

## Research article

Submitted: June 24<sup>th</sup>, 2025 – Accepted: October 20<sup>th</sup>, 2025 – Published: October 31<sup>st</sup>, 2025

Doi: 10.13133/2284-4880/1801

# A new species of *Cephalotyphlus* Coiffait, 1955 from Sardinia (Coleoptera: Staphylinidae, Leptotyphlinae)

Marco VILLANI<sup>1,\*</sup>, Michele VIOLI<sup>2</sup>

<sup>1</sup>Via Nagykata 7a, 48011, Alfonsine (RA), Italy – marcovillani.mail@gmail.com

<sup>2</sup>Via al forte 8, 42027, Montecchio Emilia (RE), Italy – violimichele@gmail.com

\* Corresponding author

## Abstract

The new species *Cephalotyphlus supramontanus* is described from Urzulei (eastern Sardinia, Nuoro province). The previously established synonymies of *C. foroiulienensis* (Pace, 1976), and *C. bergamascus* Pace, 1991 with *C. vicetinus* (Pace, 1975) are also discussed.

**Key words:** taxonomy, rove beetles, endogean fauna, new species, Supramonte, endemism.

## Introduction

The subfamily Leptotyphlinae includes very small (0,8-2,2 mm), blind, apterous and depigmented Staphylinidae living in the endogean habitat. They are widespread in the Western Palearctic with the highest amount of described species, but also in the Nearctic, Neotropical, Afrotropical and Australasian regions. Sardinia is probably the most important Mediterranean biodiversity hotspot of Leptotyphlinae, with only 25 described but over 100 undescribed species.

Leptotyphlinae are represented in Sardinia by 5 native genera: *Metrotyphlus* Coiffait, 1959, with 1 described and at least 3 undescribed species, localized in the central part of the island; *Leptotyphlus* Fauvel, 1874, with 12 described and several undescribed species, widespread throughout the island; *Cephalotyphlus* Coiffait, 1955, with 1 described species and at least the new species described herein; *Paratyphlus* Blackwelder, 1952, with 1 described and some undescribed species, localized in southern Sardinia; *Entomoculia* Croissandeau, 1891, which is probably the most diverse genus in Sardinia, with 9 described and over 50 undescribed species. The parthenogenetic species *Gynotyphlus perpusillus* (Doderò, 1900) has been found around Cagliari (unpublished data) and its occurrence in Sardinia is probably a consequence of anthropic introduction.

*Cephalotyphlus* is a genus typically including rare and localized species. Only 7 species are currently described: *Cephalotyphlus revelierei* (Saulcy, 1878) (type species),

from Corsica; *Cephalotyphlus vicetinus* (Pace, 1975), probably endemic to the Italian Prealps near Marostica (Veneto, Vicenza province), *Cephalotyphlus foroiulienensis* (Pace, 1976), widespread in the eastern Italian Prealps between Piave and Tagliamento rivers (Veneto and Friuli-Venezia Giulia regions); *Cephalotyphlus bergamascus* Pace, 1991, known from the Italian Prealps near Oltre Il Colle (Lombardy, Bergamo province); *Cephalotyphlus florentinus* (Pace, 1979), endemic to the northern Apennine near Florence; *Cephalotyphlus sarduspatris* Bordoni & Fancello, 2016, probably endemic to south-western Sardinia near Mamenga (Iglesiente, San Benedetto di Iglesias, Carbonia-Iglesias province: Bordoni & Fancello 2016).

Bordoni & Fancello (2016) in the latter paper also proposed the synonymies of *Cephalotyphlus foroiulienensis* and *C. bergamascus* with *C. vicetinus*, based only on the comparison of the original figures of the aedeagi published by Pace (1975, 1976, 1991) but without mentioning any examined specimen. According to our opinion, the above mentioned synonymies should be considered insufficiently supported and probably to be rejected because, despite the differences in the aedeagi shape are actually small, they seem to be constant, as confirmed by the examination of a large series of specimens of the three involved taxa (Villani, personal observations).

*Cephalotyphlus* is currently placed in the monogeneric tribe Cephalotyphlini. However, this systematic placement appears to be poorly supported by morphological evidence:

the third maxillary palpomere is, in fact, large and rounded, and the abdomen exhibits a deep furrow at the base of the 5<sup>th</sup> visible ventrite. This last character is also shared by members of the tribe Entomoculiini, to which *Cephalotyphlus* more likely should be attributed, considering the strong morphological similarities with the genera *Cyrtotyphlus* and *Neocyrtotyphlus*, in particular at the level of the shape of the aedeagus.

