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New species and a review of aphid parasitoids of Madagascar (Hym., Braconidae, Aphidiinae)

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A b s t r a c t : A summary of the aphidiine parasitoids of aphids collected from various provinces of Madagascar is presented. The material included two new species, *Binodoxys harinhalai* n.sp. and *B. madagascariensis* n.sp. which are described and figured. The aphidiine fauna of Madagascar and its comparison with that of sub-Saharan Africa and the nearby La Réunion island is discussed.

K e y w o r d s : Aphids, parasitoids, sub-Saharan Africa, Madagascar, La Réunion, Braconidae, *Binodoxys harinhalai* n.sp., *Binodoxys madagascariensis* n.sp.

Introduction

The island of Madagascar is known to have a number of both floral and faunal peculiarities. Many groups of insects are only poorly known. Two such groups are the aphids and their parasitoids (Hom., Aphididae; Hym., Braconidae, Aphidiinae). This paper discusses the aphid parasitoid material recently collected in a Madagascar biodiversity program. Unfortunately, the program was restricted to various types of trap sampling and precluded attempts to rear parasitoids from their host aphids, which is more desirable for biosystematic and ecosystem research.

Material and methods

All material was collected from 2001-2003 in malaise traps from various parts of the island as a part of a biodiversity project organized by Dr. Brian Fisher of the Department of Entomology, California Academy of Sciences, San Francisco.

Abbreviations: Prov. –Province, elev. – elevation, CAS – California Academy of Sciences collection (holotype material).

Aphid nomenclature follows REMAUDIERE & REMAUDIERE (1997)

This study reports on 59 specimens, 3 mounted as slides, and the remainders point-mounted, deposited in the Department of Entomology, California Academy of Sciences, San Francisco, CA, except for a paratype of each new species which are also deposited in the collection of P. Starý (České Budějovice).

Review of species

All the locality labels on the specimens bear also the reference "MADAGASCAR" and "California Acad. of Sciences" which were deleted in the locality listings below. Also, the collector of most of this material is R. Harin´ Hala, except where otherwise stated.

Aphidius autriquei STARÝ 1985

Prov. Diego-Suarez, Parc National Montagne d´Ambres, 975 m, 11 Feb. to 14 March 2001, 12°31´S, 49°11´S, coll.. M.E. Irwin, E. I. Schlinger, R. Harin´Hala, 1 ♀ (MA-01-01B-05).

Aphidius camerunensis MACKAUER 1966

Prov. d´Antananarivo, 3 km 41°NE Andranomay, 11.5 km 147°SSE Anjozorobe, elev. 1300 m, 5-13 Dec 2000, 18°28´24´´S, 47°57´346´´S, coll. Fisher, Griswold, et al., montane rainforest, 1 ♂ (BLF2375); Prov.d´Antsiranana, Parc National Montagne d´Ambre, 12.2 km 211°SSW of Joffreville, elev 1300 m, 2-7-Feb. 2001, 12°35´47´´S, 49°9´34´´E, coll. Fisher, Griswold et al., in montane rain forest, 1 ♀ (BLF2853); Prov. d´Antsiranana, Parc National Montagne d´Ambre, 12.2 km SSW of Joffreville, elev. 1300 m, 2-7 Feb 2001, 12°36´47´´S, 49°9´34´´E, coll. Fisher, Griswold et al., montane rainforest, 1 ♀, 1 ♂ (BL2853); Prov. Fiarantsoa, Parc National Ranomafana, radio tower at forest edge, elev 1130 m, 17-30 May 2003, 21°15.05´S, 47°24.48´E, mixed tropical forest, 1 ♀ (MA-02-098-61); Prov. Fiarantsoa, Parc National Ranomafana, radio tower at forest edge, elev 1130 m, 21-28 Jan 2002, 21°15.05´S, 47°24.43´S, mixed tropical forest, 1 ♂ (MA-02-09B-13); Prov. Fiarantsoa, Parc National Ranomafana, radio tower at forest edge, elev. 1130 m, 7-17 July 2003, 21°15.05´S, 471 24.43´E, mixed tropical forest, 1 ♀ (MA-02-09B-66); Prov. Fiarantsoa, Parc National Ranomafana, radio tower at forest edge, elev. 1130 m, 14-24 June 2002, 21°15.05´S, 47°24.43´E, mixed tropical forest, 1 ♂ (MA-02-09B-32); Prov. Fiarannantsoa, Parc National Ranomafana, JIRAM water works, near river, elev. 090 m, 21°14´91´´S, 47°27´13´´E, 1 ♂ (MA-02-09D-03); Prov. Fiarantsoa, Parc National Ranomafana, Vohiparara, at broken bridge, el 1100 m, 22-28 November 2001, 21°13.57´S, 47°22.19´E, in high altitude rainforest, 1 ♂ (MA-02-09A-A4); Prov. Fiarantsoa, Parc National Ranomafana, Vohipara, at broken bridge, elev 1100 m, 12-19 March 2002, 21°13.57´S, 47°22.19´E, high altitude rain forest, 1 ♂ (MA-02-09A-20).

