



Ancistrocerus shibuyai (Yasumatsu, 1938), **stat. restit.** (Hymenoptera: Vespidae: Eumeninae), an overlooked trans-Palaeartic species

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Abstract

Ancistrocerus shibuyai (Yasumatsu, 1938), **stat. restit.** was hitherto considered a subspecies of *A. trifasciatus* (Müller, 1776) distributed in Russia (Eastern Siberia, Far East), Mongolia, China (North-East), Korean Peninsula, and Japan, while *A. trifasciatus trifasciatus* was known to have a nearly trans-Palaeartic distribution. Due to minor but distinct morphological differences between *A. shibuyai* and *A. trifasciatus*, the former one is hereby recognized as a separate species. Based on the extensive material examined, *A. shibuyai* is shown to be widely distributed in the boreal zone of the Palaeartic region; particularly, the species is recorded for the first time from Austria, Ukraine, European part of Russia, Urals, Western Siberia, and Kazakhstan. *Ancistrocerus trifasciatus* var. *moeschleri* Blüthgen, 1938, **syn. nov.** and *A. balticus* Budrys & Orlovskytė, 2023, **syn. nov.** are synonymized with *A. shibuyai*. Distribution and biology of both *A. shibuyai* and *A. trifasciatus* are briefly discussed. A lectotype is designated for *Odynerus trifasciatus orientalis* Kostylev, 1938.

Key words: eumenine wasps, cryptic species, fauna, taxonomy, new synonymy, lectotypification

Introduction

Ancistrocerus Wesmael, 1836 is one of the largest genera of the eumenine wasps. With 118 described species, this genus is native to most zoogeographical regions except the Australian (You *et al.* 2013; Piekarski *et al.* 2017; Budrys *et al.* 2023; Fateryga *et al.* 2023). Most species of this genus nest in preexisting cavities and divide them into cells with mud partitions but seven species are known to construct aerial mud nests attached to stones (Iwata 1938; Blüthgen 1961; Krombein 1967; Spradbery 1973; Cowan 1991; Buck *et al.* 2008). Another species, *A. tuberculocephalus* (de Saussure, 1852), is able to enlarge and modify preexisting cavities (Cooper 1979). *Ancistrocerus* is one of a few genera of Eumeninae, which are species-rich and abundant in temperate regions of the Palaeartic and the Nearctic region (Blüthgen 1961; Krombein 1979; Yamane 1990; Buck *et al.* 2008; Kim 2013; Antropov & Fateryga 2017; Buyanjargal *et al.* 2017; Budrys *et al.* 2023). There are no Holarctic species (Fateryga *et al.* 2023), but several representatives of the genus are distributed through the whole temperate zone of either Eurasia or North America. One of such species is *A. trifasciatus* (Müller, 1776). Two subspecies of this species were hitherto formally recognized: *A. trifasciatus shibuyai* (Yasumatsu, 1938), distributed in Russia (Eastern Siberia, Far East), Mongolia, China (North-East), Korean Peninsula, and Japan (Kurzenko 2004; Giordani Soika 1986; Yamane 1990; Gusenleitner 1991; Kim & Yamane 2009), and *A. trifasciatus trifasciatus* with a nearly trans-Palaeartic distribution but described from Western Europe (Müller 1776).

Ancistrocerus shibuyai was described from Japan (Yasumatsu 1938, as *Odynerus shibuyai*), as a species similar to *A. densepilosellus* Cameron, 1911. In the same year, two subspecies of *A. trifasciatus* were described: *A. trifasciatus orientalis* (Kostylev 1938, as *O. trifasciatus orientalis*; later replaced with *A. trifasciatus kostylevi* by van der Vecht & Fischer 1972) from Russia (Primorskiy Territory) and *A. trifasciatus moeschleri* from the border between modern

Schulthess 1887–1897; Berland 1928; Benno 1957; Blüthgen 1961; Scobiola-Palade 1989; Pekkarinen & Huldén 1991; Schljachtenok & Gusenleitner 1996; Schneider 1997; Gusenleitner 2008; Amolin 2009; Archer 2011; Budrys *et al.* 2023), although some of its records may actually refer to *A. shibuyai*. Also known from Italy (Bonelli 1970; Selis 2023) and Turkey (Giordani Soika 1970; Yildirim & Gusenleitner 2012).

