

**Research article**Submitted: July 28<sup>th</sup>, 2018 - Accepted: October 24<sup>th</sup>, 2018 - Published: December 31<sup>st</sup>, 2018**A new species of *Teratolytta* from Iran, with an updated identification key to the males of this genus (Coleoptera: Meloidae)**Sayeh SERRI<sup>1,\*</sup>, Marco A. BOLOGNA<sup>2</sup><sup>1</sup> *Insect Taxonomy Research Department, Iranian Research Institute of Plant Protection, Agricultural Research, Education and Extension Organization - Tehran, 19395-1454, Iran - serrisayeh@gmail.com; serri@iripp.ir*<sup>2</sup> *Dipartimento di Scienze, Università Roma Tre - Viale G. Marconi 446, 00146 Roma Italy - marcoalberto.bologna@uniroma3.it*

\* Corresponding author

**Abstract***Teratolytta capillata* sp. n., the southernmost representative of the section I of this genus, is described, figured and the diagnostic characters within *T. carlae* group are listed. An updated identification key to the males of *Teratolytta* species is also provided.**Key words:** Blister beetles, Lyttini, new species, identification key, Middle East.

urn:lsid:zoobank.org:pub:

**Introduction**

*Teratolytta* Semenov, 1894 is a genus of the tribe Lyttini Solier, 1851 possibly related to *Lytta* Fabricius, 1775 (Bologna, unpublished). According to the preliminary classification published by Bologna & Di Giulio (2006), two sections are distinctly defined for this genus based upon absence (section I) or presence (section II) of two tubercles on the metasternum, right back to the base of middle legs. These sections were confirmed also after the addition of two new Anatolian species (one still formally undescribed) (Bologna & Di Giulio 2016). The section I, bearing only symplesiomorphic features in males, comprises six species groups with eleven species (including the undescribed Turkish species mentioned above), and section II includes three species groups with nine species (Bologna & Di Giulio 2006, 2016). Both sections share spread elytral patterns with metallic green ground and longitudinal bronze-cupreous stripes as in the new Iranian species (see also Bologna & Di Giulio 2016).

*Teratolytta* exhibits a Turanian-Mediterranean distribution sensu Vigna Taglianti et al. (2000), and shows the main species diversity in the eastern Mediterranean area. In fact, although the species are distributed from the Balkans across Anatolia, Transcaucasia, and Iran as far east as Central Asia and Afghanistan, most of them are endemic to the Anatolian peninsula and others have small ranges in the Near and Middle East (Bologna & Di Giulio 2006, 2016). Only one species, *T. dives* (Brullé, 1832), probably dispersed from the Ponto-Mediterranean subref-

uge (sensu De Lattin 1967) in the northeastern Mediterranean region.

Considering the new species described here, four *Teratolytta* were recorded thus far from Iran as follows: *T. eylandti* Semenow, 1894, *T. optabilis* (Falderman, 1832), *T. tricolor* (Haag-Rutenberg, 1880), and *T. capillata* sp. n. The earliest record of *Teratolytta* species from Iran goes back to Haag-Rutenberg (1880), who described *Lytta tricolor* (= *T. tricolor*) from the northeastern range (North Khorasan), and recorded again by Escherich (1894) as *T. dives*. Semenow (1894) described *T. eylandti* from Kopet Dag and this species was re-described from the same Iranian mountains as *T. holzschuhi* by Dvořák (1983). Mirzayans (1970), published records of *T. eylandti* from North Khorasan, and of *T. tricolor* (as *T. dives phalerata*) from Golestan, Kermanshah and Kerman provinces. The records of the new species described herein from Kazeroun, Fars province, and *T. tricolor* from Jiroft, Kerman province (Bologna & Di Giulio 2006), are the southernmost records of this genus in the world.

During the examination of the meloid specimens in Hayk Mirzayans Insect Museum (HMIM), two males of a new species of *Teratolytta* were found, which is described and illustrated in this paper.

In the revision of the genus *Teratolytta*, Bologna & Di Giulio (2006) published an identification key to males, and recently Bologna & Di Giulio (2016) proposed a key to females. Here we present an updated identification key to males of this genus, including the new species and *T. krejci* Bologna and Di Giulio, 2016.

