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RESEARCH ARTICLE

Polynema (Polynema) dikobraz sp. nov., a remarkable fairyfly (Hymenoptera: Mymaridae) from Madagascar

Serguei V. Triapitsyn¹

¹Entomology Research Museum, Department of Entomology, University of California, Riverside,
California, 92521, USA; e-mail: serguei.triapitsyn@ucr.edu

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Abstract: A new Afrotropical species of *Polynema* Haliday, 1833 (Hymenoptera: Mymaridae), *Polynema (Polynema) dikobraz* Triapitsyn **sp. nov.**, is described and illustrated based on the type series from Madagascar. It is quite remarkable in having unique enlarged spine-like setae on the fore wing disc, not only among the congeneric taxa but also among all the known fairyflies in the world. Together with another, undescribed, similar species of *Polynema* also from Madagascar, this new taxon is placed in the informal *dikobraz* species group of its nominate subgenus.

Key words: Chalcidoidea, Mymaridae, *Polynema*, new species, taxonomy, Madagascar.

Introduction

The fauna of fairyflies (Hymenoptera: Mymaridae) of Madagascar is poorly studied. From specimens available in a few taxonomic collections, it is known to be very diverse and unique, with most specimens representing undescribed species in known genera, although several undescribed genera in the *Polynema* group are also known to me. The earlier knowledge of Madagascan Mymaridae was based mainly on the few taxa described by French entomologist J. Risbec and Belgian fairyfly taxonomist H. R. Debauche. More recently, Huber (2015) described several new genera and species from Madagascar in the tribe Gonatocerini.

The cosmopolitan and speciose, very diverse genus *Polynema* Haliday, 1833 is

currently subdivided into three subgenera (Triapitsyn & Fidalgo 2006). A new, quite remarkable, Afrotropical species, *Polynema (Polynema) dikobraz* Triapitsyn **sp. nov.**, is described and illustrated herein. Specimens of its type series were found among the numerous (several thousand) fairyflies from Madagascar sorted to family by R. L. Zuparko while in ethanol. These were collected mainly in the course of B. Fisher's (California Academy of Sciences, San Francisco, California, USA) insect inventory project in Madagascar and loaned to me for mounting and identification.

Material and methods

Specimens preserved in 95% ethanol had been dried using a critical point drier and point-mounted; some of them were then slide-mounted in Canada balsam.

Terms used for morphological features are those of Gibson (1997). All measurements were taken from slide-mounted specimens, unless stated otherwise, and are given in millimeters as length or, for the wings, as length: width. Abbreviations used are: F = funicular segment of the female antenna or flagellomere of the male antenna; mps = multiporous plate sensillum or sensilla on the antennal flagellar segments (= longitudinal sensillum or sensilla or sensory ridge(s)).

The following collection acronyms are used for the specimen depositories: CAS = California Academy of Sciences, San Francisco, California, USA; UCRC = Entomology Research Museum, University of California, Riverside, California, USA.

Results

Polynema (Polynema) dikobraz Triapitsyn **sp. nov.** (Figs 1–11)

