

Spiders (Arachnida, Aranei) of Azerbaijan 3. Survey of the genus *Enoplognatha* Pavesi, 1880 (Theridiidae)

Пауки (Arachnida, Aranei) Азербайджана 3. Обзор пауков рода *Enoplognatha* Pavesi, 1880 (Theridiidae)

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КЛЮЧЕВЫЕ СЛОВА: фауна, Theridiidae, *Enoplognatha*, переописание, Азербайджан.

ABSTRACT. Eleven species of the genus *Enoplognatha* are recorded from Azerbaijan, seven of which are new to Azerbaijan: *E. latimana*, *E. oelandica*, *E. serratosignata*, *E. giladensis*, *E. macrochelis*, *E. parathoracica* and *E. quadripunctata*. The latter four species are new to the fauna of the former USSR. All species are illustrated by SEM and digital photographs.

РЕЗЮМЕ. В фауне Азербайджана выявлено 11 видов рода *Enoplognatha*. Семь из них — новые для страны: *E. latimana*, *E. oelandica*, *E. serratosignata*, *E. giladensis*, *E. macrochelis*, *E. parathoracica* и *E. quadripunctata*. Четыре последних вида — новые для фауны бывшего СССР. Все виды проиллюстрированы.

Introduction

The present paper is 5th in a series of papers dealing with fauna of Azerbaijan, although it has number 3. Earlier papers were devoted to new families and genera records [Marusik & Guseinov, 2003], lycosids [Marusik et al., 2003], fauna of Nakhchivan [Marusik et al., 2004] and agelenids [Guseinov et al., 2005]. While fauna of Azerbaijan is best studied among Transcaucasian spiders with over 600 reported species [Marusik et al., 2006] there are still many unreported and undescribed species in the country. *Enoplognatha* Pavesi, 1880 is a large genus of theridiid spiders with 65 species described [Platnick, 2008]. Members of the genus *Enoplognatha* are distributed mainly in Palaearctic, with a few species described from the Nearctic and tropical regions. The Mediterranean *Enoplognatha* were recently revised by Bosmans & Van Keer [1999], and 29 species were listed from this region.

The first representative of the genus from Azerbaijan (*Theridion ovatum* = *Enoplognatha ovata* (Clerck, 1757)) was reported by Atakishiev [1969]. Later Dunin recorded three additional species: *E. oelandica* (Thorell, 1875), *E. crucifera* (= *E. mordax* (Thorell, 1875), and *E. testacea* Simon, 1884 from different parts of the country [Dunin, 1984, 1989; Dunin & Mamedov, 1992]. In recent years three additional species were reported to the Azerbaijan fauna in papers by the first author [Guseinov, 2002; Guseinov & Rubtsova, 2001]: *E. thoracica* (Hahn, 1833), *E. mediterranea* Levy & Amitai, 1981 and *E. gemina* Bosmans & Van Keer, 1999. Thus, seven species of the genus *Enoplognatha* were known in Azerbaijan. In this paper we present results of the treatment of material collected during last few years by the first and second authors combined with a critical survey of literature data.

Most *Enoplognatha* species found in Azerbaijan differ from each other by carapace and abdominal pattern. We provide corresponding figures for almost all females. In addition, there are SEM microphotographs for most species.

Material and Methods

Most material treated herein was collected during last 10 years, although some earlier material was also examined and revised.

In square brackets “[]” following the species name, we list literature sources with most appropriate diagnostic illustrations. Species reported from Azerbaijan for the first time are marked with an asterisk (*); and species new to the fauna of the whole former Soviet Union are marked with two asterisks (**).

SEM photographs were made exclusively from Azerbaijan specimens, while for some digital photographs we used specimens collected from other countries.

The following abbreviations have been used for collections and museum: IZA — Institute of Zoology, Baku; YMT — Yuri M. Marusik's temporary collection in Zoological Museum, University of Turku; ZMUM — Zoological Museum, University of Moscow; ZMUT — Zoological Museum, University of Turku.

Collectors' names are abbreviated as follows: EFG — E.F. Guseinov, PMD — P.M. Dunin, YMM — Yu.M. Marusik

Microphotographs were made by SEM Jeol JSM-5200 in the Zoological Museum, University of Turku.

Survey of species

Enoplognatha gemina Bosmans & Van Keer, 1999
Figs 1–2, 35a–c, 42–43, 79.

[Bosmans & Van Keer, 1999: f. 103–107]

MATERIAL EXAMINED. 3 ♀♀ [01] (YuMC), CE Azerbaijan, Gobustan, 40°07'N 49°23'E, ~150 m, stony semi-desert, 17–31.05.2003 (YMM); 9 ♂♂ 4 ♀♀ (IZA) CE Azerbaijan, Absheron Peninsula, env. of Shagan Vill., 19–25.12.1993 (EFG); 1 ♂ (IZA) Absheron Peninsula, Baku, Bailov Park, 22.11.1994 (EFG); 1 ♀ [04] Absheron Peninsula, Baku, Ganly-Gyol L., 40° 21.46'N 49°48.36'E, 20.05 & 6.06.2003 (YMM); 6 ♀♀ (ZMMU) Absheron Peninsula, Baku, Musabekov, 40° 21.46'N 49°48.36'E, 10.03.1977 (PMD).

RECORDS. Absheron Peninsula [Guseinov & Rubtsova, 2001]. Dunin [1984] and Dunin & Mamedov [1992] reported this species as *E. oelandica* (material examined).

COMMENTS. All records of this species came from easternmost, dry part of country. This species is distributed from southern France to Egypt, Syria [Bosmans & Van Keer, 1999] and Absheron Peninsula (the north-easternmost record).

This species can be recognized by the shape of copulatory organs and dorsal abdominal pattern: light spot in front of abdomen and distinct, unbroken folium.

Enoplognatha giladensis (Levy & Amitai, 1982)**
Figs 19–23, 58, 66.

[Levy, 1998: 139, f. 260–264; Knoflach & Thaler, 2000: 412, f. 1–5, 8, 54–57]

MATERIAL EXAMINED. 2 ♀♀ (YMT), Lenkoran Distr., Hyrcan Reserve, litter (38°38.5'N, 48°47.5'E), 23.05.2003 (YMM & EFG).

COMMENTS. This species was known previously from Rhodes and Israel only [Knoflach & Thaler, 2000; Platnick 2008], and therefore Azerbaijan is the north and easternmost point of the range. In general appearance, *E. giladensis* differs from all other congeners by the lack of any pattern on the ventral and dorsal sides of the abdomen. Its habitus and uniform light-grey coloration make this species similar to members of *Robertus*. Epigyne of *E. giladensis* is unusual for a member of the genus by having very long and weakly sclerotized insemination ducts (Fig. 23), fused spermathecae and upper portion of insemination ducts. Although the male palp is also unusual, it has conformation similar to all other *Enoplognatha* species. Epigyne, male palp, and uniform light brown pattern, together with relatively long legs (Fig. 58) easily distinguish this species from the other congeners occurring in Caucasus.

Enoplognatha latimana Hippa & Oksala, 1982*
Figs 36–38, 55–56, 75.

[Hippa & Oksala, 1982: f. 4–6, 12–13, 17–20; Snazell, 1983: f. 1–2, 5–6; Wunderlich, 1995a: f. 8, 10, 13–14; Roberts, 1998: 304, f.]

MATERIAL EXAMINED. 1 ♂ (IZA) NE Azerbaijan, Ismailly Dist., env. of Khanaya Vill., 7–12.06.2002 (EFG); 1 ♂ (IZA) same dist., env. of Ivanovka Vill., 10.06.2002 (EFG).

COMMENTS. This species has a wide range and occurs from Western Europe to Central Asia and in Eastern Canada [Hippa & Oksala, 1982; Mikhailov, 1997; Paquin et al., 2001]. It was unknown from Azerbaijan, but was known from adjacent Armenia [Marusik, 1989].

By general appearance this species is almost indistinguishable from *E. ovata* and earlier two species were often confused. Main differences of these species can be found in shape of male chelicera, and shape of copulatory organs. *E. ovata* and *E. latimana* are herb-bush dwelling species, and unlike most other *Enoplognatha* which are litter dwelling.

Enoplognatha macrohelis Levy et Amitai, 1981**
Figs 3–4, 40–41, 44–45, 57, 68.

[Levy, 1998: f. 40–41, 43, 52–60; Bosmans & Van Keer, 1999: f. 83–87]

MATERIAL EXAMINED. 3 ♀♀ (IZA & YMT) SW Azerbaijan, Nakhchivan, Sharur Dist., ca 3 km E of Akhura Vill. 39°34' N 45°11'E, 1400 m, 2.06.2003 (EFG & YMM); 2 ♀♀ (YMT), Nakhchivan, Dasharkh Vill., 39°33,629'N 45°02.53'E, 870 m, 1–4.06.2003 (YMM); 2 ♀♀ (YMT) CE Azerbaijan, Gobustan, 40°07'N 49°23'E, ~150 m, stony semi-desert, 17–31.05.2003 (YMM); 15 ♀♀ (YMT) Gobustan, 40°05'N 49°25'E, mountain semidesert, 15.04.2001 (YMM); 2 ♂♂ (IZA) CE Azerbaijan, Absheron Peninsula, env. of Shagan Vill., 19–25.12.1993 (EFG); 1 ♂ (IZA) Absheron Peninsula, Baku, Bailov Park, 14.12.1995 (EFG); 2 ♀♀ [a03] Absheron Peninsula, Umbaki, 40°1'N 49°38'E, mountain semidesert, 19.04.2001 (YMM); 3 ♀♀ [02] Absheron Peninsula, environs of Baku, Dyubendy, 40°29'N 50°13'E, -9 m, semidesert, 18.05 & 8.06.03 (YMM); 1 ♀ [04] Absheron Peninsula, Baku, Ganly-Gyol L., 40° 21.46'N 49°48.36'E, 20.05 & 6.06.2003 (YMM); 2 ♂♂ (ZMMU) Absheron Peninsula, Baku, Musabekov, 40° 21.46'N 49°48.36'E, 10.03.1977 (PMD); 7 ♀♀ (ZMMU) Absheron Peninsula, Baku, Yasamal, 40° 21.46'N 49°48.36'E, 13.05.1979 (PMD).

