

Meloidae (Coleoptera) of Pakistan and Kashmir with the description of three new species, new faunistic and taxonomic records, and a zoogeographic analysis

Marco A. BOLOGNA^{1*}, Ladislav ČERNÝ², Ahmed ZUBAIR³

¹Department of Sciences, University Roma Tre, Rome, Italy

²The South Bohemian Museum in České Budějovice, České Budějovice, Czech Republic

³Zoological Museum, Federal Urdu University Pakistan, Karachi, Pakistan

Received: 19.12.2017 • Accepted/Published Online: 18.09.2018 • Final Version: 12.11.2018

Abstract: A preliminary checklist of blister beetles from Pakistan and Kashmir is carried out, with the inclusion of 79 species. *Stenoria osellai* sp. nov. from northern Pakistan, *Hycleus pakistanus* sp. nov. from Baluchistan, and *Meloe (Micromeloe) pintoii* sp. nov. from Indian Kashmir are described. Three genera, namely *Stenoria*, *Psalydolytta*, and *Rhampholyssa*, and several species belonging to both subfamilies Nemognathinae and Meloinae, are recorded for the first time from these countries, whereas the genera *Cerocoma* and *Glasunovia*, previously cited, are excluded. Several new faunistic records are also introduced. The virtually unknown genus *Xanthabris* Kaszab (tribe Mylabrini) is recorded for the first time since its description, and several of its previously undescribed morphological characters are discussed and figured. Three Oriental species previously described in other genera are referred to the genus *Zonitoschema*: *Z. melanarthra* comb. nov., *Z. straminea* comb. nov., and *Z. angustithorax* comb. nov. Several previous erroneous records from Pakistan are noted and a preliminary zoogeographic analysis of blister beetles of this region is proposed.

Key words: Blister beetles, taxonomy, faunistics, zoogeography, Palearctic, Oriental

1. Introduction

The Asian region comprising Pakistan and Kashmir represents a particularly relevant area from a zoogeographic point of view because of its transitional position between the Palearctic and Oriental regions. Despite this, the region has been scarcely studied faunistically. In particular, blister beetles have never been studied, notwithstanding their importance to agriculture and pharmacology (see Bologna, 1991; Bologna et al., 2008b, 2010; Bologna and Di Giulio, 2011). Except for a short paper by Saha (1972a), no contributions specific to the meloid fauna of the region have been published. Most of what we do know stems from faunistic records or descriptions of new species included in more general papers or in faunal surveys of neighboring countries, such as Iran (Kaszab, 1956, 1968), the United Arab Emirates (Kaszab, 1983; Bologna and Turco, 2007), Afghanistan (Borchmann, 1935; Kaszab, 1953, 1958, 1962, 1973; Nakane, 1966; Iablokoff-Khuzorian, 1983; Bologna et al., 2008a), India (Saha, 1979; Anand, 1980, 1984, 1989; Selander, 1986b, 1987, 1988), and Nepal and Xizang (Tibet) (Borchmann, 1940; Tan, 1981; Bologna, 1983, 2008, 2009; Axentjev, 1987; Pan and Bologna, 2014; Pan et al., 2014).

* Correspondence: marcoalberto.bologna@uniroma3.it

In the recent Palearctic Catalogue of blister beetles, Bologna (2008) listed 28 species from Pakistan and 19 from Kashmir, a few of which occur in both countries. Two species were erroneously recorded: *Cerocoma latreillei sterbai* Mañan and *Glasunovia sillemi* Borchmann, 1935 (see "General remarks"). In the present comprehensive study, we list 79 species from Pakistan and Kashmir. We hypothesize that a greater number occur because several other species, never recorded from Pakistan or Kashmir, are distributed in the neighboring regions of western India (Himanchal Pradesh, Punjab, and Rajasthan: Saha, 1972a, 1972b, 1979; Bologna, 2008), eastern Iran, and Afghanistan (Kaszab, 1957, 1958, 1959, 1963, 1968, 1973). This entire area represents a zoogeographic and ecological mosaic that includes Oriental, Palearctic, and Saharo-Sindian elements in a continuum of ecosystems from extreme desert to steppe, subtropical savannah, montane, and alpine habitats.

In a general checklist of beetles from Pakistan, Hashmi and Tashfeen (1992) listed some meloid species, but the identification and the taxonomy of most of them are erroneous: (a) the genera *Apogonia*, *Aserica*, *Crasthospastoides*, *Dajeania*, *Granida*, *Holtichia*,

Illecatutacea, *Lachnosterna*, *Megacephala*, *Melolontha*, *Schyzonyca*, and *Serica* actually belong to other beetle families or represent erroneous names; (b) some specific names represent only synonyms of other species and most names show errors. The emended data from that paper are reported in the checklist presented here.

Considering that the blister beetle fauna of Pakistan and Kashmir is so poorly known, a primary focus of this study is to provide an updated faunal account and checklist of the region, which includes 21 species and three genera previously unrecorded. Three of the species are described as new. The opportunity to study new material from the poorly surveyed regions of Baluchistan and Kashmir adds considerably to our understanding of this fauna. We also summarize all records from the literature, resolving most of the several errors found therein, and update records summarized by Bologna (2008). This study also allows us to extend the range of certain species previously unrecorded from Afghanistan, China, the UAE, India, Iran, and Thailand.

2. Materials and methods

Several specimens studied for this contribution were recently collected by entomologists of Pakistan directed by one of the authors (AZ). Also available was material accumulated during various European expeditions to Pakistan and Kashmir in the last century.

Specimens from the following collections (with acronyms used in the text) have been examined: Marco A. Bologna, Dipartimento di Scienze, Università Roma Tre, Rome, Italy (CB); Ladislav Černý, České Budějovice, Czech Republic (CC); Stanislav (Standa) Krejčík, Unicov, Czech Republic (CK); Vladimír Vrabec, Prague, Czech Republic (CV); Federal Urdu University, Zoological Museum (FUUZM); late Johan Probst, Vienna, Austria (Naturhistorisches Museum Wien, NHMW); Museo civico di Storia naturale, Genoa, Italy (MSNG); Museo civico di Storia naturale, Milan, Italy (MSNM); Museo civico di Storia naturale, Verona, Italy (MSNV); Museo regionale di Scienze naturali, Torino, Italy (MRSN); Natural History Museum, London, UK (NHM); Natural History Museum, Basel (NHMUK), National Museum of Natural History, Budapest, Hungary (HNHM); National Museum, Department of Entomology, Prague, Czech Republic (NMPC); Muséum national d'Histoire naturelle, Paris, France (MNHN); Musée, Institut Royal de Sciences naturelles du Belgique, Brussels, Belgium (RBINS); Zoological Museum, Amsterdam, the Netherlands (ZMAN).

Subfamilies and tribes are ordered according to phylogenetic hypotheses published by Bologna et al. (2008). Species are ordered alphabetically; for *Hycleus*, they are arranged by species group.

This paper includes a zoogeographic analysis of the Meloidae of Pakistan and Kashmir. We developed our zoogeographic analyses according to the study of generalized models of shared distribution patterns (chorotypes) (see Biondi and D'Alessandro, 2006 for a theoretical discussion), which have been mostly examined in the Palearctic Region (e.g., Vigna Taglianti et al., 1992, 1999), but also in other biogeographic regions (e.g., Biondi and D'Alessandro, 2006; Bologna et al., 2018). Vigna Taglianti et al. (1999) revised the western Palearctic chorotypes, which were utilized in our study with the addition of new Palearctic (only Central Asiatic) and Oriental chorotypes. We assigned each species from Pakistan and Kashmir to a chorotype according to their general distributions. To better explain all described and new chorotypes of the species distributed also in Pakistan and Kashmir, we represented them except three very extended chorotypes (namely the Palearctic, Oriental, and Paleotropical), which correspond to well-known biogeographic regions. In our analysis we pointed out the relative abundance of chorotypes to outline the influence of the Palearctic and Oriental components in the fauna structure, and to underline the relevance of the endemic species. This analysis, made on a rich taxon, can represent a general example to interpret the history of animal and plant distributions in Pakistan and Kashmir.

3. Results

3.1. Annotated catalogue

Subfamily Eleticinae

Tribe Eleticini

Eletica (Meteletica) testacea (Olivier, 1795)

New records. Pakistan: 1 ex., Kaghan valley, N Shogran, 2900–3100 m, 27/29.vii.2001 Heinz (NHMW, late J. Probst collection); 1 ex., Kashmir, Kotli, 31.iii.16 (FUUZM); 1 ex., idem, 26.viii.2016 (CB); 2 exx., Lower Dir, Samar Bagh, Khyber Pakhtoon Khwa, 27.vi.2015 (MUK).

Distribution. Oriental element, distributed from eastern and northern Pakistan to eastern India and Sri Lanka, northern Myanmar and northern Thailand [New country record: Chiang Mai prov., Chiang Dao (CB). Note that in this locality it is sympatric with *E. castanea* Thomas, 1893: see Bologna, 1995]. Kaszab (1955). Anand (1989) recorded *E. testacea* from some Indian states.

Remarks. The Pakistani record of *Eletica castanea* published by Hashmi and Tashfeen (1992) is erroneous and actually refers to *E. testacea*. *Eletica castanea* is restricted to the Indochinese Peninsula. Citations of *Eletica gangetica* and *E. testacea* R., published in Hashmi and Tashfeen (1992), both refer to *E. testacea*. Saha (1972b) described *E. pilaniensis* from Rajasthan and *E. kaszabi* from Gujarat, both Indian states close to Pakistan, but these taxa are probably synonyms of *testacea* [we examined specimens of *E. testacea* from Rajasthan (CB)].

Subfamily Nemognathinae**Tribe Horiini*****Horia fabriciana* Betrem, 1932**

New records. Pakistan: 1 ex., Sindh, City Karachi, District East, Korangi Crossing, 24 51 36N - 67 0 36E, 8 m a.s.l., 2.ix.2012 (CB); 1 ex., Sindh, Tharparkar Distr., Mithi, 12.vi.2012 (CB).

Distribution. Widely distributed in eastern and northeastern Africa, the Arabian Peninsula, east to Pakistan and India (Bologna and Turco, 2007). The species was recorded without details from Pakistan by Hashmi and Tashfeen (1992).

Tribe Nemognathini***Stenoria osellai* Bologna sp. nov.** (Figures 1 and 2)

ZooBank taxon LSID: BC7A10DC-9B55-4D62-A5FB-8265D3C55343

Type material. Male holotype, "Pakistan, Baltistan, Skardu, m 2400, 1.vii.1976, B. Osella" (CB). Holotype lacks right tarsomeres II-V and left III-V, and right VII-XI and left VIII-XI antennomeres. Genitalia and sternite IX (spiculum gastrale) are dissected and glued on the paper label together with specimen.

Type locality: Pakistan, Baltistan, Skardu, 2400 m a.s.l.

Description. Body length: 14 mm. Head, mouthparts (except apical third of mandibles black), antennae, pronotum and prosternum, legs (except apex of tarsomeres and claws darker), and abdomen mustard yellow, quite shiny, meso- and metathorax and apical third of elytra black.

Head short, shorter than wide, transversely trapezoidal, maximum width on temples, temples slightly longer than the longitudinal diameter of eye; eye transverse, distinctly



Figure 1. *Stenoria osellai* Bologna sp. nov.: habitus (holotype).

sinuate near the antennal base, about as wide as the lateral length of head; frons wide and quite flat, anteriorly slightly depressed, interocular space wider than the dorsal visible width of eye, a middle longitudinal impunctate area extends from the fronto-clypeal suture almost to occiput, anteriorly slightly furrowed, punctures on the remaining dorsal surface shallow and almost subrugose; fronto-clypeal suture slightly incised medially, but almost straight; clypeus subtrapezoidal, narrowed in front, only

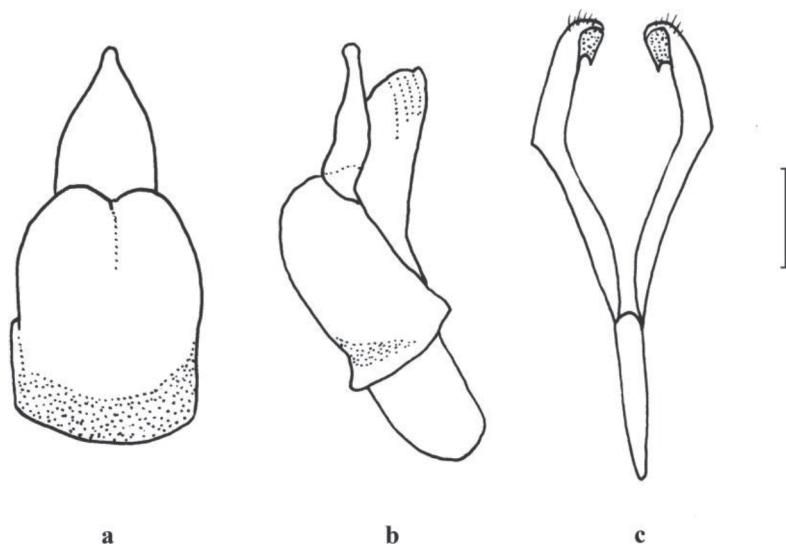


Figure 2. *Stenoria osellai* Bologna sp. nov. (holotype): tegmen in ventral (a) and lateral (b) views, and spiculum gastrale (c).

shagreened, with fore suture straight; labrum ca. 1:1 as long as clypeus, subcordiform, rounded on sides, fore margin deeply and widely emarginated. Maxillary and labial palpomeres subcylindrical, maxillary segment IV narrowed anteriorly and quite truncate, maxillary galeae shorter and fringed; mandibles distinctly curved, robust, apically pointed. Antennomeres depressed and elongate, with sides straight and subparallel, slightly widened on external apex (III on inner side), but I widened from base to apex and dorsally convex; II ca 0.5 as long as I and III, III–VIII subequal in length. Setae on head short, antennomeres microsetose.

Pronotum (Figure 1) campaniform, sides slightly widening from base to the middle and anteriorly rounded, dorsal surface slightly depressed in front at middle, basal margin almost straight. Punctures similar to those on head, but sparser. Mesonotum distinctly emerging at base of pronotum, depressed medially, narrowed on the posterior half, rounded at apex. Prosternum wide and quite flat; mesosternum and metasternum not modified; ventral setation denser and longer. Elytra (Figure 1) almost completely covering the abdomen, only dehiscent apically and scarcely sinuate on the lateral margin externally on the apical third, distinctly emarginate laterally; two inner venations well visible, dorsal surface subrugose. Leg setation long and denser than on dorsal surface; both fore and middle tibial spurs slender and pointed, both metatibial spurs thicker than pro- and mesotibial ones, but not spatulate, pointed at apex; tarsomere I of all legs twice as long as II; remaining tarsomeres slender and not modified.

Abdominal ventrites not modified and without areas of distinct setation; margin of penultimate ventrite slightly emarginate medially, last ventrite divided medially almost completely. Tegmen in ventral view (Figure 2a) with wide and subcylindrical gonocoxal base, depressed posteriorly, gonoforceps conically narrowed anteriorly; in lateral view (Figure 2b), gonoforceps slender, slightly sinuate beyond base, narrowed in apical third, apex subspatulate; aedeagus robust, apically with light lines. Lateral arms of the spiculum gastrale (Figure 2c) slender and elongate.

