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On two closely related wolf spider species *Alopecosa beckeri* (Thorell, 1875) and *A. taeniopus* (Kulczyński, 1895) (Aranei: Lycosidae)

Два близких вида пауков-волков *Alopecosa beckeri* (Thorell, 1875) и *A. taeniopus* (Kulczyński, 1895) (Aranei: Lycosidae)

Anton A. Nadolny, Mykola M. Kovblyuk
А.А. Надольный, Н.М. Ковблюк

Zoology Department, V.I. Vernadsky Taurida National University, 4 Yaltinskaya str., Simferopol 95007, Ukraine. E-mail: nadolnyanton@mail.ru, kovblyuk@mail.ru
Кафедра зоологии Таврического национального университета им. В.И.Вернадского, ул. Ялтинская 4, Симферополь 95007, Украина.

KEY WORDS: spiders, *Alopecosa*, redescriptions, spatial distribution, phenology, Crimea.
КЛЮЧЕВЫЕ СЛОВА: пауки, *Alopecosa*, переописания, ландшафтное распределение, фенология, Крым.

ABSTRACT. Redescriptions of two closely related species *Alopecosa beckeri* and *A. taeniopus* are provided based on specimens from Crimea. Comparative illustrations, diagnoses, spatial distribution, seasonal dynamic of activity for each species are presented. Distribution of *A. beckeri* presumably is limited by Crimean Mountains, and this species is endemic of Crimea probably. The earlier Crimean records of *A. mariae* and *A striatipes* are most possible misidentifications of *A. taeniopus.*

РЕЗЮМЕ. По экземплярам из Крыма переописаны близкие и трудно различимые виды *Alopecosa beckeri* и *A. taeniopus*. Для обоих видов приведены сравнительные рисунки, дифференциальный диагноз, распределение по ландшафтным зонам Крыма и сезонная динамика активности половозрелых особей. Предполагается, что *A. beckeri* распространён исключительно в Крымских горах, и что этот вид — эндемик Крыма. Указания из Крыма видов *A. mariae* и *A striatipes*, вероятно, результат ошибочного определения *A. taeniopus*.

Introduction

The genus *Alopecosa* Simon, 1885, contains 160 species, mostly from the Palaearctic [Platnick, 2010]. So far 13 species have been reported from Crimea [Kovblyuk, 2004]: *A. accentuata* (Latreille, 1817), *A. beckeri* (Thorell, 1875), *A. cronebergi* (Thorell, 1875), *A. cursor* (Hahn, 1831), *A. inquilina* (Clerck, 1758), *A. mariae* (F. Dahl, 1908), *A. pentheri* (Nosek, 1905), *A. pulverulenta* (Clerck, 1758), *A. schmidti* (Hahn, 1835), *A. solitaria* (Hermann, 1879), *A. sulzeri* (Pavesi, 1873), *A. taeniopus* (Kulczyński, 1895) and *A. trabalis* (Clerck, 1758). Some of them are poorly known, or their records are doubtful. For example, *A. beckeri* is known after the original description by Thorell [1875a] without illustrations, and *A. taeniopus* was recorded by Spassky [1927] only once. Absence of redescriptions and any illustrations of *A. beckeri* and its similarity in copulatory organs to *A. taeniopus*, is making these species difficult to distinguish. Study of syntypes of *A. beckeri* in Swedish Museum of Natural History (Stockholm), and specimens newly collected in Crimea, has confirmed the presence of these two closely related species in Crimea, and the lack in Crimea any other related species (*A. mariae* for example).

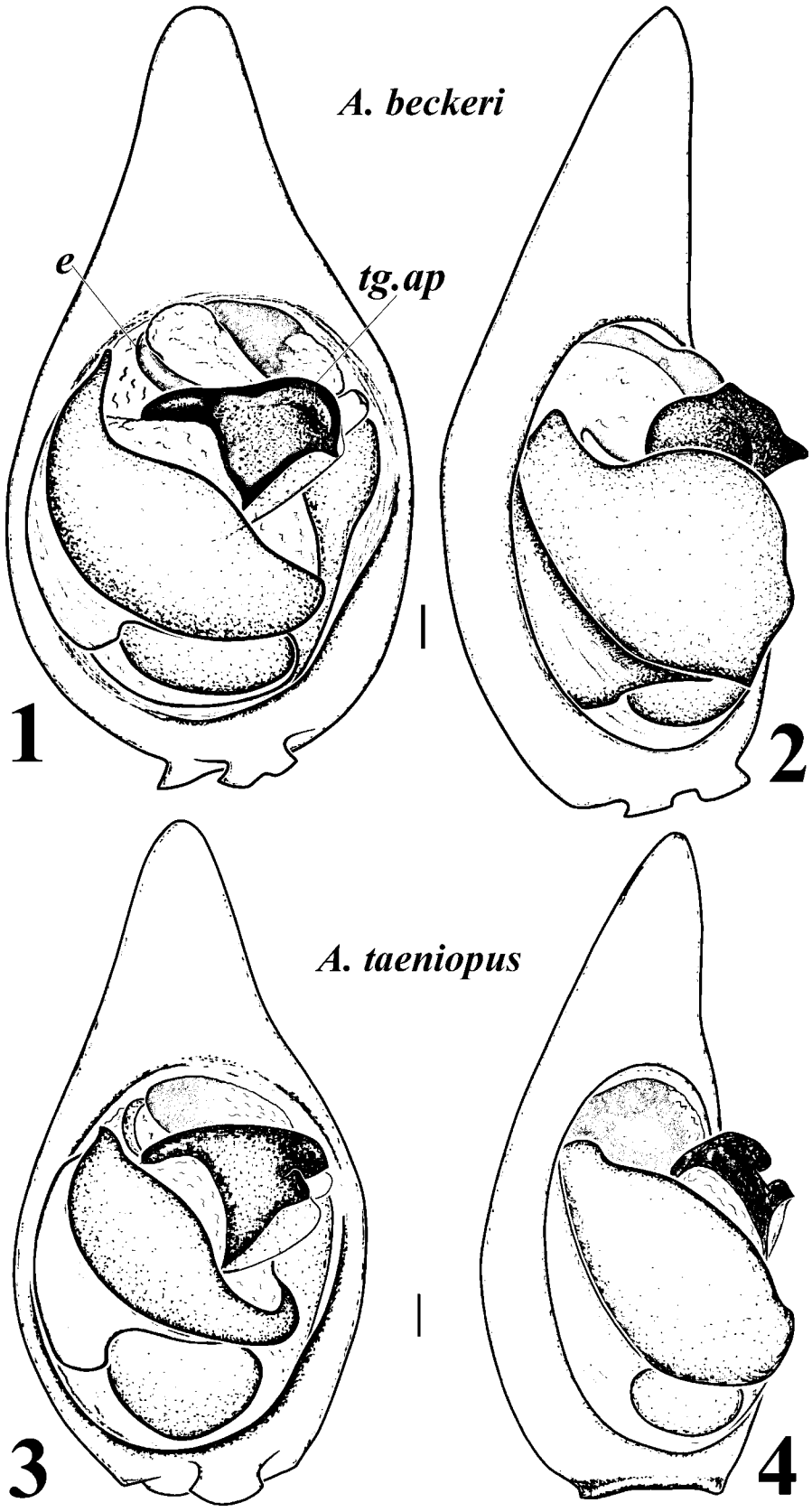
The aim of article is to provide redescriptions of *A. beckeri* and *A. taeniopus*, and also to provide information about the spatial distribution and seasonal dynamics of activity of adults in Crimea.

