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A review of the Cremastinae of the Balkan peninsula, Turkey and Cyprus with zoogeographical notes

(Hymenoptera: Ichneumonidae)

With 8 figures and 2 tables

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Summary

Keys for the identification of the Western Palearctic genera of the Cremastinae and the species of *Cremastus* GRAV. and *Temelucha* FOERSTER are provided. Three new species of the genera *Cremastus* GRAV. and *Nothocremastus* DASCH are described. For each of the 63 species currently known from the region all the available distributional data are presented and a zoogeographical typification is proposed.

Zusammenfassung

Es werden Bestimmungstabellen der westpaläarktischen Gattungen der Cremastinae und der Arten von *Cremastus* GRAV. und *Temelucha* FOERSTER vorgestellt. Drei neue Arten der Gattungen *Cremastus* GRAV. und *Nothocremastus* DASCH werden beschrieben. Für jede der 63 gegenwärtig bekannten Arten des Gebietes werden die Verbreitungsangaben und zoogeographische Bemerkungen geboten.

Introduction

The present paper concerns the generalized faunistic data, including those not indicated so far, for all 63 species of the investigated region. Thus, it could be regarded as a catalogue of the group. The valid name for each of the species, the name under which the species was described, the name under which it has been reported by different authors for the investigated region, the place and time of collected the new reported material, as well as the general distribution are specified. Three new species of the genera *Cremastus* GRAV. and *Nothocremastus* DASCH are described. 1 species is new to Bosnia and Herzegovina, 2 species are new to Macedonia, 7 species are new to Montenegro, 8 species are new to Serbia, 3 species are new to Turkey, and 1 species is new to the Yugoslavian countries¹ (in the text marked by an asterisk). The hosts of 5 species are indicated. An attempt for zoogeographical characterization of the species of the subfamily Cremastinae of the investigated territory is made. Only recently some new genera and many new species were described (DASCH, 1979; KOLAROV, 1980, 1982, 1987, 1989a & 1989b; NAROLSKY, 1990a & 1990b), including some from the investigated area. Therefore new

¹the term Yugoslavian countries (= Yu) is used only in those cases when it is not clear which country of the former Yugoslavia we refer to

keys for the identification of the Western Palearctic genera and species of *Cremastus* GRAV. and *Temelucha* FOERSTER are provided.

Materials from the following collections were examined:

Zoology Department at the Plovdiv University, the National Natural Science Museum at the Bulgarian Academy of Sciences, Sofia, the Forestry Department of the University in Beograd, the Hungarian Natural History Museum, Budapest, the National Museum of Natural History, Praha-Kunratice, the Deutsches Entomologisches Institut, Eberswalde, Museo Regionale di Scienze Naturali, Torino and the University in Edirne-Turkey, as well as the collection of the author.

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Key to the Western Palearctic Cremastinae genera

1. Front wing with areola 2. *Dimophora* FOERSTER
- Front wing without areola 2
2. Hind femur with tooth from below 1. *Pristomerus* CURTIS
- Hind femur without tooth from below 3
3. Occipital carina entirely absent. Middle tibia with single spur
- 13. *Noxocremastus* NAROLSKY
- Occipital carina developed at least partly 4
4. Middle tibia with single spur 12. *Eucremastus* SZEPLIGETI
- Middle tibia with a pair of spurs 5
5. Ventral edges of first abdominal tergite parallel or almost parallel, separated by a visible portion of first sternite for their entire length 6
- Ventral edges of first abdominal tergite curved, touching for most of their length, thus hiding the first sternite except at its base and apex 12
6. Antenna with white ring. Male genital clasper with a single lobe . 6. *Trathala* CAMERON
- Antenna without white ring 7
7. Mandible narrow, strongly elongated, curved at the middle, lower tooth longer than upper one 7. *Kasparyania* NAROLSKY
- Mandible in normal size, not curved at the middle 8
8. Abdomen cylindrical, apical edge of VI tergite in female strongly concave, apical third of ovipositor wavy sinuate (male unknown) 9. *Celor* KOKUJEV
- Abdomen in apical half compressed, ovipositor straight or sinuate at the tip 9

9. Clypeus narrow, smooth, subtruncate or weakly concave, with almost straight front edge; radial cell short, pterostigma wide 5. *Nothocremastus* DASCH
 - Clypeus convex at the middle, with curved front edge, radial cell and pterostigma not as above 10
10. Ovipositor unusually thin, longer than body, without subapical dorsal notch
 3. *Pseudocremastus* SZEPLIGETI
 - Ovipositor thickened or compressed, with subapical dorsal notch 11
11. Front wing 7,5 mm long. Clypeus wide, at the middle raised as transverse ridge. Tergites strongly elongated and compressed 10. *Regius* NAROLSKY
 - Front wing shorter. Clypeus not raised as transverse ridge. Male genital clasper bilobed 4. *Cremastus* GRAVENHORST
12. Front wing 8,3-8,7 mm long, dark coloured. Upper surface of pronotum with strong median longitudinal ridge crossing the transverse sulcus . . . 11. *Eucremastoides* KOLAROV
 - Front wing shorter, not darkened. Pronotum either without or with not so strong median longitudinal ridge, crossing the transverse sulcus 8. *Temelucha* FOERSTER

Faunistic list and descriptions

I. *Pristomerus* CURTIS

Pristomerus CURTIS, 1836. Brit. Ent., 13, p. 624.

There are 18 West Palearctic species, 8 of which are established in the territory investigated. The determination has been made after HORSTMANN (1990).

1. *Pristomerus armatus* (LUCAS, 1849)

Collyria armata LUCAS, 1849. Sc. Phys. Zool., 3, p. 328.

Pristomerus orbitalis: MEYER, 1935, p. 418; SEDIVY, 1969, p. 36; 1970, p. 11; GERMANOV, 1980, p. 73; KOLAROV, 1982, p. 65; 1987-a, p. 87, 1987-b, p. 108.

Pristomerus armatus: HORSTMANN, 1990, p. 22.

BG (Bulgaria): (GERMANOV, 1980; KOLAROV, 1982 & 1987-a; HORSTMANN, 1990). New material - Varna, 7.07.1991, 1 ♀; Jambol distr., Kroumovo, 31.07.1991, 8 ♂.

CR (Croatia): (MEYER, 1935; SEDIVY, 1969 & 1970).

GR (Greece): (MEYER, 1935; SEDIVY, 1969 & 1970; HORSTMANN, 1990). New material - Pili, 250 m, 19.06.1992, 1 ♂.

*MN (Montenegro): New material - Durmitor Mts., Budevitsa, 20.09.1991, 1 ♀.

TR (Turkey): (HORSTMANN, 1990; KOLAROV & BEYARSLAN, in press).

Distribution: Sweden, Netherlands, Belgium, France, Corsica, Germany, Switzerland, Italy, Hungary, Croatia, Montenegro, Roumania, Bulgaria, Greece, East Europe, Georgia, Armenia, Turkey, Kazakhstan, Turkmenia, Uzbekistan, Kirgizia and Siberia - Tschitinsk region.

Note: Here and below the data of MEYER (1935) for the distribution of the species on the territory of the former Soviet Union are not taken under consideration, as it is done by KASPARYAN (1981) because they need proving. The collection of MEYER had been destroyed.

2. *Pristomerus horribilis* NAROLSKY, 1987

Pristomerus horribilis NAROLSKY, 1987. Rev. Ent., **64**, p. 835; KOLAROV, 1992, p. 75.

BG: (KOLAROV, 1992). New material - Jambol distr., Kroumovo, 31.07.1991, 2 ♀.

Distribution: Germany, Switzerland, Bulgaria and Ukraine.

3. *Pristomerus kasparyani* NAROLSKY, 1986

Pristomerus kasparyani NAROLSKY, 1986. Vestn. Zool., **1**, p. 79; KOLAROV, 1992, p. 75.

BG: (KOLAROV, 1992).

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Southwestern France, Hungary, Bulgaria, Ukraine - Crimea and Turkey.

4. *Pristomerus pallidus* THOMSON, 1890

Pristomerus pallidus THOMSON, 1890. Opusc. ent., **14**, p. 1456; STROBL, 1904, p. 95; SCHMIEDEKNECHT, 1910, p. 2018; MEYER, 1935, p. 418; TOWNES et al., 1965, p. 306; SEDIVY, 1970, p. 12; FITTON, 1982, p. 79; HORSTMANN, 1990, p. 28.

CR: (THOMSON, 1890; STROBL, 1904; SCHMIEDEKNECHT, 1910; MEYER, 1935; TOWNES et al., 1965; SEDIVY, 1970; FITTON, 1982; HORSTMANN, 1990.

GR: (SCHMIEDEKNECHT, 1910; MEYER, 1935; TOWNES et al., 1965; SEDIVY, 1970; HORSTMANN, 1990).

Distribution: France, Italy, Croatia, Greece, Ukraine, Kazakhstan, Middle Asia and Mongolia.

5. *Pristomerus rivalis* NAROLSKY, 1987

Pristomerus rivalis NAROLSKY, 1987. Rev. Ent., **64**, p. 837; KOLAROV, 1992, p. 76.

BG: (KOLAROV, 1992).

Distribution: Bulgaria, Moldavia, Ukraine, Kazakhstan, Uzbekistan and Kirgizia.

6. *Pristomerus rufiabdominalis* UCHIDA, 1928

Pristomerus rufiabdominalis UCHIDA, 1928. J. Fac. Agr. Hokkaido Imp. Univ. Sapporo, **21**, p. 284; KOLAROV, 1992, p. 75.

