

# Two new species of *Typhlocharis* Dieck, 1869 of the *silvanoides* group from Portugal (Coleoptera, Carabidae)

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Serrano, A. R. M. & Aguiar, C. A. S., 2006. Two new species of *Typhlocharis* Dieck, 1869 of the *silvanoides* group from Portugal (Coleoptera, Carabidae). *Animal Biodiversity and Conservation*, 29.1: 9–18.

## Abstract

*Two new species of Typhlocharis Dieck, 1869 of the silvanoides group from Portugal (Coleoptera, Carabidae).*— Two endogean carabid species of *Typhlocharis* Dieck, 1869 in the *T. silvanoides* species group are described, *Typhlocharis carinata* n. sp. and *Typhlocharis paulinoi* n. sp. *T. carinata* is characterized by the elytron with four discal setae and one subapical seta, the abdominal sternum II with a median carina, more developed near the posterior margin, stronger in male than in female, the median lobe of aedeagus strongly sickle-shaped and the parameres bisetulose, each with a large apical seta and a short sub-apical seta. *T. paulinoi* is characterized by the elytron with three discal setae and one subapical seta, the abdominal female sterna II and III without any fovea, the internal sac of median lobe in central area very diffuse with one lateral sclerite and the right paramere bisetulose, with a large apical seta and a short sub-apical seta. Affinities to putative relatives and a key for the identification of the seven known species belonging to the *silvanoides* group are also given.

Key words: Coleoptera, Carabidae, Anillina, *Typhlocharis*, New species, Portugal.

## Resumen

*Dos nuevas especies de Typhlocharis Dieck, 1869 del grupo silvanoides de Portugal (Coleoptera, Carabidae).* — Se describen dos nuevas especies de carábidos endogeos de *Typhlocharis* Dieck, 1869, del grupo de especies *T. silvanoides*: *Typhlocharis carinata* n. sp. y *Typhlocharis paulinoi* n. sp. *T. carinata* se caracteriza por sus élitros con cuatro sedas discales y una seta subapical, el esternito abdominal II con una carena media, más desarrollada cerca del margen posterior, más fuerte en el macho que en la hembra, el lóbulo medio del edeago más falciforme, y los parámetros bisetulados, cada uno de ellos con una seda apical grande y una seda subapical corta. *T. paulinoi* se caracteriza por sus élitros con tres sedas discales y una seda subapical, los esternitos abdominales femeninos II y III sin fovea alguna, el saco interno del lóbulo medio de la zona central muy difuso, con un esclerito lateral y el parámetro derecho bisetulado, con una seda apical grande y una seda subapical corta. También se tratan las afinidades con especies supuestamente emparentadas y se da una clave de identificación de las siete especies conocidas del grupo *silvanoides*.

Palabras clave: Coleoptera, Carabidae, Anillina, *Typhlocharis*, Especies nuevas, Portugal.

(Received: 4 V 05; Conditional acceptance: 15 VII 05; Final acceptance: 26 VII 05)

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## Introduction

The genus *Typhlocharis* Dieck, 1869 (Coleoptera, Carabidae, Trechinae, Bembidiini) belongs to the subtribe Anillina, and according to the catalogue of the ground beetles of the Iberian peninsula (Serrano, 2003) is the richest genus in this peninsula, with 37 known species. Representatives of *Typhlocharis* are distributed throughout the Iberian peninsula (Europe), Morocco and Tunisia (North Africa) (Jeannel, 1963). The genus, considered to be very old, inhabits the vestiges of the Lusitanian, Lionigurian, the Betic Riffian and the Numidian Massifs (Jeanne, 1973). According to Jeannel (1963), the ancestral lucicolous of the *Typhlocharis* expanded from Africa to the Betic Riffian Massif 65 million years ago (Montian, Inner Palaeocene), radiating to the present biogeographic limits.

All species of this genus are eyeless (anophthalmous), occur in soil and are endogean. They may also be collected from the lower surface of stones superficially embedded in the soil. Most *Typhlocharis* species are local or regional endemisms; their distribution is limited, probably because of isolation due to physical barriers and a low capacity of dispersal (e.g. they move very slowly and are wingless carabids). Thus, taking into account their present distribution, they represent a great potential for phylogeographic studies.

Much has been learnt about the systematics and distribution of representatives of the genus *Typhlocharis* from Portugal has considerably increased in recent years (Serrano & Aguiar, 2000, 2001, 2002; Serrano et al., in press), but our knowledge of the genus in this country is still unsatisfactory. Eight species have been recorded for Portugal to date: *T. quadridentatus* Coiffait, 1968, *T. algarvensis* Coiffait, 1971, *T. singularis* Serrano & Aguiar, 2000, *T. sarrus* Serrano & Aguiar, 2001, *T. elenae* Serrano & Aguiar, 2002, *T. gomesalvesi* Serrano & Aguiar, 2002, *T. passosi* Serrano & Aguiar and *T. fozcoaensis* Serrano & Aguiar (Coiffait, 1968, 1971; Serrano & Aguiar, 2000, 2001, 2002; Serrano et al., in press). Two of these species (*T. algarvensis* and *T. sarrus*) belong to the *silvanoides* species group, another two to the *gomezi* species group and the remainders to the *outereloi* species group (*sensu* Zaballos & Ruiz-Tapiador, 1997). The other known species within the *silvanoides* group are: *T. silvanoides* Dieck, 1869 (Morocco: Riff), *T. armatus* Coiffait, 1968 (Spain: Cádiz, San Roque) and *T. fancelloi* Magrini, 2000 (Spain: Almería, Sierra Almagrera) (Zaballos & Ruiz-Tapiador, 1997; Magrini, 2000). According to Zaballos & Ruiz-Tapiador (1997), adults of the the *silvanoides* species group are recognized by the following combination of characters: a) umbilicate series of elytra with four setae in the anterior group and four setae in the posterior group (4+4) and b) apical edge of elytra without teeth.

