

A survey of the East Palaearctic Lycosidae (Aranei).
4. On two somatically similar species of *Alopecosa* from the Russian
Far East

Обзор восточно-палеарктических пауков-волков (Aranei:
Lycosidae). 4. О двух внешне похожих видах *Alopecosa* из
Дальнего Востока

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КЛЮЧЕВЫЕ СЛОВА: новый вид, синонимия.

ABSTRACT. A description of *Alopecosa tanakai* sp.n. and redescription of *A. kaplanovi* Oliger, 1983, are given. Both species occur in the Maritime Province of Russia. These two species are of the same size and pattern, but their copulatory organs are very different. A brief discussion is provided for the complicated and contradictory synonymy of *Alopecosa auripilosa* (Schenkel, 1953), *A. argenteopilosa* (Schenkel, 1963), *A. albofasciata fornicata* (Schenkel, 1963) and *A. aerosa* (Schenkel, 1963) described from China.

РЕЗЮМЕ. Описан новый вид *Alopecosa tanakai* sp.n. и переописан *A. kaplanovi* Oliger, 1983. Оба вида известны из Приморья, они имеют одинаковый размер и окраску, но существенно различаются по строению копулятивных органов. Даны краткие замечания по противоречивой синонимии *Alopecosa auripilosa* (Schenkel, 1953), *A. argenteopilosa* (Schenkel, 1963), *A. albofasciata fornicata* (Schenkel, 1963) and *A. aerosa* (Schenkel, 1963) описанных из Китая.

Introduction

A survey of the wolf spiders of the Maritime (=Primorsky) Province has revealed two *Alopecosa* species with very similar general appearance. Although two species show almost the identical pattern, they clearly differ in the conformation of copulatory organs. Only one of them has been recognized as the described species *Alopecosa kaplanovi* Oliger, 1983. This work is devoted to a redescription of *A. kaplanovi* Oliger, 1983, a description of a new species, and comments on four Chinese species described by Schenkel [1953, 1963].

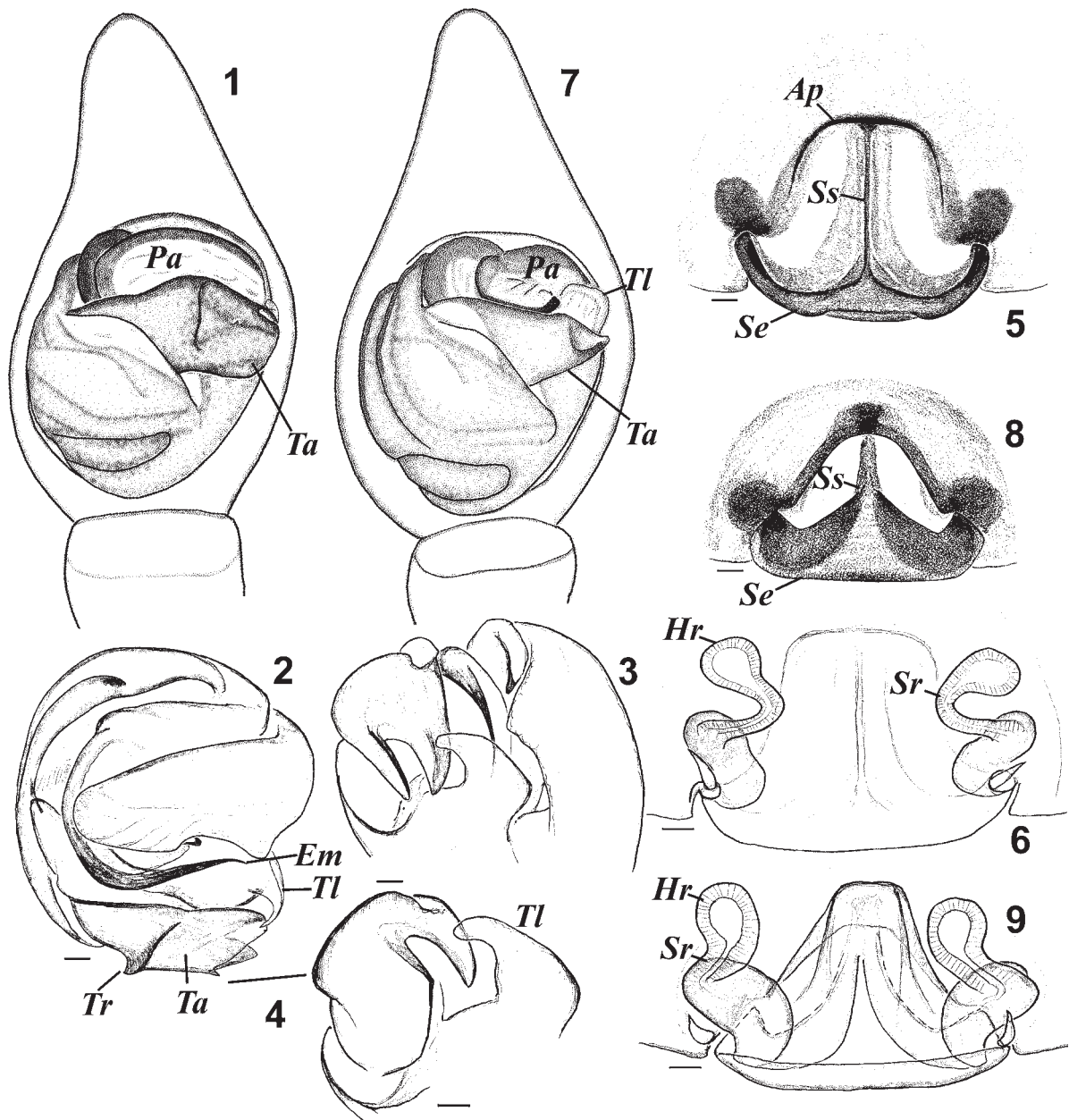
All material examined here has been shared between the Zoological Museum of the Moscow State University (ZMMU), the Zoological Museum, University of Turku (ZMUT), the temporary collection of Yu. M. Marusik in the ZMUT (YMT), and the temporary collection of M.M. Omelko (MOC). Illustrations were made using transmitted light microscope with drawing “apparatus”. SEM-microphotographs were made with JEOL JSM-5200 in the Zoological Museum, University of Turku. Digital photographs were made also in University of Turku.