Distribution. Endemic to northern Pakistan.

Diagnosis. A large *Stenoria* species, easily separated from most congeners by the combination of the following characters: smooth claws, elytra only dehiscent apically and scarcely sinuate externally; head, including antennae, pronotum, legs and abdomen mustard yellow; meso- and metathorax and apical fourth of elytra black; body setation golden-yellow.

Etymology. This new species is named after “Beppe” (Bartolomeo Giuseppe) Osella, Italian specialist of Coleoptera Curculionidae and a colleague of one of us (MAB) in an early period of his research activity. Professor

Osella collected this blister beetle during an alpine expedition to Karakorum.

Remarks. *Stenoria osellai* is phenetically distinguished from other *Stenoria* by its elytral features; however, its position within the genus is questionable. *Stenoria* is in considerable need of systematic study. The definition of the genus and relationships within remain problematic. The larval morphology of two western Palearctic species [*apicalis* (Latreille, 1802) and *analisis* Schaum, 1859] supports the distinction of the genus (see Bologna, 1991; Bologna and Pinto, 2001) but adult characteristics of other species do not allow convincing separation from *Apalus*, *Sitaris*, *Sitarobrachys*, and the Central Asiatic genus *Nyadatus* Axentjev, 1981. *Stenoria osellai* is morphologically similar to *Nyadatus* in that the elytra are scarcely emarginate externally and the tarsal claws are smooth. Bologna and Pinto (2001) previously considered it as possibly related to the species described as *Nyadatus*. Other species with smooth claws currently assigned to *Stenoria* are known: *thakkola* Schawaller, 1996; *laterimaculata* (Reitter, 1898); and an undescribed species from the Caucasus (Bologna and Pinto, 2002). Bologna and Pinto (2002) previously suggested that *Nyadatus* could represent an intrageneric unit of *Stenoria*.

***Zonitis (Zonitis) afghanica* Kaszab, 1958** (Figure 3)

New records. Pakistan, more than 100 exx., NWFP, Chitral distr., Kalash valleys, Bumburet valley, Broon village, 29.7–6.8.1998, L. Černý and L. Čížek (CB, CC).

Distribution. Recorded from Afghanistan; new species record for Pakistan.

Remarks. This species is variable in color and a few specimens with a red head and pronotum but completely black elytra were collected together with the nominotypical form; mating between these phenotypes was not observed.

***Zonitis (Zonitis) nigripectus* Fairmaire, 1891**

Distribution. Fairmaire (1891) described this species from Kashmir, but the type locality, Kulu, now is in the Indian state of the Himanchal Pradesh, close to Kashmir. It was recorded from Kashmir by Anand (1989), but this probably followed the original description rather than being based on new unpublished records.

Remarks. We examined the type of this species (MNHN), labeled “Kulu”; “*Zonitis nigripectus* Fairm. K”. The definition of the genus *Zonitis* requires clarification, especially with respect to the assignment of several tropical species (Bologna and Pinto, 2002; Bologna et al., 2013). However, both *afghanica* and *nigripectus* belong to *Zonitis* and seem to be closely related to certain central Asiatic species. In *nigripectus* the head, pronotum, apex of abdomen, and elytra except the apical third (which is black) are ochre-reddish; femora are yellow-orange; the remaining parts of body are black. Both metatibial spurs are slender with the external spur as long as the inner one.

***Zonitoschema melanarthra* (Fairmaire, 1894) comb. nov.** (Figure 4)

New records. Pakistan: 2 exx., NWFP, N of Peshawar, Tangi village, 27.vii.1998, attracted by light, L. Černý and L. Čížek (CC, CB).

Distribution. Until now this species was recorded only from India; new species record for Pakistan. It was described from “Barway” in the Jharkhand State and afterwards quoted by Fairmaire (1896) from Pune (as Poona), in the Maharashtra State.

Remarks. This species was described as *Zonitomorpha*, and we are proposing for it a **comb. nov.** Its identification was confirmed after the examination of the holotype (MNHN) and a second specimen from Pune (MNHN). Specimens from Tangi differ slightly from the holotype in the shape of pronotum, which is slightly more rounded in the fore sides, but this character could be variable as the specimen from Pune shows a wider and more rounded pronotum than the holotype.

Zonitoschema has a Palearctic distribution, being distributed in the Afrotropical and Oriental regions, with a partial spread in the southern Palearctic (Batelka and Bologna, 2014) and Australasian regions (Bologna et al., 2013). Species relationships are not clarified and the genus requires revision. A key to the Saharo-Sindian species was published by Batelka and Bologna (2014), and keys to the Afrotropical and Asian species are in preparation (Bologna et al., unpublished).

This is one of the few Palearctic and Oriental species of *Zonitoschema*, some of which are undescribed,

with the apical fifth of the elytra black (Bologna and Pan, unpublished). Among them, *Z. melanarthra* is characterized by the black antennae except antennomere I yellow-orange, and the black legs with the basal 2/3 of the tibiae orange-red. It is very similar to *Zonitoschema angustithorax* (Pic, 1912) (**comb. nov.**, described as *Zonitomorpha*) from E China (Qingdao), which has a narrow pronotum with parallel sides.

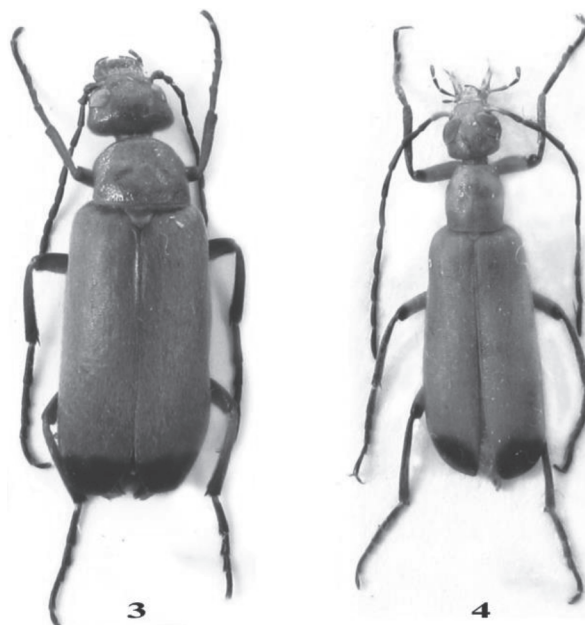
***Zonitoschema straminea* (Fairmaire, 1894) comb. nov.**

New records. Pakistan: 1 ex., Islamabad, sect. E, 7 33°43'N 73°03'E, 600 m, 20.vi.2011, G. Sabatinelli, at light (CB, in alcohol 95%).

Distribution. Until now recorded only from eastern India (Jharkhand State); new species record for Pakistan.

Remarks. We refer a single examined specimen to *straminea*; the identification was confirmed after the examination of the holotype (MNHN) and a possible paratype from “Barway” (MNHN, labeled respectively: (a) “Barway. P. Cardon; *Zonitis straminea* Fairm. n. sp.”; (b) “*Zonitis straminea* Fairm. Bengala; Barway. P. Cardon”).

This species was described as *Zonitis*, and we are proposing for it a **comb. nov.** It is characterized by the almost completely orange body with antennal segments III–XI and the last two tarsomeres on each leg including the claw black. The pronotum is slightly widened at middle. No other Old World species has a similar color combination (Batelka and Bologna, 2014; Bologna and Pan, unpublished).



Figures 3–4. *Zonitis afghanica* Kaszab, 1958: habitus (3); *Zonitoschema melanarthra* (Fairmaire, 1894): habitus (4).

Hashmi and Tashfeen (1992) recorded, without comment, an undetermined species *Zonitoschema* from Pakistan.

Subfamily Meloinae

Tribe Lyttini

Lytta (Lytta) antennalis (Marseul, 1873)

Distribution. This species, erroneously cited from Japan by Bologna (2008), due to erroneous identification, actually is distributed from northern Pakistan and northern India to the Himalayan region and Xinjiang.

A single specimen from Rawalpindi (13/17.vii.1995, J. Klir; NHMW, late J. Probst collection) possibly refers to a new species of the nominotypical subgenus, close to *L. antennalis*.

Lytta (Lytta) flavipennis (Motschulsky, 1860)

Distribution. This species is distributed in India and Himalaya, and recorded from Pakistan by Hashmi and Tashfeen (1992). We did not examine specimens from this country, but from the Indian N Punjab, close to Kashmir [2 ex., Kangra valley-Yol, 1300 m, iv–vii.1944, C. Lomi (CB, MRSN)].

Lytta (Lytta) kashmirensis Bologna, 1983

Distribution. Recorded only from the Indian Kashmir [Urdukas, 3900 m, (CB)] (Bologna, 1983, 2008; Bologna and Osella, 1989).

Remarks. In CK (see <http://www.meloidae.com/cs/obrazky/370/>) is preserved one specimen from Pakistan [Northern Areas, 5 km S Babusar, 3400 m, 35.11N 74.03E (30 km south Chilas) 19–21.VII.2000], which is identified as *L. kashmirensis*. However, this specimen differs from *L. kashmirensis* in that the elytral apex is yellow and smooth, the elytral punctures less deep and dense, and those on the head and pronotum sparser and tiny. This specimen possibly refers to another undescribed species of the nominotypical subgenus.

Lytta (Asiolytta) limbata (Kollar and Redtenbacher, 1842)

New records. Pakistan: 1 ex., Dir, Lawarac Pass, 2700–3300 m, 17–19.viii.1981, Heinz leg. (NMPC, from Dvorak's collection).

Distribution. This species was recorded from Pakistan by Hashmi and Tashfeen (1992). The nominotypical form, described from Kashmir, is recorded from Afghanistan, Kashmir, northern India (Uttar Pradesh), and Nepal (Bologna, 2008); the subsp. *afghanica* Kaszab, 1981, described from Afghanistan, is distributed also in Pakistan (Lulu Sar: Kaszab, 1981) but it was not reported from this country by Bologna (2008).

Remarks. The taxonomy of the subgenus *Asiolytta* is poorly understood. We briefly examined at HNHM types of the subsp. *afghanica*, which is easily separated from the nominotypical form based on male genitalia and protarsomeres (see also Kaszab, 1981), and we suspect

that it could represent a distinct species. Contrary to our opinion, Axentjev (1987) synonymized both *L. limbata afghanica* and *L. poeciloptera* Semenov, 1893 with *L. limbata*.

Lytta (Asiolytta) discipennis (Fairmaire, 1891)

Distribution. Apparently endemic to Kashmir (Fairmaire, 1891). It was recorded from there by Anand (1989), and we know of specimens from the Indian Punjab, Kangra valley (CB).

Remarks. We examined the male holotype of this species (MNHN, labeled “*Cantharis discipennis* Fairm. Kashmir”). A distinguishing feature of this species is the modified male protarsomere I, which is narrowed basally and has a triangularly pointed ventral lamina.

Lytta (Eolytta) flavoangulata (Fairmaire, 1891)

New records. Pakistan: 1 ex., northern area, Astor, Rama rest-house, 35.3565°N -14.8080°E, 3170 m, 7.vi.2007, G. Carpaneto (CB).

Distribution. New species record for Pakistan. Until now it has been recorded from Kashmir (Fairmaire, 1891; Borchmann, 1935; Anand, 1989) and Afghanistan (Kaszab, 1981; see Bologna, 2008). The species is new also for India, Himanchal Pradesh [Mandi, 3500 m, 1.vii.2003 (CB, MSNG)].

Remarks. This species was referred by Kaszab (1962) to the subgenus *Poreospasta* Selander, 1960, but recently Shapovalov (2016) placed this and other Central Asiatic species in the new subgenus *Eolytta*. At present we are unable to evaluate differences between *Eolytta* and *Poreospasta*, a subgenus that could be restricted to North America.

We examined the holotype of this species (MNHN, labeled: “Kashmir”; “*Cantharis flavoangulata* Fairm. Kashmir”). The species is recognized by its primarily black body with metallic green or black elytra, and distinctly trapezoidal pronotum, black in color except for its lateral margins of pronotal disk broadly marked with orange.

Lytta (Mesolytta) vrendenburgi Kaszab, 1962

Distribution. Described from Nushki (Kaszab, 1962), in Pakistan Baluchistan, erroneously considered as an Afghanistan locality by Bologna (2008). It also occurs in Uzbekistan (see below).

Remarks. Dvořák (1983) considered this species a synonym of *L. (M.) coccinea* (Ménétriés, 1849), on the basis of specimens from Uzbekistan (Kyzyl-Kum, Kyzyl-Kyr, nr. Bukhara) that we also examined (CB). The synonymy was not accepted by Bologna (2008), because the black leg coloration is a constant character in *vrendenburgi* specimens from Uzbekistan and Pakistan (see Kaszab, 1962). In addition to this color feature, the shape of the head is different. In *vrendenburgi* the male temples are slightly widened and more convex than in *coccinea*. We have examined specimens clearly referable to

coccinea from Uzbekistan (Minski, CB) and consequently *vrendenburgi* and *coccinea* are widely sympatric.

***Cyaneolytta coerulea* (Pfaff, 1834)**

New records. Pakistan: 2 exx., Sindh, Mithi, Thar desert, 24.x.2015 (FUUZM); 1 ex., Sindh, Tharparkar district, Islamkot, 1.ix.2016 (FUUZM); 1 ex., Sindh, Tharparkar District, Nagarparkar desert, 25.ix.2016 (FUUZM).

Distribution. Oriental species, also marginally distributed in the Palearctic Region (Pakistan, Sikkim, Uttar Pradesh: Bologna, 2008). Hashmi and Tashfeen (1992) recorded it from Pakistan as *Epicauta acteon* Dejean, and Anand (1980, 1989) as *Cyaneolytta acteon*. It was also noted from Pakistan by Selander (1986a, 1986b). Two additional species have been cited in the nearby Indian state of Rajasthan: *C. rajasthanica* Kaszab, 1978 and *C. indica* Anand, 1980; both are possibly synonyms of *C. coerulea* and their validity need confirmation after the comparative examination of types.

Remarks. The complex synonymy of this species was clarified by Selander (1986a).

***Lydomorphus (Lydomorphus) tenuicollis* (Pallas, 1798)**

New records. Pakistan: 2 exx., Baluchistan, Nushki, 8.x.2016 (CB; FUUZM); 1 ex., N Baluchistan, 40 km W of Kingri village, 23.vii.1998, attracted by light, L. Černý and L. Čížek (CC); 1 ex., Punjab, Changa Manga forest, 70 km S from Lahore, 9–21.viii.1998 (NHMW, late J. Probst collection); 15 exx., idem, 19–21.viii.1998; L. Černý and L. Čížek (CC).

Distribution. Sahelo-Arabian-Sindian element, widely distributed from Egypt and Sudan, through the Arabian Peninsula to southern Iran, Pakistan, and India. Recorded from Pakistan by Selander (1988), Anand (1989), and Bologna (2008).

Remarks. Usually recorded in the literature as *ruficollis*. Hashmi and Tashfeen (1992) erroneously cited this species as “*Epicauta tervicolis* Pul.” and “*Lytta tonvicollis* Pall.”

***Lydomorphus (Lydomorphus) angusticollis suturellus* (Haag-Rutenberg, 1880)**

New records. Pakistan: 2 exx., Baluchistan, Nushki, Kili Jamaldini, 22.vii.2012 (FUUZM); 2 exx., idem (only Nushki), 25.v.2016 and 3 exx., 8.x.2016 (CB).