After carefully studying several endogean carabid specimens from Portugal, we concluded that they represent two new species of the genus *Typhlocharis*,

belonging to the *silvanoides* group. This work aims to describe these new species and to provide notes about relationships with the closest forms. Moreover, we provide a key to all known species of the *silvanoides* species group.

## Material and methods

Field work was conducted in several areas near the Mértola, Almodovar and Odemira localities in the Province of Baixo Alentejo and in several localities throughout the Province of Algarve (both Provinces of Portugal); this resulted in the collection of specimens of endogean beetle species of the subtribe Anillina. The specimens were collected by hand from under embedded stones in fragments of Mediterranean secondary forest habitat dominated by holm-oaks, rock-roses shrubs and lentisk bushes (*Quercus coccifera* Linnaeus, *Cistus ladanifer* Linnaeus and *Pistacia lentiscus* Linnaeus) with patches of man-induced land uses. Additional specimens were obtained from samples of soil taken from the above-mentioned localities using the Berlese apparatus.

The morphological study of adult specimens was conducted using a scanning electron microscope JEOL JSM-5200 LV. Measurements and drawings were done with a Wild M5 stereoscopic microscope equipped with a dissecting microscope ocular micrometer and a drawing tube.

The distribution of species in the descriptions is given in UTMcoordinates (1 km x 1 km). For practical reasons, the map used for the representation of distributions was 10 km x 10 km squares (fig. 24). Some localities are therefore enclosed in the same 10 km x 10 km square.

## Results

### *Typhlocharis carinata* n. sp.

(figs. 1–8, 17–18, 21, 24)

### Diagnosis

Anophthalmous, body parallel, depressed, brown or brownish-yellow with integument microreticulate and scattered pubescence. Elytron with four discal setae, one subapical seta, and eight (4+4) marginal umbilicate setae; apical edge sinuate without teeth (males and females), sutural one absent. Hind trochanters inermes in both sexes. Abdominal sternum II with a median carina, more developed near the posterior margin, stronger in the male than in the female; abdominal female sternum II with one slightly posteriolateral fovea on each side; abdominal female sternum III with one very faint lateral fovea. Aedeagus (figs. 17, 18) with the median lobe strongly sickle-shaped, basal lamina markedly arcuate; internal sac in central area with one twisted sclerite; parameres bisetulose, each with a large apical seta and a short sub-apical seta.

## Description

Length of holotype: 2.9 mm.

Length of paratypes: 2.1–2.9 mm ♂♂, 2.3–2.9 mm ♀♀.

Head (figs. 1, 3): robust, slightly wider than long (length: 0.34–0.51 mm ♂♂ and 0.38–0.61 mm ♀♀; width: 0.48–0.65 mm ♂♂ and 0.51–0.57 mm ♀♀) with hexagonal microsculpture and slightly depressed in the middle of the front; anterior region of clypeus with one strong median depression; vertex with transversal microsculpture which, in the area below the anterior margin of the pronotum, is arranged in parallel ridges to form a file (*pars stridens*) (figs. 1, 2). Cephalic chaetotaxy (large setae): labrum with three pairs of setae (those on sides longer), one seta on each side of clypeus and two pairs close to frontal sulcus, a pair of supraocular setae (anterior and posterior) present over each eye and two–three posterior pairs of setae between vertex and lateral carinae. Antennae moniliform, mouth-parts (fig. 3) as usual in the genus.

Pronotum (fig. 4): rectangular, slightly longer (1.1–1.3 times) than wide (length: 0.62–0.88 mm ♂♂ and 0.66–0.81 mm ♀♀, width: 0.56–0.76 mm ♂♂ and 0.59–0.75 mm ♀♀), slightly narrowed towards posterior angles which are marked with one tooth; disk flattened, with three longitudinal slight sulci, one central and one on each side; the lateral sulci only visible in the second half of disk; anterior margin strongly emarginate in the middle region; lateral margins arcuate, with three or four minor denticles near the posterior angles; disk depressed near the posterior margin, this slightly emarginate in the middle region. Chaetotaxy: five longitudinal series of setae between midline and lateral margins, alternatively with minute and large setae directed anteriorly; one anterior seta on each side in anterior quarter, one posterior seta on hind angle; anterior margin with three–four pairs of setae.

Elytra (fig. 5): 1.7–1.9 times longer than wide (length: 1.15–1.52 mm ♂♂ and 1.22–1.47 mm ♀♀, width: 0.64–0.83 mm ♂♂ and 0.66–0.86 mm ♀♀), parallel and oval posteriorly, with one slightly longitudinal carina at the beginning of seventh stria; dorso–ventrally flattened on the disk; transverse scutellar organ present near the beginning of suture (fig. 4); scutellar region not punctured; humeral angles rounded, with a small tooth in the beginning of carina; lateral margins serrate, teeth decreasing in size posteriorly; apical margin without any tooth (fig. 5), subsinuate after the end of longitudinal carina. Chaetotaxy: part of the pubescence of the disk is arranged in five lines since the sutural line, these short setae are erect and slightly directed anteriorly; four large discal setae stand out close to the third line, one subapical seta coinciding with the end of seventh stria; umbilicate series divided in two groups of four setae each (4+4) (fig. 5).