Aphidius colemani VIERECK 1912

Prov. d´Antananarivo, botanic garden, near to the entrance to Andaribe National Parc, 1-5 Sep 2001, 18°55.58´S, 48°24´47´´S, tropical forest, elev 1025 m, 1 ♀ (MA-01-08B-11); Prov. Fiarantsoa, Parc National Ranomafana, Belle Vue at Talakahely, elev 1020 m, 16-15 February 2003. – 21°15.99´S, 47°25.21´E, secondary tropical forest, 1 ♀ (MA-02-09C-5); Prov. Fiaranantsoa, Parc National Ranomafana, Belle Vue et Talatakely, elev 1020 m, 21 March to 12 April 2003, 21°15.99´S, 47125.21 E, secondary tropical forest, 1 ♀ (MA-02-09C-57); Prov. Fiarantsoa, Parc National Ranomafana, radio tower at forest edge, 22-28 Nov 2001, 21°15.05´S, 47°24.43´E, elev 1130 m, mixed tropical forest, 1 ♂(MA-02-09B-04); Prov. Fiarantsoa, Parc National Ranomafana, at broken bridge, elev 1110 m, 25 July to 3 August 2002, 21°13.57´S, 47°22.19´E, high altitude rain forest, 1 ♂ (MA-02-09A-36); Prov. Fiaranantsoa, Parc National Ranomafana, JIRAM water works, 16 Oct to 8 Nov 2001, 21°14.19´S, 47°27.13´E, near river, elev. 690 m, 2 ♀ (MA-02-09D-01, MA-02-09D-03); Prov. Fiaranantsoa, Foret d´Atsirakambiaty, 7.6 km 285°WNW Itremo, elev 1550 m, 22-26 Jan 2003, 20°35´36´´S, 046°33´48´´E, colls. Fisher, Griswold et al., montane rainforest, 1 ♀ (BLF7155).

Aphidius seyrigi GRANGER 1949

Environs of Tananarive, Bekily (GRANGER 1949). The species is taxonomically unclear,

characterized mainly in having 16-17 segmented antenna and a prevailingly testaceous and brownish coloration (selected characters from the original description by GRANGER 1949).

***Binodoxys harinhalai* n.sp. (Figs. 1-3)**

D i a g n o s i s Female: Antenna 12-segmented, flagellomeres narrow and long. Propodeum areolated. Petiole long and narrow, spiracular tubercles slightly smaller than secondary tubercles; distance between spiracular and secondary tubercles shorter than width across spiracles. Ovipositor sheaths relatively strong and stout. Prongs strong and stout, short, arcuate at the apex; with 3-4 perpendicular strong setae on the upperside, and 8-11 long feeble setae on the lowerside, with single long apical seta. Head brown, general coloration prevailingly brown; ovipositor sheaths and prongs brown. Male: Face brown.

D e r i v a t i o n o m i n i s : The name of the new species is derived from the family name and in honour of the collector, R. Harin´Hala.

