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A new genus of cleptoparasitic bees from the West Indies (Hymenoptera: Halictidae)

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Abstract. *Nesosphecodes* gen. nov., a new genus of cleptoparasitic bees (Halictinae: Halictini) is described and figured. *Nesosphecodes* is most similar to *Microsphecodes* but differs most notably by the larger body size, more sparse punctation, coal-black integument with the absence of any yellowish areas on the head and mesosoma, and shorter free portion to the marginal cell with submarginal cells extending just barely beyond the pterostigmal apex, among other characters. The genus is differentiated from other sphecodines (e.g., *Sphecodes*, *Microsphecodes*, *Eupetersia*). Three new species are described: *Nesosphecodes anthracinus* sp. nov. from Puerto Rico, *N. halictophagus* sp. nov. from the Dominican Republic, and *N. cubicola* sp. nov. from Cuba. A key to the species is presented.

Key words: Apoidea, Anthophila, cleptoparasite, Puerto Rico, Cuba, Dominican Republic, Neotropical region.

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I. INTRODUCTION

The West Indian halictine fauna is diverse and includes some apparently monophyletic derivatives that diversified in the Caribbean such as the "*Habralictellus*" group of *Dialictus*. This diversity is mirrored in the geological record as evidenced by several genera and species represented in Miocene Dominican amber (summarized in ENGEL 2001). Many of these lineages are derived from the South American fauna (e.g., *Augochlora*, *Neocorynura*), although some exceptions to this biogeographic pattern do apparently exist (e.g., *Agapostemon*).

In addition to the typical, pollen-collecting halictines, there are also cleptoparasitic species documented from the Caribbean and belonging to the subtribe Sphecodina (Halictinae: Halictini; *vide* ENGEL, 2005), as well as one parasite of the tribe Augochlorini (*Temnosoma*; *vide* ENGEL, 2000). Unfortunately, these species are far less understood and for quite some time I have known about several new parasitic halictines, including a new genus, in the West Indian fauna. Herein I describe the new genus to make its name available for other researchers presently working on the Caribbean fauna, particularly the bee faunas of Cuba and Puerto Rico. The new group superficially resembles in some characteristics the Eastern Hemisphere genus *Eupetersia* BLÜTHGEN (1928) or

even more strongly so the neotropical genus *Microsphecodes* EICKWORT & STAGE (1972). The format for the descriptions generally follows that used by ENGEL *et al*. (1997) and morphological terminology is based on that of ENGEL (2001). The abbreviations F, S, and T are used in the descriptions for flagellomere, metasomal sternum, and metasomal tergum, respectively.

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II. SYSTEMATICS

Nesosphecodes gen. n.

T y p e s p e c i e s. *Nesosphecodes anthracinus* sp. n.

D i a g n o s i s. This genus includes moderate-sized to large *Microsphecodes*-like species with entirely black integument and broad heads. The mandibles are long and simple, being slightly longer than the compound eyes (Figs 1, 2, 4, 5), the clypeus is exceptionally short and broad and the subantennal sulci are short, their length being about as long as the diameter of the antennal toruli. Females of *Nesosphecodes* differ from typical female *Sphecodes* by the fine punctation of the head and mesosoma, not coarse and closely packed as in *Sphecodes*, even less punctate than *Microsphecodes*; by the pronotal lateral angles lacking a distinct vertical ridge or carina; the length of the scape reaching back to the ocelli; the length of F2 twice as long as F1; the gently rounded preoccipital area; the short and broad clypeus; the anterior border of the mesoscutum when viewed in profile is gently convex, while typical *Sphecodes* have an abrupt, declivitous anterior surface well defined from the mesoscutal dorsal surface; the nearly impunctate hypoepimeral area; the dense, plumose setae obscuring the propodeal lateral and posterior surfaces; the width of the linear costal cell being one-third the width of the costal vein; the acute marginal cell apex; and the non-depressed apical margins of T2–4. Males are notable for the same characters except the relative lengths of F1 and F2 in male *Sphecodes* are fairly variable. This genus superficially resembles the Eastern Hemisphere genus *Eupetersia* in that the female F1 is dramatically shorter than F2 (Fig. 4). The genus differs from *Microsphecodes* by the larger body size, shortened female F1, complete absence of yellow markings, and the submarginal cells extending beyond the pterostigmal apex (albeit only slightly so) (Fig. 6).