Legs: with robust femora, inner margin of profemur with a reasonably developed tooth; trochanters of third pair similar in male and female, without special features (figs. 7, 8), protarsus without dilated segments.

Abdomen (figs. 6–8): with sternum II with one median carina, more developed near the posterior margin (fig. 6), stronger in male than in female; sternum II of female with one slightly posteriolateral fovea on each side, sternum III with one very faint lateral fovea (fig. 8).

Male genitalia (figs. 17, 18): in lateral aspect with a median lobe strongly sickle-shaped, basal lamina markedly arcuate, apex stands out (fig. 17); median lobe in dorsal aspect with rather thin apex thin, bent to left (fig. 18); internal sac in central area with one twisted sclerite; parameres bisetulose, each with a large apical seta and a small one sub-apical seta; left paramere strongly arcuate, with dorso–basal edge very expanded.

Female genitalia (fig. 21): with gonocoxites of ovipositor weakly sclerotized, each one in ventral aspect with one apical seta; internal genital tract with spermathecal duct short and spermatheca spheroid; spermathecal gland long, with proximal region membranous and apical region more or less sclerotized.

## Type series

Holotype ♂: Portugal, Odeceixe (UTM: 29SNB2242), 13 I 2004. Paratypes: 9 ♂♂ and 11 ♀♀ (2 ♂♂ and 1 ♀ gold coated), same locality and date; Pincho (UTM: 29SNB2218), 9 ♂♂, 10 I 2004; Alferce (Monchique) (UTM: 29SNB4320), 1 ♀, 12 I 2004. Holotype and paratypes deposited in the collection of the senior author, Department of Animal Biology (Lisbon).

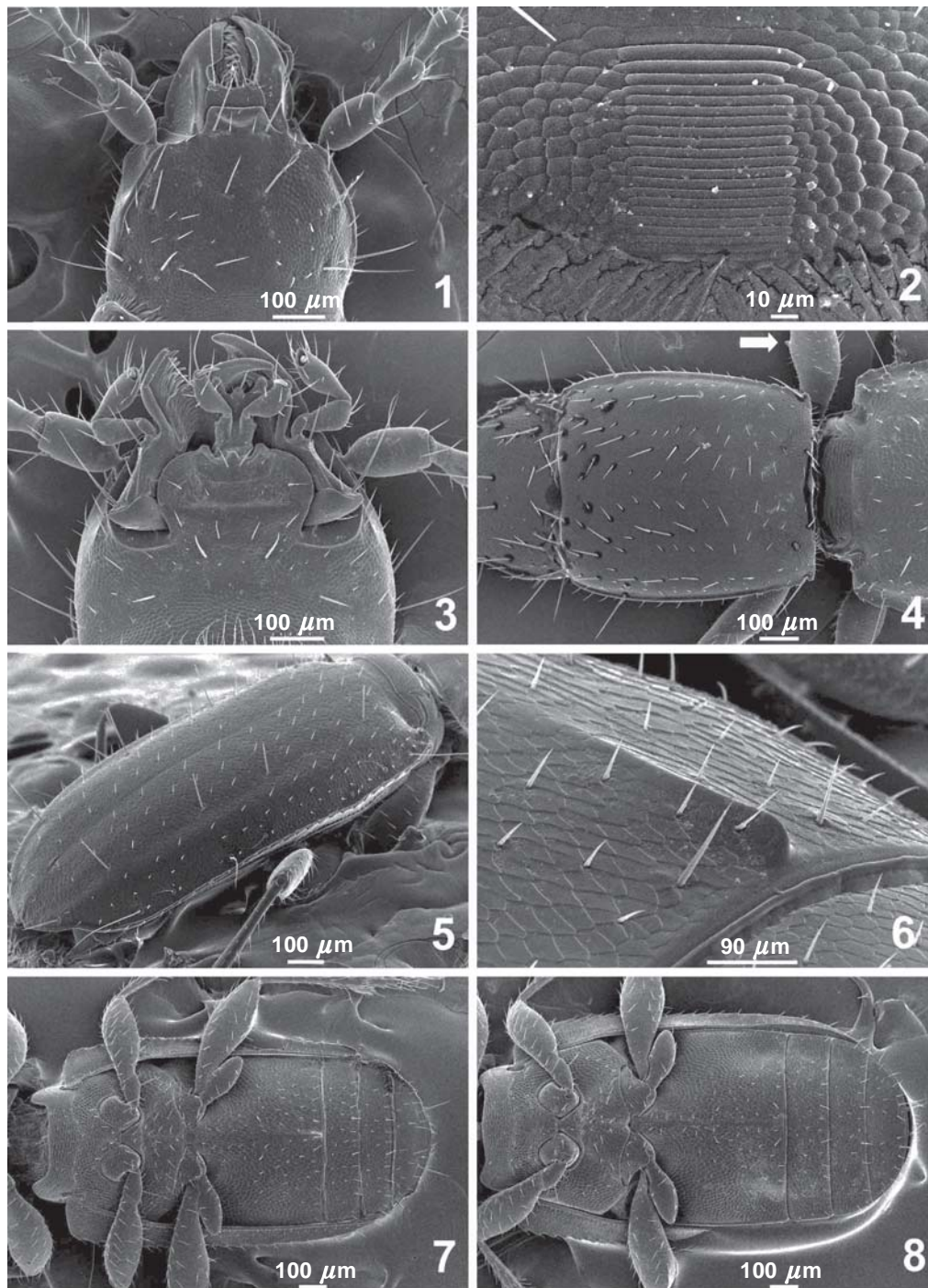
## Etymology

The specific epithet of the new species is the latinized adjectival from the peculiar carina found in the middle region of the abdominal sternum II.