Alopecosa tanakai Omelko & Marusik, sp.n.
Figs 1–6, 10–14, 21, 23–25.

MATERIAL. Holotype ♂ and paratypes 10 ♂♂, 4 ♀♀ (ZMMU & MOC), RUSSIA, Maritime (Primorski) Prov., Ussuri Dist., Gornotayozhnoye Vil., 43°41'26"N 132°09'13"E, 23.08.–25.10.2003 (M.M. Omelko); 2 ♂♂ 1 ♀♀ (ZMUT), same locality, 31.03.–5.05.2002 (M.M. Omelko); 1 ♂, 1 ♀ (YMT) same locality, 24–25.08.2002 (M.M. Omelko); 2 ♂♂, 3 ♀♀ (MOC), same locality, March–August.2002 (M.M. Omelko); 2 ♂♂ (ZMMU) same locality, 20.04.2008 (M.M. Omelko); 1 ♀ (ZMMU), Maritime Prov., Lazovski Dist., Kiyevka Vil., 7.06.1982 (T.I. Oliger); 1 ♂ (ZMMU) Maritime Prov., Lazovski Distr., Kiyevka Vil., backyard, 2.10.1978 (T.I. Oliger).

ETYMOLOGY. This species is named after the famous Japanese lycosidologist, Dr. Hozumi Tanaka from Amagasakishi, Japan, who has greatly contributed to the study of Far Eastern wolf spiders.

DIAGNOSIS. By the general pattern and shape of epigyne, the new species resembles the trans-Palaearctic *A. inquilina* (Clerck, 1757) [cf. Figs 3a,e in Lugetti & Tongiorgi, 1969], although *A. tanakai* sp.n. can be easily separated by the presence of two pairs of abdominal spots, the wide apical pocket of epigyne and the wider fovea. The male palp of *A. tanakai* sp.n. is somewhat similar to that of *A. taeniopus* (Kulczyński, 1895) [cf. Figs 24a–b in Lugetti & Tongiorgi, 1969], but can be distinguished by the more massive tegular apophysis having strong ridge, spine and strongly divided terminal part.



Figs 1–9. Copulatory organs of *Alopecosa tanakai* sp.n. (1–6) and *A. kaplanovi* (7–9): 1, 7 — palp ventral view; 2–4 — bulbus, from above, retrolaterally and below-retrolaterally, respectively; 5, 8 — epigyne, ventral view; 6, 9 — epigyne, dorsal view. Scale 0.1 mm. Abbreviations: *Ap* — apical pocket, *Em* — embolus, *Hr* — head of receptaculum, *Pa* — palea, *Se* — septum and septal plate, *Sr* — stem of receptaculum, *Ss* — septal stem, *Ta* — tegular apophysis, *Tl* — tegular lamella, *Tr* — ridge of *Ta*.

