



Palaeartic species of the genus *Heterocola* (Hymenoptera: Ichneumonidae: Tersilochinae)

Палеарктические виды рода *Heterocola* (Hymenoptera: Ichneumonidae: Tersilochinae)

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Abstract. Palaeartic material of the genus *Heterocola* Förster was studied, the holotypes of four species were examined and re-described. *Heterocola concava* (Uchida) from Japan is transferred to *Phradis* Förster (**comb. nov.**), and the genus *Heterocola* is excluded from the fauna of Japan. Specimens of *H. proboscidalis* (Thomson) and *H. rufiventris* Horstmann deposited in the Zoological Institute RAS (St Petersburg) and briefly mentioned from the former USSR by K. Horstmann in his revision (1981) are found and re-examined, and their complete label data are provided. Extensive faunistic records of the Palaeartic species of *Heterocola* primarily based on the Zoological Institute RAS collection are provided. Colour photographs of six species are given for the first time. An identification key to six species of *Heterocola* occurring in the Palaeartic region is provided; taxonomic status of the seventh species, *H. pappi* Kolarov, is not clear.

Резюме. Изучен палеарктический материал рода *Heterocola* Förster, исследованы и переописаны голотипы 4 видов. Вид *H. concava* (Uchida) из Японии перемещен в род *Phradis* Förster (**comb. nov.**), в связи с чем род *Heterocola* исключен из фауны Японии. Экземпляры видов *H. proboscidalis* (Thomson) и *H. rufiventris* Horstmann, хранящиеся в коллекции Зоологического института РАН (Санкт-Петербург) и упомянутые с территории бывшего СССР К. Хорстманном в его ре-визии (Horstmann, 1981), найдены в коллекции, изучены, и даны полные данные их этикеток. Представлены обширные новые сведения о распространении палеарктических видов *Heterocola* (главным образом по материалам Зоологического института РАН). Впервые даны цветные фотографии 6 палеарктических видов. Подготовлен ключ для определения 6 палеарктических видов *Heterocola*; таксономический статус седьмого вида, *H. pappi* Kolarov, требует уточнения.

Key words: Palaeartic region, fauna, taxonomy, re-description, type, parasitoids, *Phradis*, new combination

Ключевые слова: Палеарктика, фауна, таксономия, переписание, тип, паразитоиды, *Phradis*, новая комбинация

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Introduction

Heterocola Förster, 1869 is a small tersilochine genus with one species in South Africa (Khalaim, 2007b) and eight species in the Palaeartic region

(Yu et al., 2016). In the Palaeartic region, six species are restricted to the Western Palaeartic region, one [*H. proboscidalis* (Thomson, 1889)] is widely distributed across the Palaeartic region, and one [*H. concava* (Uchida, 1956)] is known

only from Japan (Yu et al., 2016). Four species occurring in Europe were revised by Horstmann (1971) and subsequently three more *Heterocola* species were described in separate publications from Bulgaria, Greece and Turkey (Horstmann & Kolarov, 1988; Kolarov, 1989; Kolarov & Beyarslan, 1994). Nothing is known about host preferences of any species of the genus.

Morphologically, *Heterocola* is one of the most distinctive genera of the subfamily. It is easily recognised by the combination of its exceptionally long maxillary palps, strongly antefurcal second recurrent vein (2m-cu) and first tergite without glymmae. Besides the *Heterocola*, such long maxillary palps are present only in one tersilochine genus, *Palpator* Khalaim, 2006, which comprises two species in South Europe, North Africa and Middle East (Khalaim, 2006, 2016), but in contrast to *Heterocola*, in the latter genus second recurrent vein (2m-cu) is postfurcal. A recently described from Mexico monotypic genus *Labilochus* Khalaim, 2017 resembles *Heterocola* by having extremely long mouthparts (i.e. glossa and galeae), but both maxillary and labial palps in this genus are very short, and first metasomal tergite has a distinct glymma joining by furrow to the ventral part of postpetiole (Khalaim et al., 2017).

The aim of this study is to revise available Palaearctic material of the genus, re-describe holotypes of four species, and provide an identification key and colour photographs.

Material and methods

This work is primarily based on a large material from the Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia (ZIN). Additional specimens were studied from the Zoological Museum of the Moscow State University, Moscow, Russia (MSU) and the Finnish Museum of Natural History, Helsinki University, Helsinki, Finland (MZH). Following holotypes were examined: *H. concava* from the Hokkaido University, Sapporo, Japan (EIHU); *H. longipalpis* Kolarov et Beyarslan, 1994 and *H. nigrotibialis* Horstmann et Kolarov, 1988 from the Zoologische Staatssammlung, Munich, Germany (ZSM); and *H. similis* Horstmann, 1971 from the Swedish Museum of Natural History, Stockholm, Sweden (NHRS).

Morphological terminology generally follows that of Townes (1971) with changes according to Khalaim (2011). List of species and examined material are given in alphabetical order. In *Distribution* sections, countries are listed generally from west to east, and new country records are marked by an asterisk (*). References with earlier original geographic records are provided for all species.

Wings (Figs 45–50) were slide-mounted using Solakryl BMX. Photographs (except for Figs 1–4) were taken in ZIN with a Canon EOS 70D digital camera attached to an Olympus SZX10 stereomicroscope; partially focused images were combined using Helicon Focus 6.7.1 Pro software. Photographs of *H. concava* (Figs 1–4) were kindly provided by K. Konishi (Ehime University, Matsuyama, Japan).

Results

Genus *Heterocola* Förster, 1869

Type species: *Thersilochus proboscidalis* Thomson, 1889, by subsequent monotypy (Szépligeti, 1899: 221, 238; see: Viereck, 1914: 69; Perkins, 1962: 426). Gender feminine (Hopper, 1959: 164).

Diagnosis. Small and medium-sized, with body length mostly 2.6 to 4.0 mm and fore wing length 2.0 to 3.5 mm. Head, in dorsal view, roundly tapered behind eyes, with gena 0.7–1.0 times as long as eye width. Maxillary palp exceptionally long, distinctly longer than head height, with four palpomeres; labial palp short to long, with two or three palpomeres. Mandible moderately slender, usually distinctly punctate (except apex), with upper tooth somewhat longer than lower. Malar space short, 0.1–0.3 times as long as basal mandibular width. Flagellum filiform or slightly clavate, basally slender, usually with 15–18 flagellomeres. Hypostomal carina absent, or incomplete and represented by short wrinkle adjacent to occipital carina; this area often granulate or longitudinally striate. Notaulus absent or weak. Foveate groove completely absent or as weak impression in front part of mesopleuron; sometimes path of foveate groove indicated by denser granulation or weak irregular wrinkles. Propodeal spiracle small, separated from pleural carina by 4.0–6.0 times diameter of spiracle. Propodeum with basal area short, sometimes confluent with apical area or in-

distinctly separated from it (transverse carina mediodorsally more or less obliterated); apical area long, anteriorly rounded or truncated, usually conspicuously impressed. Fore wing with second recurrent vein (2m-cu) strongly antefurcal; metacarpus (R1) short, extending about four tenths way from distal corner of radial cell to fore wing apex. Hind wing with nervellus weakly reclivous to vertical. Legs slender. First metasomal segment slender, entirely or predominantly smooth, more or less round in cross-section centrally; glymma completely absent. Second tergite 1.8–2.5 times as long as anteriorly broad. Thyridial depression somewhat elongated, usually 1.5–2.0 times as long as broad. Ovipositor slender, weakly upcurved, usually long (sometimes longer than body), with weak dorsal subapical depression or notch.

Remarks. Seven species of *Heterocola* occur in the Palaearctic region. Only one abundant species, *H. proboscidalis* (Thomson, 1889), is distributed across the Palaearctic region, while six other species are restricted to Europe, North Africa and Middle East, and *H. linguaria* (Haliday, 1838) was also recorded from East Kazakhstan. Flight period of all species is in spring and early summer period, with only several specimens with later collecting dates.