Distribution. Sahelo-Sindian element, widely distributed from Sudan and Horn of Africa, through the Arabian Peninsula and southern Iran to western India. Recorded from Pakistan (Baluchistan) by Kaszab (1968) and Selander (1988) (see Bologna, 2008). Hashmi and Tashfeen (1992) erroneously recorded this species as *Epicauta angusticollis* Koll.

***Lydomorphus (Lydomorphus) pictus* (Laporte de Castelnau, 1840)**

New records. Pakistan: 1 ex., N Baluchistan, 40 km west of Kingri village, 23.vii.1998, L. Černý (CC); 1 ex., Sindh, Mithi, Thar Desert, 24.x.2015 (FUUZM).

Distribution. Oriental species distributed in Pakistan and India (we know specimens from Rajasthan, Ajmer, CB). Recorded from Pakistan by Hashmi and Tashfeen (1992) as *Epicauta picta*, but not reported by Bologna (2008).

***Sybaris praeustus* (Redtenbacher, 1842)**

New records. Pakistan: 1 ex., Sindh, Tharparkar district, Nagarparkar Desert, 25.ix.2016 (FUUZM); 1 ex., Sindh, Tharparkar district, Islamkot, 2.x.2016 (CB).

Distribution. Recorded only from Kashmir and Uttar Pradesh, India (Bologna, 2008).

Remarks. The genus *Sybaris* is distributed through the sub-Saharan African, eastern Sind, and Oriental regions. It has never been studied comprehensively and needs revision. The Asiatic species, in particular, are difficult to distinguish.

***Sybaris testaceus* (Fabricius, 1792)**

Distribution. Species recorded from Pakistan (Hashmi and Tashfeen, 1992; Bologna, 2008), India, and Nepal (Bologna, 2008).

***Sybaris tunicatus* (Redtenbacher, 1842)**

Distribution. Endemic to Kashmir (Anand, 1989; Bologna, 2008).

Remarks. The validity of the species needs confirmation because it was based on the presence of an anterior black spot on the elytra, which could represent only a variation of the coloration of *S. praeustus* (Redtenbacher, 1842).

***Sybaris semivittatus* (Redtenbacher, 1842)**

Distribution. Recorded only from Kashmir and Himanchal Pradesh (Bologna, 2008).

***Eolydus conspicuus* (Waterhouse, 1889)**

Distribution. Occurring from Iran to Afghanistan and Pakistan. Also recorded from “Turkestan” (Bologna, 2008) and Baluchistan (Kaszab, 1956).

Tribe Epicautini

***Epicauta (Epicauta) atkinsoni* Kraatz, 1880**

New records. Pakistan: 6 exx., Baluchistan, Nushki, 16.vii.2015 (CB); 1 ex., idem, 8.x.2016 (CB); 3 exx., Sindh, Tando Jam Univ. Agr., 14.v.2012 (CB).

Distribution. New species record for Pakistan; previously recorded from Iran (Baluchistan), Afghanistan, and India (Kaszab, 1952, 1958; Bologna, 2008).

***Epicauta (Epicauta) hirtipes* (Waterhouse, 1871)**

Distribution. Species widely distributed in Kazakhstan, Iran, Pakistan, India, Nepal (Bologna, 2008).

***Epicauta (Epicauta) mannerheimi* (Mäklin, 1875)**

Distribution. This species is distributed in both Oriental and Palearctic regions (Buthan, Nepal, Uttar Pradesh), and some southern regions of China and Vietnam). Recorded from Pakistan by Anand (1989) and

Hashmi and Tashfeen (1992), but not reported by Bologna (2008). It could be confused with other species such as *E. rubriceps* Kollar and Redtenbacher, 1842.

***Epicauta (Epicauta) nepalensis* (Hope, 1831)**

Distribution. Distributed in both Oriental and Palearctic regions (Nepal, and some states of northern India; Bologna, 2008). Recorded from Pakistan by Hashmi and Tashfeen (1992), but not reported by Bologna (2008). It could be confused with *E. rubriceps* Kollar and Redtenbacher, 1842.

***Epicauta (Epicauta) rubriceps* Kollar and Redtenbacher, 1842**

New records. Pakistan: 2 exx., Kashmir, Azad, Kotli, 14.vii.2014 (CB, FUUZM); 1 ex., idem, 26.viii.2016 (CB).

Distribution. This species, described from Kashmir, is widely distributed in Pakistan, India, and western China (Bologna, 2008).

Remarks. The identification of specimens from Kotli, both females and damaged, needs confirmation and is questionable, after the study of male specimens.

***Epicauta (Epicauta) quadraticollis* Fairmaire, 1891**

Distribution. Species poorly known in the literature, recorded from Pakistan by Anand (1989) and from Kashmir and northern India (Himanchal Pradesh) by Bologna (2008).

***Psalydolytta villipes* (Haag-Rutenberg, 1880)**

New records. Pakistan: 3 exx., Kashmir, Azad, Kotli, 14.vii.2014 (CB; FUUZM).

Distribution. New species record for Pakistan; previously recorded only from India (Kaszab, 1954; Anand, 1977). The genus *Psalydolytta* was never previously recorded from Pakistan or Kashmir.

Tribe Mylabrini

***Mylabris (Mylabris) cfr. cernyi* Pan and Bologna, 2014**

New records. Pakistan: 6 exx., Gilgit-Baltistan, Dassu, S. Prepsl (CB, CC).

Distribution. Mediterranean Turkey, Israel and Palestine, Jordan. According to Pan and Bologna (2014) this Pakistan record is doubtful and needs to be corroborated.

Remarks. The Pakistan specimens examined could represent a new species. Molecular techniques should help to resolve this question.

***Mylabris (Mylabris) quadripunctata* (Linnaeus, 1761)**

Distribution. This species was recorded from Pakistan by Iablokoff-Khznorin (1983), but this identification is doubtful (see Pan and Bologna, 2014) and possibly refers to *Mylabris cernyi*.

***Mylabris (Calydabris) cfr. mirzayani* (Kaszab, 1968)**

New records. Pakistan: 1 ex., Baluchistan, Nushki, 12.vi.2012 (FUUZM); 3 exx., Baluchistan, City Loralai,

30.37N 68.6E, 1426 m a.s.l., 18.vi.2012 (CB); 1 ex. idem, 1.vi.2013 (FUUZM); 2 exx., Lower Dir, Tehsil, Samar Bagh, 17.vii.2012 (CB); 3 exx., idem, 22.vii.2012 (FUUZM).

Remarks. The available specimens are all damaged and cannot be adequately identified. They are close to *Mylabris (Calydabris) mirzayani* because of the elytral pattern but some differences need a deep comparison with typical specimens of this species and others from Iran, Kerman province (CB), which probably represent a new species. The mesosternum has distinct setae at the posterior apex as in the nominotypical subgenus and in the subgenus *Calydabris* Kaszab, 1960, but it is more similar to that of *Calydabris* because of the yellow coloration of the anterior sides and the posterior setae less dense. Although the ventral blade of the claws is not reduced as in most *Calydabris*, we know undescribed Iranian specimens possibly referable to *M. mirzayani* or to a distinct species, which have claws as in the Pakistan ones. The male genitalia are similar to those of *Calydabris* and differ from those of the nominotypical subgenus in that the parameres are slender and the aedeagus, also very slender at its apical third, has its two hooks distant from the apex. The identification of these specimens is appended, waiting for material in better condition.

***Mylabris (Micrabris) afghanica* Kaszab, 1953**

New records. Pakistan: ca 90 exx., Northern Areas, Shandur Pass, 4200 m, 60 km ENE Chitral, 16/17.vii.1998, J. Kaláb (CB; CC; CK); 6 exx., NWFP, Chitral distr., Bumboret valley, Gumbak pass, 3000 m, 17.viii.1999, M. Šlachta (CC); 1 ex., WFP, southwest Utrot, 2400 m, 35.28N - 72.26E, 26-28.vii.2000, J. Kaláb (CC); 3 exx., N Pakistan, Diamir distr., Nanga Parbat Mt., Rialkhot valley, 3300 m, Fairy Meadows, 18.vii.1999, M. Šlachta (CC); 3 exx., N Pakistan, Baltistan pr., Hushe valley, Nangbrok road, 3500 m, 29.vii.1999, M. Šlachta (CC).

Distribution. Central Asiatic element, endemic to the Hindu-Kush Mts., previously recorded from Afghanistan and Pakistan (Bologna, 2008).

Remarks. Specimens from Shandur Pass differ slightly from typical *afghanica* in the puncturation and need further study.

***Mylabris (Micrabris) macilenta* Marseul, 1873**

New records. Pakistan: numerous exx., NWFP, Ayuba, Ghora distr., 75 km N from Islamabad, 1/16.vi.1998 (CB); 2 exx., Northern Areas, Astor, Rama rest-house, 35.3569°N 74.8080°E, 3170 m, 7.6.2007, G. Carpaneto leg. (CB); 1 ex., Baltistan, Mimimark, 3900 m, 29.vii.1996, U. Pessolano (CB); 52 exx., Kashmir, Drass, 3330 m, 2.viii.1976, B.G. Osella (CB; MSNV); more than 100 exx., NWFP, Ayubia-Ghora Dhaka, 75 km NE of Islamabad, 12-16.viii.1998, L. Černý and L. Čížek (CC).

Distribution. Himalayan element distributed from northern Pakistan to southeastern China, through

northern India, Nepal, and Bhutan (Bologna, 2008). Already recorded from Kashmir (Borchmann, 1935; Axentjev, 1987) and Pakistan (Saha, 1972; Hashmi and Tashfeen, 1992). We also know of specimens from N Punjab, close to Kashmir [1 ex., Kangra valley-Yol, 1300 m, iv–vii.1944, C. Lomi (MRSN)]. Records from the Afghanistan Hindukush (Borchmann, 1935) refer, in part, to *M. frolovi* (see Kaszab, 1973).

Remarks. Axentjev (1987) erroneously synonymized *M. afghanica* with *M. macilentata*.

***Mylabris (Micrabris) nuristanica nuristanica*
Kaszab, 1958**

New records. Pakistan: 12 exx., NWFP, Chitral distr., Bumboret valley, Broon village, 29.vii–6.viii.1998, L. Černý and L. Čížek (CC); 1 ex., Hindukush Mts., Dir, 1700 m, 13–14.vii.1995, Jiří Klír (CC).

Distribution. *Mylabris nuristanica* is a polytypic species; the nominotypical subspecies was recorded from both Afghanistan and Pakistan.

***Mylabris (Micrabris) nuristanica subalpestris*
Kaszab, 1958**

New records. Pakistan: 15 exx., Baluchistan, Ziarat, 29–30.vi.1991 S. Prespl (CB, CC); 1 ex., NWFP, road Chitral–Mastuj, 85 km NE Chitral, 15.vii.1998, J. Kaláb (CC).

Distribution. The subsp. *subalpestris* Kaszab, 1958 was recorded only from Afghanistan but, according to the new records, it is present also in Pakistan. It was quoted from Pakistan by Hashmi and Tashfeen (1992) and from the locality of Chitral by Saha (1972a).

Remarks. Described by Kaszab (1958) in the subgenus *Eumylabris*, but correctly transferred to the subgenus *Micrabris* by Pardo Alcaide (1969).

***Mylabris (Micrabris) waziristanica* (Kaszab, 1958)**

Distribution. Distributed in Afghanistan and Pakistan (Kaszab, 1958, 1981; Bologna, 2008; Bologna et al., 2008a). Erroneously recorded from northwestern India (Kaszab, 1958; Anand 1989), but actually the type locality is in Pakistan.

Remarks. The species was erroneously described as *Coryna* Billberg, 1813 by Kaszab (1958) and compared to another species now included in the genus *Actenodia* Laporte de Castelnau, 1840, and later referred to *Mylabris (Micrabris)* by Bologna et al. (2008a) after the examination of the holotype and one paratype from Waziristan (NHM).

***Mylabris (Zitunabris) cfr. panjoensis* Kaszab, 1953**

New records. Pakistan: 1 ex., Lower Dir, Tehsil, Samar Bagh, 12.vii.2016 (CB).

Distribution. Previously recorded only from Afghanistan (Kaszab, 1953); new species record for Pakistan.

Remarks. The taxonomy and phylogenetics of the subgenus *Zitunabris* Pardo Alcaide, 1968 is incompletely resolved, as confirmed by molecular data (Salvi et al., 2018). *M. panjoensis* was described as an Afghanistan subspecies of *M. syriaca* Klug, 1845, but, in our opinion, according to the description (Kaszab, 1953), it could be a distinct species.

The Pakistan specimen slightly differs from the description that was based on Afghanistan material. The elytra are more opaque and with dense punctures, the mesosternum shape slightly differs, and the black pattern on the elytra is less undulate. This last character is more similar to the elytral pattern in *M. atrofasciata* Pic, 1921, a species endemic to Iran. The Pakistan specimen differs from the latter by its subopaque elytra, less pronounced temples, and narrower pronotum; its pronotal disk also is less depressed anteriorly. Pending a revision of the subgenus, we prefer to tentatively assign this specimen to *panjoensis*.

***Mylabris (Zitunabris) syriaca* Klug, 1845**

New records. Pakistan: 1 ex., Baluchistan, Loralai, 1.vi.2013 (FUUZM).

Distribution. The species is widely distributed from Turkey (and possibly Greece) to Levant, Iran, and Afghanistan. This is a new species record for Pakistan.

Remarks. Only one photo of the Loralai specimen was examined. It clearly shows the elytral pattern, pronotum shape, and body punctures, which correspond to this species.

***Mylabris (Eumylabris) cincta* Olivier, 1795**

New records. Pakistan: 9 exx., W Baluchistan, Tump, 90 km west of Turbat, 13–15.iv.1993, S. Bečvář (CC); 2 exx., western Baluchistan, Turbat, 8–19.iv.1993, S. Bečvář (CC); 3 exx., western Baluchistan, Gwadar, 17–18.iv.1993, S. Bečvář (CC).

Distribution. Widely distributed from Morocco to Arabia, and from Greece and Macedonia, through southern Russia, Turkey, Levant, and the Caucasus, to Central Asia, Afghanistan, Pakistan, and northwestern India (Himanchal Pradesh, Uttar Pradesh) (Bologna, 2008).

Remarks. The subgenus *Eumylabris* Kuzin, 1954 needs taxonomic revision; species remain undescribed or confused, and some of the taxa could ultimately be synonymized.

***Mylabris (Eumylabris) klapperichi klapperichi*
Kaszab, 1958**

New records. Pakistan: 25 exx., NWFP, Chitral distr., Kalash valleys, Bumboret valley, Broon village, 29.vii–6.viii.1998, L. Černý and L. Čížek (CB, CC).

***Mylabris (Eumylabris) klapperichi hirtipedes* Kaszab, 1958**

New records. Pakistan: 1 ex., Baluchistan, Nushki, Kilki Jamaldini, 22.vii.2012 (FUUZM); 2 exx., idem, 16.vi.2016

(CB); 2 exx., idem, 8.x.2016 (CB); 3 exx., Baluchistan, Khuzdar, vi.1991, S. Prespl (CB).