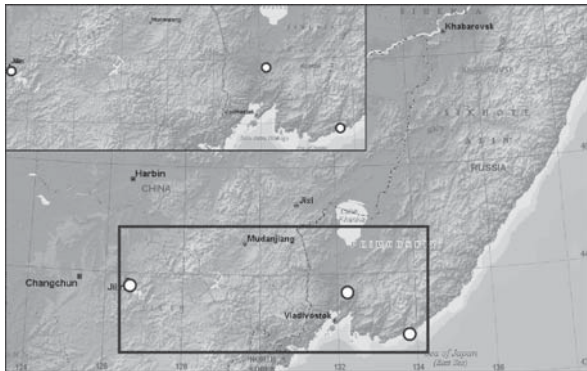
Рис. 1–9. Копулятивные органы *Alopecosa tanakai* sp.n. (1–6) и *A. kaplanovi* (7–9): 1, 7 — пальпа снизу; 2–4 — бульбус сверху; ретролатерально и снизу-ретролатерально, соответственно; 5, 8 — эпигина снизу; 6, 9 — эпигина сверху. Масштаб 0,1 мм. Сокращения: *Ap* — верхний карман, *Em* — эмболюс, *Hr* — головка рецептакулы, *Pa* — палеа, *Se* — септум и гребень септума, *Sr* — ножка рецептакулы, *Ss* — ножка септума, *Ta* — тегулярный отросток, *Tl* — тегулярная пластинка, *Tr* — гребень *Ta*.

The female of *A. tanakai* sp.n. can be easily distinguished from that of *A. kaplanovi* by the shape of septum, apical pocket, receptacula, the fovea ornamentation of white hairs and dark colored surroundings of the epigynal plate.

Two sympatric species *A. tanakai* sp.n. and *A. kaplanovi* can be distinguished in the field and in alcohol by their carapace pattern. The new species has a median band lighter than marginal bands of carapace, dark bands distinct in male and less distinct in female (Figs 23–24). In *A. kaplanovi*,

carapace has no distinct longitudinal bands (Figs 26, 28). Males of the new species have 2 or 3 pairs of dorsal abdominal spots, while those of *A. kaplanovi* always have 5 pairs.

DESCRIPTION. Male. Body length 11.56–12.75. Carapace: 4.76–5.95 long, length/width ratio 1.3; light brown with wide light median band and marginal light bands, and dark brown lateral bands (Fig. 27). Lateral bands twice as wide as marginal band. Sides of cephalic part and slope with dark brown triangular spots. Light median band widest at



Map. Distribution of *Alopecosa tanakai* sp.n.
Карта. Распространение *Alopecosa tanakai* sp.n.

the cephalic part, slightly thinner at the thoracic part and two times narrower on the slope. Eye sizes and interdistances (in the specimen with the carapace of 5.44 long): AME — 0.15; ALE — 0.15; PME — 0.45; PLE — 0.33; ALE-ALE — 1.0; PME-PME — 1.15; PLE-PLE — 1.5; AME-AME — 0.13, AME-ALE — 0.08. Sternum, labium, maxillae dark brown, almost black (Fig. 29). Abdomen light gray. Anterior part with a pair of dark triangular spots behind dark spots on carapace slope. Light median band with a pair of dark brown spots in anterior third and a pair of dark spots in mid-part, sides with dark bands. Anterior spots larger than posterior. Venter of abdomen almost black (Fig. 28). Legs light brown without annulations. Leg spination:

| | Femur | Patella | Tibia | Metatarsus |
|-----|------------|---------|------------------|--------------|
| I | 3d, 3p, 1r | 1r | 1p, 2r, 3-3v | 3p, 4r, 3-3v |
| II | 3d, 3p, 2r | 1p, 1r | 2p, 2r, 3-3v | 3p, 4r, 3-3v |
| III | 3d, 2p, 2r | 1p, 1r | 2d, 2p, 2r, 3-3v | 3p, 4r, 3-3v |
| IV | 3d, 1p, 2r | 1p, 1r | 2d, 2p, 2r, 3-3v | 3p, 4r, 4-4v |

