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Sixty-one years later: a second species of *Scolebythus* Evans (Hymenoptera: Scolebythidae) from southern Madagascar

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Abstract

Despite recent advances in the systematics and taxonomy of the relictual family Scolebythidae, the type genus *Scolebythus* Evans, 1963 remained monospecific for more than sixty years. Here, I describe and illustrate *Scolebythus bekilyensis* **sp. nov.** from a female specimen collected in southern Madagascar. This discovery emphasizes on the endemism of this genus, which is unique within the Scolebythidae for being restricted to one biogeographic realm, and suggests that potential new species are yet to be discovered in this megadiverse region.

Keywords: Insecta; Chrysoidea; parasitic wasp; taxonomy; Malagasy sub-region

Introduction

Although much more diverse during the Cretaceous (Lepeco & Melo 2022a), Scolebythidae are the smallest and most recently described extant family of Aculeata. In the extant fauna, the family comprises only four genera: *Clystopsenella* Kieffer, 1911, *Pristapenesia* Brues, 1933, *Scolebythus* Evans, 1963 and *Ycaploca* Nagy, 1975. Data on their biology are scarce, but these wasps are assumed to be ectoparasitoid on wood-boring beetle larvae (Brothers 1981; Melo 2000; Lepeco & Melo 2022b).

Clystopsenella is the most speciose genus in the family, with five species from South America and Australia (Lepeco & Melo 2021, 2022b; Engel 2023) and one fossil species from Miocene Dominican amber (Engel 2015). *Pristapenesia* consists of two extant species from South America and East Asia (Azevedo 1999; Azevedo *et al.* 2011) and two fossil species from Eocene Baltic amber and Miocene Dominican amber (Brues 1933; Prentice *et al.* 1996). *Ycaploca* is represented by one species found in South Africa, Australia, New Zealand and New Caledonia (Brothers 2011), and one doubtful species from Fiji (Beaver 2002). Finally, *Scolebythus*, the type genus of the family, is still monotypic (Evans 1963).

In the present study, I describe the second species of *Scolebythus*, based on a female specimen from the South of Madagascar.

Material and methods

The holotype specimen was collected in Bekily, Bekily District, Androy Region, South Madagascar and is deposited in the Hymenoptera collection of the Muséum National d'Histoire Naturelle (MNHN) in Paris, France. The examination and photographs were conducted with a Nikon SMZ25 with an attached Nikon D800 camera or using a Canon 50D

camera with an attached Canon 65 MPE camera lens and mounted on an automated stacking rail (StackShot). All images are digitally stacked photomicrographic composites of several focal planes, which were obtained using Helicon Focus 6.7. Adobe Illustrator CC2019 and Photoshop CC2019 software were used to compose the figures and ImageJ 1.53 for measurements.

The morphological terminology follows Lanes *et al.* (2020), with the exception of the forewing venation and cells, which follows Azevedo *et al.* (2018). I refer to the abdominal structures based on metasomal segmentation, *i.e.*, the first metasomal segment correspond to the second abdominal segment. The terminology of forewing cells used here correspond to that of Lepeco & Melo (2022b) as follows: R = radial, 1M = medial, 1R1 = submarginal, 2R1 = marginal. The surface sculpturing terminology follows Harris (1979). I adhere to the species concept proposed by Cronquist (1978), which uses distinct distributions of morphological characters as the operational criterion for delineating species boundaries. Specific comparison with *Scolebythus madecassus* Evans, 1963 was based on the original description of the species and photographs of the holotype specimen deposited in the Museum of Comparative Zoology (MCZ) at Harvard University, United States of America.

Results

Genus *Scolebythus* Evans, 1963

Scolebythus Evans, 1963: 9. Type species: *Scolebythus madecassus* Evans, 1963, by monotypy.

Key to the species of *Scolebythus* Evans, 1963

1. Forewing with uniform coloration (hyaline-yellowish); 2R1 cell more than $4 \times$ longer than wide; anterior clypeal margin incurved ... *Scolebythus madecassus*
- Forewing with two antero-posterior dark bands; 2R1 cell about $3 \times$ longer than wide; anterior clypeal margin straight ... *Scolebythus bekilyensis* **sp. nov.**

Scolebythus bekilyensis sp. nov.

(Figs 1, 2)

Etymology. The specific epithet is a reference to the locality where the type specimen was collected.

