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Three new species of *Paracephennium* O'Keefe from Costa Rica (Coleoptera: Staphylinidae: Scydmaeninae)

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Abstract. Three new species of the Neotropical genus *Paracephennium* O'Keefe (Staphylinidae, Scydmaeninae, Cephenniini) are described from Costa Rica: *P. impressum* n. sp., *P. falini* n. sp. and *P. sanjoseanum* n. sp. Diagnostic characters, including the aedeagi of the newly described species, are discussed and illustrated.

Key words: entomology, taxonomy, new species, Coleoptera, Staphylinidae, Scydmaeninae, Cephenniini, *Paracephennium*, Neotropical, Costa Rica.

INTRODUCTION

Only three genera of Cephenniini are known to occur in Meso- and South America. *Pseudocephennium* Reitter, 1883 is represented by *P. integricolle*, described from Venezuela, and *Cephennium spinicolle* Schaufuss, 1867 known from 'New Granada' and transferred to *Pseudocephennium* by Csiki (1919). However, the depository of the type material of *P. integricolle* remains unknown, and the Schaufuss' species has never been revised, so its placement should be treated as tentative. Two other genera were described recently: four species of *Paracephennium* O'Keefe, 1999 are restricted to Costa Rica, and five species of *Cephazteca* Jałoszyński, 2011 are distributed in Mexico, Nicaragua and Costa Rica.

Paracephennium is characterized by strongly modified abdominal sterna; the procoxae divided by the prosternal process; the hind pronotal angles with pits developed as indistinct impressions and not as foveae; and the elytra without basal foveae (O'Keefe, 1999). Moreover, the symmetrical aedeagus of all known species is relatively complicated, with short but complex apical projections. Three new species of *Paracephennium* are described below.

MATERIALS AND METHODS

Depositories of the studied material:

INBio – National Biodiversity Institute (Instituto Nacional de Biodiversidad), Santo Domingo de Heredia, Costa Rica;

NMC – Canadian Museum of Nature, Ottawa, Canada;

SEMC – University of Kansas, Natural History Museum and Biodiversity Research Center (Snow Entomological Collections).

The specimens used for descriptions were borrowed from and returned to SEMC. Their final depository is INBio, according to a formal agreement between these institutions (Z. Falin, pers. comm.). Therefore, the depository in the descriptive part below is indicated as SEMC/INBio.

For comparative purposes, holotypes of all species of *Paracephennium* described by O'Keefe (1999) were examined: *P. monteverde* (the type species of *Paracephennium*) (NMC), *P. laselva* (SEMC/INBio); *P. penasblancas* (NMC) and *P. newtoni* (NMC).

Aedeagi were observed in permanent mounts in Canada balsam; beetles were studied and measured with a Leica M205 C stereomicroscope. The measurements and abbreviations used in the text are as follows: body length (BL) is a sum of lengths of the head, pronotum and elytra measured separately; length of head (HL) was measured from a hypothetical line joining posterior margins of eyes to anterior margin of the frontoclypeal area; width of head (HW) includes eyes; length of antennae (AnL) was measured in the ventral position in order to include the basal part of the scape that in dorsal view is concealed under the supraantennal tubercle; length of pronotum (PL) was measured along midline; width of pronotum (PW) is maximum; length of elytra (EL) was measured along suture, from a hypothetical line joining humeral denticles to the apex; width of elytra (EW) is maximum, combined; elytral index (EI) is length divided by combined width; length of aedeagus (AeL) is that of the median lobe.

As in nearly all Cephenniini, the morphology of *Paracephennium* species is relatively uniform, and each identification must be confirmed by examination of the aedeagus.

TAXONOMY

Paracephennium impressum n. sp.

(Figs 1, 4-6)

Name derivation

The adjective *impressum* is derived from the Latin verb "imprimo", to press into or upon, to impress, imprint. The epithet refers to the impressed elytral apices.