Length of the legs and leg joints:

| | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|-----|-------|---------|-------|------------|--------|-------|
| I | 4.3 | 1.9 | 3.5 | 3.1 | 1.9 | 14.7 |
| II | 4.1 | 2.0 | 3.0 | 3.0 | 1.9 | 14 |
| III | 3.8 | 1.9 | 3.0 | 3.4 | 1.9 | 14 |
| IV | 5.0 | 2.0 | 3.7 | 5.3 | 2.2 | 18.2 |

Palp as in Figs 1-4, 10-14. Femur and cymbium dark brown. Tegular apophysis (*Ta*) massive, deeply divided in terminal part; external part with long ridge (*Tr*) which in apical view looks like a bill or spine; ventro-terminal part with small spine. Tegular lamella (*Tl*) thin. Embolus long and curved; embolus proper (*Em*) (sclerotized part with seminal duct) thin, accompanied with wide lamella (poorly visible in light microscope). Palea poorly developed, with reduced tooth.

Female. Body length 11.90-13.26. Carapace 4.59-6.29 long, length/width ratio 1.30; light yellow-brown. Lateral band slightly darker than median one, marginal bands are coloured as median. Sides of cephalic part and slope with dark brown triangle spots. Eyes field brownish. Eye sizes and interdistances (specimen with the carapace of 6.29 long): AME — 0.2, ALE — 0.2, PME — 0.45, PLE — 0.4, ALE-ALE — 1.2, PME-PME — 1.35, PLE-PLE — 1.7; AME-AME — 0.15, AME-ALE — 0.1. Abdomen gray, with two anterior dark spots behind dark spots on carapace slope and two pairs of dark spots in its anterior half. Anterior spots larger than posterior. Venter behind epigastric furrow almost black, pre-epigastral area light brown. Chelicera and palpal femora dark brown. Light yellow-brown, with distinct spination of femora II and IV.

Leg spination:

| | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|-----|-------|---------|-------|------------|--------|-------|
| I | 4.5 | 2.4 | 3.1 | 2.8 | 1.9 | 14.7 |
| II | 3.9 | 2.2 | 2.9 | 2.8 | 1.9 | 13.7 |
| III | 3.8 | 2.1 | 2.7 | 3.5 | 1.9 | 14 |
| IV | 5.0 | 2.3 | 4.1 | 5.5 | 2.2 | 19.1 |

Length of the legs and leg joints:

| | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|-----|-------|---------|-------|------------|--------|-------|
| I | 4.5 | 2.4 | 3.1 | 2.8 | 1.9 | 14.7 |
| II | 3.9 | 2.2 | 2.9 | 2.8 | 1.9 | 13.7 |
| III | 3.8 | 2.1 | 2.7 | 3.5 | 1.9 | 14 |
| IV | 5.0 | 2.3 | 4.1 | 5.5 | 2.2 | 19.1 |

Epigyne as in Figs 5-6, 21. Septum (*Se*) anchor-like, not separated from fovea (=without distinct margins); stem (*Ss*) ridge thin; arm of anchor thin; apical pocket (*Ap*) wide without socket, its margin thin, terminal parts of pocket well separated from anchor arms; fovea covered with long hairs; hairs around basal part of septum white. Vulva relatively small, consisting of basal thick sockets and club-like receptacula (thin stem (*Sr*) and round head (*Hr*)). Stems of receptacula converging and heads diverging.

HABITATS AND PHENOLOGY. In environs of the field station, most specimens were collected during the spring-time in well-heated open places on south-facing slopes covered with dry recumbent grass and dead leaves. First adults were found at the end of March, soon after the snow had melted. Females with egg-sacs were observed on May 3rd. Adult females and subadult males of the second generations were seen in 2002 on August 24-25th. In 2003, seven adult males and one female were collected by pitfall trapping in the period of September 8th - October 25th. Egg-sac sandy coloured, slightly flattened, its diameter about 9 mm.

DISTRIBUTION. So far, this species is known from the type localities, but it is likely that it occurs in the adjacent territories of China. Figures of the female epigyne and vulva of *Alopecosa solitaria* (Herman, 1879) (Figs 21b,c) provided in the unpublished dissertation by Yu [1986: f. 290-291] beyond doubt correspond to our figures of *A. tanakai* sp.n. Yu's record [1986] was based on the female collected in Jilin Province (Kouqian County).

Alopecosa kaplanovi Oligier, 1983

Figs 7-9, 15-20, 22, 26-28.

Tarentula aerosa Schenkel, 1963: 320, f. 184 (♂♀)?