*Cephalotyphlus* was first mentioned from Sardinia by Porta (1926), citing *Cephalotyphlus revelierei* (sub *Leptotyphlus revelierei*) from Fluminimaggiore. This record should be more likely attributed to *C. sarduspatris*, described from a locality not far from Fluminimaggiore (southern-western Sardinia, Carbonia-Iglesias province: Bordoni & Fancello 2016). In the description of *C. sarduspatris* the authors mention also the finding of a specimen of the same genus from Pedra Longa, Baunei municipality (central-eastern Sardinia, Nuoro province), but the identity of the specimen was impossible to establish since it was a female.

During our research in the Supramonte area (central-eastern Sardinia, Nuoro province) we recently discovered a couple of specimens belonging to a clearly undescribed species of the genus *Cephalotyphlus*, whose description is the main aim of the present paper.

## Materials and methods

The above mentioned specimens were collected with the soil washing technique. Soil samples were taken at 5-50 cm of depth and stored in plastic bags for up to a week prior to washing. The floating detritus was packaged in newspapers for some days and then placed on Berlese funnels to extract the endogean fauna. Specimens were stored in an ethanol and acetic acid mixture and then cleared up in a KOH 10% solution for 2-3 days. Then they were washed in water and mounted on a transparent acetate slide, inside a DMHF drop. Observations were made with a Reichert Microstar IV compound microscope up to a 400x total magnification. The images were taken with a Nikon Coolpix S6900 camera attached to the same microscope and stacked with Zerene Stacker 1.04 software. Graphic elaboration to underline characters in pictures 4 and 5 were done with the vectorial graphic editor Inkscape 1.0.1. Measurements were taken with the same microscope and a micrometric ocular at a 200x total magnification (sensitivity  $\pm 0.0047$  mm).

Morphometric acronyms: HL = head length on the median line from the clypeus, HW = maximum head width, PL = pronotum length on the median line, PW = maximum pronotum width, EL = elytra length from the anterior margin of scutellum to the posterior margin of elytra, EW = maximum elytra width taken together, TVL = tergite V length, TVW = maximum tergite V width, AN = antenna length. Terminology mainly follows Pace (1996).

## Results

*Cephalotyphlus supramontanus* Villani & Violi, **sp. nov.** (Figs 1-7)

### Diagnosis.

A relatively large and robust, moderately sclerotized Leptotyphlinae, well corresponding to the definition of *Cephalotyphlus*. Externally similar to other species of the genus but well distinguishable based on the aedeagus and the female genitalia.