Diagnosis

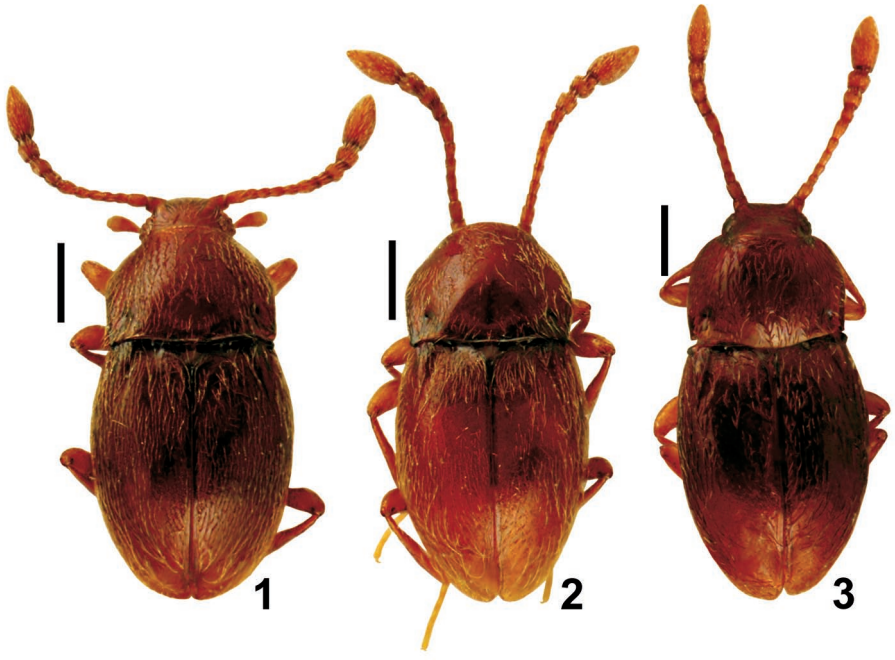
BL > 1 mm; antennomere VII twice as long as broad; elytra with oval subapical circumsutural impression; aedeagus in ventral view with dorsal apical projection visible in its distal half, without lateral subapical projections; subapical dorsal setae of aedeagus loosely distributed along proximal margin of deep excavation.

Description

Male. Body (Fig. 1) elongate and strongly convex, with shallow but distinct constriction between pronotum and elytra, BL 1.11 mm, uniformly light brown, covered with yellowish brown vestiture.

Head broadest at eyes, HL 0.14 mm, HW 0.25 mm; vertex convex; frons flattened; supraantennal tubercles small but well-marked; eyes large and strongly convex, coarsely faceted; punctures on head dorsum fine and sparse, barely discernible at magnification 40x; vestiture sparse and short, suberect. Antennae long and slender, AnL 0.55 mm, three-segmented club indistinctly delimited, antennomeres I-VII distinctly elongate (VII twice as long as broad); VIII-IX only slightly longer than broad; X as long as broad; XI slightly longer than IX-X together, 2.4 times as long as broad, moderately strongly narrowing towards subconical, blunt apex.

Pronotum in dorsal view semiellipitical, broadest near middle, PL 0.33 mm, PW 0.45 mm; anterior and lateral margins rounded; hind angles nearly right and acute; posterior margin shallowly bisinuate; ante-basal lateral pits small and shallow, each located slightly closer to lateral than posterior pronotal margin. Disc very finely but densely punctate, punctures barely noticeable under magnification 60x, very small and shallow, separated by spaces comparable to puncture diameters; setae sparse and short, recumbent.



