



Digger wasps of the genus *Hoplisoides* Gribodo (Hymenoptera, Crabronidae, Bembicinae) from the Palaearctic region, with description of two new species

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Abstract

The Palaearctic species of the digger wasps genus *Hoplisoides* Gribodo, 1884 (Hymenoptera: Crabronidae: Bembicinae) are reviewed, and a key to both sexes is given. Two new species are described and illustrated: *Hoplisoides flavescens* Mokrousov, **sp. nov.** (Azerbaijan) and *H. leleji* Mokrousov, **sp. nov.** (Turkmenistan). New synonymy is proposed for *Hoplisoides craverii* (A. Costa), 1867 = *Gorytes merceti* de Beaumont, 1950, **syn. nov.** *Hoplisoides distinguendus* (Yasumatsu, 1939), **stat. resurr.** is reinstated to full specific level. An updated checklist of the ten species of *Hoplisoides* so far known from Palaearctic region is provided.

Keywords

Azerbaijan, Bembicinae, checklist, Gorytina, key, synonymy, taxonomy, Turkmenistan

Introduction

Hoplisoides Gribodo, 1884 is a digger wasps genus with a world wide distribution (except Australia). It includes 82 species: Palaearctic – 10 (including current data), Oriental – 10, Afrotropical – 17, Neotropical – 28, Nearctic – 9, Neotropical and Nearctic – 8.

G. Gribodo (1884: 276) distinguished his genus *Hoplisoides* by having six visible metasomal segments in male, which is characteristic mostly for females. For a long time, most authors were not considered this genus as valid and species of the genus *Hoplisoides* in the current understanding were placed in *Gorytes* Latreille, 1804 (=*Arpactus* Panzer, 1805, =*Arpactus* Panzer, 1806, nom. praeocc. nec Panzer, 1806, =*Pseudoplatus* Ashmead, 1899, =*Hoplisus* Lepeletier de Saint Fargeau, 1832) (Handlirsch, 1888, 1895; Gribodo, 1894 [partly]; de Beaumont, 1950). W.H. Ashmead (1899: 323) used the name *Hoplisoides* for North American species with hindwing media diverging at cu-a and not sharply defined metapostnotum, but due to the unreliability of diagnostic features, the some *Gorytes*, *Oryttus* Spinola, 1836, *Arigorytes* Rohwer, 1912, *Psammaletes* Pate, 1936 and *Sagenista* R. Bohart, 1967 in the current understanding were also included to the genus *Hoplisoides*.

For the first time a detailed diagnosis for the genus leads de Beaumont (1952a). Finally, generic status and features became common accepted after generic revision by Bohart and Menke (1976).

Hoplisoides species, like most other Bembicinae, nest in the ground, generally in bare, sandy soil and dig relatively shallow, normally multicellular nests. The prey of *Hoplisoides* are various leafhoppers (adults and nymphs of all stages) (Kazenas 2001).

Based on a comprehensive study of specimens in various collections we list here ten Palaearctic species of *Hoplisoides*, with two species described as new. In addition, we propose new synonymy for *Hoplisoides craverii* (A. Costa), 1867 = *Gorytes merceti* de Beaumont, 1950, syn. nov. and reinstate *H. distinguendus* (Yasumatsu, 1939), stat. resurr. to full specific level. Illustrated keys to the species of *Hoplisoides* known from the Palaearctic region are presented to facilitate further research on this wasp genus.

Material and methods

This paper is based on the materials, preserved on the collection of the Zoological Institute, Russian Academy of Sciences (St. Petersburg, Russia) [ZISP], Federal Scientific Center of the East Asia Terrestrial Biodiversity, Far East Branch of the Russian Academy of Sciences (Russia, Vladivostok) [FSCV], D.N. Kochetkov personal collection (Arkhara, Russia) [DKPC], and M.V. Mokrousov personal collection (Nizhny Novgorod, Russia) [MMPC].

Photographs taken with a combination of digital camera Canon EOS M200 and Carl Zeiss Stemi 508 (Figs 1A, 2A, 3A and 4A) and Olympus SZX16 stereomicroscopes (rest figures). Final images representing a composite of several photographs taken at different focal planes and combined using Helicon Focus 7.6.1. All images were post-processed for contrast and brightness using Adobe® Photoshop® v. CC 2017 (x64).

Morphological terminology generally follows Hymenoptera Anatomy Ontology Portal (2020) and Bohart and Menke (1976): e.g., we have used the abbreviations

F – flagellomere; S – metasomal sternum; T – metasomal tergum; POL – distance between posterior ocelli; OOL – ocellocular distance; L – length; H – height; W – width. Body length measurements are rounded to 0.1 mm, the measurement ratios are rounded to 0.01.

We have used the following abbreviations for collectors: YuA – Yu.V. Astafurova; KF – K.I. Fadeev; DK – D.N. Kochetkov; AL – A.S. Lelej; VL – V.M. Loktionov, MM – M.V. Mokrousov, MP – M.Yu. Proshchalykin. New records are asterisked (*).

Key to the species is based on examined collection materials (see below), as well as data from de Beaumont (1950, 1952a, b), R. Turner (1917), and P. Nemkov (1995). The classification and distribution generally follows W. Pulawski (2020).

Taxonomy

Genus *Hoplisoides* Gribodo, 1884

Hoplisoides Gribodo, 1884: 276. Type species: *Hoplisoides intricans* Gribodo, 1884, by monotypy.

Icuma Cameron, 1905: 21. Type species: *Icuma sericea* Cameron, 1905, by monotypy [= *Gorytes vespoides* F. Smith, 1873]. Synonymized with *Hoplisoides* by R. Bohart in Bohart and Menke, 1976: 53.

Diagnosis. Genus *Hoplisoides*, according to Bohart and Menke (1976) with clarifications, characterized by: medium to small wasps; inner eye margins often nearly parallel and widely separated, sometimes converging below, especially in males; median frontal groove often indistinct; labrum inconspicuous; at least male flagellomeres VIII and IX specially modified, flattened or concave beneath; first flagellomere less than three-fourths as long as scape; mandible with an inner subtooth; pronotal collar a little thinner medially, rather closely appressed to scutum; female foretarsal rake well developed, basitarsus with three bladelike setae before apex; female arolia usually equal; posterolateral oblique scutal carina present; mesopleuron with a complete sternalulus; acetabular carina present, distinct and complete; subomaulus lacking or reduced to elevation in the form of an inflection; scutum usually coarsely punctate; forewing usually pictured, media diverging before cu-a, stigma moderate, veinlet of submarginal cell II between recurrents short; jugal lobe larger than tegula, hindwing media diverging at or very near cu-a; midtibia with two apical spurs; metapostnotum usually with longitudinal carinulae, lateral boundaries sometimes indistinct; spiracular groove present but not well impressed; metasomal segment I sometimes narrowed but tergum evenly curved, not strongly humped towards apex, male with normally visible six or seven terga and six sterna, sterna V and VI with basal and concealed hairbrushes (often hidden beneath the edge of the previous sternum), sternum VIII sword shaped and pointed apically; female pygidial plate distinct, often long and ovoid-triangular, sides sometimes bent.