E t y m o l o g y. The new genus-group name is a combination of the Greek word *nesos* (meaning, "island") and the generic name *Sphecodes* (type genus of the subtribe Sphecodina, to which the new genus belongs). The name is masculine.

C o m m e n t s. *Nesosphecodes* is the least punctate, strong-veined, parasitic halictid. It most strongly resembles *Microsphecodes* with the notable exceptions as indicated in the diagnosis (*vide supra*). The two are perhaps related. As more material is discovered and more information accumulates on these groups, *Nesosphecodes* might be classified as a subgenus of *Microsphecodes*, such a placement at this time, however, is premature. One possibility is that *Microsphecodes* should be restricted for the mainland species and a new genus proposed for those Lesser Antillean "*Microsphecodes*". In this sense, the Lesser Antilles would be occupied by West Indian "*Microsphecodes*", the Greater Antilles by *Nesosphecodes*, and the mainland by *Microsphecodes* s.str. The mainland *Microsphecodes* are distinctive (e.g., foveolate basal area of the propodeum) and such a segregation of

the species might eventually be warranted. While this one propodeal character might suggest that *Microsphecodes* is paraphyletic with respect to *Nesosphecodes*, the apomorphically pale coloration of both mainland and Antillean *Microsphecodes* appears to unite these species.

Microsphecodes and *Nesosphecodes* are also exclusively neotropical and share a short clypeus (Figs 2, 4). Making measurements of clypeal length and dividing it by its width of both sexes for 3-5 species of the following New World subgenera of *Sphecodes* and related sphecodine taxa gave the following preliminary ratios: *Nesosphecodes* 0.16, "*Drepanium*" 0.22-0.31 (x = 0.26), *Microsphecodes* 0.28-0.33 (x = 0.29), *Sphecodes* s. str. 0.29-0.46 (x = 0.39), "*Proteraner*" 0.37-0.46 (x = 0.45), *Austrosphecodes* 0.39-0.50 (x = 0.46), "*Sphecodium*" 0.45-0.54 (x = 0.51), and *Ptilocleptis* 0.63. In addition, the upper lateral surface of the propodeum of *Nesosphecodes* is similar to that of *Drepanium* (presently classified as a synonym of *Sphecodes* s. str.: *vide* MICHENER 1978, 2000) in that it is impunctate, shiny, and without setae.

Among the species *Nesosphecodes cubicola* would appear to be the most primitive, retaining a slightly more punctured integument and lacking the lamellae laterally on the pygidial plate, while at the same time possessing typical features characterizing the genus. The remaining two species would appear to be related based on their sharing of the parallel inner eye margins, lateral lamellae on the pygidial plate, and more sparse punctation. Despite these variations in the genus, all three of the species are exceptionally similar in most details. Thus, a detailed description is provided for the species represented by the most well preserved specimens (and this species is, therefore, also selected as the type species of the genus) and differential descriptions provided for the remaining species.