Type material. Holotype female Madagascar, Androy Region, Bekily: "MADAGASCAR\Bekily\Rég. sud de l'île; MUSÉUM PARIS\IV.37\A. SEYRIC; *Scolebythus* n. sp.\A. Polaszek, 1995\on loan from Paris; MNHN, Paris\EY35892" (MNHN). Holotype condition: specimen almost complete and well preserved, lacking right pedicel and flagellum, right legs, left hind leg.

Diagnosis. Anterior clypeal margin straight in frontal view (Fig. 2b); vertex evenly rounded as seen in frontal view (Figs 1b, 2b); mesoscutum with even punctures (Fig. 2c); forewing with narrow antero-posterior dark band at 1M cell position and wide antero-posterior dark band from apex of 1R1 cell to apex of 2R1 cell (Fig. 1a); forewing with 2R1 cell $3.3 \times$ longer than wide (Fig. 1a); distal margin of pterostigma evenly rounded and not much protruding in 2R1 cell (Fig. 1a); 1M cell more than $2.5 \times$ longer than wide (Fig. 1a); posterior metasomal sterna with regularly spaced long setae (Fig. 1a).

Differential diagnosis. The new species differs from *S. madecassus* by the shape of the clypeus, incurved in *S. madecassus* (Figs 3c–d: a/a'), the general contour of the vertex, subquadrate with blunt angulation posterodorsally of eyes in *S. madecassus* (Figs 3c–d: b/b'), the mesoscutum sculpture, sparse and irregular punctures in *S. madecassus* (Figs 3e–f), the forewing color and pattern, uniformly yellowish in *S. madecassus* (Figs 3g–j), the length of the 2R1 and 1M cells, $4.4 \times$ longer than wide and $2 \times$ longer than wide, respectively, in *S. madecassus* (Figs 3g–j: a–b/a'–b'), the shape of the pterostigma, angulate and protruding in marginal 2R1 cell by $1.1 \times$ maximum pterostigmal width in *S. madecassus* (Figs 3g–j: c/c'), the metasomal pubescence, posterior metasomal terga with dense patches of setae (Figs 3a–b: a–a').

Description. Female. Color. Head, scape, pedicel and flagellomeres 1–4 light reddish brown; flagellomeres 5–11 brown; palpi yellowish; frons with three dark brown spots around ocelli; mandible reddish brown except dark brown teeth. Mesosoma brown. Metasoma brown, except light brown posterior segments and sting. Forewing with antero-posterior dark band at 1M cell position and antero-posterior dark band from apex of 1R1 cell to apex of 2R1, hyaline in medial area of 1R1 cell, R cell and distally to 2R1 cell. Hind wing hyaline. Legs yellowish. Body pubescence pale yellow to white; wing setae pale yellowish.

Pubescence. Sparse overall. Clypeus, frons and mandible with short decumbent setae; palpi and antennomeres with tiny erect setae, setae shorter than flagellomere width. Gena with long erect setae, setae as long as gena. Dorsum of mesosoma and metasoma with short erect setae; ventrum of mesosoma and metasoma with long erect setae. Wing setae regularly spaced, setae as long as veins diameter.

Measurements. Approximate body length 6.72 mm; head length 1.09 mm; head width 1.09 mm; frons width 0.76 mm; mesosoma length 2.21 mm; metasoma length 3.42 mm; ovipositor length 0.51 mm; forewing length 3.98 mm; hind wing length 2.83 mm.

Structure. Head. Head as long as wide. Mandible length about $2 \times$ proximal mandibular width; quadridentate, teeth decreasing in size ventrodorsally. Clypeus transverse, without defined medial and lateral lobes; anterior margin straight. Malar space very short, length $0.4 \times$ proximal mandibular width. Frons weakly convex, punctate, distance between punctuations about 0.5 – $0.8 \times$ diameter of anterior ocellus; frons not sculpted otherwise. Compound eye oval, following general contours of head, glabrous, inner margin of eye outcurved; length of eye $0.55 \times$ length of head; supra-ocular line located at level with posterior margin of anterior ocellus. Ocellar triangle compact; distance between posterior ocelli $1.8 \times$ distance between anterior and posterior ocelli; distance between anterior and posterior ocelli equal to diameter of anterior ocellus; distance between compound eye and posterior ocellus $2.1 \times$ distance between posterior ocelli; distance between posterior ocellus and occipital carina $1.9 \times$ distance between posterior ocelli. Gena about as long as width of eye. Vertex evenly rounded. Occipital carina present, complete, extending from top of head and fading near hypostoma. Oral cavity deeply emarginated, forming broad obtuse triangle, length $1.2 \times$ proximal mandibular width; distance between hypostoma and occiput shorter than proximal mandibular width. Palpal formula 6:4; maxillary palpi short, not reaching propleuron. Antennal foramina separated from each other by about their diameter; portion of frons between antennal foramina not elevated. Antenna short, barely reaching posterior margin of pronotum; scape flattened, $2.6 \times$ longer than wide; pedicel longer than wide; flagellomeres longer than wide; flagellomere 1 shorter than flagellomere 2; flagellomere 2–10 subequal in length; flagellomere 11 longest, tapering at apex.