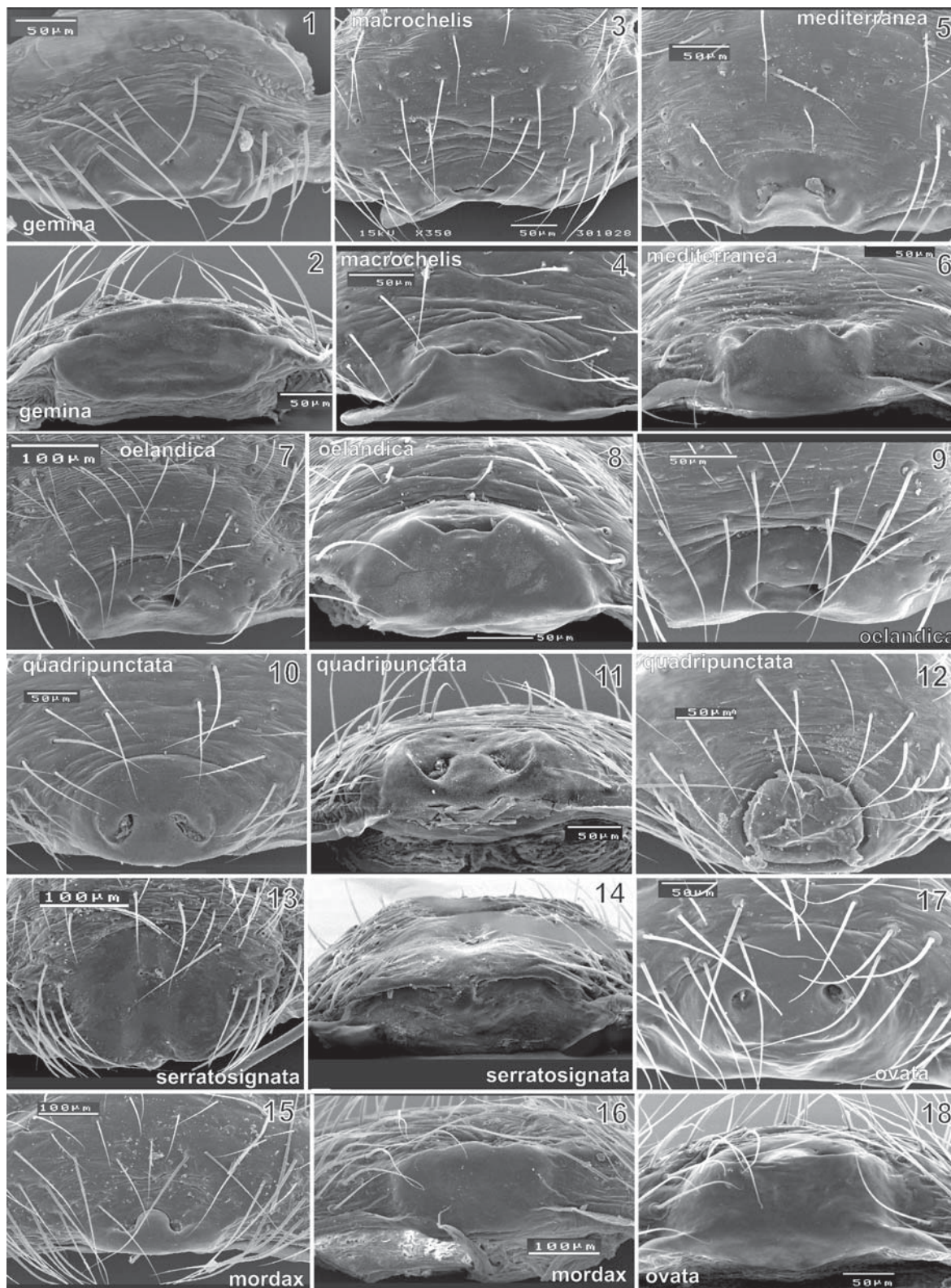
COMMENTS. *E. macrohelis* was not reported previously in former Soviet Union. This species was known to be distributed from Greece to Israel [Bosmans & Van Keer, 1999] and our records extend the known range to at least 15 degrees to the east. This species was actually known in Azerbaijan, but was wrongly identified and listed as *E. oelandica* [Dunin, 1984; Dunin & Mamedov, 1992] (material examined). It is possible that other records of *E. oelandica* from Russia and Ukraine [cf. Mikhailov, 1997] may refer to *E. macrohelis*.

This species can be recognized by the copulatory organs and the abdominal pattern: sword-like dark median band, and folium with well-developed margins only.

Enoplognatha mediterranea Levy et Amitai, 1981
Figs 5–6, 48, 73, 77, 82.

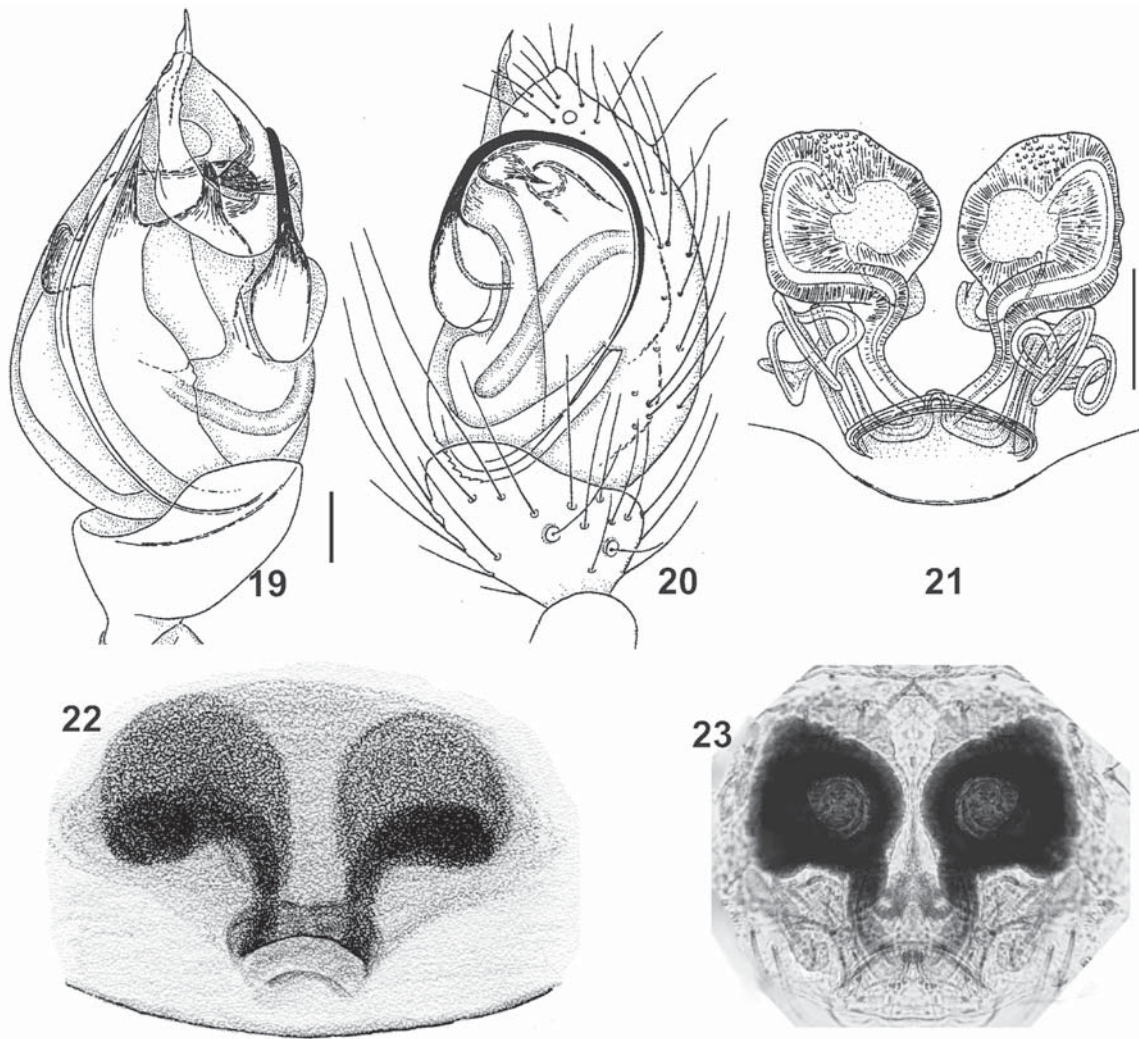
[Levy & Amitai, 1981: f. 40–49; Levy, 1998: f. 76–85; Bosmans & Van Keer, 1999: f. 58–62]

MATERIAL EXAMINED. 6 ♀♀ (IZA) SW Azerbaijan, Nakhchivan, Sharur Dist., env. of Akhura Vill., 2.06.2003 (EFG); 1 ♀ (IZA) CE Azerbaijan, Gobustan, Beyuk-Dash Mt., 18.04.1999 (EFG); 1 ♂ 2 ♀♀ (IZA) CE Azerbaijan, Gobustan, Beyuk-Dash Mt.



