GEA, FLORA ET FAUNA

New *Dicranomyia* (*Glochina*) (Diptera: Limoniidae) from Catalonia, north-eastern Iberian Peninsula

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Abstract

A new species of Limoniinae (Diptera: Limoniidae), *Dicranomyia* (*Glochina*) *collserolae* n. sp., is described. This is the seventh species of this subgenus recorded from the Iberian Peninsula and was discovered in the Serra de Collserola Natural Park, a protected area near the city of Barcelona (Catalonia). *Dicranomyia* (*G.*) *collserolae* n. sp. is characterized by the following features: general coloration grey to dark grey, silvery pruinose; thorax with four, brownish-grey longitudinal stripes on prescutum; wings subhyaline to pale brownish; male with yellowish-brown hypopygium with two rostral bristles on mid-dorsal part of rostrum of inner gonostylus. A key is provided for separating the seven species of *Dicranomyia* (*Glochina*) now known to be present in the Iberian Peninsula and Balearic Islands.

Key words: Limoniinae, Tipuloidea, Craneflies, Spain, Barcelona, Collserola.

Resum

Nova Dicranomyia (Glochina) (Diptera: Limoniidae) de Catalunya, nord-est de la Península Ibèrica

Es descriu una nova espècie de Limoniinae (Diptera: Limoniidae), *Dicranomyia* (*Glochina*) *collserolae* n. sp. Aquesta és la setena espècie d'aquest subgènere registrada en la Península Ibèrica i va ser descoberta al Parc Natural de la Serra de Collserola, una àrea protegida prop de la ciutat de Barcelona (Catalunya). *Dicranomyia* (*G.*) *collserolae* n. sp. es caracteritza pels següents caràcters: coloració general grisa a grisa fosc, pruinoso platejat; tòrax amb quatre franges longitudinals de color gris brunenc en el prescutum; ales subhialinas a marró pàl·lid; mascle amb hipopigio marró groguenc, amb dues espines rostrals en la part dorsal mitjana del rostre del gonostilo intern. Es proporciona una clau il·lustrada per a separar les set espècies de *Dicranomyia* (*Glochina*) que ara es registren de la Península Ibèrica i les Illes Balears.

Paraules clau: Limoniinae, Tipuloidea, Craneflies, España, Barcelona, Collserola.

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Introduction

The Limoniidae Rondani, 1856 are among the largest families of Diptera and consists of around 10,700 recognized species (Oosterbroek, 2023). *Dicranomyia* Stephens, 1829 is a large genus within the Limoniidae, with 1,157 species and subspecies described worldwide. It is represented in the Palearctic by 196 species and subspecies distributed into 10 subgenera, 94 of which are present in Europe in six subgenera (Oosterbroek, 2023). Currently, 20 species belonging to the subgenus *Glochina* Meigen, 1830 are known from the Palearctic and six from the Iberian Peninsula and Balearic Islands: *Dicranomyia* (*Glochina*) *bangerteri* (Mendl, 1974), *Dicranomyia* (*G.*) *mediterranea* Lackschewitz, 1942, *Dicranomyia* (*G.*) *pauli* Geiger, 1983, *Dicranomyia* (*G.*) *sericata* (Meigen, 1830), *Dicranomyia* (*G.*) *staryi* Geiger & Mendl, 1994 and *Dicranomyia* (*G.*) *tristis* (Schummel, 1829). A subgeneric description of *Glochina* is provided by Podenas *et al*. (2019).

Since 2009, the systematic studies of the Tipuloidea performed in the Serra de Collserola Natural Park, which borders on the city of Barcelona, have generated a modest list of Limoniidae species that increases almost every year (Mederos, 2018; Mederos *et al*., 2014, 2019; Mederos & Eiroa, 2016, 2017; Mederos & Zaragoza, 2017). The new species described in the present work brings to six the species of the subgenus *Glochina* known from Iberian Peninsula (seven species from Spain including the Balearic Islands). An identification key for the males of these seven species is presented here, based primarily on the characters of the hypopygium (Fig 1).

Material and methods

This study is part of a long-term project of the Insecta fauna present in the Serra de Collserola Natural Park (Barcelona province), a natural area of more than 8,000 ha that forms