Key to the Palaearctic species of the genus *Hoplisoides*

- 1 Acetabular carina far from reaching omaulus, omaulus-sternaulus opposite end of acetabular carina not or slightly curved (Figs 2B, 5F, 8B) **2**
- Acetabular carina reaching omaulus (sometimes in form of an indistinct fold), omaulus-sternaulus at junction with acetabular carina often distinctly curved (Figs 3H, 5C, 8E) **4**
- 2 Propodeum dorsolaterally smooth, with space not large punctuation (Fig. 5E). Male: apical part of clypeus concave, concavity narrowed in middle (Fig. 5D); mid tarsomeres 2 and 3 modified, assymetrical, tarsomere 2 with long process posteroapically (Fig. 6E) **2. *H. distinguendus* (Yasumatsu)**
- Propodeum dorsolaterally with coarse punctuation, sculpture near cellular (Figs 2E, 8C). Male: apical part of male clypeus not modified (Fig. 2C); mid tarsomeres 2 and 3 normal **3**
- 3 Subomaulus absent. Propodeal slope with weak median keel and obscure adjacent sculpture (Fig. 8C). Yellow or whitish coloration less developed, face, mesosoma and metasoma predominantly black. Female: POL:OOL ca. 1.2. Male: POL:OOL equal to or less than 1.4 **1. *H. craverii* (A. Costa)**
- Subomaulus present, but reduced to roller-shaped elevation. Propodeal slope with strong median keel and distinct transverse carinae (Fig. 2E). Yellow coloration well developed, face and metasoma predominantly yellow, mesosoma with large yellow spots (Figs 1A, 2A). Female: POL:OOL = 1.45 (Fig. 1D); Male: POL:OOL = 1.84 (Fig. 2D) **4. *H. flavescens* Mokrousov, sp. nov.**
- 4 T1 elongate, distinctly longer than wide. Mesosoma predominantly ferruginous **3. *H. ferrugineus* (Spinola)**
- T1 not elongate, nearly as long as wide or wider. Mesosoma predominantly black **5**
- 5 Female: mesopleural spot ferruginous; T1 with interrupted apical band, T2, 4–5 with yellow apical bands, T3 black; metasomal base ferruginous. Male unknown **10. *H. remotus* (R. Turner)**
- Mesopleural spot (if present) yellow; T1–5 with yellow apical bands; metasomal base black (except some specimens of *H. gazagnairei* (Handlirsch)) **6**
- 6 Propodeum dorsolaterally with space punctures, interspaces much larger than punctures diameter, smooth **9. *H. quedenfeldti* (Handlirsch)**
- Propodeum dorsolaterally with dense punctures or rugae, sculpture cellular or rugose (Figs 3G, 5B, 8F) **7**
- 7 Omaulus-sternaulus at junction with acetabular carina not or slightly curved, does not form tooth (Fig. 3H). Propodeum with large yellow lateral spots ... **8**
- Omaulus-sternaulus at junction with acetabular carina angularly curved (Fig. 8B, E). Propodeum without or with small yellow lateral spots **9**
- 8 Punctuation of metanotum and propodeal dorsolateral surface with coarse punctures, without smooth interspaces. Omaulus-sternaulus at junction with acetabular carina not or slightly curved. Female: tentorial pit situated about

- middle at frontoclypeal suture between eye and antennal socket (Fig. 7E); flagellomeres longer, F1 L/W = 2.42, F9 distinctly longer than wide (Fig. 7D); mid tarsomeres thinner (Fig. 7C). Male: tentorial pit situated distinctly closer to eye at frontoclypeal suture between eye and antennal socket (Fig. 7F); flagellomeres longer, F1 L/W ca. 1.5, F10 distinctly longer than wide, antennal tyloids more developed, on basal flagellomeres distinct (Fig. 7H).....
..... **6. *H. latifrons* (Spinola)**
- Punctuation of metanotum and propodeal dorsolateral surface with irregular punctures, with distinct smooth interspaces (Fig. 3G). Omaulus-sternaulus at junction with acetabular carina distinctly curved (Fig. 3H). Female: tentorial pit situated distinctly closer to antennal socket at frontoclypeal suture between eye and antennal socket (Fig. 3F); flagellomeres shorter, F1 L/W = 1.81, F9 cubelike (Fig. 7B); mid tarsomeres more robust (Fig. 7A). Male: tentorial pit situated about middle at frontoclypeal suture between eye and antennal socket (Fig. 4B); flagellomeres shorter, F1 L/W = 1.23, F10 slightly longer than wide, antennal tyloids weaker developed, on basal flagellomeres very thin (Fig. 4C) **7. *H. leleji* Mokrousov, sp. nov.**
- 9 Angular protrusion of omaulus-sternaulus very sharp (Fig. 5C). Forewing apex with very large darkened area. Apical part of male clypeus concave, concavity narrowed in middle (Fig. 5C) **5. *H. gazagnairei* (Handlirsch)**
- Angular protrusion of omaulus-sternaulus not very sharp (Fig. 8E). Forewing darkened area smaller. Clypeus of male without apical depressions
..... **8. *H. punctuosus* (Eversmann)**

Annotated checklist of the Palaearctic species of the genus *Hoplisoides*

1. *Hoplisoides craverii* (A. Costa, 1867)

Figures 8A–C

Hoplisus craverii A. Costa, 1867: 67, ♀, ♂ (syntypes: Italy, Piemonte, Brà [Museo zoologico, Napoli, Italy]).

Hoplisus ottomanus Mocsáry, 1879: 136, ♀ (holotype or syntypes: ♀, Asia Minor [now Turkey], no specific locality [Természettudományi Múzeum, Budapest, Hungary]). Synonymized by de Beaumont, 1952a: 223.

Gorytes merceti de Beaumont, 1950: 63, ♀, ♂ (holotype: ♂, Spain, El Escorial [Museo Nacional de Ciencias Naturales, Madrid, Spain]), **syn. nov.**

Hoplisoides craverii merceti: de Beaumont, 1952: 223–224; Bitsch et al. 2020: 271.

Material examined. RUSSIA: Crimea, Pervomaisky Distr., near Voikovo, 45.51°N, 33.9°E, 25.V.2016, (3 ♀, 1 ♂), leg. A. Fateryga [MMPC]; Dagestan: 8 km SW Magaramkent, 41.573°N, 48.247°E, 10.VI.2017, (3 ♀), leg. MM; Narat-Tyube Mt., 20 km W Makhachkala, 42.978°N, 47.242°E, 31.V.2019, (1 ♀), leg. MM; Kumtorkala Distr., Barkhan Sarykum, 43.002°N, 47.237°E, 29.V.2019, (1 ♀), leg. KF; near Tal-

gi vill., 42.878°N, 47.432°E, 29.V.2019, (1 ♀), leg. KF [MMPC]; SPAIN: Burgos, Fuentespina, 24.VI.1985, (1 ♂), leg. P. Sanza [FSCV]; Escurial, [18]65, (1 ♂), leg. G. Seidlitz [FSCV]; AZERBAIJAN: Zuvant, 1200–1500 m, 9.VI.1985, (3 ♀), leg. V. Tobias [FSCV]; TURKEY: 10 km E Karakurt, 1.VI.1988, (2 ♂), leg. K. Warncke [FSCV]; TURKMENISTAN: 5 km N Firjuza, Vanovsky, 10.V.1990, (1 ♀, 1 ♂), leg. AL [FSCV]; UZBEKISTAN: Chatkalsky Nature Reserve, 1400–1800 m, 18.V.1980, (3 ♂), leg. D. Kasparyan [FSCV]; KAZAKHSTAN: 30 km W Almaty, 6.VI.1979, (1 ♀), leg. D. Kasparyan [FSCV].

Distribution. Portugal, Spain, Italy, France, Bosnia and Herzegovina, Croatia, Greece, Republic of Macedonia, Czech Republic, Hungary, Slovakia, Russia (*Crimea, *Dagestan, Rostov Prov., Volgograd Prov., Orenburg Prov.), Armenia, Azerbaijan, Turkey, Turkmenistan, Uzbekistan, Kazakhstan, Mongolia.

Remark. De Beaumont (1952a: 223) changed the state of *Gorytes merceti* de Beaumont to rank of subspecies of *Hoplisoides craverii* (A. Costa). As the only differences between these forms, he cited coloring features of the clypeus and legs. The study of the material from Spain, Russia (Crimea, Dagestan), Azerbaijan, Turkey, Turkmenistan, Uzbekistan and Kazakhstan showed a high variability of these characteristics. We consider ssp. *merceti* de Beaumont is only a color variation of a rather variable species with a range of color geographic forms.

