

**On the actual subgeneric identity of the elusive Iberian endemic species  
*Cryptops (Trigonocryptops) similis* Machado, 1953  
(Scolopendromorpha: Cryptopidae)**

**О подлинной подродовой принадлежности неуловимого иберийского  
эндемичного вида *Cryptops (Trigonocryptops) similis* Machado, 1953  
(Scolopendromorpha: Cryptopidae)**

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КЛЮЧЕВЫЕ СЛОВА: *Cryptops*, *Trigonocryptops*, *similis*, Пиренейский полуостров, Scolopendromorpha, эндемик.

**ABSTRACT.** The incomplete description of certain significant taxonomic features involving *Cryptops (Trigonocryptops) similis* Machado, 1953 has recently raised reasonable doubts regarding the subgeneric status of this elusive Iberian endemic. Based on a single specimen from Málaga Province, the subgeneric diagnostic characteristics of *C. similis* have been reevaluated and found to align well with the recently renewed diagnostic criteria of the *Trigonocryptops* Verhoeff, 1906 subgenus. Moreover, the present study provides the fifth record of this taxon, exposes its easternmost known locality, and includes the first photographs of the species.

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**РЕЗЮМЕ.** Неполное описание некоторых важных таксономических признаков *Cryptops (Trigonocryptops) similis* Machado, 1953 недавно вызвало обоснованные сомнения относительно подродового статуса этого неуловимого эндемика Иберийского полуострова. На основе единственного экземпляра из провинции Малага подродовые диагностические признаки *C. similis* были пересмотрены и оказались хорошо согласованными с недавно обновлёнными диагностическими критериями подрода *Trigonocryptops* Verhoeff, 1906. Кроме того, настоящее исследование представляет собой пятое упоминание данного таксона, указывает его самое восточное известное местонахождение и включает первые фотографии этого вида.

## Introduction

In peninsular Spain the scolopendromorph genus *Cryptops* Leach, 1814 is represented by eight species belonging to two subgenera: *Cryptops s.str.* Leach, 1814 and *Trigonocryptops* Verhoeff, 1906. In this territory, this latter subgenus contains two Andalusian endemic species: the cave dweller and obviously troglophile adapted species, *C. (T.) longicornis* Ribaut, 1915 and *C. (T.) similis* Machado, 1953, a soil dweller but also elusive species from Cádiz and Málaga provinces, which only count with four published records [Voigtländer, Reip, 2013] and ten known collected specimens: 1 ind. from Tarifa, Cádiz; 3 ind. from Sierra de Alcojona, in Parauta, and Sierra de Ronda, Málaga (without coordinates) [Machado, 1953], 2 ind. from Puerto/Sierra del Cabrito, Algeciras, Cádiz (without coordinates) [Serra 1985], 2 ind. from Véjer de la Frontera (36°37'12"N, 5°29'24"W) and 1 ind. from Alcalá de los Gazules (36°49'12"N, 5°16'12"W), Cádiz [Carballo, Daza, 1991; M. Zapparoli in Voigtländer, Reip, 2013] and, 1 ind. from Benaoján (36°41'13.2"N, 5°16'15.6"W), Málaga [Voigtländer, Reip, 2013] (Fig. 1).

Besides, subgenus *Trigonocryptops* taxonomy has been recently checked by Lewis [2005], Schileiko & Stoev [2016] and Schileiko *et al.* [2018, 2020, 2024]. Respectively, the former author synonymized *Paratrigonocryptops* Demange, 1963 with this subgenus. The second ones questioned the validity of the subgenus while in the remaining publications *Trigonocryptops* appears to be accepted and the authors provided constantly improved criteria to identify this subgenus. To date, Schileiko *et al.* [2024] morphologic criteria are the more complete and detailed to recognize the subgenus.

Following that publication, subgenus *Trigonocryptops* is defined as follow: 1. Cephalic plate with complete or