## Affinities

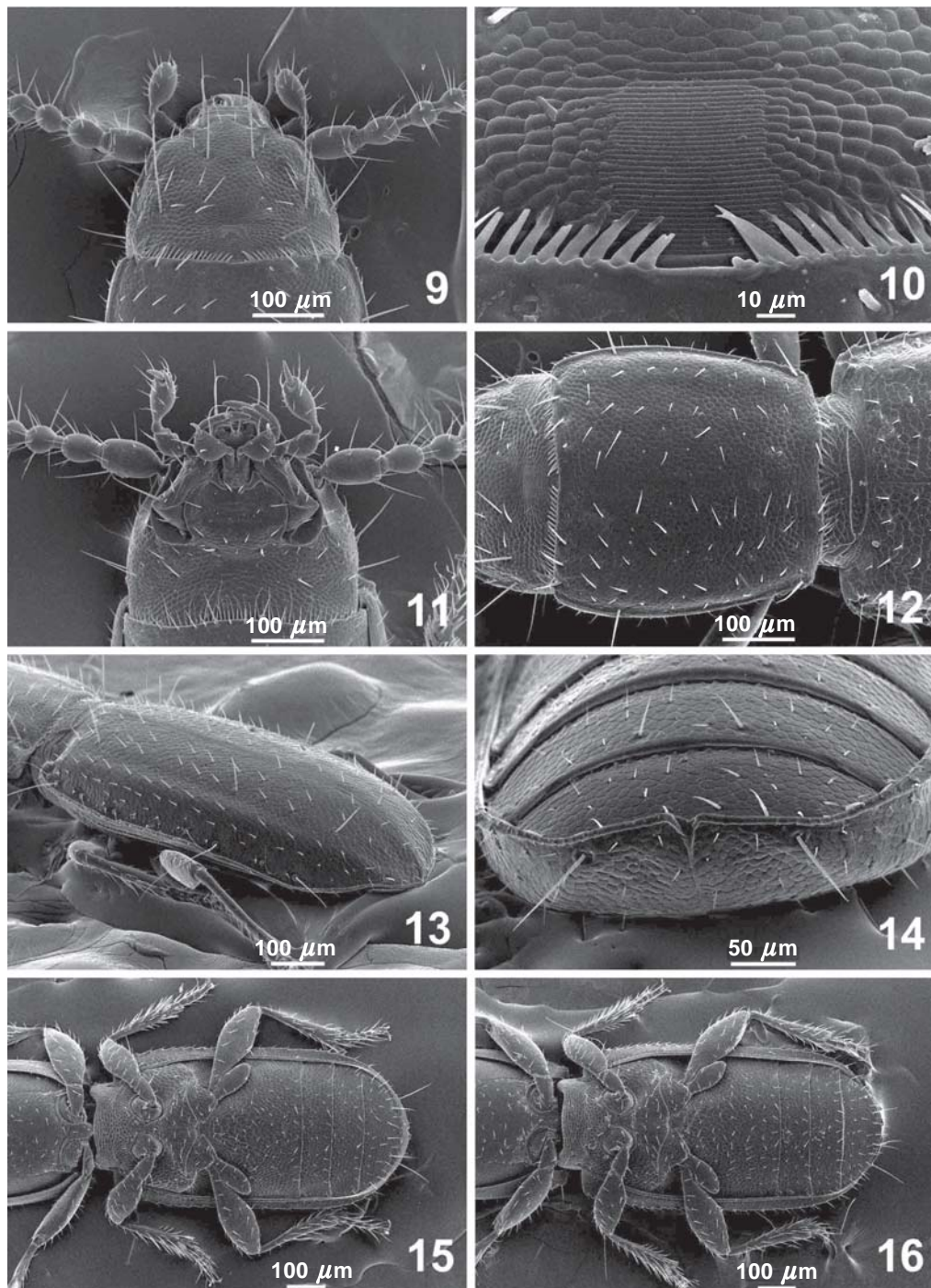
The new species is the largest in the genus *Typhlocharis* and belongs to the *silvanoides* group based on the absence of teeth in the apical edge of elytron and the occurrence of four setae in each group of the umbilicate series. However, it is well differentiated within the *silvanoides* group by the presence of a median carina in the abdominal sternum II (fig. 6), stronger in males than in females. In some species of *Typhlocharis* (e. g. *T. monasticus* Zaballos & Wrase, *T. peregrinus* Zaballos & Wrase and *T. navaricus* Zaballos & Wrase) the males also present a median tubercle in the same sternum, near the posterior margin (Zaballos & Wrase, 1998). Apparently this structure is found in some species of the same or of different groups (e.g. *monasticus* and *outereloi* groups, *sensu* Zaballos & Ruiz–Tapiador, 1997; Zaballos & Wrase, 1998). The phylogenetic importance of this structure is therefore uncertain with no additional data available. The localization of the tubercle suggests / highly suggests that it may be a derivative of the carina now found in the new species. This assumption is corroborated by the fact that the *silvanoides* group is the most basal group within the





Figs. 1–8. *Typhlocharis carinata* n. sp.: 1. Head, dorsal view; 2. Stridulatory organ (*pars stridens*), dorsal view; 3. Head, ventral view; 4. Posterior part of the head, pronotum and anterior part of elytra, ♂ dorsal view (arrow: tooth in the inner margin of profemur); 5. Right elytron, latero–dorsal view; 6. Carina in sternum II, ♂ ventral view; 7. Thorax and abdomen, ♂ ventral view; 8. Thorax and abdomen, ♀ ventral view.