Distribution. Polytypic species; both the nominotypical and the subsp. *hirtipedes* Kaszab, 1958 have been recorded from Afghanistan and Pakistan (Bologna, 2008).

Remarks. The nominotypical form, described from Afghanistan, differs from the subsp. *hirtipedes* in having less dense punctures on the head and pronotum. We suspect that *hirtipedes* could be a distinct species or a subspecies of another *Eumylabris* species.

Mylabris (Eumylabris) magnoguttata (Heyden, 1881)

New records. Pakistan: 13 exx., Gilgit, 21.vi.1991, S. Prespl (CB, CC, CK).

Distribution. Central Asiatic element, distributed from southeastern Russia through the whole of Central Asia to northwestern China (Bologna, 2008). The intraspecific taxonomy needs classification and the subspecies *pardoi* Kaszab, 1958 is endemic to Afghanistan and northern Pakistan. The presence in Pakistan of the nominotypical form, tentatively cited by Bologna (2008), must be confirmed.

Remarks. This is a polytypic species but, pending a revision of the subgenus, the recognition of subspecies is impossible.

Mylabris (Eumylabris) posticalis (Dokhtoureff, 1889)

Distribution. Species widely distributed in Central Asia: Iran, Afghanistan, Pakistan, Kyrgyzstan, Uzbekistan, Chinese Xinjiang.

Remarks. The taxonomy of this species and that of the *M. calida* complex (the Maghrebian populations probably are distinct from others) needs revision and requires the examination of types of all related taxa.

Mylabris (Eumylabris) pulchra Kaszab, 1958

New records. Pakistan: 1 ex., Baluchistan, Central Zarghun, 21.iv.1957 (CK, from the website <http://www.meloidae.com/en/pictures/36260>).

Distribution. Recorded from Afghanistan (Kaszab, 1958); new species record for Pakistan.

Mylabris (Eumylabris) quinqueplagiata Kaszab, 1958

Distribution. Previously recorded only from Afghanistan and Pakistan (Bologna, 2008). Cited by Saha (1972a) from the Salt Range.

Mylabris (Eumylabris) tiftensis Billberg, 1813

New records. Pakistan: 3 exx., Baluchistan, Zhob, v.1991, S. Prespl (CC); 5 exx., Punjab prov., Bhakar (Mianwali), 15.v.2008, M. A. Akhter (CC).

Distribution. Recorded from northwestern India and Pakistan (Lahore: Lyallpur) by Kaszab (1958 as *M. klapperichi adam*) and by Saha (1972a), who proposed the synonymy of these taxa. Erroneously cited by Hashmi and Tashfeen (1992) as *M. tiftensis*.

Remarks. We examined specimens of this species at MNHN in Marseul's collection. The synonymy with *M. klapperichi adam* Kaszab, 1958 needs confirmation.

Mylabris (Argabris) impedita bogatschevi Kaszab, 1958

New records. Pakistan: 1 ex. northwestern Pakistan, northern areas, Shandur Pass, ca. 60 km ENE Chitral, 16.–17.vii.1998, J. Rejsek (CC)

Distribution. Polytypic species distributed in Tajikistan (the nominate and the subsp. *kryzhanovskii* Pripisnova, 1987, and *lopatini* Pripisnova, 1987), Kazakhstan, Afghanistan (both the nominate and the *bogatschevi* subspecies), Uzbekistan. New for Pakistan.

Mylabris (Argabris) klugi Redtenbacher, 1850

Distribution. Polytypic species distributed from Turkmenistan and Iran to the Chinese Xinjiang, through Kazakhstan, Tajikistan, and Afghanistan (subsp. *kabuliensis* Kaszab, 1958). Recorded by Hashmi and Tashfeen (1992) from Pakistan.

Croscherichia goryi (Marseul, 1870)

New records. Pakistan: 1 ex., Baluchistan, Nushki, 16.vi.2016 (CB); more than ca. 50 exx., western Baluchistan, Turbat, 8–19.iv.1993, S. Bečvář (CC); 8 exx., SW Baluchistan, Gwadar, 17–18.iv.1993, S. Bečvář (CC); 2 exx., Lower Dir, Khyber Pakhtunkhwa, Samar Bagh, 17.vii.2012 (CB); 1 ex. idem, 22.vii.2012 (FUUZM); 1 ex., Khyber Pakhtunkhwa, Dera Ismail Khan, 12.v.2016 (FUUZM); 4 exx., Pazni Rek, 23.iii.1935 (NHM); Jangul, Makran, 1.vi.1963, G. Popov (NHM); Ormara, 26.iv.1931, M. Sharif (NHM).

Distribution. Arabic-Sindian element, distributed in northeastern Africa (Egypt, N Sudan), Levant and Arabic Peninsula, southern Iraq and Iran, southern Pakistan and western India (Bologna and Coco, 1991). The species also is distributed in northeastern Afghanistan and this is a new species record for this country: Jalalabad env., Nangahar, 550 m, J. Pljusch, 13.v.2010 (3 exx. CC) and 13.v.2012 (1 ex. CB; 2 exx. CC).

Croscherichia salavatiani Kaszab, 1968

New records. Pakistan: 2 exx., Baluchistan, Nushki, 16.vi.2012 (CB; FUUZM); 3 exx., idem, 8.x.2016 (CB); 4 exx., Baluchistan, Nushki, Kili Jamaldini, 22.vii.2016 (FUUZM); 1 ex., western Baluchistan, Tump, 90 km W of Turbat, 13–15.iv.1993, S. Bečvář (CC); 8 exx., western Baluchistan, Turbat, 8–19.iv.1993, S. Bečvář (CC).

Distribution. Arabic-Sindian species, distributed in the Arabic Peninsula, southern Iran, southern Afghanistan, southern Iran, and southern Pakistan. Previously recorded from two Pakistan localities by Bologna and Coco (1991).

Xanthabris baluchistana Kaszab, 1956 (Figures 5 and 6)

New records. Pakistan: 2 exx., Baluchistan, Nushki, 16.vi.2012 (CB); 4 exx., Baluchistan, Quetta Gajak ... (illegible), 9.vii. ... (illegible) (CB, HNHN, NHM).



Figure 5. *Xanthabris baluchistana* Kazab, 1956: habitus.

Distribution. This species has been recorded only from Pakistan, Baluchistan (Kaszab, 1956, 1958; Bologna, 2008), and it was described from Quetta [erroneously indicated as Paetta in Kaszab (1956)], a town in the Pakistan Baluchistan. Specimens we examined from Quetta (NHM) are topotypic and collected with the holotype, but they were not included in the type material.

We examined one photo of a specimen of this genus from the Arabic peninsula (Abu Dhabi), housed in a private collection not available for study (Geisthardt, *in litteris* 7.2016). It differs slightly from the Pakistan specimens. According to this record the genus *Xanthabris* occurs also in the Arabic Peninsula.

Remarks. This species belongs to a scarcely studied monotypic genus, until now known only from the female holotype (Kaszab, 1956; Bologna and Pinto 2002), and with relationships never discussed. It is well distinguished phenetically from other Mylabrini by the red color of the head, pronotum, antennae, and abdomen, and particularly by antennal shape (Figure 6a; see also figure in Kaszab, 1956), which distinguishes it from all other Mylabrini genera: antennomere I very elongate, II extremely short and rounded, III cylindrical and slightly elongate, IV–IX greatly transverse and short, compressed and progressively wider, X cylindrical, XI cylindrical and narrowed in the apical half. The mesosternum (Figure 6e) is narrow, without a modified fore portion (“scutum”), and the anterior edge of the mesepisterna is distinctly furrowed anteriorly. The male genitalia, previously undescribed, are distinct within the tribe: tegmen in ventral view (Figure 6b) with gonocoxal piece suboval, slender, and gonoforceps narrow, slender, submembranous

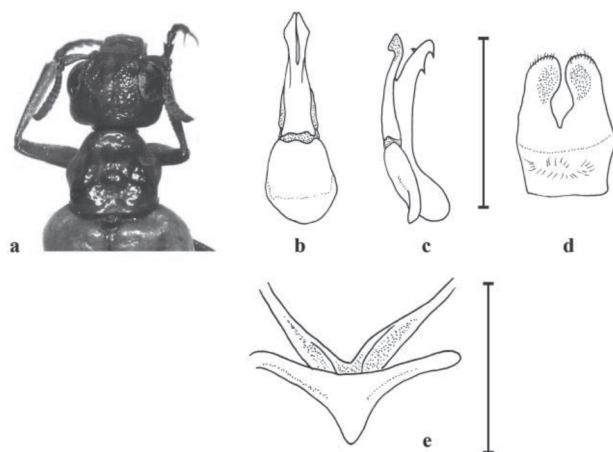


Figure 6. *Xanthabris baluchistana* Kazab, 1956: head, pronotum and antennae (a); tegmen in ventral (b) and lateral (c) views; last visible ventrite of male (d); mesosternum (e).

basolaterally and with each gonostylus apically expanded triangularly, together forming a slightly sclerotized subrhomboidal apex; tegmen in lateral view (Figure 6c) with both gonoforceps and gonocoxal piece very slender, gonoforceps bent ventrally at apex and forming a slightly sclerotized securiform expansion; aedeagus (Figure 6c) with two hooks, the distal one slightly removed from apex, shorter than proximal one, both acutely pointed. Penultimate ventrite distinctly emarginate in both sexes and male last visible ventrite (Figure 6d) almost divided in two portions, slightly depressed at base and densely setose at apex, while in all other genera of Mylabrini is only V-emarginate at apex; hemiventrites are more translucent at base, contrasting the red color of abdomen.

The combination of morphological characters of *Xanthabris* is very distinctive among Mylabrini and does not show a clear-cut relationship to other mylabrine genera: (i) the mesosternum (Figure 6e) without a modified fore portion is present in some *Hycleus* lineages (the *Mesogorbatus*-type) and in other mylabrine genera such as *Croscherichia*, *Actenodia*, etc., while the distinct anteriorly furrowed mesepisterna is very close to that of *Hycleus* and related genera (*Ceroctis*, *Paractenodia*: Bologna and Pinto, 2002; Bologna et al., 2008); (ii) to the contrary, the aedeagus, with both hooks far from apex, differs from *Hycleus* and is more similar to *Mylabris* and related genera such as *Croscherichia*, *Actenodia*, *Mimesthes*; (iii) the antennal shape differs from that of all other genera of this tribe. Molecular studies based on well-preserved material are necessary to resolve this phylogenetic problem.

(a) *Hycleus*, *Mesogorbatus* lineage

Hycleus sexmaculatus Group (sensu Bologna and Turco, 2007)

***Hycleus balteatus* (Pallas, 1782)**

Distribution. Indian species, recorded from Pakistan by Hashmi and Tashfeen (1992) as *Mylabris*, but not reported by Bologna (2008).

***Hycleus bipunctatus* (Olivier, 1811)**

New records. Pakistan: 15 exx., Baluchistan, Nushki, 16.vi.2012 (CB); 8 exx., idem, 16.vii.2015 (CB); 4 exx. idem, 8.x.2016 (CB; FUUZM); 1 ex., idem, 16.vi.2016 (CB); 1 ex., Baluchistan, Nushki, Kili Jamaldini, 25.v.2016 (CB); 3 exx. idem, 22.vi.2013 (FUUZM); 1 ex. idem, 22.vii.2016 (FUUZM); 1 ex., Baluchistan, Tump, 15.4.1993 (CK); 30 exx., western Baluchistan, Tump, 90 km west of Turbat, 13–15.iv.1993, S. Bečvář (CC); 2 exx., western Baluchistan, Turbat, 8–19.iv.1993, S. Bečvář (CC); 1 ex., Khyber Pakhtoon Khwa, Dera Ismail Khan, 12.v.2016 (FUUZM).

Distribution. Recorded from Arabia, Iran, and Iraq; new species record for Pakistan.

Remarks. This species belongs to the group of *Hycleus sexmaculatus* (see Bologna and Turco, 2007). This group was considered in the literature (Kuzin, 1954) as *Mylabris* (*Sphenabris*), but actually represents a complex lineage of *Hycleus* with the mesosternum of the Mesogorbatustype, and, in most species, having the last antennomere narrowed or highly tapered and pointed (Bologna and Turco, 2007). The taxonomy and relationships of this group of species is under study (Serri and Bologna, unpublished). Unfortunately, the type of *H. bipunctatus* (Olivier, 1811), a species described from Arabia and recorded also from Iran and Iraq (Kaszab, 1983; Bologna, 2008), is probably lost. Although we did not find the type at MNHN, we examined old specimens in Marseul's collection from Arabia, Syria, and Iraq, which probably were compared with Olivier's types. These, as well as our specimens and the figure of the Arabic specimen published by Kaszab (1983), are similar to *H. trianguliferus reitterioides* (Kaszab, 1956) in elytral pattern and pronotal punctation. We have not seen the types of *reitterioides*, described from S Iran, but have examined specimens from this region and suspect that *reitterioides* is distinct from *H. trianguliferus* (Heyden, 1883) (distributed from Iran to Afghanistan and in Central Asia; Bologna, 2008) and is a synonym of *H. bipunctatus*. Pending a revision of this group (Serri and Bologna, unpublished), we prefer to not formally propose the synonymy at this time.

***Hycleus javeti umbilicatus* (Kaszab, 1958)**

New records. Pakistan: 1 ex., NWFP, 85 km NE Chitral, Chitral-Mastuj road, 15.vii.1998 (CV).

Distribution. Polytypic species, distributed in Iraq, Iran, and Turkmenistan (nominotypical subspecies) and in Afghanistan (subsp. *umbilicatus*); new species record for Pakistan.

***Hycleus schauffelei* (Kaszab, 1957)**

New records. Pakistan: 1 ex., western Baluchistan, Tump, 90 km west of Turbat, 13–15.iv.1993, S. Bečvář (CC).

Distribution. Species recorded from Iran (Kaszab, 1968; Bologna, 2008); new species record for Pakistan.

Hycleus orientalis* Group (sensu Bologna and Turco, 2007)**Hycleus hanguensis* (Kaszab, 1958)**

Distribution. Described from Hangu, northwestern Pakistan; endemic to this country (Kaszab, 1958).

Remarks. The placement of this species in this group is based only on its similarity with *H. rajah*, noted by Kaszab (1958).

***Hycleus rajah* (Marseul, 1872)**

New records. Pakistan: 1 ex., Lower Dir, 12.vii.2012 (CB); 1 ex., Lower Dir, Timergara, 22.vii.86 on *Hibiscus* (MRSNB).

Distribution. Distributed only in India and Pakistan; new species record for Pakistan.

***Hycleus rouxii* (Laporte de Castelnau, 1840)**

Distribution. Indian species, also occurring in Sri Lanka. Recorded from Pakistan by Hashmi and Tashfeen (1992) as *Mylabris*, but not reported by Bologna (2008).

Hycleus maculiventris* Group (sensu Bologna, 1990 and Bologna and Turco, 2007)**Hycleus schah* (Reiche, 1866)**

New records. Pakistan: 1 ex., Pakistan, S. Prespl (CB); 1 ex., Baluchistan, S. Prespl (CK); 1 ex., Baluchistan, Zhob, v.1991, S. Prespl (CC). Possibly these different localities refer to the last one only.

Distribution. Sindian element, previously recorded only from certain regions of Iran (nominotypical form) and Afghanistan (subsp. *tuxeni* Kaszab, 1953). New species record for Pakistan.