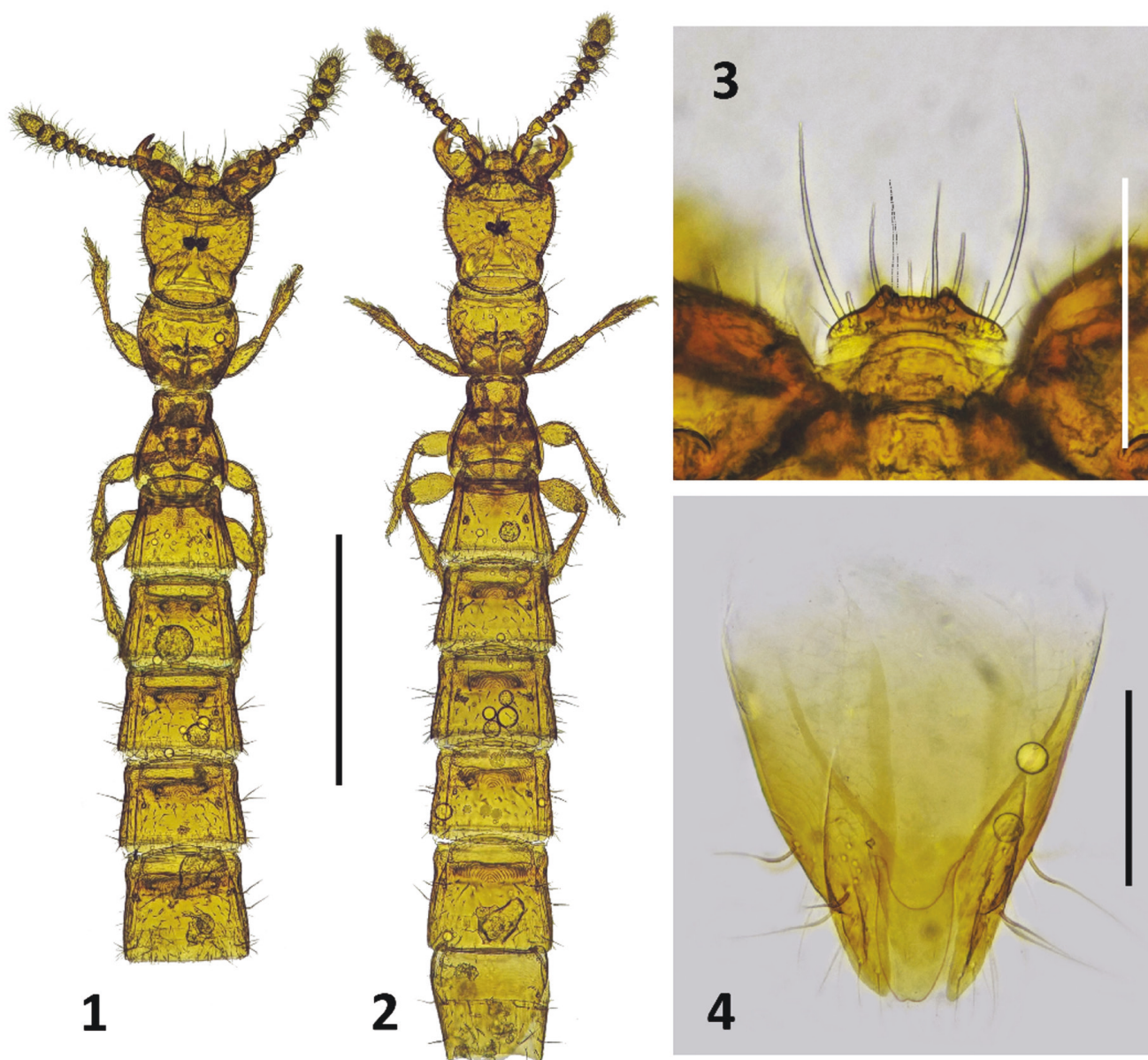
**Examined material.** Holotypus ♂: **ITALY, Sardinia:** Urzulei (Nuoro province), Riu Sa Terina, 40.110278N, 9.473917E, 940 m, 18 Mar 2025, leg. Marco Villani. Paratype ♀: same data as holotypus. The type material is currently preserved in Marco Villani private collection and will be deposited in the Museo Civico di Storia Naturale Giacomo Doria.

**Description** (Holotypus ♂) (Fig. 1).

Head large, rounded, wider than pronotum, smooth, microreticulated only in the neck. Labrum (Fig. 3) transverse, with two stout teeth, slightly closer to each other than to the lateral edges. Chaetotaxy as in Fig. 3. Antennae slender, with scape large and robust and pedicel slightly longer than half of the scape. Antennomeres III-IV subequal, smaller than the others. Antennomere V slightly larger than IV and VI. Antennomeres VII-X gradually larger. Antennomere XI roughly conical, almost twice longer than X. III maxillary palpomere large, rounded.

Pronotum as long as wide and shorter than head, with smooth surface. Anterior margin wider than posterior margin. Sides curved. Coxal cavities rounded, separated by a thin, triangular apophysis. Elytra, from the scutellar shield, slightly shorter than pronotum, with convex sides, smooth. Scutellum microreticulated. Legs moderately developed, with femurs and tibiae thin at the base and enlarged toward the apex, with a clavate shape. Tarsi 2-segmented, with the first tarsomere about half as long as the second.

