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New or interesting records of Palearctic Orthoptera (Insecta)

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ABSTRACT

The author reports some interesting Orthoptera from Palearctic region, namely: *Pezodrymadusa subinermis* Karabag, 1961, *Montana stricta* Zeller, 1849 from Sardinia, *Paranocarodes sulcatus* (I. Bolivar, 1912) from Armenia, *Scintharista notabilis* notabilis (Walker, 1870) from Azores, *Brachycrotaphus tryxalicerus* (Fischer, 1853) from Egypt, and *Euchorthippus declivus* (Brisout, 1848) from Sardinia (Italy). Additionally, he establishes the synonymies *Uvarovistia rammei* Katbeh Bader et Massa, 2001 = *Eupholidoptera peneri* Kaltenbach, 1969; *Pterolepis pedata* A. Costa, 1882 = *Rhacocleis berberica dubronyi* Baccetti, Massa et Canestrelli, 1995 from *Lampedusa* Is. (Sicily). With new material he supports the conclusion of Nadig (1981) that *Stenobothrus nadigi* La Greca, 1986 is a synonym of *S. ursulae* Nadig, 1986 from Piedmont and Aosta Valley (Italy). He also describes the unknown male of *Ocnerosthenus verrucosus* (Brunner von Wattenwyl, 1882) and the unknown female of *Orchamus kaltenbachi* Massa, 2009. Finally, he records a female of *Anadrymadusa ornatipennis* (Ramme, 1926) from Patmos Is. (Greece), and a female of *Eupholidoptera uvarovi* (Karabağ, 1952) from Kassos Is. (Greece).

Key words: Ensifera, Caelifera, systematics, distribution, synonymies

I had the chance to gather some specimens of Orthoptera collected in different countries of Palearctic Region (Armenia, Greece, Italy, Algeria, Egypt, Israel, Jordan, Syria, Azores Is.), preserved in various Museums and collections, finding some interesting records of little known species and establishing some new synonymies, that I report here. They belong to the following families: Tettigoniidae (6 species), Pamphagidae (3 species) and Acrididae (4 species).

MATERIAL AND METHODS

Photographs and biometrics. Series of images of specimens with different focal planes were taken using a Nikon Coolpix 4500 digital camera, mounted on a Stereomicroscope Optech EMX-210-2, and were integrated using the freeware CombineZP (Hadley, 2008). Measurements on mounted specimens were taken using a digital calliper (preciseness 0.01 mm).

Institutions. Naturhistorisches Museum, Wien (NMW), Museo Nacional de Ciencias Naturales, Madrid (MCNM), Museo Regionale di Scienze Naturali, Turin (MSNT), Museo Civico di Storia Naturale, Milan (MSNM), Museo Civico di Storia Naturale,

Genoa (MSNG), Museum für Naturkunde, Berlin (ZMHB), coll. B. Massa, University of Palermo (BMCP), coll. P. Fontana, Isola Vicentina (PFCV).

RESULTS AND DISCUSSION

Tettigoniidae

Pezodrymadusa subinermis Karabag, 1961

Material examined: Armenia, Syunik, 3 km ENE Meghri, Artsvokar gorge, 15.V.2008, M. Kalashian, 1♂, 1♀; Ararat prov., 8 km E Urtsadzor, foot Mt. Kyutuz (1100 m), 7.VII.2004, M. Kalashian, 1 ♀. (BMCP).

Previously known only from type-locality (Turkey: Elazig). According to Karabağ (1961), sides of last tergites of this species are unicolourous, while in Armenian specimens examined by me they are black and brown. Differently from what has been reported by Karabağ (1961), elytra are apically black. However, being unknown in its variability, I consider the pair of specimens here listed to belong to *P. subinermis*. The male last tergite appendages are short, thin and almost parallel, in lateral view downcurved, cerci are straight, apically acuminate, median branches of titillators are slender, thin, with a few spines; the female, paler than the male, shows shorter tegmina, subgenital plate is swollen and acutely incised (Figs 1-8). Characteristics match those reported by Karabağ (1961) and of the holotype depicted in OSF (Eades & Otte, 2009). Pronotum of Armenian specimens show upper surface light brown and lateral lobes dark brown, the typical sulcus distinctly brown; a dark ring (not very pale, as reported by Karabağ, 1961) is present near the apical part of femurs and tibiae, hind femurs show a small elongated dark brown spot in the basal upper edge and inside (cf. Karabağ, 1961).