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Type Material: Holotype female on slide (Fig. 1) [deposited in CAS], labeled: 1. "MADAGASCAR: Prov. D'Antanarivo 3 km 41°NE Andranomay, 11.5 km 147° SSE Anjozorobe, el. 1300 m 5-13.xii.2000, 18°28'24''S 47°57'36''E, Fisher, Griswold et al. California Academy of Sciences Montane rainforest, MT, coll code BLF2372, CAS LOT # 005501"; 2. "Mounted at UCR/ERM by V. V. Berezovskiy 2011 in Canada balsam"; 3. [magenta] "*Polynema (Polynema) dikobraz* Triapitsyn HOLOTYPE ♀"; 4. "Det. by S. V. Triapitsyn 2011". The holotype is dissected under 4 coverslips and almost complete (lacking a radicle of one antenna). The type locality is now in Analamanga Region. **Paratypes:** MADAGASCAR: Analamanga Region, 18°28'24''S 47°57'36''E, 1300 m, 5–13.xii.2000, B. L. Fisher, T. L. Griswold *et al.* (Malaise trap in montane rainforest, BLF2372, CAS LOT # 005501) [1 ♀ on slide, UCRC]. Diana Region, Amber Mountain National Park, 12°31'13''S, 49°10'45''E, 1125 m, 30.v–6.vi.2001, R. Harin'Hala (Malaise trap, MA-01-01D-12, CAS LOT # 007160) [1 ♀ on point, UCRC]. Vatovavy-Fitovinany Region: Ranomafana, JIRAMA water works, 21°14.91'S 47°27.13'E, 690 m, 28.ix–6.xii.2001, M. E. Irwin, R. Harin'Hala (Malaise trap near river, MA-02-09D-05, CAS LOT # 036341) [1 ♀ on point, CAS]. Ranomafana National Park: 21°15.05'S 47°24.43'E, 1130 m, 16.x–8.xi.2001, R. Harin'Hala (Malaise trap, MA-02-09B-01, CAS LOT # 009559) [1 ♂ on slide, CAS]; Vohiparara, 21°13.57'S 47°22.19'E, 1110 m, 21–28.i.2002, R. Harin'Hala (Malaise trap in high altitude rainforest, MA-02-09A-13, CAS LOT # 09555) [1 ♀ on slide, CAS].

