

## ***Dicranomyia (Idiopyga) nigristigma* NIELSEN, 1919 (Diptera, Limoniidae) recorded for the first time from calcareous springs in Romania**

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**Summary:** *Dicranomyia (Idiopyga) nigristigma* NIELSEN, 1919 (Diptera, Limoniidae) is recorded for the first time from Romania. The species was collected in some calcareous springs in the Apuseni Mountains and highlight an overlooked Limoniidae diversity in similar habitats from the karstic area from here.

**Rezumat:** *Dicranomyia (Idiopyga) nigristigma* NIELSEN, 1919 (Diptera, Limoniidae) este semnalată pentru prima dată din România. Specia a fost colectată de-a lungul unor izvoare calcaroase din Munții Apuseni, și evidențiază o biodiversitate a Limoniidelor încă neexplorată din ecosistemele carstice de la noi.

**Key words:** Limoniidae, Diptera, new record, the Carpathians.

### **Introduction**

*Idiopyga* SAVCHENKO, 1987 is a subgenus of the species-rich genus *Dicranomyia* STEPHENS, 1829, separated from all other representatives of the genus because of the unusually complex hypopygium of the males (SAVCHENKO 1987). In present a number of 27 species and subspecies were recorded from this subgenus in the Holarctic area. However, few individual species should have rather restricted distribution (OOSTERBROEK 2021). A number of 19 species and subspecies are present in Europe, with relatively few species (only six) restricted to the continental spring fens or marshy habitats at different altitudes. The rest of the species (13) has larger distribution from the western Palearctic to the Nearctic regions (OOSTERBROEK 2021).

Records of *Idiopyga* species in Romania are rather sporadically. The first record of *Dicranomyia (Idiopyga) stigmatica* (MEIGEN, 1830) was published in 1986 from the northern part of the Eastern Carpathians (Valea Putnei, Rarău-Giumalău Mountains) by ERHAN in 1986 and cited later by various sources (ex. UJVÁROSI 2007). Later a new country record of the species was added from a marshy area around Voslobeni (Gheorgheni Depression, the Eastern Carpathians) (UJVÁROSI *et al.* 2011). Quite recently, new distribution data was recorded for *Dicranomyia (Idiopyga) alpina* BANGERTER, 1948, swept from marshy vegetation near a high-altitude lake from the Eastern Carpathians, the Iezer Lake, at 1735 m a.s.l. (Călimani Mountains) (KOLCSÁR *et al.* 2021).

### **Material and methods**

The two male specimens were collected both in the Apuseni Mountains around some calcareous spring fens: 1 male, Bihor Mts., Valea Drăganului, Cîrpa spring complex, 1050 m a.s.l., 46.693° N, 27.675° E, 10<sup>th</sup> October, 2021 (leg. A. DÉNES); 1 male, Gilău Mountains, Valea Someșului Cald, spring fen near Smida, 1023 m a.s.l., 46.643° N, 22.876° E, 26<sup>th</sup> September, 2021 (leg. L. KERESZTES). Diptera materials were collected using sweep net and searching the hygrophilous vegetation near springs and brooks. Individuals of *D. (I.) nigristigma* were preserved dry (one male) and in ethanol 95% (one male) in the reference Diptera collection of Faculty of Biology and Geology (DCFGB), Babeș-Bolyai University, Cluj Napoca, Romania.

High resolution photos of the wings were taken with a stereomicroscope (Olympus SZ51) equipped with a digital camera in dark and white background (Canon EOS 750D). Photos of the male hypopygium and details of some genital structure were taken in glycerol without coverslip using a compound microscope (Olympus CX23) with a high-resolution camera (Canon EOS 750D). As for stacking software, we used Zerene Stacker software. Male genitalia was left overnight in 10% potassium hydroxide (KOH) and for one hour in undiluted glacial acetic acid, to neutralise and wash out the soap that was created from the soft tissues. The male genitalia was then transferred to a larger amount of glycerol to wash out the acid. Afterwards, they were transferred to a drop of glycerol on a slide with rounded excavation. The

genitals were dissected, the parts were oriented using the stereomicroscope, and then the slide was carefully transferred to the compound microscope for the taking of photos. Stacking results in general consist of 5-10 single exposures with the stereomicroscope and of 10-50 exposures with the compound microscope.

## Results

*Dicranomyia (Idiopyga) nigristigma* NIELSEN, 1919 is recorded for the first time for the Limoniidae fauna of Romania.

The two male individuals were collected as part of a monitoring project focusing on the biodiversity and distribution of aquatic insects in springs and headwaters from the Apuseni Mountains, Romania, collecting both adults and larvae of a large number of other aquatic invertebrate taxa.

Male individuals were identified using reference literature sources (THOMAS 1972, MENDEL 1985, PODENAS *et al.* 2006). Right wing and details in the male hypopygium of specimen collected from a marshy spring near Smida, Someșul Cald River area, the Apuseni Mountains is presented in fig. 1.