Material and Methods

Syntypes of *A. beckeri* were examined by M.K. in the Swedish Museum of Natural History (Stockholm) in 2004 courtesy of T. Kronestedt. Drawings and photos of the male palp and female epigyne of syntypes of *A. beckeri* were examined courtesy of Yu.M. Marusik and T. Kronestedt. Specimens of *A. beckeri* and *A. taeniopus* from Crimea for this study were recently collected by M.K., mostly by pitfall traps. Specimens of *A. taeniopus* from Belgorod and Rostov Areas of Russia from collection A.V. Ponomarev (Rostov-on-Don) were examined as comparative material.

Following abbreviations have been used in text: SMNH — Swedish Museum of Natural History (Stockholm); TNU — collection Zoology Department, V.I. Vernadsky Taurida National University (Simferopol); a — apical; d — dorsal; pl — prolateral; rl — retrolateral; v — ventral. Abbreviations on figures: *tg.ap* — tegular apophysis; *p* — palea; *e* — embolus.

Illustrations were made using reflecting and transmitted light microscopes. Illustrations of epigynes were made after maceration in KOH 20% water solution.



Figs 1–4. Male palps of *Alopecosa beckeri* (1–2) and *A. taeniopus* (3–4): 1, 3 — ventral view; 2, 4 — prolateral view.
Рис. 1–4. Пальпы самцов *Alopecosa beckeri* (1–2) и *A. taeniopus* (3–4): 1, 3 — вентрально; 2, 4 — пролатерально.

Coloration was described from specimens preserved in 75% ethanol/water solution with added glycerin (9:1 by volume). Legs and palps segments were measured after their separation from the cephalothorax. All measurements are in mm. All scale bars are equal 0.1 mm.

Species survey

Alopecosa beckeri (Thorell, 1875)
Figs 1–2, 5–6, 9–10, 13–16, 21, 23–24, 27–28, 31–35.

Tarentula b. Thorell, 1875a: 104 (♂♀).
Tarentula b.: Thorell, 1875b: 151 (♂♀).
Lycosa b.: Schmidt, 1895: 454 (♂).

RECORDS FROM CRIMEA. Thorell, 1875a — sub *Tarentula b.* sp.n.; Schmidt, 1895 — sub *Lycosa*; Reimoser, 1919 — sub *Tarentula*; Charitonov, 1932; Tyshchenko, 1971; Mikhailov, 1997; Kovblyuk, 2002 — sub *Tarentula*; Kovblyuk, 2004a.

MATERIAL. UKRAINE. ***Crimea*****:** Syntypes 1 ♂, 1 ♀ (SMNH, Collectio Thorell, No. 232/1452, 233/1452), Yalta, leg. A. von Nordmann. Alushta Distr.: 1 ♂ (TNU), Alushta, 13.01.2001, E.Yu. Sviridenko; 2 ♀♀ (TNU), Chatyr-Dagh Mt., Eklizi-Burun Mt., S slope, 1100 m, 10.03.2008, A.A. Nadolny; Bakhchisaray Distr.: 4 ♂♂, 1 ♀ (TNU), Ay-Petry Yaila, 17 km N from Visokogornoe Vil., 8–9.09.1999, M.M. Kovblyuk; Simferopol Distr.: 13 ♂♂, 9 ♀♀ (TNU), NE slope of Chatyr-Dagh Mt., 29.03.2000, M.M. Kovblyuk; 2 ♀♀ (TNU), NNW slope of Chatyr-Dagh Mt., 12.04.2000, M.M. Kovblyuk; 7 ♂♂, 3 ♀♀ (TNU), E slope of Chatyr-Dagh Mt., 13.05.2000, M.M. Kovblyuk; 1 ♂, 1 ♀ (TNU), Chatyr-Dagh Yaila, 4.11.2000, M.M. Kovblyuk & O.V. Kukushkin; 5 ♂♂, 8 ♀♀ (TNU), Chatyr-Dagh Mt., Orlinoe Gorge, pitfalls, 8.04–18.11.2000, 17.03.2002, M.M. Kovblyuk; Sudak Distr.: 3 ♀♀ (TNU), between Shelkovichnoe and Veseloe Vil., 26.05.1998, M.V. Onchurov; Yalta Distr.: 1 ♀ (TNU), environs Yalta, 9–10.09.1999, M.M. Kovblyuk; 1 ♂ (TNU), Yalta Mountain-Forest Nature Reserve, Yaltinskaya Yaila Mt., over Uch-Kosh Gorge, 16.04.2000, G.A. Prokopov; 1 ♂, 1 ♀ (TNU), Martyan Cape Reserve, pitfalls, 25.03–30.04.2000, M.M. Kovblyuk; 1 ♂ (TNU), Martyan Cape Reserve, pitfalls, 10-24.03.2001, M.M. Kovblyuk; 5 ♂♂, 1 ♀ (TNU), Yalta, Massandra park, pitfalls, 24.12.2000–15.04.2001, M.M. Kovblyuk; 8 ♂♂, 2 ♀♀ (TNU), Martyan Cape Reserve, pitfalls, 19.02.2000–17.04.2001, M.M. Kovblyuk; 1♂, 1 ♀ (TNU), same locality, 10.03–29.04.2001, M.M. Kovblyuk; 1 ♀ (TNU), Crimean State Nature Reserve, environs of kordon Asport, 13.06.2001, M.M. Kovblyuk; 3 ♂♂, 3 ♀♀ (TNU), Yalta Mountain-Forest Nature Reserve, Yaltinskaya Yaila Mt., Iograf-Bogaz Gorge, 9.09.2001, M.M. Kovblyuk; 1 ♀ (TNU), Ay-Petry Mt., 16.09.2001, A.A. Khaustov; 1 ♀ (TNU), Ay-Petry Yaila, Kilse-Burun Mt., 14.10.2001, M.M. Kovblyuk; 107 ♂♂, 51 ♀♀ (TNU), 1 km N from Nikita, pitfalls, 8.01.2000-3.03.2007, M.M. Kovblyuk & A.A. Khaustov; 1 ♂ (TNU), Yalta Mountain-Forest Nature Reserve, Yalta Yaila Mt., 1.05.2002, A.A. Khaustov; 1 ♂, 5 ♀♀ (TNU), Yalta, 27.10.2002, A.A. Khaustov; 1 ♀ (TNU), Ay-Petry Mt., 1200 m a.s.l., 5–6.10.2003, O.V. Kukushkin; 15 ♂♂, 29 ♀♀ (TNU), Crimean State Nature Reserve, Nikitskaya Yaila Mt. (=Scrinita), pitfalls, 9.03.2001–26.05.2002, M.M. Kovblyuk; 50 ♂♂, 27 ♀♀ (TNU), Yalta Mountain-Forest Nature Reserve, Uch-Kosh Gorge, N 44°32′22″, E 34°10′44″, 527 m a.s.l., pitfalls, 10.03-13.12.2008, M.M. Kovblyuk.

DIAGNOSIS. Male palp of *A. beckeri* is similar to that of *A. taeniopus*, from which it can be distinguished by not bifurcate tegular apophysis (Figs 1–2, 5–6, 21) (bifurcate in *A. taeniopus* — see Figs 3–4, 7–8, 22). *A. beckeri* differs also from *A. taeniopus* by having an embolus not reaching the paleal edge (Figs 9–10) (in *A. taeniopus* embolus reaches paleal edge — Figs 11–12). Epigyne of *A. beckeri* with straight margins and on anterior part forms the swelling (Figs 23, 27). Epigyne of *A. taeniopus* with curved margins, and without swelling on anterior part (Figs 25, 29). *A. beckeri* usually has light colored venter of abdomen (rarely dark) (Figs 33–35), but in *A. taeniopus* venter of abdomen is always dark (Figs 38–39). In addition these species differs slightly by body size: in *A. beckeri* male carapace 4.4–5.6 long, in female — 4.8–6.2 long; in *A. taeniopus* — 3.8–4.7 and 4.2–5.1 respectively.