Anadrymadusa ornatipennis (Ramme, 1926)

Material examined: Greece, Patmos Is., 25.V.2007, 1♀, A. Cattaneo (BMCP).

The islet of Patmos is placed at SW of Samos (S. Sporadhes), not far from it, the type locality of this species. When Ramme (1926) described this species, he examined also two females from other islets of S Sporadhes (Chios and Nisyros) and from SW Anatolia (Turkey) (record considered as improbable by Karabağ, 1961). Additionally, Heller (1988) cited it from Rhodes (see also Willemse & Willemse, 2008) and Korsunovskaya *et al*. (2002) confirmed it from Turkey. However, Karabağ (1961), who examined the female from Nisyros and another one from Xantha (locality not traced by Willemse, 1984), was not sure that the females belonged to the same species and considered that until a female from the type locality should be studied the problem would remain open. Karabağ (1961) also pointed out that in the females examined the V-VII sternites show a very distinct and wide median furrow, and the subgenital plate has a very distinct median furrow. The specimen collected on Patmos Is. (Fig. 9) does not show the median furrow in V-VII sternites and in the subgenital plate (Figs. 10-11) and could actually belong to *A. ornatipennis* with a higher probability than females so far examined. It would be useful to revise the distribution of the species from safely identified specimens; specimens coming from other islets (see list of doubtful localities in Willemse 1984) could belong to one undescribed species.

Biometrics (in mm). Total length (from head to apex of femurs): 49.4; length of pronotum: 9.2; height of pronotum: 6.6; length of hind femurs: 31.3; length of tegmina: 10.0; ovipositor length: 23.1.

***Montana stricta* Zeller, 1849**

Material examined: Italy, Sardinia, Sassari, 1♀ (ZMHB).

It has been generically recorded from Sardinia by Harz (1969), but not listed by Fontana et al. (2005).

***Rhacocleis korsakovi* Uvarov, 1942**

Material examined: Algeria, surroundings of Algeri, 27.VII.1976, B.Massa, 1♀ (BMCP)

According to Willemse & Willemse (2005), while *Rhacocleis* bears three spines on the outer upper side of fore tibiae, *Pterolepis* presents only one. They did not examine any specimen of *R. korsakovi* and consequently did not establish to which genus it belongs. The specimen above listed presents three spines, thus the species remains in the genus *Rhacocleis*.

Note: to complete the list of *Rhacocleis*/*Pterolepis* arranged by Willemse & Willemse (2005) I checked spines on fore tibiae of another taxon not examined by them, *Rhacocleis berberica dubronyi* Baccetti, Massa et Canestrelli, 1995, establishing its synonymy with *Pterolepis pedata* A. Costa, 1882.

***Eupholidoptera peneri* Kaltenbach, 1969**

Material examined: Israel, Mt Charmel, June 1987, 1♂, 1♀ (PFCV); Jordan, Ajloun, 12.VII.87, holotypus female of *Uvarovistia rammei* (MSNG).

Katbeh Bader & Massa (2001) examined a female specimen collected in Jordan, characterized by its 9th abdominal tergite brownish-black at the center (not at the sides), with two spots at both sides (not a transverse series of brown spots along the fore margin), tegmina concealed by pronotum, subgenital plate unicoloured and ovipositor short and gently upcurved. They concluded that it belonged to the genus *Uvarovistia* Mařan, naming as a new species, *Uvarovistia rammei*. However, Kaltenbach (1969) described a species of *Eupholidoptera* Mařan from Israel, very pale, with a general coloration green-yellowish; the female of this species shows the subgenital plate and the ovipositor very similar to those described for *U. rammei*. The comparison of one female of *E. peneri* with the holotype female of *U. rammei* confirmed that they belong to the same taxon. Coloration of *E. peneri* is yellow testaceous, 9th abdominal tergite black at the center and with two black spots at sides. According to Çiplak *et al.* (2009), it is the *Eupholidoptera* species most similar to *Uvarovistia*, by its short ovipositor. Thus, I establish the following synonymy: *Uvarovistia rammei* Katbeh Bader et Massa, 2001 = *Eupholidoptera peneri* Kaltenbach, 1969. Distribution of the latter consequently covers Israel and Jordan.