Remarks. This species belongs to the group of *Hycleus maculiventris* (Klug, 1845), a N Afrotropical-Sindian lineage, discussed by Bologna and Turco (2007). The validity of the Afghanistan subspecies *tuxeni* needs confirmation.

(b) *Hycleus*, lineage Mesoscutatus***Hycleus belli* Group (here defined)*****Hycleus belli* (Borchman, 1940)** (Figure 7a)

New records. Pakistan: 2 paratypes labeled "T.R. Bell, Karachi; *Myl. Belli* n. sp." (handwritten by F. Borchmann) (NHMUK); 1 paratype, idem (HNHM, NMNHB); 1 paratype, idem (MNHN); 1 paratype, idem (HNHM); 2 exx., Sindh (NMNHB).

Distribution. Recorded only from Pakistan (Borchmann, 1940; Pardo Alcaide, 1958; Saha, 1972; Bologna, 2008).

Remarks. Pardo Alcaide (1958) tentatively referred this species to the group of *H. pallipes* (Olivier), subgroup of *H. nigriplantis* (Klug, 1845) (see below), which has a

mesosternum of the Mesoscutatus-type. The elytral pattern is similar to that of species belonging to that group, such as *H. nigriplantis*, *H. dohrni* (Marseul, 1872) [to which it was compared by Borchmann (1940)], and *H. pakistanus* **sp. nov.** However, the examination of *H. belli* types shows this species to be distinct from the *H. pallipes* group. The mandibles are neither curved at the apex nor acutely pointed, and they are ca. as long as the labrum; moreover, the external metatibial spur is stick-like and not spatulate, and the pro- and mesotibial spurs are small and slender.

The elytral pattern of this species (Figure 7a) is very similar to that of some species of the group of *H. brunripes* (Klug, 1845), which has the Mesogorbatus-type mesosternum.

***Hycleus pallipes* Group (sensu Pardo Alcaide, 1958)**

***Hycleus dohrni* (Marseul, 1872)**

Distribution. N India; recorded from Pakistan as *Mylabris* by Saha (1972: Murree Subdiv., nr. Gharial) and Hashmi and Tashfeen (1992), but not reported by Bologna (2008). We studied specimens from Indian northern Punjab, close to Kashmir [3 exx., Kangra valley-Yol, 1300 m, iv–vii.1944 C. Lomi (CB)].

***Hycleus pakistanus* Bologna sp. nov.** (Figures 7b and 8)

ZooBank taxon LSID: 70D962DF-F572-4B11-81C2-375A01D1BF6D

Type material. Female holotype and 2 female paratypes, “Baluchistan, Nushki, 8.x.2016” (CB); 1 male paratype, idem, 16.vi.2016 (CB); 2 male and 2 female paratypes, idem, 16.vii.2015 (CB). Type specimens are all

more or less damaged, and we selected one of the better preserved females as holotype with almost complete legs and one complete antenna. Paratypes lack a few or almost all antennomeres (except I–II), one or parts of legs, and sections of dorsal setation. Genitalia and sternite IX (spiculum gastrale) are dissected and glued on the paper label together with the specimen

Other specimens not considered paratypes, from Baluchistan, Nushki, Kili Jamaildini, 25.v.2016 and 22.vii.2012 (FUUZM), were examined as photos.

Type locality. Pakistan, Baluchistan, Nushki.

Description. Body length: 11.5–14.1 mm. Body shiny and black except legs, antennae, labial and maxillary palpi, and apex of labrum orange, elytra slightly shining, yellow-brown with the following black pattern: a narrow margin around scutellum, a humeral round spot, an anterior row of three spots, progressively smaller from inner to external margins, one middle incomplete, narrow transverse fascia not reaching the inner nor the external margin, anteriorly angulated in the middle, and one preapical suboval spot with a linear, laterally directed projection (Figure 7b). Silver setation very dense and quite long on the whole surface, but short, sparse, and recumbent on elytra, mixed on humerus with sparse black erect setae. Apex of tibiae and ventral side of tarsomeres, especially the basal ones, with black robust setae lining golden pads on venter.

Head transverse, subrectangular, with the maximum width at the level of eyes; punctures shallow, fine and quite dense, intermediate surface impunctate, shiny, particularly

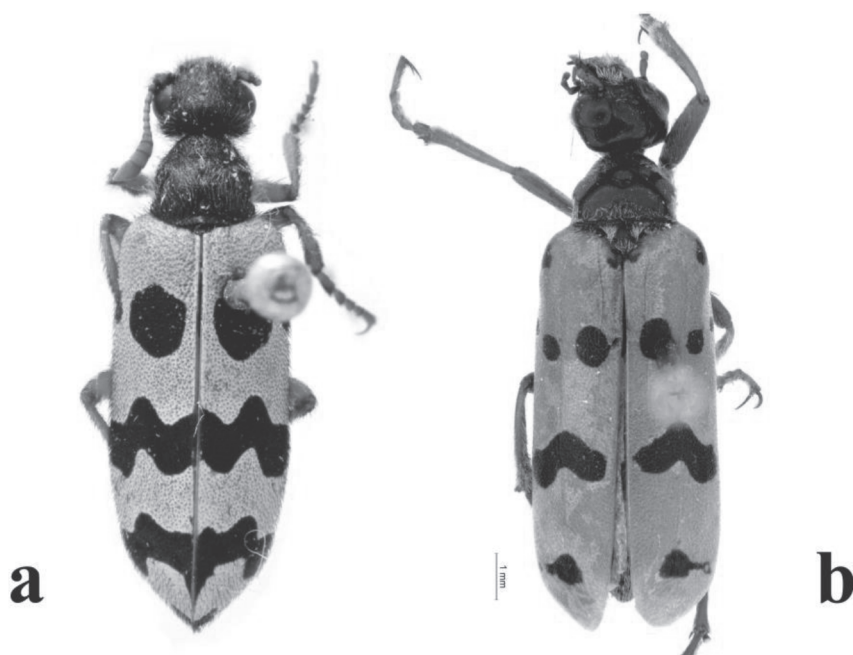


Figure 7. *Hycleus belli* (Borchman, 1940): habitus (a). *Hycleus pakistanus* Bologna **sp. nov.** (holotype): habitus (b).

on frons; frons almost flat, with a middle smooth rounded area and a depression immediately behind, and with a faint short longitudinal line, more or less visible; vertex slightly convex, templa short, subparallel, shorter than the longitudinal diameter of eye; eye subglobose, with the anterodorsal margin distinctly sinuate at the level of the antennal insertion. Clypeus distinctly narrower than the interocular width, slightly rounded on sides, flat and with punctures as on head except impunctate anteriorly, fronto-clypeal suture distinct; labrum slightly longer and narrower than clypeus, the fore margin slightly sinuate, the fore portion impunctate and sloping, leaving apical half of mandibles exposed. Maxillary palpomeres without obvious sexual dimorphism, subcylindrical and stout, IV flattened and slightly enlarged apically, with black setae on the external side of the apex of each palpomere (except IV), these most noticeable on III; maxillae not modified; labial palpi with long and dense setae, particularly on the penultimate palpomere. Mandibles distinctly longer than labrum, falcate and pointed, in lateral view slightly curved, apical half abruptly reclinate. Antennae with 11 antennomeres, I–VI slightly shiny and darker, the following opaque; antennomere I subequal in length to II–III together; II short and subcylindrical; III–VI slender and subcylindrical, III distinctly longer than IV; VII–IX similar in length, subtrapezoidal, apically enlarged on external side, increasing in width and length from VII to X, XI at base almost as wide as X but ca. 1.8 times longer, the apical half distinctly narrowed, apex obtuse.

Pronotum subhexagonal, almost as long as wide and slightly wider than head, slightly sinuate on sides before the middle and then distinctly narrowing anteriorly; fore portion of disk distinctly depressed; a wide medial longitudinal depression in middle, base depressed just in

front of mesonotum, dorsal surface with a longitudinal medial deep depression; punctures as on head. Elytra parallel, dorsally slightly convex anteriorly, with dense shallow punctures; elytral pattern as in Figure 7b. Mesosternum of the Mesoscutatus-type (Figure 8a) with the “scutum” very large, smooth and shiny, covering surface almost completely, slightly raised over the remaining surface, with long setae posteriorly; fore margins of mesepisterna well defined. Legs slender; protibial spurs different, the anterior one slender and curved, the posterior one robust, stick-like; both mesotibial spurs slightly robust, stick-like; metatibial spurs different, the inner one slender and pointed, the external one spatulate and widened; male protibiae with sparse black and longer setae, lacking in female; male protarsomeres with golden pads and distinctly longer black setae fringing tarsomeres I–III, pads of meso- and metatarsomeres also with black short and robust setae; all female tarsal pads with black robust setae mixed with short golden setae.

Posterior margin of the penultimate male abdominal ventrite almost straight, that of the last visible ventrite deeply V-emarginate. Male genitalia as in Figure 8b; gonoforceps robust, suddenly narrowed at apex, depressed on the dorsal apical half; aedeagus with distal hook distinctly smaller than proximal hook, which is gibbous.

Distribution. Endemic to western Pakistan.

Diagnosis. This *Hycleus* species belongs to the group *H. pallipes*, and among this group to the *H. nigriplantis* subgroup (sensu Pardo Alcaide, 1958). Its assignment here is based on the elongate, pointed, and apically reclinate mandibles, the robust pro- and mesotibial spurs, and the spatulate external metatibial spur. Within the *H. nigriplantis* lineage it differs from *H. rouxi* by its completely yellow rather than black antennae, its 11 distinct antennomeres,

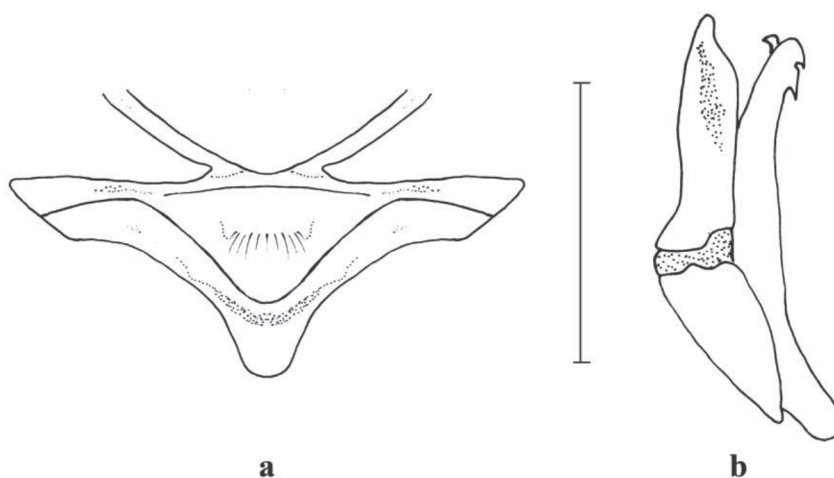


Figure 8. *Hycleus pakistanus* Bologna sp. nov. (holotype): mesosternum (a); tegmen in lateral view (b).

the yellow body setation, the uniformly yellow apex of the elytra; from *H. nigriplantis*, which is very similar, it differs primarily by the elytra being shiny yellow and not subopaque ochre, and by the different elytral pattern in which the black apical spot is transverse and not undulate and does not reach the inner suture; from *H. dohrni* it differs by the uniformly yellow setae on the head, and the elytral pattern characterized by smaller black spots and uniformly yellow elytral apex that lacks a narrow black margin. From both *dohrni* and *nigriplantis* it also differs by the wider modified portion of mesosternum ("scutum"), which occupies the major part of the sternite.

Etymology. The new species is named after the country to which it is apparently endemic.

Remarks. Affinities and similarities among the species of the subgroup of *H. nigriplantis* are discussed in the Diagnosis.

Hycleus phaleratus Group (sensu Pan et al., 2014)

Hycleus biundulatus (Pallas, 1782)

New records. Pakistan: 3 exx., Islamabad, 15.ix.2011, G. Sabatinelli (CB, in alcohol 95%); 22 exx., northern Pakistan, Taxila, nr. Islamabad, 525 m, N33°44'47.2" E72°48'05", 23.9.2001, M. Šlachta (CC); more than 100 exx., Punjab, Changa Manga – forest motel, 70 km S of Lahore, 19–21.viii.1998, L. Černý and L. Čížek (CC).

Distribution. Species widely distributed in the Oriental region: its range includes China (Fujian, Yunnan), Indonesia (Java), India, Sri Lanka, and Pakistan (Pan et al., 2014). Recorded from Pakistan as *Mylabris* by Hashmi and Tashfeen (1992).

Remarks. In the literature this species is usually cited as *Mylabris/Hycleus pustulata/us* (Thunberg, 1791).

Hycleus cichorii (Linnaeus, 1758)

New records. Pakistan: 8 exx., Lower Dir, Tehsil, Samar Bagh, 12.vii.16 (CB); 4 exx., Kashmir, Kotli, 26.viii.2016 (CB).

Distribution. Pan et al. (2014) cited this species from SE China (Guangxi, Yunnan, Guangdong, Taiwan, Hong Kong), Vietnam, Laos, Cambodia, Thailand, Indonesia (Java), Nepal, Sikkim, and northern India and doubtfully from Japan. Recorded from Pakistan by Hashmi and Tashfeen (1992) as *Mylabris*, but not reported by Bologna (2008).

Hycleus horai (Saha, 1972)

Distribution. Endemic to Pakistan; described from the Salt Range and other eastern localities (Saha, 1972).

Remarks. The validity of this species needs confirmation; it could be a synonym of *H. phaleratus* (Pallas, 1781). The characters listed by Saha (1972) hardly seem diagnostic in such a complex group of species (Pan et al., 2014).

Hycleus medioinsignatus (Pic, 1909)

New records. Pakistan: 1 ex., Kashmir, Azad, Kotli, 13.vii.2014 (CB); 1 ex., idem, 26.viii.2016 (CB).

Distribution. Previously recorded from Mongolia; central, eastern, and southern China; northern India (Himanchal Pradesh, Madhya Pradesh, Punjab); and Nepal (Pan et al., 2014); it is a new species record for Pakistan. We also know of specimens from northern Punjab (India) close to Kashmir [24 exx., Kangra valley-Yol, 1300 m, iv–vii.1944 C. Lomi (CB, MRSN)].

Hycleus phaleratus (Pallas, 1781)

New records. Pakistan: 1 ex., Baluchistan, Nushki, 10.vi.2016 (CB); 1 ex. idem, 8.x.2016 (CB); 5 exx., Lower Dir, Khyber Pakhtoon Khwa, Samar Bagh, 16.vii.2012 (CB); 3 exx., Lower Dir, Timergara, 25.1985 on *Hybiscus* (MRSNB); 2 exx., Swat, 11.vii.2012 (CB); 1 ex., Khyber Pakhtunkhwa, Dera Ismail Khan, 15.vii.2016 (CB); 1 ex., Kashmir, Rawalakot, 17.viii.2009 (CB); 2 exx., Kashmir, Azad, Kotli, 13.vii.2014 (CB); 3 exx., northern Pakistan, Taxila, near Islamabad, 525 m, N33°44'47.2" E72°48'05", 23.9.2001, M. Šlachta (CC).