Two species, *H. nigrotibialis* Horstmann et Kolarov, 1988 and *H. similis* Horstmann, 1971, are almost identical in structure and coloration, and differ more or less reliably from each other only by the length of ovipositor. In some examined specimens of *H. nigrotibialis*, a labial palp comprises three palpomeres while labial palp in *H. similis* is only with two palpomeres. Unfortunately, labial palps are often hidden and indiscernible when the head is closely attached to mesosoma, and therefore using of this character for identification is not always possible. Moreover, additional specimens of *H. nigrotibialis* and *H. similis* must be studied to confirm that number of labial palpomeres is stable in these two species (as well as in *H. longipalpis*). Thus, taxonomic status of *H. nigrotibialis* and *H. similis* requires further investigation.

The holotype of *H. pappi* Kolarov, 1989 was not studied, original description and illustrations of this species are insufficient, and therefore its taxonomic status is not clear (see *Remarks* to this species).

The identification key to six *Heterocola* species (without *H. pappi*) occurring in the Palaearctic region is given below. Couplets 1 to 3 work well both for males and females, and couplets 4 and 5 work only for females.

Key to Palaearctic species of *Heterocola* (excluding *H. pappi*)

1. Mesopleuron entirely densely and coarsely punctate, smooth between punctures (Figs 9, 10, 30). Maxillary palp with palpomere 2 much longer than palpomeres 3 and 4 separately (Fig. 5); labial palp with three long palpomeres. (Subgenus *Heterocoloides* Horstmann, 1971) 2
- Mesopleuron granulate, impunctate or with fine punctures centrally (Figs 28, 38, 43). Maxillary palp with palpomere 2 slightly shorter than palpomeres 3 and 4 separately (Figs 17, 33); labial palp with two or three very short palpomeres (often concealed when head closely adjoined with mesosoma). (Subgenus *Heterocola* s. str.) 3
2. Metasoma behind first segment dark brown to black (Figs 5, 7). First metasomal segment round in transverse dissection centrally, smooth (Fig. 11). Ovipositor sheath longer than body (Fig. 5), or about 5.0 times as long as hind tibia 1. ***H. linguaria***
- Metasoma behind first segment reddish brown to brown (Fig. 29). First metasomal segment trapeziform in transverse dissection centrally, usually striate laterally. Ovipositor sheath shorter than body (Fig. 29), or about 3.0 times as long as hind tibia 6. ***H. rufiventris***
3. Head, in dorsal view, with gena 0.7–0.8 times as long as eye width (Fig. 27). Mesopleuron impunctate, granulate, dull (Fig. 28). Propodeum with transverse carina mediodorsally usually distinct. Ovipositor with narrow dorsal subapical notch 5. ***H. proboscidalis***
- Head, in dorsal view, with gena 0.9–1.0 times as long as eye width (Figs 16, 22, 34, 42). Mesopleuron finely or distinctly punctate centrally, granulate to almost smooth between punctures. Propodeum with transverse carina mediodorsally weak or obliterated, thus basal area often confluent with apical area (Figs 25, 39). Ovipositor with shallow dorsal subapical depression (as in Fig. 18) 4
4. Flagellum basally very slender; second and third flagellomeres about 2.4 times as long as broad, distinctly widened at apex (Fig. 15). Ovipositor sheath 1.25–1.60 times as long as first tergite (Figs 12, 19) 2. ***H. longipalpis***

- Flagellum basally less slender; second and third flagellomeres 1.6–1.8 times as long as broad, cylindrical or evenly widened from base to apex (Figs 23, 35). Ovipositor sheath more than twice longer than first tergite 5
- 5. Ovipositor sheath 2.0–2.3 times as long as first tergite (Fig. 20). Labial palp with three palpomeres 3. *H. nigrotibialis*
- Ovipositor sheath 2.8–3.2 times as long as first tergite (Figs 31, 41). Labial palp with two palpomeres 7. *H. similis*

***Phradis concavus* (Uchida, 1956), comb. nov.**
(Figs 1–4)

Ischnobatis (?) *concavus* Uchida 1956: 98. Holotype female (examined), Japan, Kagoshima Pref., Amami Ōshima Island, Simmura (= Shimura), 9.IV.1954, coll. S. Takagi *et al.*; deposited in the EIHU.

Remarks. The species was described in the genus *Ischnobatis* Förster, 1869 but with remarks that this generic assignment is preliminary (Uchida 1956: 99). Kusigemati (1980: 1) examined the holotype of *I. concavus*, provided re-description of this species based on the holotype and additional material from Amami Ōshima and Okinawa islands in South Japan, and transferred this species to the genus *Heterocola*.

The holotype of *I. concavus* was revised by the senior author during his visit to the Ehime University in 2018 and this species was found to be a typical member of the genus *Phradis* Förster, 1869 as it has a moderately long maxillary and labial palps (much shorter than those in the genus *Heterocola*), interstitial second recurrent vein (2m-cu) in the fore wing, propodeum mediodorsally with short basal area and lacks glymmae on the first metasomal segment. Thus, this species is transferred here to the genus *Phradis* (**comb. nov.**), and the genus *Heterocola* is excluded from the fauna of Japan.

Description. Female (holotype). Body length 3.3 mm, fore wing length about 2.1 mm. One fore wing absent, one hind wing (and partly fore wing) in glue, and fragment of fore wing attached to the carton layer apart from the insect.

Head behind eyes strongly rounded in dorsal view, gena about 0.7 times as long as eye width; in lateral view, head dorsally rounded (vertex not truncated). Malar space short, about 0.4 times as long as basal mandibular width. Mandible slender, with upper tooth somewhat longer than lower one.

Palps not especially long. Clypeus separated from face by distinct groove, evenly convex, almost lenticular (lower margin slightly truncated), almost entirely smooth with fine punctures in upper four tenths. Flagellum moderately slender, filiform, with 14 flagellomeres; subbasal flagellomeres 1.4–1.5 times as long as broad, subapical flagellomeres about 1.3 times as long as broad. Face and frons very finely granulate, dull, with fine (mostly inconspicuous because of granulation) punctures. Gena almost smooth. Occipital carina complete.

Mesosoma. Notaulus with distinct wrinkle on anterolateral side of mesoscutum. Mesoscutum densely granulate, with fine and dense (mostly inconspicuous because of granulation) punctures. Upper end of epicnemial carina distinctly curved and joining front margin of mesopleuron. Mesopleuron centrally very shallowly sculptured, finely punctate and weakly shining, peripherally finely granulate and impunctate. Foveate groove short, narrow and sharp, extending in front 0.20–0.65 of mesopleuron. Propodeal spiracle small, separated from pleural carina by about 2.5 times diameter of spiracle. Propodeum with dorsolateral area almost smooth; basal area short, small, subquadrate, 0.15 times as long as apical area; apical area long, rounded anteriorly, strongly impressed along midline; apical longitudinal carinae complete.

Fore wing with second recurrent vein (2m-cu) interstitial. Metacarpus (R1) short, extending about six tenths of way from distal corner of radial cell to fore wing apex. Vein 2rs-m present. First abscissa of radius (Rs+2r) longer than width of pterostigma. Brachial cell posteriorly closed. Hind wing with nervellus (cu1&cu-a) weakly reclivous. Legs slender.

Metasoma. First tergite slender, round in cross-section, smooth; postpetiole, in dorsal view, widened and clearly broader than petiole; glymma absent. Second tergite 1.8 times as long as anteriorly broad. Thyridial depression almost twice as long as broad. Ovipositor slender, strongly and evenly upcurved, with very shallow dorsal subapical depression, without teeth; sheath 2.3 times as long as first tergite.

Colour. Head, mesosoma and first metasomal tergite dark reddish brown. Clypeus yellow, on upper margin brownish. Mandibular teeth reddish black. Antenna with scape and pedicel brownish



Figs 1–4. *Phradis concava*, holotype, female. 1, habitus, lateral view; 2, head and mesoscutum, dorsal view; 3, head, front view; 4, body, lateral view. Scale bar: 1.0 mm.

yellow ventrally and yellowish brown dorsally; flagellum pale yellow-brown basally, darkening towards apex. Tegula and pterostigma brown. Legs

yellow, hind coxa darkened with brown. Metasoma behind first tergite predominantly reddish brown; tergite 2 black (probably abnormally).