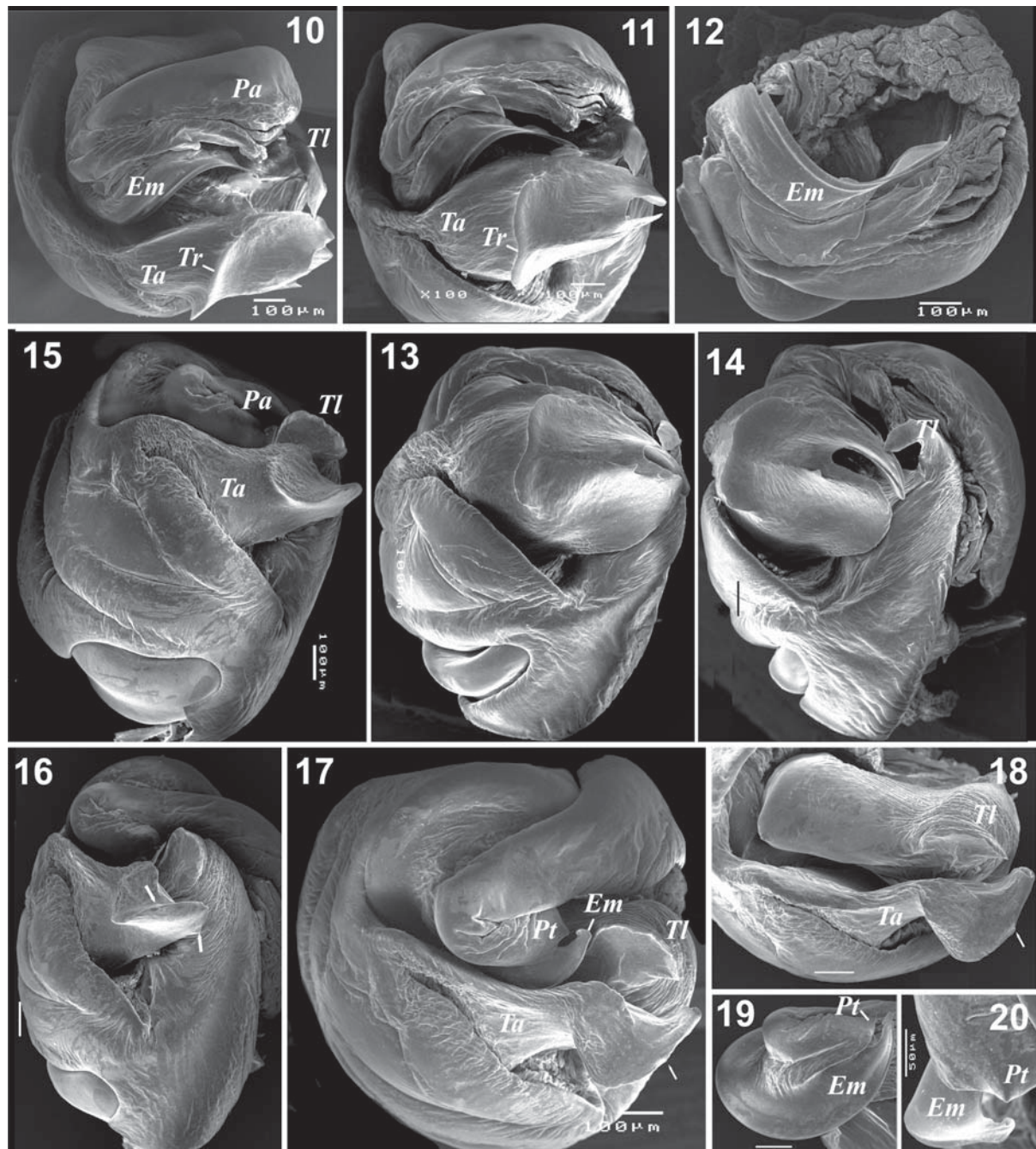
A. kaplanovi Oligier, 1983: 303, 1-4 (♂♀)

A. aerosa: Song, 1986: 75, f. 7-8 (♂♀)?

MATERIAL EXAMINED. 59 ♂♂, 18 ♀♀ (ZMMU, ZMUT, YMT & MOC), RUSSIA, Maritime (Primorski) Prov., Ussuri Dist., Gornotayozhnoye Vil., 43°41'26"N 132°09'13"E, 2003-2007 (M.M. Omelko); 1 ♀ (ZMMU), Maritime Prov., S part, Lazo Reserve, site Amerika, 30.05-2.06.2006 (Yu. Sundukov); 1 ♀ (ZMMU), Maritime Prov., S part, Lazo Reserve, Petrova site, sandy beach, 24.6.1979 (T. Oligier); 1 ♀ (ZMMU), Lazo Reserve, environs of Denyovskoye Vil., Sandagou site, heath on the field edge near forest, 3.08.1979 (T.I. Oligier).