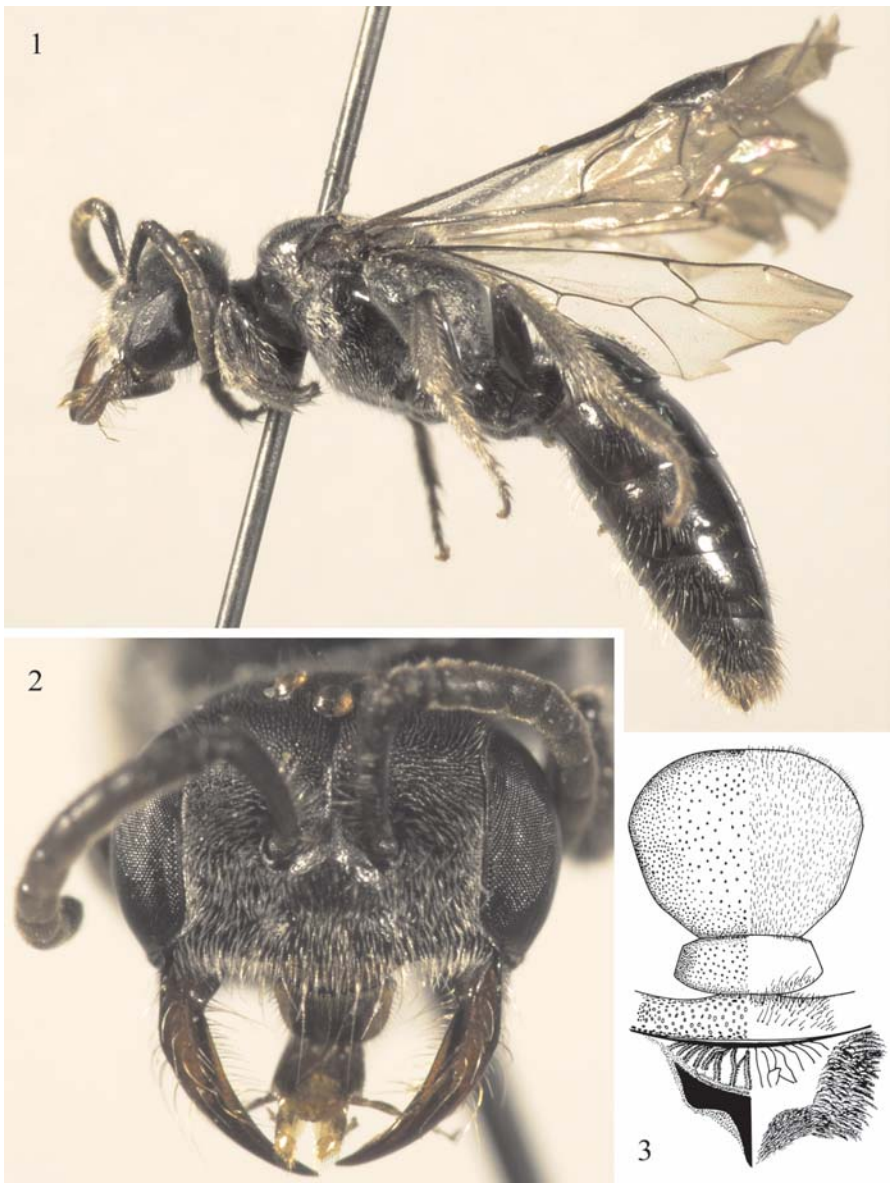
Nesosphecodes anthracinus sp. n.

Figs 1-6

D i a g n o s i s. This species can be recognized by its larger body size relative to the other species. It is most similar to *N. halictophagus* as both have the inner margins of the compound eyes parallel (not converging ventrally), more sparsely punctate mesoscutum, and the lateral margins of the pygidial plate lamellate. However, aside from its larger body size *N. anthracinus* differs in the pygidial plate apex being broadly rounded (rather than narrowed in *N. halictophagus*) and on the lower part of the face (ventral to and around the antennal toruli) the short, subappressed, branched setae do not obscure the integument in direct frontal view (such setae noticeably obscuring integument of lower face and clypeus in direct frontal view in *N. halictophagus*).

