*Belgian Journal of Entomology*, 62: 1-30 (2018) ISSN : 2295-0214
www.srbe-kbve.be

urn:lsid:zoobank.org:pub:DADF36A4-BAA9-48BA-ABEA-7E01909E563E

# Belgian Journal of Entomology

## The *Xylocopa* Latreille, 1802, of Ethiopia (Hymenoptera: Apidae)

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Published : Brussels, February 12, 2018

Citation. Pauly A., Hora Z.A., Wayessa D.N. & Amberbir K., 2018. The *Xylocopa* Latreille, 1802, of Ethiopia (Hymenoptera Apidae). *Belgian Journal of Entomology*, 62: 1-30.

ISSN 1374-5514 (Print Edition)
ISSN 2295-0214 (Online Edition)

Le Belgian Journal of Entomolgy est édité par la Société royale belge d'Entomologie, association sans but lucratif, fondée le 9 avril 1855.
Siège social : rue Vautier 29, B-1000 Bruxelles

De Belgian Journal of Entomology is uitgegeven door de Koninklijke Belgische Vereniging voor Entomologie, vereniging zonder winstoogmerk, opgericht op 9 april 1855.
Sociale zetel : Vautierstraat 29, B-1000 Brussel

The Belgian Journal of Entomology is published by the Royal Belgian Society of Entomology, a non-profit association established on April 9, 1855.
Head office: Vautier street 29, B-1000 Brussels

Les publications de la Société sont financées avec le concours de la Fondation Universitaire de Belgique.

De publicaties van de Vereniging worden gefinancieerd met de steun van de Universitaire Stichting van België.

The publications of the Society are partly sponsored by the University Foundation of Belgium.

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Cover plate: *Xylocopa flavorufa* on flowers of *Lablab purpureus,* Adis Ababa, 6.XI.2011 (© J.L. Boevé)

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## Abstract

A total of 18 species of *Xylocopa* are identified from Ethiopia. We provide data and visited plants records for each species, as well as a short diagnose and illustrations. A new species, *Xylocopa higosamuloensis* Pauly sp. nov., is described. The following synonymy has been established after revision of the types: *Xylocopa flavorufa* var. *harrarensis* Vachal, 1922 = *Xylocopa combusta* (Smith, 1854); *Xylocopa villosa* Friese, 1909 = *Xylocopa erythrina* Gribodo, 1894; *Xylocopa carinata* var *alpina* Friese, 1922 = *Xylocopa bicarinata* Alfken 1932 = *Xylocopa hottentotta* Smith, 1854; *Xylocopa nigripes* Friese, 1915 = *Xylocopa scioensis* Gribodo, 1884.

**Keywords**: bees, visited plants, new records, new species.

## Introduction

This paper is a first contribution to the knowledge of the *Xylocopa* from Ethiopia. We give, for each species, a short diagnosis, an illustration of habitus, the list of material collected as well as the foraged plants. A total of 19 species are listed from the country. We have recorded a similar number of species from the Burundi (PAULY *et al*., 2015), while EARDLEY (1983) recorded 24 species from South Africa. Most African species are illustrated on the Atlas Hymenoptera website (PAULY, 2017). The catalog of African *Xylocopa* contains about 120 species (EARDLEY, 1987; EARDLEY & URBAN, 2010), but many of them are probably synonyms.

*Xylocopa* are also called "carpenter bees" because they dig galleries in the dead wood to build their nests. They are often found nesting in beams or wooden stakes of dwellings. Some also nest in hollow stems such as bamboo.

Carpenter bees are more efficient pollinators on legume crops because, heavier than the honeybee, they better trigger the pollination mechanism of flowers (FREE 1966, 1970). Several studies show that the presence of carpenter bees in legume crops in Africa can increase yields by a more efficient pollination (PANDO *et al*., 2011, 2013, KINGHA *et al*., 2012; PAULY *et al*., 2015).

Collection of dead wood and felling of trees in which nests are dug risk of rarefy carpenter bee populations and thereby reducing the pollination service to cultivated crops. To overcome this gap in landscapes where carpenter bees have become rare, it is possible to manage, near

the crops, artificial nests made of these materials. These same nests are reused each year by carpenter bees (SOLOMON & PURNACHANDRA, 2006).

## Material and methods

The bees were collected by the authors using a hand net on the flowers of wild and cultivated plants during a 3 years GTI project, from 2010 to 2012. These specimens are mentioned below under "New material". They are deposited at the Royal Belgian Institute of Natural Sciences, Brussels, Belgium (RBINS) and a collection of reference has been deposited at the Zoological Museum of the University of Addis Ababa (ZMAA). We have studied also old specimens preserved at the ZMAA, in the Museum of Natural History, London, UK (NHML) and some specimens collected by Gerard Schulten at the Rijksmuseum of Natural History, Leiden, The Netherlands (RMNH). Types of species described from Ethiopia have been examined to the Museum für Naturkunde an der Humboldt Universität zu Berlin, Germany (MNHUB), the Muséum National d'Histoire Naturelle, Paris, France (MNHNP) and the the Natural History Museum, in London, the United Kingdom (NHML).

## Xylocopinae

### ***Xylocopa aethiopica*** Pérez, 1901 (Fig. 1)

*Xylocopa (Xylomelissa) aethiopica*

LITERATURE. "Abyssinie" 1♀ holotype (MNHNP), examined (PÉREZ, 1901).

DIAGNOSIS. Colouration (Fig. 1a,b) similar to *X. cornigera* Friese, 1909, known from Tanzania and the Shaba in the R.D. Congo but the size smaller (13 mm for the holotype, 15 mm for the identified specimen from Cheleka; *X. cornigera* is 18 to 22 mm long). Tarsi II, tibias and tarsi III red. Head Fig. 1c. Clypeus with a tubercle in the middle of the anterior border, sides of the clypeus slightly raised, with a small not punctuated area (Fig. 1d).

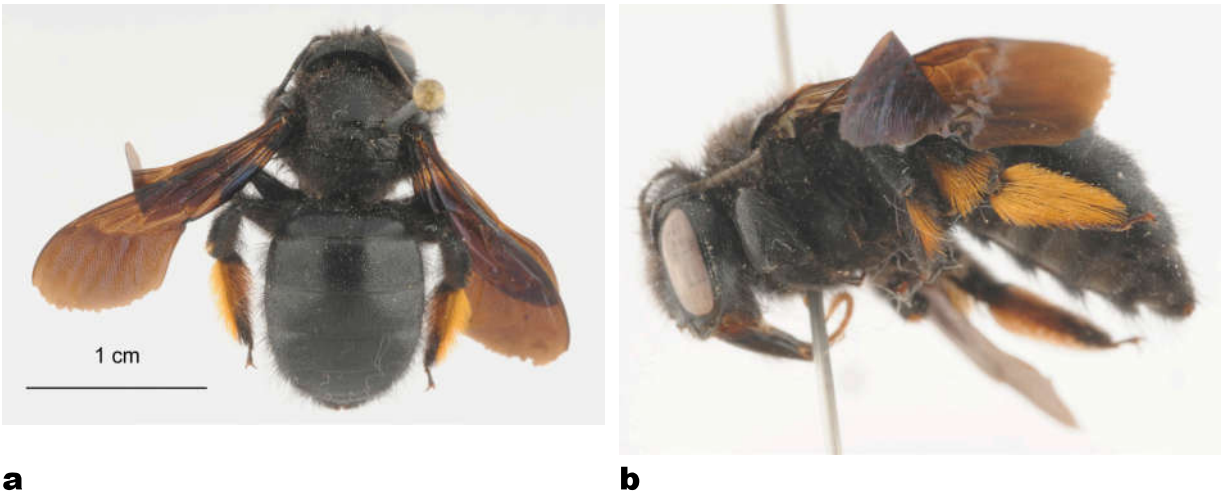


Fig. 1. *Xylocopa aethiopica*, female (Cheleka Forest); a, dorsal view; b, lateral view.

**c** **d**

Fig. 1. *Xylocopa aethiopica*, female (Cheleka Forest) (continued); c, head; d, clypeus.

New material: OROMIA [Bale], Cheleka Forest, 7°01'N 39°30'E, 24.X.2010, *Plectranthus garckeanus*, 1♀.

## ***Xylocopa caffra*** (Linnaeus, 1767) (Figs 2-5)

*Xylocopa (Koptortosoma) caffra*

DIAGNOSIS. Female. Middle sized species (14-22 mm); colouration of hind margin of the mesosoma and tergum 1 yellow (Fig. 4a). Vertex shorter and with denser punctuation as *X. inconstans* (Fig. 4b). This species may be distinguished from *X. schoana* by the presence of a mite pouch on T1 (Fig. 5b). The colour on sides of thorax are variable from black to yellow (Fig. 3a,b). Male. Totaly covered by yellow pubescence (Fig. 2), morphologically not distinguishable from those of *X. schoana, X. pubescens* and *X. olivacea*.

The females may be separated into different colour varieties:

(a) Propodeum with orange acarinarium (Fig. 5a) and thorax with black sides (Fig. 3a):

OLD MATERIAL. Tana Gion, 22.II.2007, 1♀, leg. J. Bekele (ZMAA) . – Tana Hotel, Lake Tana, 2.X.2007, 2♀, leg. J. Bekele (ZMAA). – Rib River, Gondar, 11.X.2007, 2♀, leg. Tibebe Dejene (ZMAA). – Prov. Sidamo-Borana, Malghe Waudo farm, to Awasa Meer, 2.IV.1960, 1♀, leg. M.J.A. de Koster (RMNH). – C. Abyssinia, Maraquo, 7.V.1914, 1♀, leg. O. Kovacs (NHML). – Koka, 8°27'N 39°06'E, 28.VIII.1976, 2♀, mixed *Acacia* woodland, leg. C.P.J.Ash (NHML).

NEW MATERIAL. AMHARA, Blue Nile Falls, 11°29'N 37°35'E, 1616m, 15.X.2011, *Cassia alata* and *Justicia schimperana*, 6♀ – Hamusit, nr Bahir Dar, 11°42'N 37°29'E, 1890m, 15.X.2011, *Brassica* sp., 4♀.

OROMIA, Bako, 9°07'N 37°03'E, 25.XI.2010, *Hygrophila auriculata*, 1♀, 12.I.2011, *Solanum incanum*, 2♀. – Mojo, 8°36'N 39°07'E, 6.X.2010, *Caesalpinia alata*, DN07, 1♀. – Holeta, 9°04'N 38°30'E, 2450m, 5.X.2010, *Viccia dasycarpa* (DN02), 1♀. – Gibe, 7°45'N 37°39'E, 20.VI.2011, *Solanum incanum*, 1♀. – Sokoru, 7°55'N 37°25'E, 19.VI.2011,

*Solanum incanum*, 1♀. – OROMIA. Lake Ziway, 7°56'N 38°43'E, 1638m, 14.IX.2012, *Hypoestes forsakolii*, 7♀.

SOUTHERN. Dilela between Gogetti and Tiya, 8°14'27N 38°29'02E, 1905m, 28.X.2011, *Cassia alata*, 2♀.

(b) Propodeum with orange acarinarium and thorax with yellow sides (Fig. 3b):

NEW MATERIAL. OROMIA [Bale], Sofomar, 6°13'N 39°46'E, 31.I.2011, *Aloe berhana*, 7♀. – [W. Hararghe], Gadullo, 8°23'N 40°23'E, 1625m, 5.I.2011, Asteraceae n°111, 3♀. – [W. Hararghe], Mechara, 8°36'N 40°19'E, 30.x-13.XI.2010, *Desmodium uncinatum*, 1♀. – Bako, 9°07'N 37°03'E, 13.XI.2010, *Salvia leucantha*, 1♀, *Caesalpinia spinosa*, 1♀.