Male. Unknown.

Distribution. South Japan.

1. *Heterocola (Heterocoloides) linguaria*

(Haliday, 1838)

(Figs 5–11, 45)

Porizon linguaria Haliday, 1838: 117. Lectotype female (not examined), England, “2397” (designated by Fitton, 1976: 335); deposited in the National Museum of Ireland, Dublin, Ireland.

Ischnobatis punctulatus Szépligeti, 1899 (Horstmann, 1981: 15).

References. Horstmann, 1971: 67 (*H. punctulata*; “Lower Rhine” [Germany], Hungary, “Carinthia” [Austria], Serbia, Italy, Switzerland, “Bessarabia” [Moldova/Ukraine], Algeria). Horstmann, 1981: 19 (England, Belgium, Germany, Romania). Kolarov, 1987: 27 (Bulgaria). Kolarov & Beyarslan, 1994: 97 (Turkey). O’Connor et al., 2007: 255 (Ireland). Khalaim 2016: 263 (Bulgaria, Morocco, Turkey). Kolarov, 2017: 509 (Turkey).

Material examined. **Azerbaijan:** SW of Lerik, Talysh [Mt.], Gosmalyan, 7 and 8.VI.1967, coll. D.R. Kasparyan, 3 females (ZIN); 40 km E of Shamakhi, steppe, 22.V.1972, coll. D.R. Kasparyan, 3 females (ZIN); *Nakhchivan*, 5 km W of Ordubad, Akulis, garden, 10.IV.1982, coll. D.R. Kasparyan, 4 females (ZIN) and 1 female (MZH); same locality and collector, 1000 m, 2–8.V.1982, 5 females and 1 male (ZIN). **Hungary:** *Vas County*, 4 km W of Köszeg, 4.VII.1994, coll. A.G. Kotenko, 1 female and 4 males (ZIN); Köszeg, forest, 19.V.2001, coll. A.G. Kotenko, 1 female (ZIN); Orfalu, 18.VI.1994, coll. A.G. Kotenko, 1 female (ZIN). **Kazakhstan:** *East Kazakhstan Prov.*, Zaysan Distr., 8 km above Kenderlyk, floodplain of Kenderlyk Riv., 9.VI.1961, coll. V.I. Tobias, 2 females and 1 male (ZIN); 18 km SE of Zaysan, foothills of Saur Range, 15.VI.1973, coll. M.A. Kozlov, 1 female (ZIN). **Russia:** *Kursk Prov.*, environs of Kursk, Petropavlovka, 25.VI.1937, coll. D. Dovnar, 1 female (MSU); *Crimea*, Kerch, 14.V.1902, 1 female (ZIN); *Volgograd Prov.*, “Сарапта. Беккеръ” [Volgograd, coll. Bekker], 1 female (ZIN). **South Ossetia:** Liakhvi Nature Reserve, Atsriskhevi, 1500 m, hornbeam-beech forest, 13.VIII.1984, coll. D.R. Kasparyan, 1 female (ZIN).

Distribution. Morocco, Algeria, Ireland, England, Switzerland, Austria, Italy, Belgium, Germany, Hungary, Serbia, Romania, Bulgaria, Turkey, Moldova/Ukraine, *South Ossetia, *Azerbaijan, *Russia (European part), *Kazakhstan (east).

2. *Heterocola (Heterocola) longipalpis*

Kolarov et Beyarslan, 1994

(Figs 12–19, 46)

Heterocola longipalpis Kolarov et Beyarslan, 1994: 97.

Holotype female (examined), Turkey, “TR. 19.7.90 Erzurum 2100 Azuze Tabyasi” [Turkey, Erzurum, Aziziye Tabyasi, 2100 m, coll. A. Beyarslan] (Fig. 14); deposited in the ZSM (see *Remarks*).

References. Çoruh & Khalaim, 2012: 63 (Turkey). Kolarov, 2017: 508 (Turkey, Greece).

Remarks. The holotype originally was in the J. Kolarov private collection (Kolarov & Beyarslan, 1994; Yu et al., 2016); currently it is deposited in the ZSM.

In the original description (Kolarov & Beyarslan, 1994), *H. longipalpis* was compared with *H. nigrotibialis* differing from the latter by longer maxillary palps, postfurcal nervulus, shorter ovipositor, and by punctuation and colour pattern of the body. Only length of the ovipositor, and additionally structure of flagellum, are found working well for separation of *H. longipalpis* and *H. nigrotibialis*, while other characters used by Kolarov are very similar, or variable in these two species (see the key above).

One female of *H. nigrotibialis* from West Azerbaijan Province of Iran recorded by Khalaim (2016: 263) actually belongs to *H. longipalpis* as it has flagellum very slender basally and ovipositor sheath almost 1.6 times as long as first tergite. In this specimen, labial palp is with two palpomeres.

Description. Female (holotype). Body length 3.8 mm; both fore wings incomplete and therefore their length is not measured. Moderately well-preserved specimen (Fig. 12) with apices of both fore wings, distal tarsomeres of one mid and both hind legs, and distal half of ovipositor sheath missing; one fore wing and one hind wing are attached by glue on a cardboard separately (Fig. 13).

Head behind eyes roundly tapered in dorsal view, gena 0.9 times as long as eye width (Fig. 16). Malar space short, about 0.2 times as long as basal mandibular width. Mandible moderately slender, distinctly punctate in basal six tenths, with upper tooth slightly longer than lower one. Maxillary palp very long (Fig. 17), with basal palpomere relatively short and three distal palpomeres longer (palpomere 2 slightly shorter than palpomeres 3 and 4 separately); labial palps unable to discern



Figs 5–11. *Heterocola linguaria*, females (5, 6, 10, 11, Kokujev collection; 8, Talysh; 9, South Ossetia) and male (7, Hungary). **5, 7**, habitus, lateral view; **6**, labels of female in Fig. 5; **8**, head, postero-ventro-lateral view; **9**, mesosoma, ventro-lateral view; **10**, mesopleuron, postero-lateral view; **11**, first tergite, lateral view.

(short or broken); glossa relatively long, extending backwards to about three quarters of third maxillary palpomere (Fig. 17). Clypeus lenticular with lower margin truncated, 2.5 times as broad as long, separated from face by distinct groove; clypeus smooth, with distinct punctures in upper four tenths. Flagellum (Fig. 15) slightly clavate, with 15 flagellomeres; basal flagellomeres slender basally and distinctly widened at apex; flagellomeres 2 and 3 about 2.4 times as long as broad, subapical flagellomeres more or less square. Face, frons and vertex finely punctate on granulate background, dull (punctures on vertex weaker). Gena with fine and sparse punctures on shallowly granulate background, centrally punctures indistinct. Occipital carina complete.

Mesosoma. Notaulus slightly impressed, with weak wrinkle on anterolateral side of mesoscutum (Fig. 16). Mesoscutum finely punctate on granulate background (Fig. 16), sculpture on lateral lobes somewhat shallower. Scutellum with lateral longitudinal carinae developed in its anterior two tenths. Mesopleuron granulate, centrally with distinct punctures on shallowly granulate background. Foveate groove absent. Propodeal spiracle separated from pleural carina by 5.0 times diameter of spiracle. Propodeum partly covered by glue, its carinae mostly weak; dorsolateral area finely punctate on finely granulate background, dull; basal area square or slightly transverse, posteriorly open and confused with apical area (transverse carina mediodorsally obliterated); apical area broad anteriorly, impressed along midline, uneven.

Fore wing (Fig. 13) with vein 2m-cu strongly antefurcal, unpigmented in front part. Metacarpus (R1) probably short. Vein 2rs-m somewhat thickened. First abscissa of radius (Rs+2r) straight, somewhat longer than width of pterostigma. Nervulus slightly postfurcal. Brachial cell posteriorly closed; posterior abscissa of postnervulus weakly pigmented. Hind wing with nervellus (cu1&cu-a) slightly reclivous. Legs slender. Hind femur 3.8 times as long as broad and 0.75 times as long as tibia. Spurs of hind tibia short, apically curved.

