Entomofauna

ZEITSCHRIFT FÜR ENTOMOLOGIE

Band 32, Heft 35: 469-476 ISSN 0250-4413 Ansfelden, 25. November 2011

First record of the subfamily Figitinae (Hymenoptera: Cynipoidea: Figitidae) from Madagascar: *Figites vizekae* nov.sp.

J. PUJADE-VILLAR & M. MADL

Abstract

Figites vizekae nov.sp. is described from Sainte Marie Island (Nosy Boraha). This species represents the first record of the subfamily Figitinae from the Malagasy Subregion. Morphological characters are illustrated and discussed. A key to the *Figites* species with a partially open radial cell is proposed.

Key words: Hymenoptera, Figitidae, Figitinae, *Figites*, new species, Madagascar.

Zusammenfassung

Figites vizekae nov.sp. wird von der Insel Sainte Marie (Nosy Boraha) beschrieben. Morphologische Merkmale werden abgebildet und diskutiert. Ein Bestimmungsschlüssel zu den *Figites*-Arten mit einer teilweise offener Radialzelle wird vorgeschlagen.

Introduction

The subfamily Figitinae is a group of hymenopteran parasitoids belonging to the family Figitidae (Cynipoidea). Currently this subfamily includes 14 valid genera (RONQUIST 1999), three with a scutellar spine (*Neralsia* CAMERON 1883, *Xyalophora* KIEFFER 1901, and *Xyalophoroides* JIMÉNEZ & PUJADE-VILLAR 2008) and ten without a scutellar spine (*Amphitectus* HARTIG 1840, *Figites* LATREILLE 1902, *Homorus* FÖRSTER 1869, *Lonchidia* THOMSON 1832, *Melanips* WALKER 1835, *Paraschiza* WELD 1944, *Sarothrioides* BELIZIN 1961, *Sarothrus* HARTIG 1840, *Seitneria* TAVARES 1928, *Trichiza* FÖRSTER 1869 and *Zygosis* FÖRSTER 1869).

The subfamily Figitinae is characterized by the lack of derived characters present in other figitid subfamilies (RONQUIST 1999). Recently, BUFFINGTON et al. (2007) consider that it is a monophyletic or paraphyletic group depending on the different analyses. In fact, it is defined by negative characters (PARETAS-MARTÍNEZ et al. 2011): radial cell not sclerotized forming a typical wing cell (unlike Pycnostigminae), scutellum without an oval, tear-drop shaped, or elongate elevated plate dorsally (unlike Eucoilinae), metatibial spur at most 1/4 length of first metatarsomere (unlike Plectocynipinae), apex of forewing rounded (unlike Emargininae), areolet absent on forewing (unlike Parnipinae and Euceroptrinae), head squared or rounded in anterior view and mandibles larger and not overlapping (unlike Anacharitinae), facial impression absent and metasomal tergum III rounded, not saddle-shaped (unlike Aspicerinae), larger insects, typically longer than 2 mm in length (unlike Charipinae), circumtorular impression absent (unlike Thrasorinae) and second metasomal segment modified into either a collar with strong carinae (unlike Mikeiinae).

The subfamily Figitinae is recorded from all zoogeographical regions and comprises about 170 valid species. Currently, only five *Figites* species are known from the Ethiopian Region. Species of this subfamily are parasitoids of different families of Diptera Cyclorrhapha (RONQUIST 1999). *Figites* species attack carrion-feeding larvae of the families Anthomyiidae, Calliphoridae, Muscidae, Sarcophagidae, etc (FERGUSSON 1986).

The genus *Figites* is defined by following characters: scutellum usually margined and rugose; metasomal tergum II glabrous and usually sulcate; wings pubescent or glabrous, radial cell usually closed and areola absent. It is known from North and South America, Europe, Africa and Sri Lanka (FERGUSSON 1986).

Material and methods

This study is based on the material of the Naturhistorisches Museum Wien. Voucher specimens are deposited in the collection Juli Pujade-Villar at Universitat de Barcelona.

