

New data on distribution of four species of the genus *Trypoxylon* (Hymenoptera: Crabronidae: Trypoxylini) in European Russia

Новые данные о распространении четырех видов рода *Trypoxylon* (Hymenoptera: Crabronidae: Trypoxylini) в европейской части России

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КЛЮЧЕВЫЕ СЛОВА: Hymenoptera, Crabronidae, Trypoxylini, *Trypoxylon*.

ABSTRACT. New data on distribution of four species of digger wasps of the genus *Trypoxylon* (Crabronidae: Trypoxylini) in European Russia are provided. *Trypoxylon beaumonti* Antropov, 1991 is recorded for the first time for Russia, *T. koreanum* Tsuneki, 1956 is recorded for the first time for European Russia, an areal of *T. rubiginosum* Gussakovskij, 1936 is specified, and previously unknown female of *T. inopinatum* Antropov, 1986 is described.

РЕЗЮМЕ. Приведены новые данные о распространении в Европейской части России четырех видов роющих ос рода *Trypoxylon* (Crabronidae: Trypoxylini). *Trypoxylon beaumonti* Antropov, 1991 впервые указан с территории России, *T. koreanum* Tsuneki, 1956 впервые указан из Европейской части России, уточнен ареал *T. rubiginosum* Gussakovskij, 1936 и впервые описана неизвестная ранее самка *T. inopinatum* Antropov, 1986.

Trypoxylon beaumonti Antropov, 1991

Trypoxylon beaumonti Antropov, 1991, ♀, ♂
MATERIAL. RUSSIA: 4♀♀, 6♂♂, Krasnodar reg., Gelendzhik distr., Krinita env. 44,400°N 38,316°E, forest stream. 6–13.IX.2009 (K. Tomkovich) [Zoological Museum of Moscow Lomonosov State University — ZMMU].

DISTRIBUTION. *Trypoxylon beaumonti* was described in the revision of the species-subgroup *attenuatum* on a series of specimens of the both sexes from Portugal, France, Italy, Switzerland, Germany, and Austria.

In the next years distribution of *T. beaumonti* was confirmed for France [Ljubomirov, 1999; Schmid-Egger, 2001; Vago, 2007; Frommer, 2009b; van der Smissen, 2010;

Schmid-Egger, 2011; Bitsch, 2014], Italy [Mochi, Luchetti, 1994; Pagliano, 1994; Negrisol, 1995; Pagliano, Scaramozzino, 1999; Pagliano, Negrisol, 2005; Pagliano, 2009; Strumia et al., 2012], Switzerland [Neumeyer, 2000], Germany [Schmid-Egger, 1994, 1995; Schmid-Egger et al., 1995; Schmidt et al., 1995; Schmid-Egger et al., 1996; Schmid, Schmid-Egger, 1997; Mader, Chalwatzis, 2000; Schmid-Egger, 2000; Ohl et al., 2001; Mandery et al., 2003; Jacobs, 2007; Frommer, 2009a, b; Schmid-Egger, 2010; Tischendorf et al., 2011; Frommer, 2014], and Austria [Gusenleitner, 1995; Zettel et al., 2013; Zettel et al., 2014], and also was expanded to Spain [Tormos et al., 1996; Tormos et al., 2005], Andorra [González et al., 2000], Slovakia [Deván, 2004; Vepřek, Straka, 2007], Czech Republic [Vepřek, Straka, 2007; Dvořák et al., 2008], Hungary [Frommer, 2009b], Slovenia [Gogala, 2011], Greece [Standfuss, Standfuss, 2006, 2012], and Bulgaria [Ljubomirov, 1999; Guéorguiev, Ljubomirov, 2009].

Trypoxylon beaumonti is recorded from Russia for the first time.

DISCUSSION. Occipital carina forming in its lower corners a pair of widened lobes separated from the posterior side of the head and long erect pubescence, particularly on the lower part of the head are the most characteristic peculiarities for both sexes of this species differing it from other Russian representatives of the species-subgroup *attenuatum*. Furthermore, females of *T. beaumonti* differ by distinctly developed lateral angles of clypeus bordering a strongly protruded medial lobe. Males of *T. beaumonti* also differ by genitalia with obtuse preapical lateral angles of penis narrower than preapical hooks, with parameres bilobed apically deeper than the level of penis preapical hooks and with straight apical lobe, and volsellae bearing short marginal bristles.

We suppose, that in this case it is hardly justified to speak about the expansion of the species to the East. Most likely,

researchers simply began to pay attention to the earlier unknown peculiarities, differing *T. beaumonti* from other European members of the species-subgroup *attenuatum*.

