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The East Mediterranean Genus *Orchamus* STÅL, 1876 (Insecta: Orthoptera: Pamphagidae)

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Abstract

The genus *Orchamus*, living in the East Mediterranean area, is revised. On the whole, six species are identified, some of them geographically overlapping; *Orchamus kaltenbachi* sp.n. from Karpathos Is. (Greece) is described, characterized by small size, very small cerci and peculiar phallic complex. A key to species is proposed.

Key words: *Orchamus*, revision, East Mediterranean, Middle East, new species.

Zusammenfassung

Die Gattung *Orchamus* aus dem östlichen Mittelmeerraum wird revidiert. Sie umfasst sechs Arten, wovon einige geographisch überlappen. *Orchamus kaltenbachi* sp.n. von der Insel Karpathos (Griechenland) wird als neu beschrieben, charakterisiert durch Kleinheit, sehr kleine Cerci und einen ungewöhnlichen männlichen Kopulationsapparat. Ein Schlüssel zu den Arten wird vorgelegt.

Introduction

Within the genus *Orchamus* STÅL, 1876 five species have been so far described, but their records are few and scattered, and a summary of actual status seems useful. In fact, *Orchamus* specimens are generally scarce, in many cases they are single findings from one locality, often only a female or just a juvenile. A major problem is that just by the scarcity of material, the normal variability is by far insufficiently known. I got the chance to study a good sample of specimens, finding some characters, mainly on males, to tell apart the different species, arriving to conclusions not completely agreeing with those stated in previous papers. I report here the results of this study.

Material and methods

This work is based on the study of specimens from the following institutions: Museo Nacional de Ciencias Naturales of Madrid (MNCNM); Muséum National d'Histoire Naturelle, Paris (MNHN), British Museum of Natural History, London (BMNH), Naturhistorisches Museum, Vienna (NHMW), Zoologisches Forschungsmuseum Alexander Koenig, Bonn (ZFMK), Museum für Naturkunde, Berlin (ZMB), Museo Regionale di Scienze Naturali, Turin (MRSNT), Museo Civico di Storia Naturale, Milan (MCSNM), coll. B. Massa, University of Palermo (CMUP), coll. P. Fontana, Isola

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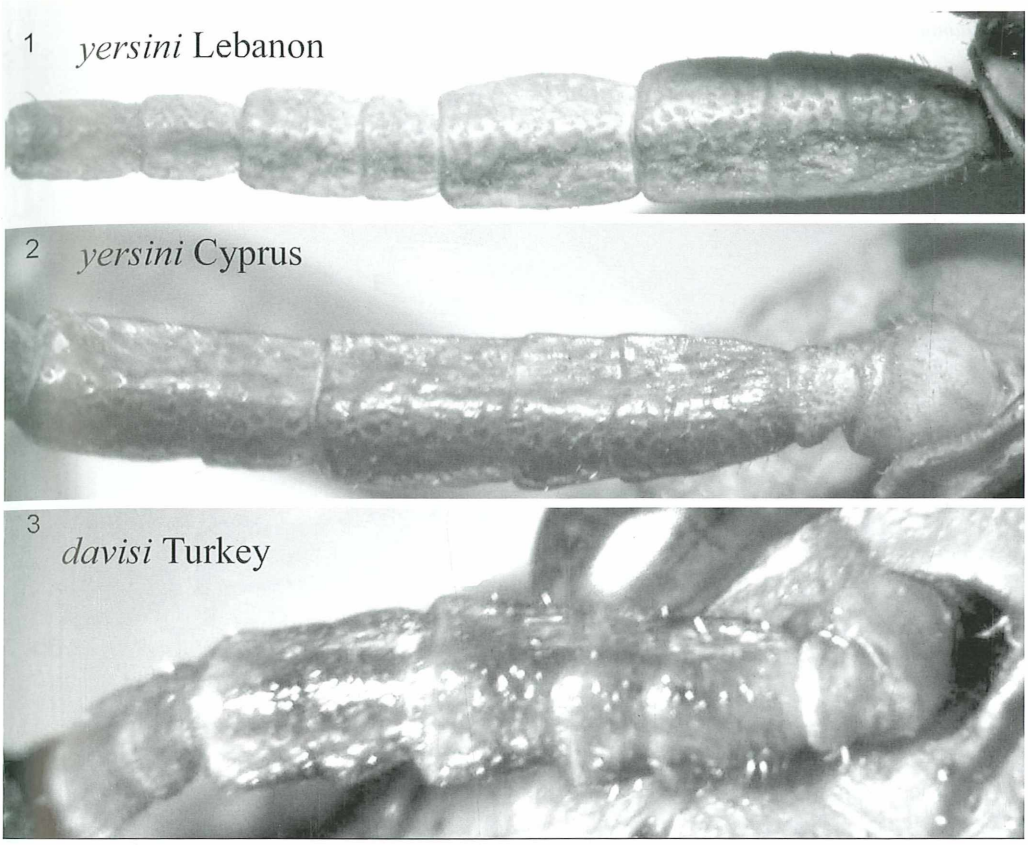
Vicentina (CP). Photographs of specimens were taken using a Nikon Coolpix 4500 digital camera, mounted on a Stereomicroscope Optech EMX-210-2, measurements on mounted specimens were taken using a digital calliper (preciseness 0.01 mm), as reported in Fig. 6.

The Genus *Orchamus* STÅL, 1876

The genus *Orchamus* (type species: *O. raulinii* LUCAS, 1854), named after a king of Greek mythology, has been described on the basis of its flattened antennal segments and fastigium well protruding. Even if DIRSH (1958) synonymized it with *Acinipe* RAMBUR, 1858, claiming that the study of the known species of both genera showed that there are no characters to allow for their generic differentiation, DESCAMPS & MOUNASSIF (1972) reinstated it again, showing that *Orchamus* differs from *Acinipe* and *Paracinipe* DESCAMPS & MOUNASSIF, 1972 in the presence of only 12–14 flattened antennal segments (Figs. 1–3), fastigium well projecting, metanotum and abdomen with a median keel, subgenital plate of the male divided into two parts by a transverse suture, and epyphallus bearing many small spines arranged disorderly. However, some authors have not followed their rearrangement, still listing East Mediterranean species within *Acinipe* (e.g.: FISHELSON 1985, NASKRECKI & ÜNAL 1995, KATBEH-BADER 2001).