Description

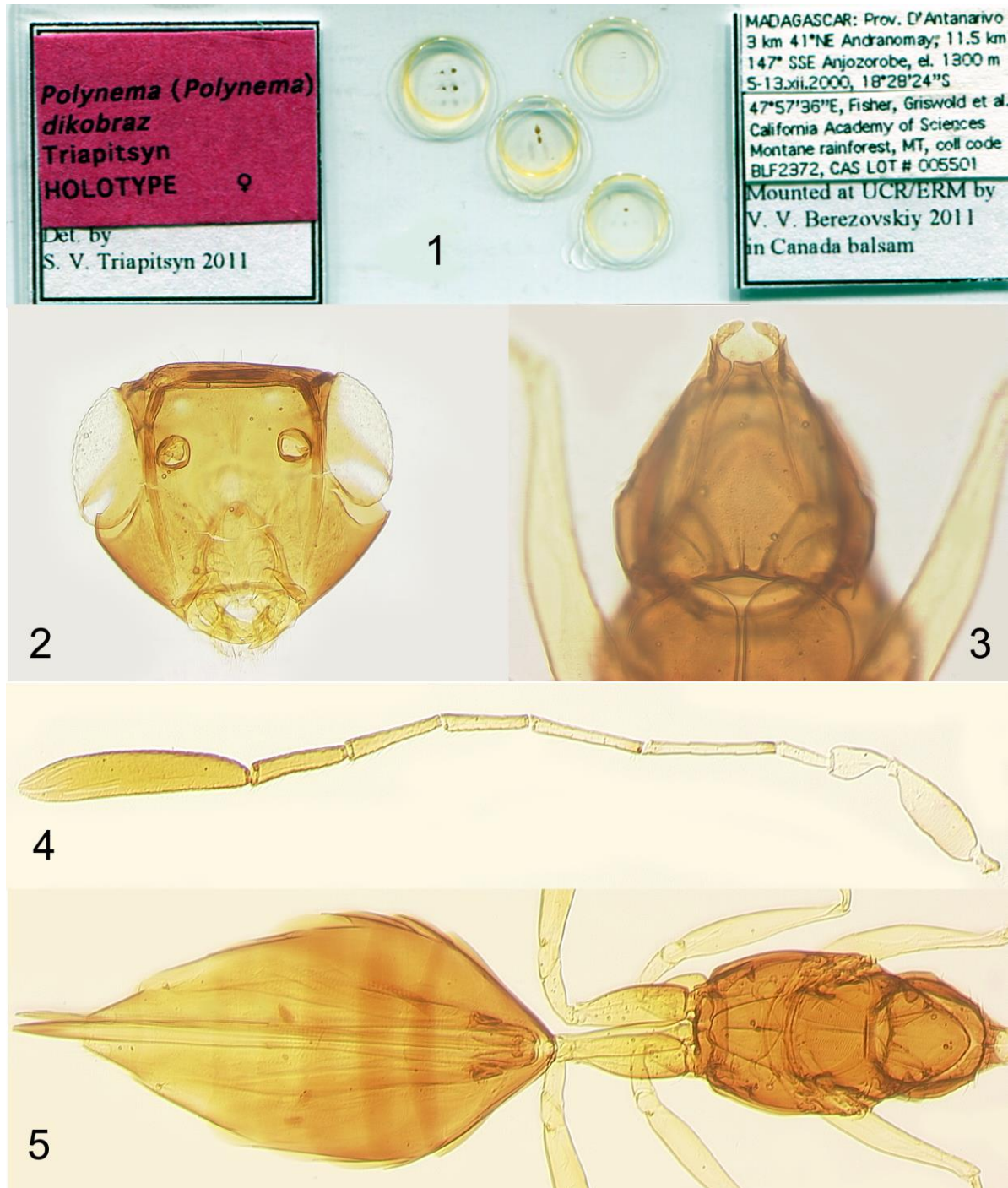
Female (holotype). Body mostly brown except petiole and a pair of small subapical lateral spots on gaster light brown; scape, pedicel and F1 light brown, F2–F5 brown, F6 and clava dark brown; legs mostly light brown except procoxa yellowish. Head as in Fig. 2; mandible 3-dentate. Antenna (Fig. 4): scape with cross-ridges, $2.9 \times$ as long as wide in lateral view (excluding a short radicle); pedicel a little longer than F1; F2 the longest funicular segment, F3 longer than the following funicular segments, F4 a little shorter than F5, the latter slightly shorter than F6, mps only on F6 (1); clava long, $4.9 \times$ as long as wide, with 8 mps (6 of them apical and 2 subapical). Mesosoma (Fig. 5) smooth. Pronotum mediolongitudinally divided, with several pairs of short setae. Mesoscutum wider than long, a little longer than scutellum. Axilla with 1 weak, long seta (0.052 mm). Scutellum with a row of small foveae on frenal line; scutellar placoid sensilla closer to anterior margin of scutellum than to its posterior margin. Propodeum smooth, with a pair of setae. Fore wing (Fig. 6) $3.9 \times$ as long as wide; submarginal vein with a long seta, marginal vein with 2 dorsal macrochaetae (distal one very long); longest marginal seta $0.98 \times$ maximum width of wing; disc with 2 distinct