



## FIRST RECORD OF *STRUMIGENYS BAUDUERI* (EMERY, 1875) (HYMENOPTERA: FORMICIDAE) IN SLOVAKIA

Adrián PURKART<sup>1</sup>, Lukáš JANCÍK<sup>2</sup>

<sup>1</sup>Comenius University Bratislava, Faculty of Natural Sciences, Department of Zoology, Mlynská dolina, Ilkovičova 6, 842 15 Bratislava, Slovakia; e-mail: purkart.adrian@gmail.com

<sup>2</sup>Keblianska 374/38, 020 01 Streženice, Slovakia; e-mail: lukas.jancik.857@gmail.com

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**Abstract:** The ant genus *Strumigenys* F. Smith, 1860 is characterized by tiny body size, distinctive cephalic morphology, and a cryptic, predominantly soil-dwelling lifestyle. In this study, we report the first confirmed record of *Strumigenys baudueri* (Emery, 1875) from the Cerová vrchovina Highlands in southern Slovakia. The initial detection of a male in 2023 prompted intensified sampling efforts, which subsequently led to the discovery of a worker specimen in 2024, thereby confirming the presence of a local colony. The Jesenské-Bárta site currently represents the northernmost known locality of this species in Europe. Key morphological differences between males of *S. baudueri* and *S. argiola* are briefly outlined.

**Key words:** soil fauna, cryptic ant, Central Europe, new species, Attini

## INTRODUCTION

Knowledge of the Slovak myrmecofauna is continuously expanding, with new taxa regularly documented across this geomorphologically diverse Central European region. This trend is strongly influenced by the application of diverse sampling techniques (PURKART et al. 2021), the exploration of previously under-surveyed habitats (JANCÍK 2024), and the progressive northward spread of thermophilic species (PURKART & REPTA 2022). Among the ant taxa whose detection requires a more complex methodological approach are undoubtedly species of the genus *Strumigenys* F. Smith, 1860. This genus contains minute Attini ants, characterized by extremely small body size (most < 4 mm), a specific head shape, and a cryptic, predominantly soil- and litter-dwelling lifestyle. To date, only a single species has been confirmed from Slovakia – *Strumigenys argiola* (Emery, 1869). Owing to its small size (workers < 2 mm) and strict cryptobiotic habits, *S. argiola* is widely considered to be under-recorded (SEIFERT 2018), which likely explains why its first documented findings in Slovakia are relatively recent (DEVÁN 2008; PURKART et al. 2021).

Another species present in Central Europe is *Strumigenys baudueri* (Emery, 1875). Similar to *S. argiola*, it is a small-bodied predator that forages primarily in the soil and leaf litter horizons. Because of its highly inconspicuous mode of life, its bionomics remain poorly understood, though available evidence suggests broad ecological parallels with *S. argiola*. The literature reports its occurrence in open grasslands, deciduous woodlands, and various types of urban greenery, predominantly at elevations below 500 m a.s.l. (ARCOS & GARCÍA 2023). With a distribution extending from Morocco to Armenia (GUÉNARD et al. 2017), the species also occurs in several northern parts of its range, including Bulgaria (BEZDĚČKA & BEZDĚČKOVÁ 2010), Romania (MARKÓ 2008), Croatia (BRAČKO 2006), Hungary (GALLÉ et al. 1998), South Tyrol (NALINI et al. 2024), and Switzerland (BARONI URBANI 1998). Here, we present the first confirmed record of *S. baudueri* in Slovakia, based on material collected in the Cerová vrchovina Highlands.

## MATERIAL AND METHODS

Ant specimens were obtained during routine arthropod sampling conducted in sites inhabited by the European ground squirrel (*Spermophilus citellus* (Linnaeus, 1766)) within the Cerová vrchovina Highlands. These surveys form part of the monitoring of ongoing nature conservation activities implemented under the LIFE19 NAT/SK/000895 project. Arthropods were primarily sampled using 500 ml entomological pitfall traps with a seven-centimetre opening diameter. Traps were filled with a 3 % formaldehyde solution.