2. *Hoplisoides distinguendus* (Yasumatsu, 1939), stat. resurr.

Figures 5D–F, 6C–F

Gorytes (Harpactus) distinguendus Yasumatsu, 1939: 12, ♀ (holotype: ♀, China, Jilin, Changchu [Kyushu University, Fukuoka, Japan]).

Hoplisoides distinguendus: Tsuneki, 1963: 10.

Hoplisoides gazagnairei distinguendus: Tsuneki, 1971: 11; Pulawski, 2020.

Material examined. RUSSIA: Buriatia, Naushki, 25 km W Kyakhta, VIII.1984, (1 ♂), leg. AL; near Dzhida, Dzhida River, 27.VII.2007, (1 ♂), leg. AL, MP, VL [FSCV]; Amur Prov: Arkhara, 3–4.VIII.2013, (3 ♀); ibid, 7–8.VI.2014, (1 ♂); ibid, 3.VII.2015, (1 ♂); ibid, 2–3.VIII.2016, (3 ♂), leg. DK; 27 km E Arkhara, 2–3.VIII.2013, (2 ♂); ibid, 10–11.VII, 13.VIII.2013, (4 ♀, 3 ♂); ibid, 5–7.VIII.2014, (3 ♀, 1 ♂), leg. DK [DKPC]; Primorsky Terr., 7 km E Khasan railway st., 27.VII.1986, (1 ♀), leg. AL [FSCV]; vicinity of Khasan, Golubiny Utes, 11.VIII.1976, (1 ♀), leg. N. Kurzenko; Anisimovka, 3.VIII.1983, (1 ♂), leg. AL [FSCV]; MONGOLIA: Zavkhan Aimag, 30 km WNW Tes-Somon, 3–4.VII.1968, (1 ♂), leg. M. Kozlov [FSCV].

Distribution. Russia (*Buriatia, *Amur Prov., Primorsky Terr.), Kazakhstan, Mongolia, China (Inner Mongolia, Beijing, Jilin), Korean Peninsula.

Remark. The reason to reduce the status of *distinguendus* to rank of subspecies of *gazagnairei* was, most likely, a similar form of males clypeus (apical part of the clypeus concave). The modified clypeus is not unique for these two taxa: clypeus with

separated apical part present in the North American *Hoplisoides hamatus* (Handlirsch, 1888), *H. nebulosus* (Packard, 1867), *H. placidus* (F. Smith, 1856) and *H. punctifrons* (Cameron, 1890) (Buck, 2007). Besides, *H. gazagnairei* and *H. distinguendus* have many significant differences (besides coloration), given in the Table 1.

Based on the above differences and the huge geographical hiatus, we consider *Hoplisoides gazagnairei* (Handlirsch, 1893) and *H. distinguendus* (Yasumatsu, 1939) as different species.

3. *Hoplisoides ferrugineus* (Spinola, 1839)

Hoplisus ferrugineus Spinola, 1839: 497, ♂ (holotype or syntypes: ♂, Egypt, no specific locality, lost). Neotype: ♀, Egypt: Shubra [The Natural History Museum, London, Great Britain], designated by de Beaumont, 1952a: 229.

Gorytes imsganensis Nadig, 1933: 90, ♂ (syntypes: ♂♂, Morocco, Agadir [originally coll. Nadig, now in Eidgenössische Technische Hochschule Zürich, Switzerland]). Synonymized by de Beaumont, 1952a: 229.

Distribution. Morocco, Libya, Egypt, Israel, Saudi Arabia, United Arab Emirates, Oman.

Table I. Comparison of morphological features of *Hoplisoides gazagnairei* and *H. distinguendus*.

	<i>H. gazagnairei</i>	<i>H. distinguendus</i>
Both sexes		
Transverse anterior concavity of scutellum	ribs very short, poorly distinguishable	with clearly visible ribs (Fig. 5E)
Form of acetabular carina and omaulus	acetabular carina reaching omaulus, omaulus-sternaulus angularly very sharp curved (Fig. 5C)	acetabular carina far from reaching omaulus, omaulus-sternaulus opposite end of acetabular carina not or slightly curved (Fig. 5F)
Propodeum	dorsolaterally with coarse punctuation and rugose sculpture; gibbous; edges of metapostnotum poorly visible (Fig. 5B)	dorsolaterally smooth, with space not large punctuation; uniformly convex; metapostnotum clearly separated (Fig. 5E)
Males		
Apicoposterior spine on male hind tarsomeres 1–3	as long as apicoanterior spine	2–3 times longer than apicoanterior spine (Fig. 6F)
Clypeus	apical margin with median weak bilobate protrusion; lateral setae not combined into brush (Fig. 5A)	apical margin without median protrusion, with simple wide excision; lateral setae combined into thin brush (Fig. 5D)
Antenna	flagellomeres shorter, F10–F11 visibly transverse, F12 ratio length to width near 1.4 (Fig. 6A)	flagellomeres longer, F10 cubelike, F11 longer than wide, F12 ratio length to width near 1.9 (Fig. 6C)
Foretarsomeres 2–4	transverse (Fig. 6B)	strongly transverse (Fig. 6D)
Midtarsomeres 2 and 3	symmetrical, not modified	strongly asymmetrical, tarsomer 2 with long process apicoposteriorly (Fig. 6E)
Metasomal tergum 1	as long as wide (dorsal view)	distinctly longer than wide (dorsal view)
Metasomal tergum 2	thickened at base, slightly concave behind the thickening (lateral view)	not thickened, uniformly slightly convex
Metasomal sternum 6	strongly convex	almost flat

4. *Hoplisoides flavescens* Mokrousov, sp. nov.

<http://zoobank.org/F120A591-E392-4F38-93FD-35A053D6FB19>

Figures 1A–E, 2A–F

Material examined. Holotype ♀: Azerbaijan, Nakhichevan AR / Julfa, Daridagh / 38°59'N, 45°40'E 900 m / 20.VI 2019 Proshchalykin, / Aliyev, Maharramov // Holotype ♀ / *Hoplisoides flavescens* / Mokrousov [ZISP]; Paratypes: ♀, same data as holotype but differing as for the collection date, 16.VI.2019 [ZISP]; ♀, same data as holotype but differing as for the collection date, 17.VI.2019 [MMPC]; ♂, Azerbaijan, Nakhichevan AR / Babek, 3 km NE Sirab / 39°18'N, 45°32'E 1250 m / 21.VI.2019 Proshchalykin, / Aliyev, Maharramov [ZISP].

Diagnosis. Acetabular carina far from reaching omaulus; subomaulus present, but reduced to elevation in form of inflection; POL:OOL = 1.45 at females and 1.84 at male; head, meso- and metasoma with very developed yellow coloration. From all Palaearctic species differs by present subomaulus (reduced to elevation in form of inflection) and very developed yellow coloration (the only species with yellow coloration on ventral part of mesosoma and predominantly yellow metasomal sterna). Morphological differences from all Palaearctic species given in key.