brown bands besides some brownish areas behind venation: first (proximal, beyond venation) band shorter, second (distal) band wider and at wing's apex (extending to its apical margin and occupying about 0.25 of wing's total length); disc setose throughout (most setae normal), with 20–21 very long, brown or dark brown, strongly enlarged spine-like modified setae (Fig. 7) on and next to proximal brown band. Hind wing (Fig. 6) $42.6 \times$ as long as wide; apex of venation with a short, thickened seta; disc slightly infumate, longest marginal seta $11.3 \times$ maximum width of wing. Coxae smooth. Metasoma (Fig. 5): petiole smooth, about $4 \times$ as long as wide, slightly longer than metacoxa; ovipositor occupying almost entire length of gaster, exerted beyond its apex by $0.11 \times$ own total length, $1.7 \times$ length of metatibia.

Measurements of the holotype (mm). Body 1.47 (of the dry-mounted specimen prior to being slide-mounted); head (of the dry-mounted specimen prior to being slide-mounted) 0.165; mesosoma 0.473; petiole 0.197; gaster 0.756; ovipositor 0.812. Antenna: radicle 0.027; rest of scape 0.151; pedicel 0.072; F1 0.063; F2 0.16; F3 0.142; F4 0.106; F5 0.118; F6 0.121; clava 0.285. Fore wing 1.71:0.437; longest marginal seta 0.427; longest discal (spine-like) seta 0.221. Hind wing 1.279:0.03; longest marginal seta 0.338.