BG: (KOLAROV, 1992).

*M (Macedonia): New material - Gradosko, 16.04.1966, 1 ♂; 16.-19.05.1966, 2 ♂, ex *Gypsonoma aceriana* DUP.

Distribution: Poland, Austria, Hungary, Roumania, Macedonia, Bulgaria, East Europe, Caucasus, Siberia, China and Japan.

7. *Pristomerus tibialis* KOLAROV, 1982

Pristomerus tibialis KOLAROV, 1982. Acta Zool Bulg., **19**, p. 65; 1987-b, p. 109; NAROLSKY, 1987, p. 839; HORSTMANN, 1990, p. 33.

BG: (KOLAROV, 1982 & 1987-b; NAROLSKY, 1987; HORSTMANN, 1990).

Distribution: Bulgaria.

8. *Pristomerus vulnerator* (PANZER, 1799)

Ichneumon vulnerator PANZER, 1799. Faun. Insect. Germ., 6, Tafel 7.

Pristomerus vulnerator: KOHL, 1905, p. 222; GREGOR, 1933, p. 166; THOMPSON, 1957, p. 537; NIKOLOVA, 1962, p. 91; DIRIMANOV & SENGALEVITCH, 1963, p. 191; ALTAY, 1966 (according to Soydanbay, 1978:70); GANCHEV, 1970, p. 133; 1973, p. 156; PETCU, 1971, p. 255; TUATAY et al., 1972, p. 119; GEORGHIOU, 1977, 180; CHARIZANOV, 1977, p. 19; 1979a, p. 21; 1979b, p. 22; SLAVOV & IVANOV, 1981, p. 64; KOLAROV, 1982, p. 65; 1987-a, p. 88; 1987-b, p. 108; ZAPRYANOV & STOEVA, 1982, p. 75; ANGELOVA, 1983, p. 97; ZAPRYANOV, 1985, p. 141; DOGANLAR, 1987, p. 80; DIMOVA, 1987, p. 88; HORSTMANN, 1990, p. 36; SHAMU & ZAPRYANOV, 1991, p. 221; OZDEMIR & KILINCER, 1990, p. 315; ONCUER, 1991, p. 237.

Pristomerus vulnerator var. 4 and var. 5: STROBL, 1904, p. 95.

BG: (GREGOR, 1933; NIKOLOVA, 1962; DIRIMANOV & SENGALEVITCH, 1963; GANCHEV, 1970 & 1973; CHARIZANOV, 1977, 1979a & 1979b; SLAVOV & IVANOV, 1981; KOLAROV, 1982, 1987-a & 1987-b; ZAPRYANOV & STOEVA, 1982; ANGELOVA, 1983; ZAPRYANOV, 1985; DIMOVA, 1987; SHAMU & ZAPRYANOV, 1991). New material - Stara planina Mts., Reseletz, 14.07.1991, 2 ♀.

CP (Cyprus): (GEORGHIOU, 1977).

CR: (STROBL, 1904). New material: ROKARITSA, 19.06.1962, 2 ♀.

GR: (HORSTMANN, 1990).

R (Roumania): (PETCU, 1971).

*SR (Serbia): New material - Zemun, 17.08.1953, ex *Carpocapsa* sp., 2 ♀; Beograd, 7.05.1952, 1 ♀; Kosmay, Bogavac, 1.06.1952, ex *Acrobasis consociella* HB., 1 ♀; 29.02.1954, ex *Evetria buoliana* DENN. et SCHIFF., 1 ♀.

TR: (KOHL, 1905; ALTAY, 1966; TUATAY et al., 1972; SOYDANBAY, 1978; OZDEMIR & KILINCER, 1990; ONCUER, 1991). New material - Tekirdag, Saray, 25.06.1992, 1 ♀.

Distribution: Europe, Turkey, Siberia, Japan and Korea.

II. *Dimophora* FOERSTER

Dimophora FOERSTER, 1868. Verh. Natur. Ver. Preus. Rheinl., 25, p. 155.

There are 2 West Palearctic species, both established in the investigated territory. They can be distinguished by the key proposed by SEDIVY (1970).

1. *Dimophora evanialis* (GRAVENHORST, 1829)

Mesoleptus evanialis GRAVENHORST, 1829. Ichn. eur., 3, p. 16.

Dimophora evanialis: SEDIVY, 1969, p. 34; 1970, p. 6; KOLAROV, 1982, p. 64; 1986, p. 87; 1987-b, p. 108; 1989-b, p. 75.

BG: (KOLAROV, 1982; 1986; 1987-b & 1989-b). New material - Stara planina Mts., Reseletz, 14.-16.07.1991, 5 ♂; Shipkovo, 12.08.1986, 1 ♂; Jambol, 11.07.1987, 1 ♂.

CR: (SEDIVY, 1969 & 1970).

*MN: New material - Dobrolovina, Durmitor Mts., 18.-20.09.1991, 1 ♂ and 1 ♀.

Distribution: Sweden, Finland, Denmark, Spain, Germany, Poland, Czechia, Slovakia, Corsica, Croatia and Bulgaria.

2. *Dimophora nitens* (GRAVENHORST, 1829)

Campoplex nitens GRAVENHORST, 1829. Ichn. eur., 2, p. 437.

Demophorus robustus: GREGOR, 1933, p. 166.

Dimophora similis: STROBL, 1904, p. 96.

Dimophora arenicola: STROBL, 1904, p. 96.

Dimophora arenicola var. b: STROBL, 1904, p. 166.

Dimophora robusta: SEDIVY, 1969, p. 35; 1970, p. 7; KOLAROV, 1982, p. 64; 1987-a, p. 87; 1989-b, p. 75.

BG: (GREGOR, 1933; SEDIVY, 1969 & 1970; KOLAROV, 1982; 1987-a, 1987-b & 1989). New material - Stara planina Mts., Reselets, 24.07.1982, 1 ♂.

CR: (STROBL, 1904).

*SR: New material: Belgrad, 19.08.1989, 4 ♂♂ and 1 ♀.

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Sweden, Denmark, England, Germany, Austria, Czechia, Slovakia, Croatia and Bulgaria.

III. *Pseudocremastus* SZEPLIGETI

Pseudocremastus SZEPLIGETI, 1905. Gen. Ins., 35, p. 50.

Monotypic, known from Middle Europe and West Kazakhstan.

IV. *Cremastus* GRAVENHORST

Cremastus GRAVENHORST, 1829. Ichn. eur., 3, p. 730.

Till now there have been known 22 species in the Western Palearctic region. 18 species have been established from the investigated territory, including a new one, described here.

Key for identification of the Western Palearctic species of genus *Cremastus* GRAV.

(*C. flavator* AUBERT is not included).

- | | | |
|---|---|-----------------------------|
| 1 | First abdominal segment nearly 2 times shorter than second | 2 |
| - | First abdominal segment nearly as long as second | 5 |
| 2 | Second recurrent vein interstitial | 3 |
| - | Second recurrent vein postfurcal | 4 |
| 3 | Face entirely yellow | <i>C. sp. 2</i> |
| - | Only eye orbitae yellow | <i>C. graecus</i> KOLAROV |
| 4 | Thorax and propodeum strongly elongated; ovipositor tip straight | |
| | | <i>C. aegypticus</i> SZEPL. |
| - | Thorax and propodeum moderately or weakly elongated; ovipositor tip sinuate | |
| | | <i>C. sp. 1</i> |

- 5 Ventral margins of first tergite curved in the middle; second recurrent vein interstitial or antefurcal *C. lineatus* GRAV.
 - Ventral margins of first tergite parallel 6
- 6 Areola of propodeum almost as long as wide 7
 - Areola of propodeum longer 8
- 7 Gena shorter than basal width of mandible *C. quadratus* sp. n.
 - Gena longer than basal width of mandible *C. crassitibialis* UCHIDA
- 8 Second recurrent vein interstitial; areola of propodeum 4,0 as long as wide apically *C. curviterebrans* SEDIVY
 - Second recurrent vein postfurcal, areola of propodeum not so elongated 9
- 9 All tibiae stout and swollen, with white colouration; eye orbitae divergent downwards *C. inflatipes* ROMAN
 - At least hind tibiae not swollen 10
- 10 Prepectal carina raised in the middle as lamella 11
 - Prepectal carina not raised in the middle 12
- 11 Clypeus mat, gena moderately long; male ocellus small, face black with yellow marking *C. crassicornis* THOMSON
 - Clypeus shining, gena very short; male ocellus large, almost touching eye; face almost entirely yellow *C. cephalotes* SEDIVY
- 12 Face entirely black, gena 1,5 as long as basal width of mandible; body length 13 mm *C. gigas* HEINRICH
 - Face usually with yellow mark, gena and body shorter 13
- 13 Ventral margins of first tergite indistinct; thorax mat; male ocellus large *C. infirmus* GRAV.
 - Ventral margins of first tergite distinct; thorax punctured, usually shining 14
- 14 Middle and hind tibiae from above light coloured, hind tibia basally and hind femur apically yellow; mesonotum, mainly in the male, with yellow spots; male ocellus small; body length 11 mm *C. spectator* GRAV.
 - Middle tibia red-brown coloured, mesonotum without yellow colouration 15
- 15 Clypeus wide, weakly convex, with almost straight front edge 16
 - Clypeus narrow, either moderately or strongly convex, with curved front edge 17
- 16 Middle and hind tibiae brown-reddish, without distinct dark ring; male ocellus large; body length 8 mm *C. geminus* GRAV.
 - Middle and hind tibiae distinctly darkened basally and apically; male ocellus smaller; body length 5,5-6 mm *C. lineiger* HELLEN
- 17 Clypeus strongly convex, nasiformly projected in front; nervulus antefurcal *C. nasutor* AUBERT
 - Clypeus moderately convex, not projected in front 18

- 18 Scutellum and subtegular ridge yellow, ovipositor tip sinuated; body length 5-6 mm . . .
 *C. kratochvili* SEDIVY
 - Scutellum black 19
- 19 Face, scapus from below and pronotum usually red coloured; hind tibia distinctly banded,
 in male yellow in the middle; male ocellus small; body length 5-8 mm
 *C. bellicosus* GRAV.
 - Face black, usually with yellow marks 20
- 20 Clypeus with yellow colouration; body length 5,5 mm *C. pungens* GRAV.
 - Clypeus black; body longer 21
- 21 Gena approximately as long as basal width of mandible; hind tibia with white marks; body
 length 9,5 mm *C. tristator* AUBERT
 - Gena shorter; hind tibia without white marks; body length 6-8 mm
 *C. puberulus* SZEPL.