Description. Female. Body length 9.6–11.4 mm (holotype 9.6 mm); fore wing length of holotype 7.3 mm. Head (Fig. 1C, D). Head ratio H:W = 0.85; POL:OOL = 1.45; eyes slightly convergent downwards. Frons above antennal sockets without longitudinal elevation (carina). Occipital carina well developed; it does not reach hypostomal carina at distance slightly larger than diameter of anterior ocellus. Antennae elongate, all flagellomeres distinctly longer than wide. Mandibles with internal blunt

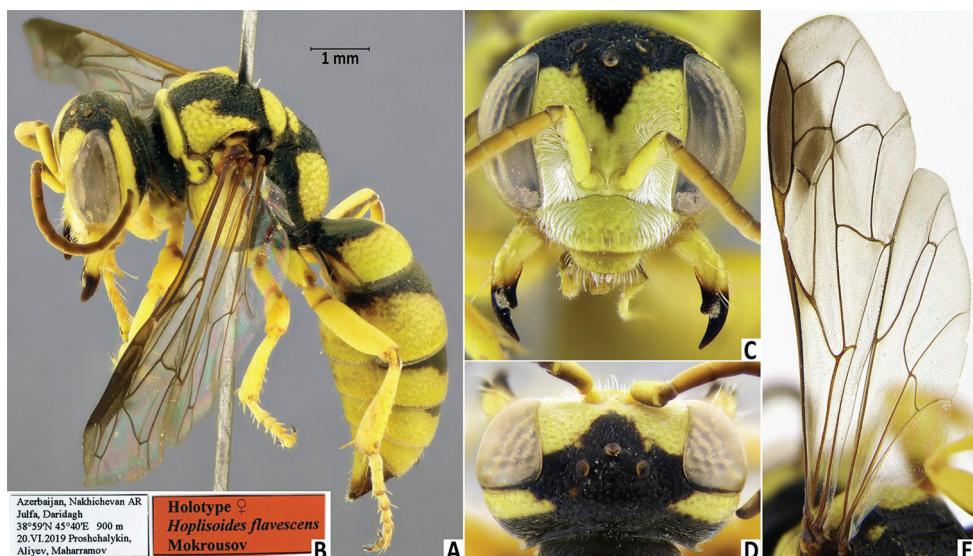


Figure 1. *Hoplisoides flavescens* Mokrousov, sp. nov., holotype, female: **A** habitus, dorsolateral view **B** labels **C** head, frontal view **D** head, dorsal view **E** wings, dorsal view.

tooth in apical third. Punctuation above antennal sockets and temples sparse; along inner edges of eyes and at vertex dense, interspaces less than punctures diameter; clypeus in central part with several large punctures. Mesosoma. Acetabular carina acute, far from reaching omaulus, laterally connects to subomaulus reduced to elevation in form of inflection; omaulus-sternaulus acute, uniform, not curved. Metapostnotum well separated, with shallow medial furrow with transverse ribs and lateral folds diverging to posteriorly. Propodeal slope with strong median keel and distinct transverse carinae. Punctuation on pronotal collar sparse; on mesonotum and scutellum irregular, deep, with micropunctured interspaces; mesopleuron with dense punctuation, more sparse ventrally and posterolaterally; dorsolateral parts of propodeum with irregular dense punctuation. Wings (Fig. 1E). Venation typical for genus; hindwing media diverging at cu-a. Legs. Foretarsal rake well developed, basitarsus with three rake setae before apex; setae slightly spatulate. Metasoma. T1 not elongate, approximately as long as width. Pygidial plate broad, sharply edged, with elongated punctures forming irregular longitudinal wrinkles. Punctuation of T1 irregular, interspaces much larger than punctures diameter; T2–T4 with smaller punctures, interspaces about punctures diameter; T5 with obscure punctato-wrinkled sculpture; S2–S5 scattered punctured, punctures on S2 large. Coloration (Fig. 1A). Predominantly yellow with black pattern. Black or brown are: apical third of mandibles, upper part of frons and vertex between eyes, back part of head, stipes, prementum; pronotum (except collar and lobes), median and posterior parts of mesonotum, anteroventral and posterolateral parts of mesopleuron, metapleuron and propodeum (except large lateral spots); arolia; decreasing from metasomal base to top, basal bands on T1–T4 (at holotype on T5 also); S1 basally, S2 anterolateral spots and narrow anterior band (interrupted at holotype), S3 anterior band and T6 entire. Upper of scape, pedicel and antenna, basal dorsal spots or stripes on fore- and midfemora, longitudinal stripe on hind femur and tibia, apex of hind

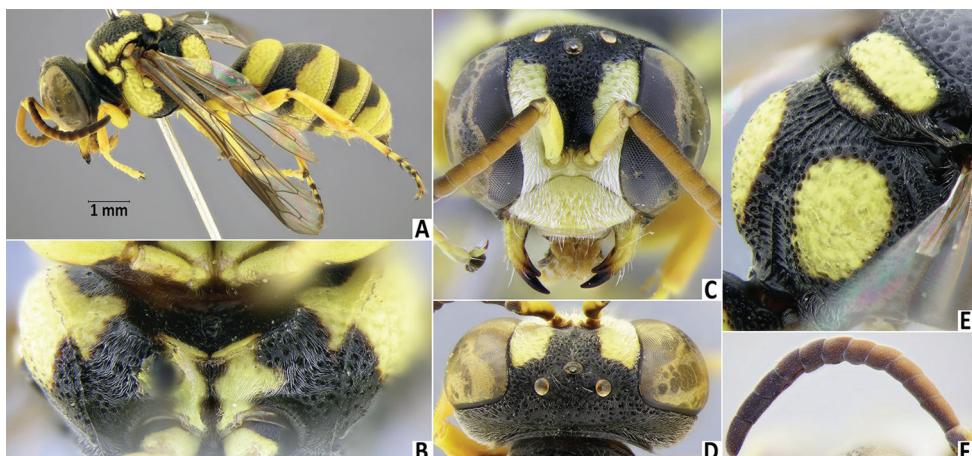


Figure 2. *Hoplisoides flavescens* Mokrousov, sp. nov., male, paratype: **A** habitus, lateral view **B** metasoma, ventral view **C** head, frontal view **D** head, dorsal view **E** scutellum, metanotum and propodeum, postero-lateral view **F** antenna, dorsal view.

tarsomeres, are brownish. Forewing with darkened area on radial cell, apex of submarginal cell I, submarginal cell II and anterior part of submarginal cell III; isolated small darkening at apex of median cell. Setation ill developed; head along inner edges of eyes and lateral parts of clypeus with dense silvery pubescence. Stout setae on clypeus, labrum and mandibles.

Male. Body length 8.6 mm. Head (Figs 2C–D). Head ratio H:W = 0.79; POL:OOL = 1.84; eyes distinctly convergent downwards. Frons above antennal sockets without longitudinal elevation (carina). Occipital carina well developed; it does not reach hypostomal carina at distance distinctly larger than diameter of anterior ocellus. Hypostomal carina opposite end of occipital carina with very gentle lamellar elevation. Clypeal lateral brush present, thin, consists of one-two bristles. Mandibles with internal blunt tooth in apical third. Punctuation above antennal sockets and temples sparse; along inner edges of eyes and at vertex dense, interspaces less than punctures diameter; clypeus in central part with several large punctures. Antennal tyloids on F1–F3 linear; F4–F5 prominent, keel-like; F6–F7 short and wide; F8–F9 long and wide, F10–F11 lacking. Mesosoma (Fig 2B) and wings as at female. Legs. Foretarsal rake poorly developed, tarsal rake spines present only on basi- and second tarsomeres. Basal midtarsomeres symmetrical, not modified; apicoposterior spine on hind tarsomeres 1–4 distinctly longer than apicoanterior spine. Metasoma. Seven normally visible terga. T1 gibbous, with distinct constriction at border T1 and T2 (Fig. 2A). Coloration (Fig. 2A). Similar to female, but yellow coloration less developed. Head predominantly black (except wide stripes at inner edges of eyes, lower part of frons, clypeus and labrum); mesosoma ventrally with black pattern; decreasing from metasomal base to top, basal bands on T1–T5; S1 basally, S2 anterolateral large spots, S3 anterior band, S6 and T7 entire black. Setation similar to female, but micropubescent little more developed.

Etymology. Species name derive from adjective Latin word “flavescens” – becoming yellow, and characterizes a well-developed yellow coloration.