## Material and Methods

Specimens were examined and illustrated using a stereomicroscope Zeiss Stemi SV8 equipped with a Zeiss drawing tube 474622-9901. They were measured magnified up to 64 times using a stereoscopic microscope with an eye-piece linear micrometer. Photograph was taken using a 650D Canon digital camera through an Olympus SZH stereomicroscope. The total length of types is the interval from the apex of mandibles to the apex of elytra. The male genitalia were dissected, illustrated and mounted on cards. The labels are cited in quotation marks. Lines within each label are separated by slashes. Additional comments are given in brackets.

The studied material is deposited at the Hayk Mirzayans Insect Museum (HMIM), Tehran, Iran.

## Results

### *Teratolytta capillata* sp. n. (Figs 1, 2)

**Type Material.** Holotype ♂ (HMIM) **Iran:** “FARS: KAZERUN/ Gavkoshak // 31.1.1976 / L.T. [Light trap] ([leg.] Abai)” printed label. The holotype lacks the right antenna. Paratype ♂ (HMIM), **Iran:** “FARS/ KAZERUN, Gavkoshak/ 15–21.1.1976/ L.T [Light Trap] ([leg.] Abai)” printed label. The paratype lacks the right protarsus.

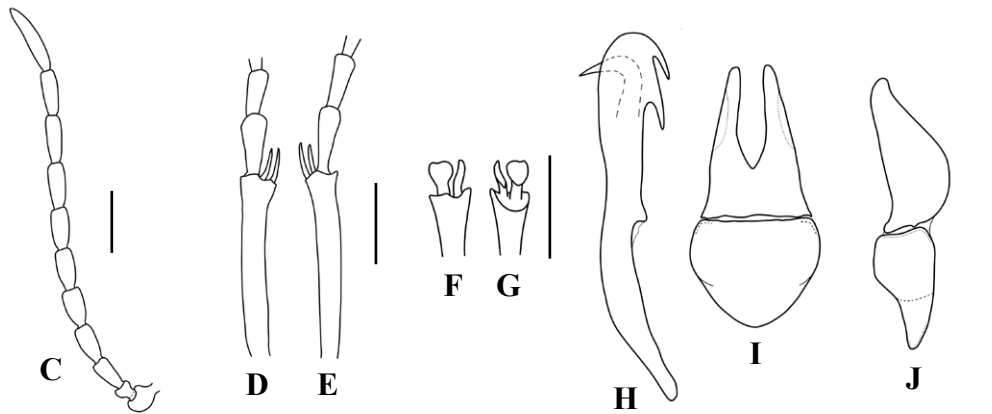
**Diagnosis.** Middle sized (12.5–13.3 mm) (Fig. 1A). Body metallic bronze-cupreous, partially green. Legs orange-red with black trochanters and knees. Setation white and long, with scattered black setae on the fore part of body. Head punctures scattered and irregular, intermediate surface distinctly shagreened and subopaque. Male mesotibia and first mesotarsomere not modified. Pro- and mesotibiae straight, with two apical spurs. Metatrochanters triangular without modified apical setae. Gonoforceps with robust apical lobes, short in lateral view; aedeagus with two large apical hooks; endophallic hook curved. Female unknown.

**Description.** Body metallic, bronze-cupreous with green vertex, apex and base of pronotum, and green longitudinal stripes at middle of pronotum, next to elytral suture, lateral margin and middle of each elytron; elytral suture blue; maxillary palpi orange-red as well as legs, except coxae, trochanters, apex of femora and base of tibiae, which are black; mouthparts black, antennae subopaque black. Setation white with scattered black setae on fore part of body and last sternite. Total length 12.5–13.3 mm; head maximum width 2.5–2.6 mm; pronotum length 1.7–1.8 mm, pronotum maximal width 2.3–2.4 mm; elytral maximal width 4.1–4.2 mm. Head subtrapezoidal, distinctly wider than long, maximum width at temples; lateral sides of head obliquely narrowed from base to eyes; frons very slightly