The morphological terms are drawn from GIBSON (1985), RONQUIST & NORDLANDER (1989) and RONQUIST (1994). Concerning the terms for sculpture see HARRIS (1979). Measurements and abbreviations include: F1–F12, first and subsequent flagellomeres; length and width of each antennomere are indicated (width between brackets); POL (post-ocellar distance) is the distance between the inner margins of the posterior ocelli; OOL (ocellar-ocular distance) is the distance from the outer edge of posterior ocellus to the inner margin of the compound eye; LOL (lateral-frontal ocellar distance) is the

distance between lateral and frontal ocelli; the width of the forewing radial cell is measured from the margin of the wing to the beginning of Rs vein.

Specimens were studied using stereomicroscopy and scanning electron microscopy. The SEM photos were taken with a Stereoscan Leica-360 by Palmira Ros-Farré at a low voltage (700V) without coating, in order to preserve the specimens. The fore wing was photographed directly in the stereomicroscope with a digital camera Canon PowerShot SX210 15 by Maria del Mar Ferrer Suay.

***Figites vizekae* nov.sp.**

M a l e : Length. 4.2-4.3 mm (n = 5).

Colour: Black. Head, mesosoma (including tegulae), most part of metasoma, coxae and partially femora II-III completely black. Mandibles with teeth dark brown. Antennae dark brown to black. Forewing veins yellowish. Legs red- brown, tarsi darker.

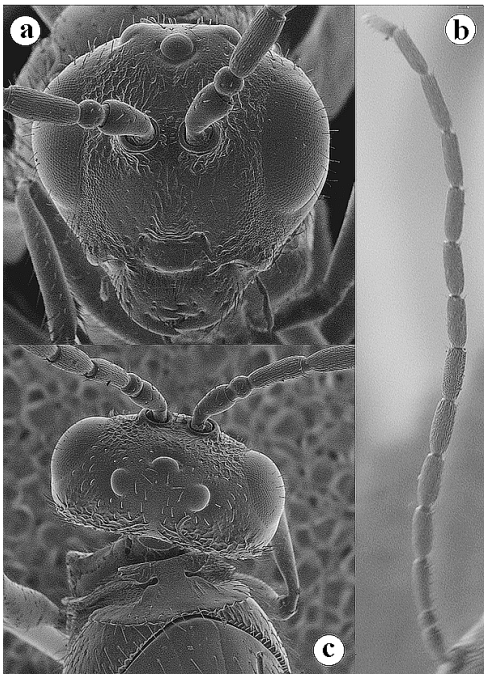

Fig. 1: *Figites vizekae* nov.sp.: (**a**) head in frontral view, (**b**) head and pronotal plate in dorsal view, and (**c**) male antenna.

Head (Figs 1a, 1c): Oval, slightly narrower than mesosoma, with white sparse setae; slightly broader than long (38:36) in anterior view, with big mandibles; gena not broadened behind eye. Lower face with two smooth shiny areas, coriaceous laterally, rugose centraly; with deep punctuation bellow toruli and basally, sparsely in the midle. Malar sulcus absent; malar area coriaceous, 0.53 times as long as compound eye. Clypeus impressed, few setosae, shiny with some piliferous points, rounded and shortly emarginated ventrally, medially not incised; anterior tentorial pits small, indistinct; epistomal sulcus and clypeo-pleurostomal line distinct, broad, impressed. Transfacial line around 1.5 times as long as compound eye. Diameter of toruli shorter than distance between toruli and compound eye (3:5), and shorter than distance between toruli (3:4). Upper face and fronts coriaceous, with some rugae-carinae and pilifereous points. In dorsal view 2.2-2.3 times as broad as long in dorsal view. POL: OOL: OCO is 10: 6: 4 and the diameter of lateral ocelus is 3. Vertex smooth and shiny dorsaly, rugose with piliferous points later to occiput; postoccipital carina indistinct; occiput smooth.

