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Review of Chrysolampinae DALLA TORRE 1898 (Hymenoptera: Perilampidae) with descriptions of new species from Turkey

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Abstract

The palearctic species of Chrysolampinae DALLA TORRE 1898 (Hymenoptera: Perilampidae) are reviewed, and a key provided to identify species of *Chrysolampus* SPINOLA 1811. Descriptions and distributions of *Chrysolampus thenae* (WALKER 1848), *C. splendidulus* (SPINOLA 1808), *C. rufitarsis* (FÖRSTER 1859) and *Brachyelatus viridis* HOFFER & NOWICKY 1954 (the last three species as new records for Turkey) are given. Eight new species, *Chrysolampus pazarcikus* nov.sp., *C. gencerae* nov.sp., *C.akcakalenus* nov.sp., *C.dortyolus* nov.sp., *C. adiyamanus* nov.sp., *C. besnilus* nov. sp., C. *yayladagus* nov.sp. and *Elatomorpha nurdagica* nov.sp. are described and diagnostic features of the species illustrated.

Key words: Hymenoptera, Chrysolampinae, Palearctic species.

Zusammenfassung

Der Paläarktis Arten von Chrysolampinae DALLA TORRE 1898 (Hymenoptera: Perilampidae) überprüft, und ein Schlüssel zur Verfügung gestellt, um Arten von *Chrysolampus* SPINOLA 1811 zu identifizieren. Beschreibungen und Verteilungen von

Chrysolampus thenae (WALKER 1848), *C. splendidulus* (SPINOLA 1808), *C. rufitarsis* (FÖRSTER 1859) und *Brachyelatus viridis* HOFFER & NOWICKY 1954 (die letzten drei Arten als neue Datensätze für die Türkei) gegeben. Acht neue Arten, *Chrysolampus pazarcikus* nov.sp., *C. gencerae* nov.sp., *C. akcakalenus* nov.sp., *C. dortyolus* nov.sp., *C. adiyamanus* nov.sp., *C. besnilus* nov.sp., *C. yayladagus* nov.sp. und *Elatomorpha nurdagica* nov.sp. werden beschrieben und Diagnose-Funktionen der Arten dargestellt.

Introduction

In the Palearctic Region *Chrysolampus* SPINOLA 1811, together with *Chrysomalla* FÖRSTER 1859, *Brachyelatus* HOFFER & NOWICKY 1954 and *Elatomorpha* ZEROVA 1970 were placed in Chrysolampinae DALLA TORRE 1898, (DARLING 1997). There are some disagreements in the family placement of Chrysolampinae, which often are included either as Perilampidae (FERRIERE & KERRICH 1958; BOUČEK 1972, 1983; DARLING 1986) or as Perilampinae (Pteromalidae) (RIEK 1966; GRAHAM 1969; BURKS 1979). The placement of the subfamily was discussed in detail by DARLING (1986), and most authors now treat that the Chrysolampinae are best classified as a subfamily of Perilampidae, based on the characters of the adults (BOUČEK 1972; 1978; 1988; BOUČEK & RASPLUS 1991, DARLING 1986; 1988a,b; 1997; HERATY & DARLING 2007); and information on life history and immature stages (DARLING & MILLER 1991).

Keys to the genera and species of Chrysolampinae have been published by NIKOL'SKAYA & KYAO (1954) and DZHANOKMEN (1978) for 8 palearctic species, PECK et al. (1964), GRAHAM (1969) and BOUČEK (1956, 1972) for 7 European species, DARLING (1986) for 6 nearctic species. DOĞANLAR (1984) listed *Chrysomalla roseri* (FÖRSTER 1859) and *Chrysolampus thenae* (WALKER 1848) in Perilampinae from Erzurum, Turkey, and DOĞANLAR & DOĞANLAR (2012) revised the palearctic species of *Chrysomalla*.

In this study, identification keys are given to identify the Turkish genera of Chrysolampinae and species of *Chrysolampus*. We describe eight new species of Chrysolampinae from Turkey.

Material and methods

This study is based on examination and identification of specimens collected from several parts of Anatolia (Turkey), and specimens examined at The Natural History Museum, London. The collected specimens are deposited in the Insect Museum of the Plant Protection Department, Agriculture Faculty, Mustafa Kemal University, Antakya, Hatay, Turkey (MKUI). Specimens were collected by sweeping and transferring directly into 96 % ethanol. After sorting the material type materials were dehydrated and mounted on pins and properly labeled, and some specimens of the species were stored in absolute ethanol for DNA extractions.

The left wing and one antenna of a paratype of each new species and a specimen of other species were slide-mounted in Canada balsam. The types and slides of the species are deposited in the Insect Museum of the Plant Protection Department, Agriculture Faculty,

Mustafa Kemal University, Antakya, Hatay, Turkiye (MKUI). Photographs of diagnostic characters of the new species were taken using a Leica DM 5500 B microscope with a digital Leica DFC 295 camera.

Terminology and abbreviations

Morphological terminology follows GIBSON (1997). Abbreviations used in the key and descriptions are: C = claval segment, F = funicular segment, OOL = distance between posterior ocellus and inner margin of eye, POL = distance between posterior ocelli.

C h r y s o l a m p i n a e DALLA TORRE 1898

D i a g n o s i s . Head and mesosoma with coarse sculpture; pronotal collar large, at least half as long as mesoscutum, sharply margined anteriorly; notauli complete; hind tibia with two strong apical spures; antennal formula 11173, sexually dimorphic, male scape expanded with punctures and pores on anterior surface; mandibles robust, bidentate; labrum as a semicircular flab that can be extended beyond the clypeus, with setae along anterior margin; clypeus differentiated from the face by sutures, anterior margin entire, without teeth or tubercles; prepectus narrowly triangular, not on the same place as, or closely associated with, the pronotum; forewing with long marginal vein, 3.5-6 times as long as stigma vein; metasoma with petiole usually distinctly sculptured; female metasoma anteriorly high, with first tergum very broad and incised laterally on hind margin (BOUČEK 1972; DARLING 1986).

Key to Turkish genera (modified from BOUČEK 1972)

1 Petiole longer than broad, dorsally sculptured, with laterally and basally margined longitudinal carina that overlaps the nucha; Forewing with some pilosity basally in most species; pronotal collar distinctly margined anteriorly ..... *Chrysolampus* SPINOLA 1811

- Petiole at least slightly transverse, weakly sculptured, without longitudinal carinae; Forewing bare in basal third; pronotal collar margined or rounded anteriorly 2

2 Pronotal collar sharply margined anteriorly and with some very coarse piliferous punctures posterior of carina, often also with coarse rugae getting finer towards hind margin of pronotum; sculpture of mesoscutum consisting mainly of cross-striations; malar space in known species at least 1/3 the length of eye ..... *Chrysomalla* FÖRSTER 1859

- Pronotal collar rounded without any trace of a transverse carina anteriorly, and dorsally as finely sculptured as collum; sculpture of posterior half of mesoscutum often engraved-reticulate; malar space at most about 1/3 the length of eye 3

3 Postmarginal vein about twice as long as stigmal vein and stigma only slightly enlarged; axillae broadly separated by truncate base of scutellum; hind basitarsus dorsally about as long as maximum width of hind tibia ..... *Brachyelatus* HOFFER & NOWICKY 1954

- Postmarginal vein at most as long as stigmal vein and stigma more distinctly enlarged; axillae meeting in middle, hence scutellum hardly attaining mesoscutum; hind basitarsus much longer than maximum width of hind tibia..... ..... *Elatomorpha* ZEROVA 1970

Chrysolampus SPINOLA 1811

Chrysolampus SPINOLA 1811: 147, no. 6. Type-species: *Diplolepis splendidula* SPINOLA by monotypy.

Elatus WALKER 1848: 104, 153. Type-species: *E. thenae* WALKER by monotypy; synonymized with *Chrysolampus* by BOUČEK (1956: 94).

Lamprostylus FÖRSTER 1856: 42. Type-species: *L. punctatus* FÖRSTER [included by FÖRSTER 1859: 113]; synonymized by CRAWFORD (1914: 74).

D i s c u s s i o n . There have been several taxonomic treatments of *Chrysolampus* under different generic names, including *Lamprostylus* and *Elatus* by SCHMIEDEKNECHT (1909), RUSCHKA (1924), and NIKOL'SKAYA (1952; 1954); and *Chrysolampus* by RUSCHKA (1924), BOUČEK (1956, 1972, 1988), KERRICH (1958), FERRIERE & KERRICH (1958), PECK et al. (1964), DZHANOKMEN (1978), GRAHAM (1969) and DARLING (1986). DARLING (1986) stated that *Chrysolampus* included 18 species (Palearctic (7), Nearctic (5), Indo-Pacific (1) Australian (5), and BOUČEK (1988) listed 7 Australasian species. NOYES (2011) gave 47 species of the world (Palearctic (33) and 14 from other regions) from which only 8 of the 33 Palearctic species were validated by earlier works, the status of the others is obscure.

Key to the Palearctic species

1 Gastral petiole with 6 longitudinal carinae, 1 ventral, 2 lateral, 3 dorsal (Fig. 1g) 2

- Gastral petiole with 4 longitudinal carinae, 1 ventral, 2 lateral, 1 dorsal (Figs. 2e, 4e, 6d, 9d) 3

2 Anterior margin of pronotal collar with two teeth; mesosoma shiny and nearly smooth; body violet-black; funicular segments with 1 row of longitudinal sensilla; Forewing hyaline; basal cell and costal cell with a few setae; speculum broad, opened ..... *C. dentatus* (BOUČEK 1956)

- Anterior margin of pronotal collar without teeth (Fig. 1a); mesosoma with coarse 'honeycomb' sculpture (Fig. 1b); body dark blue; funicular segments with 2 rows of longitudinal sensilla (Fig. 1d); Forewing with a pale fumation behind marginal vein extending to basal and cubital veins; basal cell with 3 rows of setae and costal cell with 4 or 5 rows of setae ventrally and 2 rows of setae dorsally in basal half; speculum narrow, closed, (Fig. 1e) ..... *C. pazarcikus* nov.sp.

3 Side lobes of mesonotum, axillae and scutellum smooth; outer margins of side lobes, base and sides of scutellum with piliferous punctures; mesosoma dorsally reddish-bronze; propodeum finely reticulo-rugulose ..... *C. verae* (NIKOL'SKAYA 1954)

- Mesonotum wholly sculptured, with coarse or fine punctures (Fig. 1b, 2a,); mesosoma mostly metallic blue or green; sculpture of propodeum variable..... 4

4 Flagellum with 2 rows of longitudinal sensilla per funicular segment (Fig. 2c, 3c)..... 5

- Flagellum with 1 row of longitudinal sensilla per funicular segment (Fig. 4b, 5b)..... 6

5 Forewing (Fig. 2d), with basal cell having 3 rows of setae speculum closed ventrally, basal and cubital veins each with 1 row of setae, costal cell on under side with two complete rows of setae plus a partial row apically, on upper side with a partial row of setae apically; funicular segments with first row of longitudinal sensilla densely arranged (Fig. 2c); mesosoma having side-lobes of mesoscutum along notauli with more than 1 row of coarse punctures, coarse punctures of mesosoma very dense, the interspaces on middle part of the mesoscutum very narrow and transversely rugulose (Fig. 2a); scutellum anteriorly and laterally very densely, coarsely punctuate, interspaces on punctuate parts almost nil. (Fig. 2e)..... ..... *C. punctatus* FÖRSTER 1859

- Forewing (Fig. 3d)with basal cell and cubital vein bare, speculum open, and costal cell with 1 and a partial row of setae apically on under side, on upper side bare; funicular segments with first row of longitudinal sensilla sparsely arranged (Fig. 3c); mesosoma having side-lobes of mesoscutum along the notauli with only 1 row of coarse punctures (Fig. 3a), scutellum with coarse punctures rather sparse, the interspaces on most densely punctate parts about as wide as punctures themselves (Fig. 3e)..... *C. prominens* (RUSCHKA 1924)

6 Forewing with basal cell having 3 rows of setae(Fig. 4d), basal vein with 1 row, cubital vein with 2 rows, and costal cell with 4 or 5 rows of setae on under side and a partial row on upper side in basal half; speculum closed ventrally, broad on upper side, hairy on under side; mesosoma (Fig. 4a) with a coarse honeycomb sculpture formed of large coalescent piliferous punctureson pronotal collar, mesoscutum and scutellum; mesosoma blue to blue-green, with pronotal collar green to golden or coppery, and lateral angles nearly rectangular. Large species, 4-5 mm..... ..... *C. splendidulus* (SPINOLA 1808)

- Forewing (Fig. 5c, 7c) with basal and cubital vein having not more than 1 row of setae; costal cell with at most 2 rows of setae; speculum open or closed ventrally; mesosoma (Fig. 7a) without coarse punctures, or with at most some small and sparsely distributed punctures on mesosoma; color of mesosoma variable. Smaller species, 1.6-3 mm..... 7

7 Females 8

- Males..... 15

8 First funicular segment with longitudinal sensilla (Fig. 5b, 13b); speculum open or closed ventrally 9

- First funicular segment without longitudinal sensilla (Fig. 12b, 7b); speculum closed ventrally 10

9 Mesoscutum (Fig. 5a) on anterior half with 2 rows of piliferous punctures, transversally striated with reticulation, on posterior half with 3 or 4 transverse carinulae; scutellum with some piliferous punctures(Fig. 5d); forewing (Fig. 5c) with speculum closed ventrally, basal cell with 5 rows of setae, and costal cell with 1 complete and a partial rows of setae on under side and 6 setae apically on upper side; antenna (Fig. 5b) with first funicular segment with 1 longitudinal sensilla on both sides, and 3.7 times as wide as long; F_{2-5} with 3 sensilla on one side and 4 on other side..... *C. gencerae* nov.sp.