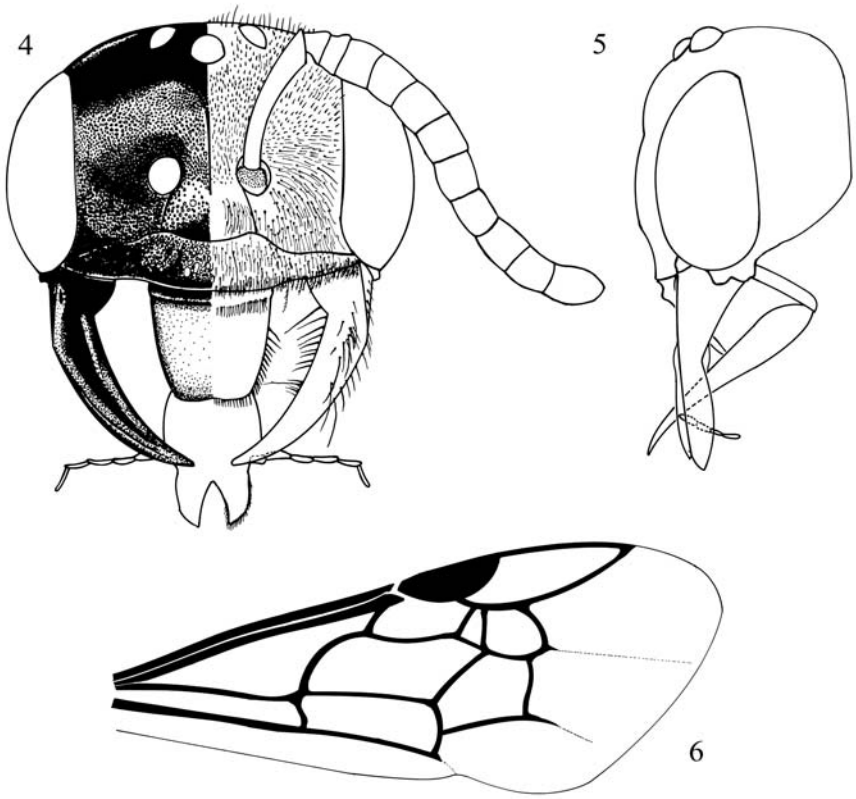
D e s c r i p t i o n. **Female.** Total body length 9.2 mm; forewing length 7.2 mm. Head much broader than long (width 2.4 mm, length 1.6 mm as measured from clypeal apex to vertex in frontal aspect) (Figs 2, 4). Frontal line carinate from just below antennal toruli to half of distance to median ocellus, becoming an impressed line from that point onward. Mandibular base meeting lower border of compound eye. Upper and lower interorbital distances nearly equal (*i.e.*, compound eyes not converging ventrally, inner margins parallel); inner margin of compound eye relatively straight. Gena about as broad as compound eye in profile (Fig. 6). Scape length 0.84 mm; F1 much shorter than F2, length about one-half length of F2; distal flagellomere with inner apical half glabrous. Intertegular distance 1.62 mm. Basal vein distad cu-a by two times vein width; 1rs-m distad 1m-cu by vein width; 2rs-m distad 2m-cu by ten times vein width; first submarginal cell about as long as combined lengths of second and third submarginal cells; second submarginal cell narrowed anteriorly, posterior border about twice as long as anterior border; anterior border of third submarginal cell nearly one-half length of posterior border and nearly three times length of anterior border of second submarginal cell; hind wing with distal hamuli arranged 3-1-1-3. Pygidial plate large and broadly rounded at its apex, margins (lateral and apical) lamellate.

Clypeus weakly imbricate with weak punctures separated by a puncture width; remainder of head with minute punctures (Fig. 4), separated by 1-2 times a puncture width, integument between punctures smooth and shining, punctures weaker on vertex; postgena smooth and impunctate. Pro-



Figs 1-3. Holotype female of *Nesosphecodes anthracinus* sp. nov. 1. Lateral habitus. 2. Facial aspect of female. 3. Pattern of punctation (left half) and setation (right half) of mesosomal dorsum – from anterior to posterior: mesoscutum, mesoscutellum, metanotum, propodeum.