Measurements (in mm). Israel specimens of *Eupholidoptera peneri*. Total length: 23.7 (male), 21.2 (female); pronotum length: 10.5 (male), 10.0 (female); pronotum height: 5.1 (male), 5.0 (female); length of hind femurs: 21.5 (male), 21.7 (female); ovipositor length: 12.8. Jordan specimen (holotypus female of *Uvarovistia rammei*).

Total length: 20.8; pronotum length: 9.7; pronotum height: 5.0; length of hind femurs: 19.0; ovipositor length: 11.5.

***Eupholidoptera uvarovi* (Karabağ, 1952)**

Material examined: Greece, Dodecanesos, Kassos Is., 25.V-3.VI.2009, A. Cattaneo, 1♀.

Considered endemic to Karpathos Is., it is now recorded also on the small islet of Kassos, between Karpathos and Crete. The last 2 abdominal tergites are black and for this reason it was transferred by Harz (1969) to the genus *Uvarovistia*, but Çiplak *et al.* (2009) have shown that other male characters are typical of *Eupholidoptera*. The shape of subgenital plate of Kassos specimen is very similar to that depicted by Çiplak *et al.* (2009); measurements lie within those reported by latter authors: total length 22.6, length of pronotum 9.2, length of hind femurs 19.7, length of ovipositor 17.4.

Pamphagidae

***Paranocarodes sulcatus* (I. Bolivar, 1912)**

Material examined: Armenia, 18 km E Erevan, 11.VII.1963, A.Giordani Soika, 1♂; Syunik, 1 km E Lichk, 1740 m, 15.V.2008, M. Kalashian, 1♂ (BMCP).

Known from Iran, Turkey and Syria (Bei-Bienko & Mistshenko, 1951; Demirsoy, 1973), previously unrecorded from Armenia.

***Ocnerosthenus verrucosus* (Brunner von Wattenwyl, 1882)**

Material examined: Syria, ex Lederer, ex Brunner, holotypus female (NMV); 25 km W Damascus, 15-16.V.1961, Kasy & Vartian, 1♀ (NMV); Suk Wadi Barada, 1500 m, 17.V.1893, 2♂♂, 2♀♀ (MSNT); Syria, 2♂♂ (MSNT).

Massa (1995) tentatively ascribed to *Ocnerosthenus kneuckeri* (Krauss, 1909) specimens above listed, collected by Festa (1894) and identified by Giglio Tos (1893) as *Prionosthenus galericulatus* (Stål, 1876) and *P. verrucosus* Brunner, 1882 (currently *Ocnerosthenus verrucosus*). However, Massa & Fontana (2007), revising the genus *Ocnerosthenus* Massa, 1995, did not treat them. These specimens, indeed, needed to be studied more accurately, because they showed some characteristics not consenting to ascribe them to one of the hitherto known species. Now, I observed a character shared with the holotypus of *O. verrucosus*, rarely present in other species, that is the undulate hind border of pronotum. Thus, I may conclude that these specimens should belong to this species, which should be geographically located on the Antilebanon range, an area not covered by other congeneric species. Consequently, I exclude the possible synonymy of *O. simulans* (Bolivar, 1911) with *O. verrucosus*, suspected by Massa & Fontana (2007).