F e m a l e : Head: Antenna 12-segmented, filiform, reaching to middle of metasoma, flagellar segments long and slender, 3.5 as long as wide, with semi-erect setae which are equal to flagellomere width. Eye large, gena equal to 1/7 of eye-length

Mesosoma: Mesonotum with notauli indicated only anteriorly, smooth, with sparse short setae near the notauli and near the distal margin. Propodeum areolated, with distinct pentagonal medium-sized areola. Forewing (Fig. 2): Stigma triangular, 3.5 times as long as wide, R1 vein (=metacarpus) equal to half of stigma length. RS vein about ¼ longer than stigma. Hind femur with sparse semi-erect setae which are equal to half of femur diameter.

Metasoma: Petiole (Fig. 1) long, three times as long as width at apex; both spiracular and secondary tubercles prominent, the area between them narrowed; middle third rugose; distance between spiracular and secondary tubercles shorter than width across spiracles;width across secondary tubercles slightly exceeding that across the primary tubercles; secondary tubercles with two setae. Genitalia (Fig. 3): Ovipositor sheaths relatively broad and stout. Prongs short and stout, straight, arcuate at the apex; with 3-4 long perpendicular setae on the upperside, their length twice as much as the prong width; with 8-11 feeble setae on the lowerside, which are about ¼ shorter than the upper setae; with single long seta at the apex.

Coloration: Head uniformly dark brown, palpi and mandibles except for brown apexes yellow. Antennae: Scape and pedicel yellow, flagellomere 1 yellow to prevailingly brownish apicad. Mesosoma brown, prothorax lighter. Tegulae yellowish. Wing venation light brown. Legs yellow, tarsi light brownish. Metasoma uniformly brown, tergite 2 with yellowish basal margin. Ovipositor sheaths and prongs dark brown.

Length of body: about 2.2 mm.

Male: Antenna 13-segmented. Head brown, general coloration similar to the female.

M a t e r i a l : Note: Male specimens were not included in the paratypes. Prov. Fianarantsoa, Parc National Ranomafana, radio tower at forest edge, elev 1130 m, 16 Oct – 8 Nov 2001, 21°15.05´S, 47°24.43´E, mixed tropical forest, 1 ♀ paratype (MA-02-09B-01); Prov. Fiaranantsoa, Parc National Ranomafana, Belle Vue at Talatakely, elev 1020 m, 4-14 July 2002, 21°15.99´S, 47°25.21´E, secondary tropical forest,1 ♀, poor condition – slide (MA-02-09C-34); Prov.

Fiaranantsoa, Parc National Ranomafana, radio tower at forest edge, elev 1130 m, 15-27 April 2003, 21°15.05′S, 47°24. 43′E, coll. R. Harin'Hala, Calif. Academy of Sciences, malaise, mixed tropical forest, **holotype** ♀ (CAS No.18051) (MA-02-09B-58); Prov. Fiaranantsoa, Parc National Ranomafana, Belle Vue at Talatakely, elev 1020 m, 16-26 Feb 2003, 21°15.99′S, 47°25.21′E, secondary tropical forest. 1 ♀ paratype (MA-02-09C-54); Prov. Fiarantsoa, Parc National Ranomafana, radio tower at forest edge, elev 1130 m, 21-28 Jan 2002, 21°15.05′S, 47°24.43′E, mixed tropical forest, 1 ♀ paratype, slide (MA-02-09B-13).

***Binodoxys madagascariensis* n.sp. (Figs. 4-7)**

D i a g n o s i s : Female: Antenna 12-segmented, flagellomeres long and narrow. Propodeum areolated. Petiole long and narrow, width across spiracular tubercles slightly less than across secondary tubercles and slightly less than the distance between spiracular and secondary tubercles. Ovipositor sheaths slightly arcuate, long and narrow. Prongs long and narrow, slightly arcuate, upperside with 5 strong setae, lowerside with 6-7 feeble setae, with simple apical seta. Coloration : Head yellow with brownish occiput and temples. Male: Face yellow.

D e r i v a t i o n o m i n i s : The name of the new species was derived from the country of origin.

F e m a l e : Head: Antenna 12-segmented, filiform, reaching to middle of the metasoma, flagellomeres long and slender. Eyes medium-sized, gena equal to ¼ of eye-length.