Distribution. Azerbaijan (Nakhichevan).

5. *Hoplisoides gazagnairei* (Handlirsch, 1893)

Gorytes gazagnairei Handlirsch, 1893: CLVI, ♀, ♂ (syntypes: ♀♀, ♂♂, Algeria, Né-mours, now Ghazaouet [Naturhistorisches Museum, Wien, Austria]).

Material examined. TUNISIA: (1 ♂), leg. Reitter [FSCV].

Distribution. Morocco, Algeria, Tunisia, Libya.

Remark. *Gorytes maroccanus* Dusmet y Alonso, 1925: 246 (= *Hoplisoides gazagnairei maroccanus* (Dusmet) according to de Beaumont 1952a: 227) was described based on slight differences of the colour of metasoma. This character varies with the climatic conditions the wasps live in and usually is unsuitable for a taxonomic differentiation. This taxon is probably synonym of *Hoplisoides gazagnairei* (Handlirsch), but for the final conclusion it is necessary to study the types or specimens from the type locality (Morocco).

6. *Hoplisoides latifrons* Spinola, 1808

Gorytes latifrons Spinola, 1808: 247, ♀ (lectotype: ♀, designated by de Beaumont, 1952b: 41, Italy, Liguria [Museo Regionale di Scienze Naturali, Torino, Italy]).

Hoplisus pulchellus Wesmael, 1852: 103, ♀, ♂ (syntypes: Switzerland, Genève [Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium?]). Synonymized by Handlirsch, 1888: 400.

Hoplisus minutus Mocsáry, 1879: 136, ♀, ♂ (syntypes: ♀♀, ♂♂, Hungary, Debrecen and Nagyvárad [Természettudományi Múzeum, Budapest, Hungary]). Synonymized by Handlirsch, 1888: 400.

Material examined. RUSSIA: Crimea, Balaklava, F. Morawitz coll., (1 ♀) [FSCV]; Volgograd Prov., Sarepta [Volgograd], (1 ♀) [FSCV]; AZERBAIJAN: Julfa, Gulistan, 38°58'N, 45°36'E, 740 m, 26.VII.2018, (1 ♀), leg. MP, Kh. Aliyev, M. Maharramov [MMPC]; Babek, 3 km NE Sirab, 39°18'N, 45°32'E, 1250 m, 10.VI.2019, (1 ♂), leg. MP, Kh. Aliyev, M. Maharramov [MMPC]; TURKEY: Hakkari, Esendere, 21.VII.1988, (1 ♂), leg. C. Schmid-Egger [FSCV]; UZBEKISTAN: Fergana, 14.VI.1963, (1 ♂), leg. V. Tobias [FSCV]; KAZAKHSTAN: Central Kazakhstan, Kok-Kuduk, 46°20'N, 69°50'E, (1 ♀) [ZISP]; 15 km SSW Zyryanovsk, Chapaev, 2.VIII.1979, (1 ♀), leg. V. Kazenas [FSCV].

Distribution. Portugal, Spain, France, Belgium, Switzerland, Italy, Germany, Austria, Czech Republic, Croatia, Greece, Slovakia, Hungary, Romania, Ukraine, Russia (Crimea, Dagestan, Volgograd Prov., Tatarstan, Orenburg Prov.), Algeria, Libya, Azerbaijan, Turkey, Uzbekistan, Tajikistan, Kazakhstan.

7. *Hoplisoides leleji* Mokrousov, sp. nov.

<http://zoobank.org/F8C676F2-88F5-4C54-954D-A9E6A8A4AA9C>

Figures 3A–H, 4A–E, 7A–B

Material examined. Holotype, ♀: Туркмения / 5 км С Фирюзы / Лелей 24.V.90 [Turkmenistan, 5 km N Firjuza, 37°57'N, 58°06'E, 24.V.1990, leg. A.S. Lelej] // Holotype ♀ / *Hoplisoides leleji* / Mokrousov [ZISP]. Paratypes: 1♀, 1♂ with same data as holotype [♀ in FSCV, ♂ in ZISP].

Diagnosis. Acetabular carina reaching omaulus, omaulus-sternaulus at junction with acetabular carina curved; female Head ratio H:W = 0.77; POL:OOL = 1.09; male head ratio H:W = 0.80; POL:OOL = 1.37; punctuation of metanotum and propodeal dorsolateral surface with irregular punctures, with distinct smooth interspaces. More related to *H. latifrons* Spinola, differs by more space punctuation of propodeum (coarse on *H. latifrons*); omaulus-sternaulus at junction with acetabular carina distinctly curved (not curved at *H. latifrons*). Female differs also: tentorial pit situated distinctly closer to antennal socket at frontoclypeal suture between eye and antennal socket (nearly at middle at *H. latifrons*); flagellomeres shorter, F1 L/W = 1.81, F9 cubelike (F1 L/W = 2.42, F9 elongate at *H. latifrons*); mid tarsomeres more robust.

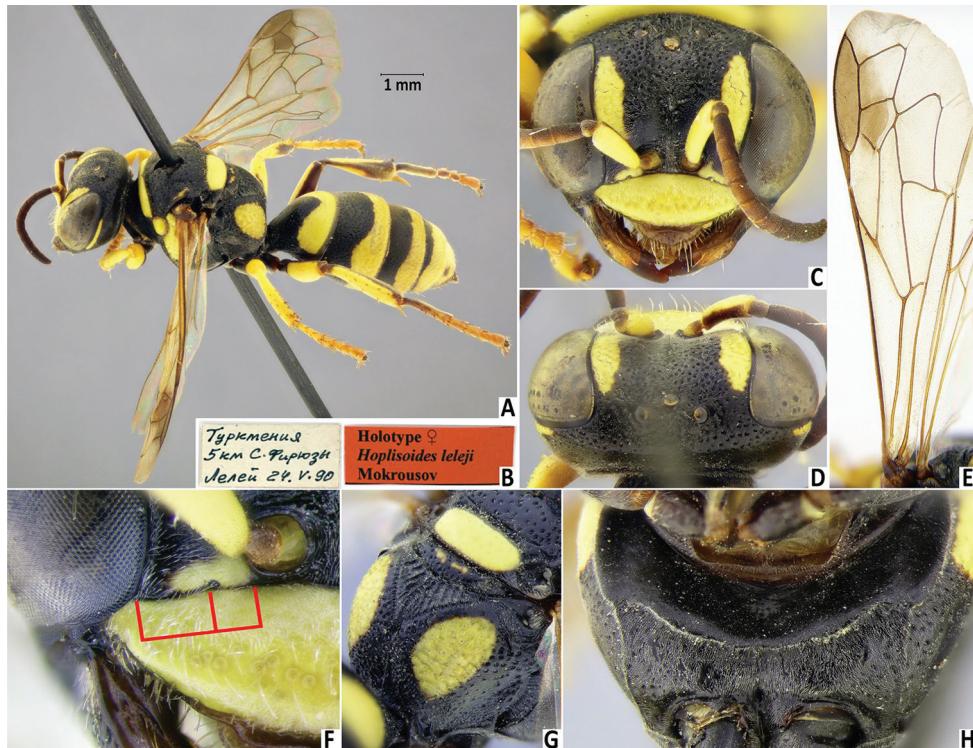


Figure 3. *Hoplisoides leleji* Mokrousov, sp. nov., holotype, female: **A** habitus, dorsolateral view **B** labels **C** head, frontal view **D** head, dorsal view **E** fore wing, dorsal view **F** tentorial pit and adjacent area, frontal view **G** scutellum, metanotum and propodeum, posterolateral view **H** metasoma, ventral view.