Description of male (Fig. 12): body laterally little compressed, fastigium in lateral view just sloping forward below the line of the carinula before the eye, pronotum raised, thick, interrupted by the transverse sulcus (it may be also interrupted by other two sulci), posterior border of pronotum bearing some tubercles, first tergites with a keel, metatergite as high as pronotum, ratio between width and length of mesosternal space 1.2-1.5, ratio between width and length of metasternal space 1.4. Phallic complex similar to that of other species of the genus (Figs. 14-16), aedeagus sclerites in ventral view asymmetrically overlapped (Figs. 17-18).

Characters of the female are (Fig. 13): body dorso-ventrally compressed, fastigium in lateral view evidently sloping forward below the line of the carinula before the eye, pronotum compressed laterally, just raised, thick, interrupted by the first sulcus, posterior border of pronotum bearing some tubercles, abdomen saddle shaped, with a small keel only on the first tergite, in lateral view the first abdominal tergite is anteriorly hardly lower than pronotum, ratio between width and length of mesosternal space 1.5, ratio between width and length of metasternal space 1.7-1.8.

Biometrics. Males. Total length: 23.4-23.5; pronotum length: 5.2-5.3; pronotum height: 5.9-6.0; length of hind femurs: 11.2-11.3; height of hind femurs: 3.7-3.8.

Females (in parenthesis measures of the holotypus after Massa & Fontana, 2007). Total length: 42.5-46.5 (48.5); pronotum length: 12.0-12.5 (13.8); pronotum height: 12.8-13.4 (15.0); length of hind femurs: 18.0-19.0 (19.0); height of hind femurs: 5.6-5.8 (6.1). The holotypus is larger than other specimens.

The key to males and to females of the genus *Ocnerosthenus* proposed by Massa & Fontana (2007) should be easily completed, with the characteristic of undulate hind border of pronotum and asymmetrical overlap of aedeagus sclerites.

***Orchamus kaltenbachi* Massa, 2009**

Material examined: Greece, Dodecanesos, Karpathos, VI.2009, A.Cattaneo, 1♀ (BMCP).

Revising the genus *Orchamus* Stål, I described a new species from Karpathos Is., located between Crete, inhabited by *O raulinii* (Lucas, 1854) and probably by *O. yersini* (Brunner von Wattenwyl, 1882), and Rhodes, inhabited by *O. yersini*. Male characters are very small size, pronotum keel just raised and sinuous, hind femurs relatively short (total length/length of hind femur: 2.23; length/height of hind femur: 3.81), inner side of hind tibiae roseate, cerci very small. Now I dispose also of one female, whose characteristics are: fastigium protruding forward as much as the eye width; frontal ridge compressed, protruding between antennal segments. 12 antennal segments, first two round, others flattened, just reaching the fore border of the pronotum. Prosternum with 4-5 small teeth. Pronotum rugulose, keel in lateral view just raised and sinuous, deeply interrupted by transverse sulcus (Fig. 19). Hind margin of pronotum concave. Metanotum rugulose, with four longitudinal just visible stripes. Tegmina with a network of veinlets, not exceeding the first abdominal segment. Hind femurs brownish, hind tibiae hairy, inner side greyish, spines yellowish with base and tip blackish. Epiproct stout, cerci very small, as long as wide (Fig. 22). It appears similar to the female of *O. raulinii* from Crete, which shows the fastigium more sloping, pronotum keel arcuate, except in its most anterior part, and cerci longer than high (Figs. 20, 23); it is also related to *O. gracilis* (Brunner von Wattenwyl, 1882) from Cyprus, which shows fastigium and pronotum keel similar to that of *O. raulinii*, but cerci as long as high (Figs. 21, 24) (cf. also Massa, 2009).

Biometrics. Total length: 44.2; pronotum length: 9.5; pronotum height: 10.0; length of hind femurs: 18.4; height of hind femurs: 4.7; total length/length of hind femur: 2.4; length/height of hind femur: 3.9.

Acrididae

***Scintharista notabilis notabilis* (Walker, 1870)**

Material examined: Portugal, Azores, S. Miguel, Furnas, VIII.1886, Corsaro expedition, 1♀ subad. nymph (MSNG).