Distribution. Oriental element, widely distributed from western Pakistan to Indochina and southern China (Pan et al., 2014). Recorded from Pakistan by Anand (1984) and Hashmi and Tashfeen (1992 as *Mylabris phalarata*).

Remarks. This species belongs to a difficult group of species, never studied in detail and difficult to identify (see Pan et al., 2014). For this reason, the validity of the subsp. *choaicus* Saha, 1972, described from Pakistan, needs confirmation and we prefer to list our records at the species level only.

Incertae sedis Group

Hycleus jacquemonti (Blanchard, 1844)

Distribution. Described and recorded only from Kashmir (see Anand, 1989; Bologna, 2008).

Remarks. The species has not been studied since its description and it remains as *incertae sedis*.

Tribe Cerocomini

Rhampholyssa steveni (Fischer von Waldheim, 1824)

New records. Pakistan: 1 ex., Baluchistan, Nushki 8.x.2016 (CB).

Distribution. Turanian species belonging to a genus that includes only *R. steveni* and *R. antennata* Reitter, 1906. This species is recorded from southern Russia, Kazakhstan, Iran, Turkmenistan, Uzbekistan, Kyrgyzstan, Tajikistan, Afghanistan (Turco and Bologna, 2008), and Chinese Xinjiang (Wang et al., 2012). Both tribe and genus are new for Pakistan.

Tribe Meloini

Meloe (Micromeloe) pintoii Bologna sp. nov. (Figures 9 and 10)

ZooBank taxon LSID: 55D102A0-C1CA-4A1C-9693-D2D2BB9B9C3C

Type material. Male holotype (MSNM) and 1 male paratype (CB), "V. Ille Sind, Rezan, m 2250, 10.iv.1929" (the holotype with an additional label "CO17"); 1 male paratype



Figure 9. *Meloe pintoii* Bologna sp. nov. (paratype): habitus.

(MSNM), “hac. d. Sooroo, Dras, m 3100, 14.iv.1929”; 1 female paratype (MSNM), “hac. d. Sooroo, Kargil, m 2700, 17.iv.1929” (with an additional label “CO 42”). Types are well preserved, but the paratype from Dras lacks part of both antennae, the right fore leg, and posterior right tarsomeres. Genitalia and sternite IX (spiculum gastrale) are dissected and glued on the paper label together with specimen.

Type locality. India, Jammu-Kashmir, Sind Valley, Rezan, 2250 m.

Description. Body length: 11.5–13.5 mm. Body black, shiny, but head and particularly pronotum with dull blue-violet metallic reflections, elytra black with blue metallic reflections, last five antennomeres subopaque and partially dark brown (especially in holotype and one paratype). Setae dark, but slightly silver at apex, present also on head and pronotum.

Head trapezoidal, distinctly wider than long, maximal width at temples; dorsal surface flat, frons wide, the entire fore half of frons widely and subcircularly depressed, with a distinct and deep longitudinal narrow furrow from the fronto-clypeal suture to the middle; temples obliquely widened, distinctly wider than eyes, which are small and almost flat, only slightly emerging from the lateral outline; punctures fine and sparse on the depressed frontal area, denser, wider, and deeper on temples and occiput, intermediate surface shagreened and more opaque in front, shinier posteriorly; fronto-clypeal suture well defined, incised in the middle; clypeus transverse,

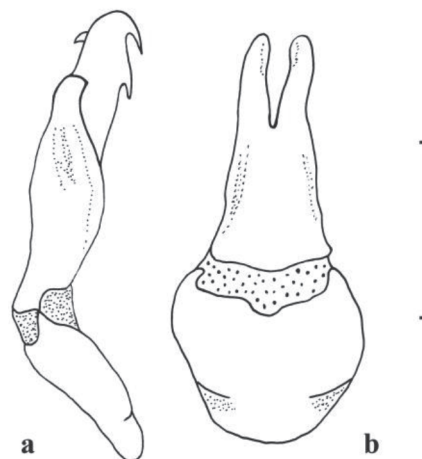


Figure 10. *Meloe pintoii* Bologna sp. nov., male (paratype): male genitalia in lateral view (a) and tegmen in ventral view (b).

rounded anteriorly on sides, anterior third impunctate and less sclerotized; labrum distinctly transverse and ca. 1.5 as wide as clypeus but shorter; punctures on both clypeus and labrum sparse as on frons. Antennae short, reaching humerus, antennomeres slender, I ca. twice as long as II, slightly widened apically, II subglobose, III–X similar in shape, cylindrical with III ca. 1.3 as long as IV–X, XI ca. 1.5 as long as X, distinctly narrowed at apical third. Maxillary and labial palpomeres short, maxillary IV widened apically; mandibles robust, curved, slightly exceeding labrum.

Pronotum slightly narrower than head, distinctly transverse with sides deflexed, dorsal surface not at all convex, almost flat, medially with a deep triangular depression expanding from fore margin to the posterior half, a suboval depression also on each side; dorsal and lateral surface with punctures similar to those on temples and occiput; basal margin broadly emarginate and distinctly depressed. Mesonotum emerging from the pronotum base, broadly rounded apically. Elytra quite flat, particularly on the basal portion laterally distinctly deflexed, with surface uniformly rugulose. Legs short, femur robust; male protarsomeres I–IV and mesotarsomeres I–III with pad composed of dense and short golden setae, the remaining tarsomeres as well as all female tarsomeres with short and scattered dense black setae; tarsal claws narrow, curved in apical third, smooth ventrally. Tibial spurs slender and narrowed at apex, except outer metatibial spur, spatulate.

Abdominal ventrites densely subrugopunctate; posterior margin of ventrites straight except penultimate one widely emarginate; last male ventrite deeply and broadly incised, hemiventrites with dense and robust setae; last female ventrite with posterior margin rounded and with regular setation. Male genitalia in lateral view

with gonoforceps widened in the middle and apical part robust and slightly curved, aedeagus very robust with both hooks elongate and pointed, but differently oriented, the distal one positioned at apex (Figure 10a); tegmen in ventral view with robust gonoforceps fused in the basal 2/3 and gonocoxal piece wide and short (Figure 10b).

Distribution. Kashmir.

Diagnosis. A small species, tentatively referred to the subgenus *Micromeloe* Reitter, 1911, but with some features intermediate to the subgenera *Meloellus* Reitter, 1911 and *Chiomeloe* Reitter, 1911. Characterized by small size, head almost flat, finer punctures on the frontal depressed area, with a distinct furrow on the fore part of the head, antennomeres slender, especially the last one, pronotum slightly flattened, transverse and medially depressed, elytra laterally deflexed and dorsally quite flat, head and pronotum black with metallic violet reflections and elytra metallic dark blue.

Etymology. This species is named after John Darwin Pinto, Professor Emeritus of the University of California at Riverside, teacher of one of us (MAB) in the study of blister beetles, who greatly explored and resolved the diversity of North American Meloidae and at the beginning of his career revised the Nearctic species of the genus *Meloe*.

Remarks. As noted in the Diagnosis, the subgeneric assignment of this species is tentative, and the validity of the subgenera *Micromeloe*, *Meloellus*, and *Chiomeloe* must be further tested, ideally also by molecular analysis.

The placement of the new species in the subgenus *Micromeloe* is therefore uncertain. The general shape of *pinto* is similar to that of some *Micromeloe*, but it differs because of the presence of a distinct frontal longitudinal furrow and the presence of sparse setae on pronotum, which usually is almost glabrous in other *Micromeloe* species. Similar characters are present also in *M. (Micromeloe) intermedius* Escherich, 1904 from Central Asia (Kazakhstan, Tajikistan, Uzbekistan), which, as in *pinto*, has similarly distinct body punctuation, differently than most other *Micromeloe*, in which the punctuation is very vague. The shape of head and pronotum, and the body coloration, are different in *pinto* and *intermedius*.

M. (Chiomeloe) nigropilosellus Reitter, 1900 (Uzbekistan), which is phenetically similar to *pinto*, differs because of temples wider than pronotum and the lacking of a frontal furrow. From the species of the subgenus *Meloellus*, which has the frons furrowed, *pinto* differs by the black rather than clear setation. However, one species referred to this subgenus, *sulciceps* Reitter, 1890 (Kazakhstan), is very similar to *pinto*. It differs by its piceous body coloration, less depressed frons, the frontal furrow extending further posteriorly, shorter antennae, and elytral sides less distinctly deflexed.

Meloe (Eurymeloe) servulus Bates, 1875

New records. Kashmir: 3 exx., Sind Valley, 2000–2800 m, 2/5.v.1929, Nederlandse Karakorum-Expeditie J. A. Sillem, det. F. Borchmann (HNHM, ZMAN).

Distribution. Species recorded from Afghanistan, Tibet, Nepal (Bologna, 2008), and from Indian Kashmir (Borchmann, 1935; Axentjev, 1987).

Remarks. This species is poorly known. It is similar to *M. (E.) brevicollis* Panzer, 1792, widely distributed in the Palearctic region. It differs by its shiny black color, smaller size, finer punctures, less periform antennomeres (Figure 11a), slightly less reniform and more rounded pronotum (Figure 11b) with a depression on each side of disk, setose tergites. Tegmen in ventral view as in Figure 11c; tegmen and aedeagus in lateral view as in Figure 11d.

Meloe (Eurymeloe) transversicollis Fairmaire, 1891

New records. Kashmir: Holotype, Kashmir (MNHN).

Distribution. Described and recorded only from Kashmir (Bologna, 2008), and generically from “Himalaya” (Anand, 1989).

Remarks. The assignment to the subgenus *Eurymeloe* was confirmed after the study of the holotype, housed at MHNHP (the photo is placed on the museum website).

Meloe (Eurymeloe) punjabensis Kaszab, 1958

Distribution. Endemic to Pakistan, but erroneously considered as an Indian species and not reported by Bologna (2008). The species was described from “Punjab, Murrée Hills, Thobba”. Actually, Murree (or Murri) is a locality of the Pakistan Punjab, a few km north of Rawalpindi and close to the Indian Kashmir border.

Meloe (Lampromeloe) variegatus variegatus Donovan, 1793

Distribution. Palearctic polytypic species, widely distributed from the Iberian Peninsula to N China, through northwestern Africa, western and central Asia, including Kashmir (Bologna, 2008).

Meloe (Meloegonius) rufiventris himalaycus Kaszab, 1978

New records. Kashmir: 1 ex., Sind Valley, Gandkakar Mt., 3200 m, 4.iv.1929 (MSNM).

Distribution. This species is widely distributed from central Europe and Central Asia to China, with isolated populations in northern Africa (Bologna, 2008). This subspecies is endemic to Kashmir (described from India: Srinagar and Pahalgam) (Kaszab, 1978).

Remarks. This subspecies was erroneously synonymized with *Meloe (Meloegonius) cicatricosus* Leach, 1815 by Axentjev (1987).

Meloe (Meloe) proscarabaus Linnaeus, 1758 s.l.

Distribution. Palearctic species, widely distributed from the Iberian Peninsula to Japan and at least to northern China, through northern Africa, western and central Asia (Bologna, 2008). Recorded from Kashmir and

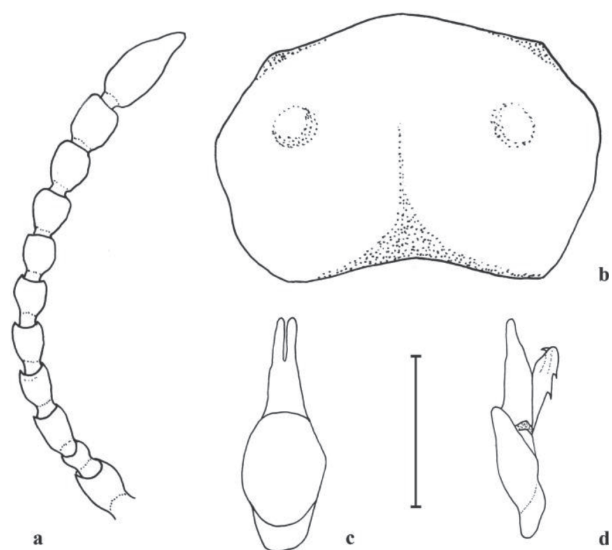


Figure 11. *Meloe servulus* Bates, 1875: antennae (a); pronotum (b); male genitalia in ventral (c) and lateral (d) views.

Himalaya (Anand, 1978), but these citations are doubtful. Its presence in Tibet (subsp. *sericeorugosus* Axentjev, 1987) also needs confirmation.

Remarks. We suspect that the above citations of *proscarabaeus* could actually refer to *M. semicoriaceus*, a similar species of the same lineage.

M. proscarabaeus is a highly variable species with very distinct populations in western and eastern Europe, in Anatolia and the Caucasus, and in central Asia, a few of which are described as distinct species or subspecies (see Baudi, 1878a, 1878b; Kaszab 1973).

Meloe (Meloe) semicoriaceus Fairmaire, 1891

New records. Kashmir: holotype meli, Kashmir (MNHN); 2 exx., Sind Valley, Gund, 2080 m, 9.iv.1929 (MSNM).

Distribution. This species was described from Kashmir and recorded from this region also by Anand (1989). It was also reported from Iran, but this record is doubtful (Bologna, 2008).

Remarks. This species is closely related to *M. proscarabaeus*. We examined photos of a *Meloe (Meloe)* from Kashmir (Srinagar) which could be referred to *M. semicoriaceus*, but without the examination of the specimens we prefer to not consider them.

Meloe (Meloe) violaceus Marsham, 1802

Distribution. Palearctic species, widely distributed from the Iberian Peninsula to northern China and Tibet, through western and central Asia, with doubtful records from Afghanistan and isolated relic populations in Maghreb. Recorded also from Kashmir and Himalaya (Anand, 1978; Bologna, 2008) but these citations could

refer to another species.

Meloe (Meloe) cfr. lobatus Gebler, 1832

New records. Pakistan: 1 ex, Kaghan, vi.1991 S. Prespl (CB).

Remarks. The single specimen examined is a female and consequently the identification is uncertain. Among the Asiatic species of the nominotypical subgenus, one group (the *lobatus* group) includes about 15 species in which the pronotum is much longer than wide, distinctly sinuate basolaterally, and the middle male antennomeres are greatly widened. No species from this group have been recorded from Pakistan and the closest localities are in northwestern India (Himanchal Pradesh), Nepal, and Tibet. The specimen from Kaghan probably belongs to a new species of this group, which is under revision (Bologna et al., in preparation), especially because of the shape of the pronotum and its punctuation.

3.2. Additional taxonomic remarks

Bologna (2008) erroneously recorded *Cerocoma (Mesocerocoma) latreillei sterbai* Mařan, 1944 from Pakistan (as *C. latreillei schah* Kaszab, 1968, which is a synonym). This was based on the examination of specimens from Iranian Baluchistan, but actually this species was never collected in the Pakistan territory, but only in Iraq and Iran (Turco and Bologna, 2011) and specifically the subsp. *sterbai* only in Iran.

In the same catalogue (Bologna, 2008) *Glusunovia sillemi* Borchmann, 1935 is recorded from Afghanistan and Kashmir. Actually, the locality cited as Karakorum and considered to be in Kashmir is now in the Chinese Xizang, close to the northern Kashmir border. The presence of this species also in Kashmir is probable.