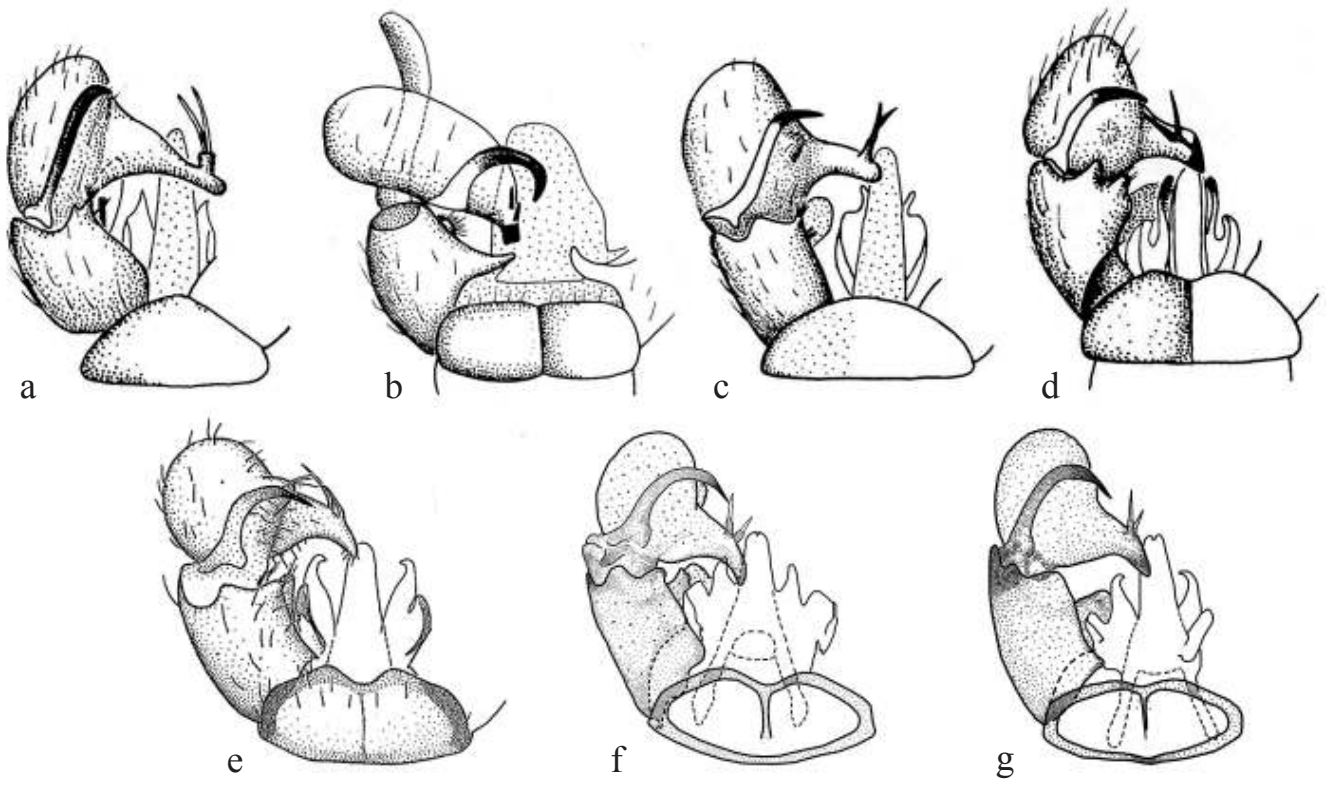

Figure 1. Hypopygium of the *Dicranomyia* (*Glochina*) species present in the Iberian Peninsula and Balearic Islands: a) *Dicranomyia* (*Glochina*) *tristis* (Schummel, 1829); b) *Dicranomyia* (*G.*) *sericata* (Meigen, 1830); c) *Dicranomyia* (*G.*) *pauli* Geiger, 1983; d) *Dicranomyia* (*G.*) *bangerteri* (Mendl, 1974); e) *Dicranomyia* (*G.*) *staryi* Geiger and Mendl, 1994; f) *Dicranomyia* (*G.*) *mediterranea* Lackschewitz, 1942 and g- *Dicranomyia* (*G.*) *collserolae* n. sp.; a–d) after Geiger, 1986; e) after Geiger & Mendl, 1994).

part of the mountains of the Catalan Coastal Range (Fig 2). With a maximum altitude of 512 m a.s.l., Collserola is isolated from the rest of this range and is bordered to the south by the city of Barcelona and the Mediterranean Sea. Although it is a largely forested area, there are a significant number of different habitat units that are typical of Mediterranean landscape mosaics. The climate of Collserola is Mediterranean and fairly stable throughout the site (14.4 °C average annual temperature and 619 mm annual rainfall), although with small local variations (microclimates) due to orientation, altitude, exposure to winds and forest cover, among other factors.

The specimens were sampled with a net on the grass and in low vegetation along the margins of a path near the park's biological station (Can Balasc), in a north-facing Mediterranean mixed forest environment. The description of this new species is based on dry-mounted specimens, although part of the type material is preserved in 70% ethanol. Specimens were examined with a Motic SMZ-168 Zoom stereo microscope and a Kyowa Unilux-12 83-483D. Images were taken by multi-stack with iPhone 11 and subsequently processed with Helicon Focus 8. Measurements were made with an ocular reticule. The male and female genitalia were macerated in a 4 % KOH solution and preserved in microvials in glycerin, together with the respective specimens. For classification, we followed Starý (1992) and also used the Catalogue of the Craneflies of the World (Oosterbroek, 2023), which includes *Dicranomyia* within the subfamily Limoniinae, family Limoniidae. The morphological terminology mainly follows that of Gelhaus (2009) and Cumming & Wood (2017). The terminology of the wing venation is adopted from de Jong (2017).