Species are squamipterous; in the male elytra are 2.5–3 times, in the female 3–4 times as long as broad. Krauss' organ is present and characterized by gentle lines. While *Acinipe* and *Paracinipe* live from Spain through North Africa and S Italy to Egypt and Syria, the distribution of *Orchamus* covers only the Middle East and some E Mediterranean islands (DESCAMPS & MOUNASSIF 1972, HARZ 1975, WILLEMSE 1984, MASSA 1995, NASKRECKI & ÜNAL 1995). This genus is related to other Middle Eastern squamipterous Pamphagidae, namely *Prionosthenus* BOLIVAR, 1878, *Ocneropsis* UVAROV, 1942, *Ocnerosthenus* MASSA, 1995, characterized by more or less flattened antennal segments, last sternite of male divided by a transverse suture into two parts and phallic complex short and stout, with aedeagus valves stout. It differs clearly from *Paracinipe* in the shape of antennal segments, not flattened, and from *Acinipe*, in the last male sternite not divided and antennal segments not flattened. Even if I found an overlap between the number of antennal segments of *Orchamus* and *Paracinipe* (may be found 15 on both genera), as already recorded by DESCAMPS & MOUNASSIF (1972), the shape of them, flattened in *Orchamus*, more or less rounded in *Paracinipe*, may be considered a good character to identify the genera correctly. Moreover, another good character lies on the epyphallus shape, which is posteriorly straight in *Orchamus* (Fig. 4c), while in most species of *Paracinipe* (all ones living in the East Mediterranean area) it is clearly concave (Fig. 5c); aedeagus valves are different too, thick in *Orchamus*, elongated in *Paracinipe* (as well as in *Acinipe*), and endophallus apodeme is short in *Orchamus*, elongated in *Paracinipe* (Figs. 4b, 5b, 22–29). However, the shape of male subgenital plate cannot be used easily to tell apart species of the two genera and a good practice is necessary; indeed, the transverse suture dividing the last sternite into two parts in *Orchamus* is very similar to that of *Paracinipe*, differences lying only on proportions of the two parts (Figs. 4a, 5a). *Paracinipe* is very probably well related to *Orchamus* and its close Middle Eastern genera, and it is the only West Mediterranean Pamphaginae geographically covering Middle East.



Figs. 1–3: Antennal segments. (1) *Orchamus yersini* female from Beirut (Lebanon) (NHMW); (2) *O. yersini* female from Cyprus (MRSNT); (3) *O. davisi* female from Guzeluluk (Turkey) (CMUP).

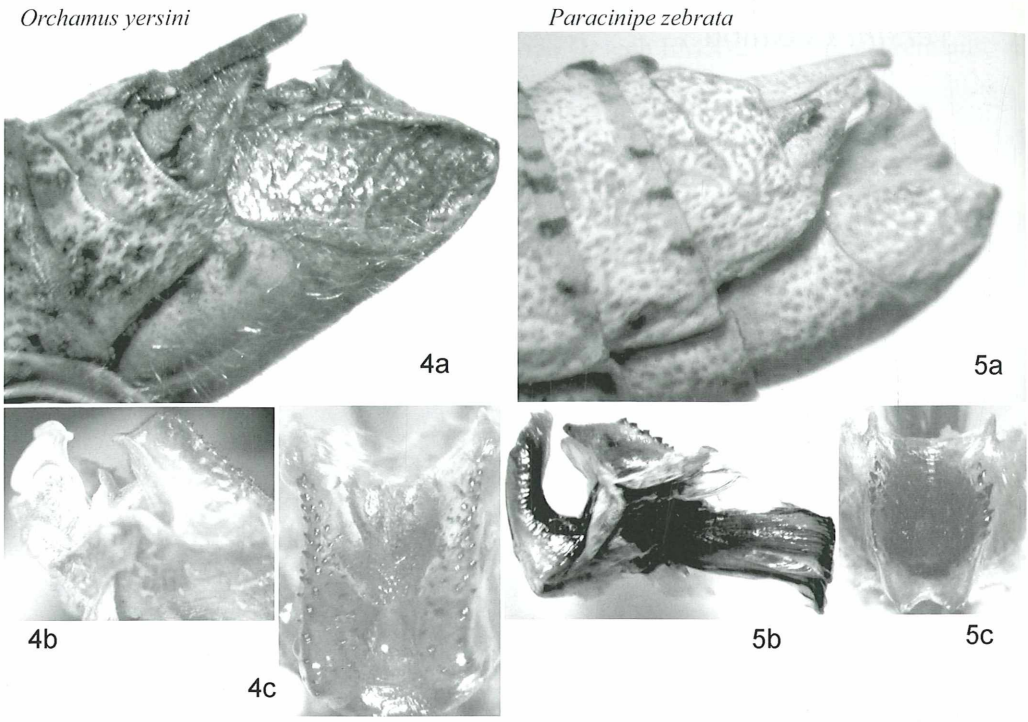
Species belonging to the Genus *Orchamus*

Orchamus yersini (BRUNNER, 1882) (Figs. 1, 2, 4, 11, 17, 19, 22–23, 31–33, 39–41)

Pamphagus yersini BRUNNER 1882: Prodr. Eur. Orth.: 200–201.

Type locality: Candia (= Crete), Greece.

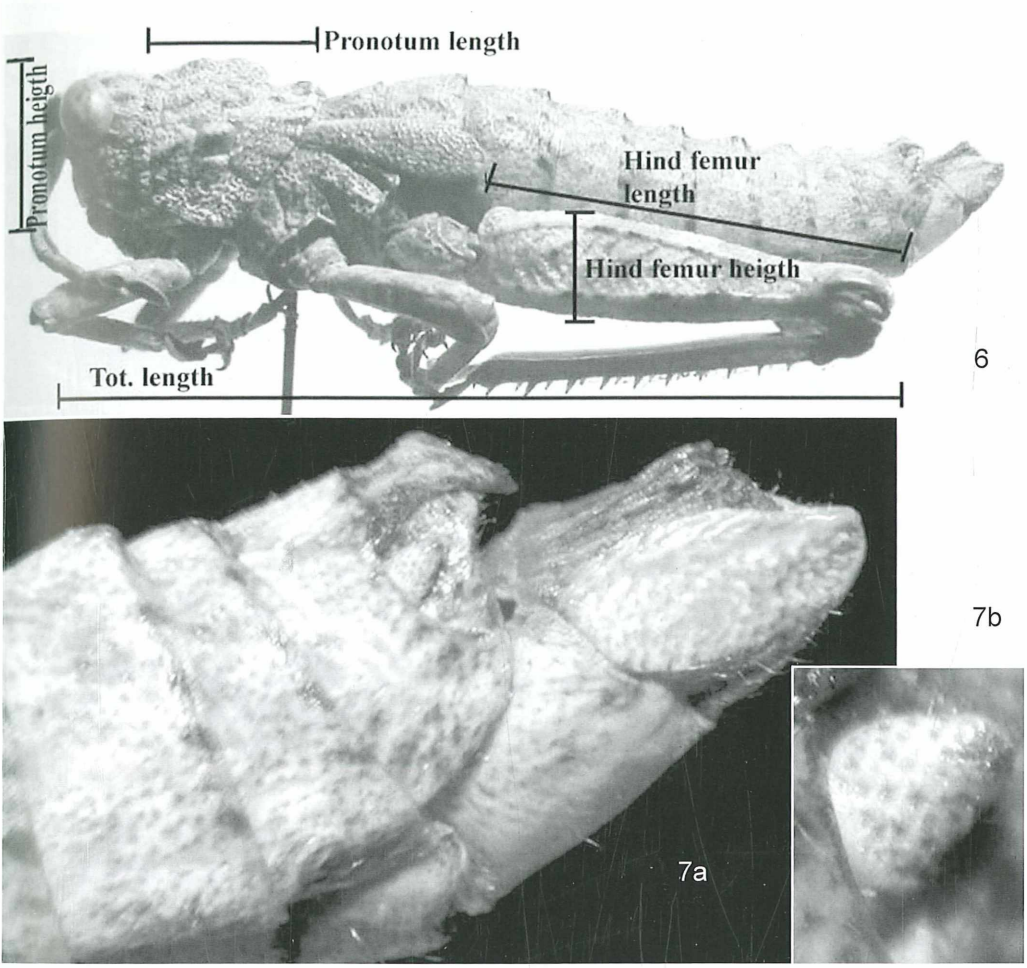
Material examined: Crete, Candia (♂ holotypus, ♀ allotypus) (NHMW); Lebanon, Crolla (1 ♂); Beirut (3 ♀) (Coll. Festa, MRSNT); Beirut, Lederer (4 ♂, 6 ♀), Beirut, Tindermann (1 ♀), Beirut, Türk 1870 (2 ♂) (NHMW); Beirut (4 ♂, 3 ♀); Beirut, 1919 (1 ♂); Zahlé, 1887 (1 ♂) (MNHN); Beirut (2 ♂, 2 ♀) (MNCNM); Beirut, Brunner (1 ♂) (ZMB); Syria, Haber 1872, (1 ♀); Syria (3 ♂, 2 ♀) (NHMW); Syria, Ladakia 8.V.1885 (1 ♂, 2 ♀) (MNHN); Ladakia, 8.VI.1880 (1 ♂) (MRSNT); Ladakia, Leuthner (1 ♂); Syria (1 ♂, 3 ♀) (ZMB); Greece, Samos, Maratokampos (1 ♀) (ZMB); Rhodes, Petaloudes 5-16.V.1970 (1 ♀) (Coll. La Greca, MCSNM); W-Greece, Koutsilaris, Achelos mouth 26.IV.1987 (1 ♂, reared in laboratory by J. Szijj) (only photo examined) (ZFMK); Cyprus, Truqui (2 ♂, 2 ♀) (Coll. Festa, MRSNT); Turkey, Makri [= Fethiye], D. Krüper (identified as *O. yersini* by Brunner and as *O. davisi* by Ramme) (1 ♂, 1 ♀) (NHMW).