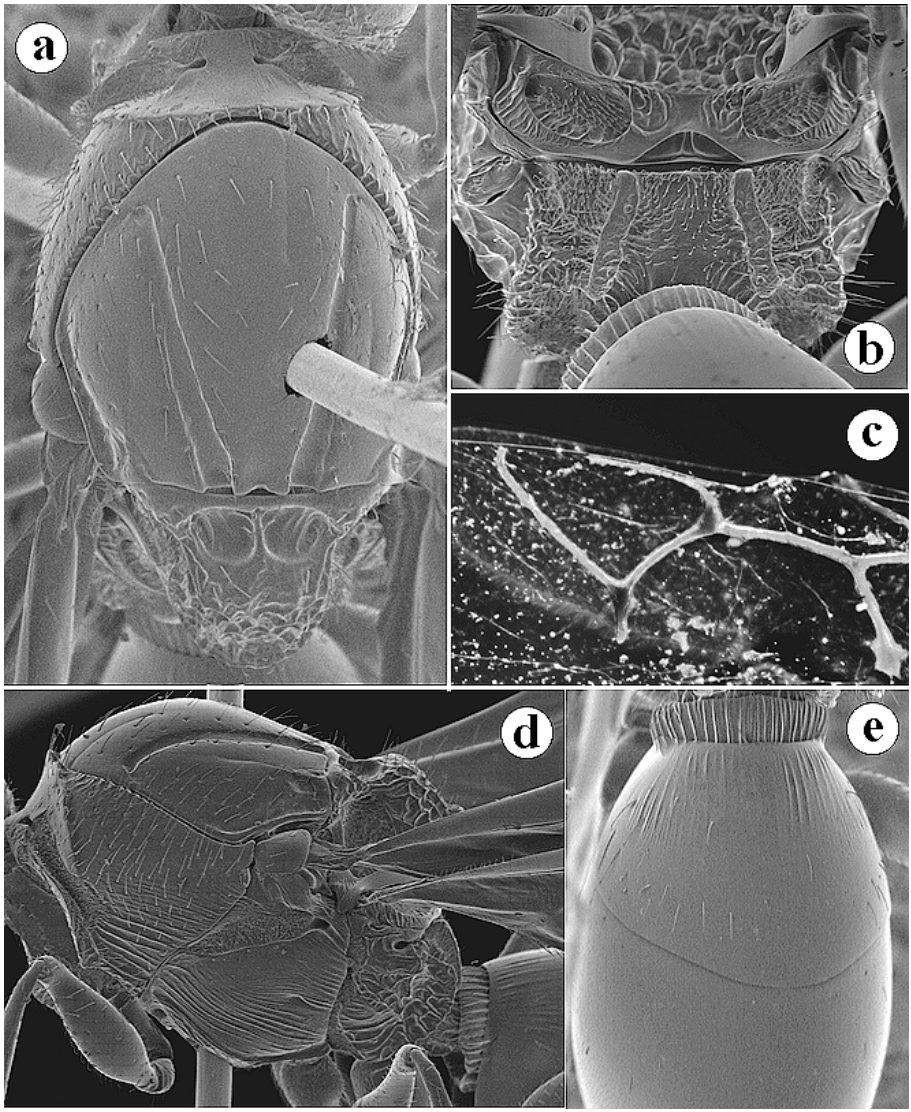

Fig. 2. *Figites vizekae* nov.sp.: (**a**) mesosoma in dorsal view, (**b**) propodeum, (**c**) radial cell of forewing, (**d**) mesosoma in lateral view, and (**e**) metasoma in dorsal view.

Antennae (Figs 1b, 1c): Antenna with 14 segments, filiform. Scape and pedicel smooth, with few scattered setae; flagellomeres scarcely setose; placodeal sensilla in all flagellomeres, very visible; F1 not modified only very few curved almost rectilinear; antennal formula: 8(3), 3(3), 10(3), 9(3), 9(3), 9(3), 9(3), 9(3), 9(3), 10(3), 10(2.5), 10(2.5), 10(2), 14(2).

Mesosoma (Figs 1c, 2b, 2d): Pronotum pubescent, upper laterally smooth-alutaceous with piliferous points; lower lateraly transversally carinated. Scutum smooth and shiny, with some few white setale. Notauli deep, percurrents without sculpture; median mesoscutal impression very short. Scutellum marginated, sparsely pubescent, rugose, alutaceous-coriaceous; scutellar foveae rounded, large, marginate, carinated interiorly, separated by a carina. Mesopleura transversally carinated, smooth and shiny next to mesopleural triangle. Propodeum sparsely pubescent, coriaceous; propodeal carina thick, strongly impressed, vertical, divergent and incomplete with a coriaceois sculpture. Metascutellum subrectangular, ventrally concave, sculptured. Ventral bar of metanotal trough partially sculptured; metanotal trough coriaceous inferiorly carinated and pubescent.