**Fig. 1** – *Teratolytta capillata* sp. n.; male, habitus in dorsal view (A). Pronotum in dorsal view (B).

depressed at middle; mandibles short, robust and curved; clypeus convex; fore margin of labrum slightly emarginate; maxillary and labial palpomeres slender; last maxillary palpomeres 1.25 times as long as penultimate; antennae (Fig. 2C) extending to the basal third of elytra; antennomere I about twice as long as II, III shorter than I and II together; III subequal to IV; III–X elongate, cylindrical; XI 1.6 times as long as X, cylindrical, narrowing in apical third; antennomeres I and II with long black setae. Pronotum (Fig. 1B) subpentagonal, maximal width anterior to middle, wider than long, transversally depressed along the base, pronotal punctures shallow and very scattered. Scutellum relatively wide, subquadrate, with round and slightly depressed apex. Elytra rugose, relatively flattened, without clear tracks of venation, setation uniformly distributed, at basal third bicolour (white and black), and longer than on middle and apex of elytra. Metathorax without tubercles. Tibiae of all legs with two apical spurs, both pointed and slender on pro- and mesotibiae (Figs 2D–E); spurs of metatibiae robust, inner pointed, outer spoon-like



**Fig. 2** – *Teratolytta capillata* sp. n.: antenna (C); mesotibia and mesotarsomere I and II, lateral and inner views (D-E); apex of metatibia and metatibial spurs, dorsal and ventral views (F-G); aedeagus, lateral view (H); tegmen, ventral view (I); tegmen, lateral view (J). Scale bar = 1 mm.

(Figs 2F-G); male tibiae of all legs cylindrical, not modified at apex, with regular setation; male mesotarsomere I (Figs 2D-E) of all legs slender, not modified, with simple setation, male metatrochanters without modifications. Last visible ventrite of male with shallow emargination and short black setae. Gonostyli in ventral view divided on 2/3 and with robust apical lobes (Fig. 2I), in lateral view robust and with short lobes (Fig. 2J); aedeagus (Fig. 2H) with two large apical hooks, slightly different in shape and size, distal one slightly smaller than proximal; endophallus hook curved, apically slender and acutely pointed (Fig. 2H).

**Etymology.** The epithet “*capillata*” (Latin, adjective: having long hairs) refers to the long setation which covers the whole body of this beautiful beetle.

**Discussion.** The absence of two tubercles on the male metasternum is a good character to refer *Teratolytta capillata* to the section I of the genus, which consists of six species groups with 11 species as defined by Bologna & Di Giulio (2006, 2016). Among them, *T. carlae* species group was considered as one of the monotypic groups, probably the most basal group of species in the genus due to the complete absence of sexual dimorphism, including lack of tubercle on metasternum, unmodified tibiae and tarsomeres. The newly described *Teratolytta capillata*, which belongs to the *T. carlae* species group and is very similar to that, is clearly distinguished from *T. carlae* according to: the structure of aedeagus, which has the longer and more inclined distal hook; the shape of the pronotum, whose maximal width is anterior to middle, and punctuation of pronotum, whose intermediate surface of punctures is more shagreened; the body setation, especially on pronotum and elytra, which is white and distinctly longer; and also the longitudinal green stripes on pronotum and elytra. Two additional species of section I were described by Bologna & Di Giulio (2016): *T. krejciki* belonging to a distinct species group, not greatly modified in legs structures,

and a formally undescribed species A from Turkish Pontus, probably belonging to the *T. carlae* group.

*Teratolytta* sp. A, the possible new species related to *T. carlae* from the Turkish Pontus, briefly characterized by Bologna & Di Giulio (2016), and known on a single female, seems to have similar but shorter setation, and similar elytral pattern to *T. capillata*; the discovery of its male will clarify the true relationship of these species. *T. krejciki*, belonging to another basal group of the section I, but with very slightly modified metatrochanters (triangularly elongate without modified apical setae), differs from the new species at least because of the general body colouration (totally metallic green), the slender shape of pronotum, the curved mesotibia, the shape of the distinctly distanced aedeagal hooks, the shorter body setation, and the finer punctures of head and pronotum.