DESCRIPTION. Male and female from Crimea. Measurements (♂/♀): total length 9.5 / 12.5; carapace 5.6 / 6.0 long, 3.5 / 4.4 wide. Length of palp segments (male/female): femur 2.1 / 2.1, patella 1.2 / 1.2, tibia 2.2 / 1.2, tarsus 1.7 / 1.7. Length of leg segments (male/female):

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus
I	3.4 / 4.0	1.8 / 2.2	2.7 / 3.0	2.8 / 2.8	2.0 / 1.8
II	3.2 / 3.8	1.8 / 2.1	2.4 / 2.7	2.8 / 2.8	1.8 / 1.8
III	3.1 / 3.5	1.6 / 1.8	2.2 / 2.4	3.0 / 3.2	1.6 / 1.7
IV	4.0 / 4.6	1.8 / 2.2	3.1 / 3.6	4.4 / 5.0	2.0 / 2.2

Male leg spination. Femur: I — d 1-1-1, pl 1, rl 1-1-1; II — d 1-1-1, pl 1-1, rl 1-1-1; III — d 1-1-1, pl 1-1, rl 1-1-1; IV — d 1-1-1, pl 1-1, rl 1. Patella: I — pl 1; II — pl 1; III — pl 1, rl 1; IV — pl 1, rl 1. Tibia: I — pl 1-1, rl 1-1, v 2-2-2 (a); II — pl 1-1, rl 1-1, v 2-2-2 (a); III — d 1-1, pl 1-1, rl 1-1, v 2-2-2 (a); IV — d 1-1, pl 1-1, rl 1-1, v 2-2-2 (a). Metatarsus: I — pl 1-1-1 (a), rl 1-1-1 (a), v 2-2-3 (a); II — pl 1-1-1 (a), rl 1-1-1 (a), v 2-2-3 (a); III — pl 1-1-1 (a), rl 1-1-1 (a), v 2-2-3 (a); IV — pl 1-1-1 (a), rl 1-1-1 (a), v 2-2-3 (a).

Female leg spination. Femur: I — d 1-1-1, pl 1, rl 1-1; II — d 1-1-1, pl 1-1, rl 1-1; III — d 1-1-1, pl 1-1, rl 1-1; IV — d 1-1-1, pl 1, rl 1-1. Patella: II — pl 1; III — pl 1, rl 1; IV — pl 1, rl 1. Tibia: I — pl 1-1, v 2-2-2 (a); II — pl 1-1, v 2-2-2 (a); III — d 1-1, pl 1-1, rl 1-1, v 2-2-2 (a); IV — d 1-1, pl 1-1, rl 1-1, v 2-2-2 (a). Metatarsus: I — pl 1 (a), v 2-2-3 (a); II — pl 1-1 (a), v 2-2-3 (a); III — pl 1-1-1 (a), rl 1-1-1 (a), v 2-2-3 (a); IV — pl 1-1-1 (a), rl 1-1-1 (a), v 2-2-3 (a).

Cheliceral teeth (♂♀): anterior — 3, posterior — 2.

General appearance: male — Figs 31, 33–34; female — Figs 32, 35. Abdomen more often light on venter, rarely dark (Fig 34).

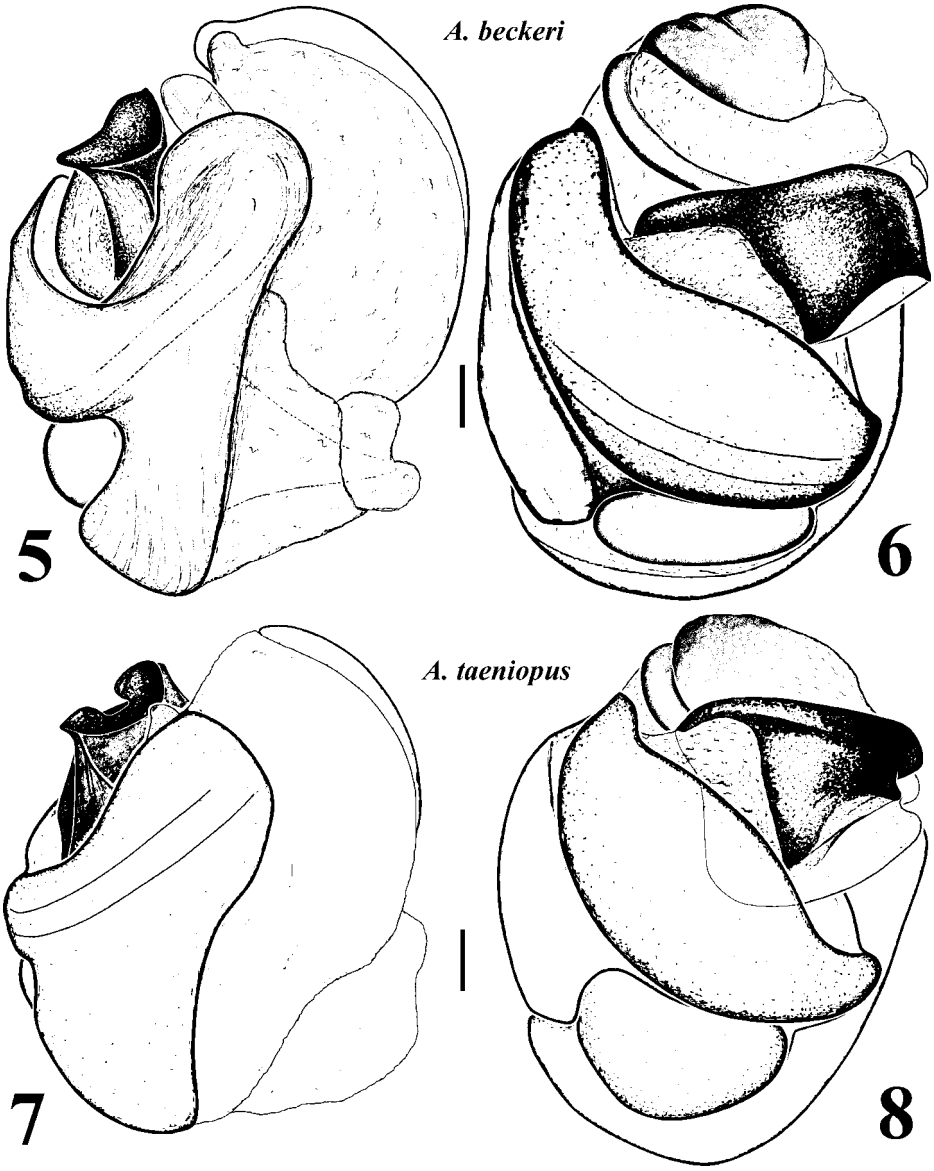
Male palp: Figs 1–2, 5–6, 9–10, 13–16, 21; epigyne: Figs 23–24, 27–28.

VARIATION. Males (n = 10): carapace length varies from 4.4 to 5.6, carapace width — from 3.2 to 4.0. Females (n = 10): carapace length varies from 4.8 to 6.2, carapace width — from 3.7 to 4.6.

TYPE LOCALITY. Environs of Yalta, Crimea [Thorell, 1875b; label data of syntypes].

DISTRIBUTION. Crimean Mountains.

NOTE. Record *A. beckeri* from Sarepta (Krasnoarmeisk in Volgograd Area of Russia) [Becker, 1888; Charitonov, 1932; Mikhailov, 1997] is rather doubtful and must be referred to another, probably undescribed, species. This problem should be addressed in the future. That is why *A. beckeri* should be listed as species endemic for the Crimean Peninsula.



Figs 5–8. Male copulatory organs (bulbus) of *Alopecosa beckeri* (5–6) and *A. taeniopus* (7–8): 5, 7 — retrolateral view; 6, 8 — ventral view.

Рис. 5–8. Копулятивные органы самцов (бульбус) *Alopecosa beckeri* (5–6) и *A. taeniopus* (7–8): 5, 7 — ретролатерально; 6, 8 — вентрально.