***Trypoxylon inopinatum* Antropov, 1986**

Trypoxylon inopinatum Antropov, 1986b, ♂

MATERIAL. RUSSIA: 1♀, Krasnodar reg, Temryuk distr., 2 km SE from vil. Kuchugury, 45.381613°N, 37.022832° E, 16.06.2014 (Mokrousov) [ZMMU].

DESCRIPTION. **Female** (described for the first time). Head in frontal view rounded, slightly wider than height (74:65). Clypeus with convex basal surface and distinct apical border, bearing a pair of small medial teeth and rounded lateral angles. Supraclypeal sclerite shorter than wide. Supraantennal tubercle tuberiform, with very weak medial carina not reaching its apex, with obtuse-angled transverse apical carina, connected ventrally by a medial carenula between narrow antennal socket rims. Postantennal furrow undeveloped. Front convex, flat-concave medially. Ratio of distances between eyes on vertex and clypeus = 28:20; ratio of distance between eye and ocellus to ocellar diameter and distance between lateral ocelli = 4:5:8. Third antennal segment twice longer its maximum width (11:5). Occipital carina thin, complete circled, divided by distance exceeding foretibial width from hypostomal carina. Pronotal collar twice longer its black posterior band. Scutellum flat-convex. Propodeal dorsal area not enclosed laterally by furrows, with shallow medial furrow (its width is equal to hindocellar diameter); lateral carina distinct, though weak. Hindcoxal organs round, pitshaped, weakly margined posteromedially, placing posteriorly from coxal middle. First abdominal segment clavate, with straight lateral sides, moderately and uniformly widened posteriorly, with ratio of its length to maximum apical width and minimum basal width = 63:21:15. Pygidium uniformly tapered apically, ridgeless.

Front densely punctate (punctures 0.5–1 diameters apart), densely (especially medially) microsculptured, dull. Vertex more delicately punctate, semidull. Scutum like frontal middle densely punctate and microsculptured, dull. Scutellum punctate more delicately than scutum, semidull. Mesopleuron sculptured almost like scutum (punctures 2–4 diameters apart), microsculptured, semidull. Anterior part of metapleuron shiny. Propodeal dorsum completely obliquely striate, with medial furrow transversely carinate. Propodeal hind side delicately transversely rugose. Propodeal lateral sides obliquely densely microstriate and micropunctate, semidull.

Pubescence silvery, short (mainly not longer and only twice longer on clypeus than hindocellar diameter), erect or semierect, most dense on clypeus.

Black; mandibular apical half, palpi, and tibial spurs brown.

Body length 7.0 mm, forewing length 4.5 mm.

DIAGNOSIS. From the ratio of the distance between the eyes at the vertex and at the level of clypeus *T. inopinatum* should be attributed to the species-subgroup *-figulus*, including *T. figulus* (Linnaeus, 1758), *T. medium* de Beaumont, 1945, and *T. minus* de Beaumont, 1945, but differs from these species by the apically bidentate clypeus and by distinctly longer first abdominal segment (ratio of length to maximum width = 3:1 instead of 2–2.5:1 in all the mentioned species). *Trypoxylon inopinatum* also differs from *T. figulus* by smaller body size, by the clypeus without distinct large punctures and by round, pitshaped hindcoxal organs. *T. inopinatum* differs from *T. medium* by the clypeus without long apical projection and with rounded lateral corners. *T. inopinatum* differs from *T. minus* by the absence of a shorn-like hook on

the antero-ventral margin of mesopleura. Finally, *T. inopinatum* differs from all members of the species-group *figulus* by the form of the first abdominal segment having almost straight lateral sides weakly and uniformly diverging from the base to apex, instead of concave anteriorly in other species.

DISTRIBUTION. Russia (Krasnodarsky kray: Lazarevskoye, Temryuk).

***Trypoxylon koreanum* Tsuneki, 1956**

Trypoxylon koreanum Tsuneki, 1956, ♂

= *Trypoxylon mowchowense* Tsuneki, 1981a, ♀

= *Trypoxylon okeanskayanum* Tsuneki, 1981a, ♀, ♂

MATERIAL. RUSSIA: 1♀, 3♂♂, Belgorod reg., Belgorod dist., vil. Pulyaevka, 10–12.07.2007 (Potanin) [ZMMU].

DISTRIBUTION. Russia: Primorskiy Kray (Adimi, Okeanskaya, Sutshan, Sedanka, Kongaus, Gornotayozhnoye, Poyma river, Ussuriyskiy reserve, Lazo, Lazovsky reserve, Anisimovka, Barabash-Levada, “Kedrovaya Pad” reserve), Sakhalin Island. China: Inner Mongolia (Dyn-yuan’-in, N Alashan’); Szechuan (Mowchow); Yunnan. Korea: Seoul.

Trypoxylon koreanum is mentioned from European Russia for the first time.