Male differs also: tentorial pit situated about middle at frontoclypeal suture between eye and antennal socket (distinctly closer to eye on *H. latifrons*); flagellomeres shorter, F1 L/W = 1.23, F10 slightly longer than wide (F1 L/W ca. 1.5, F10 distinctly longer than wide on *H. latifrons*), antennal tyloids weaker developed, on basal flagellomeres very short (distinct on *H. latifrons*). Morphological differences from all Palaearctic species given in key.

Description. Female. Body length 9.6–10.6 mm (holotype 9.6 mm); fore wing length of holotype 7.2 mm. Head (Figs 3C–D). Head ratio H:W = 0.77; POL:OOL = 1.09; eyes slightly convergent downwards. Frons above antennal sockets without longitudinal elevation (carina). Occipital carina well developed; it does not reach hypostomal carina at distance larger than diameter of anterior ocellus. Tentorial pit situated distinctly closer to antennal socket at frontoclypeal suture between eye and antennal socket (Fig. 3F); flagellomeres shorter, F1 L/W = 1.81, F9 cubelike. Punctures deep, but scattered on frons (from below with several punctures only), clypeus and back side of head, more dense on vertex. Mesosoma (Fig. 3H). Acetabular carina reaching omaulus, omaulus-sternaulus at junction with acetabular carina curved. No subomaulus. Metapostnotum well separated, with weak medial furrow and lateral

folds diverging to posteriorly. Propodeal slope with strong median keel and irregular adjoining sculpture or transverse rugae. Punctuation on pronotal collar and scutellum small and sparse; on mesonotum irregular, deep, but sparse; mesopleuron and sides of propodeum punctuation sparse, with large smooth interspaces; dorsolateral parts of propodeum irregular punctured, with noticeable smooth interspaces. Wings (Fig. 3E). Venation typical for genus; hindwing media diverging at cu-a. Legs. Foretarsal rake well developed, basitarsus with three rake setae before apex. Metasoma. T1 not elongate, approximately as long as width. Pygidial plate broad, sharply edged, with elongated little smoothed punctures. Punctuation of T1 irregular, dense at base and sparse posteriorly; T2 with large, T3–T5 with smaller irregular punctures; S2 with large S3–S6 with smaller scattered punctures. Coloration (Fig. 3A). Black and brown with rich yellow pattern. Yellow are: clypeus (except apical border), spot laterally of antennal socket and large spot along inner edge of eye, narrow strip at posterior margin of eye; scape and pedicel from below; pronotal collar and lobes, small spot on mesonotum near axilla, scutellum, large spot on mesopleuron, lateral large propodeal spot; metanotum on holotype marked yellow (black on paratype); wide apical bands on T1–T5 (T5 predominantly yellow) and apicolateral spot on S2. Apical border of clypeus, labrum, middle part of mandibula and basal flagellomeres from below brownish. Fore- and mid legs yellow with black coxae, trochanters, base of femora and apicoposterior spot on tibiae. Hind coxa and trochanter black; hindfemur and hindtibia posteriorly, hind tarsus completely brownish. Forewing with darkened area on radial cell, submarginal cell II and anterior part of submarginal cell III. Setation ill developed; head along inner edges of eyes and lateral parts of clypeus without silvery pubescence. Stout setae on clypeus, labrum and mandibles.

Male. Body length 8.0 mm. Head (Figs 4B–E). Head ratio H:W = 0.80; POL:OOL = 1.37; eyes distinctly convergent downwards. Frons above antennal sockets without longitudinal elevation (carina). Occipital carina well developed; almost reaches hypostomal carina. Hypostomal carina near end of occipital carina with distinct lamellar elevation. Tentorial pit situated about middle at frontoclypeal suture between eye and antennal socket (Fig. 4B). Clypeal lateral brush present, thin. Flagellomeres short, F1 L/W = 1.23, F10 slightly longer than wide. Antennal tyloids on F1–F9 thin; on F10 developed at base only; on F10 lacking. Punctuation as at female. Mesosoma and wings as at female. Legs. Foretarsal rake poorly developed, tarsal rake spines short. Basal midtarsomeres symmetrical, not modified; apicoposterior spine on hind tarsomeres not longer than apicoanterior spine. Metasoma. Seven normally visible terga. Punctuation similar to female. Coloration. Similar to female, but stripe along inner edge of eye reaches to clypeus; supraclypeal sclerite, mandibles (except apex), midcoxa apically, hind coxa and hind trochanters predominantly, hind tarsus with yellow pattern. Anterolateral spots on S2 large, brown spot on foretibia small. Antenna completely dark. Setation similar to female.

Etymology. The species is named after famous Russian entomologist Arkady S. Lelej (FSCV), who collected the type series of the new species.

Distribution. Turkmenistan.

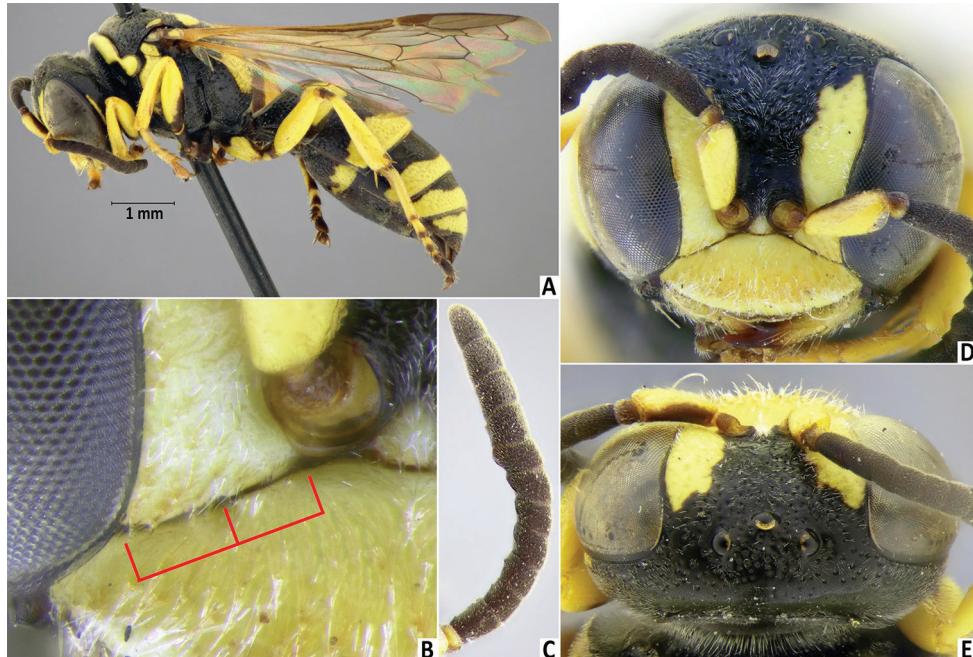


Figure 4. *Hoplisoides leleji* Mokrousov, sp. nov., male, paratype: **A** habitus, lateral view **B** tentorial pit and adjacent area, frontal view **C** antenna, dorsal view **D** head, frontal view **E** head, dorsal view.

8. *Hoplisoides punctuosus* (Eversmann, 1849)

Figure 8

Hoplisus punctuosus Eversmann, 1849: 393, ♀, ♂ (lectotype: ♀, designated by Nemkov, 1995: 134, Russia, Spasskoye, 120 km east of Orenburg [ZISP]).

Hoplisus punctatus Kirschbaum, 1853: 45, ♀ (holotype or syntypes: ♀, Germany, Herzogtum Nassau, Mainz-Mombach [Natural History State Collection in Museum Wiesbaden, Wiesbaden, Germany]). Synonymized by Handlirsch, 1888: 395, synonymy confirmed by Pulawski, 1965: 571.

Hoplisus crassicornis A. Costa, 1859: 53, ♂ (syntypes: ♂♂, Italy, Calabria, Aspromonte and Sangiovannifiore [Museo zoologico, Napoli, Italy]). Synonymized with *Gorytes punctuosus* by Handlirsch, 1888: 395 and with *Hoplisoides punctatus* by de Beaumont, 1952a: 219.