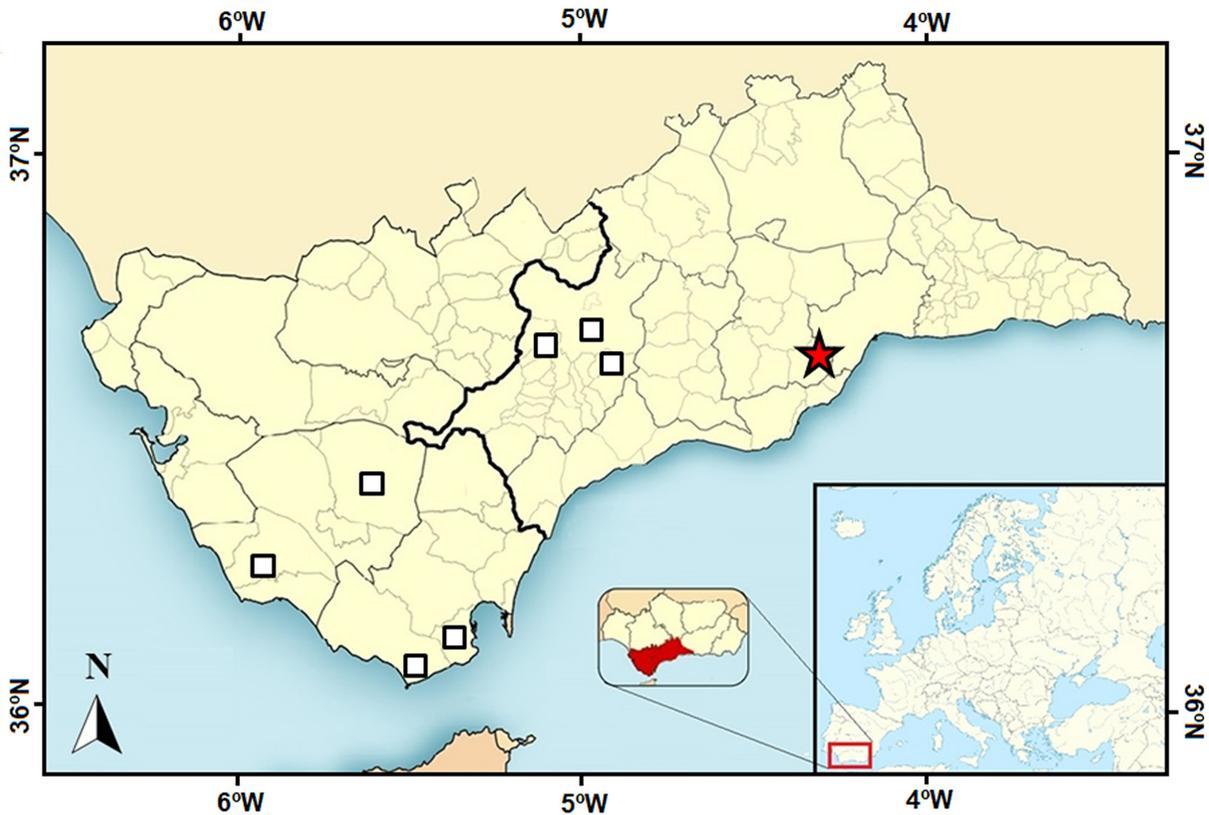


Fig. 1. *Cryptops (Trigonocryptops) similis* Machado, 1953 currently known distribution. Previous records are represented by white squares. Red star points Alahurín de la Torre, Málaga, the newest and the most oriental record of the species. Inserted maps point the Andalucía region position in Continental Spain (Europe), and within, the position in Andalucía of Cádiz (left) and Málaga (right) provinces (separated by a bold line).

Рис. 1. Современное известное распространение *Cryptops (Trigonocryptops) similis* Machado, 1953. Предыдущие находки обозначены белыми квадратами. Красная звезда указывает на Алаурин-де-ла-Торре, Малага — самое новое и наиболее восточное местонахождение вида. Вставленные карты показывают положение региона Андалусия в континентальной Испании (Европа), а также в пределах Андалусии — расположение провинций Кадис (слева) и Малага (справа), разделённых жирной линией.

(more rarely) incomplete paramedian sutures. 2. Clypeus with setose plate(s), which are delimited by sutures and bear 2–10 setae. 3. Pretarsus of maxillae 2 apically pointed, with or without a ventral projection. 4. Dorsal brush of maxilla 2 as long as or slightly longer than the corresponding pretarsus. 5. Anterior margin of forcipular coxosternite bilobed, in most species with long enlarged marginal setae. 6. Tarsungula long, overlapping each other by at least 1/3 of their length when adducted. 7. Tergite 1 mainly with anterior transverse suture, often with (complete or incomplete) paramedian sutures. 8. Sternites with well-developed transverse thickening between coxae of legs; at least some anterior sternites with endosternites bordered by trigonal sutures of various configurations (K-, C- and X-shaped). 9. Anterior corners of the endosternite of some anterior sternites with lateral projections. 10. In the most species catapleurite bipartite. 11. In most species femur of the ultimate legs with 1 well-developed saw tooth.