- Mesoscutum (Fig. 13a) on anterior half without piliferous punctures, transversally striated, with some rugae on posterior part; scutellum without piliferous punctures; forewing (Fig. 13c) with speculum open ventrally, basal cell with 2 rows of setae, and costal cell bare on upper side and with complete row of setae on under side; antenna (Fig. 13b) with first funicular segment with 1 or 2 longitudinal sensilla on both sides, and 2 times as wide as long; F_{2-5} with 3 sensilla on both sides ..... *C. thenae* WALKER 1848

10 Antenna (Fig. 12b) with second funicular segment with 1 longitudinal sensilla on one and sometimes both sides, F_3 with 1 sensilla on one side and 2 on other side; F_4 with 2 sensilla on one side and 2 or 3 on other side; C_1 with 3 sensilla on one side and 6 on other side; forewing (Fig. 12c) with basal cell with 3 rows of setae; costal cell with one complete and a partial rows of setae on under side..... *C. rufitarsis* (FÖRSTER 1859)

- Antenna (Fig. 7b) with second funicular segment with 2 longitudinal sensilla at least on one side; number of the longitudinal sensilla on other flagellar segments variable; forewing (Fig. 7c) with basal cell with 3-5 rows of setae; number of rows of setae on costal cell variable..... 11

11 Antenna (Figs. 7b, 8b) with second funicular segment with 2 longitudinal sensilla on one side and at most 1 on other side..... 12

- Antenna (Figs. 9b, 10b) with second funicular segment with 2 longitudinal sensilla on both sides..... 13

12 Antenna (Figs. 7b) having F_5 with 4 sensilla; C_1 with at least 5 sensilla on both side; forewing (Figs. 7c) having basal cell with 5 rows of setae; costal cell with 2 complete row of setae on under side, bare on upper side; mesoscutum (Figs. 7a) with transverse longitudinal carinae in anterior half and fine longitudinal carinae posteriorly, without piliferous punctures; axillae separated from each other; scutellum (Figs. 7d) with longitudinal striation in anterior half and in posterior half almost smooth, but with some piliferous punctures; propodeum with distinct median carina..... *C. akcakalenus* nov.sp.

- Antenna (Figs. 8b) having F_5 with 2 sensilla on both sides, C_1 with 3 sensilla on both sides; forewing (Figs. 8c) having basal cell with 3 rows of setae; costal cell on under side with 1 complete row of setae and a partial row in apical half; mesoscutum (Figs. 8a) transversally striated in anterior half, and with distinct reticulation and some deep, longitudinal rugae posteriorly; scutellum (Figs. 8d) with distinct rugae on basal 1/3 and finely striated medially; propodeum with weak median carina ..... *C. dortyolus* nov.sp.

13 Antenna (Figs. 9b) having F_3 with 2 sensilla on both sides; mesoscutum (Figs. 9a) with broad transverse striae over anterior 1/3, 1 or 2 transverse carinulae medially, fine reticulation apically; scutellum with transverse coarse striae anteriorly and with some punctures, but frenum smooth; propodeum (Figs. 9d) reticulate near median carina, but with some striae below spiracle; forewing (Figs. 9c) having basal cell with 3 rows of setae; costal cell with one complete and a partial row of setae on under side and 3 setae on upper side basally..... *C. adiyamanus* nov.sp.

- Antenna (Figs. 8c) having F_3 with at least 3 sensilla on one side; sculpture of mesoscutum variable; scutellum with fine striae anteriorly, with or without punctures; frenum at least finely striated, sometimes with deep piliferous punctures; sculpture of propodeum and setal patern of basal and costal cells variable 14

14 Mesoscutum (Fig. 10a) anteriorly with fine transverse striae on narrow band, 3 or 4 rows of piliferous punctures medially, and distinct reticulation posteriorly; frenum with deep piliferous punctures apically; propodeum (Fig. 10d) with distinct carinulae medially; antenna (Fig. 10b) having F_{3-4} with 2 sensilla on one side and 3 on other side; F_7 with 3 or 4 sensilla on one side and 4 on other side; forewing (Fig. 10c) having basal cell with 3 rows of setae; costal cell with one complete and a partial rows of setae on under side and 4 setae on upper side ..... *C. besnilus* nov.sp.

- Mesoscutum (Fig. 11a) with coarse transverse striae in anterior half, 2 rows of piliferous punctures, and with 3 or 4 transverse carinulae posteriorly; frenum without deep piliferous punctures; propodeum (Fig. 11e) irregularly reticulate; antenna (Fig. 11c) having F_{3-4} with 4 sensilla on both sides; F_7 with 6 sensilla on both sides; forewing (Fig. 11d) having basal cell with 5 rows of setae; costal cell with 2 complete rows of setae on under side and without setae on upper side..... ..... *C. yayladagus* nov.sp.

15 Scape with sensory pores narrow and sparsely arranged (Fig.13f); antenna (Fig. 13e) with first funicular segment 1.36-1.6 times as wide as pedicel and with 3 or 4 sensilla on one side; F_{2-3} with 4 sensilla on both sides; forewing (Fig. 13c) with speculum open ventrally; basal cell with 3 rows of setae; costal cell with one complete and a partial rows of setae on under side ..... *C. thenae* (WALKER 1848)

- Scape with sensory pores broad, densely or sparsely arranged (Fig. 12e) ; antenna (Fig. 12e) with first funicular segment almost as wide as pedicel, with at most 2 sensilla on one side; F_2 with fewer sensilla at least on one side; forewing (Fig. 12c) with speculum closed ventrally; number of setae on basal and costal cells variable..... 16

16 Scape 3.46 times as long as wide, with dense pores of broad sensory area narrowing basally(Fig. 12e); antenna (Fig. 12b) withfirst funicular segment without sensilla; F_{2-3} with 2 sensilla on both sides; forewing (Fig. 12c) with costal cell with 1 complete and a partial rows of setae on under side ..... *C. rufitarsis* (FÖRSTER 1859)

- Scape 3.1 times as long as wide, with sparse pores of broad sensory area not narrowing basally (Fig. 6b); antenna (Fig. 6a) withfirst funicular segment with 1 sensilla on one side and 2 on other side; F_2 with 3 sensilla on one side and 4 on other side, and F_3 with 4 sensilla on both sides; forewing with costal cell with 2 complete rows of setae on under side..... *C. shurik* (NIKOL'SKAYA 1952)

Chrysolampus dentatus (BOUČEK 1956)

Elatus dentatus BOUČEK 1956a: 327-329.
Chrysolampus dentatus; BOUČEK 1956b: 86, 97.
Chrysolampus dentatus; GRAHAM 1969: 88.

T y p e m a t e r i a l : Holotype ♂, Czechoslovakia, Bohemia (Z. Bouček), in Narodni Museum, Prague. The ♀ is unknown.

R e m a r k s . The species was described in *Elatus* by BOUČEK (1956a) and later transferred to *Chrysolampus* by BOUČEK (1956b). The species was not examined and the characters used in the key were taken from BOUČEK (1956a).

D i s t r i b u t i o n . Czech Republic, Czechoslovakia.

B i o l o g y . Unknown.

***Chrysolampus pazarcikus* nov.sp. (Figs 1a-g)**

D e s c r i p t i o n .

♂. 3.8-4.0 mm. Body with head and mesosoma dark blue, with metallic reflection; antenna with scape and pedicel dark green, flagellum more weakly metallic; mandible black, teeth dark brown; legs concolorous with mesosoma, tarsi brown with apical segments infuscate; Forewing with fumation in basal half but apically hyaline, venation mainly testaceous.

Head (Fig. 1a) in dorsal view almost as broad as mesoscutum, 2.3 times as broad as long; 1.3 times wider than high; POL 0.9 times OOL, posterior ocellus separated from eye by 2.8 diameters; ocellar area with scattered piliferous punctures behind and laterad ocelli; lower edge of toruli distinctly above ocular line; malar space 0.4 times width of mouth opening and 0.4 times height of eye; face and frons coarsely reticulate. Antenna (Fig. 1c) with flagellum broader medially than basal and apical width, with dense whitish setae; scape extending about 0.9 times distance to anterior ocellus; pedicel plus flagellum 2.4 times as long as scape, 0.7 times as long as breadth of head, 0.9 times as long as distance between eyes; scape 5 times and pedicel 1.5 times as long as wide; F_1 1.4 times as wide as pedicel and 1.4 times as wide as long, F_2-F_7 equal in length, about 1.3 times as wide as long, F_7 slightly wider and longer than F_1, number of longitudinal sensilla on flagellar segments as in Fig. 1d; clava 1.5 times as long as wide, C_1 slightly longer than C_2, the latter 1.4 times as long as C_3.

Mesosoma (Fig. 1b) in dorsal view 1.2 times as long as broad and 1.2 times as wide as high. Pronotum with collar occupying 0.3 times its length, margined anteriorly by a fine but distinct carina; sculpture fine on neck, but with coarse piliferous punctures on collar. Mesoscutum (Fig. 1b) twice as broad as long, with coarse piliferous punctures, including axillae and scutellum, the latter 1.2 times as wide as long, with frenal groove fine but distinct at about one-fourth median length of scutellum; frenum with coarse longitudinal carinulae, and posterior rim costulate. Propodeum (Fig. 1f) with distinct median carina and coarse, broad rugae lateral to it, but almost smooth between outer rims of punctures and spiracles; spiracle ellipsoidal, almost touching metanotum. Forewing about twice as long as wide, with dense pilosity as in Fig. 1e; length of costal cell: marginal vein: stigmal vein: postmarginal vein about 58: 32: 8: 8; stigma separated from posterior edge of postmarginal vein by about its own height; basal cell with 3 rows of setae and costal cell with 4 or 5 rows of setae on under side and 2 rows of setae on upper side in basal half; speculum closed ventrally, narrow on upper side, hairy on under side.

Metasoma in dorsal view about 1.2 times as long as broad, 0.9 times as long as mesonotum, and bluntly rounded posteriorly. Petiole (Fig. 1g) 1.4 times as long as basal width, reticulate, with 6 longitudinal carinae (1 ventral, 2 lateral, 3 dorsal (1 median, 2 submedian). Tergites smooth.

♀. Unknown.

S t u d i e d m a t e r i a l : Holotype. ♂, Türkiye: Kahramanmaraş, Pazarcık, Yukarımülk, 24.iv.2007, swept from lent field, (O. & M. DOĞANLAR), deposited in the Insect Collection of Mustafa Kemal University (MKUI). Paratype: 1♂, same data as holotype.

D i a g n o s i s . *Chrysolamus pazarcikus* nov.sp. is similar to *C. dentatus* BOUČEK in having a petiole with 6 longitudinal carinae, but it differs in having coarse piliferous punctures on the mesosoma (in *C. dentatus* mesosoma almost smooth). It differs from

other species with piliferous punctures on the mesosoma, and by having 6 longitudinal carinae on the petiole and the forewing with fumation (other species with 4 longitudinal carinae on petiole and forewing hyaline).

B i o l o g y . Unknown.

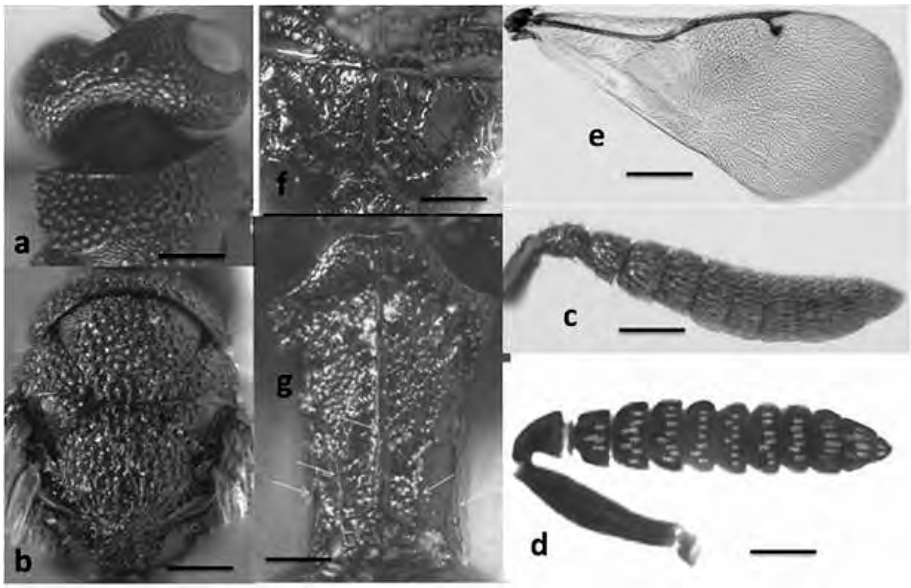

Fig. 1a-g: *Chrysolampus pazarcikus* nov.sp. ♂: (**a**) pronotum and head in dorsal view; (**b**) mesosoma in dorsal view; (**c**) pedicel and flagellum showing setae; (**d**) antennae showing longitudinal sensilla; (**e**) forewing; (**f**) propodeum; (**g**) petiole. (scale bar for a, b = 0.3 mm; c, d, f, g = 0.15 mm; e= 0.5 mm).

Chrysolampus verae (NIKOL'SKAYA 1954)

Elatus verae NIKOL'SKAYA 1954; NIKOL'SKAYA & KYAO 1954: 412.
Chrysolampus verae; DZHANOKMEN 1978: 226.

T y p e m a t e r i a l : Holotype ♀, Kazakhstan (Kyao), in Zoological Museum, Stalingrad.

R e m a r k s . The species was described in *Elatus* by NIKOL'SKAYA in NIKOL'SKAYA & KYAO (1954) and later transferred to *Chrysolampus* by DZHANOKMEN (1978). The species is not known to us and the characters used in the key were taken from DZHANOKMEN (1978).

D i s t r i b u t i o n . Kazakhstan, Tselinograd Obl. (NOYES 2011).

B i o l o g y . Unknown.

Chrysolampus punctatus (FÖRSTER 1859) (Figs 2 a-d)

Lamprostylus punctatus FÖRSTER 1859: 113-114.
Chrysolampus punctatus; RUSCHKA 1924: 93-94.
Chrysolampus punctatus; BOUČEK 1956: 87, 97.
Chrysolampus punctatus; GRAHAM 1969: 89.

T y p e m a t e r i a l : Holotype ♀, Köln am Rheinufer, in Naturhistorisches Museum, Vienna. The holotype was described as a ♂, but RUSCHKA (1924) stated that it is a ♀.