Figs. 4–5: (4a) Last sternite of male of *Orchamus yersini* from Ladakia (Syria) (MRSNT); (4b) Lateral view of phallic complex *O. yersini* from Syria (NHMW); (4c) Epyphallus of *O. yersini* from Beirut (MRSNT); (5a) Last sternite of male of *Paracinipe zebrata* (BRUNNER); (5b) Lateral view of phallic complex of *P zebrata*; (5c) Epyphallus of *P zebrata* from Negev (Israel) (BMNH).

According to the original description (BRUNNER 1882) and material examined, its colour is grey-brownish, with scattered red dots, vertex is as long as wide, protruding forward and rugulose, antennae are flattened, of 12–15 segments, longer than head and pronotum. Frontal ridge compressed, protruding between antennas, sinuous between ocelli, pronotum rugulose, roof shaped, anteriorly raised, in the back interrupted by transverse sulcus, keel in lateral view well raised before the sulcus, after low, thick from above. Tegmina with a network of veinlets, exceeding the first abdominal segment in the male, just as long as it, in female. Cerci are longer than wide (Fig. 4a). Hind femurs brownish, hind tibiae grey-brownish or roseate (one Syrian specimen), hairy. Prosternal tubercle bearing some teeth, two of them longer than others.

UVAROV (1942) believed that Yersin in 1860 incorrectly identified as *Orchamus raulinii* some specimens collected at Beirut and presented their description to Brunner, who deduced that Yersin's species was distinct from *O. raulinii*, and, describing it under the name "Pamphagus Yersini", introduced a confusion by quoting its distribution as follows: Candia (= Crete), Beirut. Thus, being Yersin's specimens collected at Beirut, Brunner's Crete record was due to a mistake. However, types of *O. yersini* came really from Crete, labels attached to the type specimens of *O. yersini* contain the following

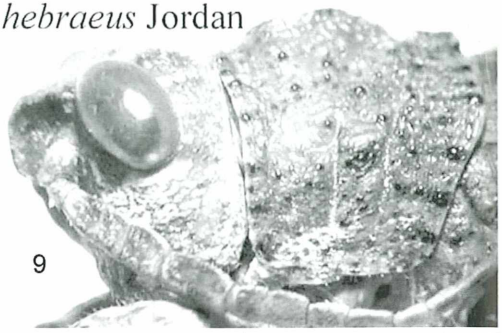


Figs. 6–7: (6) Lateral view of *O. kaltenbachi* sp.n., holotypus from Karpathos (Greece), showing the schematic illustration of measurements taken on all the specimens examined; (7a) Last abdominal segments of *O. kaltenbachi* sp.n.; (7b) Cercus of *O. kaltenbachi* sp.n. (NHMW).

inscriptions: holotypus ♂, Coll. Br. v. W., Cat. Nr. 10 986, Candia, Prof. Zeller/det. Br. v. W. yersini/don. Dohrn, Candia 1855; allotypus ♀, Coll. Br. v. W., Candia, Prof. Zeller/det. Br. v. W. yersini/don. Dohrn, Candia 1855. The number of catalogue written on one of the labels of the holotype agrees with the locality (Candia) under the same number in Brunner's catalogue (A.P. Kaltenbach, pers. comm.). HARZ (1975) reported also some drawings of the types. Following WILLEMSE & KRUSEMAN (1976), types might bear uncorrect locality labels and thus *O. yersini* does not occur in Crete. Probably there was an earlier confusion of localities by Dohrn, before Brunner received these specimens; as a matter of fact, since the year of the locality label, 1855, no further material from Crete has become available (WILLEMSE & KRUSEMAN 1976), with the exclusion of the record from Omalos by WERNER (1903), considered *O. raulinii* by RAMME (1927). Some years ago I listed as *O. gracilis* four specimens collected by FESTA (1894)

8

hebraeus Jordan



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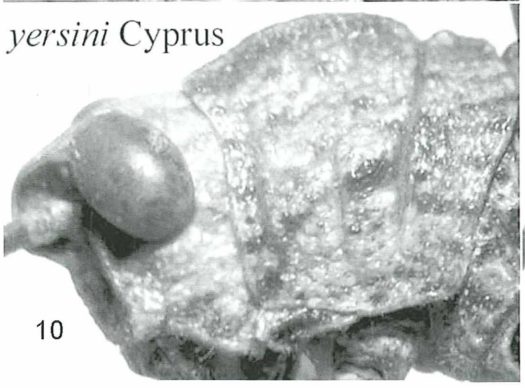
yersini Cyprus



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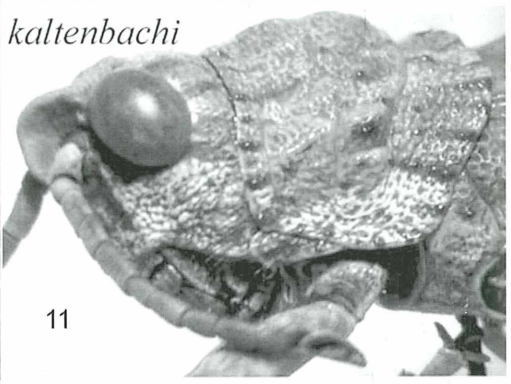
kaltenbachi