Mesosoma: Mesonotum with notauli slightly crenulate in the ascendent part; hairless except for two setae close to the distal margin. Propodeum areolated (Fig. 4). Forewing (Fig. 5): Stigma relatively narrow, less than three times as long as broad. R1 vein (= metacarpus) a little longer than half of stigma. RS vein long, by 1/6 longer than stigma, and terminating at about the same length as RS vein. Lower marginal setae distinctly longer than the surface setae.

Metasoma: Petiole (Fig. 6) long and narrow; rugose in the second third, with 2-3 setae at the secondary tubercles; more than three times as long as width across the spiracles; spiracular tubercles prominent; width across spiracular tubercles slightly longer than across secondary tubercles; secondary tubercles prominent, slightly wider than width across spiracular tubercles. Genitalia (Fig. 7): Ovipositor sheath slightly arcuate, long and narrow. Prongs long and narrow, arcuate at the end; with 5 strong setae at the upperside; with 6-7 feeble setae on the lowerside, their length equal to these on the upperside; with single simple apical seta.

Coloration: Head yellow, occiput and temples brownish. Palpi yellow, narrow apices of mandibles brown. Antenna light brown; scape, pedicel and basal portion of F1 yellowish. Mesonotum brown; prothorax, narrow base of mesonotum, upper and lower part of mesopleura yellow. Tegulae yellow. Legs yellow. Petiole brown, with yellow distal pattern. Metasoma brown, with yellow spot at tergite 1; apex yellow – ovipositor sheaths yellow, prongs yellow with brown apex.

Length of body: about 2.2 mm.

M a l e : Antenna 13-segmented. Coloration similar to the female, apex of metasoma brown.

M a t e r i a l : Note: Male specimens were not included in the paratypes.

Prov. d'Antananarivo, 3 km 41°NE Andranomay, 11.5 km 147°SSE Anjozorobe, elev 1300 m, 5-13 Dec 2000, 18°28'24''S, 47°57'36''E, coll. Fisher, Griswold et al., montane rainforest, 1♂ (BLF2375); Prov. Antsiranana, Foret d'Anabohazo, 11-16 March 2001, 21.6 km 247°WSW Maromandia, tropical dry forest, 1♂ (BLF3336); Prov. Diego-Suarez, Parc National Montagne d'Ambre, elev 960 m, 26-29 Jan 2001, 12°30'52''S, 49°10'53''E, coll. M.E. Irwin, E.I.Schlinger, R. Harin'Hala, 1♀ paratype, 1♂ (MA-01-01A-02); Prov. Diego-Suarez, Parc National Montagne d'Ambre, 11 Feb to 4 March 2001, 2♀ paratypes, 1♂ (MA-01-01B-05, MA-01-01D-04); Prov. Diego-Suarez, Parc National Montagne d'Ambre, elev 1125 m, 12°31'13''S, 49°10'45''E, 1♂ (MA-01-01D-05); Prov. Diego-Suarez, Parc National Montagne d'Ambre, 19 March to 5 April 2001,1♀ paratype, 8 ♂ (MA-01-01A-09); Prov. Diego-Suarez, Parc National Montagne d'Ambre, 5-21 April 2001,12°31'13''S, 49°10'45''E, 1♂ (MA-01-01D-07); Prov. Diego-Suarez, Parc National Montagne d'Ambre, 1125 m, 12°31'13''S, 49°10'45''S, 29 Jan to 11 Feb 2001, 1♀ paratype (MA-01-01D-03); Prov. Diego-Suarez, Parc National Montagne d'Ambre, 960 m, 19 March to 5 April 2001, 12°30'52''S, 49°10'53''S, 4♂♂ (MA-01-01A-09); Prov. Diego-Suarez, Parc National Montagne d'Ambre, 1125 m, 19 March to 26 April 2001,12°31'13''S, 49°10'45''E, 2♂♂ (MA-01-01D-06, MA-01-01D-08); Prov. Diego-Suarez, Sakavala beach, elev 10 m, 16-31 May 2001, 12°15'46''S, 49°43'51''E, across sandy trail, dwarf littoral forest, 1♀ paratype (MA-01-04B-10); Prov. Diego-Suarez, 7 km of Joffreville, 360 m, 7-27 April 2001, 12°20'S, 49°15'E, 1♀ paratype (MA-07-01-10); Prov. Fiarantsoa, Parc National Ranomafana, Belle Vue at Talatakely, elev 1020 m, 28 Nov – 6 Dec 2001, 21°15.99'S, 47°25'21''E, secondary tropical forest, 1♀ paratype (MA-02-09C-05); Prov. Fiarantsoa, Ranomafana, JIMRAM water works, 16 Oct-8 Nov 2001, elev 690 m, 21°14.91'S, 47°27.13'E, near river, 1♀ paratype (MA-02-09B-01); Prov. Fiarantsoa, Parc National Ranomafana, radio tower, at forest edge, elev 1130 m, 21-28 Jan 2002, 21°15.05'S, 47°24.43'E, mixed tropical forest, 1♀ paratype, slide (MA-02-09B-13); Prov. Toamasina, botanic garden, near entrance to Andasibe National Park, 7-16 Nov 2001, 18°55.58'S, 48°24.47'E, elev 1025 m, coll. R. Harin'Hala, malaise trap, tropical forest, **holotype** ♀ (CAS No. 18052) (MA-01-08B-19).