(c) Propodeum with black acarinarium and thorax with black sides:

OLD MATERIAL. Sodere, Schoa, 17.IX.1967, 1♀ (ZMAA).

NEW MATERIAL. AFAR, Awash National Park, 8°55'N 40°02'E, 20-21.VII.2011, *Solanum melongena*, 6♀.

(d) Barcoded male:

NEW MATERIAL. AMHARA. Debre Birham, Bakelo, 9°41'N 39°32'E, 2840m, 8.X.2011, *Salvia schimperi* (ZA11), 1♂.

(e) Mixed males of *X. caffra* and *X. schoana*:

OLD MATERIAL. Addis Ababba, 7000 ft, 7.X.1945, 8♂, leg. K.M. Guichard (NHML). – Higo Samula, 30.X.2011, 1♂, leg. R.J. Stordy (NHML). – Walanchiti, 8°38'N 39°27'E, 19.VII.1976, 1♂, leg. C.P.J. Ash (NHML). – Simien, Ambaras, Khabau to Aostagheb, 10,800 ft, 19-20.XI.1952, 1♂, leg. Hugh Scott (NHML).

Fig. 2. *Xylocopa caffra*, male (Debre Birhan).

Fig. 3. *Xylocopa caffra*, females, lateral view; a, with black sides (Blue Nile Falls); b, with yellow sides (Sof'Omar).


Fig. 4. *Xylocopa caffra,* female (Koka); a, dorsal view; b, vertex.

Fig. 5. *Xylocopa caffra*, female; a, propodeum with orange acarinarium; b, Tergum 1 with a mite pouch.

## ***Xylocopa combusta*** (Smith, 1854) (Fig. 6)

*Xylocopa (Mesotrichia) combusta* (Smith, 1854)
= *Xylocopa taczanovskii* Radoszkowski, 1876.
= *Xylocopa flavorufa* var. *harrarensis* Vachal, 1922. **Syn. nov.**

DIAGNOSIS. Female. Large species as *X. flavorufa*, but completely black (Fig. 6a). Male. Dentition of the middle and hind leg as in *Xylocopa flavorufa.* This species is probably a coulour variety of *Xylocopa flavorufa,* differing only by the dark brown pubescence of the mesosoma (Fig. 6b). If this is confirmed by DNA sequencing, the name *X. combusta* should have priority on *X. flavorufa*.

LITERATURE. "Abessinien" (Friese 1915). – "Abessinien", leg Raffray (*X. taczonovskyi*).

OLD MATERIAL. Maraquo, 7.V.1914, 1♂, 1♀, xi.1914, 1♀, leg. O. Kovacs (NHML). – Zuguala, 9000ft, 20.X.1945, 2♂, leg. K.M. Guichard (NHML). – Prov. Sidamo-Borana, Malghe Vaudo farm, to Awasa Meer, 20.IV.1960, leg. M.J.A. de Koster (RMNH). – Hargeisha, 16.VIII.1967, 1♀, leg. S. Chojnacki (ZMAA). – Koka, 8°27'N, 39°06'E, 30.VIII.1976, 3♀, nest holes in trunk of *Euphorbia schimperi* (photo), leg. C.P.J. Ash (NHML). – Bulcha, 6°27'N 38°11'E, 6.XII.1977, 1♂, leg. C.P.J. Ash (NHML). – Addis Abeba, 5.III.1991, 1♀, leg. G.G.M. Schulten (RMNH).

NEW MATERIAL. OROMIA. Mojo, 6.X.2010, *Caesalpinia alata*, 1♀ (DN7). – Agere-Maryam, forest 5km S, 5°29'N 38°15'E, 1963m, 25.IX.2012, *Ocimum lamiifolium*, 1♂.
SOUTHERN. Dilela, between Gogetti and Tiya, 8°14'N 38°29'E, 1905m, 28.X.2011, *Caesalpinia decapetala*, 2♀.


**a** **b**

Fig. 6. *Xylocopa combusta*; a, female dorsal view; b, male dorsal view.

## ***Xylocopa erythrina*** Gribodo, 1894 (Figs 7-8)

*Xylocopa (Xylomelissa) erythrina*
= *Xylocopa fraudulenta* Gribodo, 1894
= *Xylocopa konowi* Friese, 1903
= *Xylocopa villosa* Friese, 1909, **syn. nov.**

DIAGNOSIS. Female. Completely black (Fig. 7a). Large species (20-25 mm). Clypeus surrounded by a carina (Fig. 7c,d). Basitibial plate terminated on the proximal half of hind tibia. Male. Clypeus and paraocular area pale yellow (Fig. 8c). Mesosoma and first tergum with brown pubescence (Fig. 7b), but varieties totally black or totally yellow (var. *villosa*) (Fig. 8). Hind leg Fig. 7d

LITERATURE. Harrar (FRIESE, 1915). – "Abessinien", iv-v, "*X. fraudulenta,* die haufigzte Holzbienen" (FRIESE, 1915). – "Abyssinie", Schoa, 1♂ (Holotype *X. villosa* Friese, 1909) (examined) (Fig. 8).

OLD MATERIAL. Abbai Gorge, 6000ft, 23.X.1945, 2♂, leg. K.M. Guichard (NHML). – Bischoftu, 2.XI.1952, 2♂, leg. S. Chojnacki (ZMAA). – Gatami, (Kamb) 5.VIII.1956, 1♂, leg. G.M. Filipos (ZMAA). – Hargeisha, 16.VIII.1957, 1♀, leg. S. Chojnacki (ZMAA). – Tessenei, 7.VIII.1958, 1♂, leg. S. Chojnacki (ZMAA). – Deigi, 29.II.2007, 6♀, leg. J. Bekele (ZMAA). – Tana hotel, lake Tana, 13.X.2007, 2♀, leg. J. Bekele (ZMAA).

NEW MATERIAL. OROMIA. Bako, 9°07‘N 37°03‘E, 25.X.2010, *Hygrophila auriculata*, 3♀, *Solanum incanum*, 1♀. – Finchaa Dam, 9°33‘N 37°23‘E, 2100m, 29-30.X.2010, *Sesbania sesban*, 1♂, 1♀. – Guder, 8°58‘N 37°44‘E, 1700m, 6-7.XI.2010, *Hygrophila auriculata*, 3♀. – [W. Hararghe] Mechara, 8°36‘N 40°19‘E, 30.x-13.XI.2010, *Dolichos lablab*, 7♀, *Desmodium unicnatum*, 1♀, 5-19.XII.2010, *Cajanus cajan*, 2♀, 17-21.I.2011, *Vernonia auriculifera*, 1♀. – Agere-Maryam, forest 5km S, 5°29’N 15°32’E, 1963m, 25.IX.2012, *Ocimum lamiifolium*, 4♂.

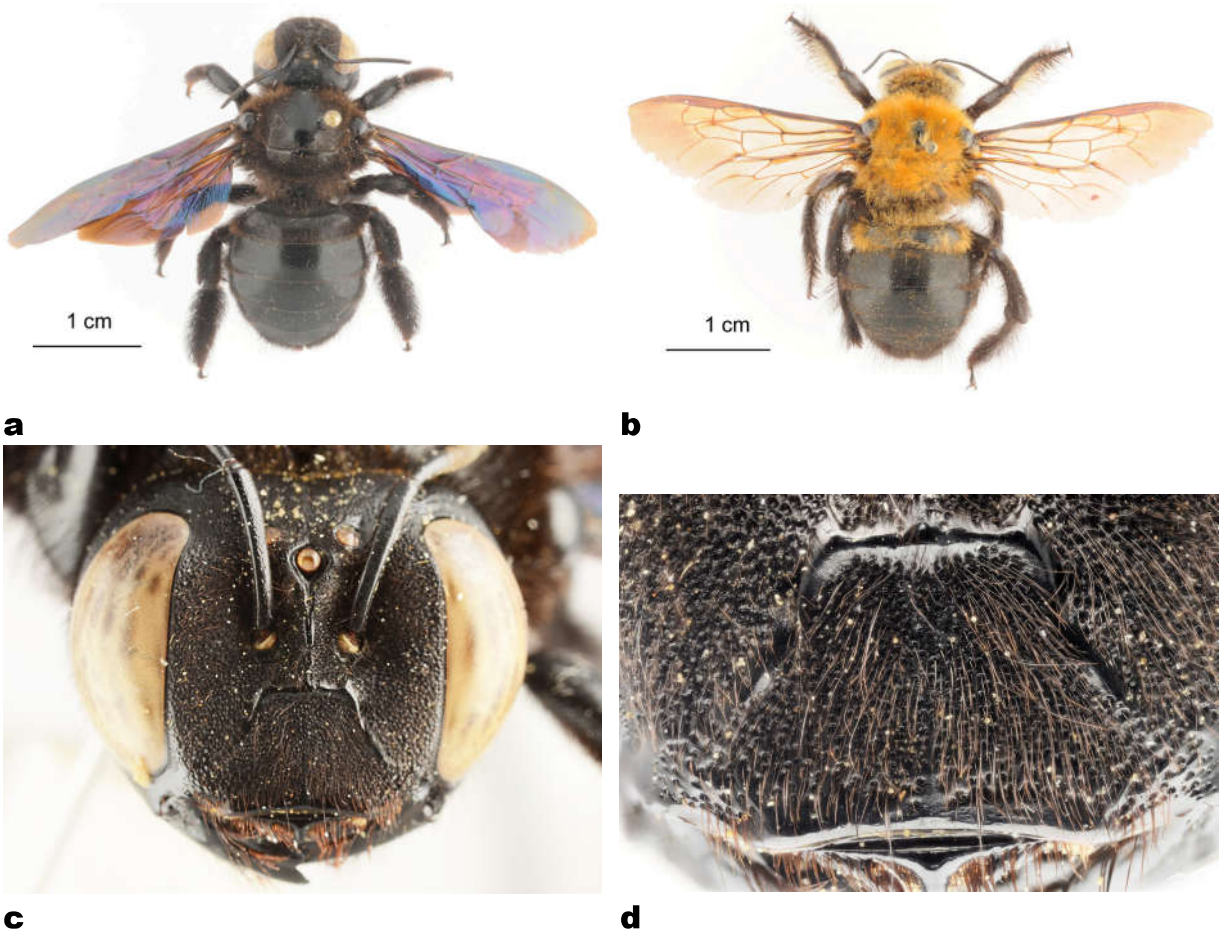


Fig. 7. *Xylocopa erythrina*; a, female dorsal view; b, male dorsal view: c, female head, d, female clypeus.