Members of the *T. carlae* species group seems to exhibit restrict distribution within the Irano-Anatolian highlands; among them, *T. capillata* is probably endemic to the south-western slope of Zagros Mountains.

#### New key to the species (males) of *Teratolytta*

(from Bologna & Di Giulio 2006, modified)

Based on the diagnostic ectoskeletal and genital characters, Bologna & Di Giulio (2006) published a comprehensive identification key to the seventeen *Teratolytta* species which were known until then. Here we present an updated key, in which *T. krejciki* Bologna and Di Giulio, 2016 and the newly described *T. capillata*, are also included.

1. Metasternum with one tubercle on each side ..... 2
- Metasternum without tubercles ..... 10
2. Metasternal tubercles oval and elongate ..... 3
- Metasternal tubercles short and conical ..... 5
3. Protibiae ventrally not depressed, integuments opaque green, tibiae black ..... *T. optabilis*
- Protibiae ventrally depressed, integuments shiny green or blue, tibiae at least partially orange-red ..... 4
4. Hind trochanter with a short triangular expansion, setose on inner margin. Last ventrite with modified setae as long as

- the latter. Distal hook of aedeagus close to proximal one ..... *T. eylandti*
- Hind trochanter with a long appendix. Last abdominal sternum with modified setae longer than the latter, distal hook of aedeagus separated from proximal one ..... *T. vanensis*
5. Hind trochanter orange-red with white setae longer than on femora ..... *T. senilis*
- Hind trochanter black, with white short setae, as long as on femora ..... 6
6. Appendix of hind trochanter elongate, with apical tuft of long modified setae ..... 7
- Appendix of hind trochanter short, without apical tuft of long modified setae ..... 9
7. Appendix of hind trochanter with an outer curved expansion, nude at apex. Mesotarsomere I basally very large. Elytra with a middle longitudinal cupreous stripe; knee monochromatic red ..... *T. tricolor*
- Appendix of hind trochanter not externally expanded at apex. Mesotarsomere I basally not very large. Elytra with or without a middle longitudinal cupreous stripe; knee black ..... 8
8. Mesotibial apex and mesotarsomere I as in Fig. 26 (after Bologna & Di Giulio 2006). Elytra green, usually with a middle longitudinal cupreous stripe ..... *T. dives*
- Mesotibial apex and mesotarsomere I as in Fig. 28 (after Bologna & Di Giulio 2006). Elytra green or blue, never with a middle longitudinal cupreous stripe ..... *T. flavipes*
9. Pronotum clearly transverse. Elytra broad basally, with angulate humeri ..... *T. monticola*
- Pronotum subtrapezoidal. Elytra not so broad basally, with rounded humeri ..... *T. dvoraki*
10. Pro- and mesotibiae with one spur, mesotibial apex not modified ..... 11
- Pro- and mesotibiae with two spurs, mesotibial apex modified or not ..... 13
11. Head without postocular depression. Last abdominal tergum modified as in Fig. 43 ..... *T. kulzeri*
- Head with postocular depression. Last abdominal tergum rounded or prominent, but not modified ..... 12
12. Elytra with a middle longitudinal cupreous stripe. Metatibiae with black spiniform setae at apex. Last abdominal tergum prominent. Endophallic hook markedly prominent at apex ..... *T. klapperichi*
- Elytra without a middle longitudinal cupreous stripe. Metatibiae without black spiniform setae at apex. Last abdominal tergum rounded. Endophallic hook normally rounded at apex ..... *T. regina*
13. Head with a large depression posterior to eyes and extended dorsally on occiput. Protibiae gradually markedly enlarged at apex. Body black-bronze, with white setation grouped in tufts. Mesotibial apex slightly modified as in Fig. 25 (after Bologna & Di Giulio 2006). Pronotum depressed on sides, with a deep longitudinal line ..... *T. pilosella*
- Head without postocular depressions. Protibiae almost cylindrical at apex. Body metallic green or blue, white setation regularly distributed. Mesotibial apex may or may not be markedly modified. Pronotum not depressed on sides and with longitudinal line moderately deep ..... 14
14. Mesotibial apex modified as in Fig. 20 (after Bologna & Di Giulio 2006). Hind trochanters with short appendix ..... *T. gentilis*
- Mesotibial apex not modified. Hind trochanters without appendix ..... 15
15. Gonoforceps slender in the distal half. Endophallic hook markedly prominent at apex. Elytra green with a middle longitudinal cupreous stripe. Pronotum pentagonal. Knees red-orange ..... *T. kaszabi*
- Gonoforceps robust in the distal half. Elytra green or blue with or without middle longitudinal stripe ..... 16
16. Mesotarsomere I slightly modified as in Fig. 21 (after Bologna & Di Giulio 2006). Mesotarsomere II with spiniform black setae. Metatibial outer spur markedly enlarged at apex, not spoon-like; metatibiae slightly curved in the distal half. Head surface shiny with more dispersed punctation. Knees red-orange ..... *T. taurica*
- Mesotarsomere I not modified ..... 17
17. Meso- and metatibiae curved. Hooks of aedeagus distinctly distanced. Elytra metallic green without middle longitudinal bronze-cupreous strip ..... *T. krejci*
- Meso- and metatibiae not curved. Hooks of aedeagus close each to other ..... 18
18. Pronotum maximal width on middle. Pronotum without longitudinal green stripe. Distal hook of aedeagus markedly smaller than proximal; endophallic hook slightly curved, not acutely prolonged apically ..... *T. carlae*
- Pronotum maximal width anterior to middle. Pronotum with middle green stripe. Distal hook of aedeagus slightly smaller than proximal; endophallic hook acutely pointed ..... *T. capillata*