R e m a r k s . FÖRSTER (1859) described the female in detail and some additional key characters were given by RUSCHKA (1924), BOUČEK (1956), and GRAHAM (1969). A female, identified by Bouček) from Austria was examined .Some features of the female are as follows:

♀. 2.8 mm. Head (Fig. 2a,b) 2.4 times as wide as long, 1.4 times as wide as mesonotum. Antenna (Fig. 2c) with scape 6.7 times and pedicel 1.8 times as long as wide; F_1-F_2 wider than pedicel, almost as wide as long, F_3-F_7 subequal in length, slightly transverse, F_7 1.4 times as wide as F_1, club 1.7 times as long as wide; C_1 1.3 times as long as C_2, the latter 1.3 times as long as C_3; number of longitudinal sensilla on flagellar segments as in Fig. 2c; pedicellus plus flagellum 2.4 times as long as scape, 0.8 times as long as width of head. Forewing (Fig. 2d) 2.2 times as long as wide; lengths costal cell: marginal vein: postmarginal: stigmal vein about 48: 30: 8: 6; stigma separated from posterior edge of postmarginal vein by its own height.Scutellum, propodeum and petiole as in Fig. 2e.

D i s t r i b u t i o n . Germany (FÖRSTER 1859; GRAHAM 1969; VIDAL 2001), Hungary (ERDÖS 1946; 1955a,b); Kazakhstan (DZHANOKMEN 2005); Lithuania, Ukraine (DZHANOKMEN 1978); Central Europe (BOUČEK 1956; KALINA 1989; DZHANOKMEN 1978; 2005); USSR: Tselinograd Obl. (GRAHAM 1969; DZHANOKMEN 2005).

S t u d i e d m a t e r i a l : Austria, Marchtrenk, O.-Öst., 1♀, 29.vii.1932 (Dr. H. Priesner) (det. by Z. BOUČEK 1975) (Bouček collection, in Czech Republic).

B i o l o g y . Unknown. Adults in May and June (GRAHAM 1969).

Chrysolampus prominens (RUSCHKA 1924) (Figs 3 a-e)

Elatus prominens RUSCHKA 1924: 96.
Chrysolampus prominens; BOUČEK 1956: 87, 97; GRAHAM 1969: 89.

T y p e m a t e r i a l : Syntypes, ♀, ♂, Trieste (Graeffe) in Naturhistorisches Museum, Vienna.

R e m a r k s . RUSCHKA (1924) described both sexes of this species in detail from Italy. The types were not examined, but some additional characters to those given in the key based on specimens studied from France are as follows:

♀. 3.0 mm. Mesosoma as in Fig. 3a. Antenna (Fig. 3b) with scape 8 times and pedicel 1.9 times as long as wide; F_1 slightlywider than pedicel, 1.3 times as long as wide, F_2-F_7 subequal in length, almost quadrate, and F_7 1.4 times as wide as F_1; club 2.2 times as long as wide, C_1 1.3 times as long as C_2, the latter 1.3 times as long as C_3.Number of longitudinal sensilla on flagellar segments as in Fig. 3c; Pedicellus plus flagellum 2.3 times as long as scape. Forewing 2.4 times as long as wide, with basal cell bare, speculum broadly open. Propodeun and petiole as in Fig. 3e.

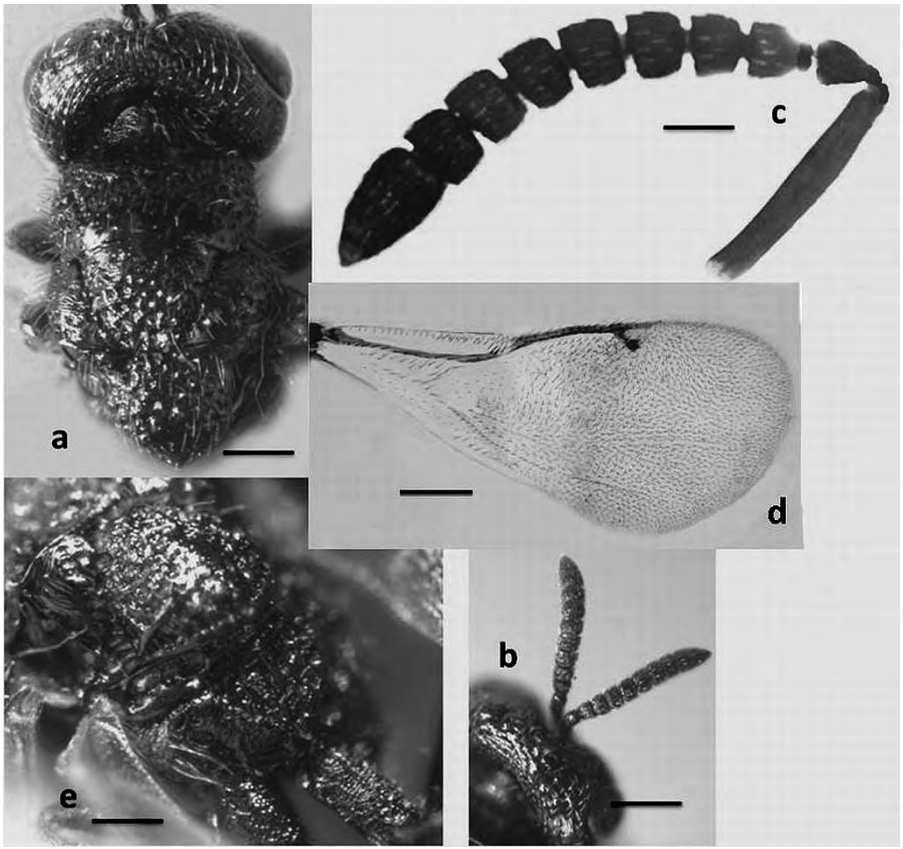

Fig. 2: *Chrysolampus punctatus* (FÖRSTER 1859). ♀. (**a**) head, pronotum and mesonotum in dorsal view; (**b**) head and antennae in dorsal view; (**c**) antennae showing longitudinal sensilla; (**d**) forewing; (e) scutellum, propodeum and petiole. (scale bar for a, e = 0.2 mm; b, d= 0.3 mm. c = 0.12 mm).

Distribution. Italy (RUSCHKA 1924); Central Europe (ERDÖS 1955; TUDOR 1967; DZHANOKMEN 1978; ASKEW et al. 2001), Spain (ASKEW et al. 2001); Kazakhstan, Slovenia, USSR (Tselinograd Obl.), Turkmenistan (DZHANOKMEN 2005).

Studied material: France: Dijan, Plombietes 16.vi.1974 (Dr. Z. Bouček) (det. by Z. Bouček 1975) (Bouček collection, in Czech Republic).

Biology. Unknown.

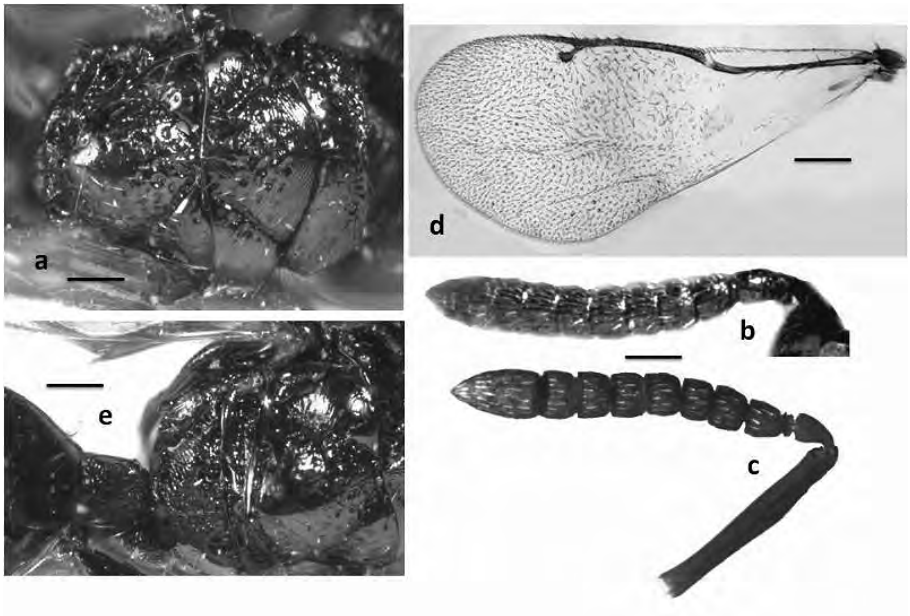

Fig. 3: *Chrysolampus prominens* (RUSCHKA 1924). ♀: (**a**) pronotum and mesonotum in dorsal view; (**b**) pedicel and flagellum showing seatae; (**c**) antennae showing longitudinal sensilla; (**d**) forewing; (**e**) scutellum, propodeum and petiole. (scale bar for a, e = 0.15 mm; b, c = 0.09 mm; d= 0.3 mm).

Chrysolampus splendidulus (SPINOLA 1808) (Figs 4a-e)

Diplolepis splendidula SPINOLA 1808: 223-224. Placed in *Chrysolampus* by PECK (1951).
Lamprostylus auricollis FÖRSTER 1859 : 114-115, Type ♀, Aachen, in Naturhistorisches Museum, Vienna, synonymized with *Chrysolampus splendidulus* SPINOLA by RUSCHKA (1924).
Chrysolampus cyaneus (FABRICIUS) DALLA TORRE 1898: 163. Synonymized with *Chrysolampus splendidulus* by PECK (1951).

T y p e m a t e r i a l : *Diplolepis splendidula* SPINOLA, Types. Italy probably in Spinola coll. (GRAHAM 1969).

R e m a r k s . Both sexes were described in detail by FÖRSTER (1808), and some key characters were given in subsequent works (RUSCHKA 1924; BOUČEK 1956; GRAHAM 1969). Some additional characters to those given in the key are as follows:

♂. 3.8-4.0 mm. Mesosoma as in Fig. 4a. Antenna (Figs. 4b,c), cylindrical, thick, flagellum with white, long, dense hairs, each segment having one row of longitudinal sensilla; scape 4 times, pedicel 1.4 times as long as wide. F_1 1.6 timeswider than pedicel, almost quadrate, F_2-F_7 subequal to each other, almost 1.4 times wider than long, club about 1.4 times as long as wide, C_1 and C_2 equal in length, twice as long as C_3. Pedicellus plus flagellum 3 times as long as scape. Forewing (Fig. 4d) 2.3 times as long as wide,

with basal cell hairy, speculum broad closed; costal cell hairy, 1.6 times as long as marginal vein, the latter 3.5 times as long as postmarginal vein; stigmal vein 0.7 times as long as postmarginal vein. Propodeun and petiole as in Fig. 4e.

♀. Unknown to us.

D i s t r i b u t i o n . Algeria (BOUČEK 1956); Caucasus (BOUČEK 1966); Czechslovakia (BOUČEK 1956; KALINA 1989) Sweden (HANSSON 1991; HEDQVIST 2003); Germany (FÖRSTER 1859); Central and Southern Europe (SPINOLA 1808; ERDÖS 1955; BOUČEK 1956a; 1965; 1966; DZHANOKMEN 1978; 2005), Kazakhstan (DZHANOKMEN 2005); North Africa (BOUČEK 1956b; 1965; 1966; GRAHAM 1969; DZHANOKMEN 1978; 2005); Russia (Moscow Oblast, Tselinograd Oblast) (DZHANOKMEN 1978; 2005); Transcaucasus (DZHANOKMEN 1978); Turkey (new record).

S t u d i e d m a t e r i a l : 2♂♂, Mucur, Kırşehir, 8.vi.2008, 39 02 N, 34 31 E, 3882 936 m, M. and O. Doğanlar, swept from wheat field, Deposited in Insect Collection of Mustafa Kemal University (MKUI).

B i o l o g y . Unknown, adults in May and June.

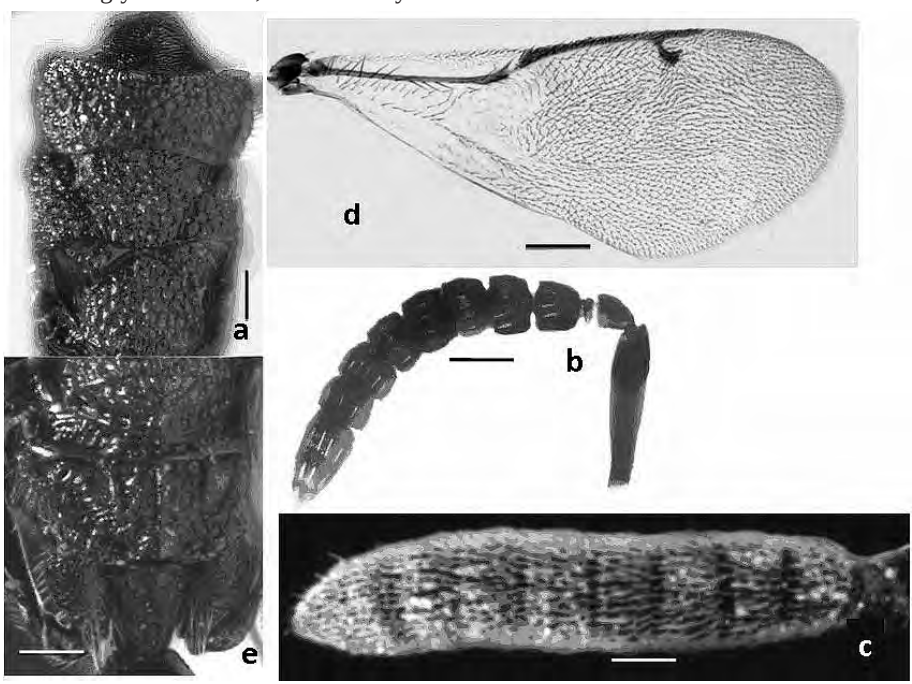

Fig. 4: *Chrysolampus splendidulus* (SPINOLA 1808). ♀: (**a**) pronotum and mesonotum in dorsal view; (**b**) antennae showing longitudinal sensilla; (**c**) pedicel and flagellum showing seatae; (**d**) forewing; (**e**) part of scutellum, propodeum and petiole. (scale bar for a, e = 0.2 mm; b= 0.1 mm; c = 0.07 mm; d= 0.23 mm).

***Chrysolampus gencerae* nov.sp. (Figs 5 a-d)**

D e s c r i p t i o n .

♀. 2.1 mm. Body with head and mesosoma dark green, with metallic reflection; antenna with scape and pedicel dark green, flagellum more weakly metallic; mandible and teeth dark brown medially yellow; legs concolorous with mesosoma, tarsi with basal two segments and apical segments infuscate, 3rd and 4th segments pale brown; wings hyaline, venation mainly testaceous.