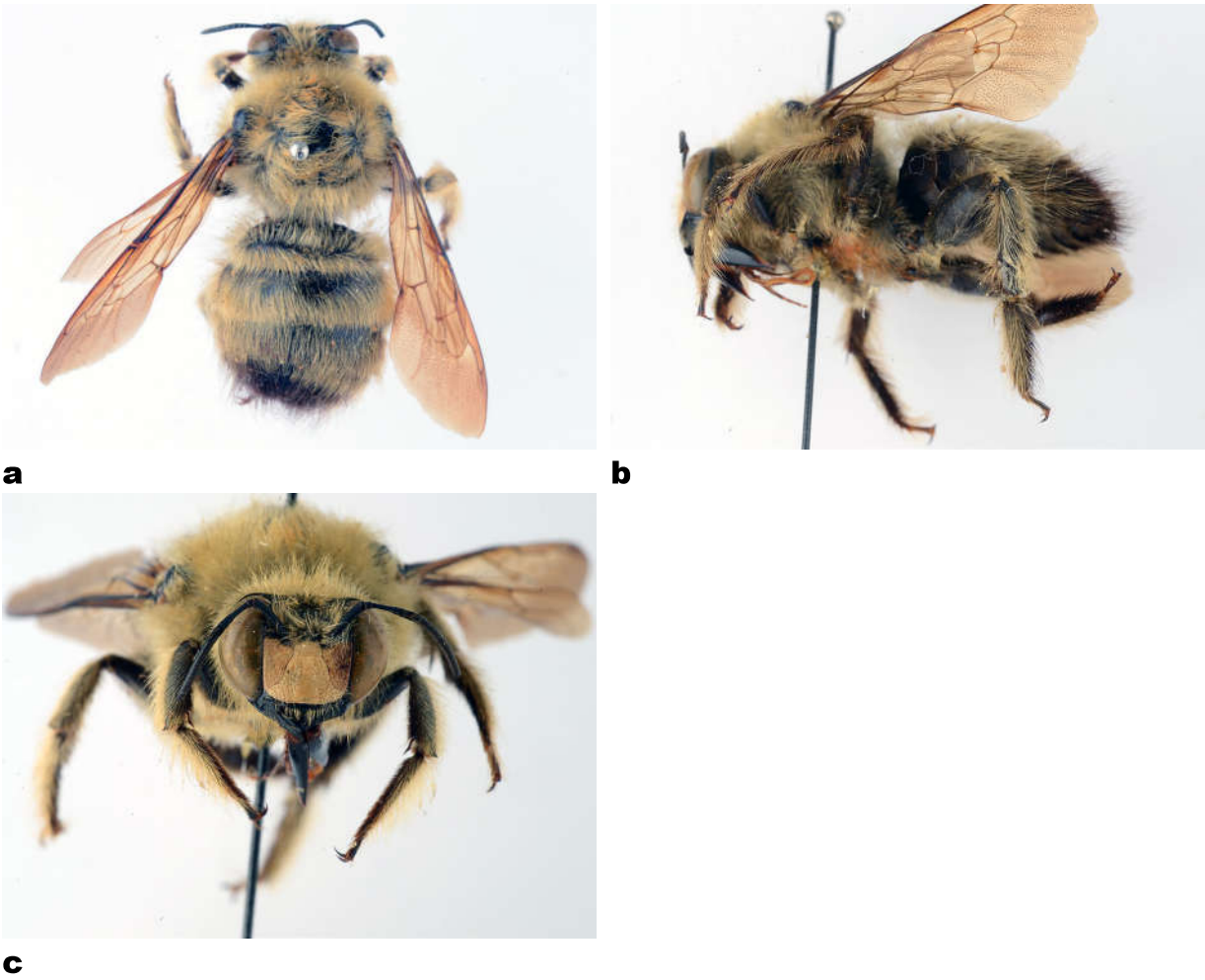


Fig. 8. *Xylocopa villosa*, male holotype (= *X. erythrina*); a, dorsal view; b, lateral view; c, head.

## ***Xylocopa flavicollis*** (De Geer, 1778) (Fig. 9)

*Xylocopa (Koptortosoma) flavicollis*
= *Xylocopa citronella* de Geer, 1778.
= *Xylocopa collaris* Olivier, 1789
= *Xylocopa divisa* Klug, 1807
= *Xylocopa sulphurea* Spinola, 1838
= *Xylocopa stuhlmanni* Kohl, 1893
= *Xylocopa stuhlmanni* var. *albicincta* Enderlein, 1903

DIAGNOSIS. A small species (13-16 mm). Female (Fig. 9). Mesosoma with yellow pubescence on the posterior half, first tergum black with a mite pouch. Male. Yellow, mesosomal dorsum brighlty yellow (see redescription in EARDLEY, 1983).

NEW MATERIAL. SOUTHERN. Arba-Minch, Nech Sar National Park, 5°58’N 37°35’E, 1108m, 19.IX.2012, *Solanum* sp., 5♀. – Arba-Minch, Lake Chamo, 5°55'N 37°32'E, 1138m, 19.IX.2012, 1♀.

Fig. 9. *Xylocopa flavicollis*, female from Arba Minch.

## ***Xylocopa flavorufa*** (De Geer, 1778) (Fig. 10)

*Xylocopa (Mesotrichia) flavorufa* (DeGeer)

DIAGNOSIS. Large species (18-33 mm) with orange brown pubescence on the mesosoma (Fig. 10a,b). Male with a large tooth on middle femora (Fig. 10c) and a tooth on hind tibia (Fig. 10d).

OLD MATERIAL. Higho Samula, 30.X.1912, 1♀, leg. R. Stordy (NHML). – Addis Ababa, iii. 1954, 1♀, leg. leg. S. Chojnacki (ZMAA). – Wocaca Forest, 27.X.1958, 1♀, 2♂, leg. Tekle Haw (ZMAA). – Prov. Sidamo-Borana, Malghe Waudo Farm to Awasa Meer, 29-30.III.1960, 1♂, leg. M.J.A. de Koster (RMNH). – UCAA Campus, 25.VII.1963, 1♂, 6♀, 19.IV.1964, 1♂, leg. Shibba (ZMAA). – Bettle, 17.XII.1963, 1♀, UCrAA, leg. M.K. Haile (ZMAA). – Bahr Dar, 11°36'N 37°25'E, 4.IV.1977, 1♀, leg. C.P.J. Ash (NHML). – Addis Abeba, 25.II.1989, 1♀, leg. G.G.M. Schulten (RMNH).

NEW MATERIAL. OROMIA. Road Sebeta to Suba Forest, 3.X.2010, Caesalpiniaceae, 1♂, 2♀ (AP5). – Holeta, 9°04'N 38°30'E, 2450m, 10-16.X.2010, *Bidens prestinaria*, 1♂, 1♀, 1.I.2011, *Bellardia trixago*, 1♀. – Between Kolobo to Genet, 9°04'N 38°44'E, 12.X.2010, DN18, 1♂, 1♀. – Finchaa Dam, 9°33'N 37°23'E, 2100m, 29-30.X.2010, *Sesbania sesban*, 1♂, 1♀. – Bako, 9°07'N 37°03'E, 12.I.2011, *Solanum incanum*, 1♀. – [W. Hararghe] Sororo, 8°54'N 40°47'E, 6-9.XI.2010, Caesalpiniaceae, 1♀. – [W. Haraghe] Mechara, 8°36'N 40°19'E, 6-18.XII.2010, 1♀, *Justicia heterocarpa*, 1♂, 1♀. – Goha Tsiyon, 10°01'N 38°14'E, 2484m, 13.X.2011, *Plectranthus ornatus*, 1♀.

AMHARA. Hayk, 11°18'N 39°41'E, 17-18.XI.2010, ZN 43, 1♀. – Lake Hayk, 11°20'N 39°43'E, 18.XI.2010, *Caesalpinia spinosa*, 1♂. – Amhara, Chefawoledi, 11°00'N 39°46'E, 20-21.XI.2010, *Hygrophila auriculata*, 1♀. – Blue Nile Falls, 11°29'N 37°35'E, 1616m, 15.X.2011, *Cassia alata* and *Justicia schimperiana*, 1♀. – Bure, 10°47'N 37°03'E, 2559m, 14.X.2011, *Justicia schimperiana*, 1♂. – Debre Tabor, 11°51'N 38°00'E, 2691m, 20.X.2011, *Cassia alata*, 1♂.

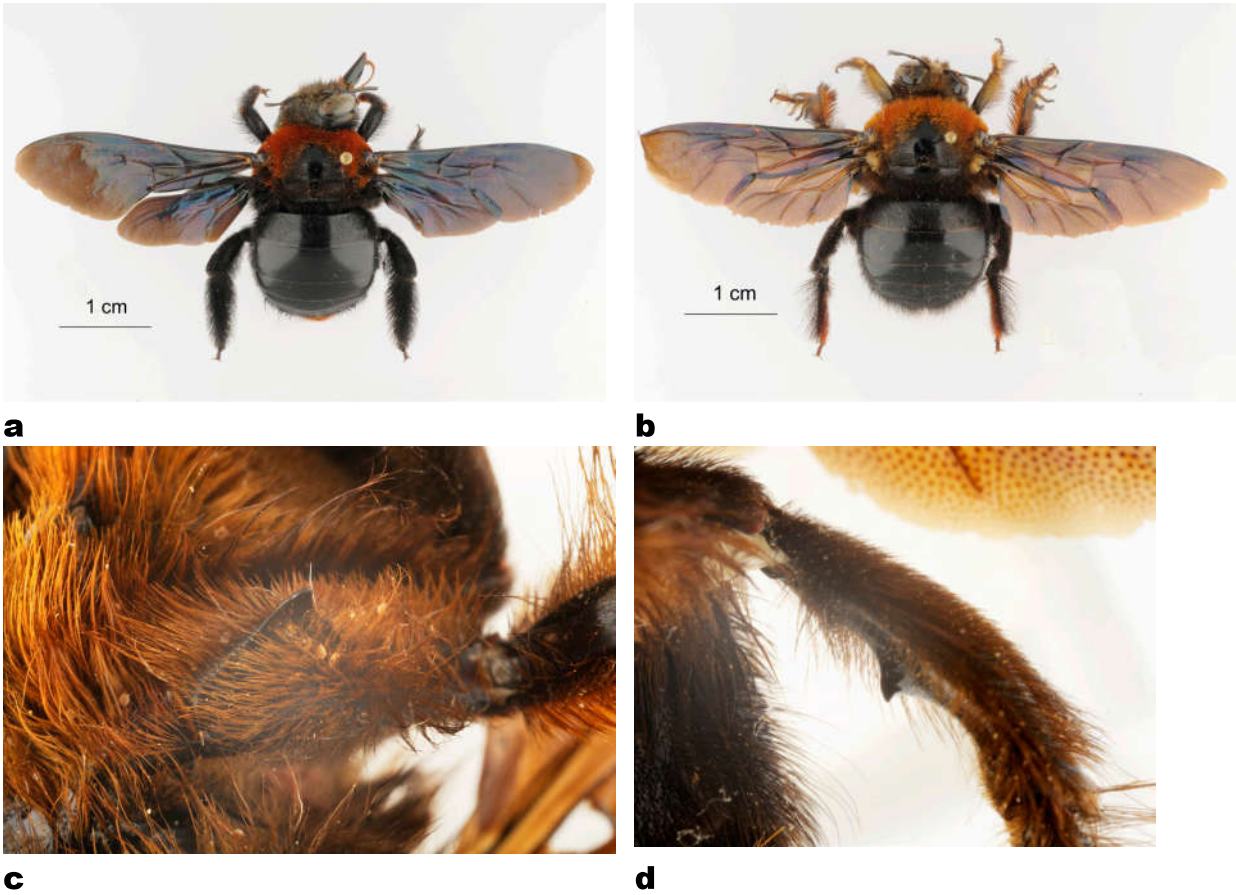


Fig. 10. *Xylocopa flavorufa* ; a, female, dorsal view; b, male, dorsal view; c, dentition of the middle femora; d, dentition of the hind tibia.

## ***Xylocopa forsiusi*** Dusmet y Alonso, 1924

*Xylocopa (Koptortosoma) forsiusi* Dusmet y Alonso

DIAGNOSIS. Following description close to *X. scioensis* but larger (16 mm).

LITERATURE. Harrar, col. Dusmet, 1♂ holotype (not examined) (Dusmet y Alonso, 1924).

## ***Xylocopa gaullei*** Vachal, 1898 (Fig. 11)

*Xylocopa (Xylomelissa) gaullei*

DIAGNOSIS. Similar to *Xylocopa kamerunensis* but smaller (holotype 16 mm; identified specimens 15-18 mm) (Fig. 11a,b); head Fig. 11c; clypeus with one medio-apical and two lateral tubercles. Male. Yellow marks on the head reaching the basis of the first ocellus (Fig. 11d).

LITERATURE. "Abyssinie", 1♂ holotype (MNHNP) (examined). – "Abessinien", 1♂ (FRIESE 1915).