The type locality of this species are the Canary Is., it has not been previously recorded for the Azores Is.

***Brachycrotaphus tryxalicerus* (Fischer, 1853)**

Material examined: Egypt, Cairo, Staudinger, 1♀ (MCNM)

The so far known distribution of this species included Sicily (type locality), Eolian Islands (Sicily), Spain and Africa, South of Sahara; the old record in Egypt shows that this species, at least in the past, was distributed without interruption from the Mediterranean area to central Africa.

***Stenobothrus ursulae* Nadig, 1986**

Material examined (12♂♂, 28♀♀): Italy, Val d'Aosta, Gran Paradiso, Val Orco, Teleccio, 2400 m, 8.IX.1953, 3♂♂, 11♀♀; Val Soana, S. Besso 2000, 12.IX.1953, 1♂, 22.IX.1953, 3♂♂, 9♀♀; Val di Cogne, D.Loson, 2500 m, 22.VIII.1953, 2♂♂, 3♀♀, D.Epinel, 2000 m, 25.VIII.1953, 1♂; Val Savaranche, Nivolet, 2500 m, 24.VII.1953, 1♀, 28.VII.1953, 1♂, 6.VIII.1953, 1♀, 1.IX.1953, 1♂; Val Scana, D. Forzo, 2200 m, 25.IX.1953, 3♀♀ (coll. La Greca, MSNM).

Nadig (1986) described this brachypterous species on many specimens collected in Piedmont (Canavese, St. Elisabetta), between 1300 and 1500 m a.s.l. Subsequently, La Greca (1986) described another brachypterous species, *Stenobothrus nadigi*, on a small series of specimens coming from Aosta Valley, Lake Chamolet, 2300 m. He compared the new species with *S. ursulae*, finding some differences, such as the absence of the median line on the fastigium, shorter antennae, less flattened last antennal segments, CU1 and CU2 not separated, wider male tympanum, male supra-anal plate showing a median incision, and swollen ventral valve of penis. Further, he considered the two species geographically separated by the Gran Paradiso Mt., *S. ursulae* linked to the mountain plane, *S. nadigi* to the alpine one. However, Nadig (1991), comparing the description of the two species and analysing their morphometry and phallic complex, proposed the synonymy *S. nadigi* La Greca, 1986 = *S. ursulae* Nadig, 1986.

Specimens from Gran Paradiso above listed (Figs. 25-31), coming from localities intermediate between those of *S. ursulae* and *S. nadigi*, may sort out eventual doubts on the synonymy. Curiously they were not examined by La Greca (1986) before the description of *S. nadigi*; some of them were included within the series of this species, others were tentatively identified as *Omocestus* prope *minutissimus*. However, they belong to the genus *Stenobothrus* Fischer, 1853, as the tooth at the base of the ovipositor valves shows (Fig. 30). Concerning biometrics, I report in Table 1 measurements of specimens from Gran Paradiso, compared with *S. ursulae* and *S. nadigi*. They are more or less intermediate between them, except the length of tegmina, a bit shorter than in the other populations. Further, specimens from Gran Paradiso show the median line on the fastigium, the male supra-anal plate of one specimen shows a median incision, while that of the other specimen does not show it

(Figs. 27, 28), and antennae appear quite short. Epiphallus does not show differences from that of the two taxa, and on the whole, characteristics of these specimens are intermediate between *S. ursulae* and *S. nadigi* (Fig. 29). I believe that actually only one species, *S. ursulae*, lives in the N-W Italy (Piedmont and Aosta Valley), from the montane to the alpine plane.

S. ursulae is not the only *Stenobothrus* bearing just flattened last antennal segments (Jago 1971); e.g.: in Italy (Apennines) another brachypterous species lives, *S. apenninus* Ebner, 1915. The median area of male tegmen of the latter species is enlarged and still bears some parallel veinlets, characteristic of the genus (Fig. 32), which in *S. ursulae* disappeared completely.