Nevertheless, in the Scolopendromorpha generic and subgeneric revision text of Schileyko *et al.* [2020], some reasonable doubts were exposed concerning the proper subgeneric diagnosis of *C. (T.) similis*: “it has sternal trigonal sutures that are typical for this subgenus, but there is

no information on presence of clypeal setose plate(s) and the corresponding figure III(2) [in the original description] is inadequate. Voigtländer & Reip [2013] mentioned another specimen of *Cryptops (T.) similis* from Southern Spain but gave no information on the two diagnostic characters of this subgenus [criteria currently expanded, see Schileyko *et al.* [2024] and above]. Thus inclusion of *Cryptops (T.) similis* in *Trigonocryptops* should be questionable at the moment”. In line with this, Schileyko *et al.* [2024] also wrote “However a few former species of *Trigonocryptops* may not meet one or both of these diagnostic criteria [sternal trigonal sutures and presence of clypeal setose plate(s)], thus not being related to this subgenus”. This last statement again suggested the case of *C. (T.) similis*, for which the clypeal setose plate(s) actually was not described or illustrated in Machado [1953] or Voigtländer & Reip [2013], nor in the other two available publications involving the species [Serra, 1985; Carballo, Daza, 1991]. However, *C. (T.) similis* was still included in the recently updated list of species in the subgenus *Trigonocryptops* [Schileyko *et al.* 2024].

To clarify this particular scenario, this text intentionally analyses a single *C. (T.) similis* specimen to observe the aforementioned morphological traits before issuing a

conclusive taxonomic subgeneric diagnosis. Also in this work, the first pictures of the species are also provided and its known distribution is expanded.

## Material and methods

Specimen (see Results below) was manually collected and soaked in 50% ethanol for 15 minutes and then transferred to an individual container with 70% ethanol to be long time preserved at the Colección Entomológica de la Universidad de Alicante San Vicent del Raspeig, Alacant, Spain (CEUA). Generic and subgeneric diagnoses were respectively based in Schileyko *et al.* [2020] and Schileyko *et al.* [2024]. Species identification was based in the texts of Machado [1953] and Voigtländer & Reip [2013]. Morphology characteristics were observed and photographed under a Leica M205C stereomicroscope connected to a montage imaging system, Leica DFC450, operated under the Cell'D program at the Universidad de Alicante (UA), Spain. Morphology nomenclature followed Bonato *et al.* [2010]. Localities map was constructed over images taken from Wikicommons image bank (CC BY-SA 3.0). Illustrations' adjustments, montage and their respective clarifying notes were performed with Adobe Photoshop CS6 software®.

## Results

Family Cryptopidae Kohlrausch, 1881

Genus *Cryptops* Leach, 1816

Subgenus *Trigonocryptops* Verhoeff, 1906

*Cryptops (Trigonocryptops) similis* Machado, 1953

Figs 1 (map), 2.

**MATERIAL:** Adult, sex unknown (CEUA Mr40). 26 mm. Málaga, Alahurín de la Torre, Carretera de Coín (36°39'37"N, 4°31'0.4"W, 104 m a.s.l.) (Fig. 1), under a stone in Mediterranean pine forest (see fig. 2E in Doménech [2024]); Coll. 18th Nov. 2021. C. D. leg.

Other examined material: *Cryptops (C.) hispanus* Brölemann, 1920 (CEUAMr41), adult, sex unknown. 16 mm. Remaining data *ibid.* CEUAMr40.

Specimens were collected according the grants provided by the Junta de Andalucía (N/Ref.: SGYB/DBP; grant date: 15 May 2021).

The analyzed specimen satisfied the generic and specific diagnosis of *C. similis*. Despite the preservation of the specimen, presumably damaged during the capture, and the optic device limitations, I properly observed nine of the eleven structures defining the subgenus with the exceptions of maxillae 2 dorsal brush, and catapleurites. The remaining diagnostic features for the subgenus *Trigonocryptops* could be examined and almost all confirmed to be present in this specimen (Fig. 2). The defining characteristics for other *Cryptops* subgenera were confirmed to not be present in this individual, in especial for the other sympatric subgenus *Cryptops s.str.*

In this specimen, paramedial sutures on the tergite 1 were complete, setose plate on clypeus carried five setae, at last endosternites 4–8 exhibit X-shaped trigonal sutures, and ultimate legs' femur didn't show saw-like teeth. In this specimen, maxillae 2 ventral projections appeared absent, clypeus' sutures were glimpsed but also were difficult to be defined, and lateral projections on the anterior part of the endosternites were not observed.