Metasoma. First tergite slender, round in cross-section centrally, predominantly smooth, with fine striae on dorsolateral sides and at base of postpetiole dorsally. Glymma absent. Second tergite twice (or somewhat more) as long as anteriorly

broad (unable to measure precisely). Thyridial depression elongate, about 1.5 times as long as broad, rounded posteriorly. Ovipositor slender, evenly upcurved, with very shallow dorsal subapical depression (Fig. 18); apical half of sheath absent, sheath (measured from sheath base to ovipositor apex) 1.25 times as long as first tergite and 1.15 times as long as hind tibia.

Colour. Head and mesosoma black (Fig. 12). Clypeus reddish brown on lower sixty-five hundredths and black on upper thirty-five hundredths (Fig. 17). Antenna entirely brownish black (Fig. 15); distal margins of scape and pedicel narrowly brownish yellow. Mandible yellow-brown centrally, brownish black at base and with teeth dark reddish brown. Maxillary palpomere 2 black with pale apex, palpomeres 3 and 4 dark brown; glossa yellow (Fig. 17). Tergite 1 black, remaining metasoma dark brown to brownish black (Fig. 12). Tegula and pterostigma dark brown (Fig. 13). All coxae and trochanters dark brown to brownish black; fore femur and tibia yellow-brown (femur darkened with brown basally); mid and hind femora dark brown with pale apices; mid and hind tibiae predominantly dark brown, pale at base and apex; all tarsi yellow-brown to brown.

Variation. In the specimen from Turkey (Fig. 19; see Çoruh & Khalaim, 2012: 63), ovipositor sheath is 1.55 times as long as first tergite or almost 1.4 times as long as hind tibia. Otherwise this female is almost completely conspecific with the holotype.

Distribution. Greece, Turkey, *Iran.

3. *Heterocola (Heterocola) nigrotibialis*

Horstmann et Kolarov, 1988

(Figs 20–25, 47)

Heterocola nigrotibialis Horstmann et Kolarov, 1988: 272. Holotype female (examined), Bulgaria, “25.7.1968 St. plania Jamna leg. A. Germanov” [Jamna, Stara Planina, 500 m] (Fig. 21); deposited in the ZSM.

References. Khalaim & Yurtcan, 2011: 388 (Turkey). Khalaim 2016: 263 (France, Iran, Netherlands, Portugal, Spain, Turkey). Kolarov, 2017: 508 (Turkey).

Material examined. **Spain:** Valencia Prov., NW of Valencia, Burjassot, bushes and *Pinus*, 17.IV.2011, coll. S.A. Belokobylskij, 2 females and 9 males (ZIN); same data, but 1.V.2011, 6 females (ZIN). **Turkey:** “Çankırı-Çerkeş 4.7.2001 Ö. Çetin”, 1 female (ZIN).



Figs 12–18. *Heterocola longipalpis*, holotype, female. 12, habitus, lateral view; 13, fragments of wings; 14, labels; 15, head with antenna, lateral view; 16, head, dorsal view; 17, head and mesosoma, ventral view; 18, ovipositor, lateral view. Scale bars: 1.0 mm.

Remarks. One female of this species recorded from Iran (Khalaim, 2016: 263) actually belongs to *H. longipalpis* (see *Remarks* under this species). Thus, *H. nigrotibialis* is deleted here from the Iranian fauna.

One female of this species from Ávila Province in Spain (Khalaim, 2016: 263) actually belongs to *H. similis*.

Description. Female (holotype). Body length 2.8 mm, fore wing length 2.1 mm. Complete and well-preserved specimen (Fig. 20); bases of both left wings are partly in glue and apex of ovipositor sheath is broken.

Head behind eyes roundly tapered in dorsal view, gena 0.9 times as long as eye width (Fig. 22). Malar space short, about 0.2 times as long as basal mandibular width. Mandible moderately slender, punctate from base to almost apex, with upper tooth slightly longer than lower one. Maxillary palp long (Fig. 20); palpomere 2 distinctly shorter than palpomeres 3 and 4 separately. Labial palp short, number of palpomeres unable to discern. Glossa short. Clypeus lenticular, separated from face by distinct groove, with lower margin slightly truncated; clypeus smooth in lower half and with coarse punctures on shallowly sculptured surface in upper half. Flagellum (Fig. 23) filiform, with 16 flagellomeres; subbasal flagellomeres 1.6–1.8 times and subapical flagellomeres 1.2 times as long as broad. Face and frons punctate on granulate background, dull. Vertex granulate (laterally granulation very shallow), without distinct punctures, dull. Gena without distinct punctures, shallowly granulate, weakly shining. Occipital carina complete.

Mesosoma. Notaulus slightly impressed, with weak short wrinkle on anterolateral side of mesoscutum (Figs 22, 23). Mesoscutum finely punctate on granulate background on median lobe (punctures mostly indistinct because of granulation), and distinctly punctate on shallowly granulate or almost smooth background on lateral lobes. Scutellum with lateral longitudinal carinae developed in its anterior two tenths. Mesopleuron granulate, centrally with rather distinct and dense punctures on almost smooth background, peripherally impunctate or with indistinct punctures. Foveate groove absent. Propodeal spiracle separated from pleural carina by 5.0 times diam-

eter of spiracle. Propodeal carinae weak, partly obliterated; dorsolateral area with very fine punctures on very shallowly granulate, almost smooth background, weakly shining; basal area (Fig. 25) slightly transverse, rectangular, posteriorly open and confused with apical area (transverse carina mediodorsally obliterated); basal longitudinal carinae weak, not clearly delimiting basal area laterally; apical area (Fig. 25) broad anteriorly, impressed along midline, uneven with irregular weak wrinkles; apical longitudinal carinae weak, anteriorly indistinct because of irregular wrinkles.

Fore wing (as in Fig. 47) with vein 2m-cu strongly antefurcal, unpigmented in front part. Metacarpus (R1) short, extending about half way from distal corner of radial cell to fore wing apex (Fig. 20). Vein 2rs-m slightly thickened. First abscissa of radius (Rs+2r) somewhat longer than width of pterostigma. Nervulus almost interstitial (Fig. 20). Brachial cell posteriorly closed. Hind wing with nervellus (cu1&cu-a) weakly recurved. Legs slender. Hind femur 3.6 times as long as broad and 0.8 times as long as tibia (Fig. 24). Spurs of hind tibia short, apically curved.

Metasoma. First tergite slender, round in cross-section centrally, predominantly smooth, with fine striae on dorsolateral sides and at base of postpetiole dorsally. Glymma absent. Second tergite 1.8 times as long as anteriorly broad. Thyridal depression elongate, about 1.5 times as long as broad, rounded posteriorly. Ovipositor slender, weakly upcurved, with very shallow dorsal subapical depression; sheath 2.3 times as long as first tergite and 2.1 times as long as hind tibia.

Colour. Head, mesosoma and first tergite of metasoma black; clypeus yellow-brown in lower six tenths. Antenna entirely brownish black. Mandible yellow-brown, brownish at base and with teeth dark red. Maxillary palp yellowish brown, basally fuscous. Tegula and pterostigma brown. All coxae, trochanters and femora dark brown to brownish black (apices of femora yellowish); all tibiae brown to dark brown, yellowish at base and apex; all tarsi brownish yellow. Second and following metasomal tergites dark brown to brownish black.

Variation. Examined specimens from Burjassot (Spain) have mesopleuron impunctate and gena 0.8–0.9 times as long as eye (dorsal view), differing in these characters from typical *H. nigrotibia-*



Figs 19–25. *Heterocola longipalpis*, female (19, Turkey) and *H. nigrotibialis*, holotype, female (20–25). **19, 20**, habitus, lateral view; **21**, labels; **22**, head, dorsal view; **23**, head with antenna, lateral view; **24**, hind leg, lateral view; **25**, propodeum, dorsal view. Scale bars: 1.0 mm.

lis. Nevertheless, all other characters correspond well with *H. nigrotibialis*, e.g. all females have ovipositor very slender apically, with shallow dorsal

subapical depression and sheath about twice as long as first tergite. Labial palps in all specimens with three short palpomeres.

Distribution. Portugal, Spain, France, Netherlands, Bulgaria, Turkey.