Head in dorsal view almost 1.2 times as broad as mesoscutum, 2.3 times as broad as long; 1.2 times wider than height; POL 1.7 times OOL, posterior ocellus separated from eye by twice diameters; ocellar area finely reticulated behind and laterad of ocelli; lower edges of toruli distinctly above ocular line; malar space 0.2 times width of mouth opening and 0.2 times height of eye; face and frons finely reticulate. Antenna (Fig. 5b): scape extending almost to anterior ocellus; pedicel plus flagellum 2.3 times as long as scape, 0.9 times as long as breadth of head, 1.3 times as long as distance between eyes; scape 3.8 times and pedicel twice as long as wide; F_1 small, anelli form, 2.6 times as wide as long, 1.4 times as wide as pedicel, F_2 1.7 times, F_3-F_7 almost equal in length, about 2.1 times as wide as long, F_7 1.6 times wider and twice longer than F_1; number of longitudinal sensilla on flagellar segments as in Fig. 5b; clava twice as long as wide, C_1 and C_2 equal in length, about 1.3 times as long as C_3.

Mesosoma (Fig. 5a) in dorsal view 1.5 times as long as broad, and as wide as height. Pronotum with collar occupying 0.2 times its length, margined anteriorly by a fine but distinct carina; sculpture fine, on collar without piliferous punctures. Mesoscutum twice as broad as long, with transverse longitudinal carinae anteriorly, and coarse transverse carinulae medially, with coarse longitudinal rugae posteriorly, piliferous punctures fine and many, axillae almost touching each other, with longitudinal striae; scutellum slightly longer than wide, with fine, transverse striae, frenal groove distinct at about one-third median length of scutellum, frenum smooth. Propodeum (Fig. 5d) with distinct median carina, lateral to it with fine reticulation; spiracles ellipsoidal, almost a diameter far from metanotum. Forewing (Fig. 5 c) about 2.3 times as long as wide, with dense pilosity on basal cell and disk as in Fig. 5c; lengths costal cell: marginal vein: postmarginal: stigmal vein as 53: 41: 9: 7; stigma separated from posterior edge of postmarginal vein by 0.8 its own height.

Metasoma in dorsal view about 1.3 times as long as broad, 0.7 times as long as mesosoma and bluntly rounded posteriorly; tergites smooth. Petiole about twice as long as basal wide.

♂. Unknown.

S t u d i e d m a t e r i a l : Holotype: ♀, Sivas, 23.5.1989, L. Karamıhlıoğlu, Deposited in Insect Collection of Mustafa Kemal University (MKUI).

D i a g n o s i s . *Chrysolamus gencerae* nov.sp. similar to *C. thenae* in having F_1 small, anelli form with one longitudinal sensilla, but it differs from *C. thenae* by mesoscutum on anterior half transversally striated, and on posterior half 3-4 transverse carinulae (in *C. thenae* mesoscutum transversally striated on anterior half, and with some rugae on posterior part); forewing with speculum closed, basal cell with 5 rows of setae; costal cell with one and half complete rows of setae on under side, 6 setae on upper side apically (in

C. thenae forewing with speculum open; basal cell with 2 rows of setae; costal cell bare on upper side, with a complete row of setae on under side).

B i o l o g y . unknown.

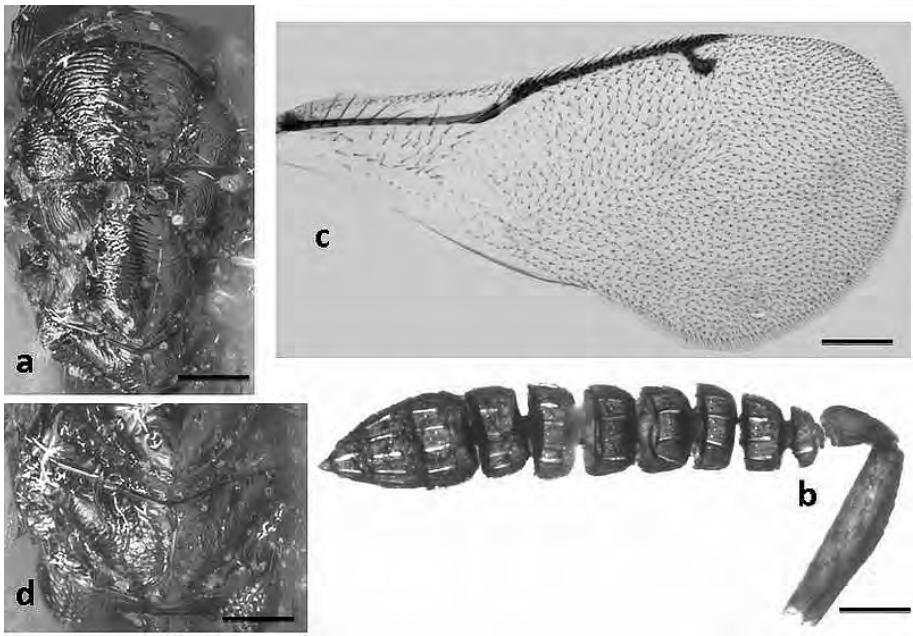

Fig. 5: *Chrysolampus gencerae* nov.sp. ♀. (**a**) mesosoma in dorsal view; (**b**) antennae showing longitudinal sensilla; (**c**) forewing; (**d**) part of scutellum and propodeum. (scale bar for a, c = 0.13 mm; b=0.07 mm; d= 0.15 mm).

Chrysolampus shurik (NIKOL'SKAYA 1952) (Figs 6a-d)

Elatus shurik NIKOL'SKAYA 1952: 200.

Chrysolampus shurik (NIKOL'SKAYA); KERRICH 1958: 82-84 (New combination for *Elatus shurik* NIKOL'SKAYA); BOUČEK 1956: 97; HEDQVIST 1975: 134.

T y p e m a t e r i a l : European part of U.S.S.R, presumably in Zoological Museum, Stalingrad (GRAHAM 1969).

R e m a r k s . The species were described in key characters by NIKOL'SKAYA (1952), and KERRICH (1958) provided its diagnostic characters and compared it with *C. thenae* and *C. rufitarsis*. Some additional diagnostic characters stated by the works mentioned above and to ones stated in the key are as follows:

♂. 2.1 mm. Head and mesonotum as in Fig. 6a.Sculptures and general appearance of propodeum, mesoscutum and scutellum as in Fig. 6c.Antennae with scape having broad area of sensory pores (Fig. 6b). The species is similar to *C. rufitarsis* in having propodeum (Fig. 6d) with some transverse carinulae crossing the median carina, but it differ by tarsi fuscous (in *C. rufitarsis* first two segments and pretarsi fuscous and 3rd

and 4th segments yellow); first funicular segment with 1 sensilla on one side, 2 on other side; F_2 with 3 sensilla on one side, 4 on other side; F_3 with 4, sensilla on both sides (in *C. rufitarsis* first funicular segment without sensilla; F_2-F_3 with 2 sensilla on both sides); petiole with lateral carinae concave, medially broader than apical and basal breath (in *C. rufitarsis* petiole with lateral carinae parallel to each other). It also differs from *C. rufitarsis* by the characters given in the key.

♀. Unknown to us.

Distribution. Czechoslovakia (BOUČEK 1968), Europe (DZHANOKMEN 1978), Moldova (BOUČEK 1961; 1965), Sweden (HEDQVIST 1975; 2003; HANSSON 1991), European part of USSR (NIKOL'SKAYA 1952; DZHANOKMEN 1978).

Studied material: 1♂, Lobau, Österreich, 9?.vi. 1935, determined by Dr. Z. Bouček, 1975, (Bouček collection, in Czech Republic).

Biology. Unknown.

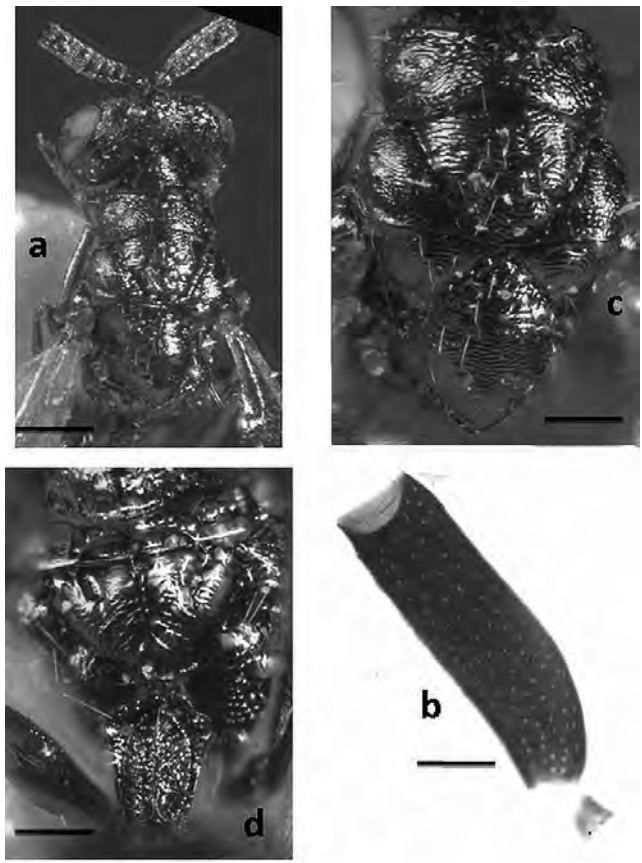

Fig. 6: *Chrysolampus shurik* (NIKOL'SKAYA 1952). ♂: (**a**) head and mesosoma in dorsal view; (**b**) scape; (**c**) pronotum and mesonotum; (**d**) propodeum and petiole. (scale bar for a = 0.21 mm; b= 0.04 mm; c = 0.12 mm; d= 0.08 mm).

***Chrysolampus akcakalenus* nov.sp. (Figs 7 a-d)**

D e s c r i p t i o n .

♀. 1.6-1.9 mm. Similar to *C. gencerae* nov.sp. in many respects. Some additional characters to that of *C. gencerae* and the diagnostic ones given in identification key as follows:

Head (Fig. 7a) in dorsal view 2.3 times as broad as long; POL 1.8 times OOL, posterior ocellus separated from eye by 2.5 diameters; malar space 0.2 times mouth opening and 0.3 times height of eye; sculpture of face and frons fine reticulate. Antenna (Fig. 7b) with scape extending about 0.8 times the distance from torulus to anterior ocellus; pedicel plus flagellum 2.3 times as long as scape, 0.7 times as long as breadth of head, almost as long as distance between eyes; scape 4.5 times as long as wide; F_1 small, anelli form, 1.3 times as wide as long, 0.8 times as wide as pedicel, F_2 twice as wide as long, F_7 twice wider than F_1; number of longitudinal sensilla on flagellar segments as in Fig. 7b.

Mesosoma 1.1 times wider than height. Pronotum with collar occupying 0.3 times its length, its carina fine. Mesoscutum as in Fig. 7a. Propodeum with distinct median carina, finely reticulated having some transverse carinae. Forewing about 2.4 times as long as wide, its pilosity as in Fig. 7c. Lengths costal cell: marginal vein: postmarginal: stigmal vein as 45: 35: 8: 6; stigma separated from posterior edge of postmarginal vein by 1.1 its own height. Scutellum as in Fig. 7d.

Metasoma in dorsal view about 1.3 times as long as broad, 0.8 times as long as mesosoma, bluntly rounded posteriorly; tergites smooth. Petiole of metasoma 1.3 times as long as basal wide.

♂. Unknown.

D i a g n o s i s . *Chrysolamus akcakalenus* nov.sp. also similar to *C. dortyolus* in having F_2 with two longitudinal sensilla on one side, but it differs from *C. dortyolus* in having $F_{5\text{-}6}$ with 4, F_7 with 5 sensilla on both side; C_1 with 5 sensilla on one side, 6 on other side (in *C. dortyolus* F_5 with 2 sensilla on both side; F_6 with 4 on one side, 3 on other side, F_7 with 3 sensilla on both side; C_1 with 3 sensilla on both side; basal cell with 3 rows of setae); and forewing with basal cell with 5 rows of setae; costal cell with two complete row of setae on under side (in *C. dortyolus* forewing with costal cell with one complete row of setae on under side, a half row on apical half).

S t u d i e d m a t e r i a l : Holotype: ♀, from Şanlıurfa to Akçakale 15 km, 26.ıv.2008, swept from wheat field, M. Doğanlar, deposited in Insect Collection of Mustafa Kemal University (MKUI). Paratype: 1♀, Adana, Karaisalı, swept from wheat field, M. and O. Doğanlar. Deposited in the Insect Collection of Mustafa Kemal University (MKUI).

B i o l o g y . Unknown.

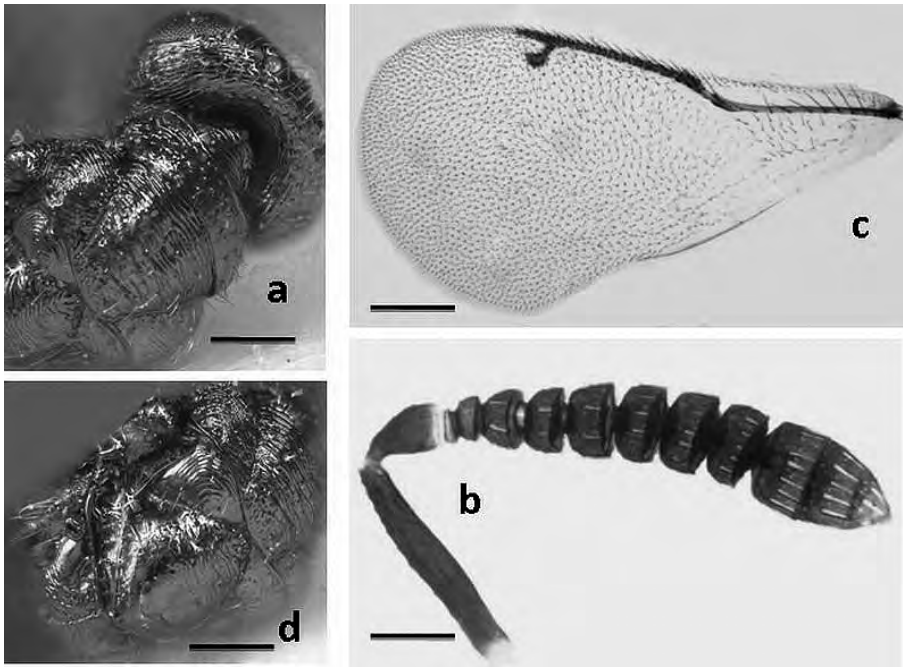

Fig. 7: *Chrysolampus akcakalenus* nov.sp. ♀: (**a**) head and mesosoma in dorsal view; (**b**) antenna showing longitudinal sensilla; (**c**) forewing; (**d**) part of mesoscutum and scutellum. (scale bar for a, d = 0.2 mm; b = 0.05 mm; c = 0.16 mm).