Abdomen with segments I-V transverse, trapezoidal, gradually enlarging, with a slight constriction on each side before the base. Urite II entirely microreticulated. Apparent tergite I with transverse microreticulation in the proximal first third, ventrite I with isodiametric reticulation in the proximal half. Apparent II-V tergites and paratergites with transverse microreticulation in the proximal first third, forming posteriorly a semicircular pattern with convexity directed forward. Apparent VI tergite with transverse microreticulation in the proximal half, the ventrite only in the basal first third. Ventrites II-V with a deep transversal sulcus at the basal fourth, with increasing length, microreticulated in the proximal portion up to and including the sulcus. Segment VI about as long as segment V, wider at the base. VI ventrite (Fig. 6) apically divided into 2 rounded lobes by a small but deep incision. Genital segment slightly shorter than VI segment, with drop-shaped and asymmetrical



**Figs 1-4** – *Cephalotyphlus supramontanus* sp. nov. 1, Holotypus ♂ (abdominal segments VI-VII removed); 2, Paratypus ♀ (abdominal segment VII removed); 3, labrum (holotypus ♂); 4, genital segment (paratypus ♀). Scale bar: 0.5 mm (Figs 1, 2); 0.1 mm (Figs 3, 4).

sternite (Fig. 7). Aedeagus (Fig. 8) slender, simple, with a quite large and globose basal bulb. Median lobe slender, with almost parallel sides for most of its length, slightly thinning and curved toward the apex, with a small incision and a triangular lobe at the apex. Parameri almost straight, simple, about 1/5 as long as the median lobe. Left paramere Y-shaped, with two setae on the dorsal branch and one on the ventral one. Right paramere simple, with three apical setae. Inner sack with a single elongated and straight piece, about as long as the median lobe and half wide as it.

Surface of the body covered with sparse small setae, with longer setae on the antennae, near the anterior and posterior angle of pronotum, around the half and at the posterior margin of urites.

#### **Description** (Paratypus ♀) (Fig. 2).

Excluding the genital segment and the ventrite VI with completely rounded margin, identical to the male but slightly less sclerotized.

Female genitalia composed by a single, slightly sclerotized piece in apical position, with a vaguely elliptical shape and two small branches anteriorly projected (Fig. 4).

**Morphometry.** Holotypus: HL: 0.268; HW: 0.221; PL: 0.197; PW: 0.202; EL: 0.212; EW: 0.188; TVL: 0.230; TVW: 0.249; AN: 0.357.

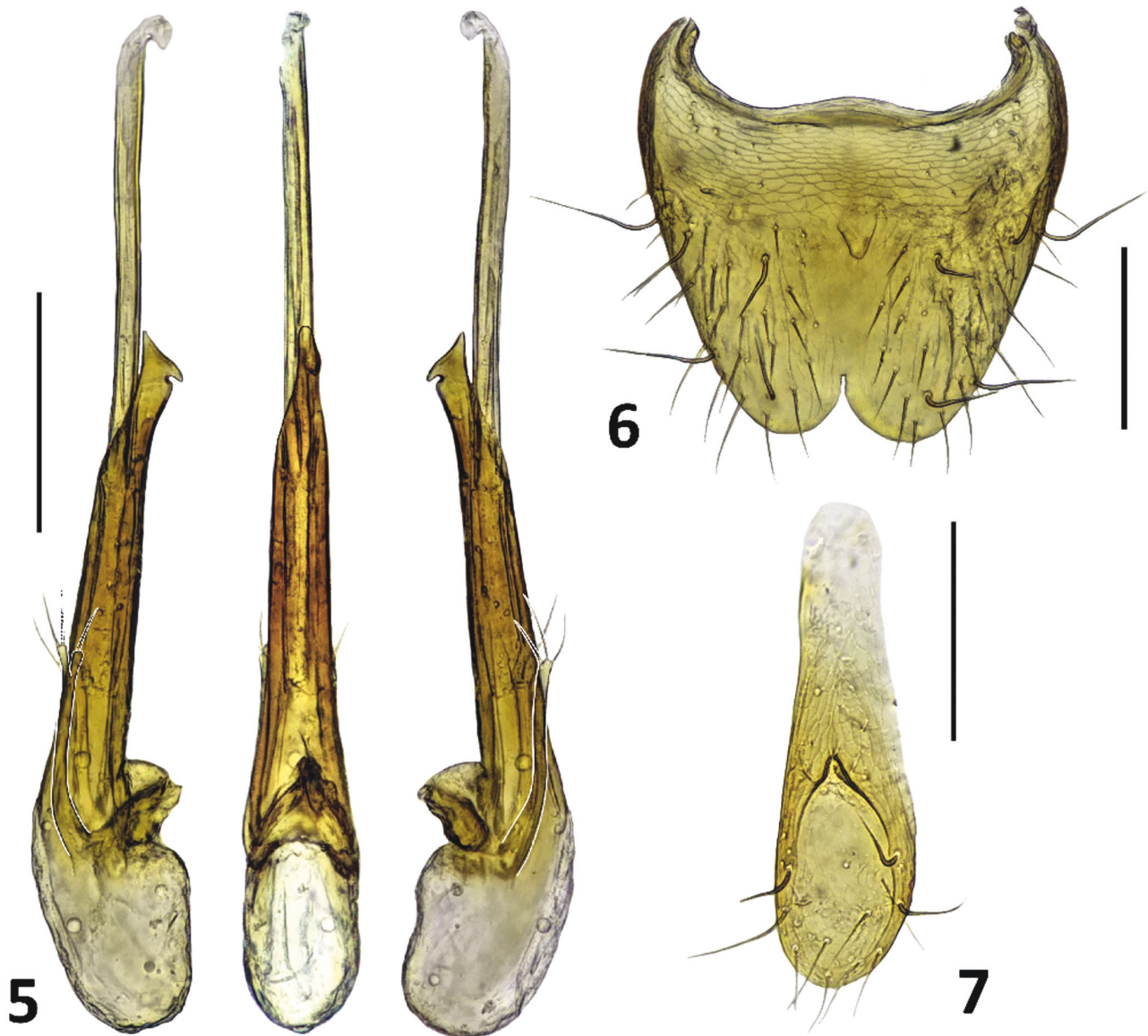
**Etymology.** Locotypic, from “Supramonte”, the vast limestone-dolomitic mountain range in central-eastern Sardinia where the new species was found.