Mesosoma. Pronotum rugose, with collar reduced, transition between dorsal and anterior surfaces of pronotum marked but without carina or sulcus. Propleuron dorsally exposed. Prosternum large, diamond-shaped, anteriorly broadly separating propleura, with

distinct longitudinal sulcus, extending on about one third of prosternum length. Mesoscutum evenly punctate, distance between punctures about $2 \times$ diameter of punctures; notauli ill-defined, only present as a complete straight shallow darkened line, parallel, posteriorly separated by width of anterior sulcus of mesoscutellum; parapsidal signa ill-defined, only present as a complete straight shallow line, anteriorly divergent and posteriorly parallel. Mesoscutellum rugose, anteriorly with narrow straight mesoscuto-scutellar sulcus. Metanotum rugose, much obscured by mesoscutellum, medial region shorter than lateral region. Metapostnotum finely rugose, well defined, forming broad obtuse triangle, slightly expanding into propodeum; slightly depressed in relation to propodeum; medial portion distinctly longer than lateral region. Metapectal-propodeal complex evenly declivitous posteriorly, transition between dorsal and posterior surfaces without carina or sulcus; dorsal and posterior surfaces rugose, with continuous ill-defined median sulcus; propodeal spiracle positioned on lateral surface, distant from metapleuron by about $2 \times$ its diameter. Dorsal proportion of medial lengths of pronotum: mesoscutum: mesoscutellum: metanotum: metapectal-propodeal complex 1.3:6.8:5.9:1:2.5:2.9.

Legs. Protrochanter inserted baso-laterally on procoxa. Tibial spur formula 1:2:?. Tarsal claws simple, edentate.

Forewing. C, Sc+R, M+Cu, A, 1Rs&1M, 1cu-a, Rs+M, 1Cu, 1m-cu, 2M, 2rs-m, 2r-rs&Rs and R1 tubular; intersection of 1Rs&1M anterior, 1Rs shorter than 1M; 1Rs&1M angled at junction with Rs+M; 1Rs intersecting anterior margin almost at right angle. C, R, 1Cu, 1M, 1R1 and 2R1 cells closed; 1M cell rectangular, length $2.5 \times$ maximum width; 1R1 cell length $1.9 \times$ maximum width; 2R1 cell length $3.3 \times$ maximum width. Distal margin of pterostigma evenly rounded; pterostigma protruding within 2R1 cell by about $0.85 \times$ maximum pterostigmal width.

Hind wing. Venation extremely reduced; A vein about $0.5 \times$ length of clavus; costal margin with one straight proximal hamuli and four hook-like distal hamuli; clavus about $0.4 \times$ length of hind wing.

Metasoma. Metasoma elongate and fusiform, longer than head + mesosoma. First metasomal tergum with longitudinal sulcus on anterior surface, transition between anterior and dorsal surface angled; dorsal surface length about $2 \times$ maximum width; posterior margin outcurved. Fifth metasomal tergum simple, without setae or declivity.

Male. Unknown.

Host record. Unknown.

Discussion

I ascribe this specimen to *Scoleythus* on the basis of the developed forewing venation with seven closed cells, thus excluding *Pristapenesia*; the 1R1 cell shorter than the 2R1 cell and the absence of intertorular elevation, thus excluding *Ycaploca*; the presence of the occipital carina, the short malar space, the junction between R1 and 2r-rs&Rs along anterior wing margin and the absence of a specialised setae patch on S5, thus excluding *Clystopsenella*.