1. *Cremastus aegypticus* SZEPLIGETI, 1905

Cremastus aegypticus SZEPLIGETI, 1905. Ann. Mus. Nat. Hist. **3**, p. 527; KOLAROV, 1989-b, p. 75.

GR: (KOLAROV, 1989-b, ex *Epidola laricinonella* MILL., Gelechiidae).

Distribution: Canarian Island, Corsica, France, Greece and Egypt.

2. *Cremastus bellicosus* GRAVENHORST, 1829

Cremastus bellicosus GRAVENHORST, 1829. Ichn. eur., **8**, p. 741; KOLAROV, 1982, p. 66; 1987-a, p. 87;
 1987-b, p. 108; 1989-b, p. 75.

BG: (KOLAROV, 1982; 1987-a, 1987-b & 1989-b). New material - Stara planina Mts., Reselet, 23.07.1992, 5 ♂♂ and 13 ♀♀.

*SR: New material - Belgrad, 19.08.1989, 1 ♀.

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Sweden, England, Germany, France, Poland, Czechia, Slovakia, Austria, Hungary, Roumania, Serbia and Moldavia.

3. *Cremastus* sp. 1

This species is intermediate between *Cremastus* GRAV. and *Temelucha* FOERST. and will be described as a new species.

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Turkey.

4. *Cremastus cephalotes* SEDIVY, 1970

Cremastus cephalotes SEDIVY, 1970. Acta Nat. Acad. Sci. Boh. Brno, **11**, p. 20; KOLAROV, 1987-a, p. 88.

Cremastus ponticus: KOLAROV, 1982, p. 66.

BG: (SEDIVY, 1970; KOLAROV, 1982 & 1987-a).

GR: (SEDIVY, 1970; KOLAROV, 1982).

Distribution: Bulgaria and Greece.

5. *Cremastus crassicornis* THOMSON, 1880

Cremastus crassicornis THOMSON, 1880. Opusc. Ent., 14, p. 1454; SEDIVY, 1969, p. 38; 1970, p. 22; KOLAROV, 1982, p. 66.

Cremastus cephalotes: KOLAROV, 1987-a, p. 88; 1987-b, p. 108.

Cremastus dalmatinus: STROBL, 1904, p. 92; SCHMIEDEKNECHT, 1910, p. 2038; BAUER, 1937, p. 158; SEDIVY, 1959, p. 110; TOWNES et al., 1965, p. 308; PETCU, 1970, p. 189; ONCUER, 1991, p. 229.

BG: (KOLAROV, 1982, 1987-a & 1987-b).

CR: (STROBL, 1904; SCHMIEDEKNECHT, 1910; MEYER, 1935; BAUER, 1937; TOWNES et al., 1965; SEDIVY, 1969 & 1970).

I (Italia, Triest): (SEDIVY, 1969 & 1970).

R: (PETCU, 1970).

TR: (SEDIVY, 1959; ONCUER, 1991).

Distribution: Sweden, Finland, Germany, Poland, Austria, Italy, Croatia, Roumania, Bulgaria and Moldavia.

6. *Cremastus geminus* GRAVENHORST, 1829

Cremastus geminus GRAVENHORST, 1829. Ichn. eur., 3, p. 744; KOLAROV, 1982, p. 66; 1987-a, p. 88; 1987-b, p. 108; 1989-b, p. 75.

BG: (KOLAROV, 1982, 1987-a, 1987-b & 1989-b). New material - Batak, 19.07.1986, 1 ♀.

*M: New material - Treska, 17.07.1954, 3 ♂♂; 25.-29.07.1959, 1 ♂ and 1 ♀; 20.06- 26.08. 1957, 2 ♀♀.

*MN: New material: Durmitor Mts., 17.-20.09.1991, 3 ♀♀.

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Sweden, Finland, Denmark, England, Spain, Italy, Germany, Switzerland, Poland, Czechia, Austria, Hungary, Montenegro, Macedonia, Bulgaria, Turkey and China.

7. *Cremastus gigas* HEINRICH, 1953

Cremastus gigas HEINRICH, 1953. Bonn. Zool. Beitr., 4, p. 184; KOLAROV, 1982, p. 66; 1990, p. 21.

BG: (KOLAROV, 1982 & 1990).

Distribution: Germany, Austria and Bulgaria.

8. *Cremastus graecus* KOLAROV, 1989

Cremastus graecus KOLAROV, 1989-b. Turk. entomol. derg., 13, p. 75.

GR: (KOLAROV, 1989-b).

Distribution: Greece.

9. *Cremastus infirmus* GRAVENHORST, 1829

Cremastus infirmus GRAVENHORST, 1829. Ichn. eur., **3**, p. 746; SEDIVY, 1969, p. 39; 1970, p. 28; KOLAROV, 1982, p. 66; 1992, p. 76.

BG: (KOLAROV, 1982 & 1992).

I: (SEDIVY, 1969 & 1970).

*MN: New material - Durmitor Mts., 17.-18.09.1991, 10 ♂♂ and 37 ♀♀.

Distribution: Sweden, Denmark, England, Germany, Poland, Austria, Czechia, Italy, Hungary, Montenegro, Bulgaria and Mongolia.

10. *Cremastus inflatipes* ROMAN, 1939

Cremastus inflatipes ROMAN, 1939. Ent. Tidskr., p. 203; KOLAROV, 1982, p. 66; 1987-a, p. 88, 1992, p. 76.

BG: (KOLAROV, 1982, 1987-a & 1992).

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Finland, Serbia (Voyvodina), Bulgaria and Turkey.

11. *Cremastus kratochvili* SEDIVY, 1970

Cremastus kratochvili SEDIVY, 1970. Acta Sci. Nat. Acad. Boh. Brno, **11**, p. 29; KOLAROV, 1992, p. 76.

BG: (KOLAROV, 1992).

Distribution: Czechia, Island Sylt, Bulgaria and Mongolia.

12. *Cremastus lineatus* GRAVENHORST, 1829

Cremastus lineatus GRAVENHORST, 1829. Ichn. eur., **3**, p. 739; SEDIVY, 1970, p. 32.

GR: (SEDIVY, 1970).

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Sweden, Greece, Turkey and Crimea.

13. *Cremastus* sp. 2

This species is similar to *C. aegypticus* SZEPL. and *C. graecus* KOLAROV and will be described as a new species.

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Turkey.

14. *Cremastus puberulus* SZEPLIGETI, 1900

Cremastus puberulus SZEPLIGETI, 1900. Tremes. Fuzet., **23**, p. 24; KOLAROV, 1987-a, p. 89.

BG: (KOLAROV, 1987-a).

Distribution: Germany, Switzerland, Italy, Czechia, Bulgaria and Moldavia.

15. *Cremastus pungens* GRAVENHORST, 1829

Cremastus pungens GRAVENHORST, 1829. Ichn. eur., 3, p. 745; SEDIVY, 1969, p. 40; 1970, p. 34; KOLAROV, 1982, p. 67; 1987-a, p. 89; 1992, p. 76.

BG: (KOLAROV, 1982, 1987-a & 1992).

YU: (SEDIVY, 1969 & 1970).

*SR: New material - Kopaonik Mts., 20.06.1957, 1 ♂ and 1 ♀.

TR: (KOLAROV & BEYARSLAN, in press). New material - Edirne, Hasiciarnavu, 30.07.1992, 1 ♀; Tekirdag, Malkara, 26.08.1992, 1 ♀; Tekirdag, Saray-Safaalan, 25.08.1992, 1 ♂.

Distribution: Sweden, Denmark, England, Germany, Netherlands, Italy, Czechia, Hungary, Yugoslavian countries, Serbia, Bulgaria, Turkey, Siberia and Mongolia.

16. *Cremastus quadratus* sp. n.

Female. Front wing 3,7 mm long. Head strongly restricted behind eyes (Fig. 1). Ocellus diameter as long as distance between lateral ocellus and eye. Temple, vertex and frons dense punctured, mat. Antenna filiform, flagellum with 32-33 segments, postannellus 4,3 as long as wide, subapical segments square. Face dense and fine punctured, shining. Clypeus smooth and shining, only with single points, convex, with curved front edge. Gena 0,8 times as long as basal width of mandible, mat.