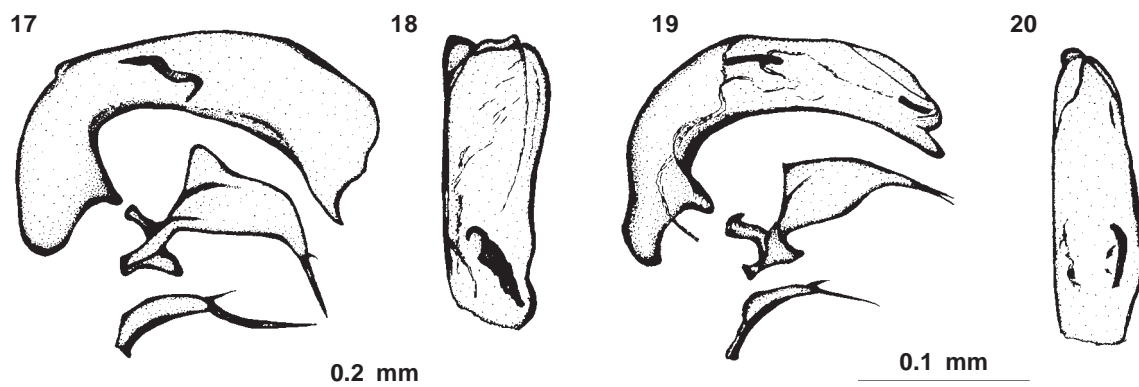
Figs. 1–8. *Typhlocharis carinata* sp. n.: 1. Cabeza, vista dorsal; 2. Órgano estridulador (*pars stridens*), vista dorsal; 3. Cabeza, vista ventral; 4. Parte posterior de la cabeza, pronoto y parte anterior de los élitros, ♂ vista dorsal (flecha: diente en el borde interno del profemur); 5. Élitro derecho, vista latero–dorsal; 6. Carena del esternito II, ♂ vista ventral; 7. Tórax y abdomen, ♂ vista ventral; 8. Tórax y abdomen, ♀ vista ventral.



Figs. 9–16. *Typhlocharis paulinoi* n. sp.: 9. Head and anterior part of pronotum, dorsal view; 10. Stridulatory organ (*pars stridens*), dorsal view; 11. Head and anterior part of pronotum, ventral view; 12. Posterior part of the head, pronotum and anterior part of elytra, dorsal view; 13. Left elytron, latero–dorsal view; 14. Elytra, apical view; 15. Thorax and abdomen, ♂ ventral view; 16. Thorax (part) and abdomen, ♀ ventral view.

Figs. 9–16. *Typhlocharis paulinoi* sp. n.: 9. Cabeza y parte anterior de la cabeza, vista dorsal; 10. Órgano estridulador (*pars stridens*), vista dorsal; 11. Cabeza y parte anterior del pronoto, vista ventral; 12. Parte posterior de la cabeza, pronoto y parte anterior de los élitros, vista dorsal; 13. Élitro izquierdo, vista latero–dorsal; 14. Élitros, borde apical; 15. Tórax y abdomen, ♂ vista ventral; 16. Tórax y abdomen, ♀ vista ventral.





Figs. 17–20. Aedeagus. *Typhlocharis carinata* n. sp.: 17. Median lobe and left and right parameres, lateral view; 18. Median lobe, dorsal view. *Typhlocharis paulinoi* n. sp.: 19. Median lobe and left and right parameres, lateral view; 20. Median lobe, dorsal view.

Figs. 17–20. Edeagos: 17–18. *Typhlocharis carinata* sp. n.: 17. Lóbulo mediano y parámetros izquierdo y derecho, vista lateral; 18. Lóbulo mediano, vista dorsal. 19–20. *Typhlocharis paulinoi* n. sp.: 19. Lóbulo mediano y parámetros izquierdo y derecho, vista lateral; 20. Lóbulo mediano, vista dorsal.

genus *Typhlocharis* (Jeanne, 1973). Curiously, within this group, *T. carinata* is the first species with this type of structure. The quality of *T. carinata* is probably basal within the *silvanoides* group based on the presence of one series of four discal setae in elytra, one subapical seta (all absent in all species of the other *Typhlocharis*'s groups) and on some peculiarities of aedeagus. These peculiarities are the median lobe and left paramere forms, and the location pattern of the setae in both parameres (see description). All these characteristics, on the other hand, reinforce Jeannel's consideration (1963) that the genera *Typhlocharis* and *Anillus* Jacquelin du Val, 1851 are close. Within the *silvanoides* group, only *T. algarvensis* Coiffait and the new species present a shiny tegument and a similar conformation of the pronotum. On the other hand, the new species and *T. armatus* Coiffait have a tooth (more developed in the former than in the latter species) in the inner margin of the male profemur. Besides the presence of one carina in the abdominal sternum II, differences in the shape of median lobe, left paramere and internal sac separate *T. carinata* n. sp. from all the others belonging to this group. The presence of one pair of posteriolateral foveae in each side of the abdominal female sternum II is also a character within the *silvanoides* group, only found in the new species. The spermatheca of *T. carinata* n. sp. has a similar form (spheroid) to that of the other new species described in this work (*T. paulinoi* n. sp., see next description), but differs from that described for *T. fancelloi* which is peanut-shaped (see fig. 7, Magrini, 2000). This structure is unknown for the other members of the *silvanoides* group. The number of apical gonocoxite setae also differs (1 vs. 2) between the latter species, but is

similar between the former species (one seta). Taking into account the analysed characters, the new species seems to have a closer relationship with *T. algarvensis* and *T. paulinoi* n. sp.