NOTE. Oligier [1983] deposited type series in the Zoological Institute, St. Petersburg, but we have been unable to find the male holotype or paratypes. Our identification is based on a comparison of our figures and the paratypes temporary stored in T. Oligier's personal collection in the Nizhnesvirski Reserve and one topotype female from site Amerika, Lazo Reseve.

COMMENTS. It is possible that *A. kaplanovi* represents a junior synonym of either *Alopecosa auripilosa* (Schenkel,

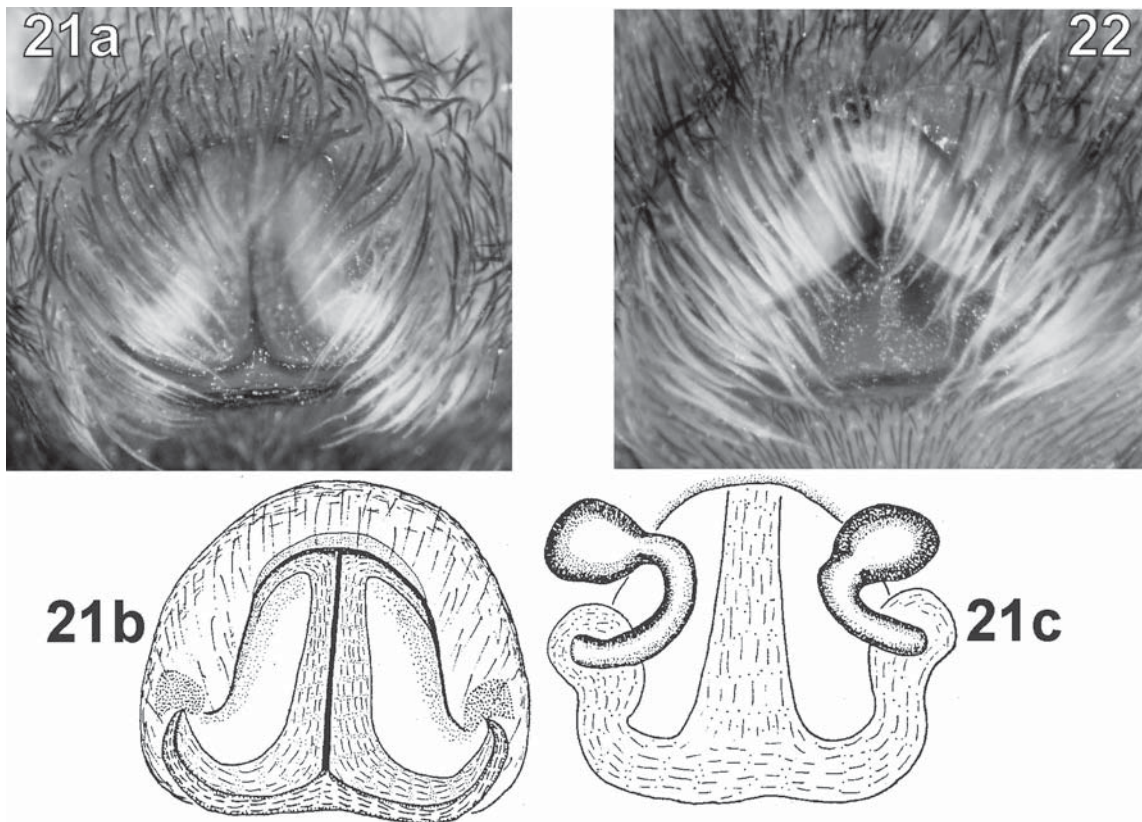


Figs 10–20. SEM microphotographs of *Alopecosa tanakai* sp.n. (10–14) and *A. kaplanovi* (15–20): 10–17 — bulbus, different turns (10–11, 17 — from above; 13, 15 — ventral view; 14, 16 — retrolateral view); 18 — tegulum and tegular apophysis, view from above; 19–20 — terminal part of bulbus (embolic division), view from above and retrolateral view. Scale 0.1 mm if not otherwise indicated. Abbreviations: *Em* — embolus, *Pa* — palea, *Pt* — tooth of plaea, *Tl* — tegular lamella, *Tr* — ridge of *Ta*. Arrows show fine spines on *Ta*.