Figs 1–18. Epigyne of *Enoplognatha gemina* (1–2), *E. macrochelis* (3–4) and *E. mediterranea* (5–6), *E. oelandica* (7–9), *E. quadripunctata* (10–12), *E. serratosignata* (13–14), *E. mordax* (15–16) and *E. ovata* (17–18): 1, 3, 5, 7, 10, 12–13, 15, 17 — ventral; 2, 4, 6, 8, 11, 14, 16, 18 — caudal; 12 — shows epigyne plaque.

Рис. 1–18. Эпигина *Enoplognatha gemina* (1–2), *E. macrochelis* (3–4) и *E. mediterranea* (5–6), *E. oelandica* (7–9), *E. quadripunctata* (10–12), *E. serratosignata* (13–14), *E. mordax* (15–16) и *E. ovata* (17–18): 1, 3, 5, 7, 10, 12–13, 15, 17 — снизу; 2, 4, 6, 8, 11, 14, 16, 18 — сзади; 12 — показана эпигина с затычкой.



Figs 19–23. Copulatory organs of *Enoplognatha giladensis*: 19, 20 — palp ventral and retrolateral; 21, 23 — vulva; 22 — epigyne. 19–21 after Knoflach & Thaler [2000].

Рис. 19–23. Копулятивные органы *Enoplognatha giladensis*: 19, 20 — пальпа снизу и ретролатерально; 21, 23 — вульва; 22 — эпигина. 19–21 по Knoflach & Thaler [2000].

21.03.2001 (EFG); 12 ♀♀ (YMT) env. of Baku, Gobystan, 40°05'N 49°25'E, mountain semidesert, 15.04.2001 (YMM); 4 ♀♀ (YMT) CE Azerbaijan, Absheron Peninsula, Umbaki, 40°1'N 49°38'E, mountain semidesert, 19.04.2001 (YMM); 1 ♀ (ZMMU) CE Azerbaijan, Absheron Peninsula, Baku, Yasamal, 40° 21.46'N 49°48.36'E, 13.05.1979 (PMD).

RECORDS. Absheron Peninsula [Guseinov, 2002]. Dunin's [1984] record of *Robertus arundineti* from Absheron Peninsula refers to this species.

COMMENTS. Until recently this species was known from eastern Greece to Israel [Bosmans & Van Keer, 1999]. Record of *E. mediterranea* from Azerbaijan [Guseinov, 2002; present data] extends known range to more than 15 degrees to the east. The known range of this species can be named as eastern Mediterranean.

By general appearance (uniform coloration) it is similar to *E. giladensis* and *E. parathoracica*, but has shorter legs than does *E. giladensis* and darker colour. From *E. parathoracica* it can be distinguished by the shape of copulatory organs.

Enoplognatha mordax (Thorell, 1875)

Figs 15–16, 46–47, 69, 74, 80, 83.

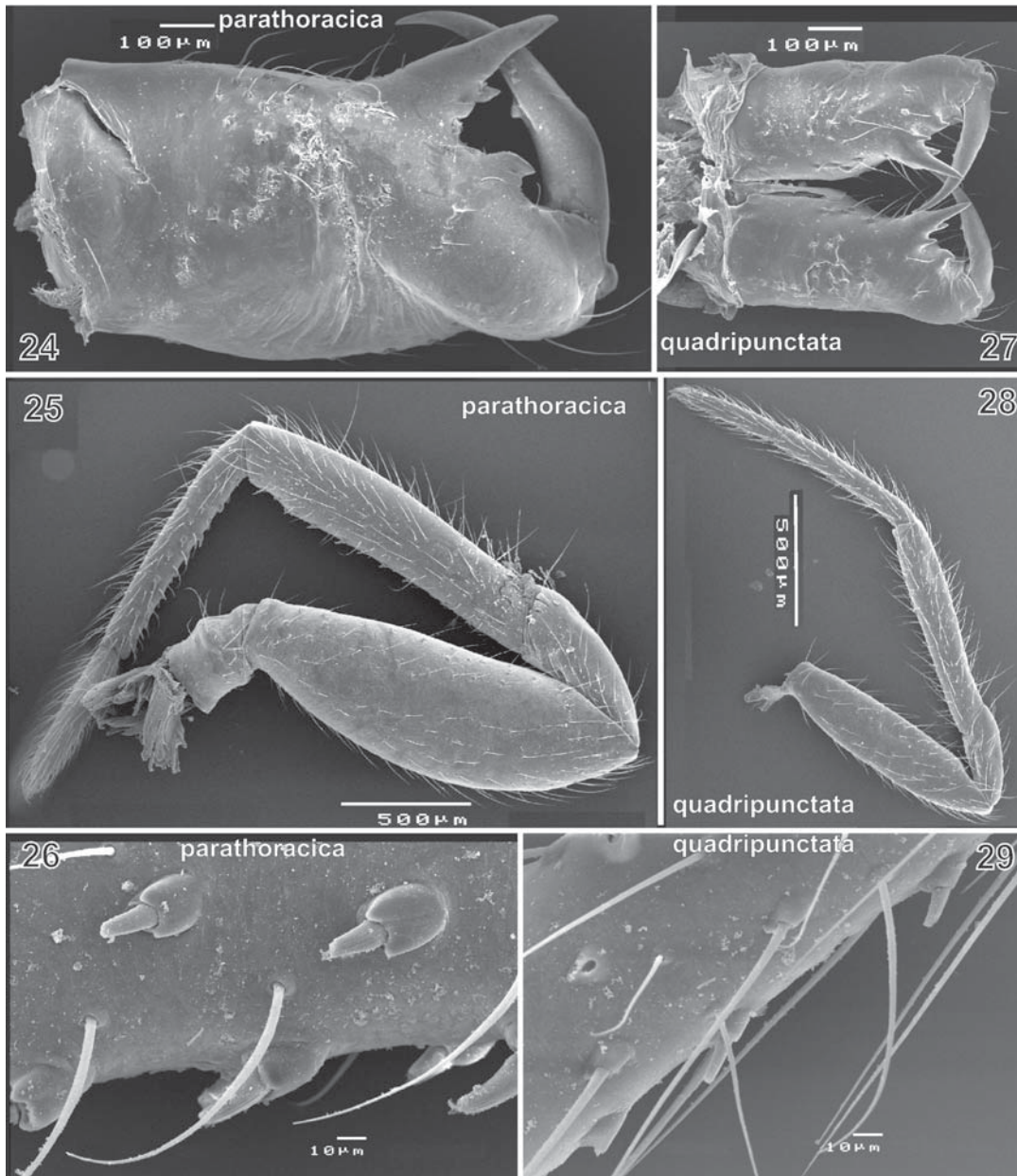
[Roberts, 1985: f. 85; Roberts, 1995: 291, f.; Wunderlich, 1995b: f. 17–23; Bosmans & Van Keer, 1999: f. 6–11]

MATERIAL EXAMINED. 2 ♀♀ 1 j (YMT) CE Azerbaijan, Absheron Peninsula, Baku, Ganly-Gyol L., 40° 21.46'N 49°48.36'E, 20.05 & 6.06.2003 (YMM).

RECORDS. sub *E. crucifera*: Absheron Peninsula [Dunin, 1984], Sheki-Zagatala area [Dunin, 1989].

COMMENTS. This species is widely distributed in Europe, present in Morocco, Cyprus [Bosmans & Van Keer 1999], reported in Tajikistan [Mikhailov, 1997] and in Xinjiang [Song et al., 1999]. Judging from the figures of *E. mordax* [Song et al., 1999: f. 60C–D] from northwestern China, the Chinese species belongs to a separate sibling species. Record from Tajikistan may also refer to other species.

Abdomen pattern in female is rather variable (Figs 46–47). This species can be distinguished from congeners by



Figs 24–29. Somatic characters of the males of *Enoplognatha parathoracica* (24–26) and *E. quadripunctata* (27–29): 24, 27 — chelicera, inner view; 25, 28 — leg I; 26, 29 — ventral part of tibia I showing modified macrosetae and their bases. Equal views have the same scale.

Рис. 24–29. Соматические признаки самцов *Enoplognatha parathoracica* (24–26) и *E. quadripunctata* (27–29): 24, 27 — хелицеры, изнутри; 25, 28 — нога I; 26, 29 — нижняя часть голени I, показаны модифицированные волоски и их основания. Одинаковые части тела в одинаковом масштабе.

the shape of copulatory organs, body pattern, and elongate abdomen in male.