Table 1. Biometrics of *Stenobothrus ursulae* from Piedmont (after Nadig, 1986, 1991) compared with its synonym *S. nadigi* from Aosta Valley (after La Greca, 1986) and with the intermediate population of Gran Paradiso.

Males	Total length	Pronotum length	Tegmina length	Hind femurs length
Stenobothrus ursulae	13.0-16.5	3.0-3.2	7.2-8.3	9.0-9.7
Stenobothrus nadigi	10.5-13.0	2.5-2.7	6.5-7.0	7.4-9.4
Specimens from Gran Paradiso	12.7-15.0	2.5-2.8	5.6-6.5	7.8-8.1
Females				
Stenobothrus ursulae	18.0-23.5	3.7-4.2	6.8-8.0	10.7-12.3
Stenobothrus nadigi	14.5-17.5	2.9-3.8	4.9-7.1	8.5-10.5
Specimens from Gran Paradiso	16.0-20.0	3.1-3.6	4.5-4.9	9.2-10.0

***Euchorthippus declivus* (Brisout, 1848)**

Material examined: Italy, Sardinia, S. Antioco Is., 4.IX.1977, 1♀, B.Massa (BMCP).

In Sardinia it has been previously reported only once from Gennargentu Mt. (Baccetti, 1963). The new record shows that this species is widespread in the island from coastal areas to mountains.