The specimens are housed in the Barcelona Natural Sciences Museum (MCNB), Barcelona, Catalonia. Full rectangular white labels are given for each type specimen. An inventory number starting with the initials MZB (former acronym Museum of Zoology of Barcelona) is attached to each specimen and the corresponding data have been entered into the respective collection database http://zoologiaenlinia.museuciencies.cat.

Abbreviations

Wing venation

A_1 = anal vein; CuA, CuP = cubital veins; dm = discal medial cell; M_3, M_4 = medial veins; m–cu = medial-cubital crossvein, r–m = radial-medial crossvein; Rs, R_1, R_2, R_{2+3+4}, R_4, R_5 = radial veins; Sc = subcostal vein.

Abdomen

st 8 = sternite; tg 8, tg 9, tg 10 = tergites.

Hypopygium

aed = aedeagus; epand = epandrium; goncx = gonocoxite; i

Figure 2. Location of the Serra de Collserola Natural Park: a, b) in Catalonia (NE Iberian Peninsula). *Dicranomyia* (*Glochina*) *collserolae* n. sp. male specimen; c) and type locality; d) at the time of sampling, near the park's biological station.

gonst = inner gonostylus; o gonst = outer gonostylus; pm = paramere; rst spn = rostral spine.

Ovipositor

cerc = cercus; hyp vlv = hypogynial valve.

Identificaction key for *Dicranomyia (Glochina)* species present in the Iberian Peninsula and Balearic Islands (males only)

1 Inner gonostylus with poorly projecting rostrum in an almost transversal position relative to the gonocoxite (Fig 1b) ..... *D.* (*G.*) *sericata* (Meigen, 1830)
– Inner gonostylus with well-developed rostrum and in common shape 2
2 Outer gonostylus almost straight, slightly curved apically 3
– Outer gonostylus progressively hook shaped 4
3 Outer gonostylus almost completely dark brown to black in colour; inner gonostylus with clearly projecting rostrum as long as main body of inner gonostylus (Fig 1a) ..... *D.* (*G.*) *tristis* (Schummel, 1829)
– Outer gonostylus blackened apically, curved in its apical quarter; inner gonostylus with rostrum projecting just under half the length of the main body of the inner gonostylus (Fig 1c)..... *D.* (*G.*) *pauli* Geiger, 1983
4 Rostrum of inner gonostylus with two rostral spines originating separately 5
– Rostrum of inner gonostylus with two rostral spines originating from almost the same basal point 6
5 Rostrum of inner gonostylus and parameres blackened apically (Fig 1d) ..... *D.* (*G.*) *bangerteri* (Mendl, 1974)
– Rostrum of inner gonostylus and parameres not blackened (Fig 1e) ..... *D.* (*G.*) *staryi* Geiger and Mendl, 1994
6 Wing venation with Sc ending beyond the origin of Rs (Fig 3b); outer gonostylus curved along its whole length (Fig 1f)..... *D.* (*G.*) *mediterranea* Lackschewitz, 1942
– Sc ending opposite the origin of Rs (Fig 3a); outer gonostylus almost straight in its basal two thirds but curved in its apical third (Fig 1g) ..... *D.* (*G.*) *collserolae* n. sp.

Results

Order Diptera Linnaeus, 1758
Family Limoniidae Rondani, 1856
Subfamily Limoniinae Rondani, 1856
Genus *Dicranomyia* Stephens, 1829
As genus. Type species: *Limnobia modesta* Meigen, 1818 (designation: Coquillett, 1910).
Subgenus *Dicranomyia* (*Glochina*)
As genus. Type species: *Glochina sericata* Meigen, 1830 (designation: Rondani, 1856).
Dicranomyia* (*Glochina*) *collserolae n. sp. (Figs 2c; 3a, c, d; 4b, d, f; 5)

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Differential diagnosis

General coloration grey to dark grey, silvery pruinose. Antenna dark grey, terminal flagellomere longer than the penultimate. Thorax grey to dark grey, silvery pruinose. Prescutum