### Comparative notes

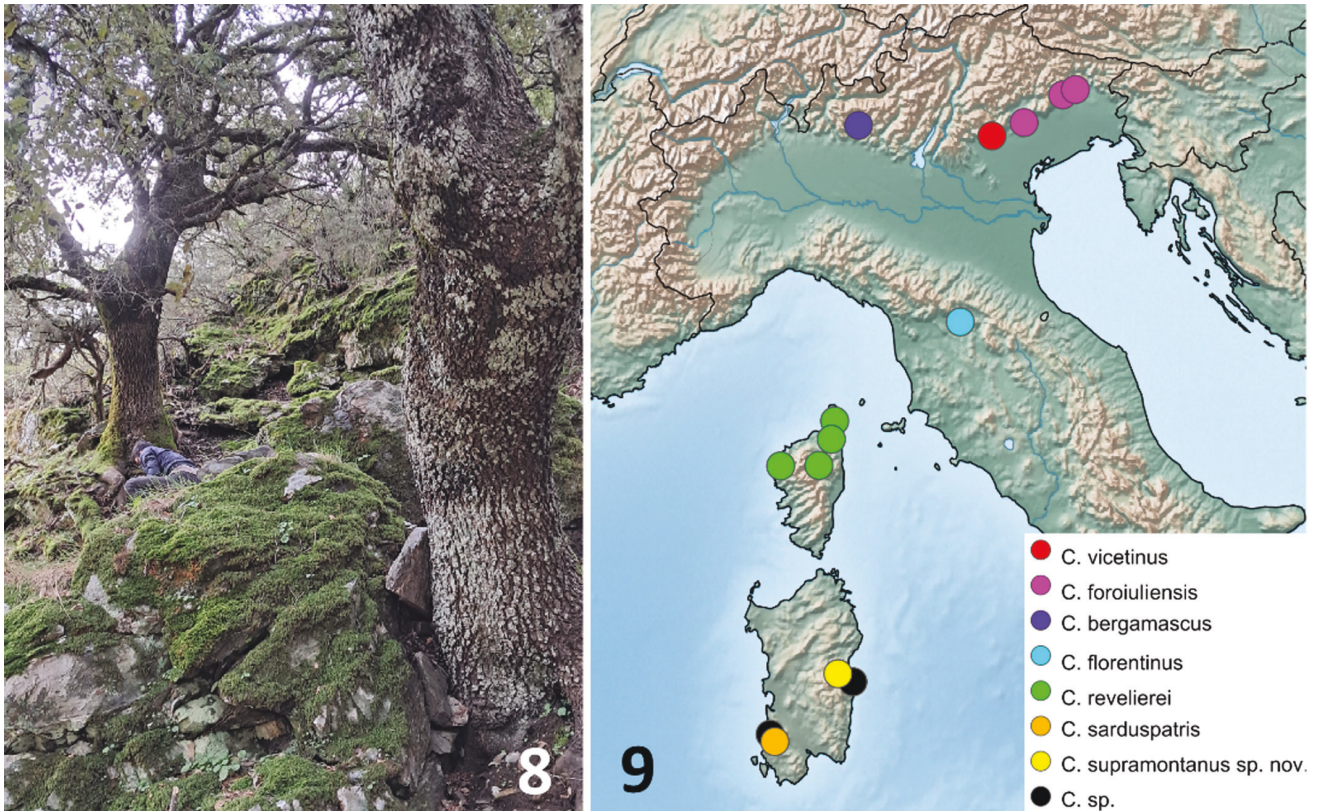
The new species looks externally similar to the other Sardinian species of the genus, *C. sarduspatris*, but it's easily distinguishable for the different shape of the aedeagus: in *C. sarduspatris* the median lobes is more slender and sinuose, with a wider and deeper pre-apical incision and a smaller apical triangle, while *C. supramontanus* **sp. nov.** has a parallel-sided median lobe, with a small pre-apical incision and a more pointed apical triangle. The aedeagus of *C. supramontanus* **sp. nov.** looks more similar to that depicted by Coiffait (1959) for the Corsican species *C. revelierei*, from which it differs in the shape of the apical triangle. The atypical asymmetry of parameri in the holotype of *C. supramontanus* **sp. nov.**, with regard to the left paramerus, suggests a possible malformation.