***Chrysolampus dortyolus* nov.sp. (Figs 8 a-d)**

D e s c r i p t i o n .

♀. 1.6 mm. Some additional characters to diagnostic ones given in identification key and the different ones from that of *C. akcakalenus* were given as follows:

Head in dorsal view almost as broad as mesoscutum, 2.3 times as broad as long; malar space 0.3 times mouth opening and 0.3 times height of eye; posterior ocellus separated from eye by 2 diameters; Antenna (Fig. 8b) with pedicel plus flagellum 1.9 times as long as scape, 0.7 times as long as breadth of head, 1.1 times as long as distance between eyes; scape 6 times, pedicel twice as long as wide; F_1 small, anelli form, twice as wide as long, as wide as pedicel, F_2 2.5 times as wide as long, F_3-F_7 gradually widening F_3 twice, F_7 2.4 times wider than long; F_7 2.2 timeswider than F_1 ; number of longitudinal sensilla on flagellar segments as in Fig. 7b.

Mesosoma (Fig. 7a) 1.6 times longer than width.Pronotum with collar occupying 0.3 times its length, its carina distinct. Mesoscutum and scutellumas in Fig. 7a. Forewing (Fig. 7c) about 2.2 times as long as wide, its pilosity as in Fig. 7c; lengths costal cell: marginal vein: postmarginal: stigmal vein as 50: 38: 8: 6; stigma separated from posterior edge of postmarginal vein by 1.5 its height. Propodeum as in Fig. 7d.

Metasoma in dorsal view about 1.2 times as long as broad, 0.9 times as long as mesonotum, bluntly rounded posteriorly; tergites smooth. Petiole (Fig. 7d) of metasoma 1.3 times as long as basal wide.

♂. Unknown.

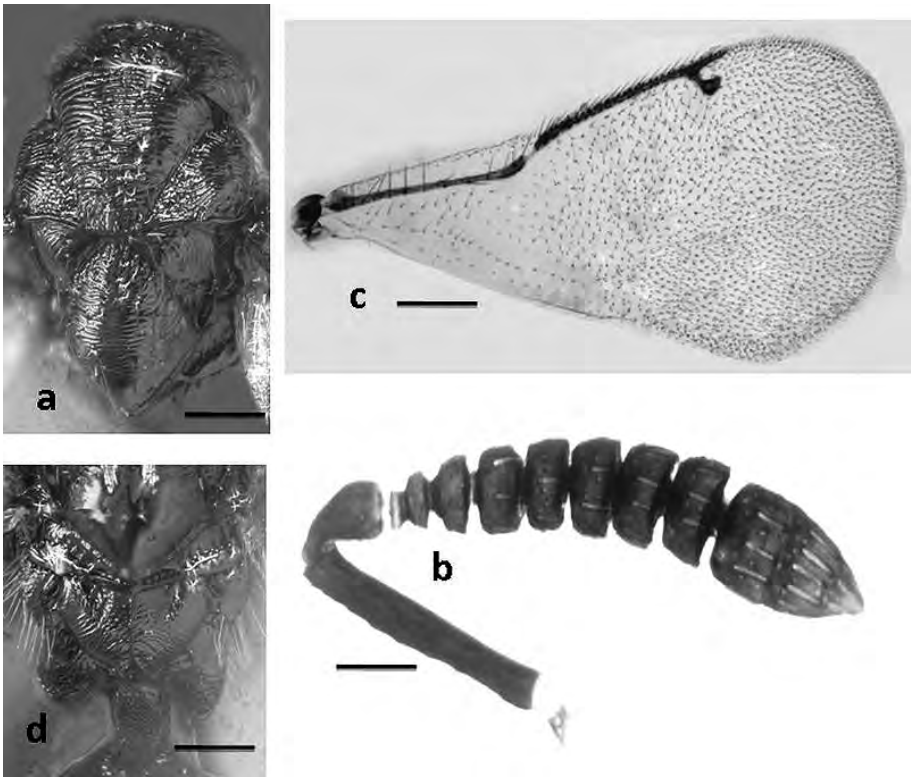

Fig. 8: *Chrysolampus dortyolus* nov.sp. ♀: (**a**) pronotum and mesonotum in dorsal view; (**b**) antenna showing longitudinal sensilla; (**c**) forewing; (**d**) part of scutellum, propodeum and petiole. (scale bar for a, d = 0.1 mm; b= 0.05 mm; c = 0.15 mm).

D i a g n o s i s . The new species is similar to *C. akcakalenus* nov.sp., and its discussions were given below that species.

S t u d i e d m a t e r i a l : Holotype: ♀, Hatay, from Dörtyol to Erzin 5 km, 14.ıv.2008, swept from *Sinapis* sp. M. Doğanlar, deposited in the Insect Collection of Mustafa Kemal University (MKUI). Paratype: 1♀, same data as holotype.

B i o l o g y . unknown.

***Chrysolampus adiyamanus* nov.sp. (Figs 9 a-d)**

D e s c r i p t i o n .

♀. 1.6 mm. Some additional characters to diagnostic ones given in identification key and the different ones from that of *C. dortyolus* were given as follows:

Head in dorsal view 1.2 times as broad as mesoscutum, 2.2 times as broad as long; 1.3 times wider than height; POL 1.5 times OOL, posterior ocellus separated from eye by 1.8 diameters; malar space 0.3 times mouth opening and 0.3 times height of eye. Antenna with scape extending about 0.8 times the distance from torulus to anterior ocellus; pedicel plus flagellum almost 2.3 times as long as scape, 0.6 times as long as breadth of head, as long as distance between eyes; scape 5.5 times, pedicel 1.7 times as long as wide; F_1 small, anelli form, 2.3 times as wide as long, and as wide as pedicel, F_2 1.8 times as wide as long, F_7 1.3 timeswider than F_1 ; number of longitudinal sensilla on flagellar segments as in Fig. 9b.

Mesosoma 1.5 times longer than width.Pronotum with collar occupying 0.3 times its length. Mesoscutum and scutellum as in Fig. 9a. Forewing about 2.2 times as long as wide, its pilosity as in Fig. 9 c. Lengths costal cell: marginal vein: postmarginal: stigmal vein as 46: 31: 8: 7; stigma separated from posterior edge of postmarginal vein by 1.5 its height. Propodeum as in Fig. 9d.

Metasoma in dorsal view about 1.2 times as long as broad, 0.9 times as long as mesonotum, bluntly rounded posteriorly; tergites smooth. Petiole (Fig. 9d) of metasoma 1.3 times as long as basal wide.

♂. Unknown.

D i a g n o s i s . *Chrysolampus adiyamanus* nov.sp. is similar to *C. besnilus* nov.sp. and *C. yayladagus* nov.sp. in having second funicular segments with two longitudinal sensilla on both side, but it differs from both species by F_3 with 2 sensilla on both sides and C_1 with 3 sensilla on one side, 4 other side (in both species F_3 with 3 sensilla at least on one sides and C_1 with 5-7 sensilla on both side).

S t u d i e d m a t e r i a l : Şanlıurfa, Bozova, Kangörmez, 24.ıv.2007, M. Doğanlar; Adıyaman, Side of Fırat river, 1♀, 24.ıv.2007, M. Doğanlar; Gaziantep, 2♀♀, from Nizip to Kargamış 25 km, 3♀♀, 23.ıv. 2008, swept from chick pea field, M. Doğanlar; Birecik, side of Fırat river, 1♀, 26.ıv.2008, deposited in the Insect Collection of Mustafa Kemal University (MKUI).

B i o l o g y : unknown.

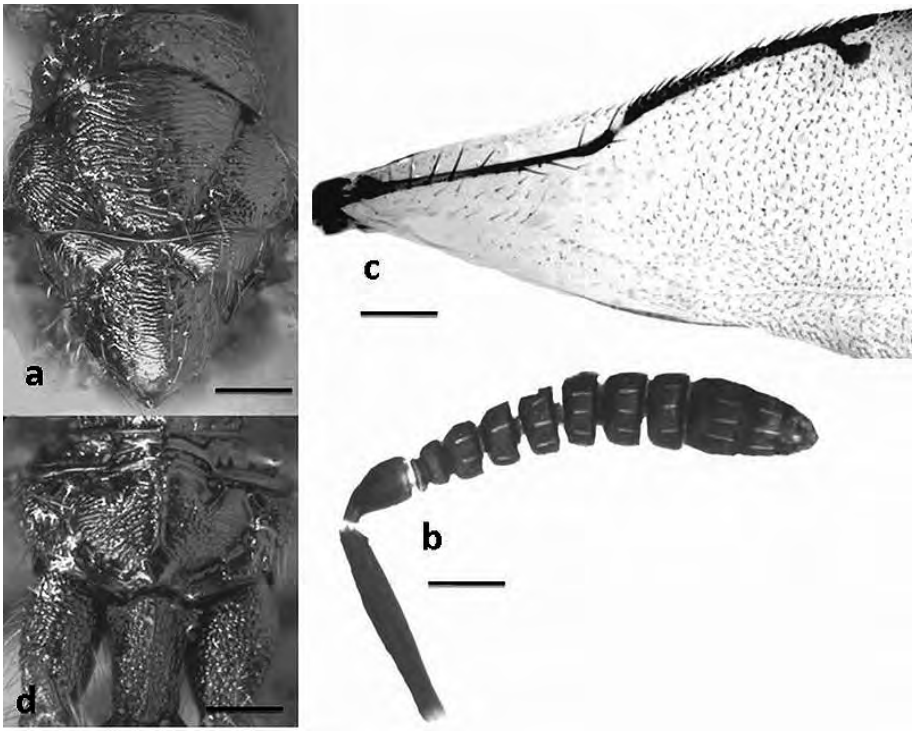

Fig. 9: *Chrysolampus adiyamanus* nov.sp. ♀: (**a**) mesosnotum in dorsal view; (**b**) antenna showing longitudinal sensilla; (**c**) forewing; (**d**) propodeum and petiole. (scale bar for a, d = 0.1 mm; b= 0.06 mm; c = 0.12 mm).

***Chrysolampus besnilus* nov.sp. (Figs 10 a-d)**

D e s c r i p t i o n .

♀. 1.4-1.6 mm.Some additional characters to diagnostic ones given in identification key and the different ones from that of *C. dortyolus* were given as follows:

Head in dorsal view 1.0 times as broad as mesoscutum, 2.1 times as broad as long; 1.2 times wider than height; POL 1.7 times OOL, posterior ocellus separated from eye by 2 diameters; malar space 0.3 times mouth opening and 0.3 times height of eye. Antenna (Fig. 10b) with scape extending about 0.7 times the distance from torulus to anterior ocellus; pedicel plus flagellum almost 2.4 times as long as scape, 0.8 times as long as breadth of head, 1.3 times as long as distance between eyes; scape 4.7-5.7 times, pedicel 1.4-1.6 as long as wide; F_1 small, anelli form, almost twice as wide as long, as wide as pedicel, F_2 twice as wide as long, F_3-F_7 gradually widening F_3 1.8, F_7 2.3-3.0 times wider than long; F_7 1.8 timeswider than F_1; number of longitudinal sensilla on flagellar segments as in Fig. 10b.

Mesosoma 1.6 times longer than width. Pronotum with collar occupying 0.2 times its length. Mesoscutum as in Fig. 10a. Forewing about twice as long as wide, its pilosity as in Fig. 10c; lengths costal cell: marginal vein: postmarginal: stigmal vein as 60: 46: 8: 8; stigma separated from posterior edge of postmarginal vein by its height. Scutellum as in Fig. 10d.

Metasoma in dorsal view about 1.1 times as long as broad, 0.7 times as long as mesonotum, bluntly rounded posteriorly; tergites smooth.Petiole (Fig. 10d) of metasoma 1.3 times as long as basal wide.

♂. Unknown.

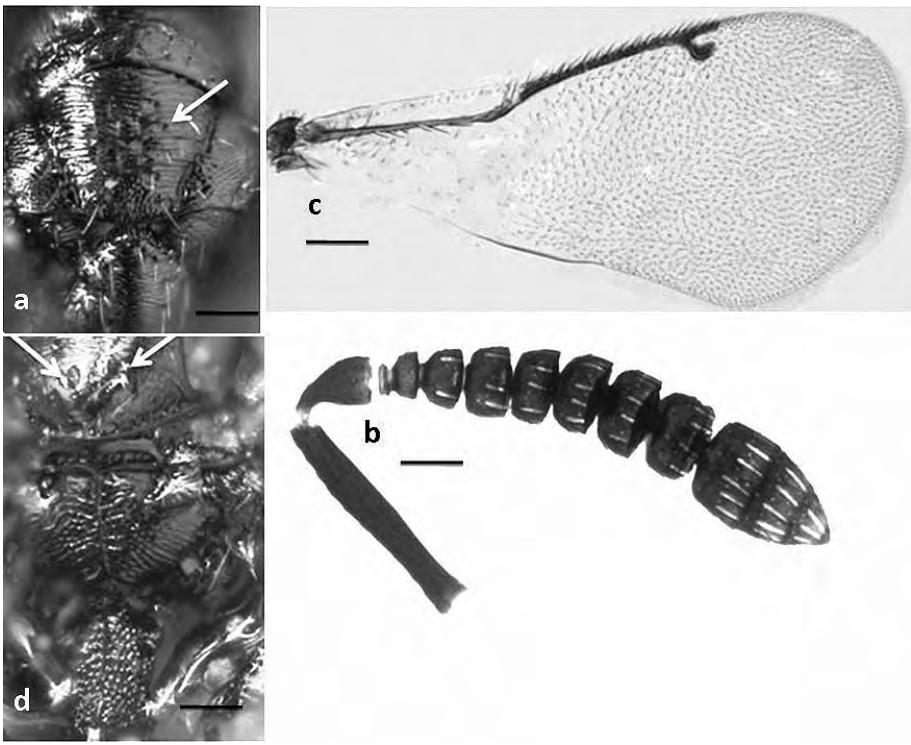

Fig. 10: *Chrysolampus besnilus* nov.sp. ♀: (**a**) pronotum and mesosnotum in dorsal view; (**b**) antenna showing longitudinal sensilla; (**c**) forewing; (**d**) apical of scutellum, propodeum and petiole. (scale bar for a, d = 0.12 mm; b= 0.06 mm; c = 0.18 mm).