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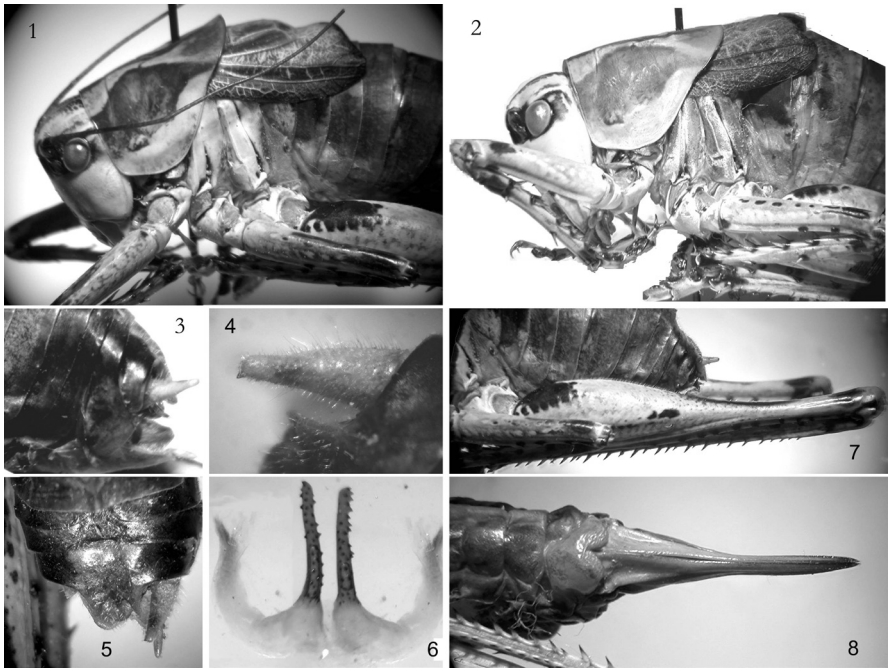
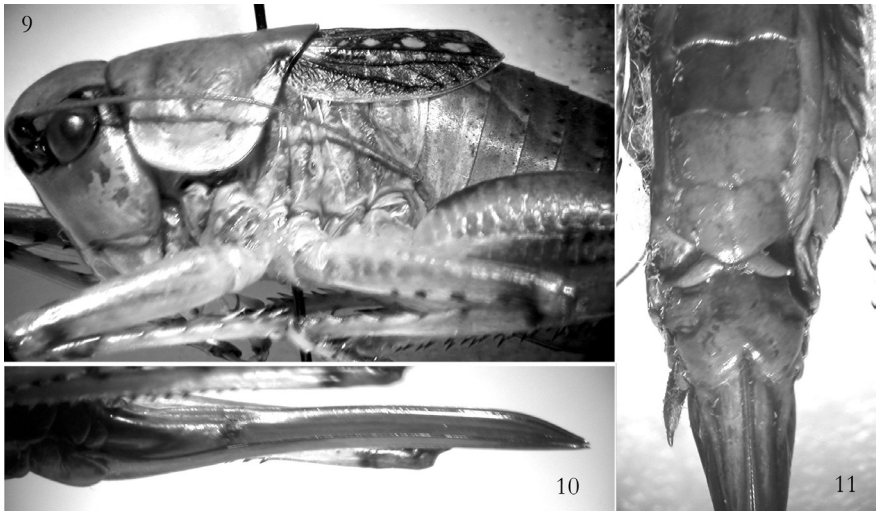
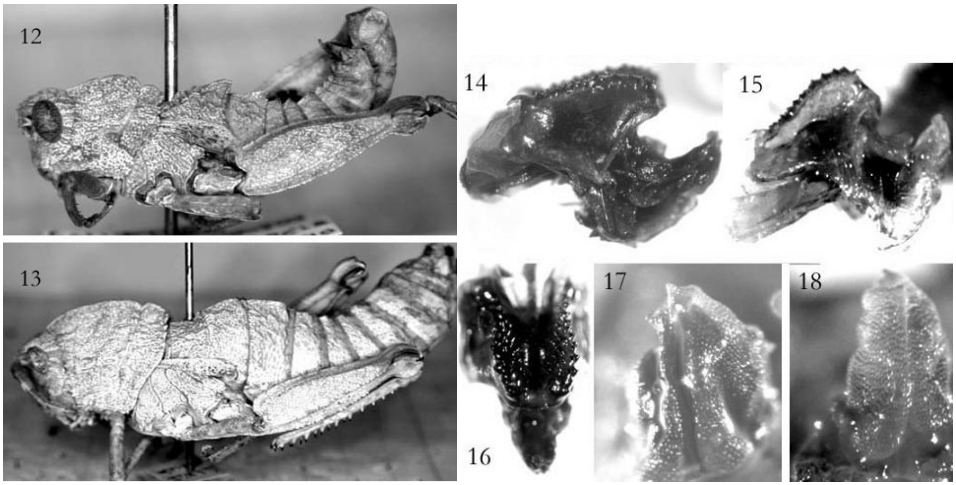
I thank very much Marcus Kalashian, who collected Armenian specimens, Augusto Cattaneo, who collected Orthoptera on Patmos and Karpathos Is. (Greece), Vicenta Llorente who consented me to examine the specimens preserved at Museo Nacional de Ciencias Naturales of Madrid, Mauro Daccordi, who allowed me to study the specimens collected by Festa and preserved in the Giglio-Tos' collection, Museo Regionale di Scienze Naturali of Turin, Roberto Poggi, who loaned me some specimens preserved in the Museo Civico di Storia Naturale of Genoa, Maurizio Pavesi, Fabrizio Rigato and Michele Zilioli for facilities and assistance during the study of specimens of La Greca's collection preserved at the Museo Civico di Storia Naturale of Milan, Michael Ohl, who facilitated the study of specimens preserved in the collections of the Museum für Naturkunde of Berlin, and Paolo Fontana, who consented me to study some specimens of his collection.