***Binodoxys* sp.**

Prov. Fiaranantsoa, Parc National Ranomafana, radio tower at forest edge, elev. 1130 m, 15-21 Dec 2001, 21°15.05'S, 47°24.43'E, mixed tropical forest, 1♀ (MA-02-09B-07).

***Ephedrus persicae* FROGGATT 1904**

(= *Ephedrus impressus* GRANGER 1949)

Environs of Tananarive (GRANGER 1949).

Note: The description and figure of *E. impressus* (GRANGER 1949) document the earlier species identification and confirmed synonymy.

Discussion

Aphids as presumed host associations of the aphidiine parasitoids

The flora of Madagascar is reported to manifest a rather peculiar phenomena including 7 endemic families and 450 endemic genera, resulting in 77% endemic species of the whole flora of 8,500 species. In spite of relatively close proximity to Africa, the over-all percentage of relationships of the flora to Africa is merely 25-30%. Instead, most of the flora manifests relationships to India (including Sri Lanka) or to the Indomalayan subregion (HENDRYCH 1984). Also, Madagascar is zoogeographically classified as representing a Madagascarian sub-region of the Ethiopian (= Afrotropical) region (BUCHAR1983).

The number of recorded aphid species is 39 for Madagascar and 44 for La Réunion (REMAUDIERE & ETIENNE 1988), but more than 100 species are predicted to occur in Madagascar (G. REMAUDIERE, e-mail to P. Starý, 21-III-2002). Some broader information on the aphids of Madagascar and related islands can be found in REMAUDIERE & ETIENNE (1988), and that on the sub-Saharan Africa by REMAUDIERE & al. (1985) and MILLAR (1994).

Aphid parasitoids

The most recent information on the aphidiine parasitoids of the sub-Saharan Africa can be found in STARÝ & al. (1985a,b).

Information on the aphidiines of Madagascar is rather scanty (GRANGER 1949) and prior to this study included only two species (*Aphidius seyrigi* and *Ephedrus persicae*) without any further information on their host and plant associations. A somewhat better situation exists for La Réunion which may be cited as a source of information or prediction for the Madagascar fauna. Starý & al. (1994) presented the following review of parasitoid (aphid) associations in La Réunion: *Aphidius camerunensis* MACK. (*Sitobion* sp.), *A. colemani* VIER. (*Aphis craccivora* KOCH, *A. gossypii* GLOV., *A. nerii* B.d.F., *A.* sp., *Brachycaudus helichrysi* KALT., *Lipaphis erysimi* KALT.., *Myzus persicae* SULZ., *Rhopalosiphum maidis* FITCH, *Toxoptera aurantii* B.d.F., *Toxoptera* sp.), *Aphidius matricariae* HAL. (*Brachycaudus helichrysi* KALT.), *Aphidius rosae* L. (*Macrosiphum rosae* L.), *Diaeretiella rapae* (M'INT.) (*Brevicoryne brassicae* L., *Lipaphis erysimi* KALT., *Myzus persicae* SULZ.); of these, *A. colemani* is the distinctly dominant species. Prior to this, TARDIEUX & RABASSE (1988) reported *A. colemani* from La Réunion, and MACKAUER & STARÝ (1967) presented evidence on *A. seyrigi*. The aphidiine species detected in La Réunion do not include any endemic species, but a mix of various elements, as follows: *Aphidius camerunensis* is widely distributed in sub-Saharan Africa. *A. colemani* is similar but its distribution tends to be pan-tropical (possibly a group-species). *A. matricariae* and *D. rapae* are almost cosmopolitan, and *A. rosae* is a West-Palearctic species (STARÝ & al. 1994).