### Ecological notes

The only known specimens of the new species were found in clayey, grey and humid soil at the base of an old holm oak tree (*Quercus ilex* L.), a few meters from the stream Riu Sa Terina (Fig. 8). Other samplings in different types of soil a few meters away did not give any result. The type locality is a very small wood patch of less than 10 old trees of *Q. ilex* surrounded by arid pastures. The area is situated at the limit between Giurese Limestones and metamorphic schist. *Cephalotyphlus supramontanus* **sp. nov.** is syntopic with *Typhloreicheia grafitii* Magrini, Onnis, Marcia & Casale 2012, *Rhegmatobius strictus* (Baudi di Selve, 1981) (Carabidae), *Leptotyphlus* sp., *Scotonomus* sp. (Staphylinidae) and *Derosasius* sp. (Curculionidae).



Figs 5-7 – *Cephalotyphlus supramontanus* **sp. nov.**, Holotypus ♂. 5, aedeagus; 6, VI ventrite; 7, VII apparent sternite. Scale bar: 0.1 mm.



Figs 8-9 – 8, habitat of *Cephalotyphlus supramontanus* sp. nov.; 9, distribution map of the genus *Cephalotyphlus*.

## Discussion and conclusions

Following the results presented in this article, the genus *Cephalotyphlus* is represented in Sardinia by two geographically distant species: *C. sarduspatris* from the Iglesias region and *C. supramontanus* sp. nov. from Supramonte. During our research we also found a female of *Cephalotyphlus* sp. on the northern slope of Monte Oro (Baunei municipality, Nuoro province), along the stream Bacu 'e Muru, not far from Pedra Longa, where another unidentified female was found, as discussed above (Bordoni & Fancello 2016). Monte Oro and Pedra Longa are located around 20 km south-east to the type locality of *C. supramontanus* sp. nov. and it should not be excluded they belong to the same species. We also examined a female specimen from Fluminimaggiore (southern-western Sardinia, Carbonia-Iglesias province) and preserved in the Natural History Museum, Genoa, probably also belonging to *C. sarduspatris* for geographic reasons.

In Sardinia the genus *Cephalotyphlus* seems to be linked to limestone areas and to the deep, clayey and humid soil both on slopes and small valleys. Considering the distribution of the two known species in Sardinia and the occurrence of the genus in Corsica it is likely that further undescribed *Cephalotyphlus* species will be found throughout the island, where they are rare and localized due to their ecological needs.

The genus *Cephalotyphlus* needs to be revised based on a large series of specimens of both sexes, which are difficult to get due to their rarity. In particular, the status of the species from the Prealps must be clarified and the male of *C. florentinus* is still to be found and described. It should be also pointed out that the aedeagus of *C. revelierei* depicted in Bordoni & Fancello (2016) looks markedly different from that depicted by Coiffait (1959), suggesting that the genus *Cephalotyphlus* may also include some additional and undescribed Corsican species.