A map with known distribution data on *D. (Idiopyga)* from Romania is presented in fig. 2.

## Discussion

*Dicranomyia (Idiopyga) nigristigma* is similar to the close related *D. (Idiopyga) stigmatica*, but separable based on the conspicuous black spot on

the wings and details in the male genital parts (fig. 1). However, the two species are ecologically highly distinct. *D. (I.) nigristigma* is confined to shaded calcareous seepages or peat bogs in the woodland area, where the semiaquatic larvae live mostly in mosses (STUBBS 2003). In Romania, the two individuals were collected in similar habitats, the spring sectors of the rivers Someșul Cald and Valea Drăganului are abundant in calcareous springs with peat bogs and marshy margins. In contrast, *D. (I.) stigmatica* avoid calcareous waters, recorded from the exclusively acid environment (Voșlobeni, După Luncă Marsch and from the Putna valley, both the Eastern Carpathians), with predominated volcanic rocks (ERHAN 1986, UJVÁROSI 2007, UJVÁROSI *et al.* 2011).

Diptera fauna of spring fens in Romania is poorly investigated. However, data on different rare or endemic Tipuloidea species (Tipulidae, Limoniidae, Pediciidae) with aquatic development stages in the karstic area of the Apuseni Mountains, suggests that these habitats are of high conservation value (DENES *et al.* 2016). During our investigation, a number of other habitat specialist Tipuloidea species were collected, too, together with *D. (I.) nigristigma*. These species belongs to Tipulidae family, like *Tipula (Savchenkia) alpha* DE JONG, 1994, *T. (Platytipula) luteipennis* MEIGEN, 1830. Similar habitat specialist Limoniidae species were also collected here, like *D. (Melanolimonia) morio* (FABRICIUS, 1787).

*Dicranota (I.) nigristigma* is an early autumn species. The fact that the species was collected in falls, together with a large number of other rare