The findings presented in the present paper demonstrate that Madagascar has both sub-Saharan African (*A. autriquei, A. camerunensis, A. colemani*) and La Réunion (*A. camerunensis, A. colemani*) elements; *E. persicae* is a species of Eurasian origin, now widely distributed throughout the world. However, the newly described species, *B. harinhalai* and *B. madagascariensis* might be endemic to Madagascar, although they may also occur in South Africa. Hopefully, future studies of the Malagasy will elucidate their host-parasitoid associations.

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Zusammenfassung

Die Aphidiinae-Parasiten verschiedener Provinzen Madagaskars wurden studiert. Daraus ergaben sich die beiden für die Wissenschaft neuen Arten *Binodoxys harinhalai* n.sp. und *B. madagascariensis* n.sp., die beschrieben und abgebildet wurden. Die Aphidiinenfauna Madagaskars wurde verglichen und diskutiert mit jener der afrikanischen Subsahara und der benachbarten Insel La Réunion.

References

BUCHAR J. (1983): Zoogeography. — Státní pedagogické nakladatelství, Praha: 1-199 (in Czech).

EASTOP V. F. & D. HILLE RIS LAMBERS (1976): Survey of the World's Aphids. — Dr. W. Junk Publishers, The Hague: 1-573.

GRANGER C. (1949): Braconides de Madagascar. — Mém.. Inst. Sci.. de Madagascar, Sér. A, **2**: 1- 428.

HENRYCH R. (1984): Phytogeography. — Státní pedagogické nakladatelství, Praha, 1-220 (in Czech).

MACKAUER M. (1966): A new aphid parasite (Hym., Aphidiidae) from West Africa. — Ent. mon. Mag. London **101**: 116-118.

MACKAUER M. & P. STARÝ (1967): World Aphidiidae. — In: DELUCCHI V. & G. REMAUDIERE (Eds), Index of entomophagous insects. — Le Francois, Paris: 1-167.

MILLAR L. (1994): A catalogue of the aphids (Homoptera: Aphidoidea) of Sub-saharan Africa. — Plant Protection Research Institute, South Africa, 130pp.

REMAUDIÉRE G., AUTRIQUE A., EASTOP V.F., STARÝ P., AYMONIN G., KAFURERA J. & R. DEDONDER (1985): Contribution a l'écologie des aphides africains. — Étude FAO Prod. Véget. Prot. Plantes **64**: 1-214.

REMAUDIÉRE G.& J. ETIENNE (1988): Les Aphididae (Hom.) des iles et archipels de l'océan Indien. — Agron. Tropic. **43-4**: 327-346.

REMAUDIÉRE G. & M. REMAUDIÉRE (1997): Catalogue of the world's Aphididae. Homoptera Aphidoidea. — I.N.R.A., Paris: 1-473.

STARÝ P., REMAUDIÉRE G. & A. AUTRIQUE (1985a): 4. Les Aphidiides parasites de pucerons en region ethiopienne, pp. 95-102. — In: REMAUDIÉRE G., AUTRIQUE A., EASTOP V.F., STARÝ P., AYMONIN G., KAFURERA J. & R. DEDONDER (1985), Contribution a l'écologie des aphides africains. — Étude FAO Prod. Véget. Prot. Plantes **64**: 1-214.