Variation (paratypes). Body (Fig. 8) length of dry-mounted, critical point-dried specimens 1.65–2.08 mm. Scape 2.7 – $3.0 \times$ as long as wide, F1 about as long as pedicel, F5 slightly longer than F6, clava 5.3 – $6.4 \times$ as long as wide. Fore wing with longest marginal seta 0.78 – $0.82 \times$ maximum width of wing; hind wing 37.9 – $48.8 \times$ as long as wide, with longest marginal seta 8.6 – $10.6 \times$ maximum width of wing. Ovipositor 1.6 – $1.7 \times$ length of metatibia, exerted beyond apex of gaster by 0.08 – $0.12 \times$ own total length.

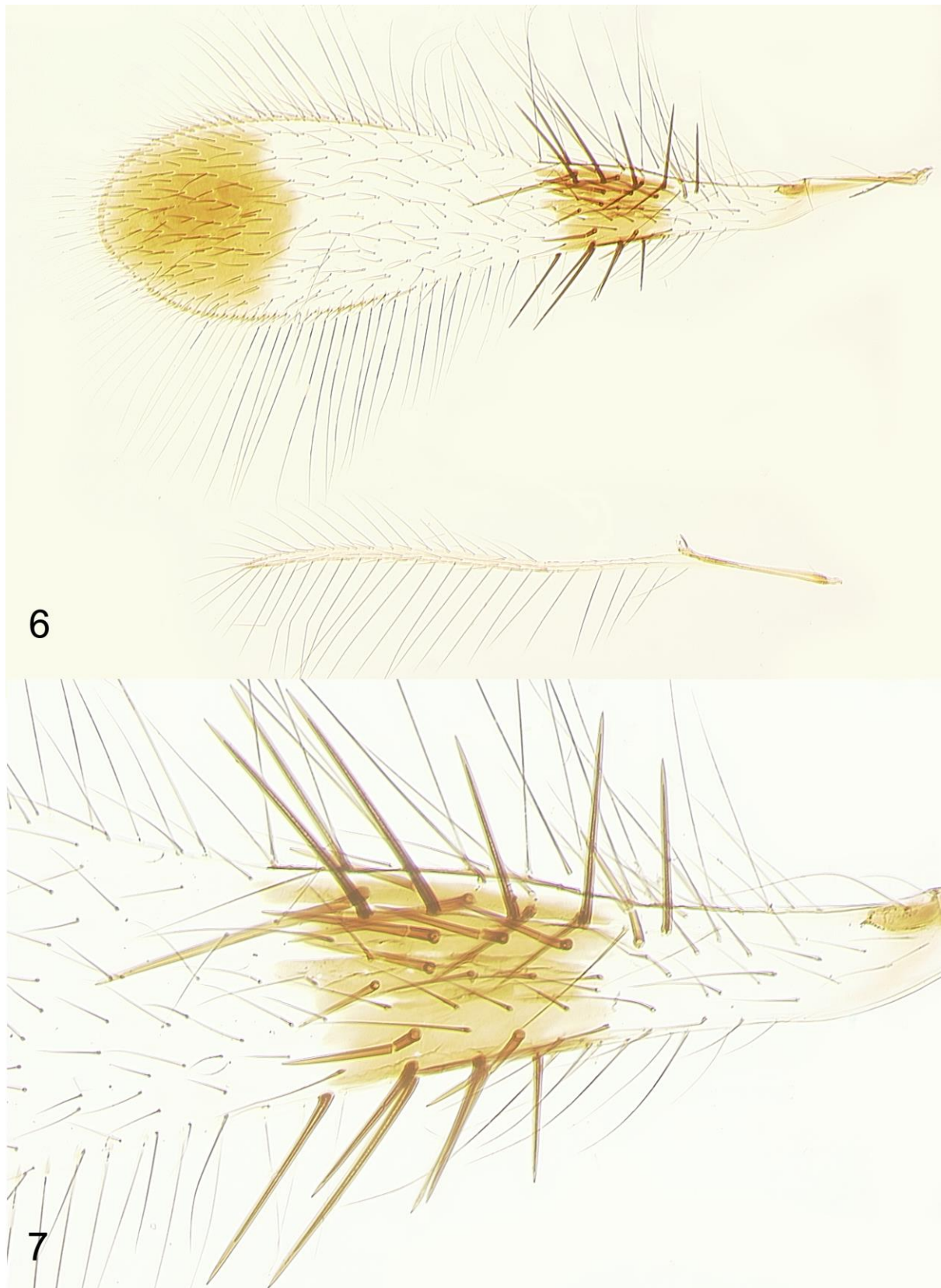
Male (paratypes). Similar to female except for the normal sexually dimorphic features such as the antenna (Fig. 9) and genitalia (Fig. 11), and the following. Flagellum brown except F1 light brown; scape (minus radicle) $2.5 \times$ as long as wide; F1 much shorter than following flagellomeres except just a little shorter than F11. Fore wing (Fig. 10) $3.8 \times$ as long as wide, with enlarged spine-like discal setae shorter than in female (the longest such seta 0.09 mm); distal brown spot on disc notably smaller than in female and not extending to wing's apical margin; longest marginal seta $0.85 \times$ maximum width of wing. Apex of venation of hind wing with a short but relatively less thickened seta than in female.