4. *Heterocola (Heterocola) pappi* Kolarov, 1989

Heterocola (Heterocola) pappi Kolarov, 1989: 74. Holotype female (not examined), Greece, Peloponnese, Taygetos Mts., Sparti, 700 m, 16.IV.1978, coll. J. Papp; deposited in the Hungarian Natural History Museum, Budapest, Hungary.

References. Kolarov, 2017: 508 (Greece, Turkey).

Remarks. This species is known to us only from its very brief original description (Kolarov, 1989: 74) illustrated by three low-quality black and white drawings (Figs 1–3 in Kolarov, 1989: 84). According to the diagnosis, *H. pappi* differs from all known Western Palaeartic species of *Heterocola* “by longer ovipositor and area basalis of propodeum”. Below, Kolarov describes ovipositor as “slightly shorter than front wing” and basal area of propodeum as “longer than wide, open behind”. Actually, description and drawings on *H. pappi*, including length of the ovipositor and areolation of the propodeum, are almost completely correspond with *H. similis* which also possesses such long ovipositor (Fig. 31) and propodeum with slightly transverse or elongated, open posteriorly basal area (Figs 39, 44). Thus, we suppose that *H. pappi* is a junior synonym of *H. similis*, but do not synonymise it formally here because the holotype of *H. pappi* was not examined.

Distribution. Greece, Turkey.

5. *Heterocola (Heterocola) proboscidalis*

(Thomson, 1889)

(Figs 26–28, 48)

Thersilochus (Thersilochus) proboscidalis Thomson, 1889: 1388. Holotype (?lectotype) female (not examined), “Germ” [Germany]; deposited in the Museum of Zoology, Lund University, Lund, Sweden.

Thersilochus pallicarpus Thomson, 1889: 1387 (Horstmann, 1971: 65).

Thersilochus monticola Thomson, 1889: 1388 (Horstmann, 1971: 65).

References. Horstmann, 1971: 65 (Sweden, Finland, Norway, Germany, France, Moravia [Czech Republic], “Bessarabia” [Moldova/Ukraine], Italy). Sawoniewicz, 1976: 12(212) (Poland). Horstmann, 1981: 19 (Poland, Bohemia [Czech Republic], Austria, Hungary, Romania, Serbia, “Mittel- und Westrußland”

[see *Remarks* below], Ukraine). Izquierdo, 1984: 85 (Spain). Khalaim, 2007a: 577 (Russia: Primorsky Terr., Yakutia, Buryatia, Irkutsk Prov., European part; Mongolia, Kazakhstan, Europe). Ghahari & Jussila, 2015: 23 (Iran). Khalaim, 2016: 263 (Estonia, Lithuania, Poland). Kolarov, 2017: 509 (Bulgaria). Khalaim & Tereshkin, 2018: 162 (Belarus). Khalaim & Várkonyi, 2018: 171 (Finland).

Material examined. **Estonia:** “Reval” [Tallinn], “Hellén”, 1 male (MZH). **Georgia:** Akhaltsikhe Distr., Khagi, mixed forest, 24.VI.1978, coll. V.A. Rikhter, 1 male (ZIN). **Germany:** *Bavaria*, SW of Heubach, Scheuelberg, 600–720 m, meadows, forest, N 48°46.8', E 09°54.9', 6.V.2016, coll. A.I. Khalaim, 1 male (ZIN). **Kazakhstan:** *Akmola [Aqmola] Prov.*, Kokshetau Mt., Terisakkan Riv., 22.V.1957, coll. V. Rudolf, 2 females (ZIN); *Karaganda [Qaraghandy] Prov.*, Karkaraly Mts., 13–15.VI.1957, coll. V.I. Tobias, 1 female (ZIN); 40 km S of Zhanaarka Station, Mt. Koksengir, 10.V.1959, coll. V.I. Tobias, 2 females, 1 male (ZIN); *South Kazakhstan [Turkistan] Prov.*, Saryagash Distr., W of Alkakolkum Sands, right bank of Syr Darya Riv., 6.V.1968, coll. D.R. Kasparyan, 1 female (ZIN); *East Kazakhstan Prov.*, 10 km SE of Zaysan, 1800 m, 6.VI.1961, coll. V.I. Tobias, 1 female (ZIN). **Latvia:** *Aizpute Distr.*, Pavasaris Kolkhoz [collective farm], 29.V.1954, coll. V. Negrobov, 1 female (ZIN). **Mongolia:** S of Ulan Bator [Ulaanbaatar], north slope of Bogdo-Ula [Bogd Khan] Mountain, Zaysan (north), 15.VI.1967, coll. I.M. Kerzhneri, 1 female (ZIN). **Russia:** *Leningrad Prov.*, 70 km NW of Leningrad [St Petersburg], Sosnovo, 2.VI.1973, coll. D.R. Kasparyan, 1 female (det. K. Horstmann, ZIN); same locality and collector (all in ZIN): 2.VI.1973 (2 females), 9.V.1980 (1 male), 9.V.1990 (1 female); 15 km NW of Leningrad [St Petersburg], Solnechnoe, 10–21. VI.1980, coll. V.I. Tobias, 6 females, 1 male (ZIN); 55 km S of St Petersburg, 4 km W of Krasnitsy, aspen forest, Malaise trap, 24–31.V.2008, coll. D.R. Kasparyan, 3 females (ZIN); *Novgorod Prov.*, 20 km NW of Pestovo, Tychkino, coll. V.I. Tobias (all in ZIN): 18.VI.1991 (1 female), 24.V.2000 (6 females, 3 males), 1–3.VI.2001 (4 females, 1 male), 22–26.V.2003 (1 female); *Tver Prov.*, Udomelsky Distr., W of Doronino, 26.V.2015, coll. A.G. Korobkov, 1 female (ZIN); *Yaroslavl Prov.*, Yaroslavl, coll. N. Kokujev (all in ZIN): 6.V.[year absent] (1 female), [date absent] (1 female, det. K. Horstmann), 7–15.V and 29.V.1895 (1 female and 1 male, det. K. Horstmann), 7–15.V.1895 (2 females, 8 males), 7.V.1899 (3 females, 7 males); Yaroslavl Uezd [county], Berdit-syno [20 km SE of Yaroslavl], 25.V.1896, coll. N. Kokujev, 1 female (ZIN); Danilov Uezd [county], Zhedenovo [12 km S of Danilov], 28.V.1914, coll. A. Shestakov, 1 female (ZIN); *Moscow Prov.*: Orekhovo, 23.V.1987, coll. Barlák, 1 female (ZIN); Podolsk Distr., Grivno Station,



Figs 26–30. *Heterocola proboscidalis*, female (26–28, Solnechnoe) and *H. rufiventris*, female (29, 30, Saratov). 26, 29, habitus, lateral view; 27, head, dorsal view; 28, 30, head and mesosoma, lateral view. Scale bars: 1.0 mm.

16.V.2004, coll. K. Tomkovich, 1 female (ZIN); *Kursk Prov.*: environs of Kursk, C...[illegible], 20.V.1937, coll. D. Dovnar, 1 female (MSU); Central Black Earth Nature Reserve, Streletskaya Step [Steppe], 5–10.V.2008,

coll. K. Tomkovich, 1 female (ZIN); *Voronezh Prov.*, Voronezh Nature Reserve, V.1950, coll. D. Dovnar, 2 females, 1 male (MSU); *Crimea*, Ay-Petry Yaila, 1200 m, 28.V.1983, coll. A. Zagulyaev, 3 females (ZIN);