HABITATS. Sub-Mediterranean and mountains forests with *Juniperus excelsa*, *J. oxycedrus*, *J. sabina*, *Pistacia mutica*, *Arbutus andrachne*, *Pinus kochiana*, *P. pallasiana*, *Quercus pubescens*, *Q. petraea*, *Carpinus orientalis*, *Carpinus betulus*.

PHENOLOGY. ♂♂ — I–XII, ♀♀ — II–XI.

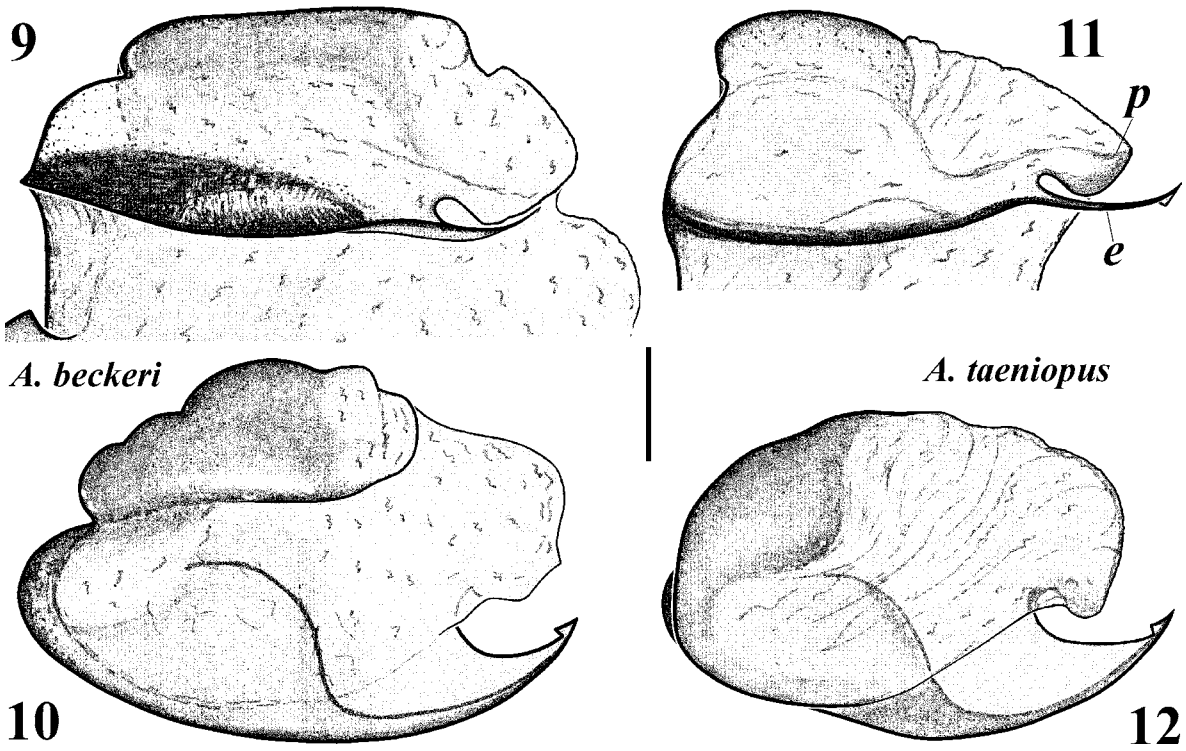
Alopecosa taeniopus (Kulczyński, 1895)
Figs 3–4, 7–8, 11–12, 17–20, 22, 25–26, 29–30, 36–39.

Tarentula t. Kulczyński, 1895: 16, pl. 1, f. 6, 9 (♂♀).
Lycosa lineatipes Nosek, 1905: 139, f. 16 (♂).
A. t.: Lugetti, Tongiorgi, 1969: 84, f. 24a–d (♂♀).
A. t.: Fuhn & Niculescu-Burlacu, 1971: 168, f. 82a–e (♂♀).
A. mariae: Hu & Wu, 1989: 192, f. 159.1–2 (♀, misidentified).
A. t.: Mcheidze, 1997: 219, f. 459 (♀).
A. t.: Song et al., 1999: 318, f. 188C (♀).

RECORDS FROM CRIMEA. Spassky, 1927; Charitonov, 1932; Tyshchenko, 1971; Mikhailov, 1997 — sub *Tarentula*; Kovblyuk, 2004a, 2004b — sub *Tarentula*; Kovblyuk et al., 2008a — misidentification *A. beckeri*; Kovblyuk et al., 2008b.

As *Alopecosa mariae* (F. Dahl, 1908) — misidentifications: Thorell, 1875a,b — sub *Tarentula striatipes* Dol.; Charitonov, 1932 and Mikhailov, 1997 — sub *Tarentula*; Kovblyuk, 2004.

NOTE. Thorell's records of *A. striatipes* from "Simferopol, Sewastopol, Alma" [Thorell, 1875a: 104] was referred by Charitonov [1932] to *A. mariae*. This record was based on unknown sex and number of specimens collected in Crimea by A. Nordmann. *A. striatipes* and especially *A. mariae* are very similar to *A. taeniopus*



Figs 9–12. Embolic division of *Alopecosa beckeri* (9–10) and *A. taeniopus* (11–12): 9, 11 — ventral view; 10, 12 — apical view.
Рис. 9–12. Эмболярный отдел *Alopecosa beckeri* (9–10) и *A. taeniopus* (11–12): 9, 11 — вентрально; 10, 12 — апикально.

[see Lugetti & Tongiorgi, 1969]. In our material from the Crimea *A. striatipes* and *A. mariae* are absent. It is reasonable to conclude that the earlier records *A. striatipes* and *A. mariae* from the Crimea were based on misidentification of *A. taeniopus.*

MATERIAL. UKRAINE. ***Crimea*****:** Bakhchisaray Distr.: 1 ♀ (TNU), Esky-Kermen, 24.02.1996, M.M. Kovblyuk; Feodosiya Distr.: 1 ♀ (TNU), Karadagh Nature Reserve, Svyataya Mt., S slope, 12.10.2003, M.M. Kovblyuk; 1 ♀ (TNU), same locality, Besh-Tash Mt., SE and W slope, 12.04.2004, M.M. Kovblyuk; 1 ♂, 1 ♀ (TNU), same locality, Lobovoy Mt. Range, Shapka Monomaha Mt., 26–30.09.2006, O.V. Kukushkin; 1 ♀ (TNU), same locality, near Shapka Monomaha Mt., 19.05.2008, A.A. Nadolny; 1 ♂ (TNU), same locality, Biological Station, O.V. Kukushkin; 1 ♀ (TNU), Feodosiya, Pasha-Tepe (=Lysaya) Mt., 2008, V.V. Savchuk. Lenin Distr. (Kerch Peninsula): 1 ♂ (TNU), Opuk Mt., SE slope, 6.10.1999, M.M. Kovblyuk. Saky Distr.: 88 ♂♂, 38 ♀♀ (TNU), environs of Pribrezhnaya railway station, pitfalls, 8.02–3.12.2000, M.M. Kovblyuk. Simferopol Distr.: 2 ♂♂ (TNU), Simferopol, 15.03., 14.04.1996, M.M. Kovblyuk; 2 ♀♀ (TNU), env. Strogonovka Vil., 16.02.1997, M.M. Kovblyuk; 2 ♂♂, 5 ♀♀ (TNU), env. Krasnolesye Vil., 31.03.2000, M.M. Kovblyuk; 1 ♀ (TNU), env. of Andrusovo Vil., pitfalls, 26.09–8.10.2000, M.M. Kovblyuk; 30 ♂♂, 6 ♀♀ (TNU), near Lozovoe, SE slope of Bairakly Mt., pitfalls, 6.02–26.11.2000, M.M. Kovblyuk; 5 ♂♂ (TNU), Simferopol, 1.5 km N from dam of Simferopol water reservoir, pitfalls, 6.02–26.11.2000, M.M. Kovblyuk; 1 ♂ (TNU), env. of Strogonovka Vil., 11.02.2001, M.M. Kovblyuk; 149 ♂♂, 41 ♀♀ (TNU), env. of Skvortsovo Vil., steppe, pitfalls, 17.02–10.07.2002, M.M. Kovblyuk; 1 ♀ (TNU), env. of Chysten'koe Vil., 8–9.05.2004, E.Yu. Sviridenko.