Рис. 10–20. Детали строения palпы самца *Alopecosa tanakai* sp.n. (10–14) и *A. kaplanovi* (15–20): 10–17 — бульбус под разными углами (10–11, 17 — сверху; 13, 15 — снизу; 14, 16 — ретролатерально); 18 — тегулом и тегулярный отросток, сверху; 19–20 — верхняя часть бульбуса (эмболюсный отдел) сверху и ретролатерально. Масштаб для рис. 10–19 — 0,1 мм и 0,05 для рис. 20. Стрелками показаны мелкие зубчики на тегулярном отростке. Сокращения: *Em* — эмболюс, *Pa* — палеа, *Pt* — зубчик палеа, *Tl* — тегулярная пластинка, *Tr* — гребень *Ta*. Стрелки показывают мелкие зубчики *Ta*.

1953), *A. argenteopilosa* (Schenkel, 1963), *A. albofasciata fornicata* (Schenkel, 1963) or *A. aerosa* (Schenkel, 1963). All of these species were described from Inner Mongolia and Gansu (China). *A. auripilosa* was described on the basis

of a subadult female [Schenkel, 1953], of which type was lost. *A. albofasciata fornicata* and *A. aerosa* were described after females [Schenkel, 1963], and *A. argenteopilosa* was described on the basis of the male holotype [Schenkel, 1963].



Figs 21–22. Epigynes of *Alopecosa tanakai* sp.n. (21) and *A. kaplanovi* (22): 21a,b, 22 — ventral view; 22c — dorsal. 21a, 22 — hairs unshaved to shove white hairs above epigynal fovea; 21b,c — after Yu [1987, sub *A. solitaria*].

Рис. 21–22. Эпигины *Alopecosa tanakai* sp.n. (21) и *A. kaplanovi* (22): 21a,b, 22 — снизу; 22c — сверху. 21a, 22 — белые волоски закрывающие ямку эпигины не удалены, чтобы показать цвет и длину; 21b,c — по Yu [1987, sub *A. solitaria*].

The names *A. argenteopilosa* and *A. albofasciata fornicata* were synonymised with *A. auripilosa* by Song [1986] on the basis of study of the type material described in 1963/ Later on, Paik [1988] synonymised *A. aerea* with *A. auripilosa*. Contrary to this, Hu & Wu [1989] synonymised *A. aerea* with *A. sulzeri* (Pavesi, 1873), previously known from Europe only. The latter synonymy has been accepted by Platnick [2008], whereas some Chinese arachnologists continue to treat *A. aerea* as a separate species [Song *et al.*, 1999].

The figures illustrating the females of *A. auripilosa* and *A. aerea* in two subsequent publications by Song [Song, 1986, Song *et al.*, 1999] are very different. The same hold true concerning the figures published by different Chinese [Hu & Wu, 1989, Yin *et al.*, 1997; Hu, 2001], Korean [Paik, 1988; Namkung, 2002, 2003; Kim & Cho, 2002] and Russian [Oliger, 1981] authors. Some of the figures fit well with the figures of the male palp illustrated by us, some of the figures of epigyne assigned by different authors to different species fit well with our figures of *A. kaplanovi*.

The specimens from Primorye identified as *A. argenteopilosa* by Oliger [1981] obviously belong to another species. Females of this species are very similar to those of *A. tanakai* sp.n.

Because of the aforementioned contradictions in the synonymy of Chinese species (the senior name is based on a subadult female of which the type is lost; all species were described on the basis of one sex; type localities are in different areas; there are three different opinions about the status of *A. aerea*), one cannot decide about the synonymy

of *A. kaplanovi* without a study of topotype material from China. Therefore, we have accepted *A. kaplanovi* as a separate species.

DESCRIPTION. Male. Total length 9.52–11.88. Carapace 4.59–5.78 long, length/width ratio 1.33; brown; pattern as in female; without distinct bands; triangular spots darker than those in female. Legs coloured as carapace, but palpal patella and tibia light yellow-brown.

Abdomen as in the female, but dark lateral bands more distinct. Anterior margin with a pair of dark coloured stripes; median band with a pair of dark triangular spots in anterior quarter; margin of median band with 3 pairs of dark spots.