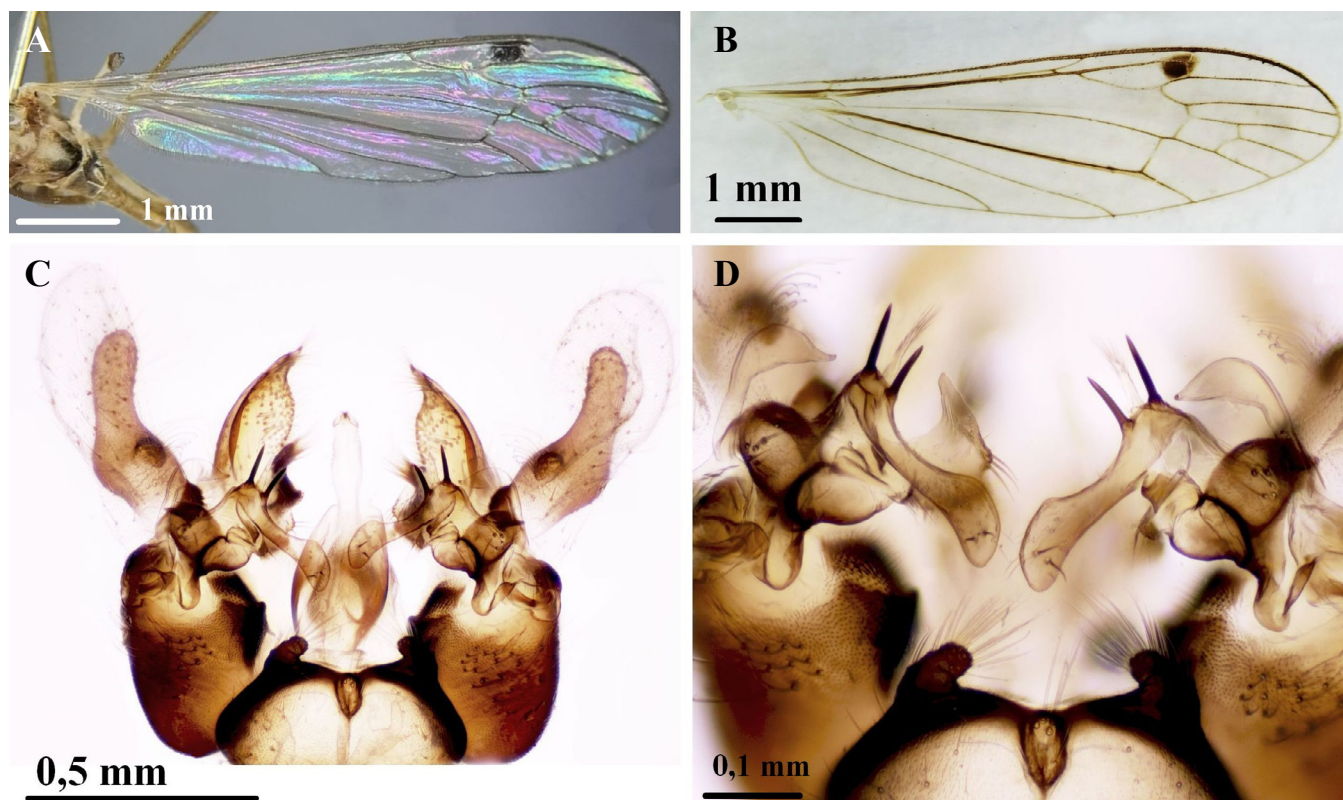


Fig. 1. *Dicranomyia (Idiopyga) nigristigma*, male. A. Right wing with wing interference in black background. B. Same wing with white background. C. End of the abdomen, dorsal, with genital appendages. D. Male genitalia, dorsal, details.

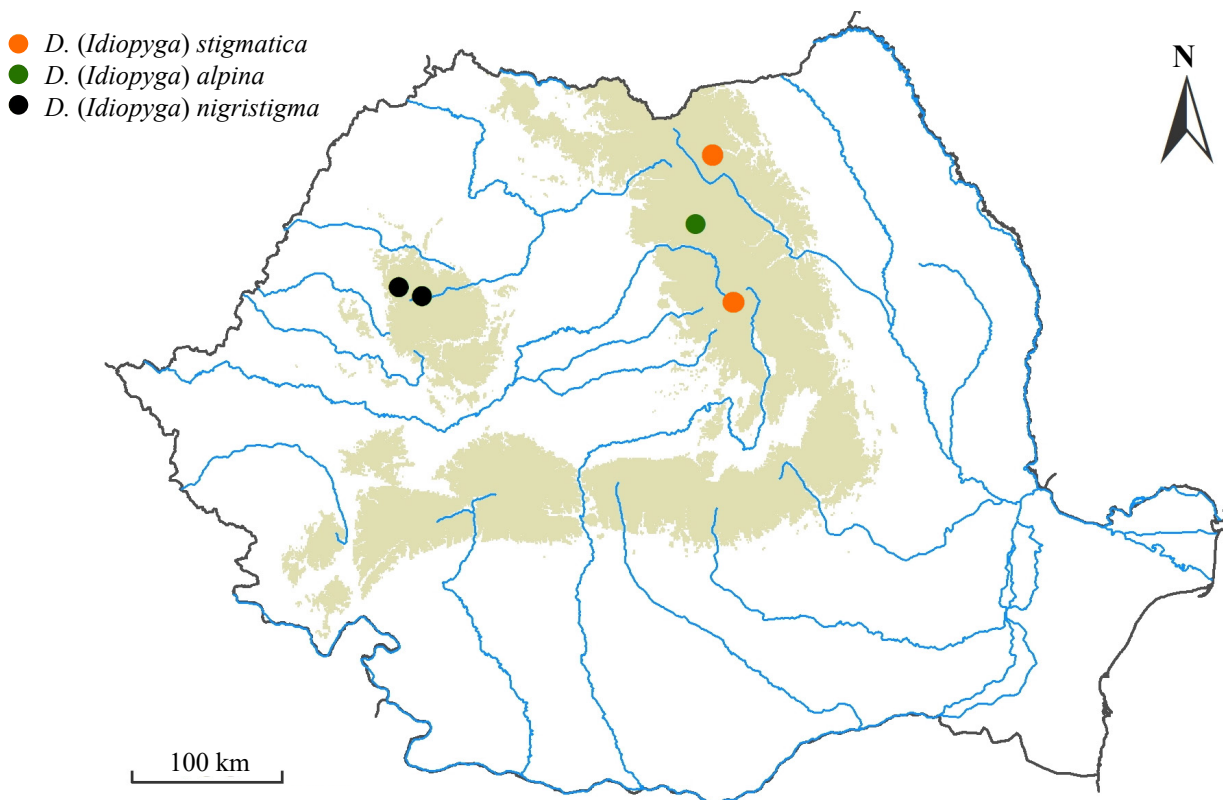


Fig. 2. Known distribution of the subgenus *D. (Idiopyga)* in Romania. Black dots – new additions; orange and green dots – literature data.

Tipuloidea species in Romania, suggest the presence of an important underestimated Tipuloidea diversity from here. It is necessary for the future to intensify several autumnal collecting campaigns, including large number of similar habitats to detect the real distribution of the species in Romania.

### Conclusions

*D. (I.) nigristigma* was recorded for the first time in Romania. However, the presence of this habitat specialist taxa in the Apuseni Mountains is of high conservative value. These vulnerable habitats are at increasing risk due to intensive deforestation and uncontrolled water supply from these springs, required by the increasing tourist activity in the area.

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