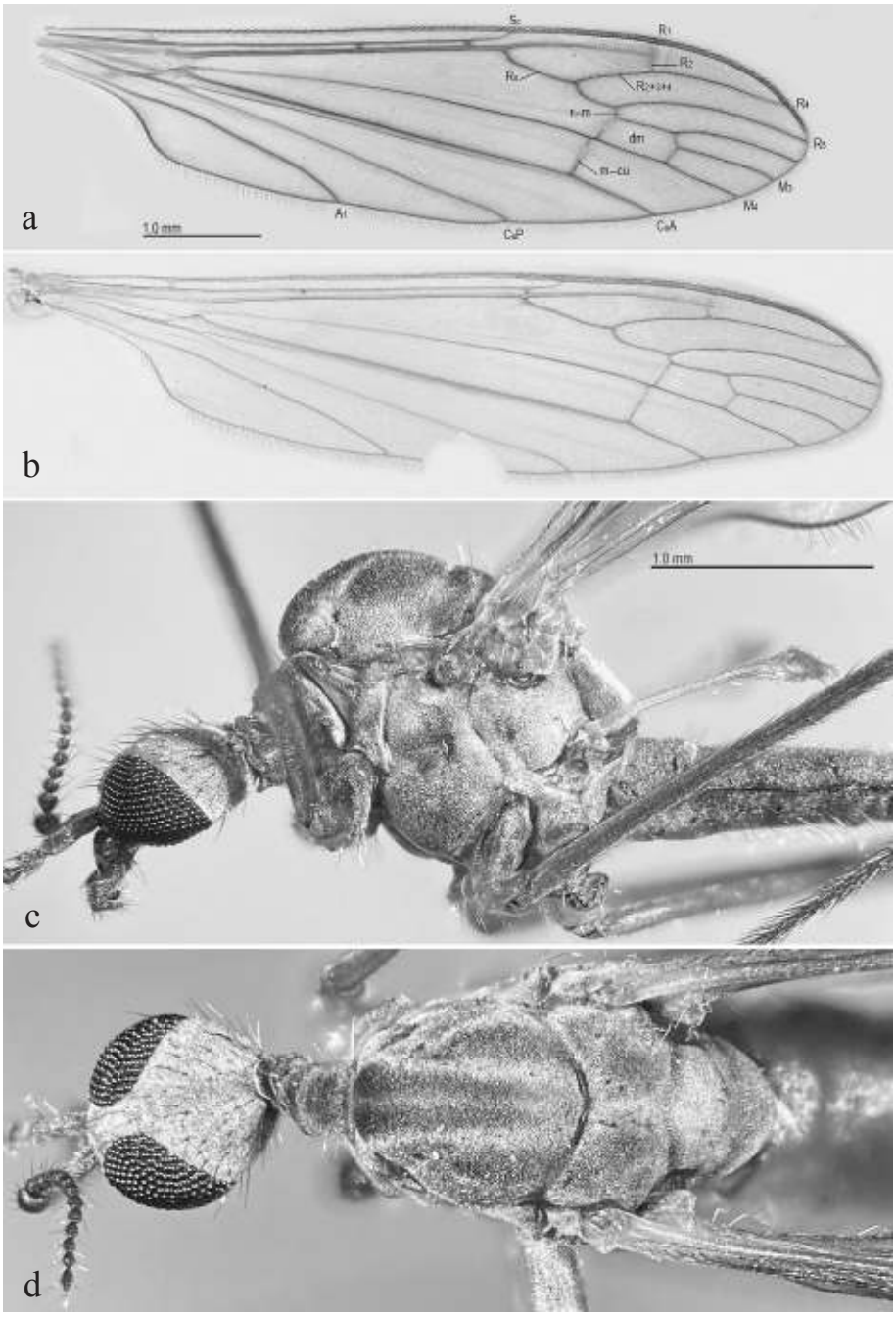

Figure 3. Wing of *Dicranomyia* (*Glochina*) *collserolae* n. sp: a) (MZB 2022-5609) and *Dicranomyia* (*G.*) *mediterranea* Lackschewitz, 1942; b) (MZB 2019-1369); thorax and head of holotype (MZB 2022-5606) of *Dicranomyia* (*G.*) *collserolae* n. sp. in lateral c) and dorsal view d).

with four, brownish-grey longitudinal stripes. Wing subhyaline to pale brownish, stigma pale brown, poorly defined. Hypopygium yellowish brown, inner gonostylus with broad prominent rostrum, slightly arched, with two thick bristles on mid-dorsal part, originating from the same point; outer gonostylus yellowish brown, stouter, becoming progressively dark brown to almost black in its apical third.

Material examined

HOLOTYPE: ♂; Camí de Can Balasc, Parc Natural de la Serra de Collserola, Barcelona, Catalonia; 250 m a.s.l.; 29/09/2022; J. Mederos leg.; Mediterranean mixed forest, on grass along the forest trail; 41°25’47.2”N 2°04’41.7”E; dry specimen, pinned with minute pin on foam; MZB 2022-5606.

PARATYPES: 1♂; *idem* as for holotype; MZB 2022-5607. 1♀, *idem*; MZB 2022-5608. 1♂, *ibidem*; in 70% alcohol together with hypopygium in microvial; MZB 2022-5609. 1♀; *ibidem*; in 70% alcohol together with ovipositor in microvial; MZB 2022-5610. 2♂♂; *idem*; in 70% alcohol; MZB 2022-5611, MZB 2022-5612. 1♀; *idem*; MZB 2022-5613. 2♂♂; *ibidem*; 01/10/2022; in 70% alcohol; MZB 2022-5614, MZB 2022-5615. 1♀; *idem*; MZB 2022-5616.