The characters that separate this specimen from *S. madecassus* are developed in the section of Results and I consider them sufficient to erect a new species, as they are used to delineate species boundaries in other genera (e.g., Azevedo *et al.* 2011; Lepeco *et al.* 2022b). Another character that distinguishes our specimen from *S. madecassus* is the body coloration (Figs 3a–b). The specimen has a lighter coloration of the cuticle than the holotype and additional specimens of *S. madecassus*, Evans *et al.* (1979) reported other “fully pigmented” individuals of *S. madecassus*. Although indicated to separate species of *Clystopsenella* (Lepeco & Melo, 2022b), the use of the body coloration as a diagnostic character remains controversial. Colombo & Azevedo (2023) commented on this usage for a genus of the

closely related Bethylidae *Trissepyris* Kieffer, 1905 and they concluded on its validity, as they observed similar patterns on different individuals, in addition to several morphological characters. However, in most cases, a lighter body coloration may rather indicate that the specimens had not reached full sclerotization at the time they were collected, instead of a fading over time as suggested by Evans (1963). Nevertheless, I suggest it is still worth mentioning as the new species is supported by additional morphological characters but this remains to be confirmed by the discovery of further specimens.

The holotype specimen of *S. madecassus* was collected in Mandritsara, Sofia Region, in the northern part of Madagascar (Evans 1963). Later, additional specimens of both sexes were found near Andasibe, Alaotra-Mangara Region, in the central-western part of the island (Evans *et al.* 1979). The labels attached to the holotype of *Scolebythus bekilyensis* **sp. nov.** indicate that it was collected in Bekily, but do not specify the exact locality or type of environment. The type localities of both *Scolebythus* species are separated from each other by a distance of about 1,000 km (Fig. 4) and the genus has also been mentioned to occur in South Africa (Brothers 2011). Large disjunct intrageneric distributions are common within the Scolebythidae. *Ycaploca evansi* Nagy, 1975 occurs both in South Africa and Australia (Brothers 2011), although probably dispersed through human action, and the two extant species of *Pristapenesia* have been described from Brazil and China, respectively (Azevedo *et al.* 2011). However, *Scolebythus* is unique in the family as it is the only extant scolebythid genus confined to one biogeographic realm. Given the high endemism rate found in Madagascar (Goodman & Benstead 2005; Vuataz *et al.* 2013) and the insect diversity (*e.g.*, Fisher 1996; Mugrabi & Azevedo 2010; Garcia & Fisher 2014), it is not surprising to record here a new species, as suggested by Carpenter (1999). On the other hand, no other scolebythid genera have been reported on the island so far. It is possible that *Scolebythus* diverged as an independent lineage from *Clystopsenella* in Madagascar and diversified there, before reaching continental Africa, or vice versa. Once again, further data on continental African Scolebythidae will be necessary to elucidate the biogeography of the Scolebythinae.

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References

- Azevedo, C.O. (1999) A key to the world species of Scolebythidae (Hymenoptera: Chrysoidea), with description of a new species of *Dominibythus* from Brazil. *Journal of Hymenoptera Research*, 8 (1), 1–5.
- Azevedo, C.O., Alencar, I.D.C.C., Ramos, M.S., Barbosa, D.N., Colombo, W.D., Vargas, J.M. & Lim, J. (2018) Global guide of the flat wasps (Hymenoptera, Bethylidae). *Zootaxa*, 4489, 1–294.
<https://doi.org/10.11646/zootaxa.4489.1.1>
- Azevedo, C.O., Xu, Z. & Beaver, R. (2011) A new species of *Pristapenesia* Brues (Hymenoptera, Scolebythidae) from Asia. *Zootaxa*, 2750 (1), 60–64.
<https://doi.org/10.11646/zootaxa.2750.1.6>