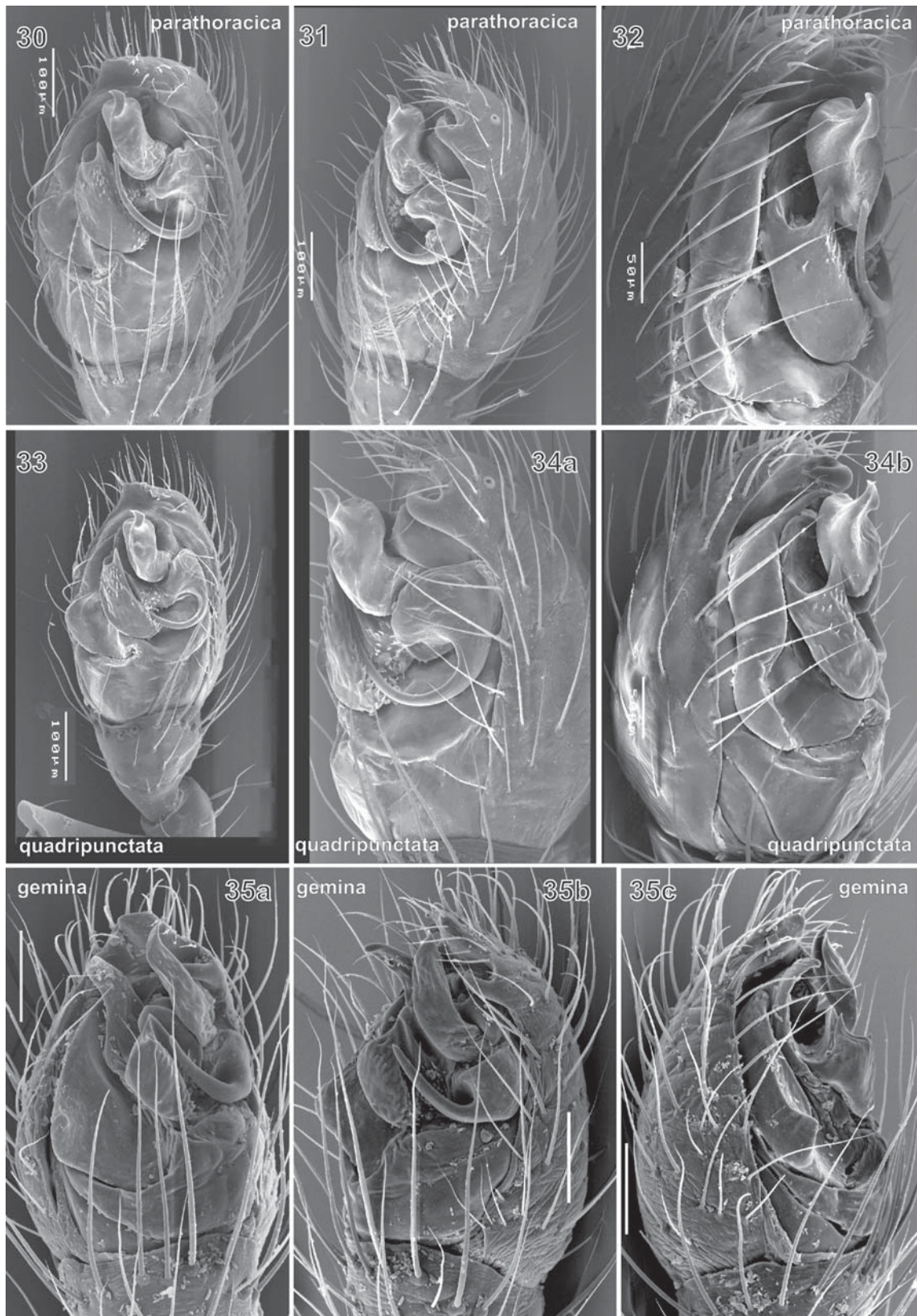
Enoplognatha oelandica (Thorell, 1875)*
Figs 7–9, 554, 67, 78.

[Wiehle, 1960: f. 10–14; Wunderlich, 1976: f. 8–15; Roberts, 1985: f. 85e; Roberts, 1995: 292, f.; Bosmans & Van Keer, 1999: f. 63–67]

MATERIAL EXAMINED. 1 ♀ (IZA) SW Azerbaijan, NE Nakhchivan, env. of Bichenek Vill., Bichenek River, 39°29,473'N

45°44.997'E, 1600 m, gravelly bank, 3.06.2003 (EFG); 2 ♀♀ (YMT) Nakhchivan, ca 3 km E of Akhura Vill. 39°34' N 45°11'E, 1400 m, 2.06.2003 (YMM); 1 ♀ (YMT) SE Azerbaijan, Zuvand area, env. of Pirasora Vill., 38°43,3'N 48°22.8'E, 1700–2000 m, 25–26.05.2003 (YMM); 1 ♀ (IZA) NE Azerbaijan, Gusar Dist., env. of Laza Vill., 1800 m, 6.08.2001 (EFG).

COMMENTS. This is the first record for Azerbaijan. Records of this species in Azerbaijan are from lowland arid areas, Absheron Peninsula and Muganskaya steppe [Dunin, 1984; Dunin & Mamedov, 1992] refer to *E. macrohelis* and *E. gemina* (material examined). In Azerbaijan *E. oelandica*



Figs 30–35. Male palp of *Enoplognatha parathoracica* (30–32), *E. quadripunctata* (33–34) and *E. gemina* (35): 30, 33, 35a — male palp, ventral; 31, 34a, 35b — retrolateral; 35, 34b, 35c — prolateral.

Рис. 30–35. Пальпа самца *Enoplognatha parathoracica* (30–32), *E. quadripunctata* (33–34) и *E. gemina* (35): 30, 33, 35a — пальпа самца, снизу; 31, 34a, 35b — ретролатерально; 35, 34b, 35c — пролатерально.



Figs 36–41. Male palp of *Enoplognatha latimana* (36–38), *E. ovata* (39) and *E. macrochelis* (40–41): 36, 41 — retrolateral; 37 — prolateral; 38–40 — ventral. Scale = 0.1 mm.

Рис. 36–41. Пальпа самца *Enoplognatha latimana* (36–38), *E. ovata* (39) и *E. macrochelis* (40–41): 36, 41 — ретролатерально; 37 — пролатерально; 38–40 — снизу. Масштаб = 0,1 мм.

was properly recorded only at high altitudes of 1400–2000 m (present data).

This species seems to have a Euro-Caucasian distribution. In Mediterranean it is known from France and Azerbaijan. Records of this species from Xinjiang [Song et al., 1999: f. 60E–F] refers to another distantly related species.

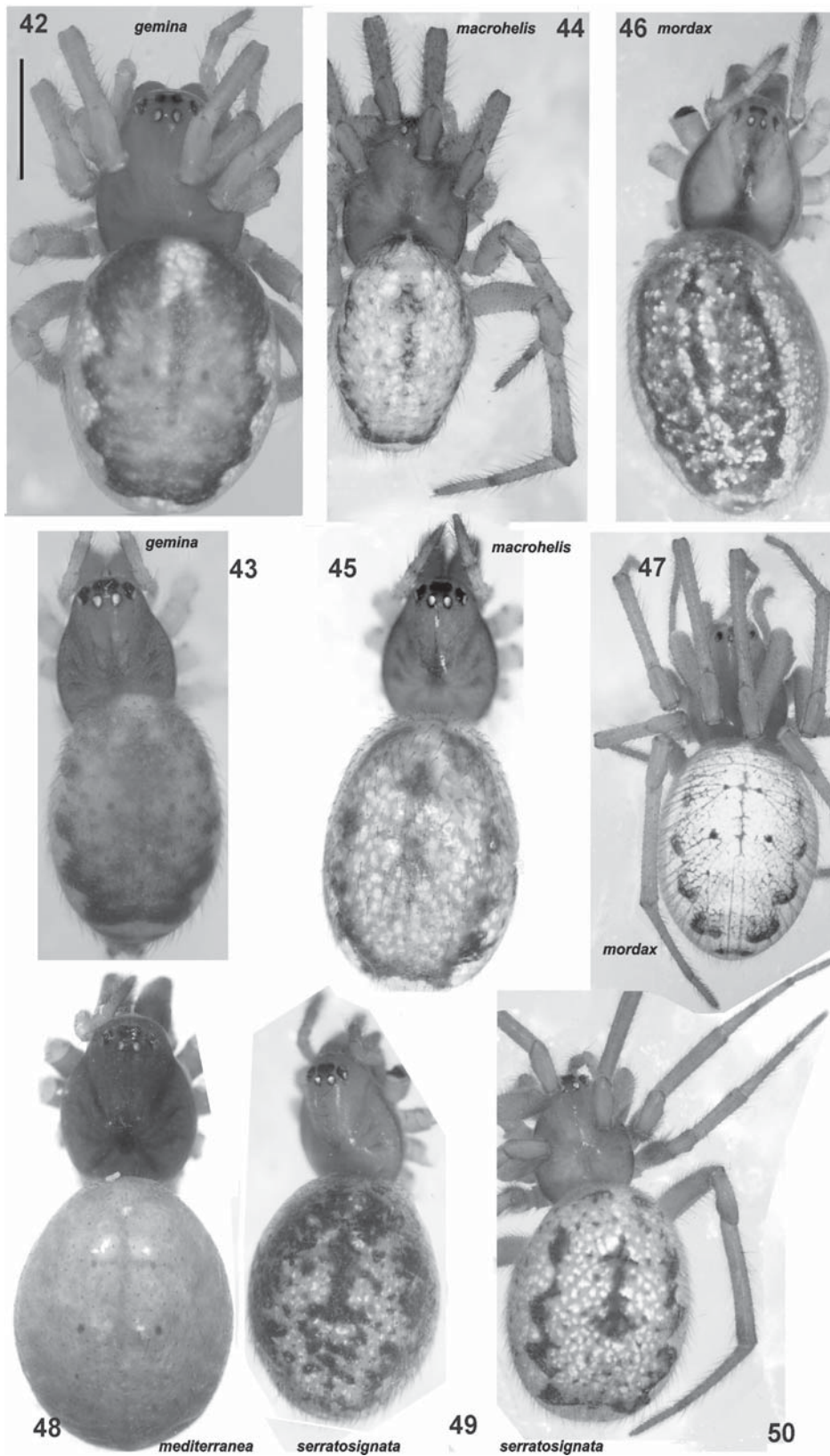
This species can be recognized by the body pattern and shape of copulatory organs.

Enoplognatha ovata (Clerck, 1757)

Figs 17–18, 39, 51.