Diagnosis: Despite having a remarkable fore wing with strongly enlarged spine-like setae on the disc in both sexes (Figs 6–8, 10), a unique feature which broadens the generic diagnosis and also distinguishes this new taxon from all other described species of the genus in the



Figures 1–4. *Polynema dikobraz* sp. nov. (female, holotype): **1**, slide; **2**, head in frontal view; **3**, prothorax; **4**, antenna; **5**, mesosoma and metasoma.

world, it belongs to the nominate subgenus of *Polynema* (but placed in its own informal species group), as it has all its important diagnostic features outlined by Triapitsyn & Fidalgo (2006): absence of pits near the toruli (Fig. 2), an “open” prothorax (Fig. 3), a characteristic short marginal vein on the fore wing (Fig. 6), petiole attached posteriorly to the gastral tergum, and male genitalia with digital hooks (Fig. 11). It is most similar to an undescribed species from the *dikobraz* species group of *Polynema* (*Polynema*), known to me from one specimen with partially broken antennae, which has a relatively shorter F2 of the female



Figures 6–7. *Polynema dikobraz* sp. nov. (female, holotype): **6**, fore and hind wings; **7**, enlarged spine-like setae on the fore wing disc.

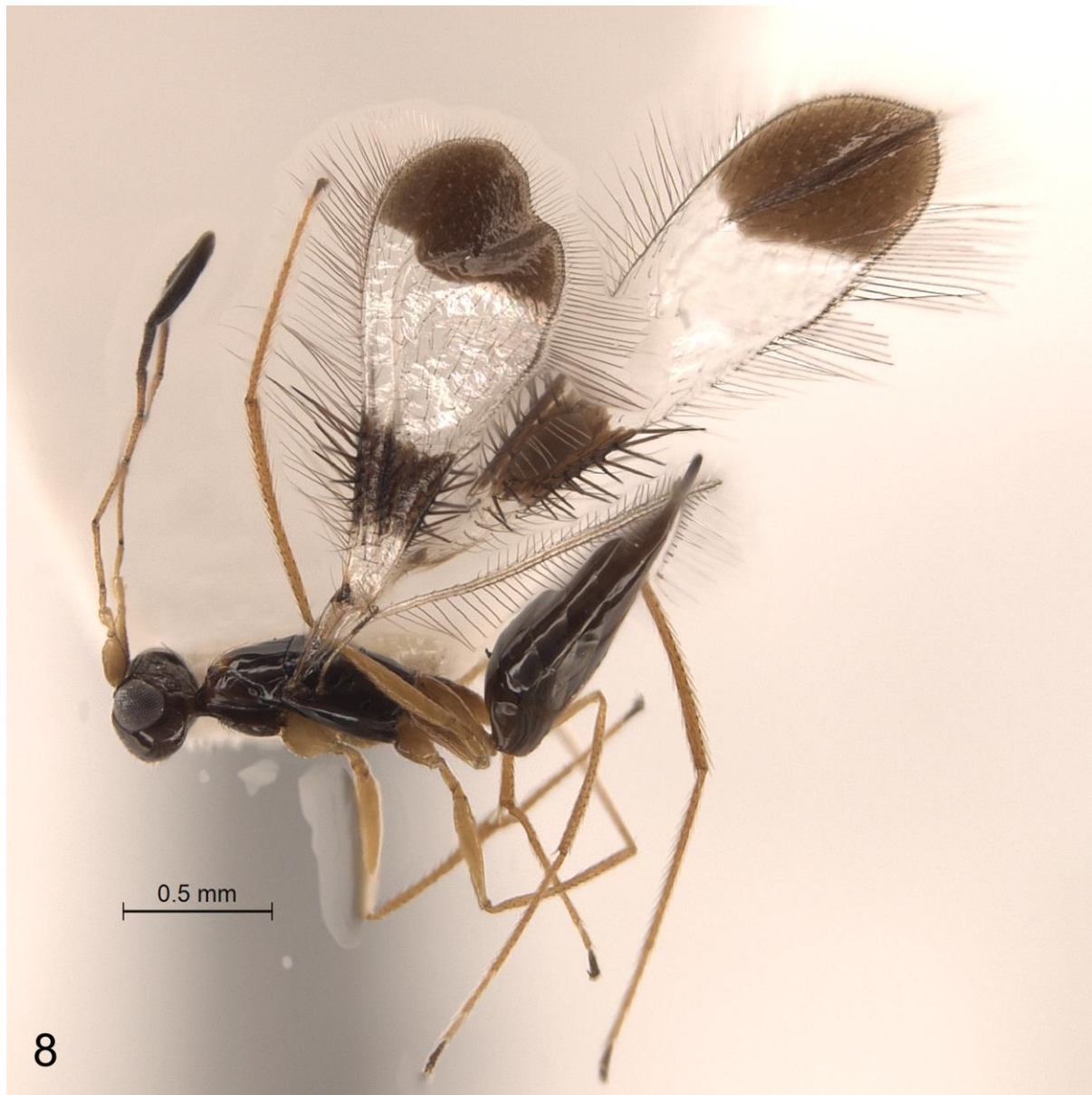