D i a g n o s i s . The new species is similar to *C. yayladagus* nov.sp. in having F_3 with 3 sensilla at least on one sides, but it differs from *C. yayladagus* nov.sp. by F_{3-4} with 2 sensilla on one side, 3 on other side; F_{5-7} with 3-4 sensilla on one side, 4 on other side; C_1 with 5-6 on both side (in *C. yayladagus* nov.sp. F_{3-4} with 4 sensilla on both sides; F_5 with 3 sensilla on one side, 5 on other side; F_{6-7} with 6 sensilla on both sides; C_1 with 7 sensilla on both side; basal cell with 5 rows of setae); basal cell with 3 rows of setae (in *C. yayladagus* nov.sp. basal cell with 5 rows of setae); Mesoscutum transversally finely

striated, with 3-4 rows of coarse piliferous punctures medially, having distinct reticulation apically; scutellum with frenum having distinct piliferous punctures apically (in *C. yayladagus* nov.sp. mesoscutum having two rows of piliferous punctures, transversally striated with reticulation on anterior half, and 3-4 transverse carinulae on posterior half; scutellum with frenum smooth).

Studied material: Holotype. ♀, Adıyaman, Besni, Sağören, 20.v.2005, swept from Lent field, E. Çıkman, deposited in Insect Collection of Mustafa Kemal University (MKUI). Paratypes: 2♀♀, same data as holotype; 1♀, Kahta, Hasancık, 12.v.2005, swept from Lent field, E. Çıkman, deposited in the Insect Collection of Mustafa Kemal University (MKUI).

Biology: unknown.

***Chrysolampus yayladagus* nov.sp. (Figs. 11 a-e)**

Description.

♀. 1.7 mm. Some additional characters to diagnostic ones given in identification key and the different ones from that of *C. dortyolus* were given as follows:

Head in dorsal view 1.1 times as broad as mesoscutum, 2.4 times as broad as long; 1.2 times wider than height; POL 1.6 times OOL, posterior ocellus separated from eye by 2.2 diameters; malar space 0.3 times mouth opening and 0.3 times height of eye. Antenna distinctly clavate, having dense setae(Fig. 11b), with scape extending about 0.7 times the distance from torulus to anterior ocellus; pedicel plus flagellum almost 2.3 times as long as scape, 0.8 times as long as breadth of head, 1.2 times as long as distance between eyes; scape 4.8 times, pedicel 1.5 as long as wide; F_1 small, anelli form, 2.3 times as wide as long, almost as wide as pedicel, F_2 2.2 times as wide as long, F_3-F_7 gradually widening, F_3 1.5, F_7 1.8 times wider than long; F_7 1.5 timeswider than F_1; number of longitudinal sensilla on flagellar segments as in Fig. 11c.

Mesosoma 1.6 times longer than width. Pronotum with collar occupying 0.2 times its length.Mesoscutum and scutellum as in Fig. 11a. Forewing about 2.4 times as long as wide, its pilosity as in Fig. 11d. Lengths costal cell: marginal vein: postmarginal: stigmal vein as 66: 52: 12: 8; stigma separated from posterior edge of postmarginal vein by 1.5 its height. Propodeum (Fig. 11e) with median carina basal half, area between spiracles finely reticulated.

Metasoma in dorsal view about 1.3 times as long as broad, 0.8 times as long as mesonotum, bluntly rounded posteriorly; tergites smooth.Petiole of metasoma 1.3 times as long as basal wide.

♂.Unknown.

Diagnosis. The new species is similar to *C. besnilus*, and its discussions were given below that species.

Studied materials: Holotype: ♀, Yayladağ, Hatay, 13.ıv. 2008, M. Doğanlar. Paratype: 1♀, same data as holotype, M. Doğanlar, deposited in the Insect Collection of Mustafa Kemal University (MKUI).

Biology: unknown.

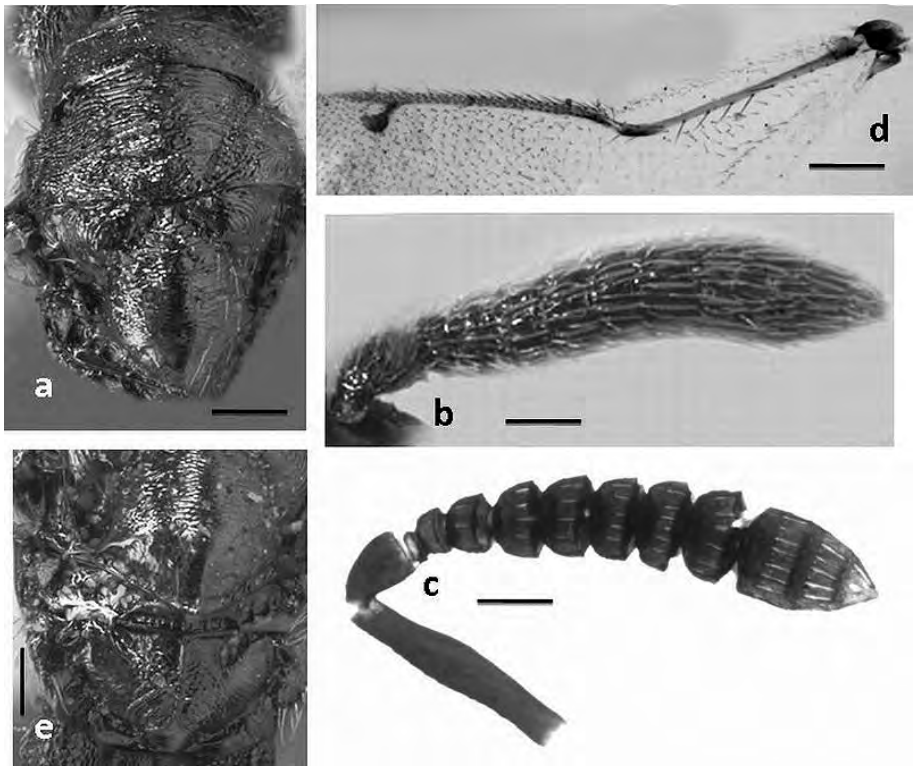

Fig. 11: *Chrysolampus yayladagus* nov.sp. ♀: (**a**) pronotum and mesosnotum in dorsal view; (**b**) pedicel and flagellum with setae; (**c**) antenna showing longitudinal sensilla; (**d**) forewing; (**e**) apical half of scutellum and propodeum. (scale bar for a = 0.14 mm; b = 0.06 mm; c = 0.08 mm; d= 0.18 mm; e= 0.1 mm).

Chrysolampus rufitarsis (FÖRSTER 1859) (Figs 12 a-e)

Elatus rufitarsis FÖRSTER 1859: 111-113,
Elatus rufitarsis FÖRSTER; RUSCHKA 1924: 95, 96, united with *Chrysolampus* by BOUČEK (1956).
Chrysolampus rufitarsis (FÖRSTER) was recorded by several authors (KERRICH 1958; FERRIERE & KERRICH 1958)

T y p e m a t e r i a l : Syntypes, ♂ from Aachen, ♀ from Tyrol, in coll. Förster (Naturhistorisches Museum, Vienna).

R e m a r k s . The both sexes of species were described from Achen and Tyrol by FÖRSTER (1859) and compared with *C. thenae* in detail. Some diagnostic characters were given by several works (RUSCHKA 1924; KERRICH 1958; GRAHAM 1969; BOUČEK 1972). Some additional characters beside the literature and mentioned in the key are as follows:

♀. 2.2-2.5 mm.Head in lateral view 1.7 times as high as long. Antenna (Fig. 12b) with scape 5.3-5.7 times as long as wide, pedicel almost 1.5 times as long as wide, F_1 as wide as pedicel, F_1 twice as wide as long, flagellum gradually widening, F_2 1.8 times, F_7 2.4-2.8times wider than long, F_7 1.8 times wider than F_1; club 1.5 times as long as wide, C_1 1.4 times as long as C_2, the latter almost as long as C_3. Number of longitudinal sensilla on flagellar segments as in Fig. 12b. Pedicel plus flagellum 2.5 times as long as scape, and1.5 times length of eye. Mesoscutum (Fig. 12a) transversally and broadly striated on anterior half, with some fine reticulation and piliferous punctures on posterior part. Forewing (Fig. 12c) 2.5 times as long as wide, with costal cell 1.3 times as long as marginal vein, the latter 5.3 times as long as postmarginal vein; stigmal vein almost 0.7 times as long as postmarginal vein. Propodeum (Fig. 12d) on either side of the median carina, irregularly sculptured, nearly always with 3-4 transverse carinulae crossing the median carina; the area between the basal pits and the spiracles very shiny, smooth.

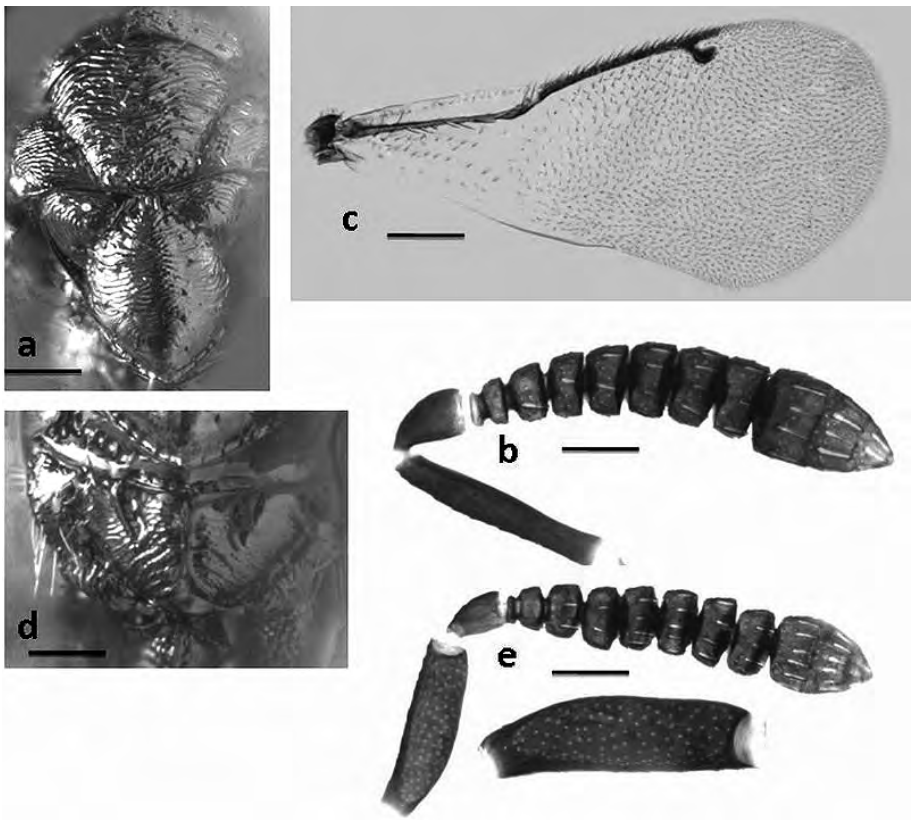

Fig. 12: *Chrysolampus rufitarsis* (FÖRSTER 1859). ♀: a-d: (**a**) pronotum and mesosnotum in dorsal view; (**b**) antenna showing longitudinal sensilla; (**c**) forewing; (**d**) propodeum; (**e**) ♂ antenna showing longitudinal sensilla. (scale bar for a = 0.14 mm; b= 0.07 mm; c= 0.19 mm; d = 0.12 mm; e= 0.9 mm and for scape 0.04 mm).

♂. 2.1-2.3 mm. Similar to female except as follows: Antenna (Fig. 12e) with scape 3.6 times as long as wide, having broad area of sensory pore, except basal part; pedicel 1.5 times as long as wide, F_1 1.2 times wider than pedicel, F_1-F_2 almost twice as wide as long, F_3-F_5 2.3 times, F_6-F_7 2.8 times as wide as long, F_7 about 1.6 times wider than F_1. Pedicellus plus flagellum 2.3 times as long as scape.

D i s t r i b u t i o n . Britain, Germany, Austria, Czechoslovakia, U.S.S.R. (GRAHAM 1969; BOUČEK 1972).

S t u d i e d m a t e r i a l : 3♀♀, Adana, Center, 4.vi.1980, A. Beyarslan; 1♀, Erzurum, Tortum, 6.vii. 1984, M. Doğanlar; 6♀♀, 6♂♂, Taşlıçiftlik, Tokat, 28.iv.-2.v.1989; H. Çam; 1♀, Gaziantep, Araban, Gelinbuğday, 37 20 N, 37 34 E, 719 m, 23.iv.2007, swept from wheat field, M. Doğanlar, deposited in the Insect Collection of Mustafa Kemal University (MKUI).

B i o l o g y . Unknown.

Chrysolampus thenae (WALKER 1848) (Figs 13 a-e)

Elatus Thenae WALKER 1848: 104, 154. Recorded also by RUSCHKA (1924) and by NIKOL'SKAYA (1952); united with *Chrysolampus* by BOUČEK (1956).

Perilampus obscurus WALKER 1874: 314. synonymized with *Chrysolampus thenae* (WALKER) by KERRICH (1958).

Chrysolampus thenae (WALKER) was recorded by KERRICH (1958) and by FERRIERE & KERRICH (1958)

T y p e m a t e r i a l : *Elatus thenae* WALKER. Type ♂ (probably holotype), Type Hym.5. 1685, bearing a Waterhouse label, also another "Type GAHAN 1927" (GRAHAM 1969).

R e m a r k s . The both sexes of species were described from Austria by RUSCHKA (1924) and some diagnostic characters were given by KERRICH (1958), GRAHAM (1969) and BOUČEK (1972). Some additional characters beside the literature and mentioned in the key are as follows:

♀. 2.2-2.7 mm. Head in lateral view 1.9 times as high as long. Pronotum and mesoscutum as in Fig. 13a. Antenna (Fig. 13b) with scape 5.0-5.5 times as long as wide, pedicel 1.3 times as long as wide, F_1 as wide as pedicel, F_1-F_7 almost twice as wide as long, F_2-F_3 1.3 times, F_4-F_7 1.5 times wider than F_1; club 1.7 times as long as wide, C1 1.2 times as long as C2, the latter almost as long as C3.Number of longitudinal sensilla on flagellar segments as in Fig. 13b.Pedicel plus flagellum 2.5 times as long as scape, and 1.4 times length of eye. Forewing (Fig. 13c) 2.2 times as long as wide, with costal cell 1.4 times as long as marginal vein, the latter 5 times as long as postmarginal vein; stigmal vein almost 0.8 times as long as postmarginal vein. Propodeum and petiole as in Fig. 13d.