COMPARATIVE MATERIAL. RUSSIA. ***Belgorod Area*****:** 1 ♂ (TNU), 25 km W from Belgorod, Kustovoe Vil., steppe, 17.10.1998, A.V. Ponomarev. ***Rostov Area*****:** Ust-Donetsk Distr.: 2 ♂♂ (TNU), Razdorskaya Vil., steppe, 28.09–13.10.2001, A.V. Ponomarev; 7 ♀♀ (TNU), same locality, 10–30.05.2003, A.V. Ponomarev; 2 ♂♂, 2 ♀♀ (TNU), Krymskyi Vil., 25.04–6.06.2005, A.V. Ponomarev; 1 ♂ (TNU), Rasdorskaya Vil., steppe, 17.09.2007, M.M. Kovblyuk.

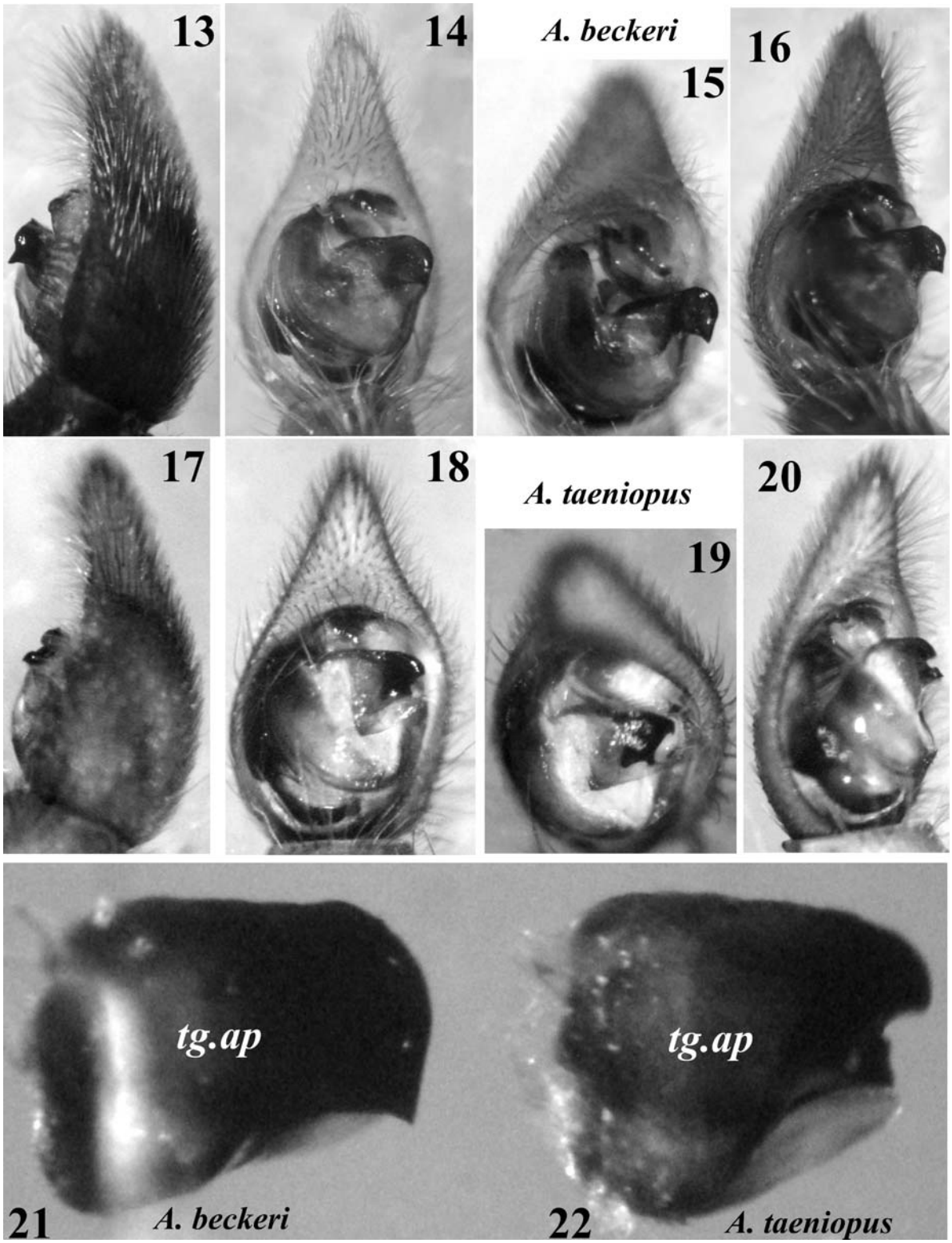
DIAGNOSIS. See the *A. beckeri* diagnosis.

DESCRIPTION. Male and female from Crimea. Measurements (♂/♀): total length 8.7 / 10.0; carapace 4.7 / 5.0 long, 3.3 / 3.5 wide. Length of palp segments (male/female): femur 1.8 / 1.6, patella 0.9 / 0.9, tibia 0.8 / 0.9, tarsus 1.5 / 1.4. Length of leg segments (male/female):

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus
I	3.0 / 3.2	1.6 / 1.8	2.3 / 2.2	2.6 / 2.2	1.8 / 1.6
II	3.0 / 3.0	1.6 / 1.6	2.2 / 2.1	2.4 / 2.2	1.7 / 1.6
III	2.8 / 2.7	1.4 / 1.5	2.0 / 1.9	2.6 / 2.4	1.6 / 1.5
IV	3.4 / 3.6	1.6 / 1.7	2.7 / 2.8	3.8 / 3.9	2.0 / 2.0