DISCUSSION. This species was discovered for the first time by V. Gussakovskij [1932] among the materials of the expedition of R. Malaise to the Far East and Kamchatka, but was mistakenly identified as *Trypoxylon varipes* Pérez, 1905. Later, it was mentioned under the same name in the revision of the Palaearctic species of the genus *Trypoxylon* [Gussakovskij, 1936].

Only 20 years later K. Tsuneki has described a separate species on two males from Korea under the name *T. koreanum* and included it into the key of the species from north-eastern Asia [Tsuneki, 1956]. After this *T. koreanum* was secondarily discovered in Russian Far East [Kazenas, 1980].

Next year K. Tsuneki has described two similar species — *T. mowchowense* Tsuneki, 1981a from China (Szechuan) and *T. okeanskayanum* Tsuneki, 1981a from the south of Primorskiy Kray. At the same time, *T. koreanum* has not been mentioned in any of his publication until 1981, when he has published the revision of the species of Japan and north-eastern Asia with additions to his original description of *T. koreanum* from Korea [Tsuneki, 1981b]. But in the generalizing paper, devoted to the “tentative grouping of the *Trypoxylon* species based upon the structure of the male genital organs” [Tsuneki, 1981c] only *T. koreanum* and *T. okeanskayanum* were mentioned as separate species from the species-group *pacificum*, because *T. mowchowense* was described on a female. It may seem strange, but none of the keys published by K. Tsuneki after 1956 includes *T. koreanum*.

Further comparative study of the type series of three mentioned species demonstrated that they were conspecific and the names *T. mowchowense* and *T. okeanskayanum* were synonymized with *T. koreanum* [Antropov, 1986, 1994]. At the same time, the compared materials mentioned by V. Gussakovskij in his revision [Gussakovskij, 1936] with the type specimen of *T. varipes* Pérez, 1905 demonstrated that all the females belonged to *T. koreanum* except the male from Irkutsk which belonged to *T. fronticornis* Gussakovskij, 1936 described in the same revision [Antropov, 1994]. Last specimen was erroneously mentioned as *T. koreanum* by P. Nemkov [2008], who also mentioned *T. koreanum* from Sakhalin Island [Nemkov, 2005] and erroneously from Japan (Honshu) [Nemkov, 2005, 2006, 2009, 2012]. Finally, T. Li & Q. Li [2010] have mentioned *T. koreanum* from southern China (Yunnan).

Finding of this species in European Russia is not unique as it reminds the case with *Crossocerus tyuzendzianus* Tsuneki, 1954, described on Honshu, and later found on Hokkaido [Nambu, 1972], mentioned from Russian Far East [Leclercq, 1988], and even discovered in the Natural-Historical Park "Bitsa forest" in the south-west of Moscow [Antropov, 1993] and later confirmed by the specimens from the National Park "Losinyi Ostrov" in the north-east of Moscow.

Both species are xylobiontes, who build their nests in abandoned borings of xylophagous insects in dry wood. Both species are relatively small, so that their detection is possible only upon the targeted collecting. We are sure, that in both cases there is no reason to assume disjunctive areals of glacial origin or accidental introduction from Primorskiy Krai with further acclimatization. The most likely cause is insufficient knowledge on the regions of southern Siberia, where finding of such species is possible.

Trypoxylon rubiginosum Gussakovskij, 1936

Trypoxylon rubiginosum Gussakovskij, 1936, ♀

= *Trypoxylon adzharicum* Antropov, 1984, ♂

MATERIAL. RUSSIA: 11♀, 5♂: Krasnodar reg., Gelendzhik distr., Krinitsa env. 44,400°N 38,316°E, forest stream, 6–13.IX.2009 (K. Tomkovich) [ZMMU].

DISTRIBUTION. Russia (Crimea: Alupka, Sosnovka (Angarskiy pereval), Zaprudnoye, Mezhor'ye, Crimean reserve; Krasnodar Krai: Sochi, Razdol'noye, Lazarevskoye, Gelendzhik, Krinitsa), Abkhazia (Gagra; Primorskoye), GEORGIA (Batumi, Tbilisi), Azerbaijan (Lenkoran').

DISCUSSION. The species was described on two females from Sochi [Gussakovskij, 1936]. *Trypoxylon adzharicum* Antropov, 1984 which was described later on males from Batumi (Georgia) was proved to be conspecific with *T. rubiginosum*, as it was confirmed by the comparative study of the types and also by direct observations on the nesting activity of *T. rubiginosum* females with subsequent rearing of the specimens of both sexes from the built nests [Antropov, 1989].

Occipital carina forming in its ventral corners a pair of widened flat lobes separated from the posterior surface of the head, and also sexual dimorphism expressed in reddish spots on abdominal tergites II–IV of females in contrast to completely black abdomen of males are the most characteristic peculiarity of this species differing it from other members of the species-group *clavicerum*.

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