**Acknowledgements** – We are very grateful to the collector, late Dr. Mansour Abai. His works which promoted the Iranian entomology will never be forgotten.

## References

- Bologna M.A., Di Giulio A. 2006. Revision of the genus *Teratolytta* (Coleoptera: Meloidae). European Journal of Entomology, 103: 137–161.
- Bologna M.A., Di Giulio A. 2016. New species of *Teratolytta* from Turkey and a key to the females (Coleoptera Meloidae). ZooKeys, 625: 87–97.
- Bologna M.A., Pinto J.D. 2001. Phylogenetic studies of Meloidae (Coleoptera) with emphasis on the evolution of phoresy. Systematic Entomology, 26: 33–72.
- Bologna M.A., Pinto J.D. 2002. The Old World genera of Meloidae (Coleoptera): a key and synopsis. Journal of Natural History, 36: 2013–2102.
- Dvořák M. 1983. Drei neue Arten und einige bemerkungen zur Familie Meloidae (Coleoptera). Acta Entomologica Bohemoslovaca, 80: 441–450.
- Dvořák M. 1996. Der Schlüssel zur Bestimmung der meloiden-Gattung *Teratolytta* (Coleoptera: Meloidae). Klapalekiana, 32: 163–165.
- Escherich K. 1894. Beiträge zur Naturgeschichte der Meloidengattung *Lytta* Fab. Verhandlungender K. K. Zoologische-Botanische Gesellschaft Wien, 44: 251–298, 4 pls.
- Haag-Rutenberg G.J. 1880. Beiträge zur Kenntniss der Canthariden. Deutsche Entomologische Zeitschrift, 24: 17–90.
- Lattin G. de 1967. Grundriss der Zoogeographie. G. Fischer, Jena, 602 pp.
- Mirzayans H. 1970. Contribution à la connaissance de la faune des Clerides et Méloïdes de l'Iran. Entomologie et Phytopathologie Appliquées, 29: 25–37.
- Semenow A. 1894. Coleoptera asiatica nova. Horae Societatis entomologicae rossicae, 28: 526–547.
- Vigna Taglianti A., Audisio P.A., Biondi, M., Bologna M.A., Carpaneto G.M., De Biase A., Fattorini S., Piattella E., Sindaco R., Venchi A., Zapparoli M. 2000. A proposal for a chorotype classification of the Near East fauna, in the framework of the Western Palearctic region. Biogeographia (n.s.), 20: 31–59.