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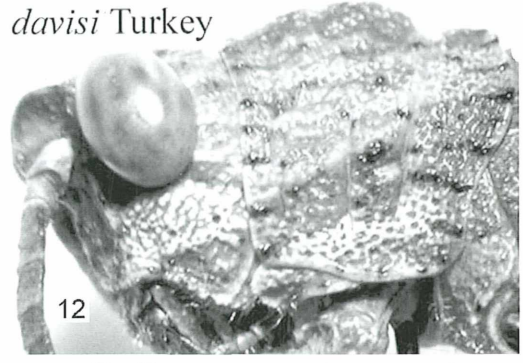
davisi Turkey



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davisi Ladakia

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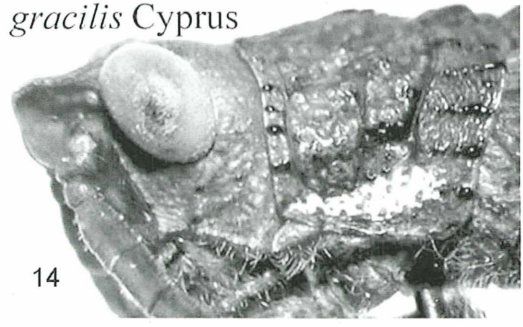
gracilis Cyprus



14

raulinii Crete

15

on Cyprus (MASSA 1995), but now I consider that I misidentified them, they really belong to *O. yersini*, as correctly labelled by Giglio-Tos (MRSNT).

Characters consenting to tell apart this species are the size (only *O. hebraeus* is larger than *O. yersini*) (Tab. 1), the pronotum shape, which in lateral view shows the prozona arcuate all over its length (WILLEMSE 1985) (Figs. 10, 11, 17, 19) and the shape of phallic complex from lateral view (Figs. 22–24); epyphallus is characterized by small and large spines arranged disorderly (Figs. 31–33), aedeagus valves from back view appear very large and opened (Figs. 39–41). This species has been collected in Lebanon, Syria, different localities of Hatay and Fethiye provinces in Mediterranean Turkey, Cyprus, Rhodes, continental Greece (Central Greece, Peloponnese) and some S Sporades islands of Greece [Kos (= Coo), between Andimakhia and Kefalo, Samos, Dhiafaniou-Olimbos, Olimbos, Pigadhia, Marathokambos] (BRUNNER 1882, GIGLIO-TOS 1893, RAMME 1927, 1951, SALFI 1929, BODENHEIMER 1935, JANNONE 1936, DESCAMPS & MOUNASSIF 1972, HARZ 1975, WILLEMSE 1984, NASKRECKI & ÜNAL 1995, SZIJJ 1992). Following UVAROV (1942) and FISHELSON (1985) it is absent from Israel, the country inhabited by *O. hebraeus* (see below); the specimen from Mt. Hermon listed by GIGLIO-TOS (1893) resulted to be *Ocnerosthenus lividipes* (FISHELSON) (MASSA & FONTANA 2007). I consider the specimen reported as *O. yersini* from Karpathos by WERNER (1936) to belong to one undescribed species (see below); consequently, the identification as *O. yersini* of a larva collected on Karpathos (HARZ 1975) is uncertain.

Orchamus hebraeus UVAROV, 1942 (Figs. 8, 9, 18, 25, 27, 36–37, 46–47)

Orchamus hebraeus UVAROV, 1942: Trans. amer. ent. Soc., 67: 348.

Type locality: Mt. Carmel, Place of Sacrifice, Israel.

Material examined: Israel, Place of Sacrifice, Mt. Carmel 26.III.1930 (1 ♂ paratypus); Palestina, Bodenheimer (1 ♀ paratypus) (BMNH); Jordan, Ajlun 24.V.1999, B.Massa (1 ♂); outskirts of Amman 26.V.99 (1 ♀) (CMUP).

According to original description (UVAROV 1942) and material examined, it is closely allied to *O. yersini*, but differs from it in its larger size, colouration creamy-grey, with bluish-grey tubercles, fastigium of vertex more sloping than on *O. yersini*, tegmina light-grey, with a dense network of brown veinlets, hind femurs with indefinite grey stripes, distinctly rufous along the lower inner carina, knee on the inner side black, with light-yellow edge, hind tibia on the inside greyish-blue, spines yellow, with base black and black-tipped, surface of body distinctly more rugulose and tuberculate, cerci longer than wide.

I consider it a valid species, related to *O. yersini*; its characteristics are the large size (it is the largest of the genus) (Tab. 1), the pronotum shape (raised and corrugated) (Figs. 8, 9, 18) the shape of phallic complex (Figs. 25, 27), epyphallus (which bears large spines,

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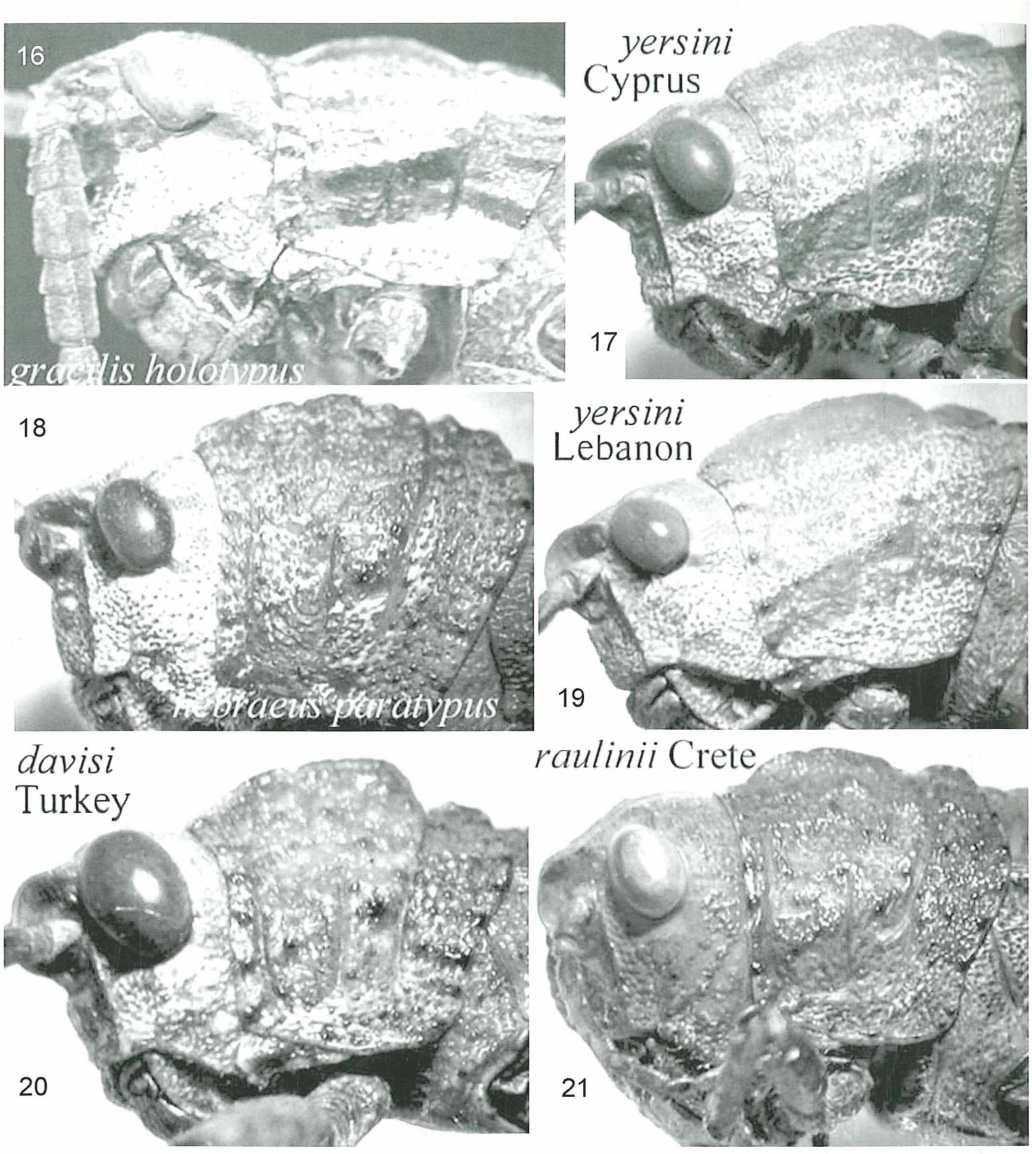
Figs. 8–15: Lateral view of pronotum of males. (8) *O. hebraeus*, paratypus from Mt. Carmel (Israel) (BMNH); (9) *O. hebraeus* from Ajlun (Jordan) (CMUP); (10) *O. yersini* from Beirut (Lebanon) (MRSNT); (11) *O. kaltenbachi* sp.n., holotypus from Karpathos (Greece) (NHMW); (12) *O. davisi* from Guzeluluk (Turkey) (CMUP); (13) *O. davisi* from Ladakia (Syria) (NHMW); (14) *O. gracilis* from Cyprus (CMUP); (15) *O. raulinii* from Crete (Greece) (after HARZ, 1975).