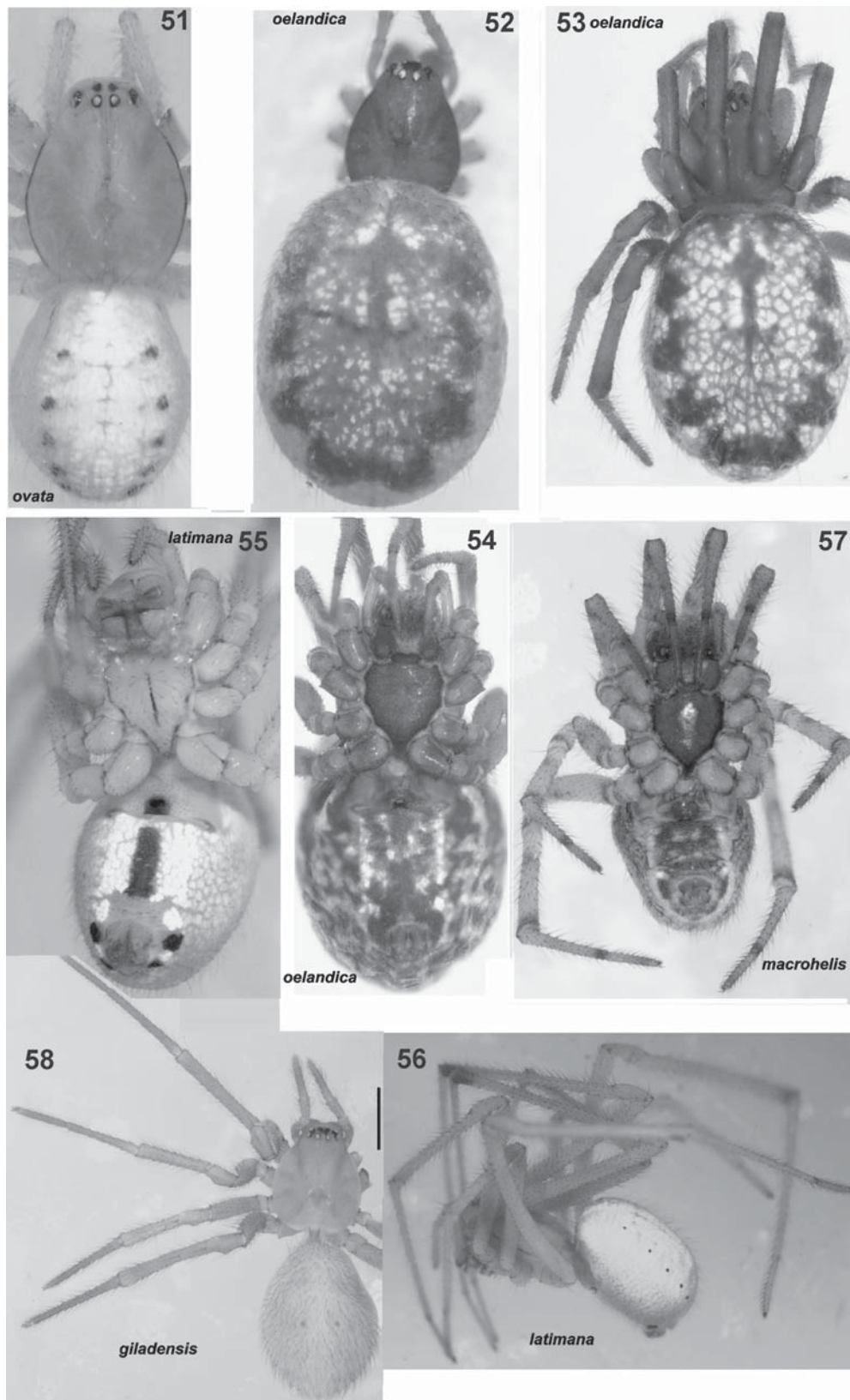
[Hippa & Oksala, 1982: f. 1–3, 14–16; Roberts, 1985: f. 85a; Roberts, 1995: 290, f.; Wunderlich, 1995a: f. 5–6, 9, 11–12]

MATERIAL EXAMINED. 2 ♂♂ 2 ♀♀ (IZA) CN Azerbaijan, Khyzy Dist., env. of Yarymja Vill., 6.06.2000 (EFG); 1 ♂ (IZA) SE Azerbaijan, Ismailly Dist., env. of Ivanovka Vill., 10.06.2002 (EFG).



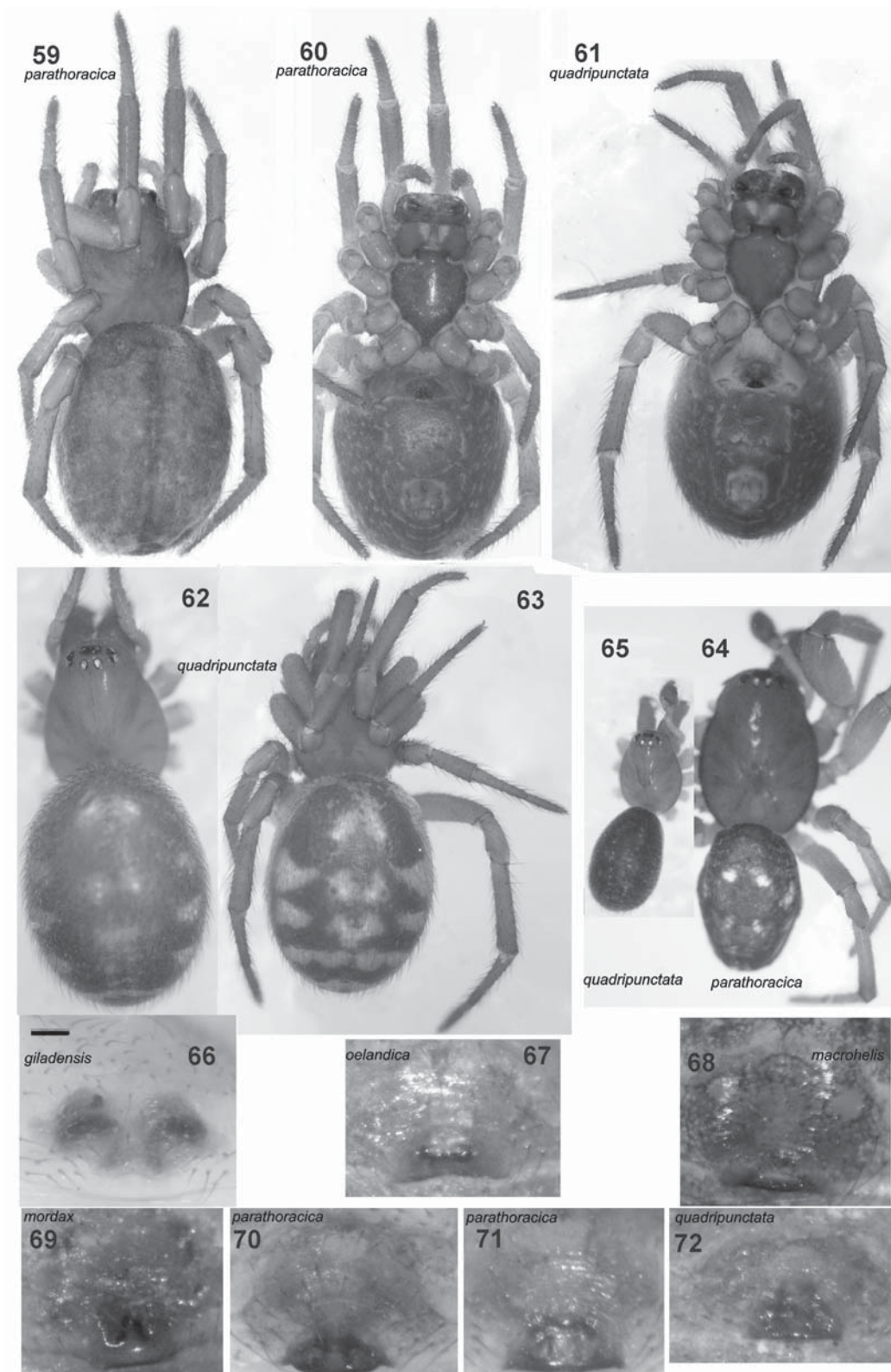
Figs 42–50. General appearance of the females of *Enoplognatha gemina* (42–43), *E. macrohelis* (44–45), *E. mordax* (46–47), *E. mediterranea* (48) and *E. serratosignata* (49–50).

Рис. 42–50. Внешний вид самок *Enoplognatha gemina* (42–43), *E. macrohelis* (44–45), *E. mordax* (46–47), *E. mediterranea* (48) и *E. serratosignata* (49–50).



Figs 51–58. General appearance of the females of *Enoplognatha ovata* (51), *E. oelandica* (52–54), *E. latimana* (55–56), *E. macrohelis* (57) and *E. giladensis* (58): 51–53, 58 — dorsal; 54–55, 57 — ventral, 56 — lateral.

Рис. 51–58. Внешний вид самок *Enoplognatha ovata* (51), *E. oelandica* (52–54), *E. latimana* (55–56), *E. macrohelis* (57) и *E. giladensis* (58): 51–53, 58 — сверху; 54–55, 57 — снизу, 56 — сбоку.



Figs 59–72. General appearance and epigynes of *Enoplognatha parathoracica* (59–61, 65, 72), *E. quadripunctata* (62–64, 70–71), *E. giladensis* (66), *E. oelandica* (67), *E. macrohelis* (68) and *E. mordax* (69): 59, 62–63 — female, dorsal; 60–61 — female, ventral; 64–65 — male, dorsal; 66–72 — epigyne, ventral.