1-3. Dorsal habitus of male *Paracephennium*; 1 – *P. impressum* n. sp.; 2 – *P. falini* n. sp.; 3 – *P. sanjoseanum* n. sp. (scale bars: 0.2 mm)

Elytra elongate and oval, broadest slightly anterior to middle, moderately narrowing towards apices, EL 0.65 mm, EW 0.53 mm, EI 1.24; each elytron with small but distinct basal impression, indistinct subhumeral line developed as very narrow and barely noticeable carina as long as only 0.2 EL, and modified apex: subapical area with shallow, nearly circular circumsutural impression interrupted in middle by raised suture, posterior margin of impression separated from elytral apex by distance much shorter than length of impressed area. Punctures on elytra more distinct than those on pronotum, very fine but very dense, nearly adjacent one to another, so that elytral surface appears less glossy than pronotal disc; setae relatively dense, short, nearly recumbent, except for suberect sparse and long setae at each side of subapical impression directed mesad and caudad. Hind wings well developed.

Legs long and slender, without modifications.

Aedeagus (Figs 4-6) elongate, AeL 0.35 mm, in ventral view with clearly visible ventral apical projection and only distal half of dorsal apical projection; subapical dorsal setae moderately long and forming loose and irregular arcuate row along proximal margin of deep excavation; apices of parameres in ventral view not broadened, each bearing three setae.

Female. Unknown.

Type material

Holotype (male): three labels: "COSTA RICA: Puntarenas Prov. / Las Alturas Biol. Sta., 1660m / 08°56.17'N, 82°50.01'W / 31-V–3-VI-2004. J.S.Ashe, Z. / Falin, I. Hinojosa. Ex: flight / intercept / trap, CR1AFH04 092" [white, printed]; barcode label "SM0621163 / KUNHM-ENT" [white, printed]; "*PARACEPHENNIUM* / *impressum* m. / det. P. JAŁOSZYŃSKI '11 / HOLOTYPUS" [red, printed] (SEMC/INBio).

Distribution.

Costa Rica, Puntarenas Province.

***Paracephennium falini* n. sp.**

(Figs 2, 7-9)

Name derivation

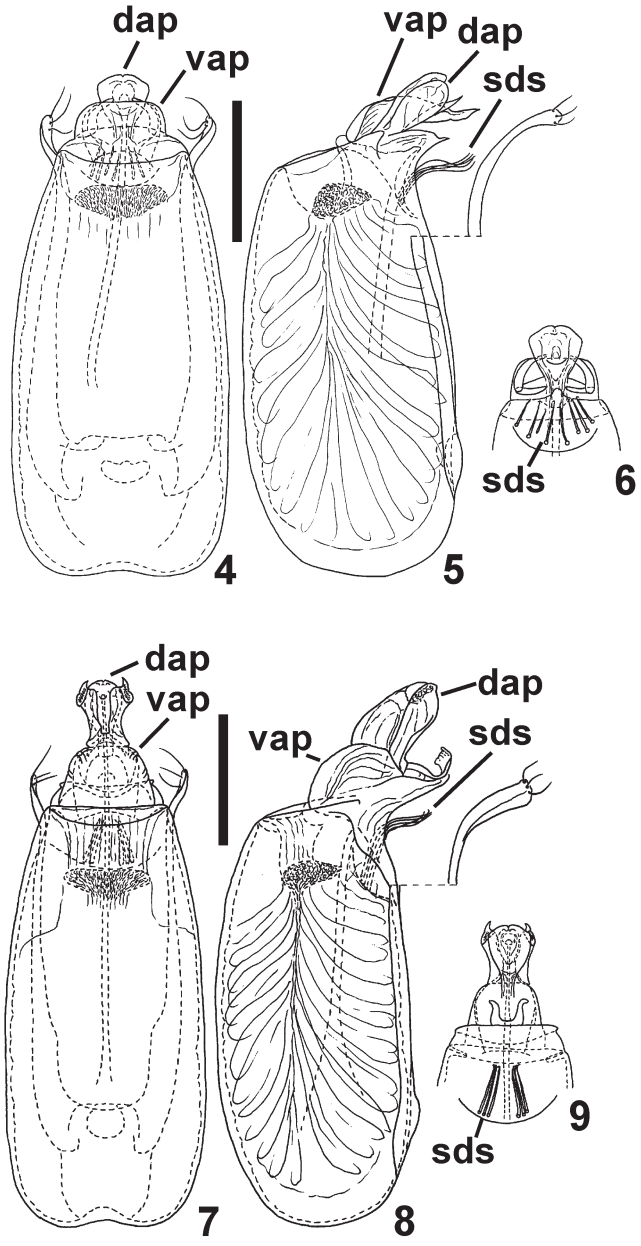
The name is dedicated to Zacchary Falin, one of collectors of this species.