We examined at ZMAN the holotype male of *G. sillemi*, which has the following labels: "between Sanju Bazar and Sugot-Karaul; 1800–3600 m; 19/31.v.1930; Nederlandse Karakorum-Expeditie J.A. Sillem; *Glusunovia Sillemi* n.sp.; Type *Glusunovia sillemi* Borchm. 1932". The species was never studied after its description and we present here new taxonomic data. The holotype is 10.8 mm long and attains a maximal width of 3 mm on the posterior third of elytra. Genitalia and last urite are mounted on a separate label. Male genitalia and spiculum gastrale are represented respectively in Figures 12a and 12b; the shape of parameres is characteristic in lateral view with a small pointed expansion at apex directed inward. The visible ventrites II and III (Figure 12c) have a medially depressed densely setose sensorial area; these sclerites are totally (II) or partially (III) black; IV is dark on the basal portion and the remaining surface of the ventrites is orange. Tarsomeres are slender, but II distinctly shorter than III. Antennomeres slender.

Anand (1989) recorded *Sybaris kashmirensis* Saha, 1979 and *S. mohami* Saha, 1979 from Kashmir, but both

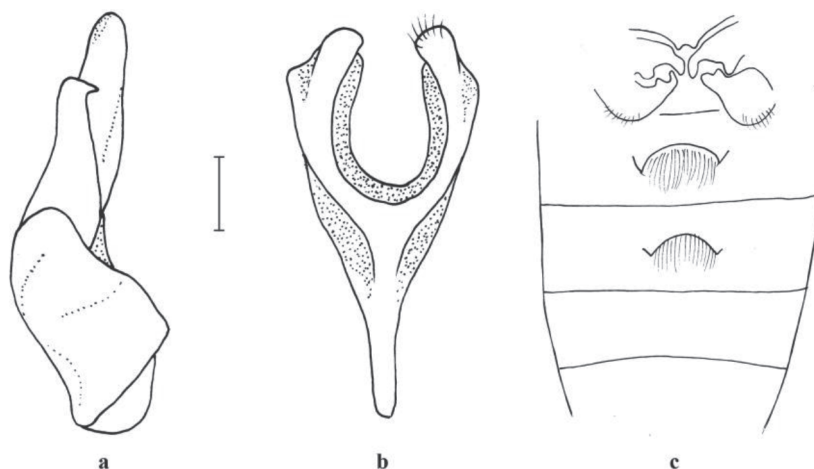


Figure 12. *Glasunovia sillemi* Borchmann, 1935: male genitalia in lateral view (a); spiculum gastrale (b); male visible ventrites II–IV (c).

taxa were not described by Saha (1979) and actually represent *nomina nuda*, possibly representing variations of *S. praeustus* (Redtenbacher, 1842).

3.3. Checklist of Meloidae of Pakistan and Kashmir

The species now known from Pakistan and Kashmir are listed below with their chorotypes (see the following paragraph for details). Four species are excluded from this list and from the zoogeographic analysis because of uncertain identification (*Mylabris* cf. *cernyi*, *M. quadripunctata*, *Hycleus horai*, *H. jacquemonti*).

Eleticinae, Eleticini

Eletica (*Meteletica*) *testacea* Oriental

Nemognathinae, Horiini

Horia fabriciana Paleotropical

Nemognathinae, Nemognathini

Stenoria osellai Endemic (Turanian)

Zonitis (*Zonitis*) *afghanica* Afghanian

Zonitis (*Zonitis*) *nigripictus* Endemic (Turanian)

Zonitoschema melanarthra Indian

Zonitoschema straminea Northern Indian

Meloinae, Lyttini

Lytta (*Lytta*) *antennalis* Himalayan

Lytta (*Lytta*) *flavipennis* Southern Himalayan

Lytta (*Lytta*) *kashmirensis* Endemic (Tibetan)

Lytta (*Asiolytta*) *limbata* Himalayan

Lytta (*Asiolytta*) *discipennis* Endemic (Centralasiatic)

Lytta (*Eolytta*) *flavoangulata* Western Himalayan

Lytta (*Mesolytta*) *vrendenburgi* Afghanian

Cyaneolytta coerulea Indian

Lydomorphus (*Lydomorphus*) *tenuicollis* Northeastern

African-Sindian *Lydomorphus* (*Lydomorphus*)

angusticollis Sahelo-Sindian *Lydomorphus*

(*Lydomorphus*) *pictus* Indian

Sybaris praeustus Northwestern Indian

Sybaris testaceus Northern Indian

Sybaris tunicatus Endemic (Indian)

Sybaris semivittatus Northwestern Indian

Eolydus conspicuus Turano-Iranian

Meloinae, Epicautini

Epicauta (*Epicauta*) *atkinsoni* Sindian

Epicauta (*Epicauta*) *hirtipes* Turano-Sindian

Epicauta (*Epicauta*) *mannerheimi* Chino-Himalayan

Epicauta (*Epicauta*) *nepalensis* Himalayan

Epicauta (*Epicauta*) *rubriceps* Himalayan

Epicauta (*Epicauta*) *quadraticollis* Endemic (Chinese)

Psalydolytta villipes Indian

Meloinae, Mylabrini

Mylabris (*Calydabris*) cf. *mirzayani* Endemic (Iranian)

Mylabris (*Micrabris*) *afghanica* Hindukuchan

Mylabris (*Micrabris*) *macilenta* Himalayan

Mylabris (*Micrabris*) *nuristanica* Hindukuchan

Mylabris (*Micrabris*) *waziristanica* Hindukuchan

Mylabris (*Zitunabris*) cf. *panjoensis* Afghanian

Mylabris (*Zitunabris*) *syriaca* Eastern Mediterranean

Mylabris (*Eumylabris*) *cincta* Centralasiatic-Mediterranean

Mylabris (*Eumylabris*) *klapperichi* Afghanian

Mylabris (*Eumylabris*) *magnoguttata* Centralasiatic

Mylabris (*Eumylabris*) *posticalis* Centralasiatic

Mylabris (*Eumylabris*) *pulchra* Afghanian

Mylabris (*Eumylabris*) *quinqueplagiata* Afghanian

Mylabris (*Eumylabris*) *tiflensis* Endemic (Centralasiatic)

Mylabris (*Argabris*) *impedita* Centralasiatic

Mylabris (*Argabris*) *klugi* Centralasiatic

Croscherichia goryi Arabic-Sindian

Croscherichia salavatiani Arabic-Sindian

Xanthabris baluchistana Endemic (Arabic-Sindian)

Hycleus balteatus Indian

Hycleus bipunctatus Arabic-Sindian

Hycleus javeti Turano-Iranian

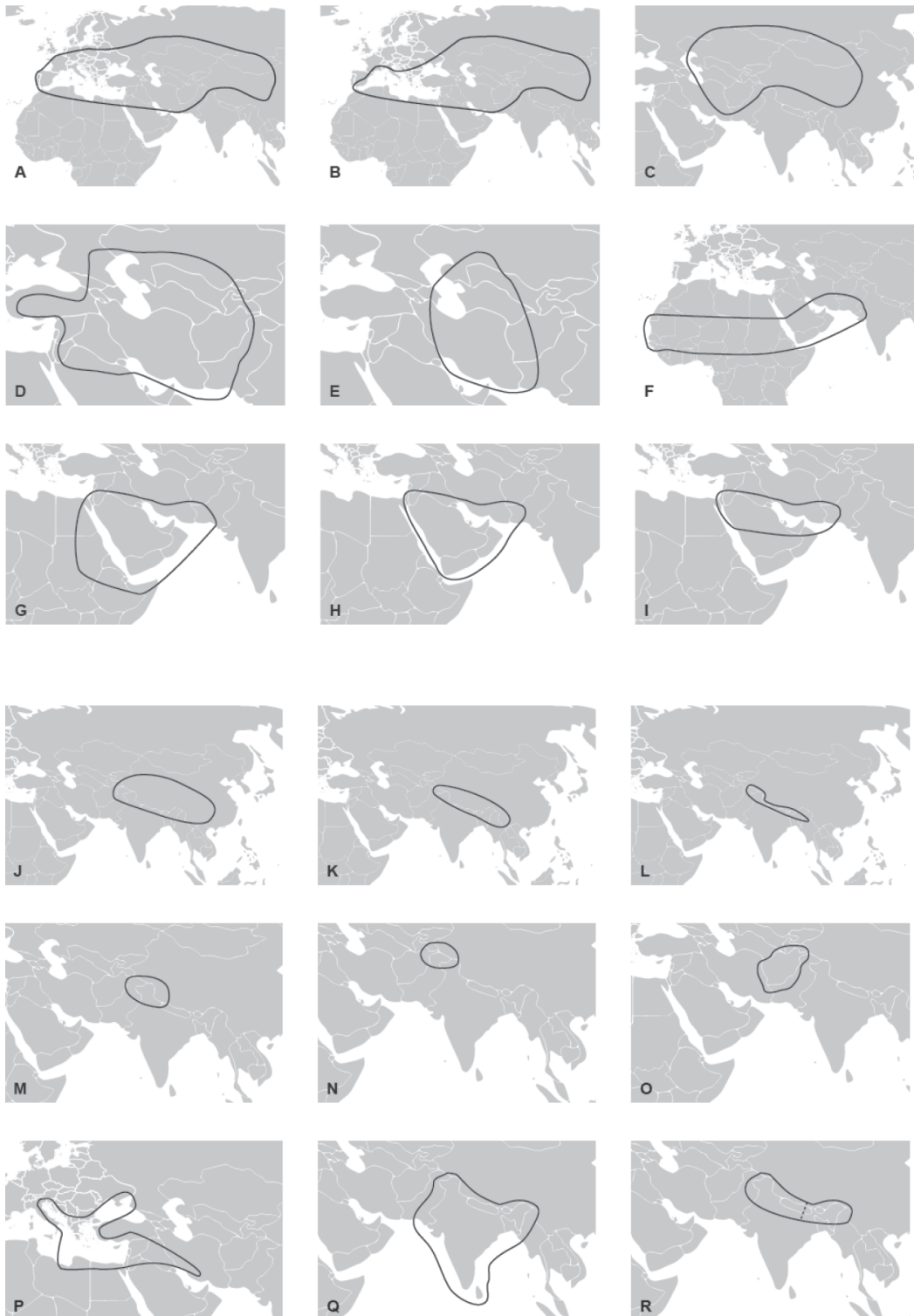


Figure 13. Chorotypes (both described and new) of the Meloidae species from Pakistan and Kashmir: A- Centralasiatic-European-Mediterranean; B- Centralasiatic-Mediterranean; C- Centralasiatic; D- Turano-Sindian; E- Turano-Iranian; F- Sahelo-Sindian; G- NE African-Sindian; H- Arabo-Sindian; I- Sindian; J- Chino-Himalayan; K- Himalayan; L- S Himalayan; M- W Himalayan; N- Hindukuchan; O- Afghanian; P- E Mediterranean; Q- Indian; R- N Indian and NW Indian (on left of the intermittent line).

Hycleus schauffelei Sindian
Hycleus hanguensis Endemic (Indian)
Hycleus rajah Indian
Hycleus rouxii Indian
Hycleus schah Sindian
Hycleus dohrni Northern Indian
Hycleus pakistanus Endemic (Sindian)
Hycleus biundulatus Oriental
Hycleus cichorii Oriental
Hycleus medioinsignatus Chino-Himalayan
Hycleus phaleratus Oriental
Hycleus belli Endemic (Sindian)
Meloinae, Cerocomini
Rhampholyssa steveni Centralasiatic
Meloinae, Meloini
Meloe (Micromeloe) pintoii Endemic (Turanian)
Meloe (Eurymeloe) servulus Himalayan
Meloe (Eurymeloe) transversicollis Endemic (Turanian)
Meloe (Eurymeloe) punjabensis Endemic (Mediterranean-Sindian)
Meloe (Lampromeloe) variegatus Central Asiatic-European-Mediterranean
Meloe (Meloegonius) rufiventris Central Asiatic-European-Mediterranean
Meloe (Meloe) proscarabeaus Palearctic
Meloe (Meloe) semicoriaceus Endemic (Palearctic)
Meloe (Meloe) violaceus Palearctic
Meloe (Meloe) cfr. lobatus Endemic (Chino-Siberian)

3.4. Zoogeographic analysis

As briefly discussed in the Introduction, the Asian region considered in this study, extending from eastern Afghanistan north to Kashmir and east to the Punjab desert, is extremely interesting from a biogeographic point of view because its biota shows mixed components of both Palearctic and Oriental regions and, in addition, displays a rich number of endemic species.

We summarized the blister beetle fauna zoogeographically using the chorotype (distribution model) of each species, based on the analysis in detail of the distribution at the specific level, excluding subspecies. As noted in Section 2, we considered the chorotypes pointed out by Vigna Taglianti et al. (1999) for most Palearctic species and proposed new chorotypes for some southeastern Palearctic and Oriental species: Afghanian, Hindukuchan, Indian, N Indian, NW Indian, Chino-Siberian, Chinese, Chino-Himalayan, Himalayan, S Himalayan, W Himalayan, and Tibetan. Chorotypes are represented in Figure 13. For this analysis 75 listed species were considered. four additional species either were of questionable identity or the record itself doubtful; as discussed in the annotated catalogue these include *Mylabris cfr. cernyi*, *M. quadripunctata*, *Hycleus horai*, and *H. jacquemonti*.

Table. Number and percentage for chorotypes of the Pakistan and Kashmir species (see text).

Palearctic	2	2.67%
Centralasiatic-European-Mediterranean	2	2.67%
Centralasiatic-Mediterranean	1	1.33%
Centralasiatic	5	6.67%
Turano-Sindian	1	1.33%
Turano-Iranian	2	1.33%
Sahelo-Sindian	1	1.33%
Northeastern African-Sindian	1	1.33%
Arabic-Sindian	3	4.00%
Sindian	3	4.00%
Chino-Himalayan	2	2.67%
Himalayan	6	8.00%
Southern Himalayan	1	1.33%
Western Himalayan	1	1.33%
Hindukuchan	3	4.00%
Afghanian	6	8.00%
Eastern Mediterranean	1	1.33%
<i>Total Palearctic chorotypes</i>	<i>41</i>	<i>54.67%</i>
Palearctic aff.	1	1.33%
Centralasiatic aff.	2	2.67%
Mediterranean-Sindian aff.	1	1.33%
Turanian aff.	4	5.33%
Chino-Siberian aff.	1	1.33%
Arabic-Sindian aff.	1	1.33%
Sindian aff.	2	2.67%
Iranian aff.	1	1.33%
Tibetan aff.	1	1.33%
<i>Total endemic with Palearctic affinities</i>	<i>14</i>	<i>18.67%</i>
Oriental	4	5.33%
Indian	7	9.33%
Northern Indian	3	4.00%
Northwestern Indian	2	2.67%
<i>Total Oriental chorotypes</i>	<i>16</i>	<i>21.33%</i>
Chinese aff.	1	1.33%
Indian aff.	2	2.67%
<i>Total endemic with Oriental affinities</i>	<i>3</i>	<i>4.00%</i>
Paleotropical	1	1.33%

All species with their chorotypes are listed in the above Checklist. Several species have a distribution restricted to portions of Pakistan and/or Kashmir. For these endemic species, we indicated their zoogeographic affinities in brackets, which are defined according to their relations with Palearctic or Oriental lineages. The number of species belonging to each chorotype and relative percentages are shown in the Table.