Thorax short, 1,53 times as long as high, dense and moderately coarse punctured, the distance between punctures shorter than their diameter, shining. Notauli weak, sternauli distinct in front third. Second recurrent vein distinctly postfurcal, intercubitus 2,0 as long as second part of cubital vein. Outer hind angle of discocubital cell obtuse. Nervulus interstitial, nervellus vertical, not intercepted. Legs with normal proportions, hind femur 4,75 as long as wide, correlations between length of hind tarsal segments as 40:20:13:7:8.

Propodeum with areolation, punctured and shining, areola pentagonal, 1,1 as long as wide, closed behind, apical area transversally striated.

First abdominal segment scarcely longer than second, with indistinct dorsolateral carina. Ventral edges of first tergite parallel. Postpetiolus and second tergite fine striated longitudinally. Ovipositor sheath 1,9 as long as hind tibia, ovipositor tip as figured (Fig. 2). Black; frontal, upper half of outer eye orbita and tegula yellow; mandible, front femur, tibia and tarsal segments reddish, apical segments darker; hind tibia cleared in the middle.

Male. Front wing 4,0 mm long. Ocellus small, frons with longitudinal carina. Flagellum with 34 segments, postannellus 3,6 times as long as wide. Dorsolateral carina of first tergite more distinct. Facial orbita also yellow, mandible and apical half of clypeus orange.

It distinguishes from the similar *C. pungens* GRAV. by form of areola, distinctly postfurcal second recurrent vein, longer ovipositor and colouration of the body.

Material: Holotype ♀, Bulgaria, Osogovo Mts., hut Igljika, 1340 m, 28.05.1988, leg J. KOLAROV, preserved in the author's collection. Paratypes 2 ♂♂, the same date and place; 1 ♀, Rhodopi Mts., peak Batashki Sneznik, 2000 m, 20.07.1986; 1 ♀, Rhodopi Mts., Laki, Kormisosh, 600 m, 10.07.1991, in author's collection.

17. *Cremastus spectator* GRAVENHORST, 1829

Cremastus spectator GRAVENHORST, 1829. Ichn. eur., 3, p. 740; SEDIVY, 1969, p. 40; 1970, p. 36; KOLAROV, 1982, p. 67.

BG: (KOLAROV, 1982).

*MN: New material - Durmitor Mts., Budevitsa, 20.09.1991, 1 ♂.

*TR: New material: Tekirdag, Saray-Safaalan, 25.08.1992, 1 ♀.
YU: (SEDIVY, 1969 & 1970).

Distribution: Sweden, Denmark, England, Spain, France, Germany, Italy, Czechia, Montenegro, Yugoslavian countries, Bulgaria, Turkey and Siberia - Irkutsk region.

18. *Cremastus tristator* AUBERT, 1970

Cremastus tristator AUBERT, 1970. Bul. Soc. Ent. Mulh., Jul.-Aout, p. 72.

TR: (AUBERT, 1970).

Distribution: Turkey - Anatolia and Namrun.

V. *Nothocremastus* DASCH

Nothocremastus DASCH, 1979. Mem. Amer. Ent. Inst., 29, p. 318.

There are described 10 Western Palearctic species and they can be distinguished by the key provided by NAROLSKY (1990a).

Till now only one species from the investigated territory has been established. Another two new species are described here.

1. *Nothocremastus beyarslani* sp. n.

Female. Front wing 2,6 mm long. Head swollen, almost not restricted behind (Fig. 3), 1,7 as wide as long. Occipital carina fully developed, almost angulated in the middle. Ocellus diameter shorter than the distance between lateral ocellus and eye. Frons strongly concave in front half, with high longitudinal carina in the middle, laterally and little behind antennal base strongly raised. Frons, vertex and temple mat, shagreened. Antenna not longer than front wing, flagellum with 26 segments, postannellus 5,0 as long as wide, subapical segments transversal. Face with parallel lateral side, coarse and densely punctured, shining, clypeus rare punctured, weakly raised, with right front edge. Gena 2,0 as short as basal width of mandible, mat.

Thorax 1,8 as long as high, coarse and densely punctured, speculum smooth. Notaulus and epomia weak. Intercubitus shorter than second part of cubital vein. Nervulus almost interstitial, postnervulus intercepted above the middle (Fig. 4). Nervellus not intercepted, vertical. Legs somewhat short, tarsus slender. Hind femur 4,1 as long as wide, the correlation between length of hind tarsal segments as 22:13:9:5:4.

Propodeum coarsely and roughly punctured, rather strongly convex, areola behind costula indistinct. First abdominal segment slightly longer than second tergite, with long and shallow glymma. Postpetiolus and second tergite finely striated longitudinally, the following tergites mat. Ovipositor sheath 1,9 as long as hind tibia. Ovipositor thick, widened to apex, with subapical dorsal notch.

Black; tegula yellow; clypeus, mandible, palpi and basal third of second tergite reddish; front and middle legs (except coxa and trochanters) and outer eye orbita in middle dark reddish; hind legs brownish, hind tibia indistinctly cleared in the middle; pterostigma and wings nervature brown.

Male. Flagellum with 28 segments, subapical segments square; Eye orbita lateral from base of antenna also yellow coloured; vertex orbita with indistinct dark red spot; legs darker, hind femur almost black. In the rest as female.

It is distinguished from the species with the concave frons by the number of the flagellar segments, strongly postfurcal second recurrent vein, indistinct areolation of propodeum and colouration of the body.

Material: Holotype ♀, Turkey, K. Maras, Golbasi, 9.05.1985, leg. A. BEYARSLAN, preserved in author's collection. Paratype 1 ♂, Turkey, Urfa, Ataturk barasi, 6.05.1985, in the same collection.

Distribution: Turkey.

2. *Nothocremastus bulgaricus* sp. n.

Female. Front wing 2,7 mm long. Head transversal, 1,85 as wide as long, roundly restricted behind (Fig. 5). Occipital carina fully developed. Diameter of ocellus little shorter than the distance between lateral ocellus and eye. Frons concave, in the middle weakly longitudinally raised, without distinct carina. Flagellum little shorter than front wing, weakly thickened apically, with 22 segments. Postannellus 5,5 as long as wide, subapical segments also elongated. Frons, vertex, temple and gena shagreened, mat, face coarse punctured, shining. Clypeus weakly raised, with right front edge.

Thorax 1,53 as long as high, dense and coarse punctured, the distance between punctures shorter than their diameter, speculum smooth. Notaulus shallow and indistinct, epomia absent. Intercubitus more than 2 times longer than second part of cubital vein. Brachial vein originated almost from the middle of postnervulus, nervulus interstitial (Fig. 6). Nervellus unclearly intercepted below middle, discoidella absent. Femurs and tibiae moderately thickened, hind femur 3,9 as long as wide, the correlation between length of hind tarsal segments as 27:13:8:5:6. Propodeum short, convex, coarse punctured, shining. Areola pentagonal, 1,6 as long as wide, lateral carina weaker developed than all others (Fig. 7).

First abdominal segment slightly longer than second tergite with shallow and long glymma. Postpetiole and second tergite fine striated longitudinally, the following tergites shagreened. Ovipositor sheath 1,8 as long as hind tibia, ovipositor thickened, compressed and widened to the apex, with weakly decurved down tip and distinct subapical dorsal notch (Fig. 8).

Black; tegula yellow; clypeus, mandible and second tergite blackish-brown; legs after trochanters red-brown, hind femur darker.

Male. unknown.

It distinguishes from the similar *N. foveolatus* NAROLSKY by the shorter front wing and ovipositor sheath, not so elongated areola of propodeum, structure of the first abdominal segment and body colouration.

Material: Holotype ♀, Bulgaria, Stara planina Mts., the hut of Reseletz, 200 m, 14.07.1991, leg. J. KOLAROV, preserved in the collection of the author. Paratypes 2 ♀♀, the same place, 23.07.1992, in the same collection.

Distribution: Bulgaria.

3. *Nothocremastus nigrutilus* (KOLAROV, 1987)

Cremastus nigrutilus KOLAROV, 1987-a. Fol. ent. Hung., 48, p. 88.

Nothocremastus nigrutilus: NAROLSKY, 1990-a, p. 13.

BG: (KOLAROV, 1987-a; NAROLSKY, 1990-a).

Distribution: Bulgaria.

VI. *Trathala* CAMERON

Trathala CAMERON, 1899. Mem. & Proc. Manchester Lit. Phil. Soc., **43**, p. 122.
Monotypic.

1. *Trathala hierochontica* (SCHMIEDEKNECHT, 1910)

Cremastus hierochonticus SCHMIEDEKNECHT, 1910. Opusc. Ichtn., **4**, p. 2037.

Cremastus (Trathala) romanicus: SEDIVY, 1965, p. 172.

Cremastus (Trathala) hierochonticus: SEDIVY, 1970, p. 15.

Trathala hierochontica: KOLAROV, 1986, p.95; 1987-a, p. 87.

BG: (KOLAROV, 1986 & 1987-a).

R: (SEDIVY, 1965 & 1970).

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: France, Roumania, Bulgaria, Turkey and Israel.

VII. *Kasparyania* NAROLSKY

Kasparyania NAROLSKY, 1990. Zool. Journ., **69**(7), p. 66.

Monotypic, not established in the territory investigated.