Рис. 59–72. Внешний вид и эпигины *Enoplognatha parathoracica* (59–61, 65, 72), *E. quadripunctata* (62–64, 70–71), *E. giladensis* (66), *E. oelunca* (67), *E. macrohelis* (68) и *E. mordax* (69): 59, 62–63 — самка, сверху; 60–61 — самка, снизу; 64–65 — самец, сверху; 66–72 — эпигина, снизу.

RECORDS. Absheron Peninsula [sub *Theridium* o., Dunin, 1984], Sheki-Zagatala area [sub *Theridium* o., Atakishiev, 1969; Dunin, 1989], Lenkoran area [Guseinov, 1999].

COMMENTS. This species has a wide distribution, and is widespread in Europe and the Nearctic. It is rare in Mediterranean [Bosmans & Van Keer, 1999]. The southernmost records of this species are in Spain and Lebanon [Bosmans & Van Keer, 1999].

This species as well as *E. latimana*, and unlike another *Enoplognatha*, are herb-bush-tree dwellers and never occur in litter.

Enoplognatha parathoracica Levy et Amitai, 1981**
Figs 24–26, 30–32, 59–61, 65, 72, 87–88.

[Levy & Amitai, 1981: f. 32–39; Levy, 1998: f. 68–75; Bosmans & Van Keer, 1999: f. 42–47]

MATERIAL EXAMINED. 1 ♂ (IZA) SW Azerbaijan, Nakhchivan, Sharur Dist., env. of Akhura Vill., 2.06.2003 (EFG); 2 ♂♂ [13] Nakhchevan area, Dasharkh Vill., 39°33.629'N 45°02.53'E, 870 m, 1–4.06.2003 (YMM).

COMMENTS. This species is new to the fauna of Azerbaijan, Caucasus and former Soviet Union as a whole. Earlier it was known to be distributed from eastern Greece to Israel [Bosmans & Van Keer, 1999]. The present records extend the known range of *E. parathoracica* to more than 15 degrees to the East. Its range can be called as East Mediterranean.

NOTE. This species is similar to *E. quadripunctata* and is possibly a junior synonym of this species. Palps of these species are almost indistinguishable, but can be distinguished by pattern (white dots in *E. quadripunctata* and uniform colour in *E. parathoracica*). Although the two species have different and distinct chelicera (swollen distal part of chelicera in *E. parathoracica*) and are of different size (cf. Figs 24–29, 65–64, 88–89), these differences may be the result of allometric growth.

Enoplognatha quadripunctata Simon, 1884**
Figs 10–12, 27–29, 33–34a,b, 62–64, 70–71, 88–91.

[Bosmans & Van Keer, 1999: f. 36–41]

MATERIAL EXAMINED. 1 ♂ 1 ♀ (IZA) SW Azerbaijan, Nakhchivan, Sharur Dist., env. of Akhura Vill., 2.06.2003 (EFG & YMM); 1 ♂ 4 ♀♀ (YMT) Nakhchivan area, Dasharkh Vill., 39°33.629'N 45°02.53'E, 870 m, 1–4.06.2003 (YMM); 1 ♂ (IZA) CN Azerbaijan, Khyzy Dist., env. of Tazakyand Vill., 3.06.2000 (EFG); 1 ♀ CN Azerbaijan, Sheki Dist., env. of Cher Vill., 28.06.1978 (PMD); 3 ♀♀ (IZA) NE Azerbaijan, Gusar Dist., env. of Alchaly-Tala locality, 11.08.2001 (EFG); 1 ♂ 3 ♀♀ [a01] CE Azerbaijan, env. of Baku, Gobystan, 40°05'N 49°25'E, mountain semidesert, 15.04.2001 (YMM); 1 ♀ (ZMMU) CW Azerbaijan, Lachin Dist., env. of Lachin City, 1.06.1980 (PMD); 3 ♀♀ (YMT) CE Azerbaijan, ca 75 km N of Baku, W of Kilyazi Vill., 40°51.5'N 49°11.5'E, 260 m, semi-desert, under stones, 7.06.2003 (YMM); 1 ♂ 3 ♀♀ (IZA) CE Azerbaijan, Absheron Peninsula, env. of Yeni-Surakhany Vill., 10.05.1994 (EFG); 1 ♂ (IZA) Absheron Peninsula, env. of Ganly-Gyol Lake, 10.04.1995 (EFG); 1 ♂ (IZA) same locality, 3.05.1995 (EFG); 3 ♀♀ (YMT) CE Absheron Peninsula, env. of Gyurgyan Vil., 40°24'N 50°16'E, semidesert, 17.04.2001 (YMM); 2 ♂♂ 5 ♀♀ (YMT) Absheron Peninsula, Baku, Ganly-Gyol L., 40° 21.46'N 49°48.36'E, 20.05 & 6.06.2003 (YMM); 5 ♀♀ (YMT) Absheron Peninsula, Umbali, 40°1'N 49°38'E, mountain semidesert, 19.04.2001 (YMM); 1 ♂ 17 ♀♀ (YMT) CE Azerbaijan, env. of Baku, Gobystan, 40°05'N 49°25'E, mountain semidesert, 15.04.2001 (YMM); 25 ♀♀ (YMT), 17–31.05.2003 (YMM); 1 ♂ (YMT) SE Azerbaijan, Zuvand area, ca 3 km W of Lerik Town, 38°43.834'N 48°25.669'E, 1200 m, slopy meadows, 25.05.2003 (EFG); 2 ♀♀ (YMT) Zuvand area, env. of Pirasora Vill., 38°43.3'N 48°22.8'E, 1700–2000 m, 25–26.05.2003 (YMM);

9 ♂♂ 1 ♀ (IZA & YMT) Lenkoran Dist., env. of Aurora Vil., 38°40'N 48°52'E, 23–28.04.2001 (YMM & EFG); 3 ♀♀ (YMT) Lenkoran area, Hyrcan Reserve, 38°38.5'N 48°47.5'E, 23.05.2003 (YMM); 1 ♂ (YMT) Lenkoran Dist., N of Lenkoran, 38°50'N 48°49' E, -20 m, seashore bog, 22.05.2003 (YMM); 1 ♀ [06] Lenkoran Dist., environs of Vel Vill., 38°38'N 48°52'E, -20 m, seashore, 22.05.2003 (YMM); 1 ♀ (YMT) SE [Azerbaijan, Lenkoran Dist. environs of Aurora Vill. 38°41'N 48°17'E, 36 m, 21–29.05.2003 (YMM); 2 ♀♀ 2 jj (YMT) Lenkoran area, Hyrcan Reserve, near dam, 38°38'N 48°47'E, 28.05.2003 (YMM).

COMMENTS. This species is new to the fauna of Azerbaijan, Caucasus and the former Soviet Union as a whole. In Azerbaijan it was recorded earlier under the name *E. thoracica* [Guseinov, 2002] and *E. testacea* [Dunin, 1984] from Absheron Peninsula (material examined).

Until recently this species was known from Portugal and Morocco to Central Turkey [Bosmans & Van Keer, 1999], and our records extend the range limits to about 13 degrees to the east. Occurrence of *E. quadripunctata* in western Turkmenistan is very probable. Its range now can be called as whole Mediterranean.

This species is similar to *E. parathoracica* and is possibly a senior synonym of this species. Palps of these species are almost indistinguishable, but can be distinguished by abdominal pattern (white dots in *E. quadripunctata* and uniform colour in *E. parathoracica*). Although the two species have different chelicera (swollen distal part of chelicera in *E. parathoracica*), and are of different sizes (cf. Figs 24–29, 65–64, 88–89), these differences may be the result of allometric growth.

NOTE. Males of this species have a modified leg I. Ventral and ventro-lateral parts of tibia, and especially the metatarsus, bear modified spine-like macrosetae with enlarged bases (Figs 28–29, 87). Such modification of leg macrosetae was known in *E. monstrabilis* Marusik & Logunov, 2002 [cf. f. 15–16 in Marusik & Logunov, 2002] and in *E. parathoracica* (Figs 25–26, 89).

Enoplognatha serratosignata (L. Koch, 1879)*
Figs 13–14, 49–50, 76, 86.

[Wunderlich, 1976: f. 17–22; Bosmans & Van Keer, 1999: f. 108–112]

MATERIAL EXAMINED. 1 ♀ (YMT) SW Azerbaijan, NE Nakhchivan, env. of Bichenek Vill., Bichenek River, 39°29.473'N 45°44.997'E, 1600 m, gravelly bank, 3.06.2003 (EFG); 7 ♀♀ (IZA) NE Azerbaijan, Gusar Dist., foothill of Sakhdag Mt., 3000 m, 8.08.2001 (EFG).