OLD MATERIAL. Abyssinie, Mission de Bonchamps, 2♂, leg. Ch. Michel & M. Potter, 1899 (MNHNP). – Gatelo Amaiyu, 4.XI.1911, 2♂, 1♀, leg. R.J. Stordy (NHML). – Burye, 6000ft, ii.1948, 1♀, leg. K.M. Guichard (NHML).

NEW MATERIAL. OROMIA. Bako, 9°07'N 37°03'E, 12.I.2011, *Solanum incanum*, 1♀. – Didessa River near Dembi, 8°02'N 36°28'E, 16-17.VI.2011, *Solanum incanum*, 1♂.

AMHARA. Nefas-Meewcha, 11°45'N 38°29'E, 2900m, 21.X.2011, *Plectranthus ornatus*, 1♂.

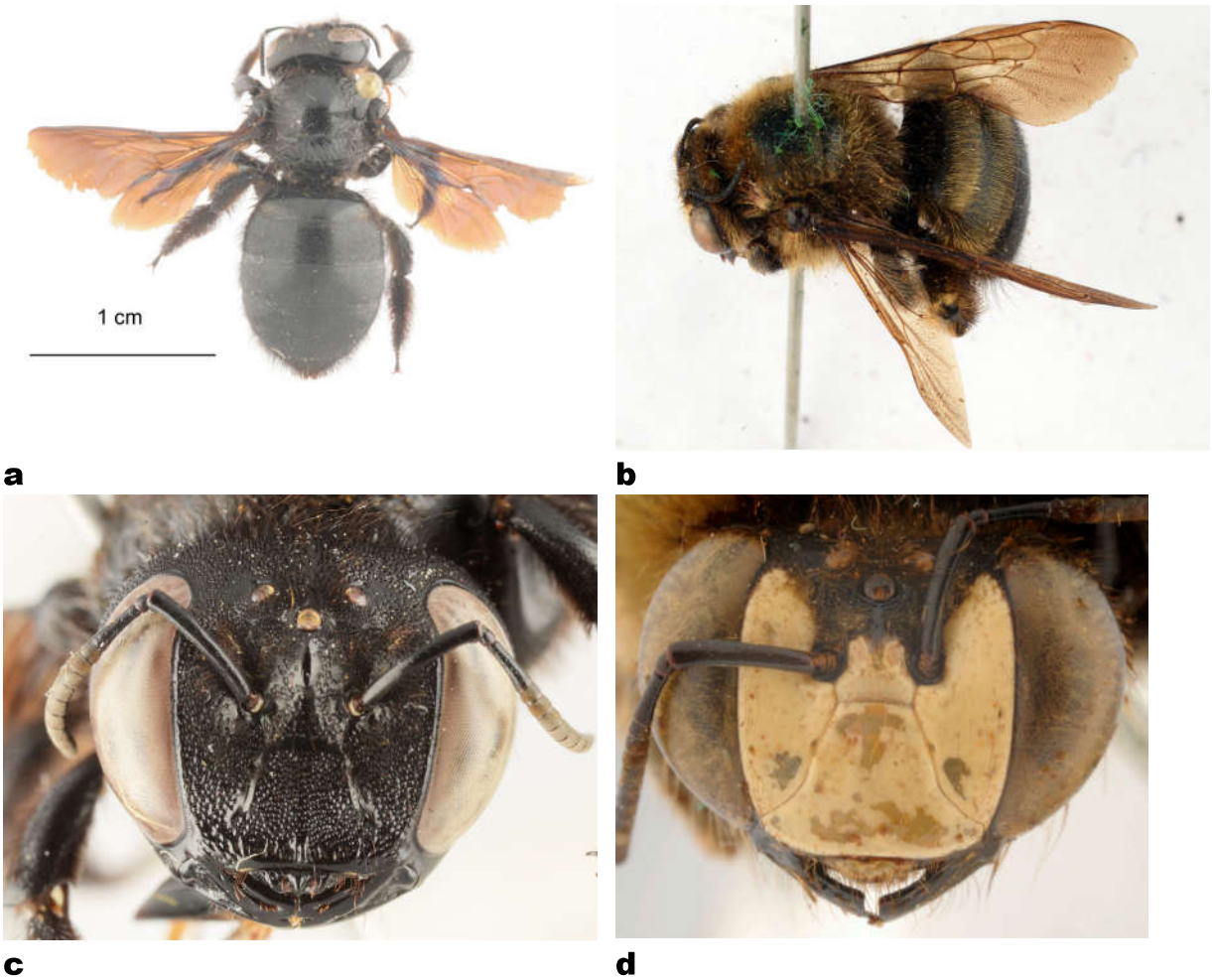


Fig. 11. *Xylocopa gaullei*; a, female dorsal view (Bako); b, male dorsal view (Gatelo Amayu); c, head (Bako); d, head (Gatelo Amaiyu).

## ***Xylocopa hottentotta*** Smith, 1854 (Figs 12-13)

*Xylocopa (Xylomelissa) hottentotta*
= *Xylocopa tarsata* Smith, 1854
= *Xylocopa carinata* Smith, 1874
= ? *Xylocopa biangulata* Vachal, 1899
= *Xylocopa carinata* var *alpina* Friese, 1922, **syn. nov.**
= *Xylocopa bicarinata* Alfken, 1932, **syn. nov.**

DIAGNOSIS. Female. Medium size species (13-19 mm), completely black (Fig. 12a); clypeus without lateral tubercles, but with a more or less prominent tubercle in the center; sometimes the median carina a little more prominent in front (Fig. 12c); lateral sides of terga and sterna with black or whitish setae. Male. Black legs; pale yellow marks of the paraocular area not exceeding the height of antennal sockets (Fig. 12d); hind femora with a strong tooth at the base; hind coxae with a tooth.

REMARK. the type of *Xylocopa bicarinata* (Fig. 13a,b) has a stronger tubercle in the middle of the clypeus (Fig. 13c) but this seems to be only a variation of *X. hottentotta*.

LITERATURE. Harrar, ♂ ♀ (FRIESE 1915; *X. tarsata, X. carinata* ). – "N.O. Africa, Eritrea 08, leg. Kristensen" 1♂, 1♀ (Types *X. carinata alpina*) (MNHUB) (FRIESE, 1922) (examined)". – "Abyssinia", 1♀ (Holotype *X. bicarinata*) (NHML) (examined). – "Abyssinie", 3♂, van Ruppel, col. P. Magretti (as *X. biangulata*) (MCS Genova) (MAA, 1968).

OLD MATERIAL. Das, 21.X.1911, 1♀, leg. R.J. Stordy (NHML). – Maraquo, xi.1914, 3♂, 2♀, leg. O. Kovacs (NHML). – Zuguala, 6500ft, 30.X.1945, 1♂, leg. K.M. Guichard (NHML). – Abbai Gorge, 6000ft, 23.X.1945, 2♀, leg. K.M. Guichard (NHML). – Asba Tafari, 5800ft, 1.IX.1945, 1♀, leg. K.M. Guichard (NHML). – Wolamo Prov., Soddo, 6800 ft, 21.X.-14.XI.1948, 3♀, leg. H. Scott (NHML). – Laka Awasa, jan 1953, 1♀ (ZMAA). – Guder, 22.X.1957, 1♀, leg. S. Chojnacki (ZMAA). – Tessenei, 12.VIII.1957, leg. S. Chojnacki (ZMAA). – Woliso, 11.oct.1960, 1♀, leg. S. Chojnacki (ZMAA).

NEW MATERIAL. OROMIA: road Suba to Holeta, 3.X.2010, *Plectranthus garckeanus*, 5♀ (DN & AP4). – Mojo, 6.X.2010, *Caesalpinia alata*, 1♀ (DN7), *Solanum indicum,* 1♀ (AZ4). – Finchaa Dam, 9°33'N 37°23'E, 2100m, 29-30.X.2010, *Sesbania sesban*, 1♀. – Holeta, 9°04'N 38°30'E, 10-16.X.2010, *Phacelia tenacetifolia*, 1♀. – Sebeta, 8°54'N 38°35'E, 2166m, 12.X.2011, Solanum incanum, 1♀. – [W. Hararghe], Mechara, 8°36'N 40°19'E, 30.x-13.XI.2010, *Desmodium uncinatum*, 1♀. – Agere-Maryam, forest 5 km S, 5°29'N 38°15'E, 1963m, *Ocimum lamiifolium*, 2♀, 1♂.

SOUTHERN. Dilela, between Gogetti and Tiya, 8°14'N 38°29'E, 1905m, 28.X.2011, *Cassia alata*, 1♀.

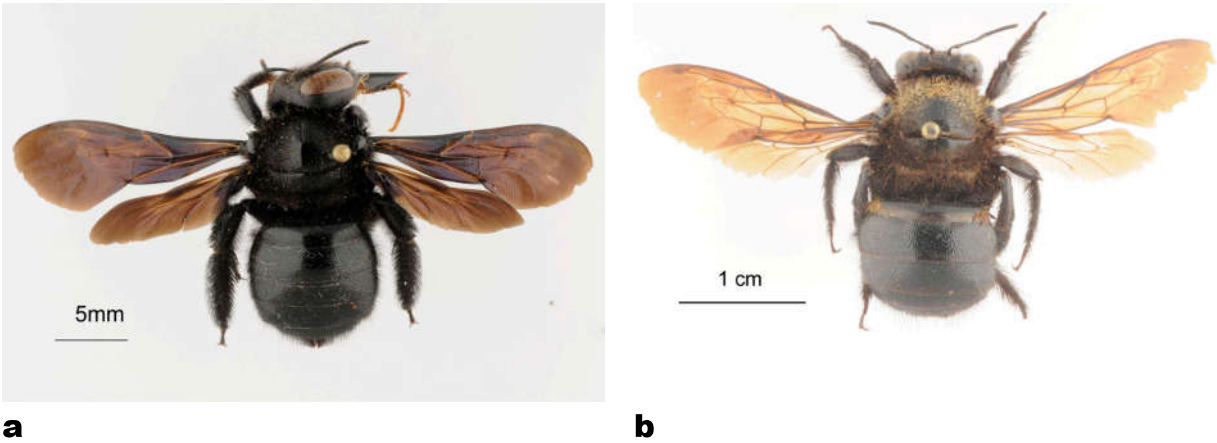


Fig. 12. *Xylocopa hottentotta*; a, female dorsal view; b, male dorsal view (Zugwala).

**c** **d**

Fig. 12. *Xylocopa hottentotta* (continued); c, female head (Suba); d, male head.

**a** **b**

**c**

Fig. 13. *Xylocopa bicarinata*, female holotype (= *X. hottentotta*); a, dorsal view; b, lateral view; c, head.

## ***Xylocopa inconstans*** Smith, 1874 (Fig. 14)

*Xylocopa (Xenoxylocopa) inconstans* Smith
= *Xylocopa abyssinica* Radoszkowski, 1876
= *Xylocopa inconstans* var. *flavescens* Vachal, 1899
= *Xylocopa chiyakensis* Cockerell 1908
= *Xylocopa inconstans* var. *flavocincta* Friese, 1909

DIAGNOSIS. A large species (18-23 mm) with large vertex (Fig. 14c). Male completely yellow (Fig. 14d). Females have two different patterns, white (nominal form 14a) (Fig.) or yellow (var. *flavescens*, Fig. 14b). Both varieties are revised by MAWDSLEY (2017).