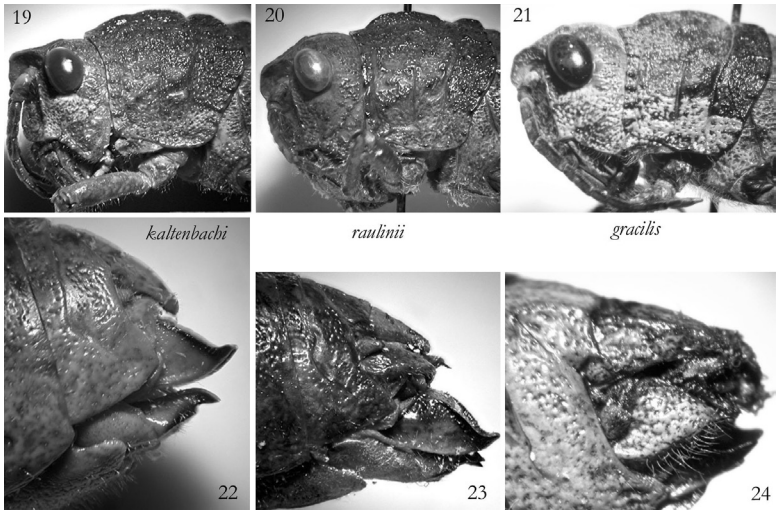
Figs. 1-8. *Pezodrymadusa subinermis* Karabag, 1961. 1) Lateral view of head, pronotum and tegmina of the male from Armenia. 2) Lateral view of head, pronotum and tegmina of the female from Armenia. 3) Male last abdominal segments. 4) Male cercus from above. 5) 10th tergum of the male. 6) Titillators. 7) Hind femur and last tergites of the female. 8) Subgenital plate and ovipositor.



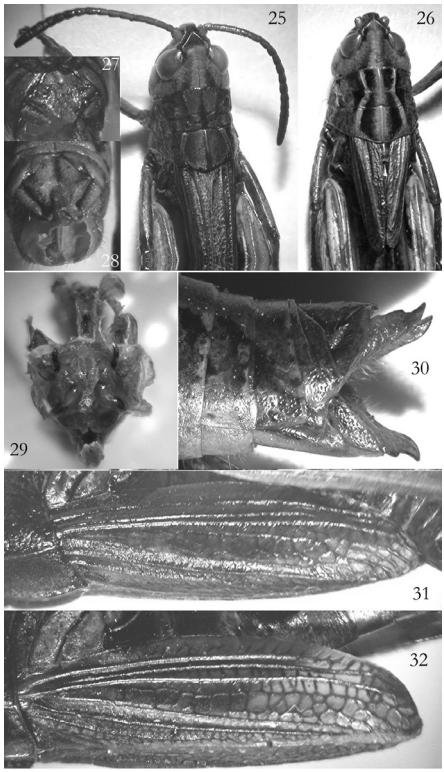
Figs. 9-11. *Anadrymadusa ornatipennis* (Ramme, 1926), female from Patmos Is. (Greece). 9) Lateral view of head, pronotum and tegmina. 10) Lateral view of the ovipositor. 11) Last sternites and subgenital plate.



Figs. 12-18. *Ocnerosthenus verrucosus* (Brunner von Wattenwyl, 1882) from Suk Wadi Barada (Syria). 12) Lateral view of a male. 13) Lateral view of a female. 14-15) Lateral view of the phallic complex of two males. 16) Phallic complex from above. 17-18) Ventral view of the apex of aedeagus sclerites of two males.



Figs. 19-24. *Orchamus kaltenbachi* Massa, 2009, *O. yersini* (Brunner von Wattenwyl, 1882) and *O. gracilis* (Brunner von Wattenwyl, 1882), females. 19-21) Lateral view of pronotum of *O. kaltenbachi,* 19) from Karpathos, *O. raulinii,* 20) from Crete and *O. gracilis,* 21) from Cyprus. 22-24) Lateral view of last abdominal segments of *O. kaltenbachi,* 22) from Karpathos, *O. raulinii,* 23) from Crete and *O. gracilis,* 24) from Cyprus.



Figs. 25-32. *Stenobothrus ursulae* Nadig, 1986 from Gran Paradiso (Aosta Valley, Italy) (25-31) and *S. apenninus* Ebner, 1915 from Apennines (Abruzzi, Italy) (32). 25-26) Head, pronotum and tegmina of the male (25) and female (26) of *S. ursulae* from above. 27-28) Supra-anal plate of two males of *S. ursulae*. 29) Phallic complex of *S. ursulae* from above. 30) Last abdominal segments and ovipositor valves of a female of *S. ursulae*. 31) Male tegmen of *S. ursulae* in lateral view. 32) Male tegmen of *S. apenninus* in lateral view.

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