- Beaver, R.A. (2002) A new species of *Ycaploca* (Hymenoptera, Scolebythidae) from Fiji. *Entomologist's Monthly Magazine*, 138 (1656–1659), 139–142.
- Brothers, D.J. (1981) Note on the biology of *Ycaploca evansi* (Hymenoptera: Scolebythidae). *Journal of the Entomological Society of Southern Africa*, 44 (1), 107–108.
- Brothers, D.J. (2011) A new Late Cretaceous family of Hymenoptera, and phylogeny of the Plumariidae and Chrysididae (Aculeata). *ZooKeys*, 130, 512–542.
<https://doi.org/10.3897/zookeys.130.1591>
- Brues, C.T. (1933) The parasitic Hymenoptera of the Baltic amber, Part 1. *Bernstein Forschungen*, 3, 4–178.
- Carpenter, J.M. (1999) What do we know about chrysidoid (Hymenoptera) relationships? *Zoologia Scripta*, 28 (1–2), 215–231.
<https://doi.org/10.1046/j.1463-6409.1999.00011.x>
- Colombo, W.D. & Azevedo, C.O. (2023) Synopsis of *Trissepyris* Kieffer, 1905 (Hymenoptera, Bethyridae), an endemic Afrotropical genus, with description of a new species. *Zoosystema*, 45 (4), 129–135.
<https://doi.org/10.5252/zoosystema2023v45a4>
- Cronquist, A. (1978) Once again, what is a species? In: Knutson, L.V. (Ed.), *BioSystematics in agriculture*. Alleheld Osmun, Montclair, New Jersey, pp. 3–20.
- Engel, M.S. (2015) The wasp genus *Clystospenella* in Early Miocene amber from the Dominican Republic (Hymenoptera: Scolebythidae). *Novitates Paleoentomologicae*, 12, 1–14.
<https://doi.org/10.17161/np.v0i12.4958>
- Engel, M.S. (2023) Two new species of *Clystospenella* Kieffer from Belize and Peru (Hymenoptera: Scolebythidae). *Entomologist's Monthly Magazine*, 159 (3), 197–204.
<https://doi.org/10.31184/M00138908.1593.4193>
- Evans, H.E. (1963) A new family of wasps. *Psyche*, 70 (1), 7–16.
<https://doi.org/10.1155/1963/92486>
- Evans, H.E., Kugler, C. & Brown, W.L. (1979) Rediscovery of *Scolebythus madecassus* with a description of the male and of the female sting apparatus (Hymenoptera: Scolebythidae). *Psyche*, 86 (1), 45–51.
<https://doi.org/10.1155/1979/26256>
- Fisher, B.L. (1996) Biogeography and ecology of the ant fauna of Madagascar (Hymenoptera: Formicidae). *Journal of Natural History*, 31 (2), 269–302.
<https://doi.org/10.1080/00222939700770141>
- Garcia, F.H. & Fisher, B.L. (2014) The hyper-diverse ant genus *Tetramorium* Mayr (Hymenoptera, Formicidae) in the Malagasy region taxonomic revision of the *T. naganum*, *T. plesiarum*, *T. schaufussii*, and *T. severini* species groups. *ZooKeys*, 413, 1–170.
<https://doi.org/10.3897/zookeys.413.7172>
- Goodman, S.M. & Benstead, J.P. (2005) Updated estimates of biotic diversity and endemism for Madagascar. *Oryx*, 39 (1), 73–77.
<https://doi.org/10.1017/S0030605305000128>
- Harris, R.A. (1979) Glossary of surface sculpturing. *Occasional papers in Entomology*, 28, 1–31.
- Kieffer, J.J. (1905) Description de nouveaux Proctotrypides exotiques avec une planche et une figure dans le texte. *Annales de la Société Scientifique de Bruxelles*, 29, 95–142.
- Kieffer, J.J. (1911) Nouveaux Bethyrides et Dryinides exotiques du British Museum de Londres. *Annales de la Société Scientifique de Bruxelles*, 35 (2), 200–233.

- Lanes, G.O., Kawada, R., Azevedo, C.O. & Brothers, D.J. (2020) Revisited morphology applied for Systematics of flat wasps (Hymenoptera, Bethylidae). *Zootaxa*, 4752 (1), 1–127.
<https://doi.org/10.11646/zootaxa.4752.1.1>
- Lepeco, A. & Melo, G.A.R. (2021) *Clystopsenella australiana* sp. nov. (Hymenoptera: Scolebythidae): first species of the genus found outside the Neotropical region. *Austral Entomology*, 60 (3), 455–460.
<https://doi.org/10.1111/aen.12551>
- Lepeco, A. & Melo, G.A.R. (2022a) Mid-Cretaceous amber from Myanmar reveals a rich diversity of extinct scolebythid wasps (Hymenoptera: Chrysidoidea). *Cretaceous Research*, 137, 105232.
<https://doi.org/10.1016/j.cretres.2022.105232>
- Lepeco, A. & Melo, G.A.R. (2022b) Synopsis of the wasp genus *Clystopsenella* Kieffer (Hymenoptera: Scolebythidae). *Zootaxa*, 5134 (1), 125–134.
<https://doi.org/10.11646/zootaxa.5134.1.6>
- Melo, G.A.R. (2000) Biology of an extant species of the scolebythid genus *Dominibythus* (Hymenoptera: Chrysidoidea: Scolebythidae), with description of its mature larva. In: Austin, A.D. & Dowton, M. (Eds.), *Hymenoptera: Evolution, Biodiversity and Biological Control*. CSIRO Publishing, Collingwood, pp. 281–284.
- Mugrabi, D.F. & Azevedo, C.O. (2010) Insecta, Hymenoptera, Bethylidae: Range extension and filling gaps in Madagascar. *Check List*, 6, 62–63.
- Nagy, C.G. (1975) A new genus of Scolebythidae (Hymenoptera) from South Africa and Australia. *Journal of the Entomological Society of Southern Africa*, 38 (1), 75–78.
- Prentice, M.A., Poinar Jr., G.O. & Milki, R. (1996) Fossil scolebythids (Hymenoptera, Scolebythidae) from Lebanese and Dominican amber. *Proceedings of the Entomological Society of Washington*, 98, 802–811.
- Vuataz, L., Sartori, M., Gattoliat, J. & Monaghan, M.T. (2013) Endemism and diversification in freshwater insects of Madagascar revealed by coalescent and phylogenetic analysis of museum and field collections. *Molecular Phylogenetics and Evolution*, 66 (3), 979–991.
<https://doi.org/10.1016/j.ympev.2012.12.003>