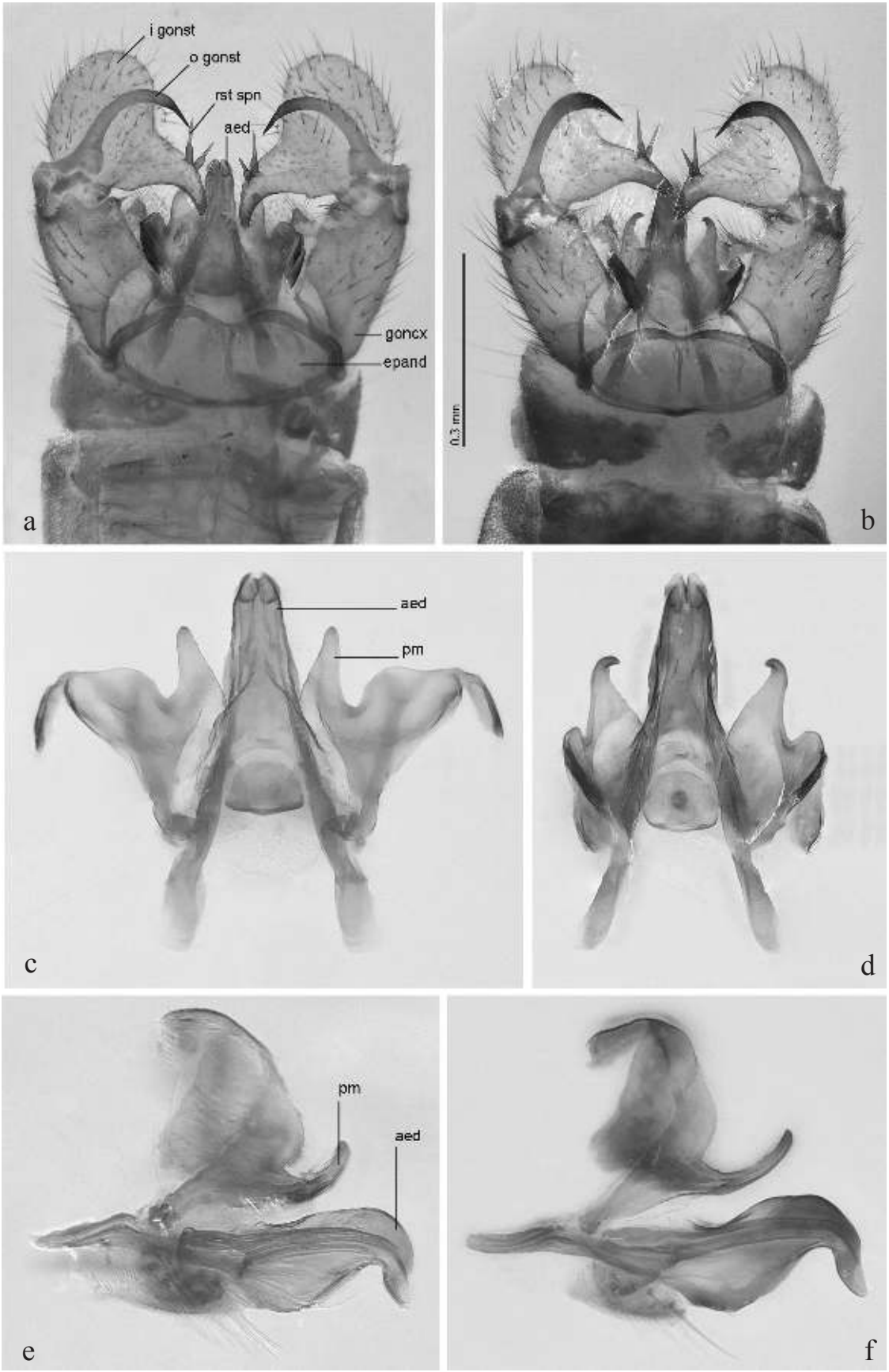

Figure 4. Hypopygium in dorsal view a) and aedeagal complex in dorsal c) and lateral view e) of *Dicranomyia* (*Glochina*) *mediterranea* Lackschewitz, 1942 (MZB 2019-1369). Hypopygium in dorsal view b) and aedeagal complex in dorsal d) and lateral view f) of *Dicranomyia* (*Glochina*) *collserolae* sp. nov (MZB 2022-5609).