Figs. 16–21: Lateral view of pronotum of females. (16) *O. gracilis*, holotypus from Cyprus (NHMW); (17) *O. yersini* from Cyprus (MRSNT); (18) *O. hebraeus*, paratypus from Palestina (BMNH); (19) *O. yersini* from Beirut (Lebanon) (MRSNT); (20) *O. davisi* from Guzeluluk (Turkey) (CMUP); (21) *O. raulinii* from Crete (Greece) (CMUP).

and some small ones, only on the central line) (Figs. 36, 37), and aedeagus valves (which appear not much chitinous and sinuous) (Figs. 46, 47).

UVAROV (1942) recorded Emek and Haifa other than the type locality. DESCAMPS & MOUNASSIF (1972) synonymized it with *O. yersini* and treated it as its subspecies, dif-

fering only on the hind tibiae colour, blue in *hebraeus*, reddish or brownish in *yersini*. Possibly overlooking the latter reference, it has been still recorded as *Acinipe hebraeus* by FISHELSON (1985) from N Israel and by KATBEH-BADER (2001) from N Jordan (Mahis). Its distribution covers northern areas of Israel and Jordan.

Orchamus davisi UVAROV, 1949 (Figs. 3, 12–13, 20, 28–29, 34–35, 42–43)

Orchamus davisi UVAROV, 1949: Bull. Soc. Fouad 1er Ent., 33: 8.

Type locality: Antalya, South West Anatolia, Turkey.

Material examined: Syria, Akbés, Leuthner (1 ♂, 1 ♀), Ladakia, Leuthner (1 ♂, 1 ♀) (NHMW); North of Ladakia (850 m) 1-3.VIII.1953, K. Christiansen (1 ♂) (BMNH); Turkey, Kulek (1 ♂); Turkey, Silifke 10.V.1962, Ressl (2 ♀) (NHMW); Turkey, Guzeluluk (Mersin, 700 m) 20.V.2001 (1 ♂, 1 ♀) (CMUP); Turkey, Taurus, Cilic 1895 (1 ♂, 1 ♀) (ZMB).

According to original description of UVAROV (1949) and material examined, it differs from *O. yersini* in more rugose integument, less elongate antennal joints; its pronotum is more arcuate and higher backwards, cerci are longer than wide, hind tibiae may be blackish-blue (DEMIRSOY 1973) or roseate (Syrian and Turkish specimens as well), spines are yellowish with base and apex black. It is a species of medium size (Tab. 1), its pronotum is much variable and shows less raised keel than *O. yersini* and *O. hebraeus* (Figs. 12, 13, 20), phallic complex is stout (Figs. 28, 29), epyphallus bears some large spines arranged disorderly (Figs. 34, 35), and aedeagus valves appear not much chitinous with hourglass shaped apex, before narrow and after widened (Figs. 42, 43).

O. davisi is distributed from the Silifke-Mersin Mediterranean Turkish area to NW Syria. UVAROV (1949) recorded it from Antalya, WEIDNER (1969) from Hatay province, KARABAĞ (1958) from Muğla, Adana and Mersin (Turkey), RAMME (1951) recorded also a specimen from Beirut (Lebanon) preserved at the Humboldt Museum of Berlin; DESCAMPS & MOUNASSIF (1972) did not list it at all. I was not able to confirm differences between *O. hebraeus* and *O. davisi* claimed by FISHELSON (1985), based on prosternal process (with numerous dense tubercles in *O. hebraeus*, with a few scattered tubercles in *O. davisi*), frontal ridge (usually reaching clypeus in *O. hebraeus*, obliterated below median ocellus in *O. davisi*) and hind tibiae colour (bluish in *O. hebraeus*, violet-reddish in *O. davisi*), and consequently his record from N Israel seems unlikely.

Orchamus raulinii (LUCAS, 1854) (Figs. 15, 21, 45)

Orchamus raulinii (LUCAS, 1854): *Acinipe Raulinii* LUCAS 1854, Rev. Mag. Zool., (2), 6: 167, Pl. 2, Fig. 2.

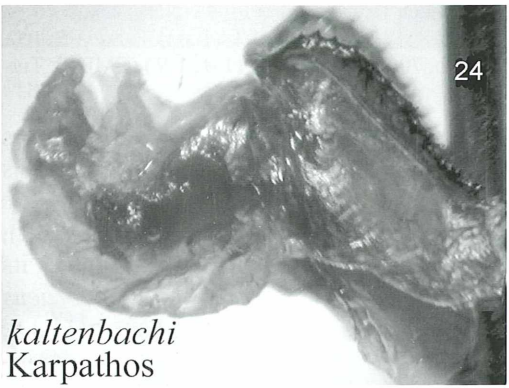
Type locality: Crete.

Material examined: Greece, Crete, Askifou 4.VI.1984, B. Massa (1 ♀) (CMUP); Lasithi, 7 km W Orino 18.VIII.2004, ex larva (imago ♀: 21.IV.2005) (biometrical data provided by J. Tilmans); Crete, Pitsidia 15.VI.1984, P Detzel (1 ♀) (not examined); Crete, Sitia, Wettstein (1 ♂ "neotypus"); Akrotiri, Kl. Aja Trias, Schulz (1 ♀); East Crete 5.V.42 (1 ♂, 1 ♀) (ZMB).

The types of this species are lost; HARZ (1975) selected neotypes from Sitia (Crete), but WILLEMSE & KRUSEMAN (1976) consider that they should be disregarded because their designation does not agree with Art. 75 of ICZN (neotype designation should be proposed in exceptional circumstances) (see also MARSHALL 1983).