As pointed out for other animal and plant taxa (e.g., Brown and Lomolino, 1998), this area shows a transitional faunal composition also as for blister beetles. The western portions of Pakistan, along the Afghanistan borders and in Baluchistan, with mountain or subdesertic ecosystems, as well as the mountain areas of Kashmir, are primarily Palearctic, while the Oriental elements are mostly distributed east of the Indus River in eastern Pakistan and at low elevation in Kashmir, characterized by arid or more humid savannahs. The Palearctic component represents the majority (41 plus 14 endemic species with Palearctic affinities: 73.33%, respectively). Among Palearctic chorotypes, the most numerous are the Central Asiatic, Himalayan, Afghanian, and Hindukuchan. A good percentage of endemic species have Turanian affinities. The Oriental component represents 25.33% (16 plus 3 endemic species with Oriental affinities), and among them, the most numerous and widely distributed are the Indian species. Only one Paleotropical element is represented.

References

- Anand RK (1978). First record of *Meloe proscarabaeus* Linnaeus and *M. violaceus* Marshall (sic!) (Coleoptera: Meloidae) from India, along with further description and a key to the Indian species. *J Entomol Res* 2: 40-42.
- Anand RK (1980). A new species of *Cyaneolytta* Peringuey (sic) (Col., Meloidae) from (sic) India. *Entomol Month Mag* 115: 227-228.
- Anand RK (1984). A note on the aberrations on the elytra of *Mylabris phalerata* (Pallas) (Coleoptera: Meloidae). *Uttar Pradesh J Zool* 4: 213-216.
- Anand RK (1989). Indian Meloidae (Coleoptera): a taxonomic review. *Bull Entomol* 30: 24-34.
- Axentjev S. (1987). Meloidae from the Nepal Himalayas (Insecta: Coleoptera). *Cour Forsch Inst Senck* 93: 471-476.
- Batelka J, Bologna MA (2014). A review of the Saharo-Sindian species of the genus *Zonitoschema* (Coleoptera: Meloidae), with description of new species from Tunisia, Yemen and Socotra Island. *Acta Entomol Mus Nat Pragae* 54 (Suppl.): 241-268.
- Baudi di Selve F (1878a). Coleotteri Eteromeri esistenti nelle collezioni del R. Museo zoologico di Torino ed in altre italiane. *Atti R Accad Sci Torino* 13: 765-866, 1027-1183 (in Italian).
- Baudi di Selve F (1878b). Heteromera in Catalogo Dejeani. *Pars sexta. Deut Entomol Z* 22: 337-376 (in Latin).
- Biondi M (1985). Osservazioni comparative sul comportamento di tre indici di similarità per dati binari. *Biogeographia* (n.s.) 11: 285-292 (in Italian).
- Biondi M, D'Alessandro P (2006). Biogeographical analysis of the flea beetle genus *Chaetocnema* in the Afrotropical region: distribution patterns and areas of endemism. *J Biogeogr* 33: 720-730.
- Bologna MA (1983). Una nuova specie di *Lytta* del Kashmir (Coleoptera, Meloidae). *Fragm Entomol* 17: 125-138 (in Italian).
- Bologna MA (1990). Faunistica e zoogeografia dei Meloidae (Coleoptera) della Somalia. *Biogeographia* (n.s.) 13: 375-457 (in Italian).
- Bologna MA (1991). *Coleoptera Meloidae*. Fauna d'Italia. XXVIII. Bologna, Italy: Calderini (in Italian).
- Bologna MA (1995). A new Eleticinae genus from Ethiopia and remarks on the tribe Morphozonitini (Coleoptera: Meloidae). *Ann Soc Entomol France (N.S.)* 31: 185-193.
- Bologna MA (2008). New nomenclatorial and taxonomic acts, and comments, Meloidae; Family Meloidae Gyllenhal, 1810. In: Löbl I, Smetana A, editors. *Catalogue of Palearctic Coleoptera*. Vol. 5. Stenstrup, Denmark: Apollo Books, pp. 45-49, 370-412.

- Bologna MA (2009). The Meloidae (Coleoptera) of Libya: an annotated catalogue and description of three new species. *Ann Soc Entomol France* 45: 345-364.
- Bologna MA, Amore V, Pitzalis M (2018). Meloidae of Namibia (Coleoptera): taxonomy, faunistics, biogeography and ecology. *Zootaxa* 4373: 1-141.
- Bologna MA, Coco E (1991). Revisione del genere *Croscherichia* Pardo Alcaide, 1950 (Coleoptera, Meloidae). *Mem Soc Entomol Ital* 67: 33-101 (in Italian).
- Bologna MA, Di Giulio A (2011). Biological and morphological adaptations in the pre-imaginal phases of the beetle family Meloidae. *Atti Accad Naz Ital Entomol* 59: 141-152.
- Bologna MA, Di Giulio A, Pitzalis M (2008a). Systematics and biogeography of the genus *Actenodia* (Coleoptera: Meloidae: Mylabrini). *System Entomol* 33: 319-360.
- Bologna MA, Oliverio M, Pitzalis M, Mariottini P (2008b). Phylogeny and evolutionary history of the blister beetles (Coleoptera, Meloidae). *Mol Phyl Evol* 48: 679-693.
- Bologna MA, Osella BG (1989). Alcuni aspetti del popolamento animale del Karakorum. Some aspects of fauna of Karakorum. In: Di Fabrizio F, editor. *Karakorum. Abruzzo Peak*. Penne, Italy: Cogecstre, pp. 165-167 (in Italian).
- Bologna MA, Pinto JD (2001). Phylogenetic studies of Meloidae (Coleoptera), with emphasis on the evolution of phoresy. *System Entomol* 26: 33-72.
- Bologna MA, Pinto JD (2002). The Old World genera of Meloidae (Coleoptera): a key and synopsis. *J Nat Hist* 36: 2013-2102.
- Bologna MA, Turco F (2007) The Meloidae (Coleoptera) of the United Arab Emirates with an updating of the Arabian checklist. *Zootaxa* 1625: 1-33.
- Bologna MA, Turco F, Pinto JD (2010). 11.19. Meloidae Gyllenhal 1810. In: Leschen RAB, Beutel RG, Lawrence JF, editors. *Coleoptera, Beetles, Vol. 2: Morphology and Systematics (Elateroidea, Bostrichiformia, Cucujiformia partim)*. Berlin, Germany: De Gruyter, pp. 681-693.
- Bologna MA, Turco F, Pinto JD (2013). The Meloidae (Coleoptera) of Australasia: a generic review, descriptions of new taxa, and a challenge to the current definition of subfamilies posed by exceptional variation in male genitalia. *Invert System* 27: 391-427.
- Borchmann F (1935). Meloidae (Col.). In: Visser C, Visser-Hoofft J, editors. *Wissenschaftliche Ergebnisse der Niederländischen Expeditionen in den Karakorum und die angrenzenden Gebiete in den Jahren 1922, 1925 und 1929/1930*. Leipzig, Germany: Brockhaus, pp. 308-309 (in German).
- Borchmann F (1940). Neue Meloiden-Arten (Col.). *Mitt Münch Entomol Gesell* 30: 592-621 (in German).
- Brown JH, Lomolino MV (1998). *Biogeography*. 2nd ed. Sunderland, MA, USA: Sinauer Associates.
- Dvořák M (1983). Drei neue Arten und bemerkungen zur Familie Meloidae (Coleoptera). *Acta Entomol Bohemosl* 80: 441-450 (in German).
- Fairmaire L (1891). Descriptions de Coléoptères des montagnes du Kashmir. *CR Soc Entomol Belg* 35: 88-103 (in French).
- Fairmaire L (1894). Hétéromères du Bengale. *Ann Soc Entomol Belg* 38: 16-43 (in French).
- Fairmaire L (1896). Hétéromères de l'Inde récoltés par M. Andrewes. *Ann Soc Entomol Belg* 40: 6-62 (in French).
- Hashmi AH, Tashfeen A (1992). Coleoptera of Pakistan. *Proc Pakistan Congr Zool* 12: 133-170.
- Iablokoff-Khnzorian SM (1983). *Fauna Armenia. Vol. 5. Coleoptera, Meloidae and Alleculidae*. Erevan, Armenia: Akademia Nauk Armyanskoy SSR.
- Kaszab Z (1953). The 3rd Danish Expedition to central Asia. Zoological results 11. Meloiden (Insecta) aus Afghanistan. *Vidensk Medd Danske naturh Foren* 115: 305-311 (in German).
- Kaszab Z (1954). Die Arten der Meloiden Gattung *Psalydolytta* Pér. *Acta Zool Acad Sci Hung* 1: 69-103 (in German).
- Kaszab Z (1955). Revision der Meloiden-Gattung *Eletica* Lac. (Coleoptera-Heteromera). *Ann Musée R Congo Belge Tervuren (Belgique)* (in 8°) *Sci Zool* 41: 1-121 (in German).
- Kaszab Z (1956). Neue Meloiden aus der Sammlung des British Museum (Coleoptera). *Ann Magaz Nat Hist* 9: 631-640 (in German).
- Kaszab Z (1957). Neue Meloiden aus Iran 1954 (Coleopt.) (Ergebnisse der Entomologischen Reisen Willi Richter, Stuttgart, im Iran 1954 und 1956 – Nr. 6). *Jahr Ver Vaterl Naturk* 112: 50-59 (in German).
- Kaszab Z (1958). Die Meloiden Afghanistans (Coleoptera). *Acta Zool Acad Sci Hung* 3: 245-312 (in German).
- Kaszab Z (1959). Neue Meloiden aus Iran 1954, 1956 (Coleoptera). *Stuttg Beitr Naturk* 20: 1-5 (in German).
- Kaszab Z (1962). Über das System der Asiatischen *Lytta*-Arten, nebst Beschreibung drei neuer Arten (Coleoptera, Meloidae). *Ann Hist-Nat Mus Nat Hung Pars Zool* 54: 289-298 (in German).
- Kaszab Z (1963). Studien über Meloiden (Coleoptera). *Ann Hist-Nat Mus Nat Hung Pars Zool* 55: 336-346 (in German).
- Kaszab Z (1968). Contribution à la faune de l'Iran, 8. Coléoptères Meloidae. *Ann Soc Entomol France (N. S.)* 4: 749-776 (in German).
- Kaszab Z (1973). Beiträge zur Kenntnis der Fauna Afghanistans (Sammelergebnisse von O. Jakes 1963-64, D. Povolny 1965, D. Povolny and Fr. Tenora 1966, J. Simek 1966-66, D. Povolny, J. Gaisler, Z. Sebenek and Fr. Tenora 1967). *Meloidae. Col Acta Mus Morav* 56-57: 267-308 (in German).
- Kaszab Z (1978). Neue Meloiden aus Asien, Afrika und Südamerika (Coleoptera). *Acta Zool Acad Sci Hung* 24: 331-342 (in German).
- Kaszab Z (1981). Faunistische und taxonomische studien über Meloiden (Coleoptera). *Ann Hist-Nat Mus Nat Hung* 73: 159-181 (in German).
- Kaszab Z (1983). Insects of Saudi Arabia. Coleoptera: Fam. Meloidae – A synopsis of the Arabian Meloidae. *Fauna of Saudi Arabia* 5: 144-204.

- Nakane T (1966). Coleoptera of Afghanistan. Results of the Kyoto University Scientific Expedition to the Karakoram and Hindukush, 1955 8: 231-248.
- Pan Z, Bologna MA (2014). Taxonomy, bionomics and faunistics of the nominate subgenus of *Mylabris* Fabricius, 1775, with the description of five new species (Coleoptera: Meloidae: Mylabrini). *Zootaxa* 3806: 1-78.
- Pan Z, Carosi M, Bologna MA (2014). A new Eastern Asian *Hycleus* and key to the Chinese species of the *phaleratus* group (Coleoptera, Meloidae, Mylabrini). *ZooKeys* 463: 11-19.
- Pardo Alcaide A (1958). Etudes sur les Meloidae (Col.) IX. Observations sur quelques *Mylabris* des régions éthiopienne et orientale. *Bull Inst R Sci Nat Belg* 34: 1-39 (in French).
- Pardo Alcaide A (1969). Études sur les Meloidae. XXI. Matériaux pour une révision des Mylabrides de l'Afrique du Nord et du Moyen Orient (2e partie). *EOS Rev Españ Entomol* 54: 367-376 (in French).
- Saha GN (1972a). Observations on a collection of blister beetles, *Mylabris* Fabricius (Coleoptera: Meloidae), from Pakistan, with the description of a new species and a new subspecies. *Proc Zool Soc Calcutta* 25: 19-23.
- Saha GN (1972b). Studies on blister beetles (Coleoptera: Meloidae) from India. I. Two new species of the genus *Eletica* Lac. *Zool Anz* 189: 98-101.
- Saha GN (1979). Revision of Indian blister beetles (Coleoptera: Meloidae: Meloinae). *Rec Zool Surv India* 74: 1-146.
- Salvi D, Maura M, Pan Z, Bologna MA (2018). Phylogenetic systematics of *Mylabris* blister beetles (Coleoptera, Meloidae): a molecular assessment using species trees and total evidence. *Cladistics* (in press).
- Selander RB (1986a). The identity of *Lytta coerulea* Pfaff, 1824 (Coleoptera, Meloidae). *J Kans Entomol Soc* 59: 557-559.
- Selander RB (1986b). An annotated catalog and summary of bionomics of blister beetles of the genus *Cyaneolytta* (Coleoptera, Meloidae). *T Am Entomol Soc* 112: 95-128.
- Selander RB (1988). An annotated catalog and summary of bionomics of blister beetles of the genus *Cylindrothorax* (Coleoptera, Meloidae). *Tr Am Entomol Soc* 114: 15-70.
- Shapovalov AM (2016). Remarks on taxonomy of the genus *Lytta* Fabricius, 1775 (Coleoptera: Meloidae) with description of a new subgenus and two new species from Asia. *Caucas Entomol Bull* 12: 99-108.
- Turco F, Bologna MA (2008). Revision of the genera *Anisarthrocera*, *Rhampholyssa* and *Rhampholyssodes*, description of the new genus *Somalarthrocera* and a phylogenetic study of the tribe Cerocomini. *Eur J Entomol* 105: 329-342.
- Tan J (1981). Coleoptera Meloidae. In: Zhongguo Kexueyuan Qingzang Gaoyuan Zonghe Kexue Kaocha Dui [The Series of the Comprehensive Scientific Expedition to the Qinghai-Xizang Plateau]. Xizang Kunthong [Insects of Xizang], 1. Beijing: China: Sciences Press, pp. 405-416.
- Vigna Taglianti A, Audisio PA, Belfiore C, Biondi M, Bologna MA, Carpaneto GM, De Biase A, De Felice S, Piattella E, Racheli T et al. (1992). Riflessioni di gruppo sui corotipi fondamentali della fauna W-paleartica ed in particolare italiana. *Biogeographia* (n.s.) 15: 129-149 (in Italian).
- Vigna Taglianti A, Audisio PA, Biondi M, Bologna MA, Carpaneto GM, De Biase A, Fattorini S, Piattella E, Sindaco R, Venchi A et al. (1999). 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.
- Wang XP, Wang HL, Pan Z, Ren GD (2012). A new Chinese record genus and one new record species of Meloidae from China (Coleoptera, Tenebrionoidea). *Acta Zootax Sin* 37: 450-452.