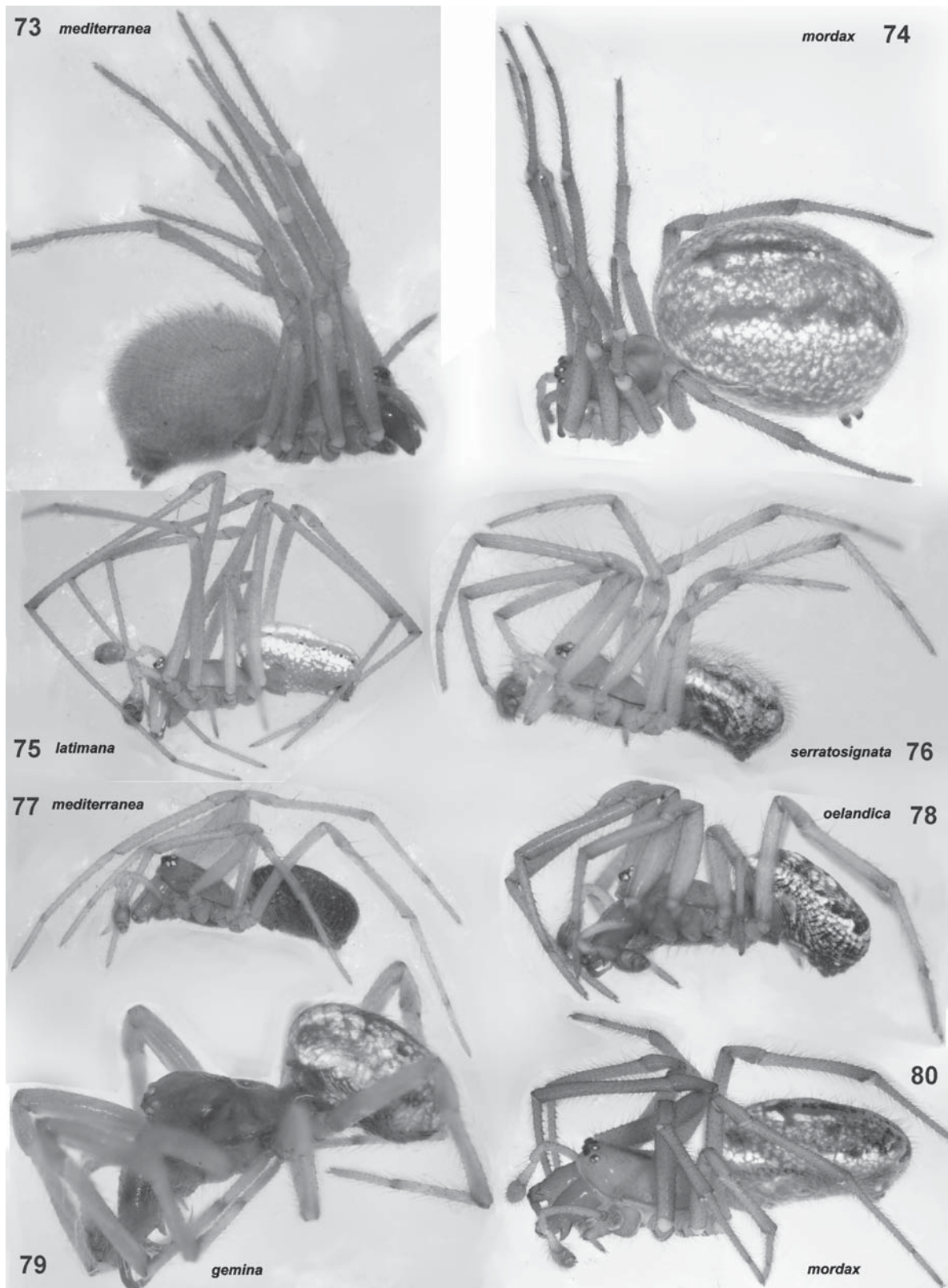
COMMENTS. Although it is the most widespread *Enoplognatha* species in the Palaearctic Region, ranging from Switzerland to Chukotka [Bosmans & Van Keer, 1999; Marusik et al., 2000], it was never reported from Azerbaijan and Caucasus as a whole. In Azerbaijan it was found only at high altitudes, 1600–3000 m, although in Siberia it may occur on seashores.

Males of this species are short-lived (personal data). Maybe it is the main reason they were not found in Azerbaijan. This species can be distinguished by the body pattern and copulatory organs (large epigynal plate).

Erroneous records

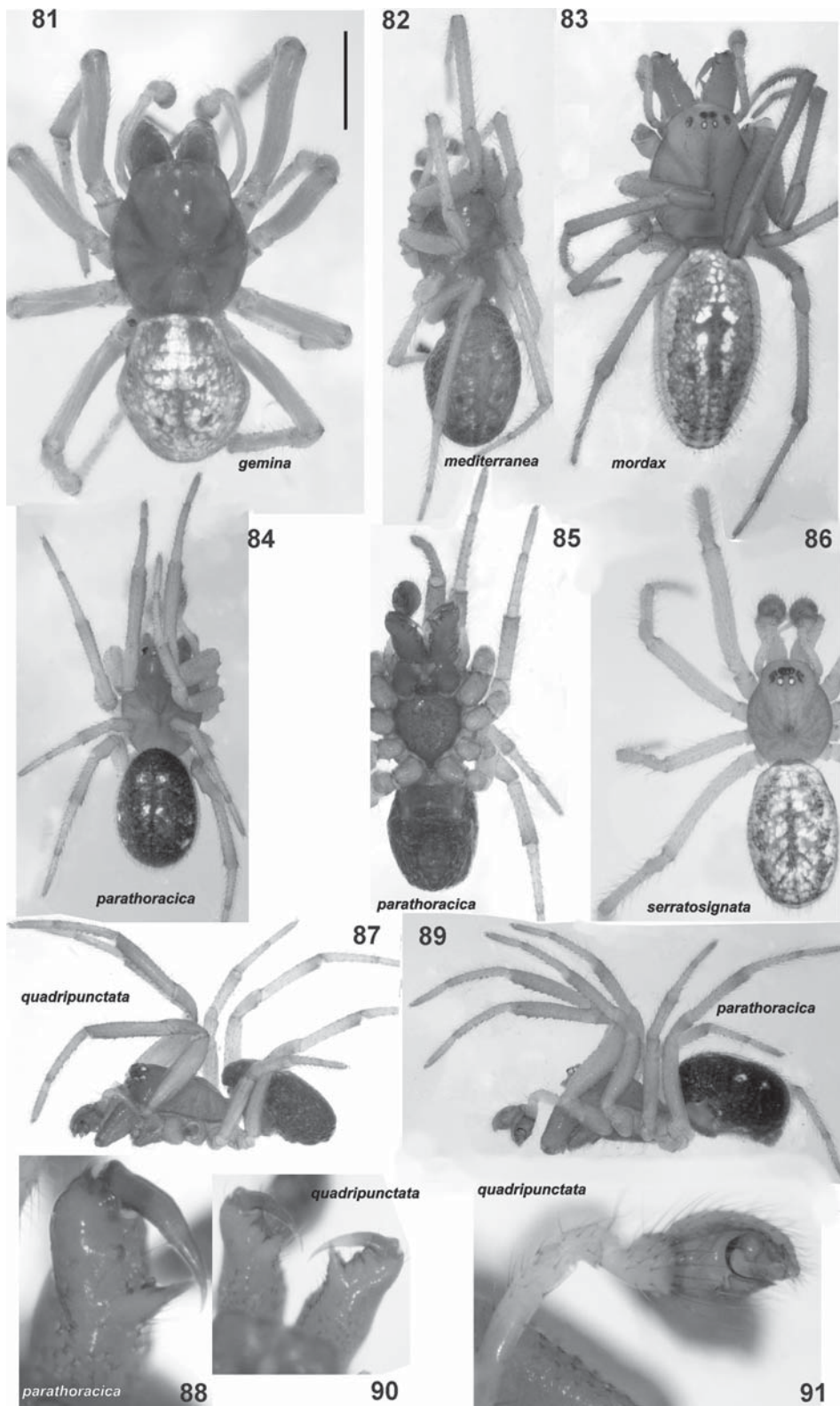
Enoplognatha oelandica (Thorell, 1875)

Records of this species from Absheron Peninsula and Mugan steppe [Dunin, 1984; Dunin & Mamedov, 1992] actually refer to *E. gemina* and *E. macrochelis* (Dunin's material examined).



Figs 73–80. Lateral view of *Enoplognatha mediterranea* (73, 77), *E. mordax* (74, 80), *E. latimana* (75), *E. serratosignata* (76), *E. oelandica* (78) and *E. gemina* (79): 73–74 — female, 75–80 — male.

Рис. 73–80. Вид сбоку *Enoplognatha mediterranea* (73, 77), *E. mordax* (74, 80), *E. latimana* (75), *E. serratosignata* (76), *E. oelandica* (78) и *E. gemina* (79): 73–74 — самка, 75–80 — самец.



Figs 81–91. Males of *Enoplognatha gemina* (81), *E. mediterranea* (82), *E. mordax* (83), *E. parathoracica* (84–85), *E. serratosignata* (86), *E. parathoracica* (87–88) and *E. quadripunctata* (88–91): 81–84, 86 — dorsal; 85 — ventral; 87–89 — lateral; 88, 90 — chelicera, inner; 91 — palp.

Рис. 81–91. Самцы *Enoplognatha gemina* (81), *E. mediterranea* (82), *E. mordax* (83), *E. parathoracica* (84–85), *E. serratosignata* (86), *E. parathoracica* (87–88) и *E. quadripunctata* (88–91): 81–84, 86 — сверху; 85 — снизу; 87–89 — сбоку; 88, 90 — хелицеры, изнутри; 91 — пальпа.

Table 1. Data on *Enoplognatha* species diversity in Mediterranean and European countries.Таблица 1. Данные по разнообразию видов рода *Enoplognatha* в Средиземноморских и Европейских странах.

Country	Species number	Square x10 ³ km	Species square	References*
Azerbaijan	11	87	0.13	6
Greece	13	132	0.10	1
Spain	13	505	0.03	1
France	11	551	0.02	1
Algeria	11	2382	0.005	1
Morocco	10	447	0.02	1
Portugal	9	92	0.10	2
Bulgaria	8	111	0.07	3
Turkey	8	781	0.01	1
Romania	7	238	0.03	4
Hungary	7	93	0.08	5
Israel	6	14	0.43	1
Tunisia	4	164	0.02	1

*1 — Bosmans & Van Keer, 1999; 2 — Cardoso, 2000; 3 — Deltshv & Blagoev, 2001; 4 — Weiss & Úrák, 2000; 5 — Samu & Szinetár, 1999; 6 — present data

Enoplognatha testacea Simon, 1884

RECORDS. Absheron Peninsula [Dunin, 1984].