#### *Typhlocharis paulinoi* new species

(figs. 9–16, 19–20, 22, 24)

#### Diagnosis

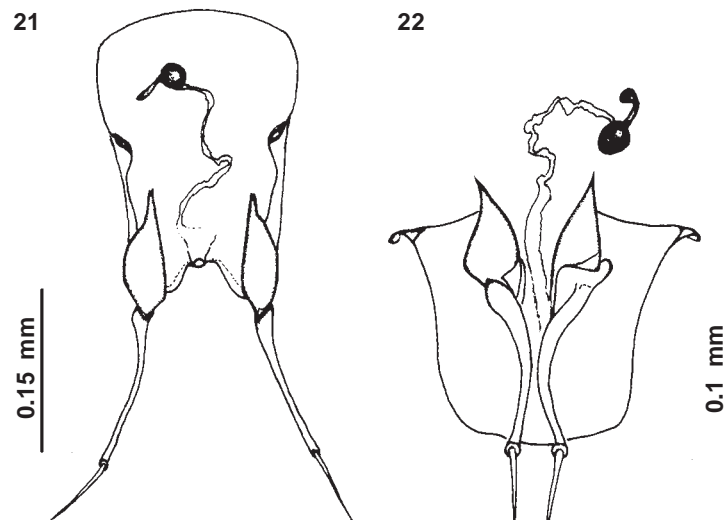
Anophtalmous, body parallel, depressed, brown, with integument microreticulate and scattered pubescence. Elytron with three discal setae, one subapical seta, and eight (4+4) marginal umbilicate setae; apical edge sinuate without teeth ( $\sigma^{\sigma}$  and  $\text{♀}\text{♀}$ ), sutural one absent. Hind trochanters inermis in both sexes. Abdominal female sternum II and III without any fovea. Aedeagus (figs. 19, 20) with the median lobe sickle-shaped, basal lamina markedly arcuate; internal sac in central area very diffuse with one lateral sclerite; left paramere with two large apical setae, right paramere bisetulose, with a large apical seta and a short sub-apical seta.

#### Description

Length of holotype: 1.6 mm.

Length of paratypes: 1.3–1.6 mm  $\sigma^{\sigma}$ , 1.3–1.8 mm  $\text{♀}\text{♀}$ .

Head (figs. 9–10): almost as long as wide (length: 0.22–0.30 mm  $\sigma^{\sigma}$  and 0.24–0.34  $\text{♀}\text{♀}$ ; width: 0.28–0.35 mm  $\sigma^{\sigma}$  and 0.32–0.38 mm  $\text{♀}\text{♀}$ ) with hexagonal microsculpture; vertex with transversal microsculpture arranged in parallel ridges to form a file (*pars stridens*) in the area below the anterior margin of pronotum (fig. 10). Cephalic chaetotaxy (large setae): Labrum with three pairs of setae (those on sides longer), one pair on sides of



Figs. 21–22. Female genitalia (ventral view): 21. *Typhlocharis carinata* n. sp.; 21. *Typhlocharis paulinoi* n. sp.

Figs. 21–22. Genitalia femenina (vista ventral): 21. *Typhlocharis carinata* n. sp.; 21. *Typhlocharis paulinoi* sp. n.

clypeus and one pair close to frontal sulcus, two pairs of supraocular setae (anterior and posterior) and 1–2 pairs of setae on the posterior region between vertex and lateral carinae. Antennae moniliform and mouth-parts (fig. 11) with no special features, as for other members of the genus.

Pronotum (fig. 12): quadrangular, as long as wide (1.0–1.1 times) (length: 0.35–0.45 mm ♂♂ and 0.35–0.46 mm ♀♀; width: 0.34–0.42 mm ♂♂ and 0.34–0.47 mm ♀♀), narrowed towards posterior angles which are obtuse; disk slightly depressed, with one faint longitudinal sulcus on each side; anterior margin slightly emarginate and posterior margin expanded on each side, emarginate in the middle region; lateral margins arcuate, with 2 or 3 minor denticles near the posterior angles; disk depressed near the posterior margin. Chaetotaxy: three irregular longitudinal series of minute setae between midline and lateral margins directed anteriorly; one anterior seta on each side in anterior quarter, one posterior seta on hind angle; four pairs of setae near the anterior margin.

Elytra (fig. 13): 1.8–1.9 times longer than wide (length: 0.70–0.85 mm ♂♂ and 0.78–0.94 mm ♀♀; width: 0.38–0.46 mm ♂♂ and 0.42–0.51 mm ♀♀), parallel and oval posteriorly, with a longitudinal carinae at the beginning of seventh stria; flattened on the disk; transverse scutellar organ present near the base of suture; scutellar region not punctured; humeral angles well marked and rounded, with a tooth in the base of carinae; lateral margins serrate, teeth decreasing in size posteriorly; apical margin without any tooth (figs. 13–14), subsinuate

after the end of longitudinal carina. Chaetotaxy: part of the pubescence of the disk is arranged in five lines from the sutural region, these short setae are erect and slightly directed anteriorly; three large discal setae stand out close to the third line, one subapical seta coinciding with the end of seventh stria; umbilicate series divided in two groups of four setae each (4+4) (fig. 13).