To complement pitfall trapping, occasional soil samples were collected to examine the soil mesofauna in detail; similarly, individual epigeic arthropods were hand-collected when encountered. All material was sorted to higher taxonomic groups, and specific specimens of the family Formicidae were identified to the species level using the relevant literature (BERNARD 1968, HERVÉ 1969, MARKÓ 2008, SEIFERT 2018, NALINI et al. 2024). Photographs of the examined individuals were taken using an Olympus E-PL6 camera body, a super macro camera lens Yasuhara Nanoha x5, an Olympus STF-8 macro flash with diffusers, and a BlueStack automatic system for the creation of focus-bracketed photos. These were focus-stacked using Helicon Focus software (version 8.1.0), and later post-processed using Adobe Lightroom Classic version 12.3. All ant specimens were preserved in 99 % pure ethanol and subsequently deposited in the private entomological collection of Lukáš Jancík.

## RESULTS AND DISCUSSION

S Slovakia: Jesenské-Bárta (48°17'27"N, 20°3'58"E, 208 m asl, Fig. 1), 22.8.-27.9.2023, *Strumigenys baudueri*, 1♂ (Fig. 2A), leg. A. Purkart det. et coll. L. Jancík; pitfall trapping on a west-facing slope with low xerophilous vegetation.

S Slovakia: Jesenské-Bárta (48°17'27"N, 20°3'58"E, 208 m asl, Fig. 1), 7.8.-4.9.2024, *Strumigenys baudueri*, 1♀ (Fig. 2B), leg. A. Purkart det. et coll. L. Jancík; pitfall trapping on a west-facing slope with low xerophilous vegetation, same spot as first record.

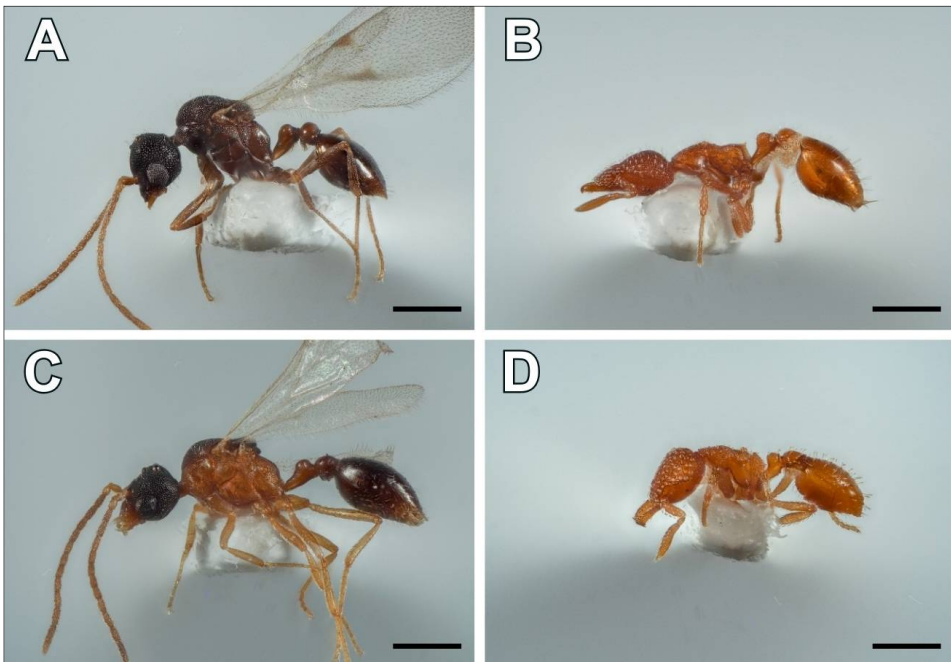


**Fig. 1.** The spring landscape of Jesenské-Bárta, consisting of pastures with patches of xerophilous vegetation, is a habitat not only for *Strumigenys baudueri*, but also for European ground squirrels. Photo: Adrián Purkart

Based on the material examined in this study, the checklist of free-living ant species known from Slovakia has been expanded to 121 taxa. The record itself is unsurprising, given that the species is widespread in neighbouring Hungary, with the state border lying less than 10 km from the sampling locality. *Strumigenys baudueri* is a minute ant species whose alates are presumed to be wind-dispersed; however, available observations suggest that dispersal distances from natal nests are typically limited (PURKART et al. 2021, JANCÍK 2024). For this reason, following the initial detection of a single male at the site, sampling intensity was increased and additional methods were used to obtain worker material. The

discovery of a worker specimen collected via pitfall trapping in 2024 confirmed the presence of a colony. Even more collection methods were used; both samples were detected only by pitfall trapping.