COMMENTS. A reexamination of Dunin's collection revealed that the specimens identified by him as *E. testacea* belong to *E. quadripunctata* which is the most abundant representative of the genus in Absheron Peninsula and other parts of Azerbaijan.

Enoplognatha thoracica (Hahn, 1833)

RECORDS. Absheron Peninsula, Khyzy Dist. (Tazakyand, Yarymja) [Guseinov & Rubtsova, 2001].

COMMENTS. These records refer to *E. quadripunctata*.

Discussion

As a result of the present study, 7 species of *Enoplognatha* new to the fauna of Azerbaijan were found. Of these four are new to the fauna of the former Soviet Union, two for Caucasus and one for Azerbaijan. At the same time 3 species were found to be mistakenly reported for the fauna of Azerbaijan. Thus we excluded these species from the list of known Azerbaijan *Enoplognatha*. The only exception is *Enoplognatha oelandica*, which although being erroneously recorded from Azerbaijan previously, was found to be in Azerbaijan. At the present fauna of Azerbaijan amounts to 11 properly recorded species. Judging from the distribution of different *Enoplognatha* species, it is possible to expect additional species in Azerbaijan, such as *E. caricis* (Fickert, 1876). This species is known from Europe, including Italy [Bosmans & Van Keer, 1999], India and Kyrgyzstan (personal data), all of Siberia and western Nearctic [Marusik et al., 2000].

Among Mediterranean countries Azerbaijan has one the highest species diversity of *Enoplognatha*. By species number only Greece and Spain have more species

(see Table 1). If to account number of species and size of the country, Azerbaijan has second largest density of species per square (Table 1). The higher "species density" was found in Israel only. It seems that fauna of Azerbaijan is relatively well studied. Several Mediterranean countries have very few recorded species: Tunisia (4), Bosnia (3), Croatia (3), Syria (1).

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References

- Atakishiev T.A. 1969. [Spiders — symbionts of the honey bee] // Uchenyye zapiski Kazanskogo Veterinarnogo Instituta. T.105. P.317–323 [in Russian].
- Bosmans R., Van Keer J. 1999. The genus *Enoplognatha* Pavesi, 1880 in the Mediterranean region (Araneae: Theridiidae) // Bull. Br. arachnol. Soc. Vol.11. Pt.6. P.209–241.
- Cardoso P. 2000. Portuguese spiders (Araneae): a preliminary checklist // P. Gajdoš and S. Pekár (Eds.). Proceedings of the 18th European Colloquium of Arachnology, Stará Lesná, 1999. Ekológia (Bratislava). Vol.19. Supplement 3. P.19–29.
- Deltshv C., Blagoev G. 2001. A critical check list of Bulgarian spiders (Araneae) // Bull. Br. arachnol. Soc. Vol.12. Pt.3. P.110–138.
- Dunin P.M., Mamedov A.A. 1992. [Spiders in cotton fields of the southeastern part of Azerbaijan] // Byull. Moskovskogo Obshch. Ispyt. Prirody. Otd. Biol. Vol.97. P.53–61 [in Russian, with English summary].
- Dunin P.M. 1984. [Fauna and ecology of the spiders of the Absheron Peninsula, Azerbaijan SSR] // Fauna i ekologiya paukoo-braznykh. Perm. P.45–60 [in Russian].
- Dunin P.M. 1989. [Fauna and altitudinal distribution of spiders (Arachnida, Aranei) of the Azerbaijan part of the southern macroslope of the Caucasus Major] // Fauna i ekol. paukov i skorpionov. Moscow: Nauka Publ. P.31–39 [in Russian].
- Guseinov E.F. 1999. [Spiders of Lenkoran Natural Region and Absheron Peninsula in Azerbaijan]. Abstract of PhD thesis. Baku 29 pp. [in Russian]
- Guseinov E.F. 2002. [Spider species (Arachnida: Araneae) new to the fauna of Azerbaijan] // Chetvertaya Mezhdunarodnaya konferentsiya "Biologicheskoe raznoobrazie Kavkaza". Makhachkala. P.291–293 [in Russian].
- Guseinov E.F., Marusik Yu.M., Koponen S. 2005. Spiders (Arachnida, Aranei) of Azerbaijan 5. Faunistic review of the funnel-web spiders (Agelenidae) with the description of new genus and species // Arthropoda Selecta. Vol.14. No.2. P.153–177.
- Guseinov E.F., Rubtsova L.E. 2001. [Spider species (Arachnida: Araneae) new to the fauna of Azerbaijan] // Study and protection of the animal world on the end of the century // Proceedings of the scientific conference dedicated to the 80-th anniversary of Academician M.A. Musaev. Baku: Elm. P.236–239 [in Russian, with English summary].
- Hippa H., Oksala I. 1982. Definition and revision of the *Enoplognatha ovata* (Clerck) group (Araneae: Theridiidae) // Entomologica scand. Vol.13. P.213–222.
- Knoflach B. & Thaler K. 2000. Notes on Mediterranean Theridiidae // Mem. Soc. entomol. ital. Vol.78. No.2. P.411–442.

- Levy G., Amitai P. 1981. The spider genus *Enoplognatha* (Araneae: Theridiidae) in Israel // Zool. J. Linn. Soc. Vol.72. P.43–67.
- Levy G. 1998. Araneae: Theridiidae. Fauna Palaestina, Arachnida III. Israel Academy of Sciences and Humanities, Jerusalem. 227 pp.
- Marusik Yu.M. 1989. [New data on fauna and synonymie of spiders from USSR] // Fauna i ekologiya paukovi skorpionov. Moscow: Nauka Publ. P.39–52 [in Russian].
- Marusik Yu.M., Guseinov E.F. 2003. Spiders (Arachnida, Aranei) of Azerbaijan. I. New families and genera records // Arthropoda Selecta. Vol.12. No.1. P.29–46.
- Marusik Yu.M., Guseinov F.G., Aliev H.A. 2004. Spiders (Arachnida, Aranei) of Azerbaijan 4. Fauna of Nakhchivan // Arthropoda Selecta. Vol.13. No.3. P.135–149.
- Marusik Yu.M., Guseinov E.F., Koponen S. 2003. Spiders (Arachnida, Araneae) of Azerbaijan. 2. Critical survey of wolf spiders (Lycosidae) found in the country with description of three new species and brief review of Palaearctic *Evipa* Simon, 1885 // Arthropoda Selecta. Vol.12. No.1. P.47–65.
- Marusik Yu.M., Logunov D.V., Koponen S. 2000. Spiders of Tuva, South Siberia // IBPN FEB RAS, Magadan. 252 pp.
- Marusik Yu.M., Logunov D.V. 2002. New faunistic records for the spiders of Buryatia (Araneae), with a description of a new species from the genus *Enoplognatha* (Theridiidae) // Arthropoda Selecta. Vol.10 (for 2001). No.3. P.265–272.
- Marusik Yu.M., Mikhailov K.G., Guseinov E.F. 2006. Advances in study of biodiversity of Caucasian spiders (Araneae) // European Arachnology 2005 (Deltshev C., Stoev P. eds), Acta Zoologica Bulgarica. Suppl. No.1. P.259–268.
- Mikhailov K.G. 1997. Catalogue of the spiders of the territories of the former Soviet Union (Arachnida, Aranei). Moscow. 416 pp.
- Paquin P., Dupérré N., Hutchinson R. 2001. Liste révisée des Araignées (Araneae) du Québec // Fabriques, Suppl. No.10. P.1–87.
- Platnick N.I. 2008. The world spider catalog, version 8.5. American Museum of Natural History, online at <http://research.amnh.org/entomology/spiders/catalog/index.html>
- Roberts M.J. 1985. The spiders of Great Britain and Ireland. Vol. 1. Atypidae to Theridiosomatidae. Harley Books, Colchester. 229 pp.
- Roberts M.J. 1995. Spiders of Britain & Northern Europe. Harper-Collins, London. 383 pp.
- Roberts M.J. 1998. Spinnengids. Tirion, Baarn, Netherlands. 397 pp.
- Samu F., Szinetár C. 1999. Bibliographic check list of the Hungarian spiders // Bull. Br. arachnol. Soc. Vol.11. Pt.5. P.161–184.
- Snazell R. 1983. On two spiders recently recorded from Britain // Bull. Br. arachnol. Soc. Vol.6. P.93–98.
- Song D.X., Zhu M.S., Chen J. 1999. The spiders of China. Hebei Science & Technology Press. 640 pp.
- Weiss I., Urák I. 2000. Checklist of the Romanian spiders (Arachnida: Araneae). <http://members.aol.com/Arachnologie/Faunenlisten.htm>
- Wiehle H. 1960. Beiträge zur Kenntnis der deutschen Spinnenfauna // Zool. Jb. (Syst.) Bd.88. S.195–254.
- Wunderlich J. 1976. Zur Spinnenfauna Deutschlands, XVI. Zur Kenntnis der mitteleuropäischen Arten der Gattungen *Enoplognatha* Pavesi und *Robertus* O. Pick.-Cambridge // Senckenberg. biol. Bd.57. S.97–112.
- Wunderlich J. 1995a. Beschreibung einer bisher unbekanntenen Kugelspinnen-Art der *Enoplognatha ovata*-Gruppe aus Deutschland (Arachnida: Araneae: Theridiidae) // Beitr. Araneol. Bd.4. S.697–702.
- Wunderlich J. 1995b. Zur Kenntnis mediterraner Arten der Gattung *Enoplognatha* Pavesi 1880, mit einer Neubeschreibung (Arachnida: Araneae: Theridiidae) // Beitr. Araneol. Bd. 4. S.703–713.