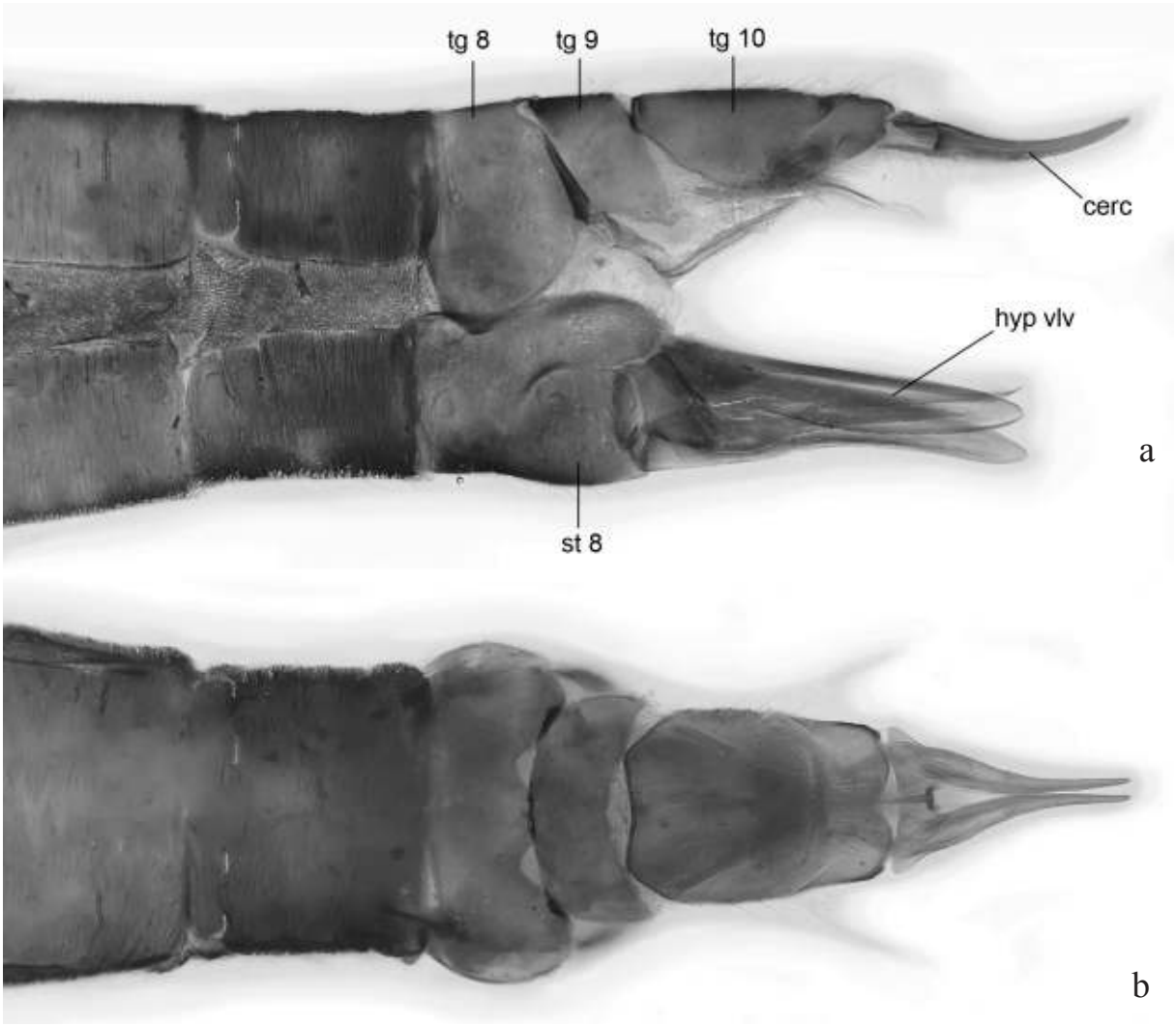

Figure 5. *Dicranomyia* (*Glochina*) *collserolae* n. sp. (MZB 2022-5610). Ovipositor in lateral a) and dorsal view b).

Other material reviewed: *Dicranomyia* (*G.*) *mediterranea* Lackschewitz, 1942. 1♂; Río Escabas, Estrecho de Priego, Priego, Cuenca; 720 m a.s.l.; 05/10/2019; J. Mederos leg.; near river, net over the vegetation; 40°26'45.2"N 2°17'09.4"W; in 70% alcohol; MZB 2019-1369.

Description

Male (n=7)

Measurements. Body length 4.9–5.9 mm, wing length 6.2–7.0 mm, antenna length 1.0–1.2 mm.

HEAD. Grey to dark grey, silvery pruinose. Antenna 14-segmented, dark grey, flagellomeres 1–7 subglobular and 8–12 oval, narrower and elongate towards apical segments, subequal in length to their verticils; terminal flagellomere slightly longer than penultimate one. THORAX (Fig 3b, c). Grey to dark grey, silvery pruinose. Prescutum with four, brownish-grey longitudinal stripes, two long central stripes and two other short lateral stripes; the two long central stripes are darker proximally on pronotum and separated by an almost imperceptible silvery brown line. Prescutal pit dark grey to black. Scutum, scutellum and mediotergite grey, silvery pruinose. Pleura grey, silvery pruinose. Coxae and trochanters brownish grey. Legs brown, becoming progressively darker towards tarsi. Femora brown to yellowish brown, darker towards distal tip. Tibiae dark brown. Tarsi dark brown to black. WING (Fig 3a). Subhyaline to pale brownish, just over four times as long as wide, veins dark brown, stigma pale brown, poorly defined. Venation (Fig 3a). Macrotrichia present on radial and medial veins, also on CuA and CuP. Sc ending in C at origin of Rs; R_{2+3+4} slightly longer than Rs; R_4, R_5 and medial veins subparallel; m–cu four times the length of r–m. Cell dm pentagonal, rectangular in shape. ABDOMEN. Dark grey, covered with short fine silvery hairs. HYPOPYGIUM (Fig 4b, d, f). Yellowish brown. Tergite 9 with a very shallow emargination on the posterior margin (Fig 1g, 4b). Gonocoxite yellowish brown, twice as long as wide and slightly longer than inner gonostylus, with large elongate subbasal ventro-mesal lobe, bearing a dark lobule near its base, and a small setose blunt tubercle at distal margin of mesal surface; inner gonostylus yellowish

Table 1. Geographical distribution of all species of *Dicranomyia* (*Glochina*) described throughout the world, and number/percentage of exclusive species for each region (data from the Catalogue of the Craneflies of the World, Oosterbroek, 2023).