Karadag, Karagach Range, 7.V.1992, coll. D.R. Kasparyan, 1 female (ZIN); *Ulyanovsk Prov.*, left bank of Volga Riv., 80 m, 14.VIII.1990, coll. Z. Yefremova, 3 females (ZIN); *Irkutsk Prov.*, Tibelti, 35 km W of Baikal Lake, 8–9.VI.1970, coll. D.R. Kasparyan, 1 female (ZIN); Bolshie Koty, 21.VI.1970, coll. D.R. Kasparyan, 2 females (ZIN); 10 km E of Bolshie Koty, Baikal Lake, 17–18.VI.1970, coll. D.R. Kasparyan, 8 females, 2 males (ZIN); Bolshoy Lug, right inflow of Olkha Riv., 21.VI.1971, coll. D.R. Kasparyan, 1 female, 3 males (ZIN); 32 km S of Irkutsk, Dachnaya Railway Station, 3–5.VI.1970, coll. D.R. Kasparyan, 2 males (ZIN); *Buryatia*, Gusinoe Lake, 28.V.1970, coll. D.R. Kasparyan, 1 female, 1 male (ZIN); 20 km W of Gusinoe Lake, 27.V.1970, coll. D.R. Kasparyan, 4 females, 7 males (ZIN); Selenduma, floodplain of Selenga Riv., 23.VI.1971, coll. D.R. Kasparyan, 2 females, 1 male (ZIN); *Yakutia [Sakha Republic]*, 30 km “above” Yakutsk, right bank of Lena Riv., Khaptagay, 30.VI.1974, coll. Yu.A. Pesenko, 1 female (ZIN); *Primorsky Terr.*, 20 km SE of Ussuriysk, Gornotaezhnoe, forest, 31.V.1990, coll. S.A. Belokobylskij, 1 female (ZIN); 30 km SE of Ussuriysk, Kamenushka, 17–21.V.1989, coll. A.G. Kirejtshuk, 1 specimen [destroyed, sex unknown] (ZIN). **Ukraine:** *Luhansk Prov.*, 15 km E of Sverdlovsk [Dovzhansk], Provalska Step [Steppe] Nature Reserve, 6.V.1974, coll. D.R. Kasparyan, 1 female (ZIN); 3 km NW of Anratsyt, 10.V.1974, coll. D.R. Kasparyan, 1 female (ZIN, det. K. Horstmann); *Kyiv Prov.*, Fastov [Fastiv], 11.V.2003, coll. A.G. Kotenko, 1 specimen [destroyed, sex unknown] (ZIN).

Remarks. Horstmann (1981) recorded this species from “Mittel- und Westrußland” and Ukraine on the basis of the material from ZIN, but without any details. Specimens of *H. proboscidalis* in the ZIN collection bearing Horstmann identification labels were examined (see *Material examined* section), those are from Leningrad and Yaroslavl Provinces of Russia and Luhansk Province of Ukraine.

Khalaim (2007a) also briefly reported this species from several provinces of Russia and other countries and regions, but without any details. In the *Material examined* section, we included all specimens on which those records were based on.

Record of this species from Iran (Ghahari & Jussila, 2015) requires confirmation.

Distribution. Trans-Palaeartic species: ?North Africa, Spain, France, Italy, Germany, Austria, Czech Republic, Poland, Hungary, Serbia, Romania, Bulgaria, Norway, Sweden, Finland, Estonia, *Latvia, Lithuania, Belarus, ?Moldova, Ukraine,

*Georgia, ?Iran, Russia (European part, Siberia, south of Far East), Kazakhstan, Mongolia.

6. *Heterocola (Heterocoloides) rufiventris*

Horstmann, 1971

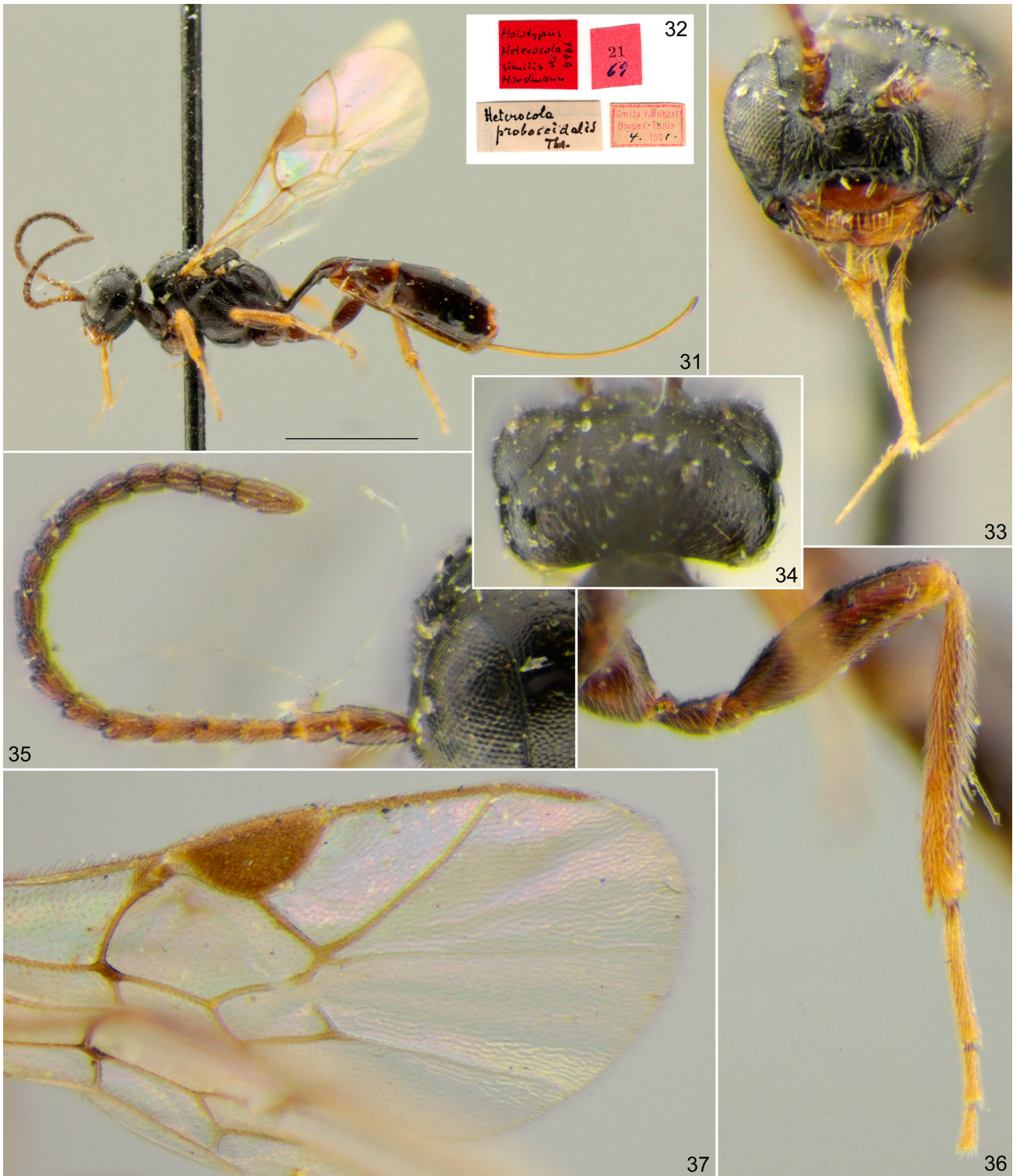
(Figs 29, 30, 49)

Heterocola rufiventris Horstmann, 1971: 66. Holotype female (not examined), Germany, Saxony-Anhalt, “Halle M.S. 12.7.96 [12.VII.1896] Enderlein”; deposited in the Museum für Naturkunde der Humboldt-Universität, Berlin, Germany.

References. Horstmann, 1981: 19 (Bohemia [Czech Republic], Ukraine). Kaźmierczak, 2004: 49 [catalogue; Poland]. Khalaim, 2016: 263 (Georgia).