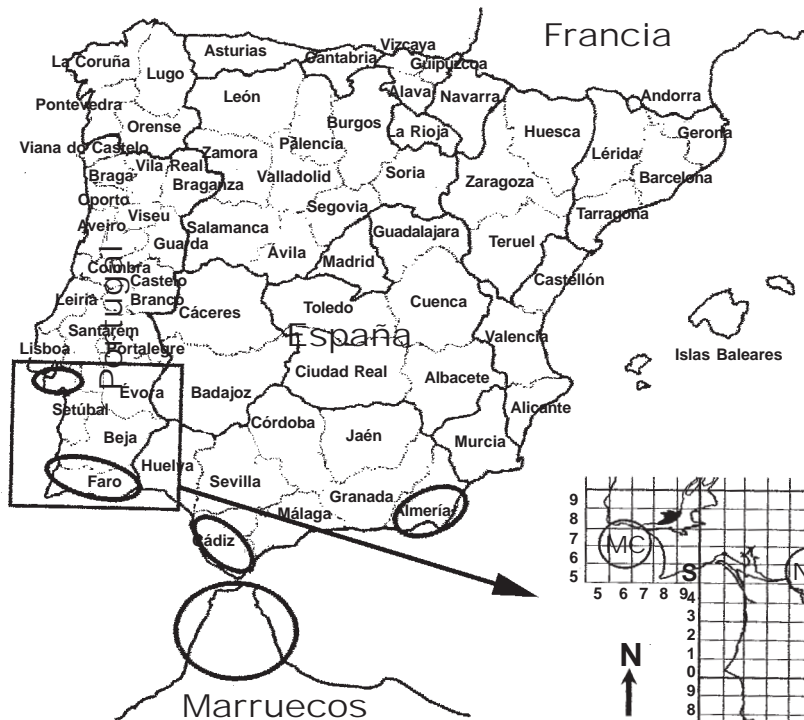
Legs: with robust femora, inner margin of profemur inerm; trochanters of third pair similar in male and female, without special features (figs. 15, 16), protarsus of male without dilated segments.

Abdomen (figs. 15, 16): with sternum II of male with no traces of any median special structure (fig. 15), female sternum II and III without any fovea on each side (fig. 16).

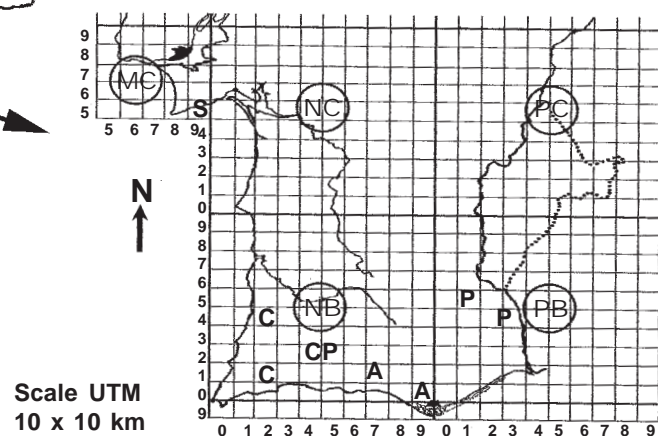
Male genitalia (figs. 19, 20): in lateral aspect with median lobe sickle-shaped, basal lamina markedly arcuate (fig. 19); median lobe in dorsal aspect (fig. 20) with apex more or less thin, bent to left; internal sac in central area very diffuse, with one lateral sclerite (dorsal aspect) and some tangled membranes; left paramere with two large apical setae, dorso-basal edge very expanded; right paramere bisetulose, with one large apical seta and one short sub-apical seta.

Female genitalia (fig. 22): with gonocoxites of ovipositor weakly sclerotized, each one in ventral aspect with one apical seta; internal genital tract with spermathecal duct short and spermatheca spheroid; spermathecal gland long, with proximal region membranous and apical region more or less sclerotized.

23



24



Figs. 23–24. Geographic distribution: 23. *Silvanoides* species group (ellipses); 24: A. *T. algarvensis* (UTM: 29SNB71, 29SNB90); C. *T. carinata* n. sp. (UTM: 29SNB21, 29SNB24, 29SNB42); P. *T. paulinoi* (UTM: 29SNB42, 29SPB15, 29SPB34); S. *T. sarrius* (UTM: 29SMC95).

Figs. 23–24. Distribución geográfica: 23. Grupo silvanoides (elipses); 24: A. *T. algarvensis* (UTM: 29SNB71, 29SNB90); C. *T. carinata* sp. n. (UTM: 29SNB21, 29SNB24, 29SNB42); P. *T. paulinoi* (UTM: 29SNB42, 29SPB15, 29SPB34); S. *T. sarrius* (UTM: 29SMC95).

#### Type series

Holotype ♂: Portugal, Alcoutim (UTM: 29SPB3046), 7 I 2004. Paratypes: 4 ♀♀, same locality and date, 10 ♂♂ and 6 ♀♀ (1 ♂ and 2 ♀♀ gold coated), same locality, 5 IV 2004; Alferce (Monchique) (UTM: 29SNB4320), 2 ♀♀, 12 I 2004; Espírito Santo (UTM: 29SPB1957), 1 ♀, 5 IV 2004. Holotype and paratypes deposited in the collection of the senior author, Department of Animal Biology (Lisbon).