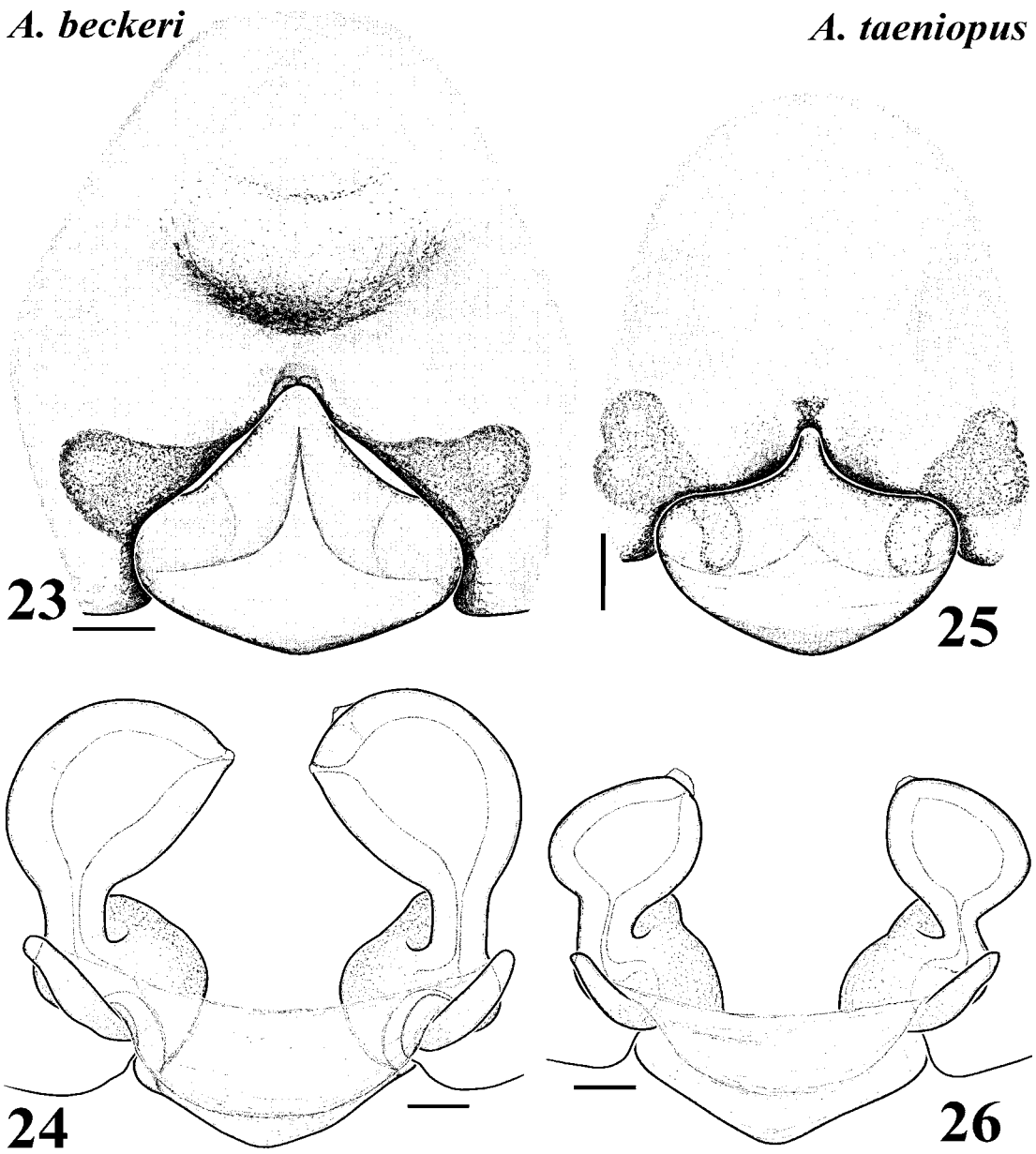
Male leg spination. Femur: I — d 1-1-1, pl 1, rl 1-1; II — d 1-1-1, pl 1-1, rl 1-1; III — d 1-1-1, pl 1-1, rl 1-1-1; IV — d 1-1-1, pl 1-1, rl 1. Patella: I — pl 1; II — pl 1; III — pl 1, rl 1; IV — pl 1, rl 1. Tibia: I — pl 1-1, rl 1-1, v 2-2-2 (a); II — pl 1-1, rl 1-1, v 2-2-2 (a); III — d 1-1, pl 1-1, rl 1-1, v 2-2-2 (a); IV — d 1-1, pl 1-1, rl 1-1-1, v 2-2-2 (a). Metatarsus: I — pl 1-1-1 (a), rl 1-1 (a), v 2-2-3 (a); II — pl 1-1-1 (a), rl 1-1-1 (a), v 2-2-3 (a); III — pl 1-1-1 (a), rl 1-1-1 (a), v 2-2-3 (a); IV — pl 1-1-1 (a), rl 1-1-1 (a), v 2-2-3 (a).

Female leg spination. Femur: I — d 1-1-1, pl 1, rl 1-1; II — d 1-1-1, pl 1-1, rl 1-1; III — d 1-1-1, pl 1-1, rl 1-1-1; IV — d 1-1-1, pl 1-1, rl 1. Patella: III — pl 1, rl 1; IV — pl 1, rl 1. Tibia: I — pl 1, v 2-2-2 (a); II — pl 1-1, v 2-2-2 (a); III — d 1-1, pl 1-1, rl 1-1, v 2-2-2 (a);



Figs 13–22. Male palps and tegular apophyses of *Alopecosa beckeri* (13–16, 21) and *A. taeniopus* (17–20, 22): 13, 17 — retrolateral view; 14, 18, 21–22 — ventral view; 15, 19 — apical view; 16, 20 — prolateral view.

Рис. 13–22. Пальпы самцов и отростки тегулюма *Alopecosa beckeri* (13–16, 21) и *A. taeniopus* (17–20, 22): 13, 17 — ретролатерально; 14, 18, 21–22 — вентрально; 15, 19 — апикально; 16, 20 — пролатерально.



Figs 23–26. Epigynes of *Alopecosa beckeri* (23–24) and *A. taeniopus* (25–26): 23, 25 — ventral view; 24, 26 — dorsal view.

Рис. 23–26. Эпигины *Alopecosa beckeri* (23–24) и *A. taeniopus* (25–26): 23, 25 — вентрально; 24, 26 — дорсально (после мацерации).

IV — d 1-1, pl 1-1, rl 1-1, v 2-2-2 (a). Metatarsus: I — pl 1 (a), v 2-2-3 (a); II — pl 1-1 (a), v 2-2-3 (a); III — pl 1-1-1 (a), rl 1-1-1 (a), v 2-2-3 (a); IV — pl 1-1-1 (a), rl 1-1-1 (a), v 2-2-3 (a).

Cheliceral teeth (♂♀): anterior — 3, posterior — 2.

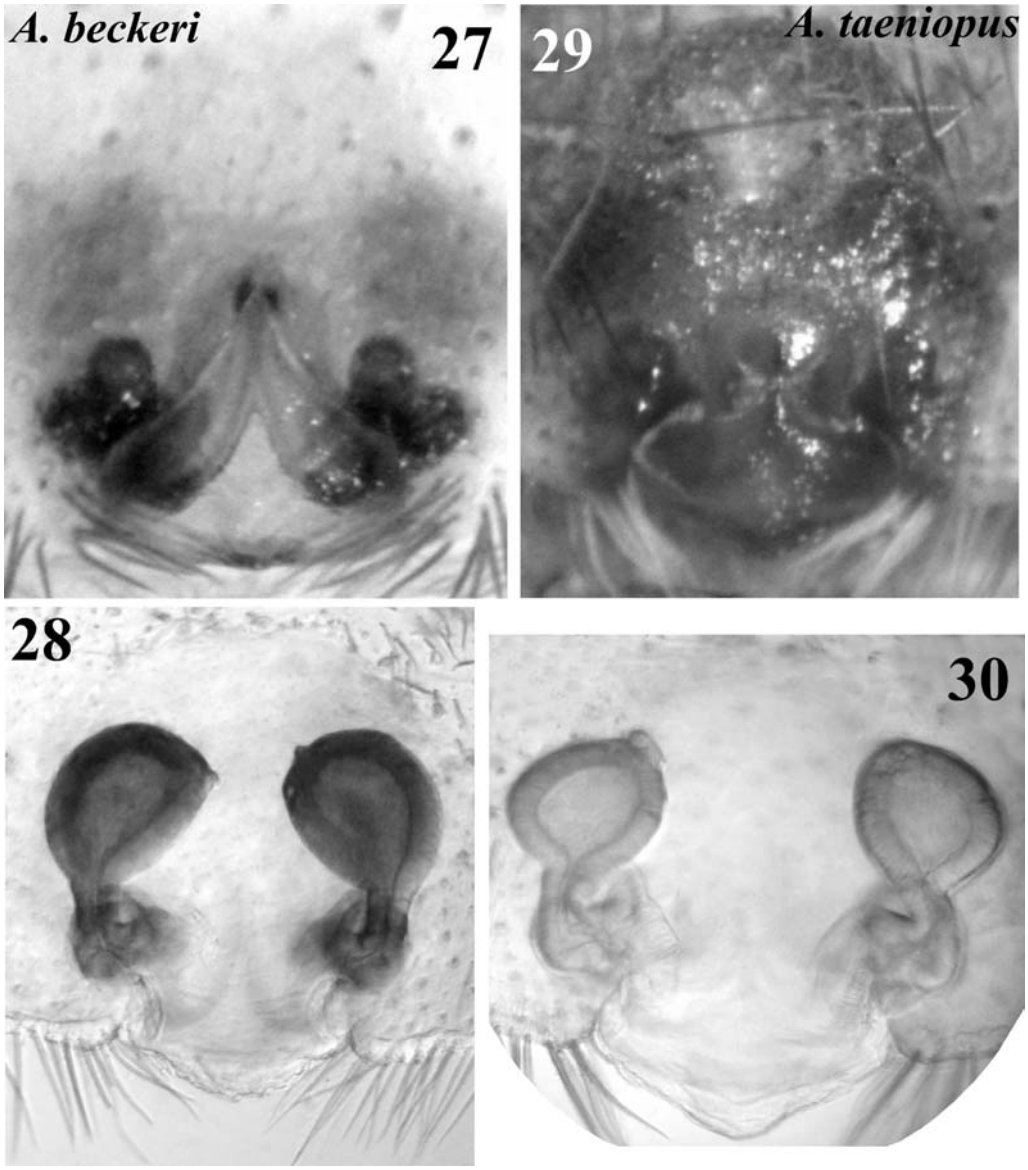
General appearance: male — Figs 36, 38; female — Figs 37, 39. Venter of abdomen is dark.