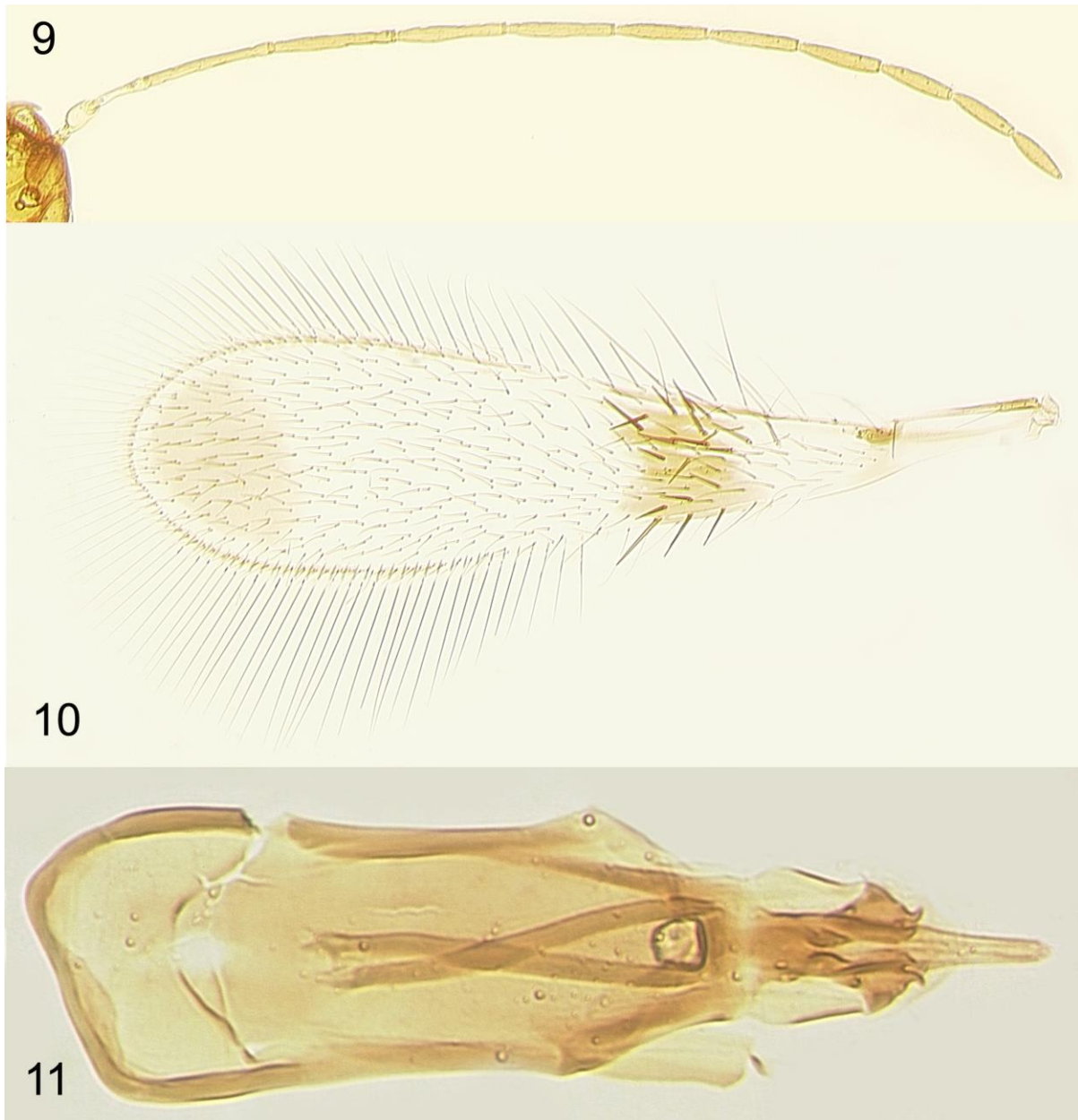
Figure 8. *Polynema dikobraz* sp. nov. (female, paratype from Amber Mountain National Park, Diana Region, Madagascar): habitus in lateral view.

antenna and a mostly light brown mesosoma: MADAGASCAR, Diana Region, Amber Mountain National Park, 12°31'13''S 49°10'45''E, 1125 m, 29.i–11.ii.2001, R. Harin'Hala [1 ♀, CAS].

Etymology: The species is a noun in apposition and that of a porcupine in Russian.

Discussion

Among the known world Mymaridae, such strongly enlarged spine-like setae on the fore wing disc are also unique. Somewhat similar, but notably shorter and located on the anterior margin of the fore wing (rather than on its disc) setae are known in the two species of



Figures 9–11. *Polynema dikobraz* sp. nov. (male, paratype): **9**, antenna; **10**, fore wing; **11**, genitalia.

the genus *Agalmopolynema* Ogloblin, 1960, *A. calyptera* Fidalgo, 1988 and *A. mirabile* Fidalgo, 1988, described from the forested zone of Patagonia, Argentina (Fidalgo 1988). They both also occur in the neighboring areas of Chile (new records, material in UCRC).

Acknowledgements

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Correspondence: Serguei V. Triapitsyn, e-mail: serguei.triapitsyn@ucr.edu

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