♂. 2.1-2.3 mm. Similar to female except as follows: Antenna (Fig. 13e) with scape 4.7 times as long as wide, pedicel 1.4 times as long as wide, F_1 1.6 times wider than pedicel, F_1-F_7 almost twice as wide as long, gradually widening towards apical, F_7 about 1.3 times wider than F_1. Pedicellus plus flagellum twice as long as scape.

D i s t r i b u t i o n : Britain, Sweden, Germany, Austria, Czechoslovakia, Hungary, U.S.S.R., Siberia (GRAHAM 1969); Turkey (DOĞANLAR 1984; ÖNCÜER 1991).

Studied material: Erzurum, 1♀, 1♂, 27.vi.1978, swept from *Medicago* field, H. Özbek; 1♀, 1♂, 26.iv.1979, swept from *Medicago* field, M. Doğanlar; 1♂, 17.vi.1984, M. Doğanlar; 2♀♀, Adana, 19.iv.2006, swept from *Sinapis* sp., M. and O. Doğanlar; 6♀♀, 6♂♂, Diyarbakır, Hilvan, Aslanköy, 5.v.2006, swept from *Onobrycis* field, M. Doğanlar, deposited in the Insect Collection of Mustafa Kemal University (MKUI).

Biology. GRAHAM (1969) gave the following knowledge: reared in Britain as a parasite of *Meligethes pedicularius* (GYLL.) by Dr. A.M. Easton, and Dr. Easton stated that mature host larvae collected from *Stachys officinalis* (L.). Adults in April-June.

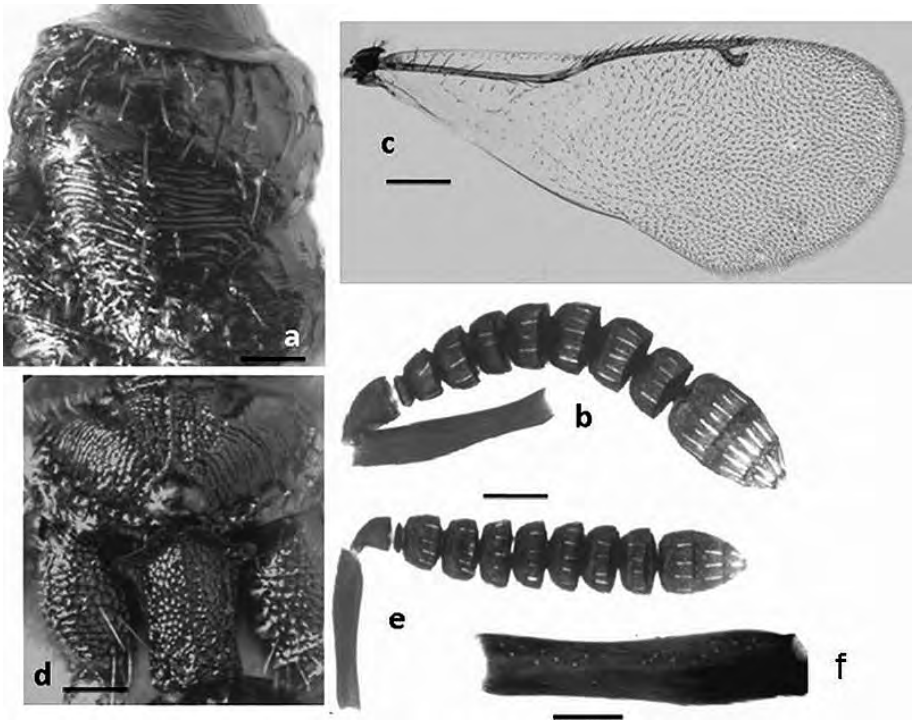

Fig. 13a-f: *Chrysolampus thenae* (WALKER 1848). a-d ♀: (**a**) pronotum and mesoscutum in dorsal view; (**b**) antenna showing longitudinal sensilla; (**c**) forewing; (**d**) propodeum and petiole; e, f. ♂: (**e**) antenna showing longitudinal sensilla; (**f**) scape with sensory pores. (scale bar for a,d = 0.1 mm; b, e=0.08 mm; c = 0.2 mm; f=0.04 mm).

Brachyelatus HOFFER & NOWICKY 1954

Brachyelatus HOFFER & NOWICKY 1954: 110. Type-species: *B. viridis* HOFFER & NOWICKY, by monotypy and original designation.

Brachyelatus HOFFER & NOWICKY; PECK et al.1964: 26; ZEROVA 1970: 936-939; BOUČEK 1972: 103.

Brachyelatus viridis HOFFER & NOWICKY 1954 (Figs 14 a-f)

Brachyelatus viridis HOFFER & NOWICKY 1954: 110-111. Type material. Holotype ♀, Czechoslovakia, Moravia, Cejc, 1940 (A. Hoffer), in coll. Hoffer, Prague.
Chrysomalla viridis (HOFFER & NOWICKY); ERDÖS 1955: 39.
Brachyelatus viridis HOFFER & NOWICKY; BOUČEK 1972: 103-104.

T y p e m a t e r i a l . Holotype ♀, Czechoslovakia, Moravia, Cejc, 1940 (A. Hoffer), in coll. Hoffer, Prague (GRAHAM 1969).

The both sexes of species were described in detail from Czechoslovakia, Prague by HOFFER & NOWICKY (1955) and some diagnostic characters were given by BOUČEK (1972). Some additional characters beside the literature and mentioned in the key are given as follows:

♀. 2.2-3.1 mm. Head (Fig. 14a) in lateral view 1.4 times as high as long. Antenna (Fig. 14b) almost as long as length of eye, with scape 5.3 times as long as wide, pedicel twice as long as wide, F_1 narrower than pedicel, F_1-F_7 almost twice as wide as long, F_2-F_7 1.3 times longer and wider than F_1; club 1.7 times as long as wide, C_1 1.2 times as long as C_2, the latter 1.3 times as long as C_3. Number of longitudinal sensilla on flagellar segments as in Fig. 14b.Pedicel plus flagellum 2.4 times as long as scape. Mesonotum (Fig. 14c) with almost transverse engraved reticulation, having some piliferous puncture; scutellum with longitudinal engraved sculpture, frenum finely indicated medially, with some fine longitudinal rugae. Propodeum (Fig. 14d) without distinct median carina, but with 3 line of carina on posterior half. Forewing (Fig. 14e) with costal cell 2.2 times as long as marginal vein, the latter 1.4 times as long as postmarginal vein; stigmal vein almost 0.5 times as long as postmarginal vein

♂. 2.2-2.4 mm. Similar to female except as follows: Antenna (Fig. 14f) with scape twice as long as wide, pedicel 1.3 times as long as wide, F_1 wider than pedicel, almost twice as wide as long, Pedicellus plus flagellum 2.5 times as long as scape.

D i s t r i b u t i o n . Southern Czechoslovakia, Austria (HOFFER & NOWICKY 1954; GRAHAM 1969), Hungary (ERDÖS 1955), Moldavia, Ukraine, Crimea, Azerbaidzhan (ZEROVA 1970) .

M a t e r i a l s t u d i e d : Turkey: Kırıkkale, 3♀♀, 2♂♂, 21.v.2008 (O. Doğanlar); Niğde, 2 fm, 21.v.2008; Karaman, 14♀♀, 5♂♂, 23.iv.2011, (M. Doğanlar), deposited in the Insect Collection of Mustafa Kemal University (MKUI).

B i o l o g y . Unknown. The specimens swept from pasture with some Fabaceae and Poaceae.

Elatomorpha ZEROVA 1970

Elatomorpha ZEROVA 1970: 937. Type-species: *E. deserticola* ZEROVA 1970: 937-939, by original designation and monotypy.
Elatomorpha ZEROVA 1970; BOUČEK 1972: 104-105.

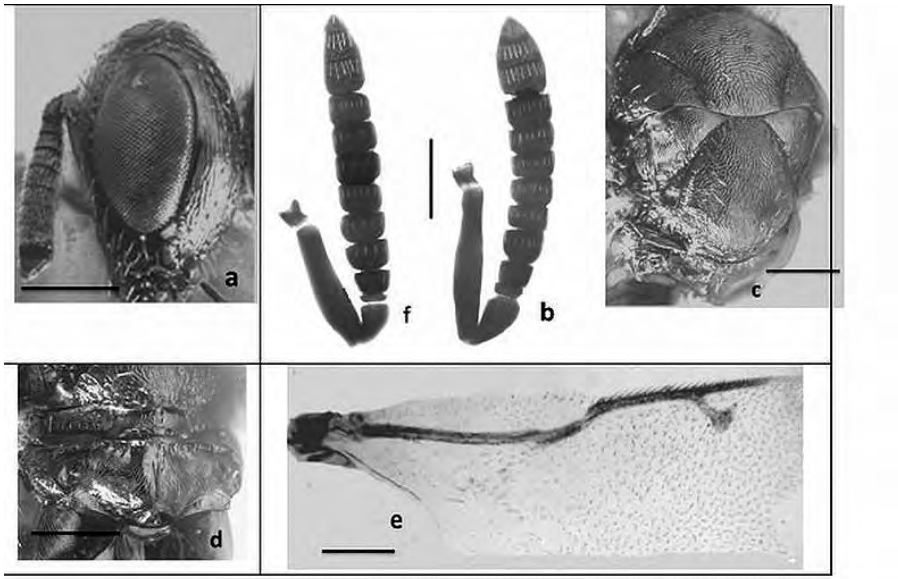

Fig. 14a-f: *Brachyelatus viridis* HOFFER & NOWICKY 1954. ♀ a-e: (**a**) head; (**b**) antenna showing longitudinal sensilla; (**c**) mesoscutum in dorsal view; (**d**) propodeum; (**e**) forewing; (**f**) ♂ antenna showing longitudinal sensilla. (scale bar: a, f = 0.125 mm, others= 0.25 mm).

Elatomorpha nurdagica nov.sp. (Figs 15 a-f)

D e s c r i p t i o n .

♀. Length of body 1.9 mm Body (Fig. 15a) dark green, including antennae and legs, except tips of tibiae pale brown, tarsi fuscous, middle segments usually pale brown. Wings hyaline, venation dark brown.

Head as broad as mesoscutum, in dorsal view about 2.4 times as broad as long. Relative measurements: head width 60, length 25, height 66, eye 30: 22, malar space 10, width of frons 42, OOL 12, POL 15, scapus 19: 4, flagellum plus pedicellus combined length 42. Genae in facial view moderately converging, straight.Mouth almost as wide as distance between eyes above.Face finely striate. Lower edge of antennal toruli only slightly below lower ocular line. Antenna (Fig. 15b) with scape almost reaching upper ocular line, enlarged distally, about 1.2 times wider than basal wide. Pedicellus dorsally 1.3 times longer than broad. Flagellum clavate, anellus short, 3.5 times as broad as long; funicular segments very densely shortly hairy, gradually widening and lengthening, F_1 2.7, $F_2$3.6, F_3-F_4 2.5, F_5 2.2, F_6-F_7 about twice as broad as long; clava about 3.7 times as long as broad, C_1 1.6 times longer than C_2. Number of longitudinal sensilla on flagellar segments: F_1-F_2 0, F_3 2, F_4-F_5 3, F_6 5, F_7 4, C_1-C_2 10, C_3 4 (Fig. 15c).

Mesosoma (Fig. 15d) slightly depressed dorsally, almost twice as long as high (in lateral view), with mesoscutum weakly convex, scutellum almost flat along median line, its

apex slightly protruding above the short and subvertical metanotum. Scutellum (Fig. 15d, f) anteriorly narrowed to a point, not quite reaching mesoscutum; apically narrowly rounded; frenum indicated only by longitudinal striation laterally. Internal corners of axillae also reticulate. Propodeum (Fig. 15f) dull, wholly finely reticulate-punctured, without median carina; sclerite fairly convex transversely; spiracles round, small and removed from metanotum by about diameters. Pleurae with upper part of mesepistenum almost smooth, lower part distinctly reticulate, finer towards midcoxae; mesepimeron reticulate, groove continuing as a straight line towards prepectus; the latter large, triangular, with distinctly raised margins, reticulate all over, about as wide as length of tegula. Forewing 2.2 times as long as broad. Forewing venation as in Fig. 15e. Relative lengths: costal cell 55, marginal vein 25, postmarginal vein 5, stigmal vein 7. Pilosity dense (except for bare basal one third of wing) but extremely short; also marginal ciliation reduced, perceptible only posteriorly and even there very short.

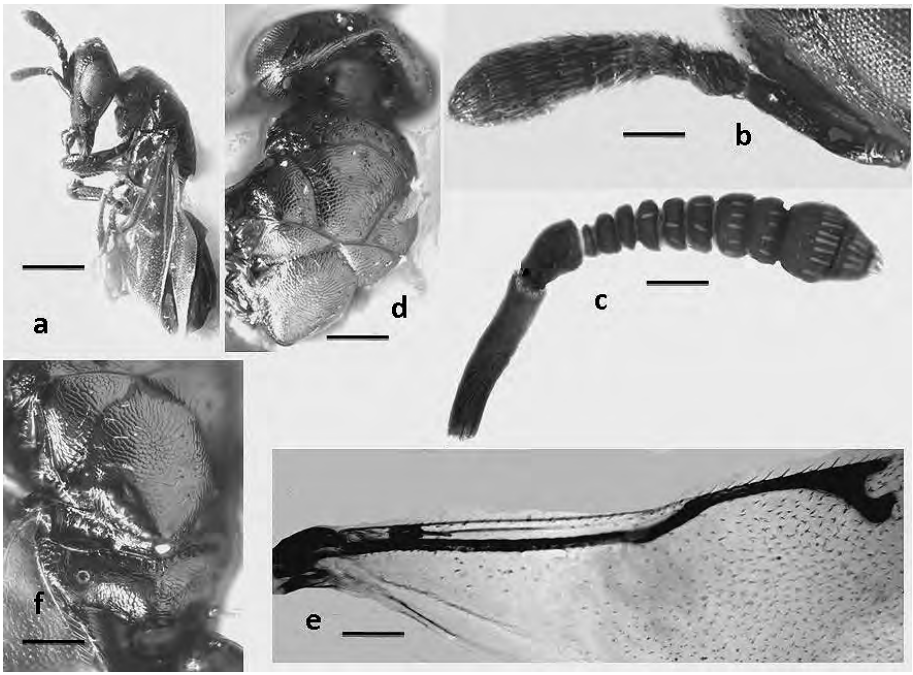

Fig. 15a-f: *Elatomorpha nurdagica* nov.sp. ♀: (**a**) body general appearance; (**b**) antenna with setae; (**c**) antenna showing longitudinal sensilla; (**d**) head and mesoscutum in dorso-lateral view; (**e**) basal part of forewing; (**f**) scutellum and propodeum. (scale bar: a = 0.33; b=0.07 mm; c=0.06 mm; d= 0.16 mm; e,f = 0.1 mm).