Figure captions:

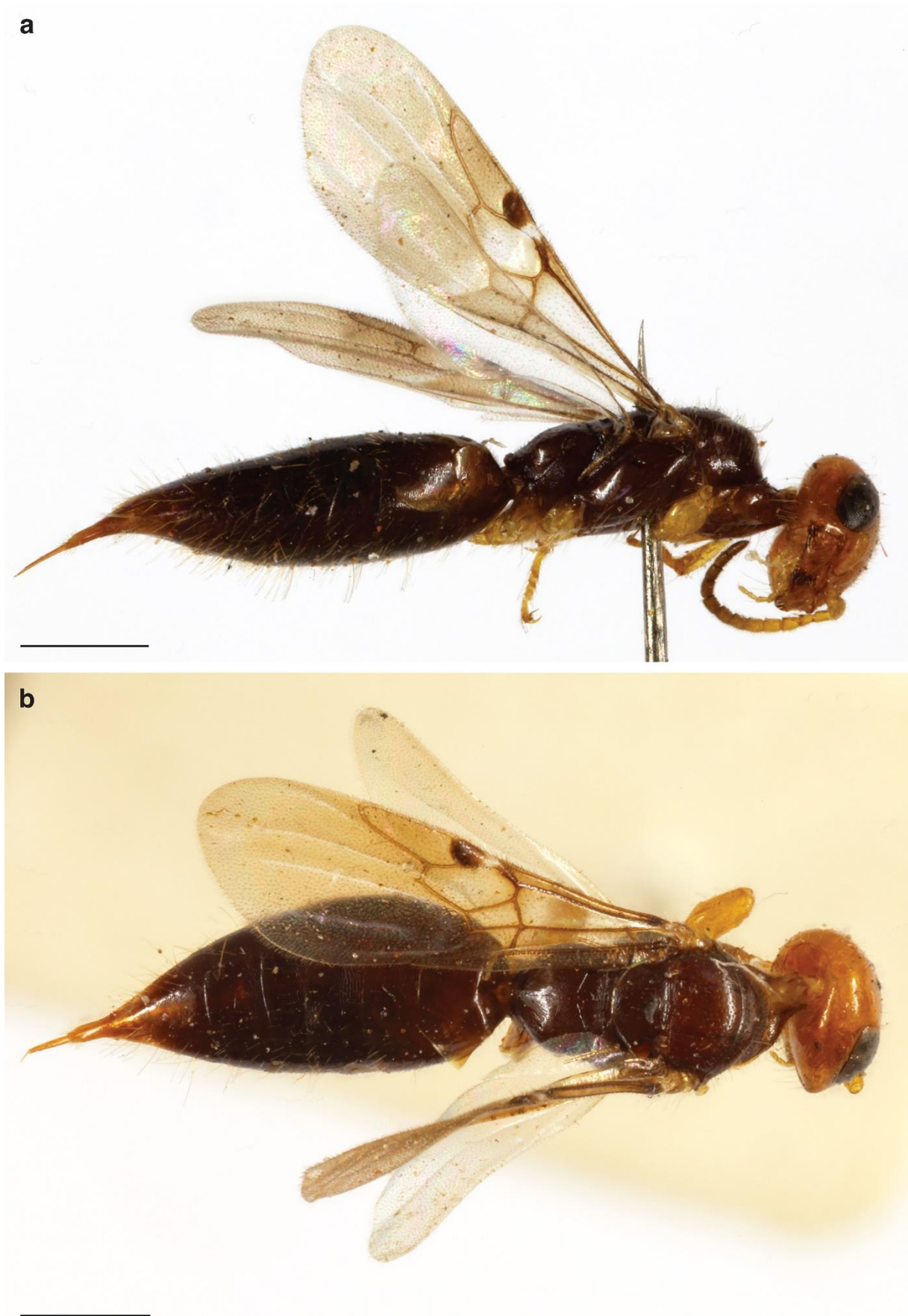


Figure 1. *Scolebythus bekilyensis* sp. nov., holotype female. a. habitus in lateral view; b. habitus in dorsal view (scale bars = 1 mm).