(a) Males:
Old material. Gihé R., 6.X.1954, 1♂, leg. S. Chojnacki (ZMAA). – Cheren, 1954, 1♂, leg. S. Chojnacki (ZMAA). – Ethiostar, 27.II.2007, 1♂, leg. J. Bekele (ZMAA)

(b) White form:
OLD MATERIAL. Jimma, 7°36'N 36°45'E, 1750m, 5.IX.1972, 1♀, leg. H.Y. Metaferia (NHML). – Jimma, 30.VII.1976, 1♀, leg. C.P.J. Ash (NHML).
NEW MATERIAL. OROMIA. Mojo, 6.X.2010, *Caesalpina alata*, 1♀ (ZA3). – Finchaa Dam, 9°33'N 37°23'E, 2100m, 29-30.X.2010, *Sesbania sesban*, 1♀. – Sebeta, 8°54'N 38°35'E, 12.X.2011, *Solanum incanum*, 1♂. – Goha Tsiyon, 10°01'N 38°14'E, 2484m, 13.X.2011, *Plectranthus ornatus*, 1♀. – Tikur-Wuha, 7°01'N 38°34'E, 23.VII.2011, *Solanum melongena*, 1♀.
AMHARA. Lake Hayk, 11°20'N 39°43'E, 18.XI.2010, *Caesalpina spinosa*, 7♂, 4♀. – Hayk, 11°18'N 39°41'E, 17-18.XI.2010, ZW43, 6♀, *Hypoestes forskaolii*, 1♀. – Chefawoledi, 11°00'N 39°46'E, *Hygrophila auriculata*, 1♂. – Bure, 10°47'N 37°03'E, 2559m, 14.X.2011, *Justicia schimperiana*, 1♀. – Blue Nile Falls, 11°29'N 37°35'E, 1616m, 15.X.2011, on *Cassia alata* and *Justicia schimperiana*, 8♀, 1♂. – Harego, Kembolcha, 11°06'N 39°39'E, 2063m, 24.X.2011, *Hypoestes forskaolii*, 1♀.
SOUTHERN. Road to Elbere, 5°20'N 36°57'E, 559m, 4.IX.2012, 1♀. – Road to Tebela, 6°38'N 37°49'E, 1386m, 18.IX.2012, *Plectranthus* sp., 3♀. – Arba-Minch, Lake Chamo, 5°55'N 37°32'E, 1138m, 19.IX.2012, 2♂. – Dilela, between Gogetti and Tiya, 8°14'N 38°29'E, 1905m, 25.X.2011, *Casia alata*, 1♀.

(c) Yellow form :
OLD MATERIAL. Asba Tafari, 5800ft, 1.IX.1945, 2♀, leg. K.M. Guichard (NHML).
NEW MATERIAL. [W. Hararghe] Mechara, 8°36'N 40°19'E, 30.x-13.XI.2010, *Dolichos lablab*, 1♂, 8♀, *Desmodium uncinatum*, 2♀, 6-18.XII.2010, 1♀, *Justicia heterocarpa*, 1♂, 4♀, *Cajanus cajan*, 1♀, 25.XII.2010, *Solanum incanum*, 2♀.

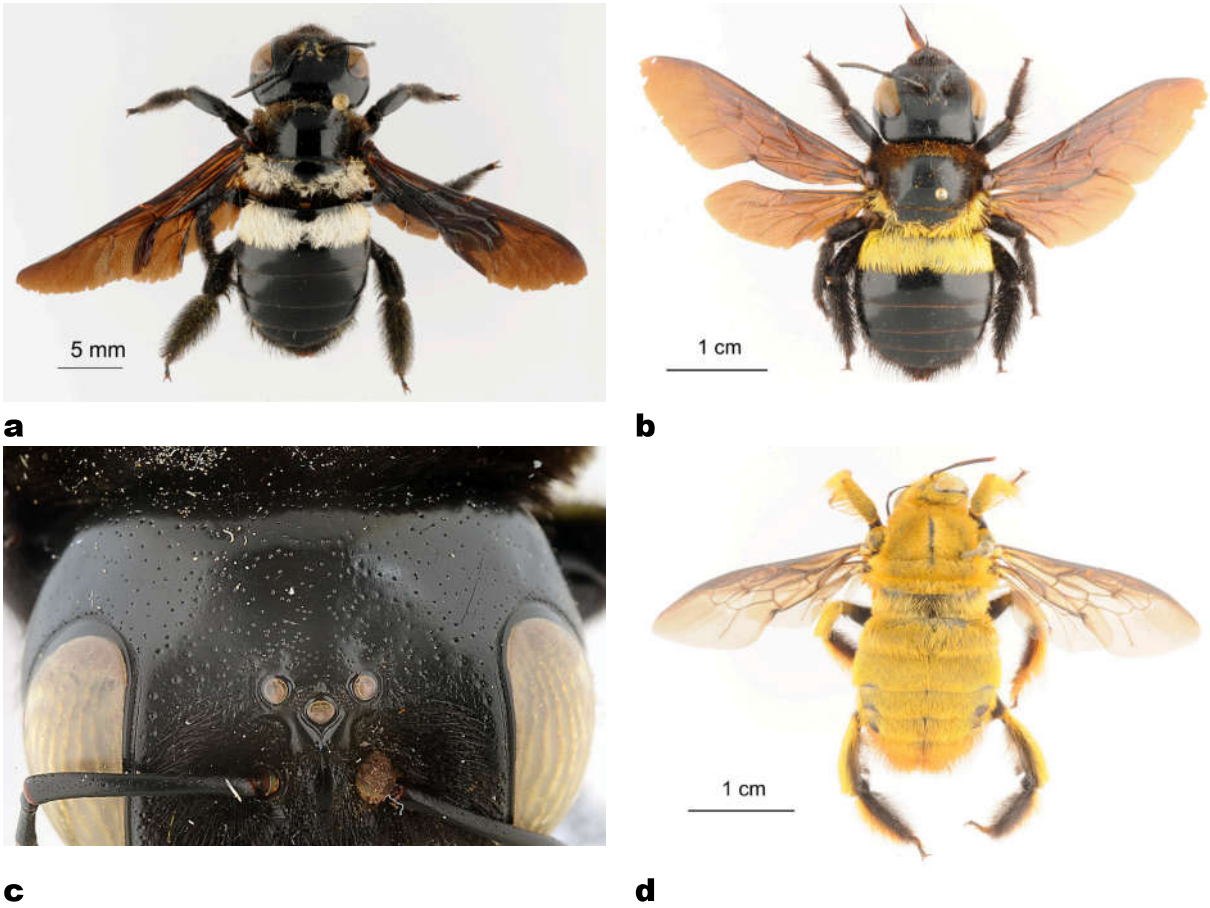


Fig. 14. *Xylocopa inconstans*; a, female dorsal view (white variety); b, female dorsal view (yellow variety); c, vertex of the female; d, male dorsal view.

## ***Xylocopa kristenseni*** Friese, 1911 (Fig. 15)

*Xylocopa flavorufa* var. *kristenseni* Friese, 1911.

DIAGNOSIS. This species is very similar to *Xylocopa flavorufa* by its size and colouration (Fig. 15a,b,d) but it differs by the lack of dentition at middle femora (Fig. 15c).

LITERATURE. Harrar, 1800-1900m, xi, leg. Kristensen (MNHUB) (examined) (FRIESE, 1911, 1915).

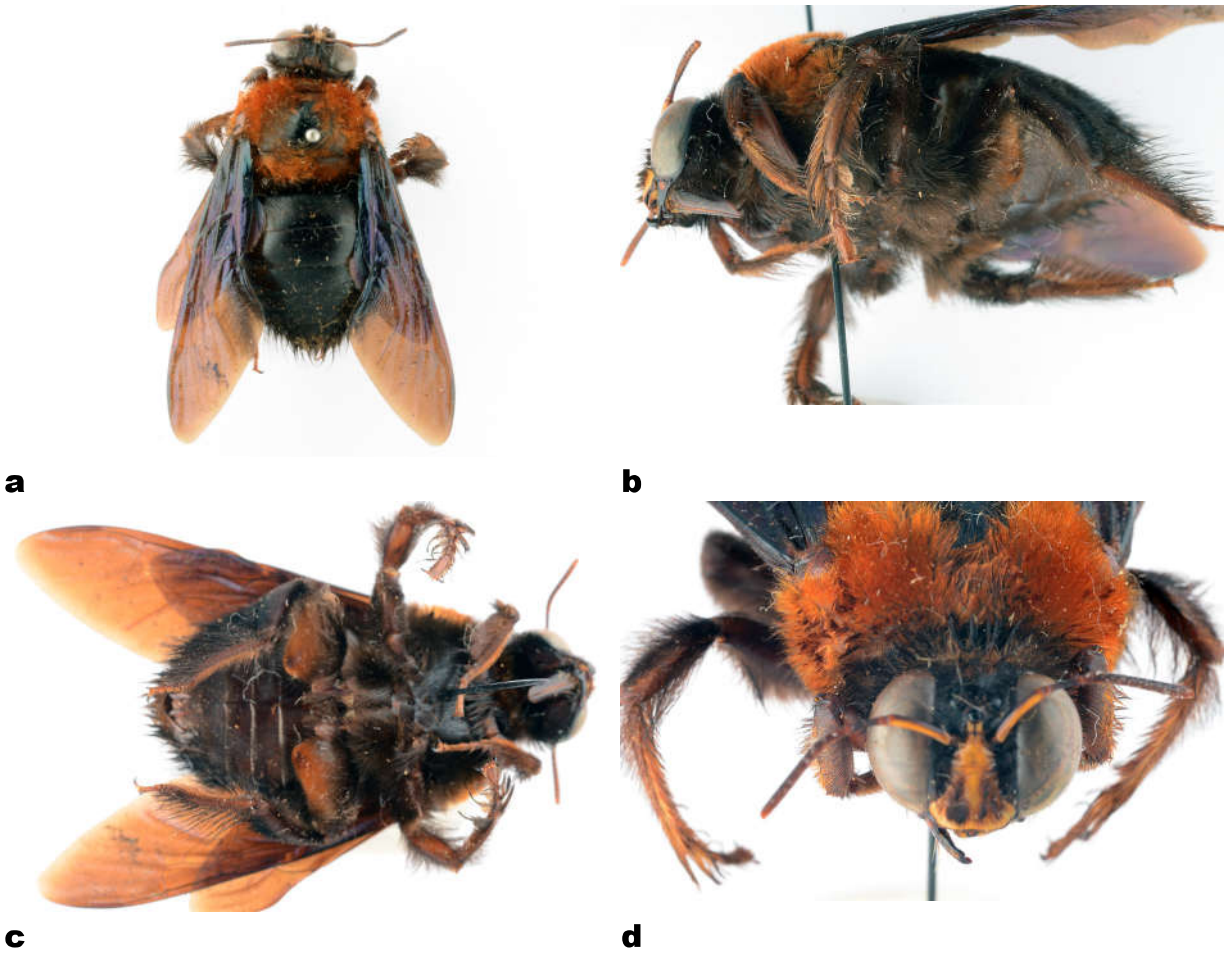


Fig. 15. *Xylocopa kristenseni*, male lectotype; a, dorsal view; b, lateral view; c, ventral view; d, head.

## ***Xylocopa longespinosa*** Enderlein, 1903 (Fig. 16)

*Xylocopa (Xylomelissa) longespinosa*

DIAGNOSIS. Small species (15 mm), with very long spines at the basis of the hind femora (Fig. 16b, c). Mesosoma and apical bands of terga grey (Fig. 16a), face yellow (Fig. 16d).

Holotype: 1♂, "Süd Galla, Boran Gallan, Kata, 2.IV.1901 (MNHUB) (examined) (ENDERLEIN, 1903; FRIESE, 1915).