#### Etymology

This new species is dedicated to the famous Portuguese entomologist Paulino de Oliveira who elaborated the first catalogue of coleopterous of Portugal and greatly contributed to the taxonomic and faunistic knowledge of these insects in the country.

#### Affinities

The new species also belongs to the *silvanoides* group. The new species shares with *T. sarrius* and *T. algarvensis* the presence and the same location pattern of three discal setae on the elytron. However, the latter species presents a slight carina in the middle region of the pronotum, a character not found in the new species or in any other species of the *silvanoides* group. The former species differs from *T. carinata* n. sp. by the number of setae in the left paramere (2 vs 1) and by the number, shape and position of the sclerites of the internal sac (cf. our figs. 19–20 with figs. 1B–1C in Serrano & Aguiar, 2001). *T. fancelloi* has an equal number of discal setae as *T. paulinoi* n. sp., but in a different position (see fig. 2 in Magrini, 2000). On the other hand, the absence of a tooth in the inner margin of the male profemur easily segre-



gates the new species from *T. armatus* and *T. carinata* n. sp. *T. paulinoi* n. sp. also differs from the latter species by the smaller length of the body, the number of discal setae on elytron (3 vs. 4) and the lack of a carina in the middle region of abdominal sternum II, among other characters. The new species, as well as *T. silvanoides* and *T. fancelloi*, do not bear any lateral foveae in the abdominal female sternum II. The new species is akin to *T. sarrus*, *T. carinata* n. sp. and apparently to *T. armatus* by the form of the apical edge of elytron which is subsinuate. The remainder species of the *silvanoides* group exhibit a round elytron apical edge. Within this group and with the exception of *T. carinata* n. sp., the conformation pattern of the median lobe of aedeagus of all species is very similar. However, this similitude is more evident between *T. silvanoides* and *T. paulinoi* n. sp. In both species the median lobe is sickle-shaped, ending in a small protuberance slightly bent to the left (cf. our figure 19 with figures 10–13 in Vigna Taglianti, 1972). The internal sacs also exhibit a vestigial sclerite close to the right side (dorsal view) and some tangled membranes. However, several differences can be observed in the aedeagus between these two species: 1. In contrast with with the same structure in *T. silvanoides*, the median lobe of the new species is not suddenly bent down in the apex; 2. The left paramere of *T. paulinoi* n. sp. is large (lateral aspect), while the same paramere in *T. silvanoides* is slender; and 3. The right paramere of the new species has one long apical seta and one

small subapical seta, while the same structure in *T. silvanoides* exhibits two apical setae. The new species can be easily distinguished from all the others of the same group by details related to the median lobe, the internal sac and the parameres. The form of the spermathecae of *T. paulinoi* n. sp. and *T. carinata* n. sp. is similar (spheroid), but the two differ from that described for *T. fancelloi* which is peanut-shaped. The number of apical gonocoxite setae also differs (1 vs. 2) between the two new species and the latter species, although it is similar to the former species (one seta). Taking the analysed characters into account, namely the features of the median lobe and the female genitalia, the new species seems to have a closer relationship with *T. silvanoides* and *T. carinata* n. sp.

As a final remark, we would like to point out that most of the described species of the *silvanoides* group are confined to Portugal south of the Tejo river (four species of the seven known), with prevalence in the Province of Algarve (three species) (figs. 23, 24).

#### Key to species of *Typhlocharis silvanoides* group

The *silvanoides* species group includes the following seven species: *T. silvanoides*, *T. algarvensis*, *T. armatus*, *T. fancelloi*, *T. sarrus*, *T. carinata* n. sp. and *T. paulinoi* n. sp. The species are distinguished from one another by character states in the key.

#### Key to species of *Typhlocharis silvanoides* group.

##### Clave para las especies del grupo *Typhlocharis silvanoides*.

1	Abdominal sternun II with a median carina; elytron with four discal setae, female with one slight pair of posteriolateral foveae. Aedeagus as in figs. 17–18	<i>T. carinata</i> n. sp.
	Abdominal sternun II without a median carina; elytron with or without three discal setae	2
2	Internal edge of femur of first pair of legs dentate in male	<i>T. armatus</i>
	Internal edge of femur of first pair of legs not dentate in male	3
3	Elytron without discal setae. Aedeagus as in figs. 10–13 of Vigna Taglianti (1972) work	<i>T. silvanoides</i>
	Elytron with discal setae	4
4	Pronotum slightly carinate in the middle region of disk	<i>T. algarvensis</i>
	Pronotum without any carina in the middle region	5
5	Apical edge of elytron rounded. Aedeagus as in fig. 4 of Magrini (2000) work	<i>T. fancelloi</i>
	Apical edge of elytron subsinuate	6
6	Median lobe of aedeagus with apex suddenly bent down; left and right parameres with two apical setae each one	<i>T. sarrus</i>
	Median lobe of aedeagus sickle-shaped continuously to apex; right paramere with one apical large seta and one subapical short seta (figs. 19–20)	<i>T. paulinoi</i> n. sp.

### Acknowledgments

We are grateful to Telmo Antunes and Sónia Proença for photographic assistance. Maria José Boavida helped us to improve the English version. We thank Vicente Ortuño Hernández and one anonym referee, whose comments improved the manuscript. This work was partially financed by Centro de Biologia Ambiental (CBA).

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