The updated distribution of the genus *Cephalotyphlus* is shown in Fig. 9. The known species of *Cephalotyphlus*, accompanied by their distribution, are listed below.

*Cephalotyphlus revelierei* (Saulcy, 1878) (Corse: Omessa [*locus typicus*]; Cap Corse, Pietracorbara; Cap Corse, La Pedina; Col de la Palmarella, south of Galeria; Monte a Torra, “entre le col de Teghime et Poggio d’Oletta” [Coiffait 1972; Orousset 2012]).

*Cephalotyphlus vicetinus* (Pace, 1975) (Veneto: Marostica, Vicenza province).

*Cephalotyphlus foroiuliensis* (Pace, 1976) [Veneto: Soligo, Farra di Soligo municipality, Treviso province; Friuli-Venezia Giulia: Gerchia, Castelnovo del Friuli municipality, Pordenone province (new record); Monte Jôf, Maniago municipality, Pordenone province (*locus typicus*)].

*Cephalotyphlus florentinus* (Pace, 1979) (Tuscany: between Volmiano and Legri, Calenzano municipality, Florence province).

*Cephalotyphlus bergamascus* Pace, 1991 (Lombardy: Oltre il Colle, Bergamo province).

*Cephalotyphlus sarduspatris* Bordoni & Fancello, 2016 (Sardinia: Mamenga, Iglesiente, San Benedetto di Iglesias, Carbonia-Iglesias province).

*Cephalotyphlus supramontanus* **sp. nov.** (eastern Sardinia, Urzulei, Nuoro province).

**Acknowledgements** – We want to express our gratitude to Roberto Poggi and Maria Tavano (Natural History Museum, Genoa), which allowed us to examine the Leptotyphlinae from the Museum's collection. We also wish to thank Luca Fancello for the advices he provided to find Leptotyphlinae in Sardinia and all the participants to our research on the Sardinian endogean fauna: Augusto Degiovanni, Daniele Festa, Daniele Maccapani, Mattia D'Amato, Niccolò Massimo and Nicola Cuffiani.

## References

- Bordoni A., Fancello L. 2016. A new species of *Cephalotyphlus* from Sardinia and taxonomic revision of the genus. *Bollettino dell'Associazione Romana di Entomologia*, 71 (1-4) (2016): 15–20.
- Coiffait H., 1972. Coléoptères Staphylinidae de la région paléarctique occidentale. I. Généralités. Sous-familles: Xantholiniinae et Leptotyphlinae. *Nouvelle Revue d'Entomologie*, 2 (2): 1–651.
- Orousset J. 2012. Coléoptères hypogés de Corse. XXXIX. Description d'une espèce nouvelle de Psélaphide du genre *Trogaster* Sharp et données chorologiques diverses (Coleoptera Staphylinidae). *Nouvelle Revue d'Entomologie*, 28 (1): 47–61.
- Pace R. 1975. Descrizione di *Italicotyphlus vicetinus* nuovo genere e nuova specie di Leptotyphlinae del Veneto (Coleoptera Staphylinidae). *Bollettino della Società entomologica italiana*, 107 (6-8): 103–112.
- Pace R. 1976. Quattro nuove specie di Leptotyphlinae del Friuli (Coleoptera, Staphylinidae). *Bollettino della Società entomologica italiana*, 108 (5-7): 104–117.
- Pace R. 1979. Nuove specie di Leptotyphlinae della Toscana (Coleoptera, Staphylinidae). *Bollettino del Museo civico di Storia naturale di Verona*, 7 (1978): 431–438.
- Pace R. 1991. Diagnosi di nuove specie di Leptotyphlinae d'Italia. *Bollettino della Società entomologica italiana*, 123 (2): 107–112.
- Pace R. 1996. Coleoptera. Staphylinidae. Leptotyphlinae. *Fauna d'Italia*, 34. Ed. Calderini, Bologna, 328 pp.
- Porta A. 1926. *Fauna Coleopterorum Italica*. Vol. II. Staphylinoida. Stab. Tipografico Piacentino, Piacenza, 405 pp.
- Saulcy F.H.C. 1878. Description de plusieurs espèces aveugles des staphylinides. *Bulletin de la Société d'Histoire Naturelle de Metz*, 15: 113–125.