The identification of individuals was performed using available literature, which, however, mostly focuses on the description of workers and gynes, while males are described only very superficially. In Slovak specimens, males of *S. baudueri* and *S. argiola* (three specimens from Slovakia; Jancík, unpublished data) differ in various morphological traits (Fig. 2). While the thorax of *S. argiola* individuals appears yellowish-red in lateral view, the *S. baudueri* male is brown. The similar darker appearance of *S. baudueri* is clearly visible in the brownish petiole and postpetiole. Differences are also present in the pubescence on the dorsum of the thorax, where *S. argiola* males show no erect setae, with only shorter decumbent or suberect setae. In contrast, *S. baudueri* has a few long and erect setae. Pilosity of the abdominal tergites likewise differs: *S. argiola* shows predominantly short decumbent to suberect setae, whereas *S. baudueri* exhibits clearly visible long, erect setae. The male of *S. baudueri* also possesses a distinct ventral protrusion on both the petiole and postpetiole, a structure entirely absent on the petiole and smaller on the postpetiole of *S. argiola*. To refine the



**Fig. 2.** Comparison of two species of the genus *Strumigenys* from Slovakia: *S. baudueri* male (A) and worker (B) collected in Jesenské-Bárta (this study); *S. argiola* male (C) and worker (D) (specimens from Slovakia; Jancík, unpubl. data). Scale 0.5 mm.

diagnostic characters separating these two species, additional material, particularly males of both taxa, will be required for later studies. Future work should therefore focus on targeted sampling and detailed comparative morphological analyses of *Strumigenys* specimens across its distributional range.

According to current knowledge, the Jesenské-Bárta represents the northernmost known locality of *S. baudueri* in Europe. In contrast, *S. argiola* has been recorded substantially further north, suggesting greater tolerance of colder climatic conditions. The habitat at the sampling site consists of grassland and shrub-dominated vegetation developed over a basic substrate. Vegetation height at the pitfall locality ranged from approximately 15 to 30 cm and is subject to periodic disturbance caused by grazing, primarily by sheep. By comparison, Slovak records of *S. argiola* originate from both natural and synanthropic habitats (PURKART et al. 2021, JANCÍK 2024). Whether *S. baudueri* occupies a similar range of habitats remains unclear, and the nest structure associated with this species has not yet been studied either (MARKÓ 2008, SEIFERT 2018, NALINI et al. 2024). Further sampling will therefore be necessary to clarify its ecological preferences and the other details about its bionomics.

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## SÚHRN

Prieskum článkonožcov suchomilných travinno-bylinných spoločenstiev v Cerovej vrchovine na lokalite v chotári obce Jesenské (miestna časť Bárta) priniesol objav nového druhu mravca pre faunu Slovenska. V poradí 121. voľne žijúcim druhom je *Strumigenys baudueri*, ktorý ako typický zástupca tohto rodu dosahuje veľmi malú veľkosť (do 2 mm). Kryptický spôsob života a tvorba málopočetných eusociálnych spoločenstiev sťažuje jeho detekciu, čím je po stránke bionómie veľmi podobný druhu *Strumigenys argiola*. Ten je z územia Slovenska známy necelé dve dekády. Prvý nález *S. baudueri* pochádza z druhej polovice leta 2023, kedy bol v materiáli zo zemných pascí objavený jeden samec. To podnietilo rozšíriť výskum o ďalšie metódy zberu v snahe nájsť kastu robotníč. To sa napokon o rok neskôr podarilo v podobe jedného exempláru, ktorý potvrdil prítomnosť funkčného hniezda na tejto lokalite. Kým determinácia robotníč *S. baudueri* je možná na základe dostupných kľúčov, komplexnejší opis samcov rodu *Strumigenys* v literatúre chýba. Vizuálne dobre odlíšiteľné charakteristiky medzi samcami *S. baudueri* a *S. argiola* sú preto načrtnuté v diskusii.