VIII. *Temelucha* FOERSTER

Temelucha FOERSTER, 1868. Verh. Naturh. Ver. Rheinlande, **25**, p. 148.

At present there are 40 species known in Western Palearctic region. 28 species have been established in the investigated territory.

Key for identification of the Western Palearctic species of the genus *Temelucha* FOERST.
(*T. buoliana* CURTIS, *T. niger* HELLEN, *T. picticollis* HELLEN, *T. pleurovitata* COSTA and *T. similis* HEDWIG are not included)

- | | | |
|---|--|----------------------------------|
| 1 | First abdominal segment 0,62 as long as second | <i>T. brevipetiolata</i> KOLAROV |
| - | First abdominal segment either almost as long as second or longer | 2 |
| 2 | Gena 2,0 as long as basal width of mandible | <i>T. genalis</i> SZEPL. |
| - | Gena shorter | 3 |
| 3 | Head and thorax in greater part light coloured | 4 |
| - | Head and thorax in greater part dark coloured | 11 |
| 4 | Hind femur 7,5 as long as wide medially; frons with a pair of tubercules | <i>T. sp.</i> 1 |
| - | Hind femur not so elongated; frons without a pair of tubercules | 5 |
| 5 | All coxae either red or yellow coloured | 6 |
| - | At least hind coxa partly dark | 10 |

- 6 Second discoidal cell 1,5 as long as first brachial one *T. shoenobius* THOMSON
 - Second discoidal cell shorter 7
- 7 Body length 3-4 mm; venation of wings unpigmented *T. anatolica* SEDIVY
 - Body longer; venation of wings pigmented 8
- 8 Ocellus small, its diameter shorter than distance between eye and lateral ocellus
 *T. dorsoniger* HEDWIG
 - Ocellus large, its diameter about 2,0 as long as the distance between eye and lateral
 ocellus; gena about 0,5 as long as basal width of mandible 9
- 9 Hind tarsal claws longer than arolium; fifth tarsal segment 4,2 as long as wide
 *T. afghana* SEDIVY
 - Hind tarsal claws as long as arolium; fifth tarsal segment 3,2-3,4 as long as wide
 *T. observator* AUBERT
- 10 Second recurrent vein interstitial *T. tricolorata* SEDIVY
 - Second recurrent vein postfurcal *T. decorata* GRAV.
- 11 Clypeus flat, with front edge almost right; head either weakly or not restricted behind
 eyes 12
 - Clypeus moderately or strongly convex, with curved front edge; head distinctly restricted
 behind eyes 18
- 12 Ventral margins of first abdominal tergite not touching each other 13
 - Ventral margins of first abdominal tergite touching each other 15
- 13 Thorax 2,6 as long as high, curved from below; front wing 2,7 mm long
 *T. cylindrator* NAROLSKY
 - Thorax not so elongated and not curved; front wing longer 14
- 14 Ovipositor sheat longer than front wing *T. caudata* SZEPL.
 - Ovipositor sheat shorter than front wing *T. pseudocaudata* KOLAROV
- 15 Eye orbita with only 2 yellow spots below base of antenna; gena black
 *T. guttifer* THOMS.
 - Eye orbita partly or entirely yellow, gena yellow 16
- 16 Second radius almost straight; ovipositor sheat as long as front wing from base to apex of
 radial cell *T. albipennis* ZETT.
 - Second radius curved near front margin of the wing 17
- 17 Ovipositor sheat as long as front wing from base to base of radial cell
 *T. signata* HOLMGREN
 - Ovipositor sheat as long as front wing from base to apex of radial cell
 *T. subsignata* KOLAROV
- 18 Clypeus strongly convex, distinctly separated from the face, projected nasiformly . . 19
 - Clypeus moderately convex, weakly separated from the face 20

- 19 Mesonotum black, scutellum with rufous colouration; face and pronotum shagreened, with only rare punctures; propodeum convex in lateral view *T. subnasuta* THOMS.
 - Mesonotum and scutellum with yellow spots; face punctured; pronotum luscious with rare and rough punctures; propodeum not convex in lateral view *T. discoidalis* SZEPL.
- 20 Scutellum entirely or partly yellow 21
 - Scutellum black, seldom brown or yellow laterally 26
- 21 Propodeum short, curved in lateral view *T. lucida* SZEPL.
 - Propodeum elongated, not curved in lateral view 22
- 22 Head rectilinear restricted behind eyes, male ocellus large *T. interruptor* GRAV.
 - Head roundly restricted behind eyes, male ocellus small 23
- 23 Body 5-7 mm long 24
 - Body 8-10 mm long 25
- 24 Mesonotum as long as wide *T. notata* KOLAROV
 - Mesonotum longer than wide *T. mohelnensis* SEDIVY
- 25 Inner eye orbita parallel; notaulus absent or weak *T. confluens* GRAV.
 - Inner eye orbita divergent downwards; notaulus distinct *T. variipes* SZEPL.
- 26 Frons raised laterally; ovipositor tip with distinct dorsal subapical notch *T. sp. 2*
 - Frons not raised laterally; ovipositor tip either without or with faint subapical dorsal notch 27
- 27 Gena pale yellow; body 4,5-5 mm long *T. tenerifensis* SEDIVY
 - Gena black to reddish 28
- 28 Scutellum carinated to middle; female gena shorter than basal width of mandible
 *T. arenosella* KOLAROV
 - Scutellum carinated to apex and (or) female gena at least as long as basal width of mandible 29
- 29 Mesonotum 1,1 as long as wide; ovipositor tip curved down *T. thoracica* KOLAROV
 - Mesonotum more elongated 30
- 30 Gena swollen, 1,3 as long as basal width of mandible; notaulus as transversally striated shalow *T. notaulata* KOLAROV
 - Gena not swollen and almost as long as basal width of mandible 31
- 31 Ovipositor tip not sinuate 32
 - Ovipositor tip sinuate 33
- 32 Lateral carina of scutellum reaching apex; male face yellow; body 4-5 mm long
 *T. arenosa* SZEPL.
 - Lateral carina of scutellum not reaching apex; face black with yellow marks; body 5-6,5 mm long *T. meridionellator* AUBERT
- 33 Base of antenna black, postoccipt concave *T. annulata* SZEPL.
 - Base of antenna either yellow or reddish 34

- 34 Male gena as long as basal width of mandible; ocellus small, its diameter as long as distance between lateral ocellus and eye; female unknown *T. szepligetii* D.T.
 - Male gena shorter; ocellus large, lateral one almost touching eye 35
- 35 Mesonotum luscious; propodeum short, curved in lateral view; petiolus cylindric, without glymma; outer surface of tibiae white *T. marocator* AUBERT
 - Mesonotum mat; propodeum elongated, not curved in lateral view; petiolus depressed, glymma almost reaching base of petiolus; outer surface of tibiae brownish
 *T. ophthalmica* HOLMGREN

1. *Temelucha afghana* SEDIVY, 1968

Temelucha afghana SEDIVY, 1968. Acta Mus. Morav., 53, p. 260; NAROLSKY, 1990-a, p. 132.

TR: (NAROLSKY, 1990-a).

Distribution: Roumania, Moldavia, Ukraine, Turkey, Jordan, Afghanistan and Morocco.

2. *Temelucha anatolica* (SEDIVY, 1959)

Cremastus anatolicus SEDIVY, 1959. Acta Ent. Mus. Nat. Prag., 33, p. 111.

Temelucha anatolica: SEDIVY, 1971, p. 10; KASPARYAN, 1981, p. 382; NAROLSKY, 1990-d, p. 132; ONCUER, 1991, p. 237.

TR: (SEDIVY, 1959 & 1971; KASPARYAN, 1981; NAROLSKY, 1990-d; ONCUER, 1991; KOLAROV & BEYARSLAN, in press).

Distribution: Turkey, beyond of Caucasus, Middle Asia and Tunisia.

3. *Temelucha annulata* (SZEPLIGETI, 1900)

Cremastus annulatus SZEPLIGETI, 1900. Termes. Füz., 23, p. 25; PETCU, 1974-75, p. 17.

Temelucha annulata: KOLAROV, 1982, p. 67.

BG: (KOLAROV, 1982).

R: (PETCU, 1974-75).

TR: (KOLAROV & BEYARSLAN, in press).

*SR: New material: Borsko, 17.07.1989, 2 ♀♀.

Distribution: Sweden, Czechia, Austria, Hungary, Serbia, Bulgaria, Moldavia and Turkey.

4. *Temelucha arenosa* (SZEPLIGETI, 1900)

Cremastus arenosus SZEPLIGETI, 1900. Termes. Füz., 23, p. 21.

Temelucha arenosa: KOLAROV, 1982, p. 67; 1987-b, p. 108.

BG: (KOLAROV, 1982 & 1987-b).

TR: (KOLAROV & BEYARSLAN, in press).

*YU: New material: Elotsice pal., 20.07.1989, 1 ♀.

Distribution: Sweden, Netherlands, France, Germany, Czechia, Corsica, Hungary, Yugoslavia, Bulgaria and Turkey.

5. *Temelucha arenosella* KOLAROV, 1989

Temelucha arenosella KOLAROV, 1989-a. Faun. Abh. Mus. Tierk. Dresden, **16**, p. 151.

BG: (KOLAROV, 1989-a).

Distribution: Bulgaria.

6. *Temelucha brevipetiolata* KOLAROV, 1989

Temelucha brevipetiolata KOLAROV, 1989-a. Faun. Abh. Mus. Tierk. Dresden, **16**, p. 149.