Forewings (Fig. 2c): Disc and margin glabrous. Radial cell partially open in the distal margin, about two times as long as broad.

Legs: Tarsal claws simple.

Metasoma (Fig. 2e): Collar with strong carinae; tergum II striated basally; tergum III punctated distally and laterally.

F e m a l e : Unknown.

B i o l o g y : Unknown.

T y p e m a t e r i a l : Holotype: Male with following labels: "MADAGASCAR, Ste. Marie, Foret de Kalalao, 23-26.X.1991, Madl." (white label), "Holotype ♂ Figites vizekae n. sp. design. Pujade-Villar 2011" (red label), Figites vizekae ♂ Pujade-Villar & Madl n. sp. det. 2011" (white label). Paratypes: 4 males, with the following labels: "Madagascar, St. Marie, Lamanona, S Ankoalabe, 29.X.1996, Madl" (white label), "Paratype ♂ Figites vizekae ♂ n.sp." (red label), Figites vizekae ♂ Pujade-Villar & Madl n. sp. det. 2011" (white label).

The holotype and two paratypes are deposited in the Naturhistorisches Museum Wien and two paratypes in the collection Juli Pujade-Villar Universitat de Barcelona.

E t y m o l o g y : *Figites vizekae* nov.sp. is dedicated to Manuela Vizek (Naturhistorisches Museum Wien) thanking for her support in our studies and her friendship over years.

D i a g n o s i s : *Figites vizekae* nov.sp. is closely related to *F. effossus* BENOIT 1956 and *F. favonius* BENOIT 1956 from Democratic Republic of Congo. The radial cell is partially open only in these three *Figites* species. *Figites vizekae* nov.sp. differs from *F. effossus* in following characters: medial sulcus in mesoscutum and areole in forewings absent; forewings completely hyaline. *Figites vizekae* nov.sp. differs from *F. favonius* in having the mesopleura not completely striated and in the larger body length. Finally, *Figites vizekae* nov.sp. differs from both species in having the metasomal tergum I longitudinally striated.

Key to the *Figites* species with partially open radial cell

1 Mesoscutum with medial sulcus. Forewings smoky, with areole. Only females known..... *effossus* BENOIT

- Mesoscutum without medial sulcus. Forewings hyaline, without areole. Only males known..... 2

2 Mesopleura completely striated. Metasomal tergum I smooth. Body length: 2 mm..... ..... *favonius* BENOIT

- Mesopleura partially smooth. Metasomal tergum I with longitudinal carinae. Body length: > 4 mm. ..... *vizekae* nov.sp.

Discussion

In Africa *Figites* species are restricted to the subsaharan region. Hitherto five species have been recorded from the Democratic Republic of Congo (BENOIT 1956; JIMÉNEZ et al. 2008): *Figites aciculata* (BENOIT 1956), *F. effossus* BENOIT 1956, *F. favonius* BENOIT 1956, *F. fraudator* BENOIT 1956 and *F. furvus* BENOIT 1956.

BENOIT (1956) considers that the species described from Belgian Congo (now Democratic Republic of Congo) are intermediate between the genera *Figites* and *Xyalophora*. After the revision of *Xyalophora* species (JIMÉNEZ et al. 2008) his opinion is not true. All *Xyalophora* species have the internal sulcus of notauli with tranverse carinae and the scutum with coriaceous sculpture at least on the basal area adjacent to notauli, while in *Figites* both structures mentioned are smooth and shiny. Nevertheless, some species from this area (including *Figites vizekae* nov.sp. from Malagasy Subregion) have a different morphology of radial cell. *Figites* was described as a genus with closed radial cell, but three species (*F. favonius*, *F. effossus* and *F. vizekae* nov.sp.) have the radial cell partially open (Fig. 2c). After a morphological phylogenetic study by JIMÉNEZ et al. (2008), this character has been used to differentiate genera with scutellar spine. Nevertheless, we don't consider this possibility, because the genus *Figites* is need of a modern taxonomic revision. *Figites* is a heterogeneous genus and probably includes different morphological genera.