notum with minute punctures separated by 1-3 times a puncture width, punctures of anterior lateral borders closer to each other, integument between punctures smooth and shining. Mesoscutum with minute punctures separated by 1-4 times a puncture width (Fig. 3), those of lateral and posterior borders separated by 1-2 times a puncture width, integument between punctures smooth and shining; tegula smooth except inner border imbricate and minutely punctured; mesoscutellum sculptured as on mesoscutum except punctures separated by 1-4 times a puncture width over entire surface. Metanotum nodulose, integument between smooth and shining. Preëpisternum weakly rugulose; mese-



Figs 4-6. Female of *Nesosphecodes anthracinus* sp. nov. 4. Facial view (left half depicts sculpturing, right half depicts setation). 5. Lateral view of head. 6. Forewing.

pisternum smooth and shining with sparse, minute punctures; metepisternum with small punctures on anterior third separated by a puncture width, upper third minutely rugulose, otherwise integument smooth and shining. Basal area of propodeum with strong, reticulating striae radiating from basal border (Fig. 3), integument between striae smooth and shining; lateral and posterior surfaces of propodeum areolate except broad, smooth basal triangle just above propodeal pit on posterior surface (Fig. 3). Metasomal terga and sterna faintly imbricate except T1 virtually smooth.

Mandible dark reddish brown; labrum and mouthparts dark brown; remainder of head and body black and shining except pygidial plate and apices of distal tarsomeres brown. Wing veins black; wing membrane somewhat fuscous on anterior half of marginal cell, otherwise hyaline.

Pubescence white except when indicated. Face with long, simple setae on lower half intermingled with much shorter, subappressed, highly-branched setae, shorter setae noticeably more dense on lower half of face and clypeus but not obscuring integument; upper half of face and vertex with less numerous, short, simple setae, a few with minute branches; some setae on vertex slightly fuscous. Setae on gena like those of vertex. Postgena with long, simple setae, a few with minute branches. Pronotum covered in minute, plumose setae, not obscuring integumental surface, such setae sparse anterior to pronotal lobe. Mesoscutum and mesoscutellum with scattered, short, simple setae, those on mesoscutellum more confined to posterior border; tegula with minute setae on apical and inner borders. Metanotum with similar setae as to those on mesoscutellum except longer and branched. Preëpisternum covered with short, plumose setae, largely obscuring integumental surface; mesepisternum with short, plumose setae becoming longer and more numerous ventrally; me-

tepisternum with short, plumose setae dense on lower third and anterior border, sparse on posterior median border. Lateral and posterior surfaces of propodeum densely covered in short, plumose setae that largely obscure integumental surface. Metasomal T1 with simple, short setae on lateral borders; T2-3 with minute, simple setae scattered on basal two-thirds, such setae longer laterally; T4 with similar setae as to those on T3 except intermingled with a few long, simple setae more apically; T5 with similar setae becoming minutely branched, fuscous, and more dense, apical margin with brush of such fuscous, branched, moderate-length setae; T6 with setae as on disc of T5; sterna with scattered simple setae, short to long in length, longer setae generally scattered in apical halves; S5 with all setae restricted to apical half; setae of S5-6 entirely fuscous.

Male. Unknown.

H o l o t y p e. ♀, Puerto Rico, Toro Negro Forest [Bosque Estatal de Toro Negro, Cordillera Central, Municipio Villalba, ca. 66°31'N, 18°08'W], 2 Nov. 1982, SNELLING & TORRES. Deposited in the Department of Entomology, Natural History Museum of Los Angeles County, Los Angeles, California, United States.

E t y m o l o g y. The specific epithet is based on the Greek meaning, "coal black", and is a reference to the dark coloration of the species.

Nesosphecodes halictophagus sp. n.

D i a g n o s i s. This species is most similar to *N. anthracinus* as both have the inner margins of the compound eyes parallel (not converging ventrally), more sparsely punctate mesoscutum, and the lateral margins of the pygidial plate lamellate. The body size of *N. halictophagus* is smaller than that of *N. anthracinus* (refer to metrics in descriptions). *Nesosphecodes halictophagus* also differs in the narrowed pygidial plate apex and the setae on the lower part of the face (ventral to and around the antennal toruli) the short, subappressed, branched setae noticeably obscure the integument of the lower face and clypeus in direct frontal view. Refer also to the diagnosis for *N. anthracinus* (*supra*).