Total species described of *Dicranomyia* (*Glochina*)	Western Palaearctic	Eastern Palaearctic	Oriental	Australian /Oceanian	Nearctic
Dicranomyia (*Glochina*) *bangerteri* (Mendl, 1974)	X				
Dicranomyia (*G.*) *basifusca* Alexander, 1919		X	X	X	
Dicranomyia (*G.*) *brevicula* (Alexander, 1934)			X		
Dicranomyia (*G.*) *brevispina* Savchenko, 1976		X			
***Dicranomyia* (*G.*) *collserolae* n. sp.** Mederos, 2023	X				
Dicranomyia (*G.*) *convergens* de Meijere, 1911			X		
Dicranomyia (*G.*) *cretica* Mendl, 1979	X				
Dicranomyia (*G.*) *hansiana* Stary and Geiger, 1985	X				
Dicranomyia (*G.*) *illingworthi* Alexander, 1914				X	
Dicranomyia (*G.*) *kaszabi* (Mannheims & Savchenko, 1973)		X			
Dicranomyia (*G.*) *kinensis* (Alexander, 1936)	X	X			
Dicranomyia (*G.*) *liberta* Osten Sacken, 1860	X	X			X
Dicranomyia (*G.*) *mediterranea* Lackschewitz, 1942	X				
Dicranomyia (*G.*) *pauli* Geiger, 1983	X				
Dicranomyia (*G.*) *perobtusa* (Alexander, 1945)		X	X		
Dicranomyia (*G.*) *persordida* Savchenko, 1976		X			
Dicranomyia (*G.*) *schineriana* (Alexander, 1964)	X	X			
Dicranomyia (*G.*) *sericata* (Meigen, 1830)	X				
Dicranomyia (*G.*) *sordida* Brunetti, 1912		X	X	X	
Dicranomyia (*G.*) *sordidipennis* (Alexander, 1940)		X			
Dicranomyia (*G.*) *staryi* Geiger and Mendl, 1994	X				
Dicranomyia (*G.*) *transsilvanica* Lackschewitz, 1928	X				
Dicranomyia (*G.*) *tristis* (Schummel, 1829)	X	X	X		
Dicranomyia (*G.*) *tristoides* (Alexander, 1929)		X			
No. species recorded by region	13	12	6	3	1
No. exclusive species by region & percentage	9 / 69.2 %	5 / 41.7 %	2 / 33.3 %	1 / 33.3 %	0 / 0.0 %

brown, rounded, with broad, prominent and slightly arched rostrum; two thick rostral spines in mid-dorsal part, originating together from the same point; outer gonostylus yellowish brown, becoming progressively dark brown to almost black on the apical third; stouter and arched in apical third, abruptly narrowing in the apical fifth; Aedeagal complex (Fig 4d, f): aedeagus with apex slightly bifid apically, parameres curved inward apically.

Female (n=4)

Measurements. Body length 6.7–7.8 mm, wing length 6.7–7.9 mm, antenna length 1.0–1.1 mm.

Like male in general aspect and colour but larger in body size and wingspan. Ovipositor (Fig 5) brown to pale brown; cercus short, slender and slightly curved; hypogynial valve robust, reaching the middle of cercus.

Biology

Unknown

Distribution

Species known only from the type locality, Serra de Collserola, Catalonia.

Etymology

The species is named after its type locality, Serra de Collserola, the protected area in which it was first found. Name in genitive, invariable.

Remarks

In the Iberian Peninsula, only *Dicranomyia* (*Glochina*) *mediterranea* is morphologically close to *Dicranomyia* (*Glochina*) *collserolae* n. sp. and the male genitalia of these two species bear a great resemblance. However, the two species can be easily separated by the vein Sc, which ends opposite the origin of Rs (Fig 3a) in *Dicranomyia* (*G.*) *collserolae* n. sp., (beyond the origin of Rs in *Dicranomyia* (*G.*) *mediterranea*, Fig 3b). In addition, in males of *Dicranomyia* (*G.*) *collserolae* n. sp. the outer gonostylus (Fig 4b) is almost straight in its basal two-thirds and arched in the apical third (in *Dicranomyia* (*G.*) *mediterranea* it is arched along its entire length, Fig 4a) and has a very shallow emargination on the posterior margin of tergite 9 (deep emargination in *Dicranomyia* (*G.*) *mediterranea*).

Discussion

The present study increases the number of *Dicranomyia* (*Glochina*) species known worldwide to 24 (Table 1). Unknown from the Afrotropic, Neotropic and Antarctic regions (Oosterbroek, 2023), this subgenus is mainly distributed in the northern hemisphere; the greatest number of recorded species is concentrated in the Palearctic (21), followed by the Oriental (6), Australian/Oceanian (3) and the Nearctic

(1) regions. It should be noted that four species are known from a single locality (Oosterbroek, 2023), and that nine of the 13 species recorded in the Western Palearctic are known only from this same area, which has the highest percentage (69.2 %) of exclusive species (Table 1). However, these values could be the result of the unequal sampling/study effort that has historically been devoted to this group in different regions.

