris* by Levy (1977).

Thanatus vulgaris syriensi Strand, 1913, Arch. Naturgesch., **79**: 158 (female). Synonymized with *T. vulgaris* by Levy (1977).

Thanatus adorus Strand, 1915, Arch. Naturgesch., **81**: 153 (female). Synonymized with *T. vulgaris* by Levy (1977).

Thanatus rehobothicola Strand, 1915, Arch. Naturgesch., **81**: 154 (female). Synonymized with *T. vulgaris* by Levy (1977).

Material. – ALTAI: 1 female (ISE), Kuraiskiy Mt. Range, Kosh-Agatch, summer 1970, A.P. Kononenko. – KAZAKHSTAN: 1 female (PSU), uncertain locality and data.

Comparative material. – TAJIKISTAN: 2 males, 5 females (ISE), Vakhsh River Valley, Garavuti, 26.06.1974, A.P. Kononenko. – USA: 3 females (AMNH), Sonora, Desemboque, 15-31.08.1953, B. Malkin.

Diagnosis. See comments under "Diagnosis" of *T. atratus*.

Distribution. Currently, *T. vulgaris* is known from Southern Europe, Africa, Middle East (BONNET, 1959; LEVY, 1977), Middle Asia (LYAKHOV, 1996), the Southern Urals (GIRFANOVA et al., 1992), North Kazakhstan (Barsakel'mes) (PAVLENKO, 1985), Altai (presented data), China (HU & WU, 1989; CHEN & ZHANG, 1991) and Korea (PAIK, 1979).

The records of *T. vulgaris* from East Siberia (MARUSIK, 1991; MARUSIK et al., 1992a, 1992b) were known to belong in fact to *T. tuvinensis* (see above). *T. vulgaris* has been also recorded from USA (DONDALE et al., 1964), with special emphasis on the fact that this species is easily transported by human commerce, though none occur north of approximately 45 degrees north latitude.

Description (based on specimens from Tajikistan):

Male. Measurements. Carapace 2.35 long and 2.20 wide. Abdomen 2.65 long and 1.50 wide. Distances between eyes: AME-AME 0.14, AME-ALE 0.08, PME-PME 0.25, PME-PLE 0.21. Median ocular area: MOA-WA 0.31, MOA-WP 0.40, MOA-L 0.39. Clypeal height 0.33. Cheliceral length 0.75. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.75	1.10	1.95	2.20	1.38
Leg II	3.40	1.20	2.90	2.55	1.68
Leg III	2.88	1.00	2.30	2.25	1.25
Leg IV	3.25	1.00	2.70	2.75	1.35

Spination of leg I: femur d 0-0-1-1, pr and rt 0-1-1-1; patella d 2-1, pr 0-1-0 or 0; tibia d 0-1, pr and rt 1-1-1, v 2-2-2ap; metatarsus pr 1-1, rt 1-0, v 2-2-0. Colouration. Carapace yellow with slightly visible dark veins composed of small spots. Sternum, maxillæ, labium and cheliceræ yellow. Abdomen yellow. Dorsum with colour markings composed of dark lanceolate spot anteriorly and V-shaped figure posteriorly. Book-lung covers and spinnerets yellow. Legs yellow with sparse dark spots, but metatarsi and tarsi usually darker than remaining segments, brownish. Palp yellow with brown bulb. Palpal structure as in figs 194-197.

Female. Measurements. Carapace 2.65 long and 2.50 wide. Abdomen 4.00 long and 2.25 wide. Distances between eyes: AME-AME 0.20, AME-ALE 0.09, PME-PME 0.34, PME-PLE 0.23. Median ocular area: MOA-WA 0.0.37, MOA-WP 0.51, MOA-L 0.41. Clypeal height 0.44. Cheliceral length 1.00. Length of leg segments:

	femur	patella	tibia	metatarsus	tarsus
Leg I	2.75	1.20	2.35	1.83	1.33
Leg II	3.20	1.45	2.85	2.25	1.45
Leg III	2.90	1.10	2.15	1.90	1.15
Leg IV	3.25	1.10	2.55	2.25	1.30

Spination of leg I: femur d 0-0-1-1, pr and rt 0-1-1-1; tibia pr and rt 1-1-1, v 2-2-2ap; metatarsus pr and rt 1-0-0, v 2-2-0. Colouration as described for male. Epigyne and spermathecæ as in figs 204-206.

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