D e s c r i p t i o n. As described for *N. anthracinus* (*vide supra*), with the following exceptions: **Female.** Total body length 8.4 mm; forewing length 6.1 mm. Head much broader than long (width 1.9 mm, length 1.3 mm as measured from clypeal apex to vertex in frontal aspect). Scape length 0.6 mm; distal flagellomere without inner apical half glabrous. Intertegular distance 1.3 mm. Hind wing with distal hamuli arranged 2-1-1-2. Pygidial plate large and narrowly rounded at its apex (almost pointed), margins (lateral and apical) lamellate.

Mesoscutum with minute punctures separated by 2-4 times a puncture width, those of lateral and posterior borders separated by 1-2 times a puncture width, integument between punctures smooth and shining; mesoscutellum sculptured as on mesoscutum except punctures exceptionally sparse; mesepisternum smooth, shining, and impunctate.

Mandible amber with dark reddish brown apex and base; remainder of head and body black and shining except metasoma and legs dark brown and pygidial plate and apices of distal tarsomeres brown.

Shorter, subappressed, plumose setae on lower half of face dense and obscuring integument of clypeus and lower face.

Male. Unknown.

H o l o t y p e. ♀, Dom. Rep. [Dominican Republic], Pedernales, 60 km NW Cabo Rojo, Las Abejas cloud for. [forest], 30.XI.1991 [30 November 1991], 1200 m, L. MASNER & S. PECK, sweep [sweep netting]. Deposited in the Canadian National Collection, Ottawa, Canada.

P a r a t y p e s. 1♀, Dom. Rep. [Dominican Republic], Pedernales, 60 km NW Cabo Rojo, Las Abejas cloud for. [forest], 30.XI.1991 [30 November 1991], 1200 m, L. MASNER & S. PECK, sweep [sweep netting]. 1♀, Dom. Rep. [Dominican Republic], La Vega Prov., PN. A. Bermudez [Parque Nacional José Armando Bermúdez], Cienaga, 19.VII–2.VIII 1995 [19 July–2 August

1995], S. & J. PECK, 1010 m, FIT [flight intercept trap], trop. evgrn. for. [tropical evergreen forest]. Deposited in the Canadian National Collection, Ottawa, Canada.

E t y m o l o g y. The specific epithet is a reference to the parasitic habits of *Nesosphecodes* species and that they likely victimize other halictines, such as sympatric *Lasioglossum* species.

C o m m e n t s. During the same collecting event at which the holotype and one of the paratypes were captured, a single female of a remarkably distinctive and large, undescribed species of *Lasioglossum* (*Dialictus*) was also taken (the species is remarkably robust with strong metallic blue opalescence, and with a larger, granulose basal area to the propodeum; reminiscent of the "*Habralictellus*" group of *Dialictus* but differing significantly from any known *Habralictellus*-like bee). The size of the species would match that of a potential host for *N. halictophagus*. The specimen of this potential host is labeled as such and is deposited in the Canadian National Collection.

There is some slight variation in the type series. The single female from Bermudez is slightly smaller (approximately 7.1 mm in total body length) which might reflect development within a slightly smaller host cell.

Nesosphecodes cubicola sp. n.

D i a g n o s i s. This species can be distinguished from the other two species by the more densely punctured mesoscutum whereby the punctures are separated by a puncture width or less on the margins and by 1-2 times a puncture width on the central disc, by the compound eyes slightly converging ventrally, and by the absence of the lateral lamellate rims on the broadly rounded pygidial plate.