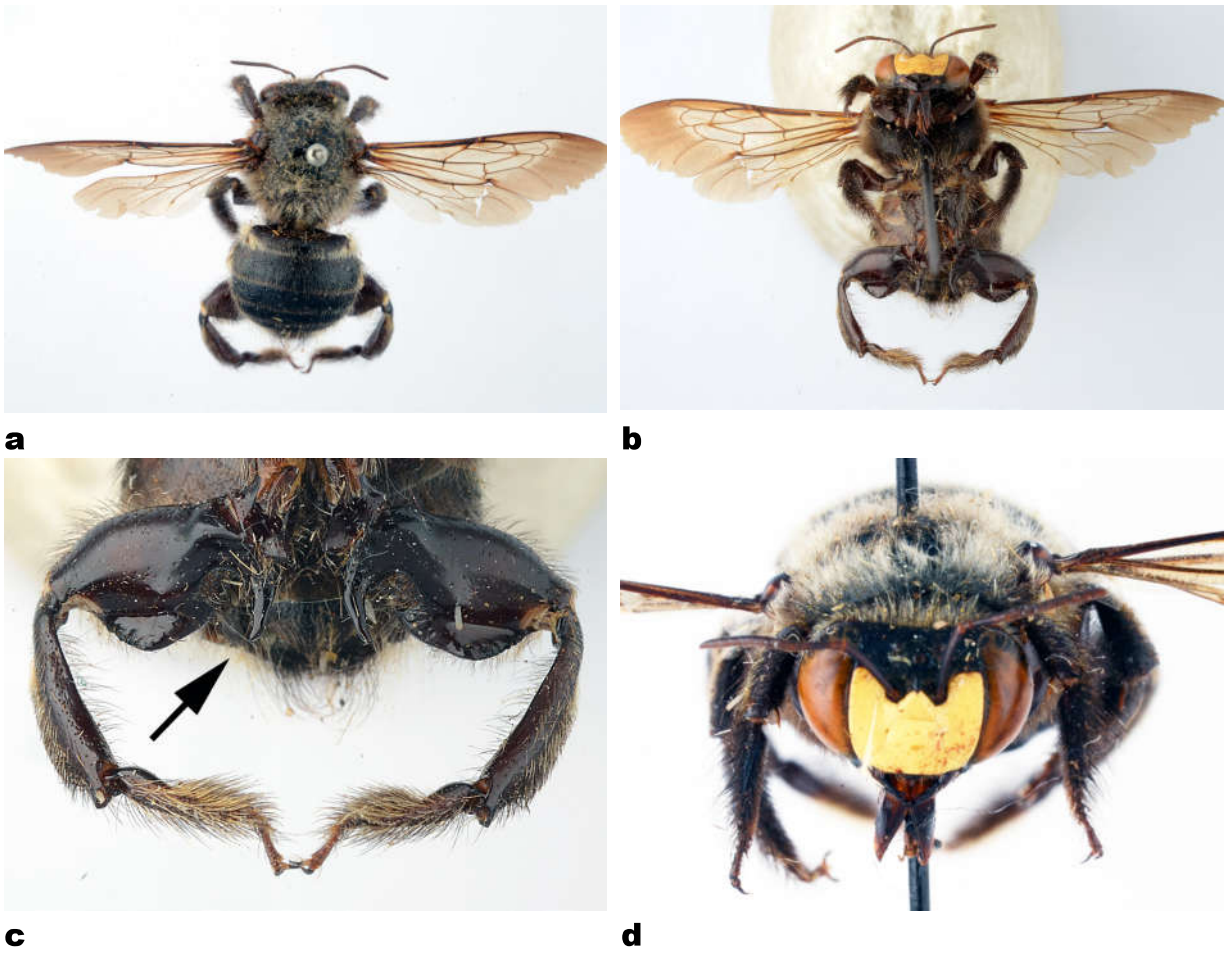


Fig. 16. *Xylocopa longespinosa*, male holotype; a, dorsal view; b, ventral view; c, hind legs with long spines at the basis of the femora; d, head.

## ***Xylocopa olivacea*** (Fabricius, 1787) (Fig. 17)

*Xylocopa (Koptothosoma) olivacea*

DIAGNOSIS. A middle size species (14-22 mm). Female. Mesosoma totaly covered by yellow pubescence, tergum 1 yellow (Fig. 17); tergum 1 with a mite pouch. Male. Totaly covered by yellow pubescence, morphologically not distinguishable from *Xylocopa caffra*, *X. schoana* and *X. pubescens*.

NEW MATERIAL. OROMIA. Bale, Harenna Forest, 6°34'N 39°43'E, 27.I.2011, *Fabaceae*, 1♀.

AMHARA. Blue Nile Falls, 11°29'N 37°35'E, 1616m, 15.X.2011, on *Cassia alata* and *Justicia schimperiana*, 1♀. – Chew-ber, SW Bermaryam, 13°22'N 37°57'E, 1726m, 19.X.2011, 1♀. – Hamusit, N. Bahir Dar, 11°42'N 37°29'E, 1890m, 15.X.2011, *Brassica* sp., 1♀.


Fig. 17. *Xylocopa olivaceae*, female dorsal view.

## ***Xylocopa pubescens*** Spinola, 1839 (Fig. 18)

*Xylocopa (Koptortosoma) pubescens*
= *Xylocopa aestuans* var. *rubida* Gribodo, 1884

DIAGNOSIS. A middle size species (16-22 mm). Female. Mesosoma totaly covered by yellow pubescence, tergum 1 black (Fig. 18a); tergum 1 with a mite pouch; head (Fig. 18b). Male. Totaly covered by yellow pubescence, morphologically not distinguishable form *Xylocopa caffra, X. schoana* and *X. olivacea*.

OLD MATERIAL. Melka Wever (?), 9°16‘N 40°09‘E, 750m, 20.XI.1973, 1♀, timber root, leg. Amde Haemanotiar (NHML).

NEW MATERIAL. OROMIA. Bako, 9°07‘N 37°03‘E, 12.I.2011, *Caesalpinia spinosa*, 1♀.
AMHARA: Debre-Birhan, 8.X.2010, *Otostegia integrifolia*, 1♀ (AP30).


Fig. 18. *Xylocopa pubescens*; a, female dorsal view (Eritrea, Ghibdo R. Valley); b, head.

## ***Xylocopa sarawatica*** Engel, 2017 (Fig. 19)

DIAGNOSIS. This species described from Saudi Arabia is similar in colour to *Xylocopa pubescens* but is smaller (14 mm) (Fig. 19). It has also a mite pouch in T1. The DNA barcoding of the specimen from Ethiopia confirm it is different from *X. pubescens*.

NEW MATERIAL. AMHARA: Zarima, 13°20'N 37°53'E, 1261m, 19.X.2011, *Cassia alata*, 1♀.

Fig. 19. *Xylocopa sarawatica*, female (Zarima)

## ***Xylocopa schoana*** Enderlein, 1903 (Figs 20-21)

*Xylocopa (Koptortosoma) schoana*

DIAGNOSIS. The female of this species has the same colouration as *X. caffra* (Fig. 20a) but differs by the lack of mite pouch in first tergum (Fig. 21b). Colour is highly variable on sides of thorax of the females (Fig. 20c,d). The type has yellow sides following original description. Male totaly covered by yellow pubescence (Fig. 20b), morphologically not distinguishable from *X. caffra, X. olivacea* and *X. pubescens*.

LITERATURE. Schoa, Addis Abeba, 4.X.1900, 3♀, 20.IX.1900 1♀ (Syntypes; ENDERLEIN, 1903; FRIESE, 1915). – "Abessinien" (FRIESE, 1915).

a) Thorax with yellow sides

OLD MATERIAL. Guder, 22.X.1957, 1♀, leg. S. Chojnacki (ZMAA). – U.C. Addis Ababa, 5.XII.1963, 2♀, leg. Oli Dj, (ZMAA). – Addis Ababa, 8000 ft, vii.1945, 4♀, 7.X.1945, 8♂, leg. K. Guichard (NHML). – Addis Ababa, 9°03'N 38°48'E, 1976, on Salvia, 1♀, leg. C. Ash (NHML).

NEW MATERIAL. AMHARA, Debre Birham, Bakelo, 9°41'N 39°32'E, 2840m, 8.X.2010, *Ocimum lamiifolium* (BW10), 1♀.
OROMIA. Entoto, 9°06'N 38°42'E, 14.X.2010, *Justicia laterocarpa* (DN26), 3♀; *Plectranthus lanuginosus* (DN27), 1♀; *Trifolium decorum* (BW14), 1♀. – Holeta, 9°04'N

38°30'E, 2450m, 10-16.X.2010, *Brassica nigra*, 4♀, 26.XII.2010, *Vernonia leopoldii*, 1♀. – [Bale], Bekele Forest, 7°01'N 39°34'E, 1.II.2011, *Echinops macrochaetus*, 1♀. – [Bale], Sebsibe Cave, 7°03'N 39°35'E, 24.X.2010, *Scabiosa columbaria*, 1♀.

b) Thorax with black sides

Old material: Addis Abeba, 25.II.1989, 1♂, 1♀, leg. G.G.M. Schulten (RMNH, dt by Schulten as "*X. schoana*").

NEW MATERIAL. AMHARA, Debre Birham, Bakelo, 9°41'N 39°32'E, 2840m, 8.X.2011, *Salvia schimperi* (AP30), 1♀, *Ocimum lamiifolium* (BW10), 1♀. – Debre Tabor, 11°51'N 38°00'E, 2691m, 20.X.2011, *Cassia alata*, 1♀. – Gelawdios Church Forest, 11°38.410'N 37°48.617'E, 2485 m, 9-11.I.2012, 1♀, forest core, Malaise trap (NHML).

ADDIS ABABA, Entoto, 9°06'N 38°42'E, 14.X.2010, *Trifolium decorum* (BW14), 1♀, 1♂.

OROMIA. Road to Suba forest, 8°58'N 38°32'E, 3.X.2010, *Plectranthus garckeanus*, 1♀ (AP4). – Muketuri, 9°33'N 38°52'E, 7.X.2010, Brassica sp., 1♀ (AP). – Muketuri, 9°33'N 38°52'E, 7.X.2010, *Caesalpina spinosa*, 3♀ (DN11). – Goha Tsiyon, 10°01'N 38°14'E, 2484m, 13.X.2011, *Plectranthus ornatus*, 2♀.

SOUTHERN. Arba-Minch, Lake Chamo, 5°55'N 37°32'E, 1138m, 19.IX.2012, 1♀.

c) Barcoded males

AMHARA, Lake Hayk, 11°20'N 39°43'E, 18.XI.2010, *Caesalpinia spinosa*, 1♂. – Bure, 10°47'N 37°03'E, 2559m, 14.X.2011, *Justicia schimperana*, 1♂. – Debre Birham, Bakelo, 9°41'N 39°32'E, 2840m, 8.X.2011, *Salvia schimperi* (AP30), 1♂.

ADDIS ABABA, Addis Ababa Sciences College, 31.X.2010, *Impatiens* sp., 1♂.

OROMIA. Holeta, 9°04'N 38°30'E, 2450m, 4.XI.2010, *Salvia leucantha*, 1♂. – Entoto, 9°06'N 38°42'E, 14.X.2010, *Justicia laterocarpa* (DN26) 2♂; *Plectranthus lanuginosus* (DN27), 1♂; *Trifolium decorum* (BW14), 1♂.