Discussion

Although the morphological differences between *A. shibuyai* and *A. trifasciatus* are minor, they are distinct. Due to these differences, *A. shibuyai* is definitely a separate species and not a subspecies of *A. trifasciatus*. Moreover, these two species are strongly distinct genetically (Budrys *et al.* 2023). Based on the extensive material examined, *A. shibuyai* is shown to be widely distributed through nearly the whole boreal zone of the Palaearctic region. Since there are no distinct morphological differences between *A. shibuyai* and *A. balticus* and there is actually no gap between their distributional ranges, the latter nominal species is hereby synonymized with the former one, as well as with *A. trifasciatus moeschleri*. *Ancistrocerus shibuyai* is distributed in the boreal zone of the Palaearctic region largely in sympatry with *A. trifasciatus*. However, *A. trifasciatus* penetrates deeply to more southern territories where it occurs in the mountains (e.g., Crimean Mountains, the Caucasus, and Tian Shan within Kyrgyzstan and Kazakhstan), and where *A. shibuyai* is apparently not distributed. Besides, *A. shibuyai* is not found in the north of European Russia, where *A. trifasciatus* is present (Fig. 3).

In Europe, *A. trifasciatus* is common in trap nests (Tschardt *et al.* 1998; Kruess & Tschardt 2002; Budrienė *et al.* 2004; Gaston *et al.* 2005; Budrys *et al.* 2009; Holzschuh *et al.* 2009; Ebeling *et al.* 2011; Ivanov *et al.* 2019; Klaus *et al.* 2023) and its biology is studied in detail, including nesting (Fitch 1879; Höppner 1909; Enslin 1921; Nielsen 1932; Jørgensen 1942; Benno 1957; Bonelli 1970; Budrys *et al.* 2010, 2023), prey records and predatory behavior (Blüthgen 1961; Budrienė & Budrys 2005a, b; Budrys & Budrienė 2012; Budrys *et al.* 2023), nest parasites (Höppner 1913; Jørgensen 1942; Holzschuh *et al.* 2009; Pärn *et al.* 2015; Paukkunen *et al.* 2015; Budrys *et al.* 2023), mating (Budrienė & Budrys 2007), and flower-visiting records (Alfken 1915; Blüthgen 1961; Haeseler 1978a, b; Schneider & Feitz 2001; Amolin & Ogol 2019; Fateryga 2020). Taking into account the present results, some of these reports may actually refer to *A. shibuyai*. Biology of *A. shibuyai* is very similar to that of *A. trifasciatus*. For example, both species construct nests with mean number of cells of 4.1 in Lithuania (Budrys *et al.* 2023). According to Hisamatsu (2002), the mean number of cells per nest of *A. shibuyai* in Japan is 2.8 but these data were based on 12 nests only. Shibuya (1938), however, reported that most nests were one-celled but those nests were apparently made in very short cavities (cf. Shibuya 1938: fig. 2). The mean number of cells per nest of *A. trifasciatus* in Crimea is 3.9 (Fateryga, unpublished data based on 16 nests). Both *A. shibuyai* and *A. trifasciatus* have similar prey diversity and nest parasites (Budrys *et al.* 2023). However, the report on the biology of *A. shibuyai* in Japan by Shibuya (1938) is noteworthy. This author described a closing plug of the nest consisted of two layers: the inner one made of mud and the outer one made of resin. Such a construction is not typical of the genus *Ancistrocerus* as a whole. Besides this, Shibuya (1938) reported that the species was univoltine and this is in contradiction even with the observations on the development of this species by Hisamatsu (2002), also from Japan. Thus, we can speculate that Shibuya (1938) might actually deal with nests of more than one species so that the observations were mixed.

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