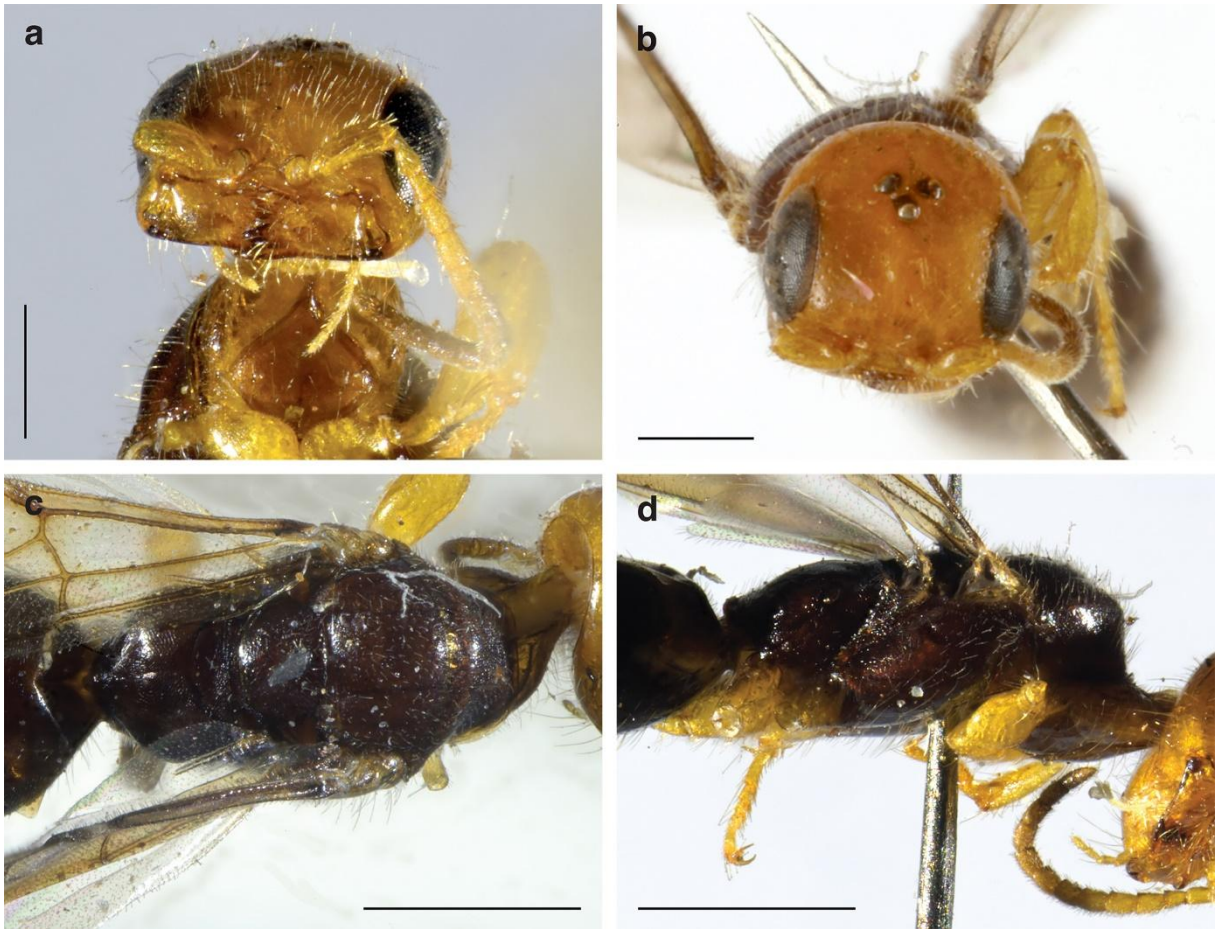


Figure 2. *Scolobythus bekilyensis* sp. nov., holotype female. a. head in frontal view; b. head in lateral view; c. mesosoma in dorsal view; d. mesosoma in lateral view (scale bars: c, d = 1 mm; a, b = 0.5 mm).