STARÝ P., REMAUDIÉRE G. & A. AUTRIQUE (1985b): New and little known species of aphid parasitoids from Burundi (Hym., Aphidiidae). — Ann. Soc. ent. Fr. (N.S.) **21**: 133-140.

STARÝ P., REMAUDIÉRE G. & J. ETIENNE (1994): Aphid parasitoids (Hym., Braconidae, Aphidiinae) of Reunion Island. — Linzer biol. Beitr. **26**: 437-442.

TARDIEUX I. & J.M. RABASSE (1988): Induction of a thelytokous reproduction in the *Aphidius colemani* (Hym., Aphidiidae). — J. Appl. Entomol. **106**: 58-61.

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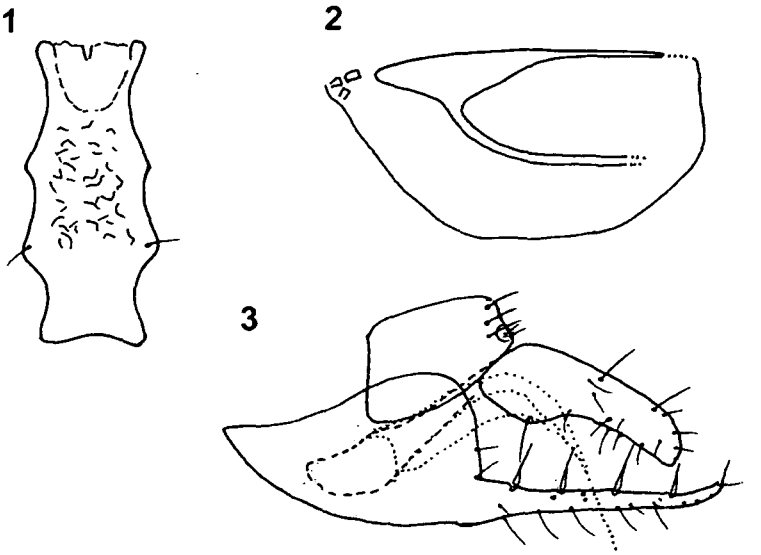
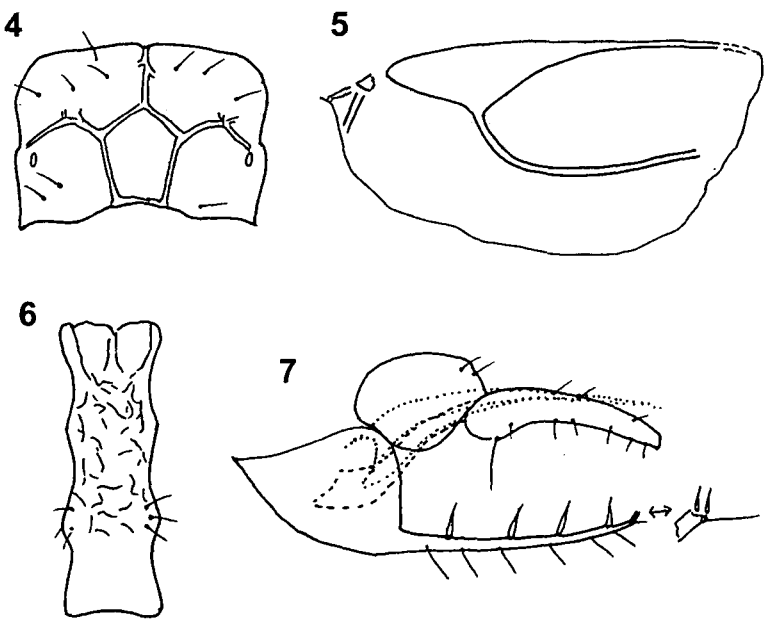


Figs 1-3: Binodoxys harinhalai n.sp., paratype ♀. (1) Petiole; (2) Forewing, a part; (3) Genitalia. (Figures drawn in a different scale).



Figs 4-7: Binodoxys madagascariensis n.sp., paratype ♀. (4) Propodeum; (5) Forewing, a part; (6) Petiole; (7) Genitalia (Figures drawn in a different scale).