Although only some of the few elements that define the subgenus could not be analyzed, the important clypeal setose plate, trigonal sutures and almost all other recently defining features were observed. This led to conclude that *C. similis* species do actually belong to subgenus *Trigonocryptops*. In accordance

with these findings, I propose that the species remain finally fixed in its original subgenus.

This report represents the fifth one for this taxon in more than 70 years, the eleventh known specimen and the easternmost record of the species.

## Discussion

In this work, the subgeneric identity of *C. similis* has been confirmed as a *Trigonocryptops* member, exactly as it was proposed in its original description [Machado, 1953] and subsequent reports [Serra, 1985; Carballo, Daza, 1991; Voigtländer, Reip, 2013]. Despite these last works not being able to fully accommodate the species subgenus according to Schileyko *et al.* [2020] criteria, many other subgeneric features presented in the renewed criteria of Schileyko *et al.* [2024] were already detailed in the previous literature. Therefore, the revision of the former related texts could solve some other imprecise subgeneric designations emplaced in this subgenus [Schileyko *et al.*, 2024]. This case also highlighted the importance of the periodical generic and subgeneric redefinitions in the taxonomic and nomenclatural disciplines.

The morphologic analysis of the subgeneric structures in the examined specimen and the related literature (see above), suggest that the trigonal sutures on the firsts sternites are the most visible and representative traits of the subgenus *Trigonocryptops*. To their exclusivity in the whole order Scolopendromorpha (see Schileyko *et al.* [2020]), the presence of these structures alone, should — provisionally — be enough for a rapid subgeneric diagnosis. Finally, in the Iberian Peninsula species, when a swift classification is required, the other important but harder to see subgeneric structures, could be tentatively disregarded since now the eight *Cryptops* species are clearly placed into their respective subgenera.

For the case of the here analyzed individual of *C. (T.) similis*, the only subgeneric traits not observed were the sternites' lateral and the maxillae 2 ventral projections. These can still be present in the species or be one of the variable characters in the subgenus, however the preservation state of the studied sample did not let to confirm or reject this asseveration. As in the case of other few structures that could not analyzed here, new and better preserved samples and the use of other optical devices such the scanning electron microscope (SEM) could help in a the already planned redescription of the species.

This text has also showed the importance of to provide an extended morphology description in centipedes of this genus. Similarly to that, the draws in the related literature [Machado, 1953; Voigtländer, Reip, 2013] has being proven useful for a species level diagnosis, but attending which criteria was used, they were not enough illustrative to subgenus trustable diagnosis [Schileyko *et al.*, 2020, 2024]. Since draws are authors' interpretations or emphasizing images pretending to clear out what it is intended to be described, and to avoid identification problems, I recommend accompanying these kinds of descriptions with photographs when possible. To support this state-