Hoplisus maculipennis Giraud in von Frauenfeld, 1861: 103, 106, ♂ (holotype or syntypes: ♂, Croatia, Dalmatia, no specific locality [Naturhistorisches Museum, Wien, Austria]). Synonymized by Handlirsch, 1888: 395.

Gorytes ibericus Mercet, 1906: 117, ♀, ♂ (syntypes: Spain, Madrid, Escorial and Montarco; and Valladolid, Jaramiel, Vaciamadrid, Villaverde [Museo Nacional de Ciencias Naturales, Madrid, Spain]). Synonymized by de Beaumont, 1950: 63, synonymy confirmed in 1952a: 219.

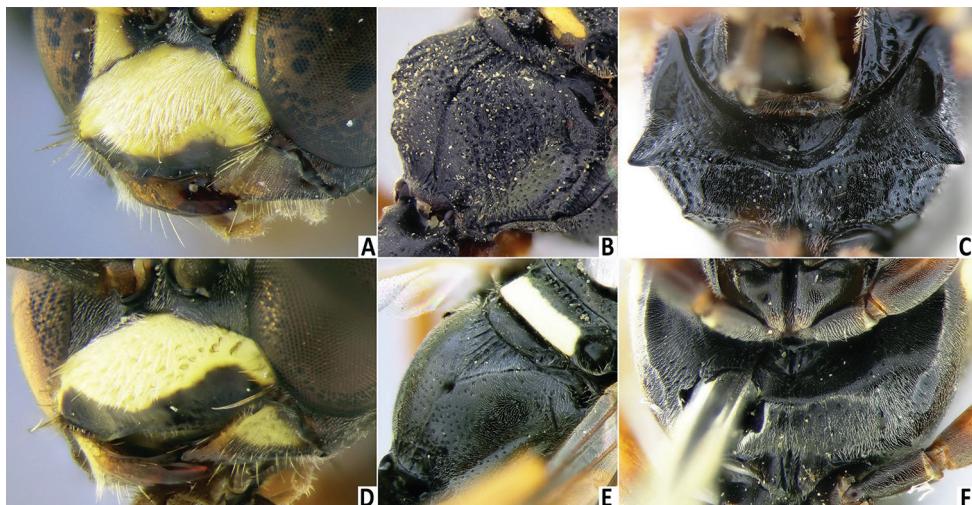


Figure 5. *Hoplisoides gazagnairei* (Handlirsch) from Tunisia [FSCV] (A–C), and *H. distinguendus* (Yasumatsu) from Buryatia, Russia [FSCV] (D–F), males: **A, D** clypeus, frontolateral view **B, E** scutellum, metanotum and propodeum, posterolateral view **C, F** metasoma, ventral view.

Material examined. RUSSIA: Crimea, Evpatoria, near Mirniy vill., 5.VI.2016, (1 ♂), leg. A. Fateryga [MMPC]; ibid, 15.VI.2016, (1 ♀), leg. S. Ivanov [MMPC]; ibid, 17.VI.2017, (1 ♀), leg. V. Zhydkov [MMPC]; Dagestan, Narat-Tyube Mt., 20 km W Makhachkala, 42.978°N, 47.242°E, 2.VI.2017, (1 ♀), leg. MM; ibid, 24.VI.2018, (1 ♀), leg. MM, KF [MMPC]; 8 km SE Staroterechnoe, 43.792°N, 47.527°E, 19.VI.2018, (2 ♀), leg. YuA, KF, VL, MM, MP [MMPC]; 3 km SW Novoterechnoe, 43.996°N, 47.326°E, 20.VI.2018, (1 ♀), leg. YuA, KF, VL, MM, MP [MMPC]; Kumtorkala Distr., Barkhan Sarykum, 43.002°N, 47.237°E, 30.V.2017, (1 ♂), leg. MM; ibid, 5.VII.2018, (2 ♀), leg. YuA, KF, VL, MM, MP; ibid, 29.V.2019, (1 ♂), leg. MM [MMPC]; Magaramkent Distr., Samur reserve, 41.866°N, 48.555°E, 4.VI.2017, (1 ♂), leg. MM [MMPC]; Krasnodar Terr., Sennoi Vill., 23, 25.VI.2012, (2 ♀, 1 ♂), leg. MM [MMPC]; 4 km E of Starotitarovskaya Cossack vill., 24.VI.2012, (3 ♀) leg. MM [MMPC]; Anapa, Verkhnee Dzhemete vill., 11.VI.2014, (1 ♂), leg. MM [MMPC]; Astrakhan Prov., Lapas vill., 46.955°N, 47.836°E, 24.V.2019, (1 ♂), leg. KF [MMPC]; Rostov Prov., W Grekovo-Stinichniy vill., 48.843°N, 40.419°E, 21.VI.2014, (3 ♀), leg. MM [MMPC]; Nizhny Novgorod Prov., near Dzerzhinsk city, 27.VIII.2000 (1 ♀), leg. MM [MMPC]; Vacha Distr., Bazarovo vill., 19.VII.2014, (1 ♀), leg. MM [MMPC]; Orenburg Prov., Kuvandyk Distr., Aytuarskaja steppe, 5.VII.2010, (1 ♂), leg. V. Nemkov [MMPC]; Altai Terr., 15 km S Blagoveschenka, Kuchukskoe lake, 52.69°N, 79.876°E, 21.VII.2017, (1 ♂), leg. MP [MMPC]; Amur Prov., 27 km E Arkhara, 12–13.VIII.2013, (1 ♀); 24 km W Arkhara, 15.VIII.2012, (4 ♀); ibid, 17–18.VII.2013, (1 ♀, 3 ♂), leg. DK [DKPC]; GEORGIA: Kakheti Reg., David Gareja monastery, 41.448°N, 45.377°E, 24.VI.2016, (1 ♀), leg. MM [MMPC]; ARMENIA: Khosrovsky Nature Reserve, 22.VI.1985, (1 ♂), leg. V. Tobias [FSCV]; AZERBAIJAN:



Figure 6. *Hoplisoides gazagnairei* (Handlirsch) from Tunisia [FSCV] (**A–B**), and *H. distinguendus* (Yasumatsu) from Buryatia, Russia [FSCV] (**C–F**), males: **A, C** antenna, dorsal view **B, D** foretarsus, dorsal view **E** midtarsus, dorsal view **F** hindtarsus, dorsal view.

JAN: Nakhchivan Autonomous Republic, Babek, Goynuk, 39°18'N, 45°40'E, 1680 m, 12.VI.2019, (2 ♀, 11 ♂), leg. MP, Kh. Aliyev, M. Maharramov [MMPC]; Sharur, Akhura, 39°33'N, 45°13'E, 1640 m, 13.VI.2019, (1 ♂), leg. MP, Kh. Aliyev, M. Maharramov [MMPC]; Shakhbuz, Zarnatun, 39°31'N, 45°46'E, 1550 m, 18.VI.2019, (3 ♂), leg. MP, Kh. Aliyev, M. Maharramov [MMPC]; Shakhbuz, Gomur, 39°27'N, 45°44'E, 1790 m, 18.VI.2018, (1 ♂), leg. MP, Kh. Aliyev, M. Maharramov [MMPC]; CYPRUS: Paphos, Peyia vill., 34.895°N, 32.3311°E, 21, 25.V.2018 (2 ♀, 1 ♂), leg. MM [MMPC]; TURKEY: Kayseri, Göreme, 1000 m, 9.VI.1988, (1 ♂), leg. C. Schmid-Egger [FSCV]; Muradye, 1750 m, 9.VI.1988, (1 ♂), leg. C. Schmid-Egger [FSCV]; UZBEKISTAN: Kashkadarya Prov., Karshy city, 38.888°N, 65.8317°E, 5.V.2015, (1 ♂), MM, MP, K. Samartzev [MMPC]; ibid, 1–6.VI.2015, (1 ♂), V. Gromenko [MMPC]; TAJIKISTAN: Kondara, 13.VI.1939, (2 ♀, 1 ♂), leg. V. Gussakovskij [FSCV]; KYRGYZSTAN: Fergana valley, Taran-Bazar vill., 15–18.V.1997, (1 ♂), V. Gromenko [MMPC]; Tchatkal valley, Chandalash riv., 41°44'23"N, 70°52'22"E, 19–20.VI.1999, (1 ♀, 1 ♂), MM [MMPC]; KAZAKHSTAN: Zharma, 9.VIII.1970, (1 ♀), V. Tobias [FSCV]; 9 km S Aksu vill., 43°10'51"N, 74°03'55"E, 11.VI.1999, (1 ♀), MM [MMPC]; MONGOLIA: Dornod Aimag, 60 km ENE Bayan-Burda, Derkhin-Chagan-Obo Mt., 21.VII.1971, (1 ♂), leg. M. Kozlov [FSCV]; Khalkhin Gol, 31.VII.1976, (1 ♂), leg. I. Kerzhner [ZISP].