Acknowledgements

We are grateful to Palmira Ros-Farré and Maria del Mar Ferrer Suay (both Universitat de Barcelona) for taking the photos. This research has been supported by the project CGL 2008-00180 of the Science and Education Ministry of Spain.

References

BENOIT P.L.G. (1956): Figitinae nouveaux du Congo Belge (Cynip.-Figitidae). – Revue de Zoologie et de Botanique Africaines **53** (3-4): 377-384.

BUFFINGTON M.L., NYLANDER J.A.A. & J. HERATY (2007): The phylogeny and evolution of Figitidae (Hymenoptera: Cynipoidea). – Cladistics **23** (5): 1-29.

GIBSON G.A.P. (1985): Some pro- and mesothoracic structures important for phylogenetic analysis of Hymenoptera, with a review of terms used for the structures. – Canadian Entomologist **117** (11): 1395-1443.

FERGUSSON N.D.M. (1986): Charipidae, Ibaliidae & Figitidae (Hymenoptera: Cynipoidea). – Handbooks for the Identification of British Insects **8** (1c):1-55.

HARRIS R.A. (1979): A glossary of surface sculpturing. **—** Occasional Papers in Entomology **28**: 31 pp.

JIMÉNEZ M., PARETAS-MARTINEZ J. & J. PUJADE-VILLAR (2008): Revision of *Xyalophora* KIEFFER and description of *Xyalophoroides* gen.n. (Hymenoptera: Figitidae: Figitinae). – European Journal of Entomology **105** (4): 751-769

PARETAS-MARTINEZ J., RESTREPO-ORTIZ C., BUFFINGTON M. & J. PUJADE-VILLAR (2011): Systematics of Australian Thrasorinae (Hymenoptera, Cynipoidea, Figitidae) with descriptions of Mikeiinae, new subfamily, two new genera, and three new species. **—** ZooKeys **108**: 21-48.

RONQUIST F. (1994): Evolution of parasitism among similar phylogenetic relationships and the origin of inquilinism in gall wasps (Hymenoptera, Cynipidae). – Evolution **48** (2): 241-266.

RONQUIST F. (1999): Phylogeny, classification and evolution of the Cynipoidea. **—** Zoologica Scripta **28** (1-2): 139-164.

RONQUIST F. & G. NORDLANDER (1989): Skeletal morphology of an archaic cynipoid (Hymenoptera: Ibaliidae). **—** Entomologica Scandinavica Supplement **33**: 40 pp.

Author's addresses:

Juli PUJADE-VILLAR
Universitat de Barcelona
Facultad de Biologia
Departament de Biologia Animal
Avda. Diagonal, 645
08028 Barcelona, Spain
E-mail: jpujade@ub.edu

Michael MADL
Internationales Institut für Entomologie
Naturhistorisches Museum, Burgring 7
1010 Wien, Austria
E-mail: michael.madl@nhm-wien.ac.at

Druck, Eigentümer, Herausgeber, Verleger und für den Inhalt verantwortlich:
Maximilian SCHWARZ, Konsulent f. Wissenschaft der Oberösterreichischen Landesregierung, Eibenweg 6, A-4052 Ansfelden, E-Mail: maximilian.schwarz@liwest.at.

Redaktion: Erich DILLER, ZSM, Münchhausenstraße 21, D-81247 München;
Roland GERSTMEIER, Lehrstuhl f. Tierökologie, H.-C.-v.-Carlowitz-Pl. 2, D-85350 Freising
Fritz GUSENLEITNER, Lungitzerstr. 51, A-4222 St. Georgen/Gusen;
Wolfgang SPEIDEL, MWM, Tengstraße 33, D-80796 München;
Thomas WITT, Tengstraße 33, D-80796 München.

Adresse: Entomofauna, Redaktion und Schriftentausch c/o Museum Witt, Tengstr. 33, 80796 München, Deutschland, E-Mail: thomas@witt-thomas.com; Entomofauna, Redaktion c/o Fritz Gusenleitner, Lungitzerstr. 51, 4222 St. Georgen/Gusen, Austria, E-Mail: f.gusenleitner@landesmuseum.at