22
yersini Ladakia


yersini Lebanon
23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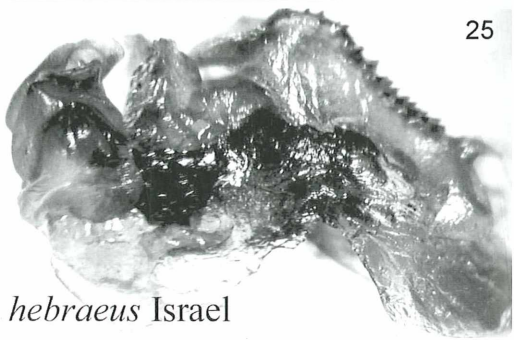
kaltenbachi
Karpathos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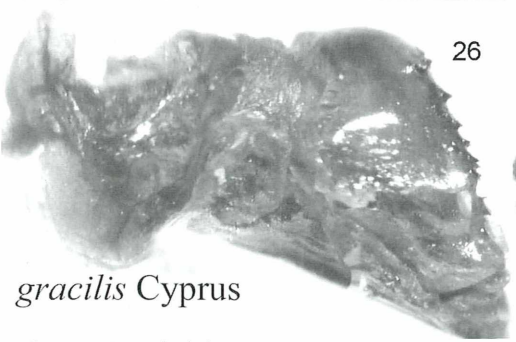
hebraeus Israel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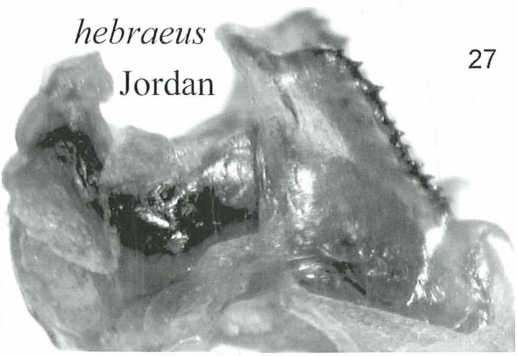
gracilis Cyprus


hebraeus
Jordan
27


davisi Ladakia
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29
davisi Turkey

Characters of this species are the medium size (Tab. 1), pronotum keel, in lateral view, arcuate except in its most anterior part (Figs. 15, 21), cerci longer than wide, and aedeagus valves (Fig. 45). Hind tibiae are greyish or pale pink, spines are yellowish, their base is bluish and apex blackish.

It may be considered one of the rarest Orthoptera of Europe; very few specimens are preserved in Museums and collections and scattered data are available for this species, recorded only from Crete, in the following localities: Iraklion (LUCAS 1854), Omalos [WERNER 1903, as *O. yersini*, but RAMME (1927) refers it to *O. raulinii*], Moni Tzagarolou (RAMME 1927, HARZ 1975), Rethimni, Nidha Plateau (KUTHY 1907, RAMME 1927), Vianos and Sitia (HARZ 1975), Askifou (MASSA 1995), Orino (J. Tilmans, pers. comm.) and Ptsidia (P. Detzel, pers. comm.); cf. also WILLEMSE & KRUSEMAN (1976) and WILLEMSE (1984).

Orchamus kaltenbachi sp.n. (Figs. 6–7, 10, 24, 30, 44)

Type locality: Karpathos, Greece.

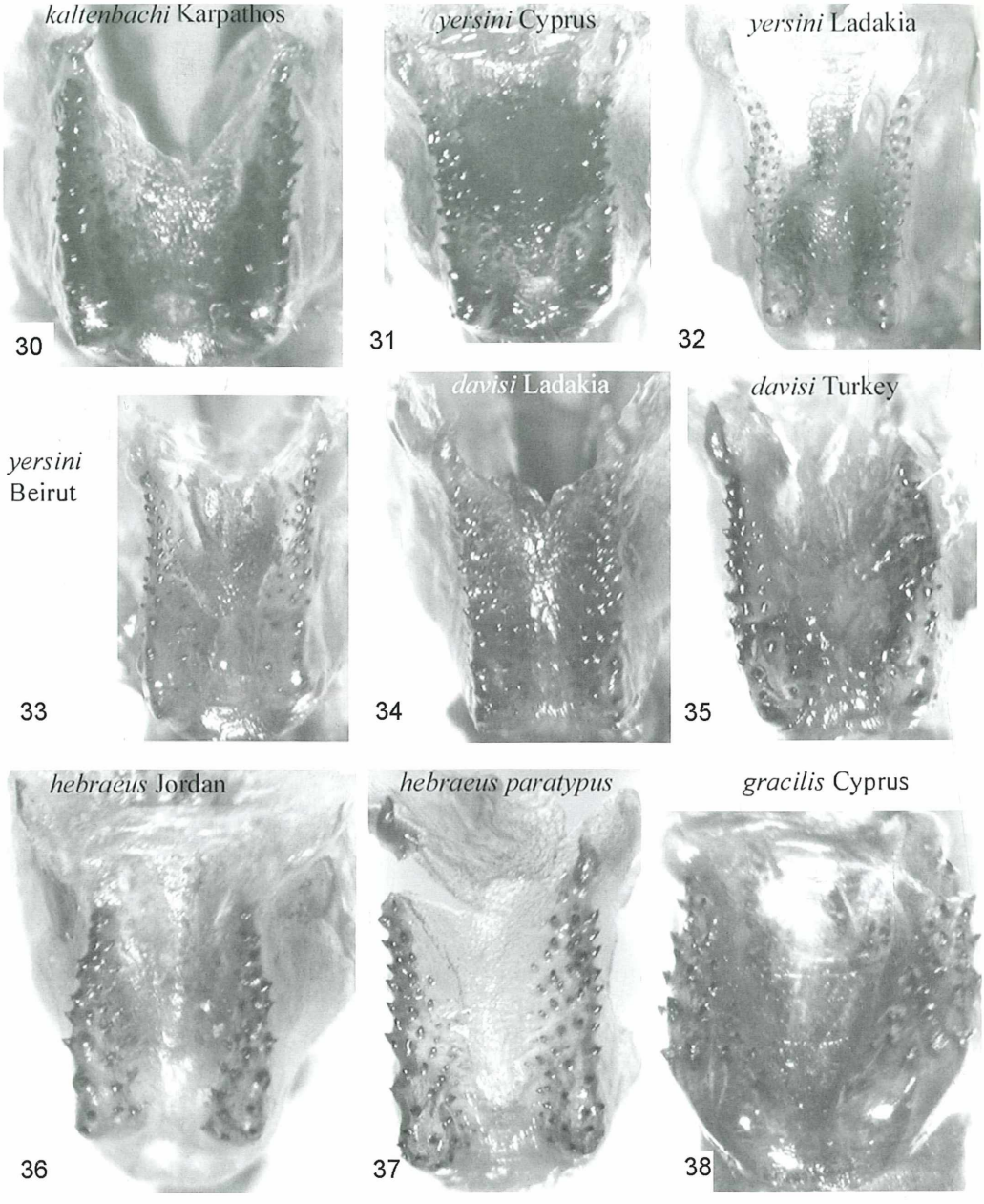
Material examined: Greece, Karpathos Is., Lastros-Geb. (= Mt. Lastos) 15.VI.1935, O. Wettstein (1 ♂ holotypus) (NHMW).