Diagnosis

BL > 1 mm; antennomere VII nearly three times as long as broad; elytra non-modified; aedeagus in ventral view with entirely visible dorsal apical projection, without lateral subapical projections; subapical dorsal setae of aedeagus forming two separated and very tight groups on proximal margin of deep excavation.

Description

Male. Body (Fig. 2) elongate and strongly convex, with shallow but distinct constriction between pronotum and elytra, BL 1.05 mm, uniformly light brown, covered with yellowish brown vestiture.



4-9. Aedeagus of *Paracephennium* in ventral (4, 7) and lateral (5, 8) views, and apex of median lobe in dorsal view (6, 9); 4-6 – *P. impressum* n. sp.; 7-9 – *P. falini* n. sp. Abbreviations: dap - dorsal apical projection; sds - subapical dorsal setae; vap - ventral apical projection (scale bars: 0.1 mm)

Head broadest at eyes, HL 0.19 mm, HW 0.24 mm; vertex convex; frons flattened; supraantennal tubercles small but well-marked; eyes large and strongly convex, coarsely faceted; punctures on head dorsum fine and sparse, barely discernible at magnification 40x; vestiture sparse and short, suberect. Antennae long and slender, AnL 0.63 mm, three-segmented club indistinctly delimited, antennomeres I-VII distinctly elongate (VII nearly 3x as long as broad); VIII-X each only slightly longer than broad; XI slightly longer than IX-X together, 2.6 times as long as broad, strongly narrowing towards subconical, nearly pointed apex.

Pronotum in dorsal view semiellipitical, broadest near middle, PL 0.31 mm, PW 0.45 mm; anterior and lateral margins rounded; hind angles nearly right and acute; posterior margin shallowly bisinuate; ante-basal lateral pits small and shallow, each located slightly closer to lateral than posterior pronotal margin. Disc very finely but densely punctate, punctures barely noticeable under magnification 40x, very small and not sharply marked, separated by spaces comparable to puncture diameters; setae sparse and short, recumbent.

Elytra elongate and oval, broadest between middle and anterior third, strongly narrowing towards apices, EL 0.65 mm, EW 0.48 mm, EI 1.37; each elytron with small but distinct basal impression, indistinct subhumeral line developed as very narrow and barely noticeable carina as long as only 0.2 EL, and apex without modifications; punctures more distinct than those on pronotum, very fine but very dense, nearly adjacent one to another, so that elytral surface appears distinctly less glossy than pronotal disc; setae relatively dense, short, nearly recumbent, except for sparse longer setae at each side of suture in subapical region, which are suberect and directed caudad. Hind wings not studied.

Legs long and slender, without modifications.

Aedeagus (Figs 7-9) elongate, AeL 0.43 mm, in ventral view with clearly visible ventral apical projection and entire dorsal apical projection; subapical dorsal setae moderately long and forming two tightly assembled and broadly separated groups on proximal margin of very deep excavation; apices of parameres in ventral view not broadened, each bearing three setae.

Female. Unknown.

Type material

Holotype (male): three labels: "COSTA RICA: Puntarenas Prov. / Las Cruces Biol. Sta., 1330m / 08°47.14'N, 82°57,58'W / 28-31-V-2004. J.S.Ashe, Z.Falin, / I. Hinojosa. Ex: flight intercept / trap, CR1AFH04 060" [white, printed]; barcode label "SM0611409 / KUNHM-ENT" [white, printed]; "*PARACEPHENNIUM* / *falini* m. / det. P. JAŁOSZYŃSKI '11 / HOLOTYPUS" [red, printed] (SEMC/INBio).