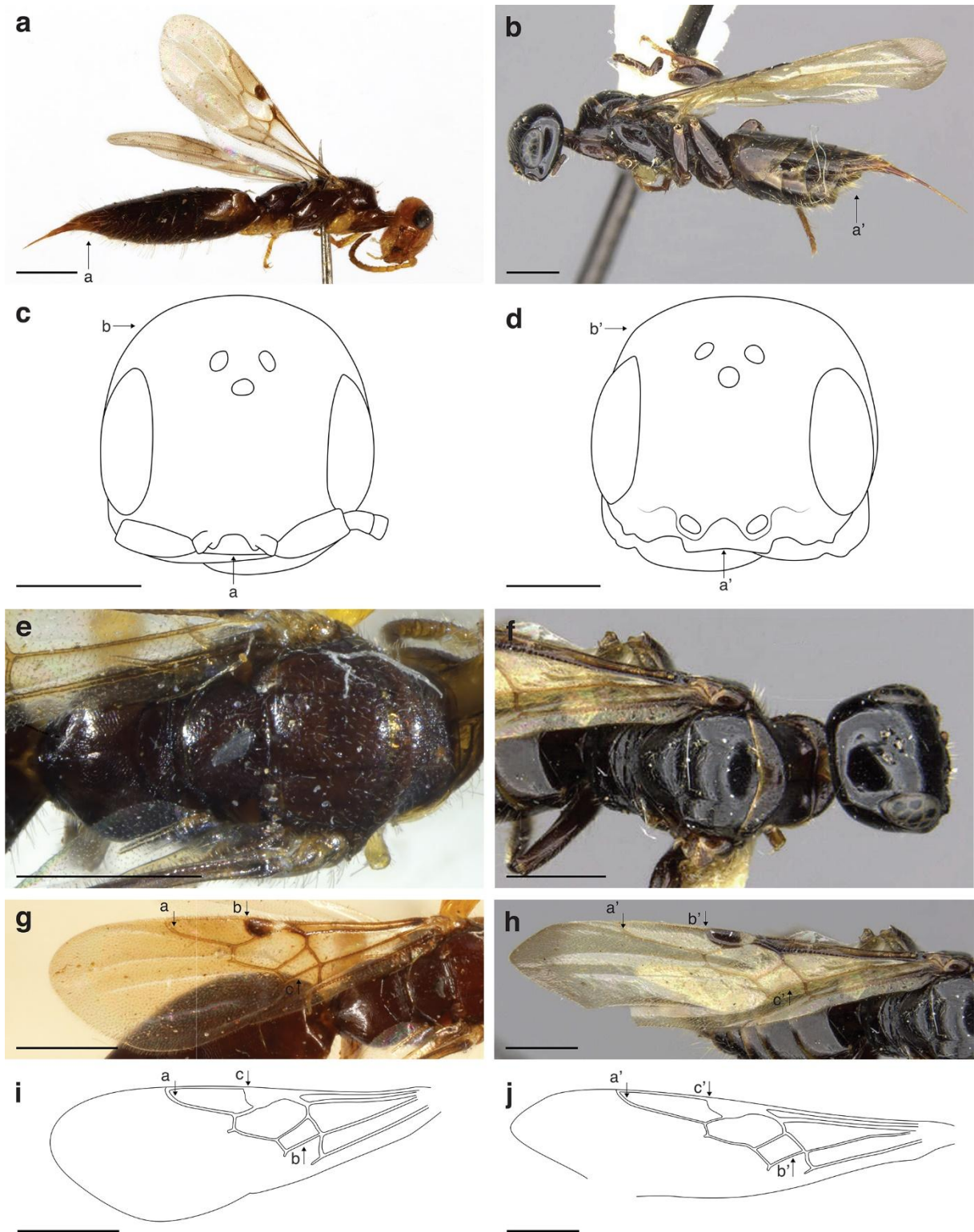


Figure 3. Comparison between holotype of *Scolebythus bekilyensis* **sp. nov.** (a, c, e, g, i) and holotype of *Scolebythus madecassus* (b, d, f, h, j). a, b. habitus in lateral view; c, d. line drawing of head in frontal view; e, f. mesosoma in dorsal view; g, h. forewing; i, j. line drawing of forewing (scale bars: a, b, e–j = 1 mm; c, d = 0.5 mm). Images of *S. madecassus*: Museum of Comparative Zoology, Harvard University; ©President and Fellows of Harvard College.



Figure 4. Distribution map of *Scolebythus* species in Madagascar.