I consider a specimen collected on Karpathos Is. (Greece), previously identified as *O. yersini* by WERNER (1936), belonging to one undescribed species, that **I name after the late orthopterologist Alfred P. Kaltenbach**, who was curator of the Orthoptera Collection at the Naturhistorisches Museum of Vienna. This record appears much interesting, because Karpathos is located between Crete (inhabited by *O raulinii* and *O. yersini*?) and Rhodes (inhabited by *O. yersini*).

Diagnosis: It is a species of small size (biometrics: see Tab. 1), characterized by the pronotum keel just raised and sinuous, hind femurs relatively short (total length/length of hind femur: 2.23; length/heigth of hind femur: 3.81), inner side of hind tibiae roseate, cerci very small.

Description: Colouration brownish. 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 exceeding the hind 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 (Figs. 6, 11). Hind margin of pronotum concave. Metanotum rugulose, with four longitudinal just visible stripes. Tegmina with a network of veinlets, longer than first abdominal segment. Hind femurs brownish with scattered black dots (Fig. 6), hind tibiae hairy, inner side roseate, spines yellowish with base and tip blackish. Last sternite long and pointed (Fig. 7a), cerci very small, as long as wide (only *O. gracilis* shows cerci as short as *O. kaltenbachi* sp.n.) (Fig. 7b). Phallic complex (Fig. 24) in lateral view similar to those of *O. davisi* and *O.*

Figs. 22–29: Phallic complex in lateral view. (22) *O. yersini* from Ladakia (Syria) (MRSNT); (23) *O. yersini* from Beirut (Lebanon) (MRSNT); (24) *O. kaltenbachi* sp.n., holotypus from Karpathos (Greece) (NHMW); (25) *O. hebraeus*, paratypus from Mt. Carmel (Israel) (BMNH); (26) *O. gracilis* from Cyprus (CMUP); (27) *O. hebraeus* from Ajlun (Jordan) (CMUP); (28) *O. davisi* from Ladakia (Syria) (NHMW); (29) *O. davisi* from Guzeluluk (Turkey) (CMUP).



Figs. 30–38: Epyphallus from above. (30) *O. kaltenbachi* sp.n., holotypus from Karpathos (Greece) (NHMW); (31) *O. yersini* from Cyprus (MRSNT); (32) *O. yersini* from Ladakia (Syria) (MRSNT); (33) *O. yersini* from Beirut (MRSNT); (34) *O. davisi* from Ladakia (Syria) (NHMW); (35) *O. davisi* from Guzeluluk (Turkey) (CMUP); (36) *O. hebraeus* from Ajlun (Jordan) (CMUP); (37) *O. hebraeus*, paratypus from Mt. Carmel (Israel) (BMNH); (38) *O. gracilis* from Cyprus (CMUP).

Table 1. Measurements in mm of *Orchamus* species arranged according to decreasing size. Sample size: cf. materials; total length is measured from the fastigium to the apex of hind femur (see Fig. 6).

Species	Total length		Pronotum length		Pronotum heigth		Hind femurs length		Hind femurs	
	males	females	males	females	males	females	males	females	males	females
O. hebraeus	38.50 ± 0.71	58.00	7.30 ± 0.28	12.80	8.55 ± 0.64	13.80	19.01 ± 0.05	27.0	4.35 ± 0.21	6.20
O. yersini	35.15 ± 2.5	51.41 ± 4.04	7.10 ± 0.65	11.67 ± 0.83	7.44 ± 0.82	12.37 ± 1.04	17.13 ± 1.32	23.9 ± 2.31	4.09 ± 0.36	5.4 ± 0.48
O. davisi	33.3 ± 2.85	52.21 ± 4.49	6.37 ± 0.71	11.23 ± 1.03	6.4 ± 0.78	11.86 ± 0.96	15.97 ± 1.17	23.95 ± 2.28	3.83 ± 0.29	5.6 ± 0.58
O. raulinii	30.2 ± 2.4	40.3 ± 3.24	5.4 ± 0.5	8.3 ± 0.74	5.8 ± 0.35	9.4 ± 1.05	13.1 ± 0.35	17.0 ± 2.0	2.9 ± 0.1	4.1 ± 0.09
O. kaltenbachi	32.4		6.6		7.1		14.5		3.8	
O. gracilis	25.65 ± 1.91	40.0 ± 1.5	4.30 ± 0.28	7.84 ± 0.27	4.70 ± 0.28	9.0 ± 0.36	11.90 ± 0.72	18.52 ± 0.89	2.95 ± 0.10	4.12 ± 0.04

gracilis, epyphallus (Fig. 30) bearing few big spines arranged more or less disorderly, aedeagus valves (Fig. 44) appearing not much chitinous (as those of *O. davisi*), with a constriction in the middle.

Note: The collector of the specimen, Otto Wettstein, was a zoologist who worked in the Aegean Islands, providing many interesting data on insects, reptiles and birds (e.g.: WERNER 1936, WETTSTEIN 1953, 1959).

Orchamus gracilis (BRUNNER, 1882) (Figs. 14, 16, 26, 38, 48, 49)

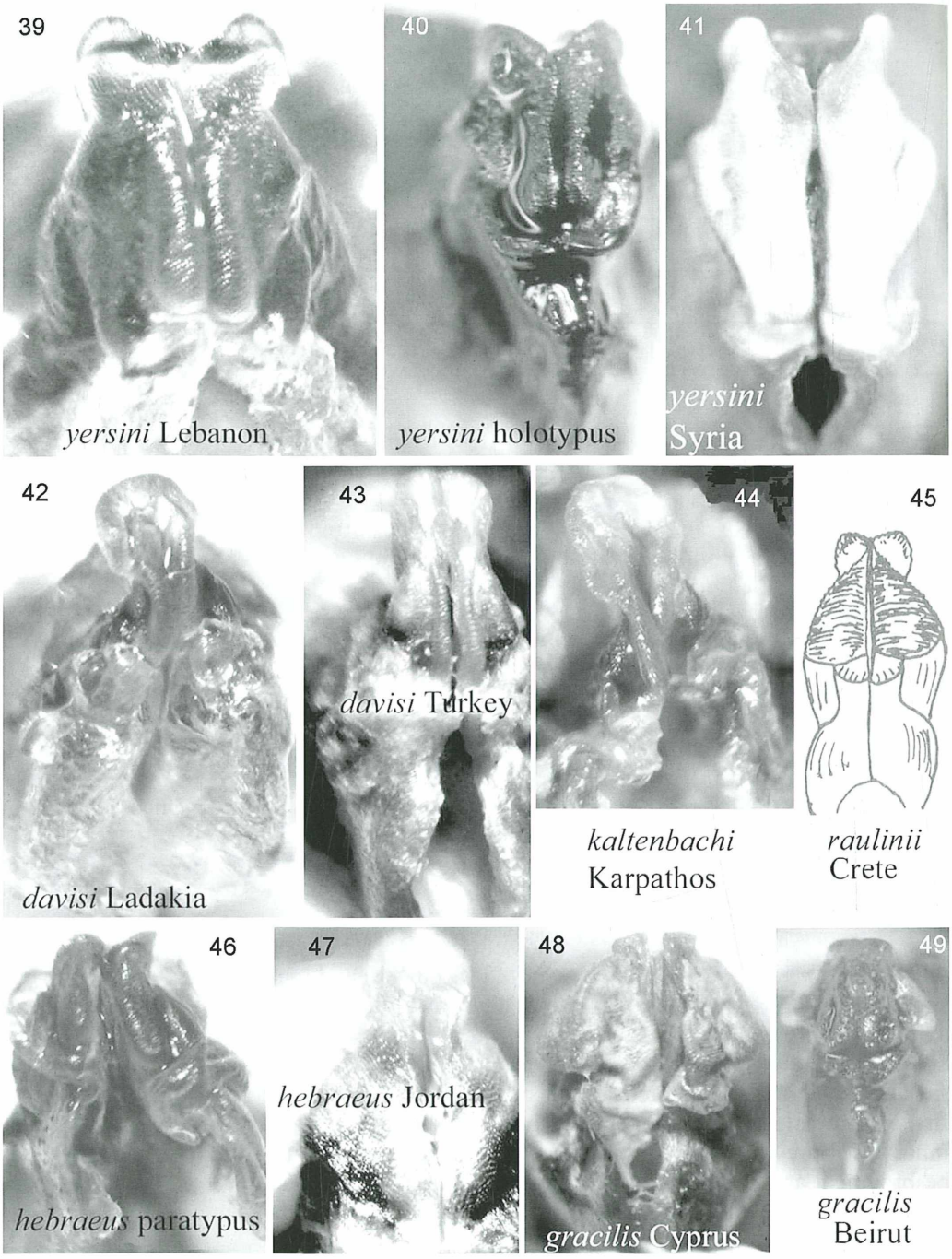
Orchamus gracilis (BRUNNER, 1882): *Pamphagus gracilis* BRUNNER 1882, Prodr. Eur. Orth.: 200.