Distribution.

Costa Rica, Puntarenas Province.

***Paracephennium sanjoseanum* n. sp.**

(Figs 3, 10-12)

Name derivation

Locotypical; the adjective *sanjoseanum* is derived from the San Jose province of Costa Rica.

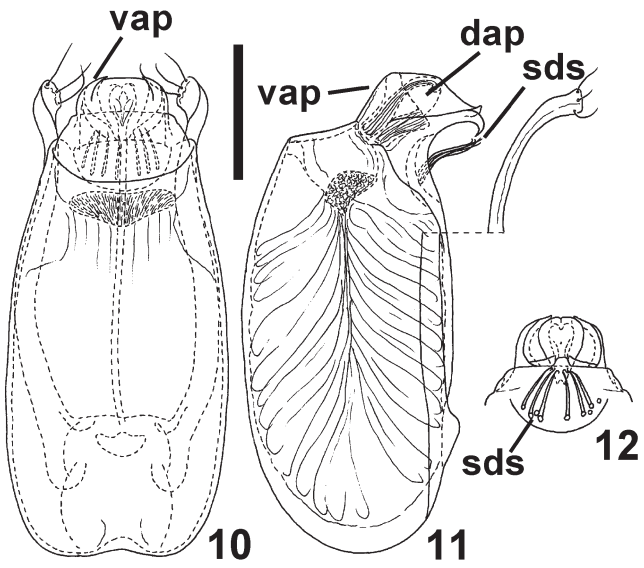
Diagnosis

BL > 1.1 mm; antennomere VII nearly three times as long as broad; elytra with oval subapical circumsutural impression; aedeagus in ventral view with dorsal apical projection not visible, without lateral subapical projections; subapical dorsal setae of aedeagus forming two separated but loose groups on proximal margin of deep excavation.

Description

Male. Body (Fig. 3) externally nearly identical to *P. falini*, differs only in measurements, modified elytral apices and aedeagus; only differences are described here.

BL 1.18 mm; HL 0.13 mm, HW 0.25 mm; AnL 0.63 mm; PL 0.35 mm, PW 0.45 mm; EL 0.70 mm, EW 0.55 mm, EI 1.27. Elytra with small, nearly circular and shallow circumsutural impression near apex divided in halves by raised elytral suture, posterior margin of impression separated from elytral apex by distance slightly shorter than length of impressed area.



10-12. Aedeagus of *Paracephennium sanjoseanum* in ventral (10) and lateral (11) views, and apex of median lobe in dorsal view (12) Abbreviations: dap - dorsal apical projection; sds - subapical dorsal setae; vap - ventral apical projection (scale bar: 0.1 mm)

Aedeagus (Figs 10-12) elongate, AeL 0.35 mm, in ventral view with only ventral apical projection visible; subapical dorsal setae moderately long and forming two irregular, loosely assembled and broadly separated groups on proximal margin of deep excavation; apices of parameres in ventral view broadened, each bearing three setae.

Female. Unknown.

Type material

Holotype (male): three labels: "COSTA RICA: San Jose Prov. / 2.4km ENE Sn Gerardo de Rivas / Cloudbridge Reserve, Ridge trail / 2050 m 09°28.07'N, 83°33.84'W / 9-12-VI-2004. J.S.Ashe, Z.Falin, / I. Hinojosa. Ex: flight intercept / trap, CR1AFH04 200" [white, printed]; barcode label "SM0659096 / KUNHM-ENT" [white, printed]; "*PARACEPHENNIUM* / *sanjoseanum* m. / det. P. JAŁOSZYŃSKI '11 / HOLOTYPUS" [red, printed] (SEMC/INBio).

Distribution.

Costa Rica, San Jose Province.

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