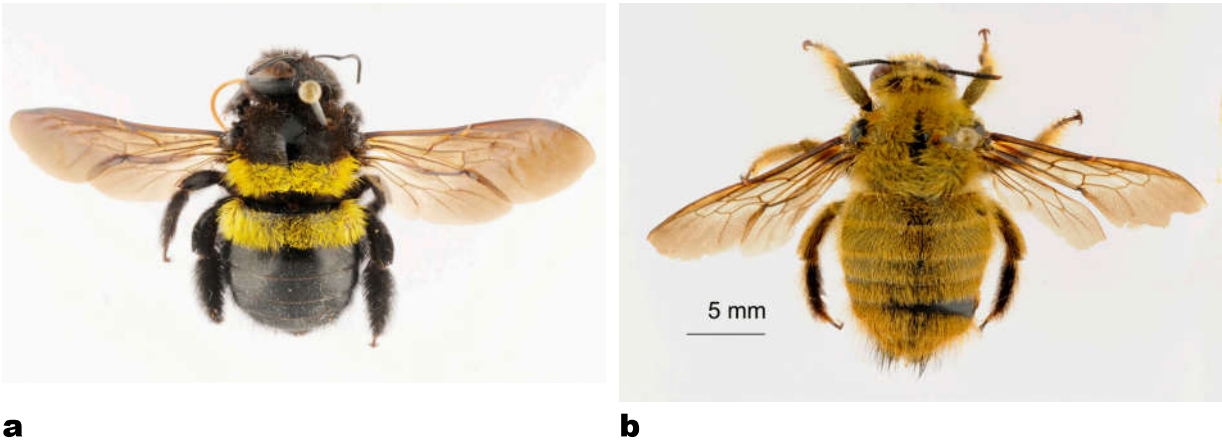


Fig. 20. *Xylocopa schoana*; a, female dorsal view; b, male dorsal view

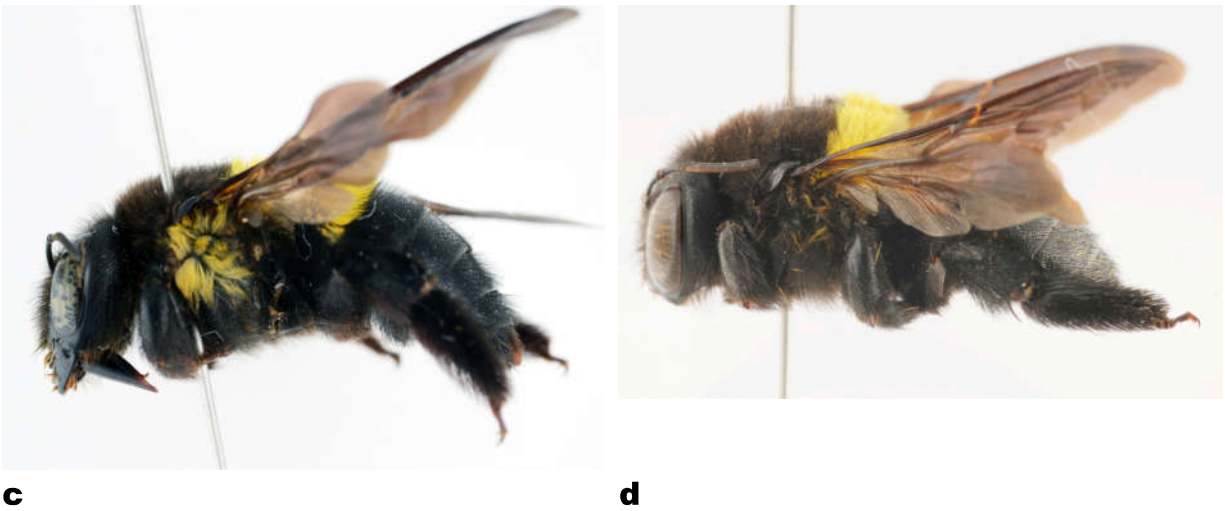


Fig. 20. (continued) *Xylocopa schoana*; c, female with yellow sides; d, female with black sides.

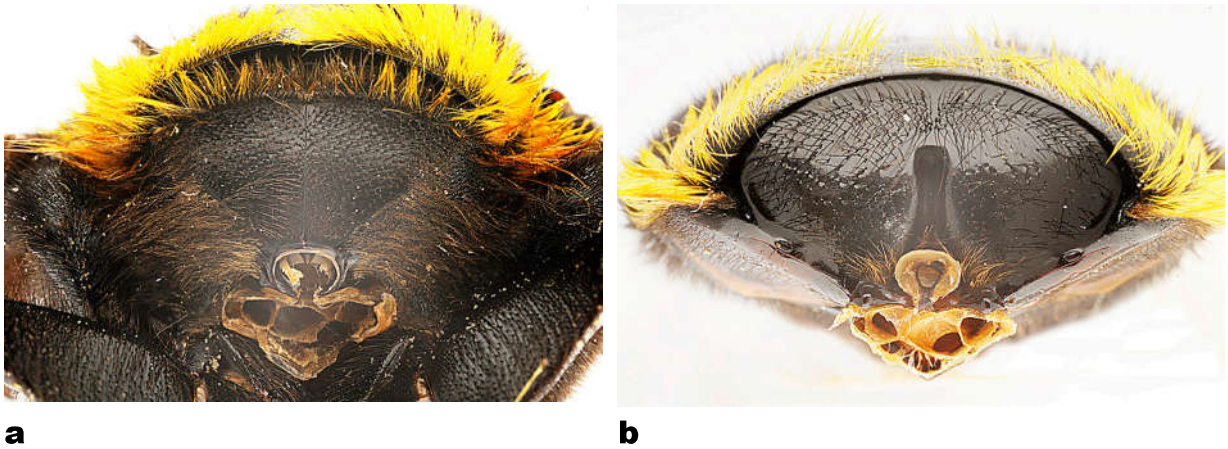


Fig. 21. *Xylocopa schoana*, female; a, propodeum; b, first tergum without mite pouch.

## ***Xylocopa scioensis*** Gribodo, 1884 (Figs 22-23)

*Xylocopa (Koptortosoma) scioensis*
*Xylocopa flavobicincta* Gribodo, 1894
*Xylocopa nigripes* Friese, 1915, **syn. nov.** (Fig. 23).

DIAGNOSIS. A smaller species (11-13 mm) than in the *Xylocopa caffra* complex, without mite pouch. Colouration of thorax is variable in both sexes, black and yellow (Fig. 22a,b), or completely yellow (Fig. 22c,d).

a) variety with thorax black and yellow

LITERATURE. Harrar, xi, ♂, ♀, leg. Kristensen (lectotype *X. nigripes*) (MNHUB) (examined) (FRIESE, 1915).

OLD MATERIAL. Asba Tafari, 5800ft, 1.IX.1945, 1♀, leg. K.M. Guichard (NHML). – L. Bischoftu, 7000ft, 12.V.1946, 5♂, 1♀, leg. K.M. Guichard (NHML). – Addis Ababa, 17 March 1954, 1♀ (ZMAA). – Gibie River, 2.XI.1957, 1♂, leg. S. Chojnacki (ZMAA). – Koka, 8°27'N 39°06'E, 28.VIII.1976, 1♂, 30.VIII.1976, 1♂, leg. C.P.J. Ash (NHML). – Addis Abeba, 25.II.1989, 1♀, leg. G.G.M. Schulten (RMNH). – Tana Hotel, Lake Tana, 13.X.2007, 2♀, leg. Tibebe Dejene & J. Bekele (ZMAA). – Bischoftu, 1♀ (ZMAA).

NEW MATERIAL. OROMIA: road to Suba forest, 3.X.2010, *Plectranthus garckeanus*, 1♀ (AP4). – Holetta, 9°04'N 38°30'E, 2450m, 26.XII.2010, *Brassica nigra*, 1♀. – [W. Hararghe] Mechara, 8°36'N 40°19'E, 30.x-13.XI.2010, *Desmodium uncinatum*, 2♀, Dolichos lablab, 7♀, *Justicia ladanoides*, 1♀, 5-19.XII.2010, *Trichodesma zeylanicum*, 2♂, 18♀, 18.XII.2010, *Jacaranda mimosifolia*, 1♀, 6-25.XII.2010, *Stylosanthes guianensis*, 1♂. – [W. Hararghe] Gadullo, 8°23'N 40°23'E, 1625m, 5.I.2011, Asteraceae n°111, 1♀. – [Bale] Sof'Omar, 6°13'N 39°46'E, 31.I.2011, *Aloe berhana*, 2♀. – Sokoru, 7°55'N 37°25'E, 19.VI.2011, *Solanum incanum*, 2♀. – Gibe, 7°45'N 37°39'E, 20.VI.2011, *Solanum incanum*, 2♀. – Lake Koka, 8°21'N 39°00'E, 1572m, 27.IX.2012, 1♀. – Lake Ziway,7°56'N 38°43'E, 1638m, 14.IX.2012, *Hypoestes forsakolii*, 1♀.

AMHARA. Efrata, 10°09'N 39°59'E, 22.XI.2010, *Aloe berhana*, 1♀. – Chefawoledi, 11°00'N 39°46'E, 20-21.XI.2010, *Hygrophila auriculata*, 1♀.

SOUTHERN. Arba-Minch, Nech sar National Park, 5°58'N 37°35'E, 1108m, 19.IX.2012, *Solanum* sp., 1♂, 3♀. – Chencha, 6°09'N 37°34'E, 1916m, 20.IX.2012, Plectranthus sp., 3♂, 1♀.

b) variety with thorax completely yellow

NEW MATERIAL. OROMIA. Bako, 9°07'N 37°03'E, 25.XI.2010, *Hygrophila auriculata*, 1♀. – [W. Hararghe] Mechara, 8°36'N 40°19'E, 5-19.XII.2010, *Cajanus cajan*, 1♀, *Trichodesma zeylanicum*, 1♀. – [Bale] Harenna Forest, 6°34'N 39°43'E, *Hypoestes forskaolii*, 1♀. – Gibe, 7°45'N 37°39'E, 20.VI.2011, *Solanum incanum*, 1♀. – Agere-Maryam, forest 5km S, 5°29'N 38°15'E, 1963m, *Ocimum lamiifolium*, 1♀.

AMHARA. Efrata, 10°09'N 39°59'E, 22.XI.2010, *Aloe berhana*, 3♂, 5♀. – Lake Hayk, 11°20'N 39°43'E, 18.XI.2010, *Caesalpinia spinosa*, 1♂, *Hygrophila auriculata*, 2♀. – Karakore, 10°25'N 39°56'E, 22.XI.2010, *Aloe berhana*, 1♂, 1♀. – Chefawoledi, 11°00N 39°46'E, *Hygrophila auriculata*, 7♂, 14♀, *Ricinus communis*, 1♂, 8♀, *Guizotia scabra*, 1♂. – Paso Mile, 11°24'N 39°38'E, 17.XI.2010, *Hypoestes forskaolii*, 1♀. – Kemise, 10°43'NN 39°52'E, 21.XI.2010, *Hygrophila auriculata*, 2♀. – Work-Amba, near Waroda on Chinese road, 11°55'N 37°49'E, 1957m, 20.X.2011, *Solanum incanum*, 1♀.