Leg spination:

| | Femur | Patella | Tibia | Metatarsus |
|-----|------------|---------|------------------|--------------|
| I | 3d, 3p, 1r | 1p, 1r | 2p, 2r, 3–3v | 3p, 4r, 3–3v |
| II | 3d, 3p, 2r | 1p, 1r | 2p, 2r, 3–3v | 2p, 4r, 3–3v |
| III | 3d, 3p, 2r | 1p, 1r | 2d, 2p, 2r, 3–3v | 3p, 4r, 3–3v |
| IV | 3d, 1p, 2r | 1p, 1r | 2d, 2p, 2r, 3–3v | 3p, 4r, 3–3v |

Length of the legs and leg joints:

| | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|-----|-------|---------|-------|------------|--------|-------|
| I | 4.2 | 1.8 | 3.3 | 3.0 | 2.3 | 14.6 |
| II | 4.2 | 2.0 | 3.3 | 3.0 | 2.4 | 14.9 |
| III | 3.4 | 1.7 | 2.9 | 3.2 | 1.9 | 13.1 |
| IV | 4.9 | 1.8 | 3.8 | 5.0 | 2.4 | 17.9 |

Palp as in Figs 7, 15–20. Cymbium dark. Palea with tooth (*Pl*); embolus (*Em*) wide, with slightly turned tip, opening directed upward; tegular apophysis (*Ta*) longer than wide;



Figs 23–28. Digital photographs of bodies of *Alopecosa tanakai* sp.n. (23–25) and *A. kaplanovi* (26–28): 23, 26 — female, dorsal view; 24, 28 — male, dorsal view; 25 — male, ventral view; 27 — female, ventral view.

Рис. 23–28. Габитус и окраска *Alopecosa tanakai* sp.n. (23–25) и *A. kaplanovi* (26–28): 23, 26 — самка, сверху; 24, 28 — самец, сверху; 25 — самец снизу; 27 — самка, снизу.

tegular lamella (*Tl*) wide and thick. Tegular apophysis with two small spines in terminal part (arrowed on Figs 16–18).

Female. Total length 11.90–13.94. Carapace 5.44–5.78 long, length/width ratio 1.32; light brown, median and marginal light bands poorly seen; margins of cephalic part and these of slope with triangle shaped dark spots; ocular area darker than other parts of carapace. Sternum, chelicera, maxillae and labium brown-black. Abdomen light brown, with two dark anteriorly and one or more pairs of droplet- or triangle-shaped in its anterior quarter; whole venter blackish. Legs light brown, without distinct annulations. Coxae brown, darker than other joints. Palp with darker terminal joint. Leg spination:

| | Femur | Patella | Tibia | Metatarsus |
|-----|------------|---------|------------------|--------------|
| I | 3d, 2p, 1r | 1r | 2r, 3–3v | 3r, 3–3v |
| II | 3d, 3p, 2r | 1r | 2r, 3–3v | 3r, 3–3v |
| III | 3d, 3p, 2r | 1p, 1r | 2d, 2p, 2r, 3–3v | 3p, 4r, 3–3v |
| IV | 3d, 2p, 2r | 1p, 1r | 2d, 3p, 2r, 3–3v | 5p, 3r, 3–3v |

Length of the legs and leg joints:

| | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|-----|-------|---------|-------|------------|--------|-------|
| I | 3.9 | 2.0 | 2.8 | 2.7 | 1.8 | 13.2 |
| II | 3.6 | 2.0 | 2.9 | 2.6 | 1.8 | 12.9 |
| III | 3.5 | 1.8 | 2.3 | 3.1 | 1.7 | 12.4 |
| IV | 4.7 | 1.9 | 3.5 | 4.5 | 1.9 | 16.5 |

Epigyne as in Figs 8–9, 22. Fovea triangle-shaped; apical pocket (*Ap*) with distinct socket; septal stem (*Ss*) shorter than septal plate; septal plate anchor shaped, although on intact epigyne it looks triangle-shaped; almost whole fovea covered with white hairs; epigynal plate surrounded by dark colored cuticle; vulva with relatively short receptacula starting from thick bean-shaped socket; stem of receptacula (*Sr*) wide and shorter than receptacular head (*Hr*).

DISTRIBUTION. The real distribution of this species is unknown. Possibly it is restricted to the Russian Far East only, although it may occur in the adjacent territories of Korea and NE China (see comments above).

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A. solitaria) in China. Lastly, we thank Nikolai Kovblyuk, Shuqiang Li, Robin Leech and Dmitry Logunov for their constructive comments on the manuscript.

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