To date, 1.134 species of the genus *Dicranomyia* distributed in 24 subgenera have been described worldwide (Oosterbroek, 2023), although Podenas *et al*. (2019) suggest that this number is probably higher and that some subgenera could be raised to the status of separate genera. This new discovery aside, the most recently described species of *Glochina* is still regarded as being endemic to Mallorca in the Balearic Islands (Geiger & Mendl, 1994). Thus, the discovery of *Dicranomyia* (*G.*) *collserolae* n. sp. ends the period of almost four decades with no description of any new continental species of this subgenus (Stary & Geiger, 1985).

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References

Cumming J.M. & Wood D. M. 2017. Adult morphology and terminology. In: Kirk-Spriggs A.H. & Sinclair B.J. (eds) *Manual of Afrotropical Diptera*, Vol. 1: Introductory Chapters and Keys to Diptera Families. Suricata 4: 89-133. South African National Biodiversity Institute, Pretoria.

de Jong, H. 2017. Limoniidae and Tipulidae (Crane Flies). In: Kirk-Spriggs A.H. & Sinclair B.J. (eds) *Manual of Afrotropical Diptera*. Vol. 2: Nematocerous Diptera and Lower Brachycera. Suricata 5: 427-477. South African National Biodiversity Institute, Pretoria.

Geiger, W. 1986. Diptera Limoniidae 1: Limoniinae. *Insecta Helvetica, Fauna* 8: 1-131.

Geiger, W. & Mendl, H. 1994. *Dicranomyia* (*Glochina*) *staryi* sp. n. (Diptera, Limoniidae) from Mallorca. *Revue Suisse de Zoologie*, 101: 43-45.

Gelhaus, J. K. 2009. Tipulidae (crane flies, Tipúlidos). In: Brown, B., V., Borkent, A., Cumming, J. M., Wood, D. M., Woodley, N. E. & Zumbado, M. A. (eds) *Manual of Central American Diptera*. Vol. 1: 193-236. NRC Research Press, Ottawa.

Mederos J. 2018. Confirmación de la presencia de *Nephrotoma suturalis wulpiana* (Bergroth, 1888) en España y novedades para la fauna de Limoniidae y Tipulidae (Diptera) de la Serra de Collserola, Cataluña. *Butlletí de la Institució Catalana d'Història Natural*, 82: 141-143.

Mederos-López, J., Caballero-López, B. & Masó-Ros, G. 2014. *Dolichopeza (Dolichopeza) hispanica* Mannheims, 1951 (Diptera: Tipulidae), primera cita para Cataluña y confirmación para la Península Ibérica. *Revista gaditana de Entomología*, 5 (1): 73-78.

Mederos, J., Claramunt-Lopez, B. & Eiroa, E. 2019. Novedades para la fauna de Limoniidae y Tipulidae (Diptera) en la Península Ibérica y actualización de la lista de especies para el Parc Natural de la Serra de Collserola, Cataluña. *Butlletí de la Institució Catalana d'Història Natural*, 83: 207-214.

Mederos, J. & Eiroa, E. 2016. Dos nuevas citas de Limoniidae de la Serra de Collserola (Cataluña, España) y lista actualizada de especies de Limoniidae y Tipulidae (Diptera) de Collserola. *Butlletí de la Institució Catalana d'Història Natural*, 80: 123-125.

Mederos, J. & Eiroa, E. 2017. Novedades para la fauna de Limoniidae y Tipulidae (Diptera) del Parc Natural de la Serra de Collserola (Cataluña, España). *Butlletí de la Institució Catalana d'Història Natural*, 81: 185-189.

Mederos, J. & Zaragoza, J. A. 2017. Nueva cita de *Pselaphochernes scorpioides* (Hermann, 1804) (Pseudoscorpiones: Chernetidae) en asociación forética con *Achyrolimonia decemmaculata* (Loew, 1873) (Diptera: Limoniidae). *Revista Ibérica de Aracnología*, 31: 133-135.

Oosterbroek, P. 2023. Catalogue of the Craneflies of the World (CCW). Available from http://ccw.naturalis.nl/ [accessed 10 May 2023].

Podenas, S., Seo, H. Y., Kim, T., Hur, J. M., Kim, A.-Y., Klein, T. A., Kim, H. C., Kang, T. H. & Aukstikalniene, R. 2019. *Dicranomyia* crane flies (Diptera: Limoniidae) from Korea. *Zootaxa*, 4595: 1-110.

Starý, J. 1992. Phylogeny and classification of Tipulomorpha, with special emphasis on the family Limoniidae. *Acta Zoologica Cracoviensia*, 35: 11-36.

Starý, J. & Geiger, W. 1985. A new *Dicranomyia* (*Salebriella*) from the Alps (Diptera, Limoniidae). *Annotationes Zoologicae et Botanicae*, 166: 1-6.