BG: (KOLAROV, 1989-a).

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Bulgaria and Turkey.

7. *Temelucha caudata* (SZEPLIGETI, 1900)

Cremastus caudatus SZEPLIGETI, 1900. Termes, Füz., **23**, p. 2.

Temelucha caudata: SEDIVY, 1969, p. 41; 1970, p. 12; KOLAROV, 1982, p. 68; 1989-a, p. 150.

BG: (KOLAROV, 1982 & 1989-a).

I: (SEDIVY, 1969 & 1970).

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: France, Czechia, Austria, Italy, Hungary, Bulgaria and Turkey.

8. *Temelucha confluens* (GRAVENHORST, 1829)

Cremastus confluens GRAVENHORST, 1829. Ichn. eur., **3**, p. 735; STROBL, 1904, p. 95; KOHL, 1905, p. 222.

Temelucha confluens: SEDIVY, 1969, p. 42; 1971, p. 7; TZANKOV, 1978, p. 162; 1985, p. 29; 1988, p. 392; KOLAROV, 1982, p. 68; 1987-b, p. 108; TZANKOV et al., 1984, p. 93; TZANKOV & GANTCHEV, 1987, p. 7; TZANKOV & STALEV, 1987, p. 272.

BG: (TZANKOV, 1978; 1985 & 1988; KOLAROV, 1982; 1987-b; TZANKOV & GANTCHEV, 1984 & 1987; TZANKOV & STALEV, 1987). New material - Stara planina Mts., Reseletz, 16.-17. 07.1990, 1 ♂ and 1 ♀.

CR: (STROBL, 1904; SEDIVY, 1969 & 1970).

*MN: New material: Durmitor Mts., 17.09.1991, 1 ♀; Kosutnjak, 5.05-3.06.1973, ex *Evetria buoliana* DENN. et SCHIFF., 2 ♂♂ and 3 ♀♀.

*SR: New material: Stragari, 14.06.1973, ex *Evetria buoliana* DENN. et SCHIFF., 1 ♂; Beograd, 31.01-9.03.1972, ex *Evetria buoliana* DENN. et SCHIFF., 1 ♂ and 2 ♀♀.

TR: (KOHL, 1905; KOLAROV & BEYARSLAN, in press).

Distribution: Spain, France, Germany, Czechia, Austria, Hungary, Croatia, Montenegro, Serbia, Bulgaria, Moldavia and Turkey.

9. *Temelucha decorata* (GRAVENHORST, 1829)

Cremastus decoratus GRAVENHORST, 1829. Ichn. eur., **3**, p. 734; STROBL, 1904, p. 94; THOMPSON, 1957, p. 384.

Cremastus ornatus: SEDIVY, 1959, p. 110; PETCU, 1971, p. 256; ONAT, 1974, p. 104; GERMANOV, 1980, p. 73; ONCUER, 1991, p. 238.

Temelucha decorata: SEDIVY, 1969, p. 42; 1971, p. 16; GEORGHIOU, 1977, p. 178; KOLAROV, 1982, p. 68; 1987-b, p. 108; 1989-b, p. 73; AUBERT, 1983, p. 51; ONCUER, 1991, p. 237.

BG: (GERMANOV, 1980; KOLAROV, 1982, 1987-b & 1989-b).

CP (Cyprus): (GEORGHIOU, 1977).

CR: (STROBL, 1904; SEDIVY, 1969 & 1971).

GR: (SEDIVY, 1969 & 1971; KOLAROV, 1989-b).

I: (SEDIVY, 1969 & 1971).

R: (PETCU, 1971).

*SR: New material: Beograd, 18-21.08.1989, 3 ♂♂.

TR: (THOMPSON, 1957; AUBERT, 1983). New material: Tekirdag, Muratli, 26.08.1992, 3 ♀♀; Kirklareli, Lule Burgaz-Evren, 25.08.1992, 1 ♀.

Distribution: Greenland, Sweden, Finland, France, Madeira, Corsica, Sicily, Italy, Czechia, Slovakia, Austria, Hungary, Croatia, Serbia, Greece, Bulgaria, Roumania, Moldavia, Turkey and Azerbaydjan.

10. *Temelucha discoidalis* (SZEPLIGETI, 1900)

Cremastus discoidalis SZEPLIGETI, 1900. Termes. Füz., 23, p. 25; PETCU, 1971, p. 256.

Temelucha discoidalis: SEDIVY, 1969, p. 42; 1971, p. 18; KOLAROV, 1989-a, p. 151.

BG: KOLAROV, 1989-a).

R: (PETCU, 1971).

YU: (SEDIVY, 1969 & 1971).

Distribution: Czechia, Hungary, Roumania, Yugoslavian countries and Bulgaria.

11. *Temelucha genalis* (SZEPLIGETI, 1900)

Paracremastus genalis SZEPLIGETI, 1900. Termes. Füz., 23, p. 10.

Temelucha genalis: KOLAROV, 1982, p. 69; 1987-b, p. 108; 1989-a, p. 149; 1989-b, p. 300.

BG: (KOLAROV, 1982, 1987-b, 1989-a & 1989-b). New material - Rhodopi Mts., Laki, Kormisosh, 500 m, 10.07.1991, 1 ♀.

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Germany, Slovakia, Italy, Sicily, Hungary, Bulgaria, Moldavia and Turkey.

12. *Temelucha guttifer* (THOMSON, 1896)

Cremastus guttifer THOMSON, 1890. Opusc. ent., 14, p. 1449.

Temelucha guttifer: PETCU, 1974-75, p. 17; KOLAROV, 1982, p. 69; 1987-b, p. 108.

BG: (KOLAROV, 1982 & 1987-b).

R: (PETCU, 1974-75).

*TR: New material - Tekirdag, Saray, 25.08.1992, 1 ♂.

Distribution: Sweden, Bulgaria, Roumania, Turkey, Daghestan and Tunisia.

13. *Temelucha interruptor* (GRAVENHORST, 1829)

Cremastus interruptor GRAVENHORST, 1829. Ichn. eur., **3**, p. 736; STROBL, 1904, p. 94; PETCU, 1970, p. 189.

Temelucha interruptor: VASIC, 1967, p. 290; TZANKOV, 1968, p. 107; SEDIVY, 1969, p. 43; 1971, p. 21; IVANOV, 1977, p. 118; KOLAROV, 1982, p. 69; 1987-b, p. 108; 1989-a, p. 154.

BG: (TZANKOV, 1968; IVANOV, 1977; KOLAROV, 1982, 1987-b & 1989-a).

CR: (STROBL, 1904; SEDIVY, 1969 & 1971).

I: (SEDIVY, 1969 & 1971).

M: (IVANOV, 1977).

R: (PETCU, 1970).

SR: (VASIC, 1967). New material - Beograd, 10.07.1951, 1 ♂.

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Western Europe from Sweden and France to Bulgaria; Moldavia, Turkey, introduced in North America.

14. *Temelucha lucida* (SZEPLIGETI, 1900)

Cremastus lucidus SZEPLIGETI, 1900. Termes. Füz., **23**, p. 23.

Temelucha lucida: KOLAROV, 1982, p. 69; 1987-b, p. 108; 1989-a, p. 153.

BG: (KOLAROV, 1982, 1987-b & 1989a).

Distribution: Czechia, Hungary, Bulgaria and Moldavia.

15. *Temelucha meridionellator* AUBERT, 1981

Temelucha meridionellator AUBERT, 1981. Bul. Soc. Ent. Mulh., Avr.-Juin, p. 22; AUBERT et al., 1984, p. 229; ONCUER, 1991, p. 238.

TR: (AUBERT, 1981; AUBERT et al., 1984; ONCUER, 1991).

Distribution: Malta, Turkey and Israel.

16. *Temelucha notata* KOLAROV, 1989

Temelucha notata KOLAROV, 1989-a. Faun. Abh. Mus. Tierk. Dresden, **16**, p. 153.

BG: (KOLAROV, 1989-a).

Distribution: Bulgaria.

17. *Temelucha notaulata* KOLAROV, 1989

Temelucha notaulata KOLAROV, 1989-a. Faun. Abh. Mus. Tierk. Dresden, **16**, p. 153.

BG: (KOLAROV, 1989-a).

Distribution: Bulgaria.

18. *Temelucha observator* AUBERT, 1977

Temelucha observator AUBERT, 1977. Bul. Soc. Ent. Mulh., Jan.-March, p. 7; NAROLSKY, 1990-c, p. 132.

TR: (AUBERT, 1977; NAROLSKY, 1990-c).

Distribution: Roumania, Crimea, Turkey, Israel, Tunisia, Morocco and Egypt.

19. *Temelucha ophthalmica* (HOLMGREN, 1858)

Cremastus ophthalmicus HOLMGREN, 1858. Svensk. Vet. Akad. Handl., 2, p. 108.

Cremastus macrostigma: STROBL, 1904, p. 94.

Temelucha ophthalmica: KOLAROV, 1989-a, p. 154.

BG: (KOLAROV, 1989-a).

CR: (STROBL, 1904).

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Sweden, France, Corsica, Czechia, Austria, Hungary, Croatia, Bulgaria and Turkey.

20. *Temelucha pseudocaudata* KOLAROV, 1982

Temelucha pseudocaudata KOLAROV, 1982. Acta Zool. Bulg., 19, p. 68.

BG: (KOLAROV, 1982).

Distribution: Bulgaria und Ukraine (NAROLSKY, in litt.).