Distribution. Morocco, Algeria, Tunisia, Portugal, Spain, France, United Kingdom, Switzerland, Italy, Germany, Austria, Czech Republic, Slovenia, Croatia, Albania, Greece, Poland, Slovakia, Hungary, Romania, Bulgaria, Ukraine, Russia (Crimea, *Dagestan, Krasnodar Terr., Astrakhan Prov., Volgograd Prov., Rostov Prov., Belgorod

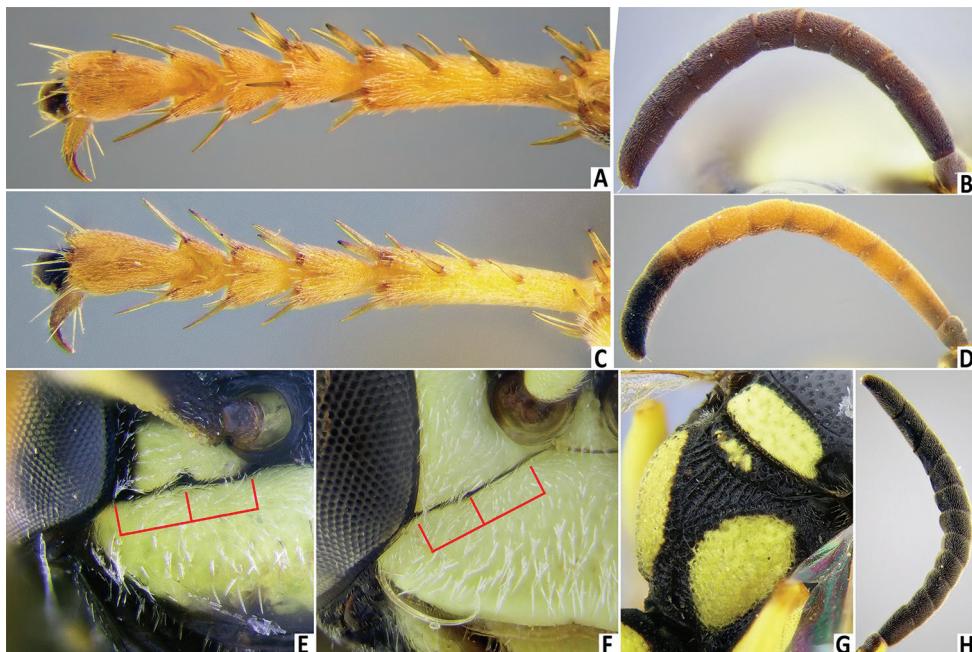


Figure 7. *Hoplisoides leleji* Mokrousov, sp. nov., holotype, female (A–B), and *H. latifrons* Spinola from Azerbaijan [MMPC] (C–H), female (A–E, G), male (F, H): A, C midtarsus, dorsal view B, D, H antenna, dorsal view E, F tentorial pit and adjacent area, frontal view G scutellum, metanotum and propodeum, posterolateral view.

Prov., Nizhny Novgorod Prov., Orenburg Prov., Novosibirsk Prov., Kemerovo Prov., Altai Terr., *Amur Prov.), *Georgia, Armenia, Azerbaijan, Cyprus, Turkey, Syria, Israel, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan, Mongolia.

Remark. *Gorytes curtulus* A. Costa, 1893: 100 (=*Hoplisoides punctuosus curtulus* (A. Costa) according to de Beaumont 1952a: 222) was described based on slight differences of the colour of femurs and antenna and the breadth of apical metasomal hair bands. These characters vary with the climatic conditions the wasps live in and usually are unsuitable for a taxonomic differentiation. This taxon is probably synonym of *Hoplisoides punctuosus* (Eversmann), but for the final conclusion it is necessary to study the types or specimens from the type locality (Tunisia).

9. *Hoplisoides quedenfeldti* (Handlirsch, 1895)

Gorytes quedenfeldti Handlirsch, 1895: 884, ♂ (holotype: ♂, Algeria: Blida-Medea [Zoologisches Museum der Humboldt Universität, currently Museum für Naturkunde der Humboldt Universität zu Berlin, Berlin, Germany]).

Distribution. Morocco, Algeria.

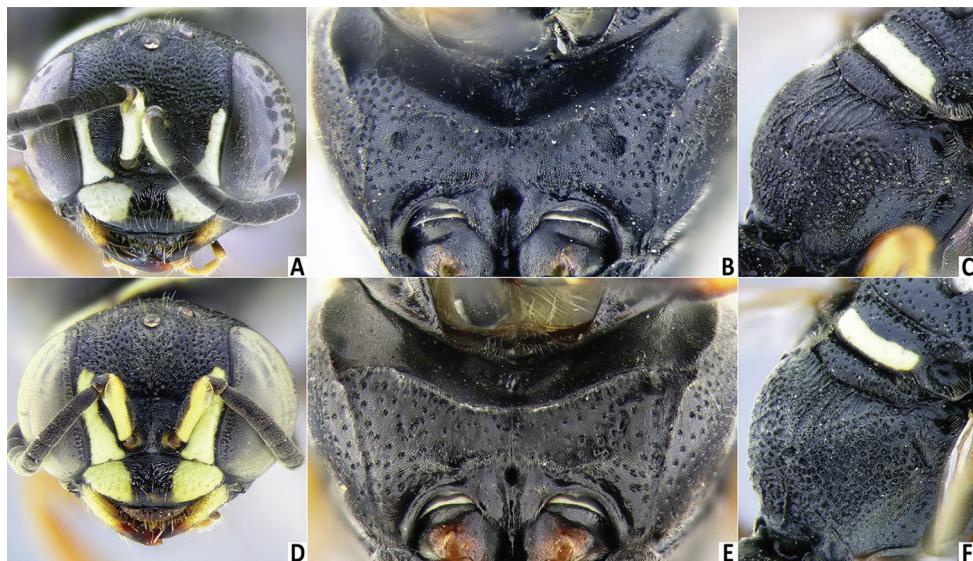


Figure 8. *Hoplisoides craverii* (A. Costa), female (A–C), and *H. punctuosus* (Eversmann), female, from Dagestan, Russia [MMPC] (D–F): A, D head, frontal view B, E metasoma, ventral view C, F scutellum, metanotum and propodeum, posterolateral view.

10. *Hoplisoides remotus* (R. Turner, 1917)

Arpactus (Hoplisoides) remotus R. Turner, 1917: 182, ♀ (holotype: ♀, India, Punjab: Jummoo [The Natural History Museum, London, Great Britain]).

Distribution. India, actually Pakistan (Punjab: Jummoo).

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