Male palp: Figs 3–4, 7–8, 11–12, 17–20, 22; epigyne: Figs 25–26, 29–30.

VARIATION. Males (n = 10): carapace length varies from 3.8 to 4.7, carapace width — from 2.8 to 3.3. Females (n = 10): carapace length varies from 4.2 to 5.1, carapace width — from 3.2 to 3.8.

TYPE LOCALITY. Georgia [Kulczyński, 1895].

DISTRIBUTION. West and Central Palaearctic nemoral range: from Bulgaria and Romania east to China (Xinjiang), north to Russian Plain (Ukraine, Belgorod Area of Russia), Middle and South Urals, West Siberia, south to Turkey, Georgia, Kazakhstan and mountainous Middle Asia [Kulczyński, 1895; Nosek, 1905; Lugetti & Tongiorgi, 1969; Fuhn & Niculescu-Burlacu, 1971; Hu & Wu, 1989; Esyunin & Efimik,



Figs 27–30. Epigynes of *Alopecosa beckeri* (27–28) and *A. taeniopus* (29–30): 27, 29 — ventral view; 28, 30 — dorsal view.

Рис. 27–30. Эпигины *Alopecosa beckeri* (27–28) и *A. taeniopus* (29–30): 27, 29 — вентрально; 28, 30 — дорсально (после мацерации).

1996; Mikhailov, 1997; Mcheidze, 1997; Song et al., 1999; Kovblyuk, 2004a].

HABITATS. Steppes with *Stipa, Festuca, Asphodeline, Amygdalus nana.*

PHENOLOGY. ♂♂ — II–XII, ♀♀ — II–XI. In Romania ♂♀ — I–XII [Fuhn & Niculescu-Burlacu, 1971].

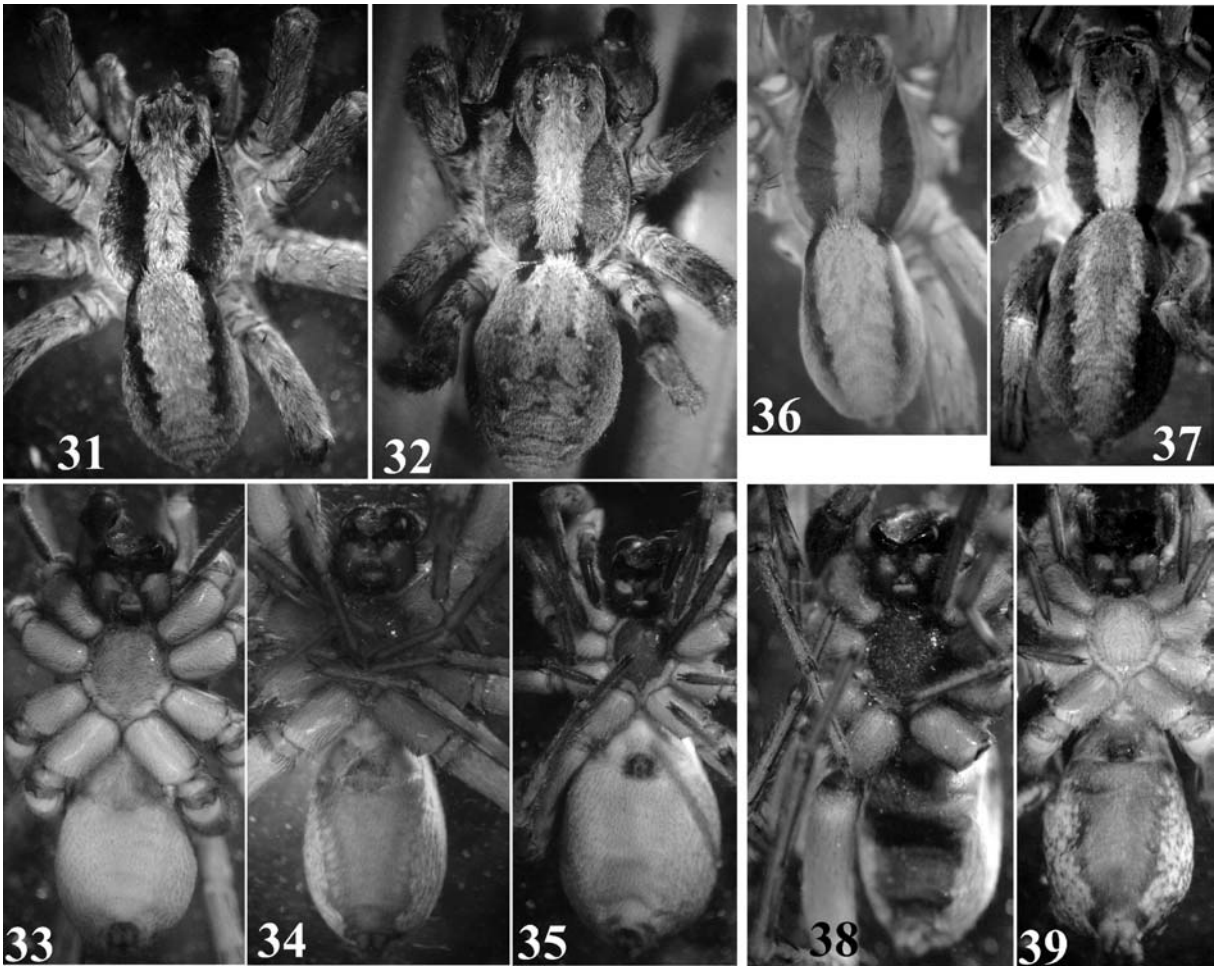
Spatial distribution

Specimens of *A. beckeri* and *A. taeniopus* were found in all Crimean landscape (physical-geographic) zones. In Crimea there are seven major landscape zones: 1 — semi-desert steppe and saline lands; 2 — true steppe; 3 — premontane forest steppe; 4 — forests of

Table 1. Distribution of *A. beckeri* and *A. taeniopus* in the landscape zones of Crimea.

Таблица 1. Ландшафтное распространение *A. beckeri* и *A. taeniopus* в Крыму.

Landscape zone	***A. beckeri***	***A. taeniopus***
Semi-desert steppe and saline lands	–	+
True steppe	–	+
Premontane forest steppe	–	+
Forests of the northern slope	+	+
Mountain meadows and yaila steppes	+	–
Forests of the southern slope	+	–
Sub-mediterranean area of the southern coast	+	+



Figs 31–39. General appearance of *Alopecosa beckeri* (male — 31, 33–34; female — 32, 35) and *A. taeniopus* (male — 36, 38; female — 37, 39): 31–32, 36–37 — dorsal view; 33–35, 38–39 — ventral view.