21. *Temelucha shoebius* (THOMSON, 1890)

Cremastus shoebius THOMSON, 1890. Opusc. ent., 14, p. 1447.

Temelucha shoebius: KOLAROV, 1982, p. 69; 1987-b, p. 108; 1989-a, p. 154.

BG: (KOLAROV, 1982, 1987-b & 1989-a).

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Sweden, Czechia, Hungary, Roumania, Bulgaria and Turkey.

22. *Temelucha signata* HOLMGREN, 1859

Temelucha signata HOLMGREN, 1859. Svensk. Vet. Akad. Handl., 2, p. 108; PETCU, 1974-75, p. 17.

Temelucha signata: KOLAROV, 1982, p. 69; 1987-b, p. 108; 1989-a, p. 150.

BG: (KOLAROV, 1982, 1987-b & 1989).

R: (PETCU, 1974-75).

Distribution: Sweden, Finland, Denmark, Czechia, Austria, Hungary, Bulgaria and Moldavia.

23. *Temelucha subnasuta* (THOMSON, 1890)

Cremastus subnasutus THOMSON, 1890. Opusc. ent., 14, p. 1450; STROBL, 1904, p. 94; GREGOR, 1933, p. 166.

Temelucha subnasuta: KOLAROV, 1989-a, p. 150.

BG: (GREGOR, 1933; KOLAROV, 1989-a).

CR: (STROBL, 1904).

*MN: New material - Durmitor Mts., 2000 m, 20.07-13.08.1981, 6 ♂♂.

Distribution: France, Germany, Croatia, Montenegro and Bulgaria.

24. *Temelucha subsignata* KOLAROV, 1989

Temelucha subsignata KOLAROV, 1989-a. Faun. Abh. Mus. Tierk. Dresden, **16**, p. 150.

BG: (KOLAROV, 1989-a).

Distribution: Bulgaria.

25. *Temelucha thoracica* KOLAROV, 1989

Temelucha thoracica KOLAROV, 1989-a. Faun. Abh. Mus. Tierk. Dresden, **16**, p. 151.

BG: (KOLAROV, 1989-a).

Distribution: Bulgaria.

26. *Temelucha* sp. 1

This species distinguishes from all known species by the extraordinary thin legs and modified frons and will be described as new species.

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Turkey.

27. *Temelucha* sp. 2

The species belongs to the group of species with black scutellum and has raised frons and untypic ovipositor tip. It will be described as new species.

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Turkey.

28. *Temelucha variipes* (SZEPLIGETI, 1900)

Cremastus variipes SZEPLIGETI, 1900. Termes. Füz., **23**, p. 26; STEFANOV et al., 1962, p. 70; TZANKOV, 1964, p. 61; 1972, p. 95.

Temelucha variipes: KOLAROV, 1982, p. 69; 1987-b, p. 108; 1989-a, p. 154; TZANKOV, 1985, p. 29.

BG: (STEFANOV et al., 1962; TZANKOV, 1964, 1972 & 1985; KOLAROV, 1982, 1987-b & 1989-a). New material - Kneza, 24.06.1991, 1 ♂ and 1 ♀.

*BH (Bosna & Herzegovina): New material - Visegrad, ex *Diprion pini* L., 1 ♀; Trebinje, 6 ♂♂ and 4 ♀♀.

*SR: New material - Beograd, Zemun, 17.07.1953, 1 ♀. Kosmay, 29.06.1954, 3 ♂♂; Boguz, 29.06.1958, 2 ♂♂; Gubavice, 10.06.1984, 1 ♂ and 1 ♀.

*TR: New material - Edirne, Havsa-Ablar, 1.08.1992, 1 ♀; Tekirdag, Saray Safaalan, 25.08.1992, 1 ♂.

Distribution: Sweden, Denmark, Mallorca, Germany, Sicily, Czechia, Austria, Hungary, Bosnia and Herzegovina, Serbia, Bulgaria, Turkey and Moldavia.

IX. *Celor* KOKUJEW

Celor KOKUJEW, 1902. Horae Soc. Ent. Rossicae, **35**, p. 210.

Monotypic, not established in the investigated territory.

X. *Regius* NAROLSKY

Regius NAROLSKY, 1990. Zool. Journ., **69**(11), p. 73.

Monotypic, known from the Caucasus, Armenia, not established in the investigated territory.

XI. *Eucremastoides* KOLAROV

Eucremastoides KOLAROV, 1980. Acta Zool. Bulg., **16**, p. 90. Monotypic.

1. *Eucremastoides angelovi* KOLAROV, 1980

Eucremastoides angelovi KOLAROV, 1980. Acta Zool. Bulg., **16**, p. 90; 1982, p. 64; 1992, p. 76; NAROLSKY, 1990-d, p. 76.

BG: (KOLAROV, 1980, 1982 & 1992; NAROLSKY, 1990-d).

TR: (KOLAROV, 1992; Sedivy, in litt.).

Distribution: Bulgaria and Turkey.

XII. *Eucremastus* SZEPLIGETI

Eucremastus SZEPLIGETI, 1905. Gen. Ins., **34**, p. 50.

There are 6 known Western Palearctic species. The distinguishing was made after NAROLSKY (1990c).

1. *Eucremastus manni* (TSCHEK, 1871)

Eugonomus manni TSCHEK, 1871. Tscher. Verh. Zool. bot. Wien, **21**, p. 67; SCHMIEDEKNECHT, 1908, p. 1456; 1935, p. 13; HABERMEHL, 1920, p. 324; MEYER, 1935, p. 60.

Eucremastus manni: KASPARYAN, 1981, p. 383; NAROLSKY, 1990-d, p. 81.

GR: (KASPARYAN, 1981; NAROLSKY, 1990-d).

TR: (TSCHEK, 1871; SCHMIEDEKNECHT, 1908 & 1935; HABERMEHL, 1920; MEYER, 1935).

Distribution: Spain, Greece, Turkey and Algeria.

2. *Eucremastus collaris* NAROLSKY, 1990

Eucremastus collaris NAROLSKY, 1990. Zool. Journ., **69**(7), p. 79.

TR: (KOLAROV & BEYARSLAN, in press).

Distribution: Turkey, Azerbaydjan, Georgia, Armenia and Nachichevansk.

XIII. *Noxocremastus* NAROLSKY

Noxocremastus NAROLSKY, 1990. Zool. Journ., 69(7), p. 65.

Monotypic, not established on the investigated territory.

Zoogeographical notes

Zoogeographical studies on representatives of the subfamily Cremastinae of the investigated region have not been carried out until now. Moreover, such investigations on the family Ichneumonidae are completely absent. The reasons must be looked for in the insufficient investigation of the group, and in the assumption by some authors (EMELYANOV, 1974) that for a zoogeographical study the most suitable objects are non-moving or slightly moving, small and non-flying animals. Without totally rejecting such an opinion, we have to consider that such an approach is more or less one-sided. A consideration of a higher number of groups of animals in a zoogeographical study enlarges its reliability. On the other hand, we have to agree with the assertion of the same author that entomologists, systematicians and faunists have accumulated, and still accumulate a great amount of data on the distribution of various species from different systematic groups, that still remain unsystematized to a large extent.

Therefore, we offer the first attempt of a zoogeographical characterization of the subfamily Cremastinae on the Balkan Peninsula, Asia Minor and Cyprus. A zoogeographical typification offered by GRUEV (1988 & 1990) and developed in his later works (GRUEV in litt.) was used. On this basis the species of the investigated subfamily are divided into zoogeographical complexes and elements, determined by studying the zoogeographical and the ecological type of every species.

The species of the subfamily Cremastinae of the investigated region belong to six complexes. The Siberian complex includes species of great ecological plasticity, which are distributed in the whole Palearctic region and some neighboring regions. In this complex the Eurosiberian species are predominant, which belong to the Euro-Asian Palearctic element, such as *Pristomerus armatus*, *Cremastus pungens*, *C. spectator* and possibly *C. infirmus* and *C. kratochvili*. *P. armatus*, whose eastern distribution reaches the Zabaykal region, is a polymorphous species and a typical so-called "expansive" species. It is very likely for it to be found further to the east, which is the reason why it will be included in the transpalearctic group. To some extent, the same is true for *C. spectator* as well. *C. infirmus* is distributed in Northern and Western Europe and Mongolia, but probably it can be found all over the Palearctic. *C. kratochvili*, known in Central Europe and Mongolia, has only recently been described and also occurs in Eastern Europe and Siberia. The three species of the Siberian complex - *Pristomerus ruftabdominalis*, *P. vulnerator* and *Cremastus geminus*, are typical transpalearctic species.

Nearly half of the species of the subfamily (Table 1), whose area of distribution includes Asia Minor and the Caucasus besides Europe, belong to the European complex. Some species, distributed all over Europe including the Northern regions, also occur in parts of Kazakhstan, Middle Asia and Iran. Most numerous are the representatives of the Middle-European element - *Pristomerus horribilis*, *Dimophora evanialis*, *D. nitens*, *Cremastus bellicosus*, *C. crassicornis*, *C. gigas*, *C. inflatipes*, *C. lineatus*, *C. puberulus*, *Temelucha annulata*, *T. arenosa*, *T. confluens*, *T. decorata*, *T. discoidalis*, *T. genalis*, *T. guttifer*, *T. interruptor*, *T. ophthalmica*, *T. shoenobius*, *T. signata*, *T. subnasuta* and *T. variipes*. The Submediterranean element is represented by *Pristomerus kasparyani*, *Trathala hierochontica*, *Temelucha caudata* and *T. lucida*.