Material examined. **Azerbaijan:** Lerik Distr., “Toveri”, 25.V.1959, coll. V. Zaytsev, 1 male (ZIN). **Georgia:** 18 km W of Akhaltsikhe, canyon and valley, 29.VI.1967, coll. D.R. Kasparyan, 1 male (ZIN). **Kazakhstan:** *Aktobe Prov.*, Mugodzhyary Mts, 15 km E of “Yubileyny”, 16.VI.1985, coll. A.G. Kotenko, 1 female, 1 male (ZIN). *West Kazakhstan Prov.*, right bank of Ural Riv., 10 km W of Kharkino [Shabdarzhai], old watercourse of Dzobay, on flowers, 2.VI.1951, coll. V.I. Tobias, 1 female (ZIN); 10 km SE of Mirgorodka [abandoned village], Aktau, 30.V.1986, coll. D.R. Kasparyan, 2 females, 1 male (ZIN); Uralsk [Oral], left bank of Ural Riv., garden, 28.V.1986, coll. D.R. Kasparyan. **Russia:** *Crimea*, Perekop Isthmus, NW of Armyansk, Turetskiy Val, 29.V.1974, coll. D.R. Kasparyan, 1 female (det. K. Horstmann, ZIN); Kerch, 14.V.1901, 1 female (ZIN); *Dagestan*, 17 km E of Terekli-Mekteb, Nogayskaya Step [Steppe], 16.V.1972, coll. D.R. Kasparyan, 1 male (ZIN); *Orenburg Prov.*, Tatarskaya Kargala, right bank of Sakmara Riv., 4.VI.1985, coll. A.G. Kotenko, 1 female (ZIN); *Saratov Prov.*, Krasnokutsky Distr., Dubrava Bus Stop, 25.V.1986, coll. D.R. Kasparyan, 1 female (ZIN); same district, date and collector, Diakovka, steppe and birches, 1 female, 3 males (ZIN); N of Ozinki, Sinie Gory [Blue Mountains], steppe, 27.V.1986, coll. D.R. Kasparyan, 1 female (ZIN). **Ukraine:** *Kherson Prov.*, Askania-Nova, steppe, 26–28.V.1974, coll. D.R. Kasparyan, 2 males (det. K. Horstmann, ZIN); *Mykolaiv Prov.*, Elanetskaya Step [Elanets Steppe] Nature Reserve, 20 km S of Elanets, 15–16.VII.2004, coll. D.R. Kasparyan, 2 females, 1 male (ZIN), 1 female (MZH).

Remarks. Horstmann (1981) recorded this species from Ukraine on the basis of the material from ZIN, but without any details. Specimens of *H. rufiventris* in the ZIN collection bearing Horstmann identification labels were examined (see *Material*



Figs 31–37. *Heterocola similis*, holotype, female. **31**, habitus, lateral view; **32**, labels; **33**, head, front view; **34**, head, dorsal view; **35**, antenna, lateral view; **36**, hind leg, lateral view; **37**, apex of fore wing. Scale bars 1.0 mm.

examined section), those are from Crimea (currently considered as a part of Russia) and Kherson Province of Ukraine.

Kaźmierczak (2004) listed *H. rufiventris* in the catalogue of Polish Ichneumonidae but with no reference on the original publication, therefore

Poland is not included to general distribution of this species.

Distribution. Germany, Czech Republic, Ukraine, Georgia, *Azerbaijan, *Russia (European part), *Kazakhstan (west).

7. *Heterocola (Heterocola) similis*

Horstmann, 1971

(Figs 31–44, 50)

Heterocola (Heterocola) similis Horstmann, 1971: 64.

Holotype female (examined), Tunisia, “Smits v. Burgst Omgev, Tunis 4.1911” (Fig. 32); deposited in the NHRS.

References. Horstmann, 1971: 64 (Tunisia, Algeria, Spain). Horstmann 1981: 19 (Denmark). Kolarov, 1987: 27 (Bulgaria). Khalaim, 2016: 264 (Tunisia).

Material examined. **Tunisia:** Hammamet, 14.VI. 1964, coll. G.J. Kerich, 1 female (ZIN).

Remarks. One female of *H. nigrotibialis* from Ávila Province in Spain (Khalaim, 2016: 263) actually belongs to this species. This female possesses labial palp with two short palpomeres and ovipositor sheath 2.8 times as long as first tergite.

Description. Female (holotype). Body length 3.35 mm, fore wing length 2.45 mm. Generally well-preserved specimen (Fig. 31) but with left hind wing, left hind leg and two distal tarsomeres of right hind leg missing.

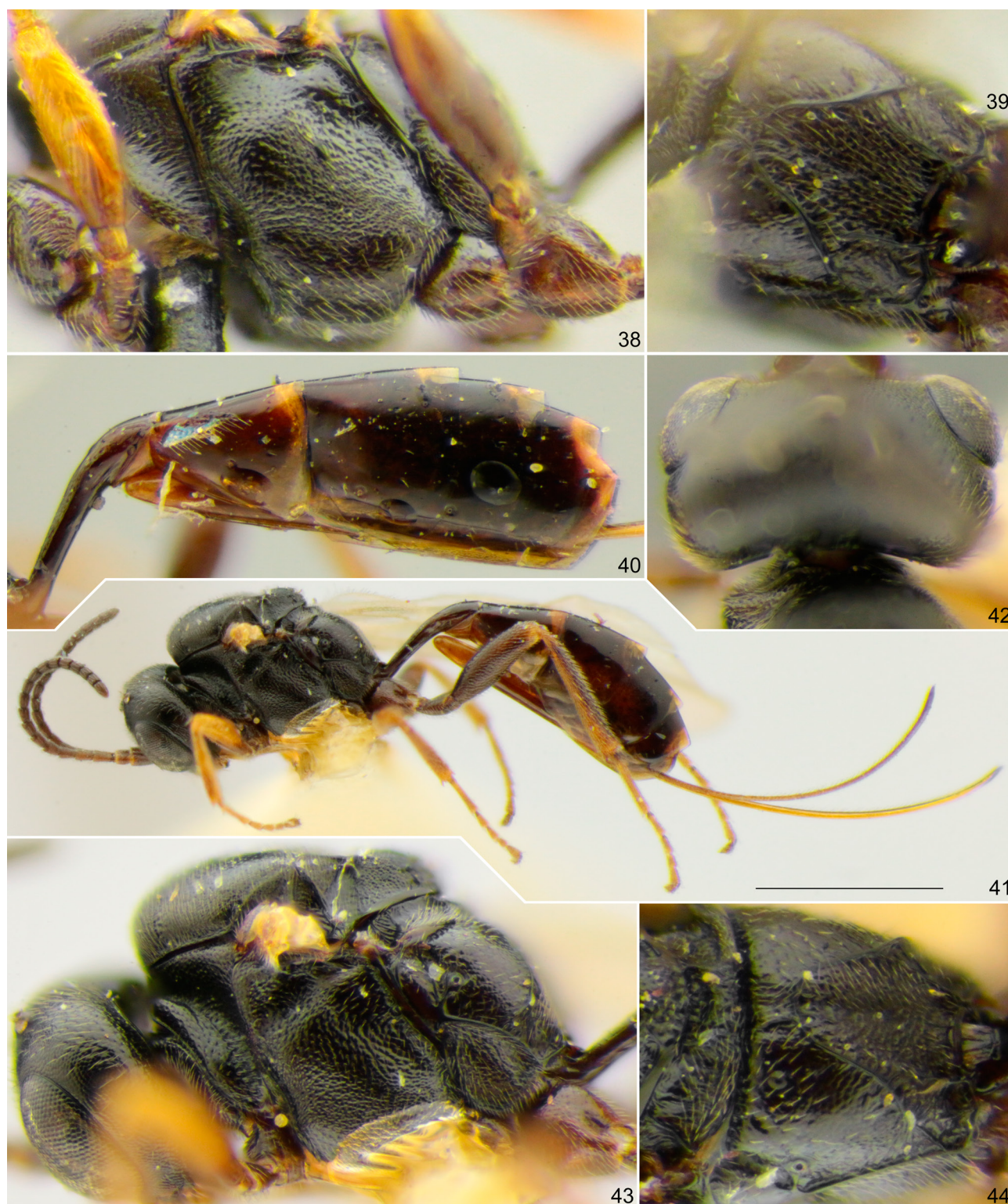
Head behind eyes roundly tapered in dorsal view, gena about as long as eye width (Fig. 34). Malar space short, about 0.25 times as long as basal mandibular width. Mandible moderately slender, distinctly punctate except apex, with upper tooth slightly longer than lower one; both teeth apically rounded, probably rubbed off. Maxillary palp very long, with basal palpomere relatively short and two distal palpomeres the longest. Labial palp short, not unusually elongated, with two palpomeres. Glossa relatively short. Clypeus (Fig. 33) lenticular, 3.0 times as broad as long, separated from face by distinct groove; clypeus smooth, with distinct punctures in upper four tenth. Flagellum (Fig. 35) filiform, with 16 flagellomeres; subbasal flagellomeres 1.6–1.8 times and subapical flagellomeres 1.2 times as long as broad. Face and frons finely but distinctly punctate on finely granulate background, dull. Vertex finely and rather densely punctate on finely and densely granulate background, dull. Gena without punctures, shallowly granulate, centrally almost smooth. Occipital carina complete.