Metasoma rather shiny, with transverse alutaceous sculpture.Hind margin of first tergum entire, the tergum nearly as long as broad.

♂. Unknown.

S t u d i e d m a t e r i a l : Holotype ♀: Turkey, Gaziantep, Nurdağ, 06.v.2006; deposited in the Insect Collection of Mustafa Kemal University (MKUI).

D i a g n o s i s . *Elatomorpha nurdagica* nov.sp. similar to *E. obscura* BOUČEK 1972 in having Forewing venation dark and mesosoma slightly flattened, about 2.2 times as long as high. But it differs from *E. obscura* by propodeum without median carina and spiracles removed from metanotum by own diameter (in *E. obscura* propodeum with median carina anteriorly and spiracles removed from metanotum by twice own diameter); upper part of mesepisternum smooth and prepectus triangular, as long as tegulae (in *E. obscura* upper part of mesepisternum reticulate and prepectus almost half-moon-shaped, longer than tegulae).

B i o l o g y . unknown. The specimen was swept from wheat field.

Acknowledgements

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References

ASKEW R.R., BLASCO-ZUMETA J. & J. PUJADE-VILLAR (2001): Chalcidoidea and Mymarommatoidea (Hymenoptera) of a *Juniperus thurifera* L. forest of Los Monegros region, Zaragosa. – Monog. Soc. Entomol. Aragonesa **4**: 16.

BOUČEK Z. (1956a): Chalcidologické poznamky III, Torymidae, Pteromalidae, Perilampidae a Eucharitidae. – Acta Entomol. Mus. Nat. Pragae **30** (462): 305-330.

BOUČEK Z. (1956b): Notes on Czechoslovak Perilampidae (Hymenoptera - Chalcidoidea). – Acta Faun. Entomol. Mus. Nat. Pragae **1**: 83-89.

BOUČEK Z. (1961): Notes on the chalcid fauna (Chalcidoidea) of Moldavian SSR. – Tru. Moldavsko. Nauc.-Issle. Ins. Sadovo., Vinog. Vinod. Kishinev. **7**: 5-30.

BOUČEK Z. (1965): A review of the Chalcidoid fauna of the Moldavian SSR, with descriptions of new species (Hymenoptera). – Sbor. Faun. Pra. Entomol. Odd. Nár. Mus. Praze **11**: 5-37.

BOUČEK Z. (1966): Materialy po faune chalcid (Hymenoptera, Chalcidoidea). – Moldavskoy SSR. 2. Tru. Moldavsko. Nauc.-Issle. Ins. Sadovo., Vinog. Vinod.. Kishinev **13**: 18-24.

BOUČEK Z. (1968): Contributions to the Czechoslovak fauna of Chalcidoidea (Hym.). – Acta Faun. Entomol. Mus. Nat. Pragae **12**: 235-246.

BOUČEK Z. (1972): Mediterranean Perilampidae: *Euperilampus* and genera allied to *Chrysomalla* (Hym., Chalcidoidea). – Mitt. Münch. Entomol. Ges. **61**: 90-107.

BOUČEK Z. (1978): A generic key to Perilampinae (Hymenoptera, Chalcidoidea) with a revision of *Krombeinius* n.gen. and *Euperilampus* WALKER. – Ent. Scan. **9**: 299-307.

BOUČEK Z. (1983): Perilampidae (Hymenoptera) of Mongola, from Dr. Z. Kaszab's expeditions. – Acta Zool. Acad. Sci. Hung. **29**: 107-121.

BOUČEK Z. (1988): Australasian Chalcidoidea (Hymenoptera). A biosystematic revision of genera of fourteen families, with a reclassification of species. – CAB International, Wallingford, Oxon, U. K., Cambrian News Ltd; Aberystwyth, Wales.

BOUČEK Z. & J.Y. RASPLUS (1991): Illustrated key to West-Palaearctic genera of Pteromalidae (Hymenoptera: Chalcidoidea): 140 pp. – Institut National de la Recherche Agronomique, Paris.

BURKS B.D. (1979): Torymidae (Agaoninae) and all other families of Chalcidoidea (excluding Encyrtidae). – In: KROMBEIN K.V., HURD P.D. jr., SMITH D.R. & B.D. BURKS (eds), Catalog of Hymenoptera in America North of Mexico **1**: 748-749, 768-889, 967-1043. Smithsonian Institute Press, Washington, D.C.

CRAWFORD J.C. (1914): The species of Perilampidae of America north of Mexico. – Proc. entom. Soc. Wash. **16** (2): 69-76.

DALLA TORRE K.W. von (1898): Catalogus Hymenopterorum hucusque descriptorum systematicus et synonymicus. V. Chalcididae et Proctotrupidae. – Leipzig, 598 pp.

DARLING D.C. (1986): Revision of the New World Chrysolampinae (Hymenoptera: Chalcidoidea). – Can. Ent. **118** (9): 934-936.

DARLING D.C. (1988a): Comparative morphology of the labrum in Hymenoptera: the digitate labrum of Perilampidae and Eucharitidae (Chalcidoidea). – Can. J. Zool. **66** (12): 2811-2835.

DARLING D.C. (1988b): A review of the genus *Krombeinius* (Hymenoptera: Perilampidae) with a reexamination of generic limits and phylogenetic relationships and the descriptions of two new species. – J. New York Entomol. Soc. **96**: 63-81.

DARLING D.C. (1997): Perilampidae. – In: GIBSON G.A.P., HUBER J. T. & J.B. WOOLLEY (eds), Annotated keys to the genera of Nearctic Chalcidoidea (Hymenoptera). Ottawa, NRC press, Canada: 534-540.

DARLING D.C. & T.D. MILLER (1991): Life history and larval morphology of *Chrysolampus* (Hymenoptera: Chalcidoidea: Chrysolampinae) in western North America. – Can. J. Zool. **69** (8): 2168-2177.

DOĞANLAR M. (1984): Notes on Chalcidoidea of Turkey. I. Chalcididae, Eurytomidae, Torymidae, Ormyridae, Perilampidae, Eucharitidae. – Türk. Bit. Kor. Derg. **8** (3): 151-158.

DOĞANLAR M. & O. DOĞANLAR (2012): Palearctic species of *Chrysomalla* FÖRSTER (Hymenoptera: Perilampidae: Chrysolampinae), with descriptions of new species from Turkey. – Turk. J. Ent. **36** (4): 521-533.

DZHANOKMEN K.A. (1978): Hymenoptera III. Chalcidoidea 5. Pteromalidae. – Op. Nas. Europ. Chas. SSSR, pp. 224-226.

DZHANOKMEN K.A. (2005): Synoptic list of the Pteromalidae (Hymenoptera, Chalcidoidea) from Kazakhstan and middle Asia. – Tet. Entomol. Res. **11**: 65.

ERDÖS J. (1946): Additamento ad cognitionem faunae chalcidoidarm (Hym.) in alveo Carpathorum I. – Frag. Faun. Hung. **9** (3/4): 47-58.

ERDÖS J. (1955a): Magyarország Allatvilága. XII. Kötet. Hymenoptera II. 2. – Füzet. Fémfürkészek I. Chalcidoidea I. Faun. Hung. **2** (2): 39-45.

ERDÖS J. (1955b): Studia chalcidologica hungarica. – Ann. Hist.-Nat. Mus. Nat. Hung. (Ser. Nov.) **6**: 283-289.

FERRIERE C. & G.J. KERRICH (1958): Hymenoptera 2. Chalcidoidea. Section (a) Agaontidae, Leucospidae, Chalcididae, Eucharitidae, Perilampidae, Cleonymidae and Thysanidae. – Handb. Iden. Brit. Ins. **8** (2) (a): 1-40.

FÖRSTER A. (1859): Zweite Centurie neuer Hymenopteren. – Verh. Nat. Ver. Preuss. Rhein. Westfal., Bonn **16**: 113.

GRAHAM M.W.R. de V. (1969): The Pteromalidae of north-western Europe (Hymenoptera: Chalcidoidea). – Bull. Brit. Mus. (Nat. Hist.) (Ent.) Suppl. **16**, 908 pp.

GIBSON G.A.P. (1997): Morphology and terminology.Chapter 2. – In: GIBSON G.A.P., HUBER J.T. & J.B. WOOLLEY (eds), Annotated Keys to the Genera of Nearctic Chalcidoidea (Hymenoptera). NRC Research Press, Ottawa, pp. 16-44.

HANSSON C. (1991): A catalogue of Chalcidoidea described by C.G. Thomson, with a checklist of Swedish species. – Ent. Scan. Suppl. **38**: 49.

HEDQVIST K.J. (1975): Notes on Chalcidoidea. VIII. The Swedish Chrysolampini with description of a new genus and species (Hym., Chalcidoidea, Pteromalidae). – Ent. Tids. **96** (3-4): 133-136.

HEDQVIST K.J. (2003): Katalog över svenska Chalcidoidea. – Ent. Tids. **124** (1-2): 97-114.

HERATY J.M. & D.C. DARLING (2007): A new genus and species of Perilampidae (Hymenoptera: Chalcidoidea) with uncertain placement in the family. – J. ent. Soc. Ont. **138**: 33-47.

HOFFER A. & S. NOWICKY (1954): Families Eucharididae and Perilampidae (Hym., Chalcidoidea) in Czecholsovakia. – Sbor. Faun. Pra. Entomol. Odd. Nár. Mus. Praze **29**: 105-112.

KALINA V. (1989): Checklist of Czechoslovak Insects III (Hymenoptera). Chalcidoidea. – Acta Faun. Entomol. Mus. Nat. Pragae **19**: 95-103.

KERRICH G.J. (1958): Systematics notes on Perilampidae (Hym., Chalcidoidea). – Op. entomol. **23**: 77-84.

NIKOL'SKAYA M. (1952): Chalcids of the fauna of the USSR (Chalcidoidea). – Opr. Faun. SSSR **44**: 199-200.

NIKOL'SKAYA M.N. & N.N. KYAO (1954): Chalcid fauna of the middle course of the river Ural and its economic importance. – Tr. Zool. Inst. Akad. Nauk SSSR. Leningrad **16**: 409-414.

NOYES J. (2011): The Natural History Museum. Universal Chalcidoidea Database. – http://www.nhm.ac.uk/ research-curation /research/ projects /chalcidoids/database.

ÖNCÜER C. (1991): A catalogue of the parasites and predators of insect pests of Turkey. pp. 240.

PECK O. (1951): Superfamily Chalcidoidea. – In: MUESEBECK C.F.W., KROMBEIN K.V. & H.K. TOWNES (eds), Hymenoptera of America north of Mexico - synoptic catalog. Agriculture Monographs. U.S. Department of Agriculture **2**: 410-594.

PECK O., BOUČEK Z. & A. HOFFER (1964): Keys to the Chalcidoidea of Czechoslovakia (Insecta: Hymenoptera). – Memoirs of the Entomological Society of Canada **34**: 120 pp.

RIEK E.F. (1966): Australian Hymenoptera Chalcidoidea, family Pteromalidae, subfamily Perilampinae. – Aust. J. Zool. **14**: 1207-1236.

RUSCHKA F. (1924): Die europäisch-mediterranen Eucharidinae und Perilampidae (Hym. Chalc.). – Deutsche Entomologische Zeitschrift, Berlin **1924**: 82-96.

SCHMIEDEKNECHT O. (1909): Hymenoptera fam. Chalcididae. – In: WYTSMAN P. (ed.), Genera Insectorum **97**: 1-550 Brussels.

TUDOR C. (1967): Chalcidoidea (Insecta: Hymenoptera) – new for the Romanian fauna. – Stud. Cer. Biol. (Ser. Zool.) **19**: 361-367.

VIDAL S. (2001): Entomofauna Germanica. Band 4. – In: DATHE H.H.; TAEGER A. & S.M. BLANK (eds), Verzeichnis der Hautflügler Deutschlands. Chalcidoidea Entomol. Nachricht. Bericht. Germany, Beiheft **7**: 61.

ZEROVA M.D. (1970): A new genus and species of the family Perilampidae (Hym., Chalcidoidea) from central Asia. – Zool. Zhur. **49** (6): 936-939.

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Afrikas Tierwelt ist geprägt durch seine Megafauna; kein anderer Kontinent lässt den Reichtum an seiner Tierwelt so offen erkennen wie Afrika, die riesigen Huftierheden mit ihren z.T. extremen Wanderungen, die Räuber und Aasfresser, die von ihnen abhängen, die Vielfalt an durchaus sichtbaren (und damit beobachtbaren) Primaten und Vögeln. Vielen Afrikareisenden ist diese Artenfülle durchaus bewusst, viele mögen auch einen Großteil der Arten kennen. Was meist fehlt, ist das Wissen über das Verhalten der Tiere, welches sich meist nur sehr zerstreut in einschlägigen wissenschaftlichen Zeitschriften findet. Richard Despard Estes hat es sich zur Aufgabe gemacht, dieses Wissen zu extrahieren, zu bündeln, zu erklären und zu illustrieren, um eine breite leserschaft über das faszinierende Verhaltensrepertoire afrikanischer Säugetiere zu informieren. Dies ist ihm fantastisch gelungen, so dass man die 20-jährige Jubiläumsausgabe jedem empfehlen kann, der eine Reise nach Afrika plant oder nach seiner Rückkehr aufbereitet.

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R. Gerstmeier

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