Type locality: Cyprus.

Material examined: Cyprus, Lederer (♀ holotypus) (NHMW); Cyprus, Nicosia (2 ♀) (NHMW); Cyprus, Kandou 27.IV.1997, A. Carapezza (1 ♂) (CMUP); Cyprus, Livadia (Troodos) 18.VI.1939, H. Lindberg (1 ♀) (CF); Lebanon: Beirut, Lederer (1 ♂, 1 ♀ labelled as paratypes) (NHMW).

According to the original description (BRUNNER 1882) and material examined, it is very small, its body is very hairy, vertex is longer than wide, antennae just longer than head and pronotum [not as BRUNNER (1882) wrote: "capite et pronoto unitis breviores"], with 13–14 flattened segments, pronotum narrow, in lateral view just raised, except in the first mm, sinuous, interrupted by transverse sulcus, tegmina arriving to hind border of first abdominal segment in the male, shorter in the female. Hind femurs short and small, inner base may be reddish or bluish, as well as inner side of hind tibiae, which may also be brownish and apically reddish; spines are cream with base and tip black. Cerci are very small, as long as wide (only *O. kaltenbachi* sp.n. shows the same character).

This is a very small species, characterized by its small size (Tab. 1), pronotum just raised (Figs. 14, 16), cerci very short, as long as wide, epyphallus bearing some large spines arranged disorderly (Figs. 26, 38), aedeagus valves ending on lancet shape (Figs. 48,


39
yersini Lebanon
40
yersini holotypus
41
yersini
Syria
42
davisi Ladakia
43
davisi Turkey
44
kaltenbachi
Karpathos
45
raulinii
Crete
46
hebraeus paratypus
47
hebraeus Jordan
48
gracilis Cyprus
49
gracilis
Beirut

49). Specimens labelled "Beirut", preserved at NHMW, belonging to *O. yersini* and *O. gracilis*, were bought by Julius Lederer (who did not collect in the Middle East in person: HORN et al. 1990) and presented to Brunner von Wattenwyl by him; since Lederer no more further specimen has been collected in Lebanon, and DESCAMPS & MOUNASSIF (1972) consider possible a labelling mistake. These specimens are labelled as paratypes, but they were not quoted by BRUNNER (1882). Very probably *O. gracilis* is an endemic taxon of Cyprus, where it cohabits with *O. yersini*. UVAROV (1949) recorded various localities from this island.

Key to species

1 Species of bigger size (males: 30–39 mm; females: 40–58 mm; Tab. 1), cerci of male longer than wide 2
Species of smaller size (males: 24–32 mm; females: 38–42 mm; Tab. 1), cerci of male very small, as long as wide 5

2 Pronotum keel from above thick and high 3
Pronotum keel from above thin, not much high, sinuous 4

3 Pronotum of males evidently higher than long (length/heigth: 0.83–0.88), epyphallus with big and some small spines arranged only along the central line (Figs. 36, 37), aedeagus valves sinuous, not much chitinous (Figs. 46, 47) *Orchamus hebraeus* UVAROV, 1942
Pronotum just higher than long (length/heigth: 0.85–1.1 in males, 0.89–1.0 in females), epyphallus bearing small and large spines arranged disorderly (Figs. 31–33), aedeagus valves very large and opened (Figs. 39, 41) *Orchamus yersini* (BRUNNER, 1882)

4 Pronotum keel, in lateral view, arcuate except in its most anterior part (Figs. 15, 21), aedeagus valves sinuous and apically widened (Fig. 45)
Orchamus raulinii (LUCAS, 1854)
Pronotum keel much variable, sinuous or not, arcuate all over its length (Figs. 12, 13, 20), epyphallus bearing some large spines arranged disorderly (Figs. 34, 35), aedeagus valves not much chitinous with hourglass shaped apex, before narrow and after widened (Figs. 42, 43) *Orchamus davisi* UVAROV, 1949

5 Abdomen and legs hairy, pronotum keel low and sinuous, mainly in female, size very small (Tab. 1), hind femurs short (total length/length of hind femurs: 2.13–2.18 in males, 2.0–2.24 in females; length/heigth of hind femurs: 4.0–4.6), epyphallus bearing some large spines arranged disorderly (Figs. 26, 38), aedeagus valves ending on lancet shape (Figs. 48, 49) *Orchamus gracilis* (BRUNNER, 1882)
Hairs only on the hind tibiae, pronotum keel just raised and sinuous, hind femurs relatively short (total length/length of hind femurs: 2.23; length/heigth of hind femurs: 3.81), epyphallus (Fig. 30) bearing few big spines arranged more or less disorderly, aedeagus valves (Fig. 44) not much chitinous, with a constriction in the middle
Orchamus kaltenbachi sp.n.

Figs. 39–49: Aedeagus valves from back view. (39) *O. yersini* from Beirut (Lebanon) (MRSNT); (40) *O. yersini*, holotypus from Crete (Greece) (NHMW); (41) *O. yersini* from Syria (NHMW); (42) *O. davisi* from Ladakia (Syria) (NHMW); (43) *O. davisi* from Guzeluluk (Turkey) (CMUP); (44) *O. kaltenbachi* sp.n., holotypus from Karpathos (Greece) (NHMW); (45) *O. raulinii* from Crete (Greece) (after HARZ 1975); (46) *O. hebraeus*, paratypus from Mt. Carmel (Israel) (BMNH); (47) *O. hebraeus* from Ajlun (Jordan) (CMUP); (48) *O. gracilis* from Cyprus (CMUP); (49) *O. gracilis*, from Beirut (Lebanon) (NHMW).

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