Mesosoma. Notaulus absent. Mesoscutum finely punctate on finely and densely granulate background on median lobe, distinctly punctate on shallowly granulate or almost smooth background on lateral lobes. Scutellum with lateral longitudinal carinae developed in its anterior two tenth. Mesopleuron finely but distinctly punctate on granulate background (Fig. 38); centrally granulation shallower and punctures stronger. Foveate groove absent, its path indicated by somewhat denser granulation. Propodeal spiracle separated from pleural carina by almost 4.0 times diameter of spiracle. Propodeum with dorsolateral area very shallowly granulate, almost smooth, with sparse inconspicuous punctures; basal area subquadrate (Fig. 39), posteriorly open and confused with apical area (transverse carina mediodorsally obliterated); basal longitudinal carinae weak, not clearly delimiting basal area laterally; apical area (Fig. 39) rounded anteriorly, impressed along midline, uneven; apical longitudinal carinae more or less complete.

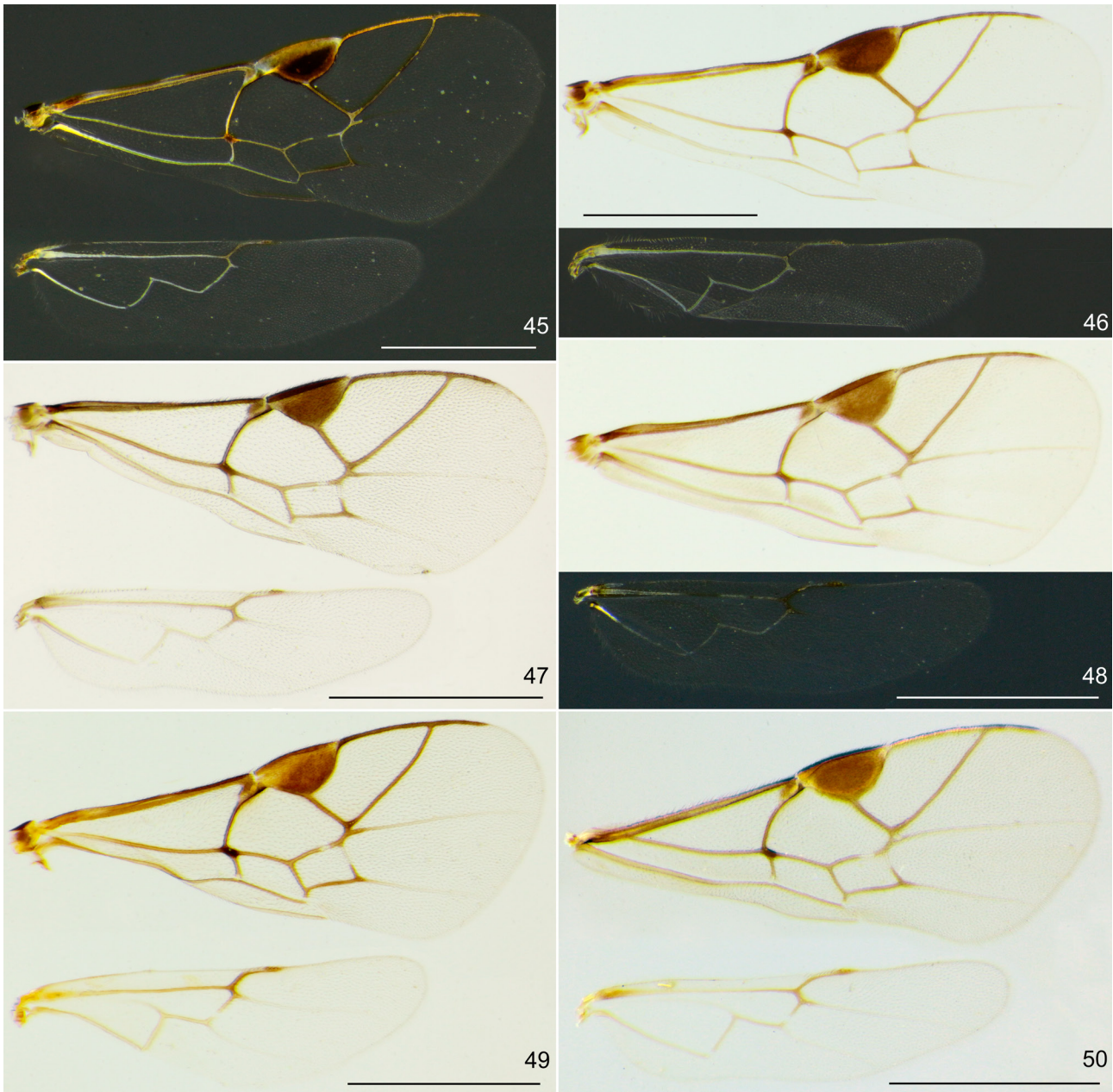
Fore wing (Fig. 37) with vein 2m-cu strongly antefurcal, unpigmented in front half. Metacarpus (R1) short, extending about 0.45 way from distal corner of radial cell to fore wing apex. Vein 2rs-m short and thick. First abscissa of radius (Rs+2r) about as long as width of pterostigma. Nervulus somewhat postfurcal. Brachial cell posteriorly closed. Hind wing with nervellus (cu1&cu-a) slightly reclivous, almost vertical. Legs slender. Hind femur 3.8 times as long as broad and 0.8 times as long as tibia (Fig. 36). Spurs of hind tibia short, apically curved.

Metasoma. First tergite (Fig. 40) slender, round in cross-section centrally; postpetiole wider than petiole (dorsal view); glymma absent. First tergite smooth, with striae on dorsolateral sides. Second tergite twice as long as anteriorly broad. Thyridial depression somewhat elongate, triangular, pointed posteriorly. Ovipositor slender, evenly upcurved; sheath almost 3.2 times as long as first tergite and 2.7 times as long as hind tibia (Fig. 31).

Colour. Head and mesosoma black (Fig. 31). Clypeus yellow-brown on lower sixty-five hundredths and black on upper thirty-five hundredths (Fig. 33). Antenna entirely brownish black (Fig. 35). Maxillary and labial palps yellowish brown, basally fuscous (Fig. 33). Tergite 1 brownish black, remaining metasoma predominantly dark



Figs 38–44. *Heterocola similis*, females, holotype (38–40) and non-type specimen from Tunisia (41–44). **38**, mesosoma, lateral view; **39**, propodeum, dorsal view; **40**, metasoma, lateral view; **41**, habitus, lateral view; **42**, head, dorsal view; **43** – head and mesosoma, lateral view; **44**, propodeum, dorso-lateral view. Scale bar: 1.0 mm.



Figs 45–50. Wings of *Heterocola* spp., females. **45**, *H. linguaria* (Azerbaijan); **46**, *H. longipalpis* (Turkey); **47**, *H. nigrotibialis* (Spain); **48**, *H. proboscidalis* (Leningrad Prov., Russia); **49**, *H. rufiventris* (Ukraine); **50**, *H. similis* (Tunisia). Scale bars: 1.0 mm.

brown (Fig. 40). Tegula and pterostigma brown. All coxae, all trochanters, basal half of fore femur, and mid and hind femora completely dark brown (extreme apices of mid and hind femora yellowish); remaining legs predominantly yellow-brown (hind tibia blackish on its dorsal side).

Variation. Examined non-type female from Tunisia (Khalaim, 2016) is morphologically almost identical to the holotype, with ovipositor sheath

almost 3.0 times as long as first metasomal tergite (Figs 41–44, 50).

Distribution. Algeria, Tunisia, Spain, Denmark, Bulgaria.

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