The Euro-Asian steppe complex includes *Pristomerus rivalis* species with a Pontic distribution, reaching Kazakhstan, Uzbekistan and Kirgizia in the east.

Pristomerus pallidus is a Pontosubmediterranean species of the Pontic element of the Euro-Asian steppe complex. *Temelucha afghana*, *T. anatolica* and *Eucremastoides angelovi* were described only recently, and it is to be elucidated which complex they belong to. They show features of the Subiranian element in the South-West Asian complex. *Eucremastus collaris* is a representative of the Asia Minor element in the South-West Asian complex. It is rather probable that *Temelucha pseudocaudata*, described recently from the Bulgarian Black Sea coast and according to NAROLSKY (in litt) also widespread along the eastern coast of the Black Sea, refers to the Euxinian element of the South-West Asian complex.

Undoubtedly, four of the species belong to the Mediterranean complex. Three of them - *Cremastrus aegypticus*, *Temelucha observator* and *Eucremastus manni* - are distributed in the whole of the Mediterranean (Holomediterranean element), while *T. meridonellator* shows features of a species of the East-Mediterranean element.

A considerable number of species should be referred (at least at present) to the endemic complex. Without any exceptions, these are the species described after 1969. Therefore, it can be expected that at least some of them can be found in other parts of the Western Palearctic as well. That is why the relativity in the proposed typification of the species of the endemic complex is greater. Half of the endemic species are conventional Bulgarian endemics - *Pristomerus tibialis*, *Cremastrus quadratus*, *Nothocremastrus bulgaricus*, *N. nigrutilus*, *Temelucha arenosella*, *T. notata*, *T. notaulata*, *T. subsignata* and *T. thoracica*. Six species are conventional endemics of Asian Turkey - *Cremastrus* sp. 1, *C. petiolaris*, *C. tristator*, *Nothocremastrus beyarslani*, *Temelucha* sp. 1 and *T.* sp. 2. Two species, namely *Cremastrus cephalotes* and *Temelucha brevipetiolaris*, are conventional Balkan endemics, and one species - *Cremastrus graecus* - is a conventional endemic in Greece.

The lack of studies on the zoogeography of the family Ichneumonidae was the reason for compiling additional data concerning the typification of the distribution of the species of the subfamily Cremastinae, which could increase the reliability of the study. For instance, such data can be taken from the geographical distribution of the hosts of the Cremastinae species that belong to various families of the Lepidoptera and have undoubtedly been better studied in this respect. A similar approach is used in the typification of some phytophages, taking into consideration the distribution of their host plants. In principle, in these cases the consumer of a higher level should be of more limited distribution than the one of a lower level. This is true only for monophagous species. Unfortunately, the hosts of a large part of the Cremastinae species occurring in the studied area are unknown. The comparison made between the distributions of three arbitrarily chosen Cremastinae species and their hosts (Table 2) showed that the distributions of the parasitoids did not coincide with those of their hosts. The more limited distribution of the parasitoid compared to that of the host is easily explained. In the reverse case, however, when the parasitoid has a wider distribution than its host (as is the case with *Cremastrus infirmus*), we have to assume that it lives parasitically on another unknown host, or that the distribution has not been sufficiently studied.

Discussing the zoogeography of the genera of Ichneumonidae represented by only one or two species in Europe, TOWNES (1969) assumes that future studies will lead to a decrease of the endemic taxa in Europe and will probably increase the number of those distributed in Europe and the Ethiopian region. After the 25 years which have elapsed since that time, it is difficult to say whether or not the second assumption has been confirmed. In the table of the Cremastinae

genera, proposed by the same author, only the genus *Eucremastus* is included. At present the genera *Dimophora*, *Trathala* and *Eucremastoides* have to be added to the above list. And, if for the time being, it is still hard to find the connection between the European fauna, more particularly that of the region studied in this paper, and the fauna of the Ethiopian region, the connection with the eastward and southeastward territories is obvious. A proof is the considerable number of species and genera recently described from this area. On the other hand, recent studies have revealed a wider distribution of known species to the east and to the south and have therefore lowered the proportion of endemic European taxa, which is in accordance with TOWNES' assumptions.

The conclusion expressed here refers to a small group of insects, and it is possible that they are not valid for other groups. On the other hand, due to the insufficient knowledge of the subfamily Cremastinae our zoogeographical notes are only preliminary.

The general synopsis of the distribution of the species of the subfamily Cremastinae of the Balkan Peninsula, Asian Turkey and Cyprus shows their zoogeographical heterogeneity. Together with the representatives of the European complex, which has the highest share of species, species belonging to the Siberian, Euro-Asian steppe, South-West Asian and the Mediterranean complexes were found in the studied region. This indicates that the constitution of the present distributions of the species of the different complexes took place at different times in the past. One of the main causes for this was the shift of the faunistic complexes, especially from the north, north-east and east due to the lower temperatures during the late Tertiary and the Quaternary.

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Appendix

Table 1. Belonging and relative part of the species of the Cremastinae subfamily on the Balkan Peninsula, the Asian part of Turkey and Cyprus to the zoogeographic complexes and elements.

| Complexes and elements | Number of species | Approximate percentage % |
|---|-------------------|-----------------------------|
| Siberian complex | 8 | 13 |
| Euro-Asian palearctic element | 8 | 13 |
| Transpalearctic subelement | 3 | 5 |
| Euro-Siberian subelement | 5 | 8 |
| European complex | 26 | 41 |
| Middle-European element | 22 | 35 |
| Sub-mediterranean element | 4 | 6 |
| Ponto-mediterranean element | 1 | 2 |
| Euro-asian steppe complex | 2 | 3 |
| Pontic element | 2 | 3 |
| South-west Asian complex | 5 | 8 |
| Subiranian element | 4 | 5 |
| Minor-Asian element | 1 | 2 |
| Euxinian element | 1 | 2 |
| Mediterranean complex | 4 | 6 |
| Holomediterranean element | 3 | 5 |
| East-mediterranean element | 1 | 2 |
| Endemic complex | 18 | 29 |
| Conventional Balkan endemits | 2 | 3 |
| Conventional endemits of Asiatic Turkey | 6 | 10 |
| Conventional Greece endemits | 1 | 2 |
| Conventional Bulgarian endemits | 9 | 14 |

Table 2. The areals of some species of Cremastinae subfamily on the Balkan Peninsula and Asia Minor and their hosts.

| Species of subfamily Cremastinae | Areal | Hosts | Areal |
|-------------------------------------|--|---|--|
| <i>Cremastus infirmus</i> | West Europe Mongolia | <i>Leptopterix hirsutella</i> DENN. & SCHIFF. Psychidae | West Europe |
| <i>Temelucha arenosa</i> | West Europa Turkey | <i>Scrobipalpa atriplicella</i> F.R. Gelechiidae | Palearctic |
| <i>Temelucha confluens</i> | Middle and South Europe Moldavia Turkey | <i>Rhyacionia buoliana</i> DENN. & SCHIFF. Tortricidae | Palearctic introduced in America |

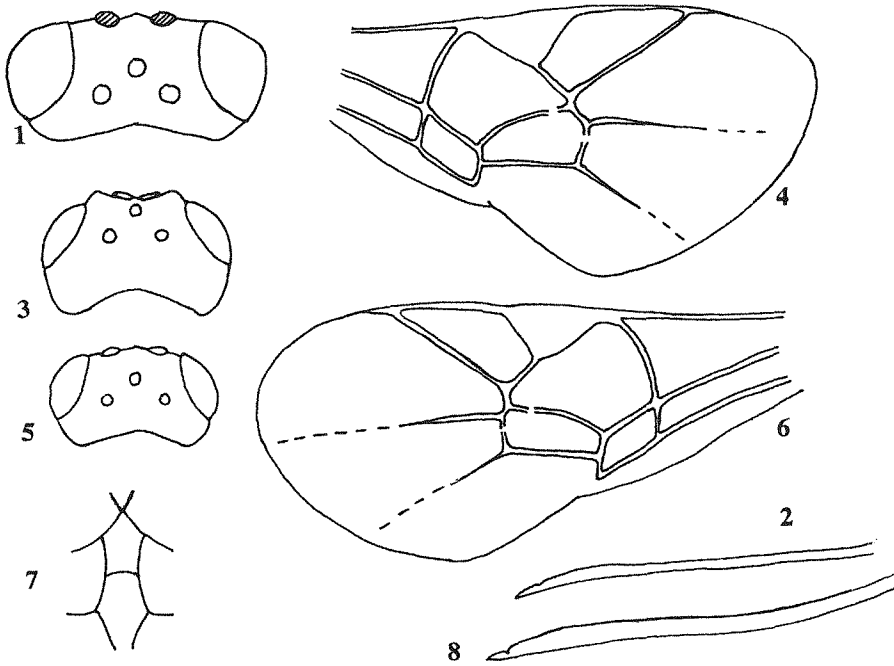


Fig. 1-2 *Cre mastus quadratus* sp. n.: 1 head from above; 2 ovipositor. - Fig. 3-4 *Nothocremastus beyarslani* sp. n.: 3 head from above; 4 front wing. - Fig. 5-8 *Nothocremastus bulgaricus* sp. n.: 5 head from above; 6 front wing; 7 areolation of propodeum; 8 ovipositor.