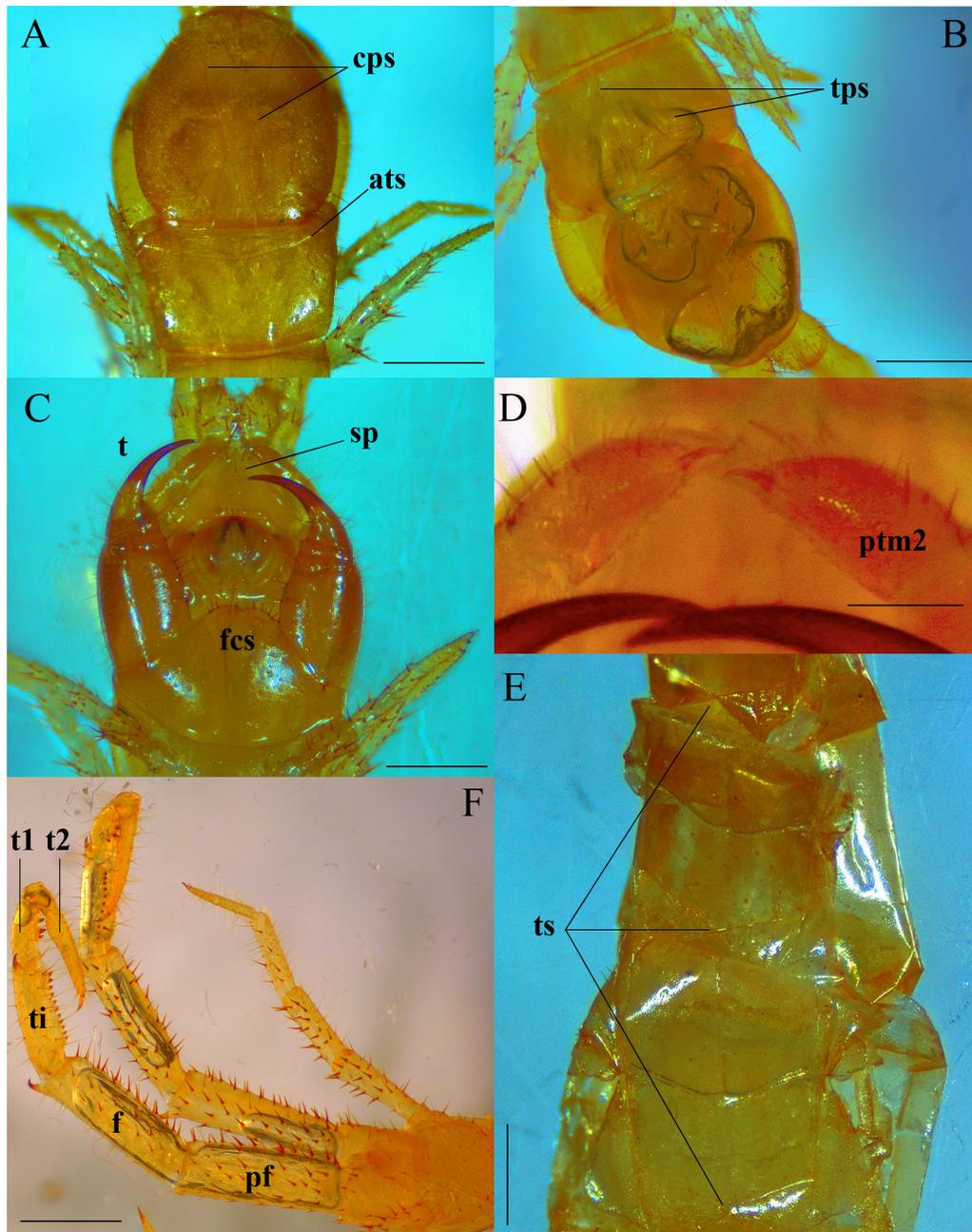


Fig. 2. *Cryptops (Trigonocryptops) similis* Machado, 1953; CEUAMr40. A — cephalic plate and tergite 1, dorsal view; B — cephalic plate and tergite 1, oblique view; C — cephalic plate and coxosternal segment, ventral view; D — pretarsi of maxillae 2, ventral view; E — sternites 6–8, ventral view; F — ultimate legs, left ventrolateral view. Abbreviations: ats — tergite 1 anterior transverse suture, cps — cephalic paramedian sutures, f — femur, fcs — forcipular coxosternite, pf — prefemur, ptm2 — pretarsus of maxillae 2, sp — clypeal setose plate, t — tarsungula, ti — tibia, tps — tergite 1 paramedian sutures, ts — trigonal sutures, t1 — tarsus 1, t2 — tarsus 2. Scale: A–C, E and F = 0.5 mm; D = 0.125 mm.

Рис. 2. *Cryptops (Trigonocryptops) similis* Machado, 1953; CEUAMr40. А — головная пластинка и тергит 1, вид сверху; В — головная пластинка и тергит 1, вид под углом; С — головная пластинка и кокостернальный сегмент, вид снизу; D — претарзусы второй пары максилл, вид снизу; E — стерниты 6–8, вид снизу; F — последняя пара ног, левый вентролатеральный вид. Сокращения: ats — передний поперечный шов тергита 1, cps — параметриальные швы головной пластинки, f — бедро, fcs — форципулярный кокостернит, pf — префемур, ptm2 — претарзус второй пары максилл, sp — щетинистая пластинка клипеуса, t — тарзунгула, ti — голень, tps — параметриальные швы тергита 1, ts — треугольные швы, t1 — первый тарзомер, t2 — второй тарзомер. Масштаб: А–С, E и F = 0,5 мм; D = 0,125 мм.

ment, this work included the first pictures of the species.

To finish and in agreement with Voigtländer & Reip [2013], author want to highlight the *C. (T.) similis* eventual relation with the geographically close species *C. (T.) numidicus* H. Lucas, 1846 and its two accepted

subspecies, *C. n. tropicus* Attems, 1909 and *C. n. aelleni* Manfredi, 1956. Despite these original works vaguely let to identify the genus in the best of the cases, some *C. (T.) similis* specific morphological similarities can be appreciated too. These suggest that a deep morphologic and

genetic reevaluation should be performed with the aim to offer the adequate taxonomic nomenclatural treatment for all these taxa.

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