Рис. 31–39. Внешний вид *Alopecosa beckeri* (самец — 31, 33–34; самка — 32, 35) и *A. taeniopus* (самец — 36, 38; самка — 37, 39): 31–32, 36–37 — дорсально; 33–35, 38–39 — вентрально.

the northern slope of Crimean mountains; 5 — mountain meadows and steppes; 6 — forests of the southern slope of Crimean mountains; 7 — sub-Mediterranean vegetation of the Southern Coast of Crimea. Landscape distribution of *A. beckeri* and *A. taeniopus* is shown in Table 1 and on Map 1.

A. beckeri is recorded only from Crimean mountains (forests of the northern slope; mountain meadows and steppes, forests of the southern slope) and in sub-Mediterranean areas of the southern coast. *A. taeniopus* was found in saline lands, semi-desert steppe and forest-steppe. A few specimens were found in forests of the northern slope and sub-Mediterranean areas of southern Crimea.

In conclusion, distribution of *A. beckeri* in the Crimea is limited by true mountain parts of peninsula only, but *A. taeniopus* occurs around the Crimean Mountains.

In addition, these species are differs in habitat preferences: *A. beckeri* occurs in forests or nearby, in contrast to *A. taeniopus*, occurring in open biotopes, chiefly in steppes.

Seasonal dynamic of activity

Seasonal activities of *A. beckeri* and *A. taeniopus* are similar. Both species have 2 peaks of activity: in spring (March) and in autumn (*A. beckeri* — in November, *A. taeniopus* — in October). Seasonal dynamics of adults' activity show in a Fig 40.

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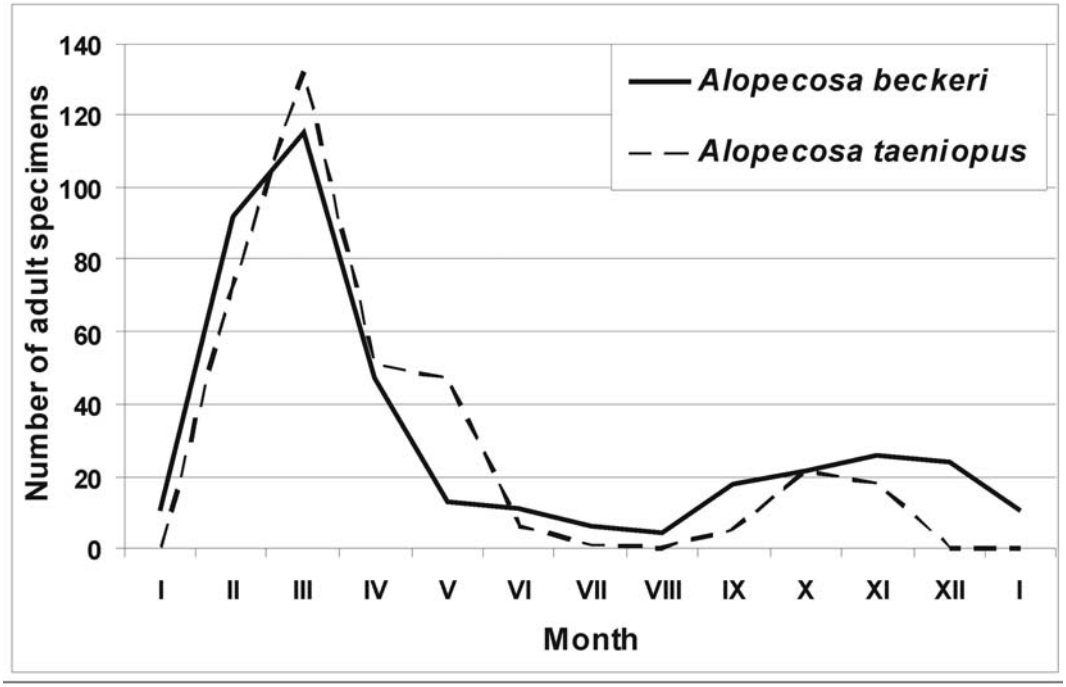

Fig. 40. Comparative phenology of *Alopecosa beckeri* and *A. taeniopus* in the Crimea, based on the specimens collected.
Рис. 40. Сравнительная фенология *Alopecosa beckeri* and *A. taeniopus* в Крыму по материалам коллекции.

some spiders collected from Crimea. Authors sincerely thank Yu.M. Marusik for some important remarks and corrections. English of the final draft was checked by Robin Leech (Edmonton, Canada).

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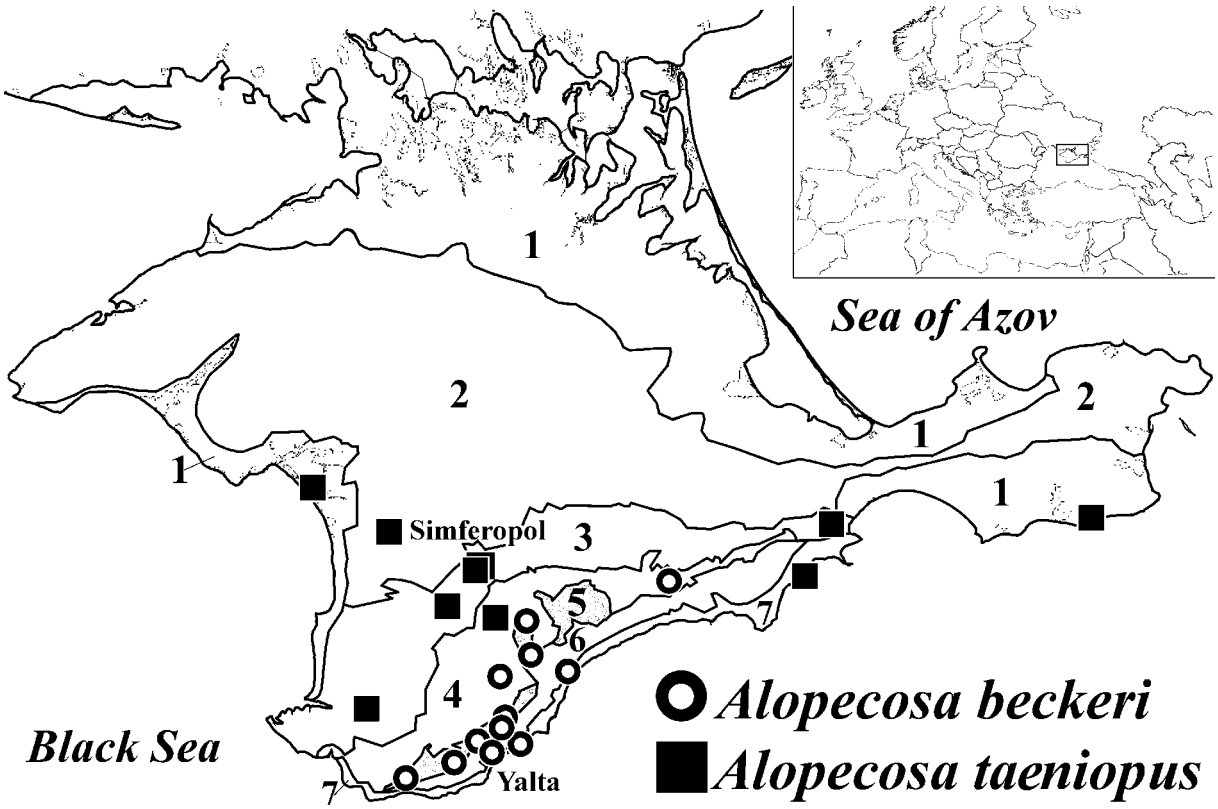

Map 1. Landscape distribution of *Alopecosa beckeri* and *A. taeniopus* in Crimea.
Карта 1. Ландшафтное распределение *Alopecosa beckeri* и *A. taeniopus* в Крыму.

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