D e s c r i p t i o n. As described for *N. anthracinus* (*vide supra*), with the following exceptions: **Female.** Total body length 7.8 mm; forewing length 5.9 mm. Head much broader than long (width 1.9 mm, length 1.5 mm as measured from clypeal apex to vertex in frontal aspect). Inner orbits of compound eyes weakly concave in upper half of face, slightly converging ventrally. Scape length 0.6 mm. Intertegular distance 1.3 mm. Basal vein distad cu-a by 2.5 times vein width; 1rs-m distad 1m-cu by three times vein width; 2rs-m distad 2m-cu by ten times vein width; anterior border of third submarginal cell approximately three-quarters length of posterior border and nearly twice length of anterior border of second submarginal cell; hind wing with distal hamuli arranged 3-1-2. Pygidial plate large and broadly rounded at its apex, margins (lateral and apical) lamellate.

Clypeus weakly imbricate with weak, coarse, contiguous punctures; remainder of head with small, contiguous punctures. Mesoscutum with small punctures separated by 1–2 times a puncture width, those of lateral and posterior borders separated by a puncture width or less; tegula smooth and impunctate. Mesoscutellum and metanotum sculptured as on mesoscutum except those punctures of metanotum shallow and coarse. Pleura imbricate, with sparse, weak, coarse punctures except hypoepimeral area smooth and impuncate.

Male. As described for the female except with the typical sexual differences (as in many cleptoparasitic species, males and females scarcely have any structural differences furthering the suggestion that in parasitic lineages females developmental adopt many typically male features: *vide* WCISLO, 1999) and with metrics as follows: Total body length 6.8 mm; forewing length 5.3 mm; head width 1.7 mm, length 1.3 mm; scape length 0.5 mm; intertegular distance 1.25 mm.

H o l o t y p e. ♀, Pico Cuba, Turquino, Ote., P. Alayo, vi 1963 [June 1963]. Deposited in the Snow Entomological Collection, Division of Entomology, University of Kansas Natural History Museum, Lawrence, Kansas, United States.

P a r a t y p e s. 1♂, [Cuba]: Gran Piedra, Caney [?], Ote., P. Alayo col., vi 1962 [June 1962]. Deposited in the Snow Entomological Collection, Division of Entomology, University of Kansas Natural History Museum, Lawrence, Kansas, United States.

1♀, Cuba: La Gran Piedra, Oriente, Zayas, vi 1963 [June 1963], Alayo-Garcia. Deposited with Julio A. GENARO (Toronto, Canada).

E t y m o l o g y. The specific epithet refers to the species' inhabitance of the island of Cuba.

C o m m e n t s. This species corresponds to the "*Sphecodes* sp. A" of the late Pastor Alayo. A single male was identified but was not dissected owing to the current condition of this unique specimen. The specimen is older and is pinned through the anterior of the thorax with a slightly oversized pin relative to the mesosomal width, resulting in the anterior of the mesosoma being rather weak. I, therefore, hesitated to dissect the terminalia for fear that the entire body might break apart. Hopefully new and more intensive collecting in Cuba will recover fresh material that can then be carefully dissecting without fear of losing a unique specimen.

Key to species of *Nesosphecodes*

1. Central disc of mesoscutum with punctures separated by 1-4 times a puncture width; pygidial plate with lamellate lateral margins; compound eyes not converging ventrally, inner margins parallel 2

–. Central disc of mesoscutum with punctures separated by 1-2 times a puncture width; pygidial plate without lamellae laterally; compound eyes slightly converging ventrally (Cuba) . . . . . ***N. cubicola*** sp. n.

2. Pygidial plate broadly rounded at apex; lower half of face with short, moderately-dense, subappressed, white, branched setae but such setae not obscuring integument; larger species, length over 9 mm (Puerto Rico) . . . . . ***N. anthracinus*** sp. n.

–. Pygidial plate narrowly rounded, almost pointed, at apex; lower half of face obscured by short, dense, subappressed, white, plumose setae; smaller species, length ca. 8.5 mm or less (Dominican Republic) . . . . . ***N. halictophagus*** sp. n.

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