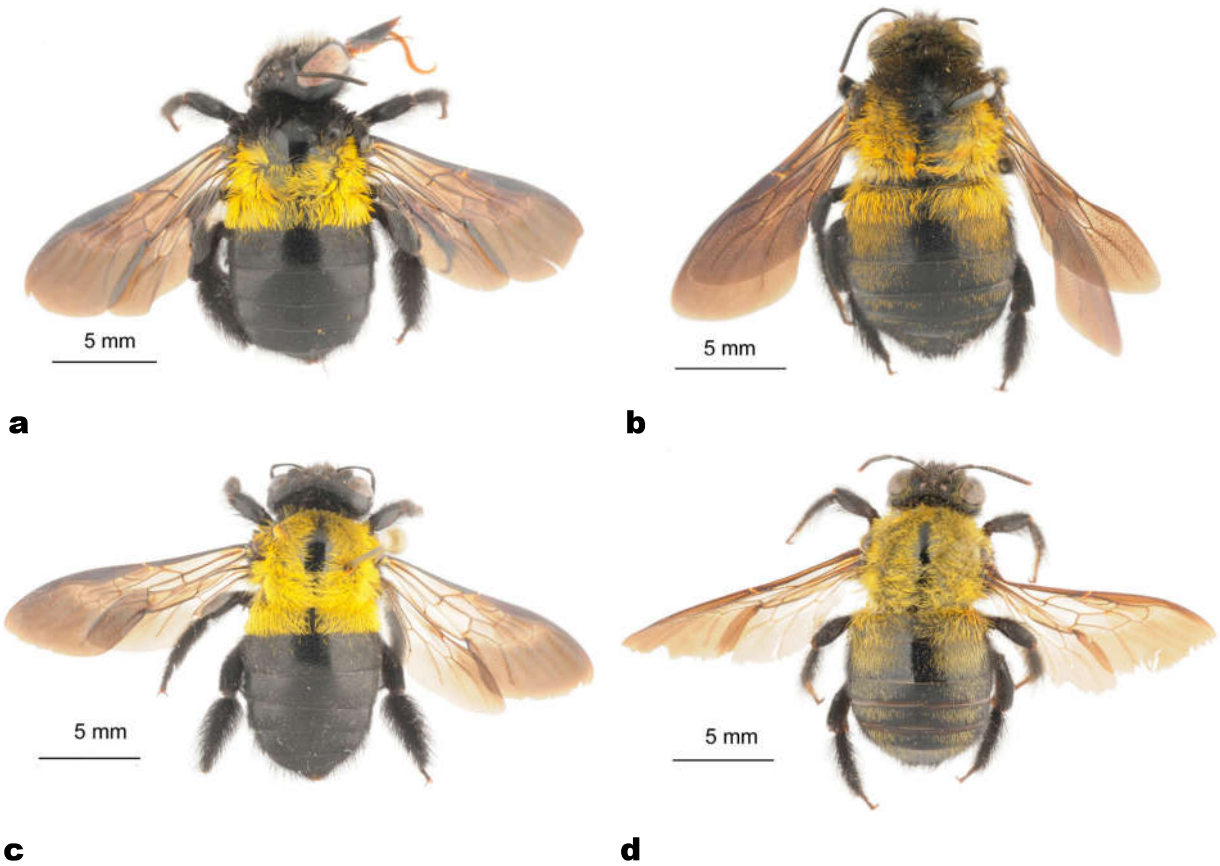


Fig. 22. *Xylocopa scioensis*; a, female with thorax black and yellow; b, male with thorax black and yellow; c, female with thorax completely yellow; d, male with thorax completely yellow.

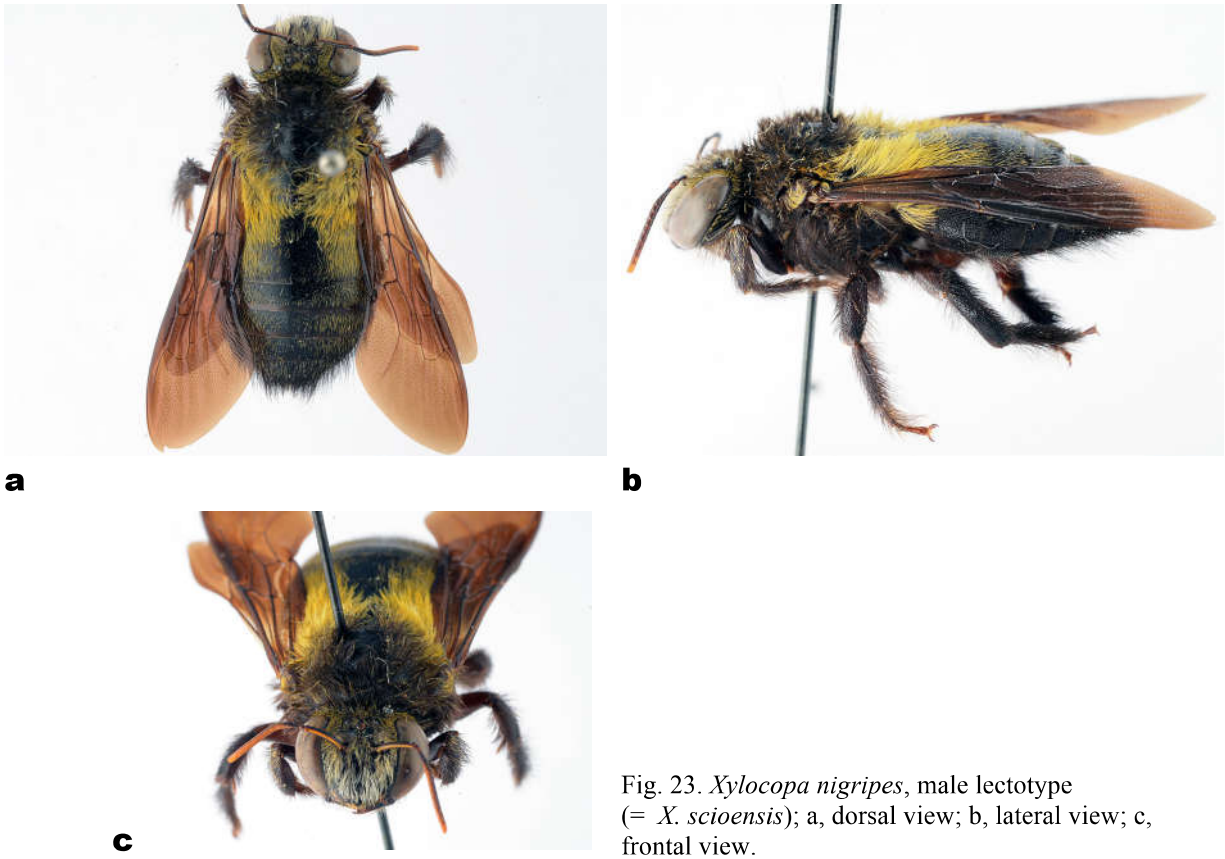


Fig. 23. *Xylocopa nigripes*, male lectotype (= *X. scioensis*); a, dorsal view; b, lateral view; c, frontal view.

## ***Xylocopa somalica*** Magretti, 1895 (Fig. 24)

*Xylocopa (Koptortosoma) somalica*
*Xylocopa flavobicincta* var. *somalica* Magretti, 1895.

DIAGNOSIS. Similar in colouration to *X. caffra* but the head bears a grey pubescence (Fig. 24).

LITERATURE. Galla (FRIESE, 1915).

NEW MATERIAL. OROMIA. Bale, Sof'Omar, 6°13'N 39°46'E, 31.I.2011, *Aloe berhana*, 2♀. – W. Hararghe, Gadullo, 8°23'N 40°23'E, 1625m, 5.I.2011, *Asteraceae* n°111, 2♀.
SOUTHERN. Arba-Minch, Nech Sar National Park, 5°58'N 37°35'E, 1108m, 19.IX.2012, *Solanum* sp., 5♀. – Derashe near Gidole, 5°41'N 37°26'E, 1138m, 22.IX.2012, *Asteraceae*, 1♀. – Road to Tebela, 6°38'N 37°49'E, 18.IX.2012, *Plectranthus* sp., 2♀.
SOUTHERN. Road to Elbere, 5°20'N 36°57'E, 559m, 24.IX.2012, *Indigofera* sp., 1♂.

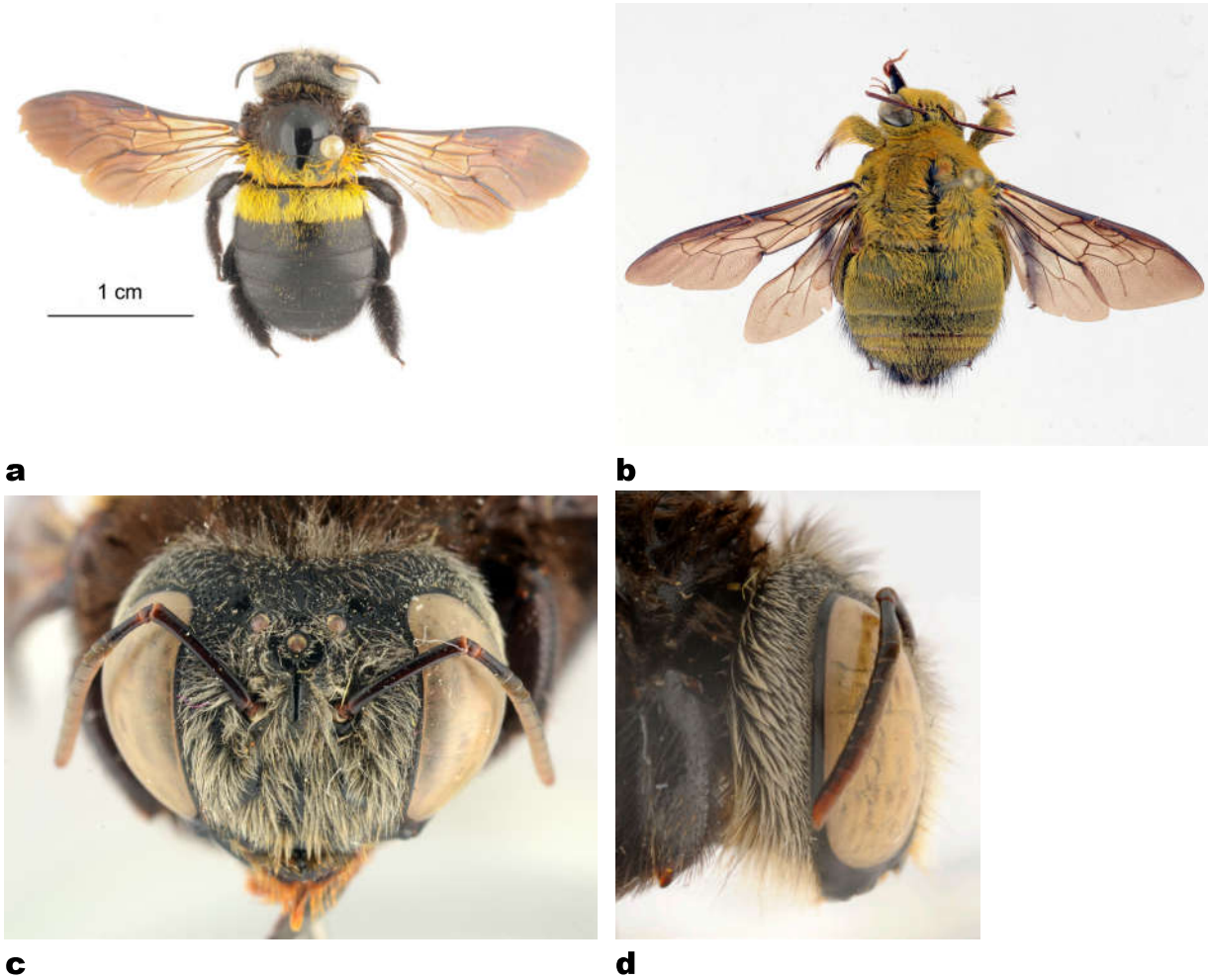


Fig. 24. *Xylocopa somalica*; a, female dorsal view; b, male dorsal view; c, female head; d, female head lateral view.

## ***Xylocopa subjuncta*** Vachal, 1898

*Xylocopa (Xylomelissa) subjuncta*

DIAGNOSIS. Large species (27 mm). Female. Similar to *X. erythrina* but clypeus not surrounded by a carina and basitibial plate ending on the apical 2/3 of the hind tibia. Morphologically similar to *X. hottentota* but larger. Male. Face pale yellow, mesosoma with black pubescence. Similar to the black variety of *X. erythrina* but the dentition of hind femora not so strong and apex of hind tibia less expanded, pilosity of the underside of the mesosoma black (grey in *X. erythrina*).

OLD MATERIAL. Environs de Harrar, Belaoua, 1♂ (Mission du Bourg de Bozas 1903 ; MNHNP).

## ***Xylocopa wellmani*** Cockerell, 1906 (Fig. 25)

*Xylocopa (Xylomelissa) wellmani*

DIAGNOSIS. Small to medium size species (14-19 mm). Female. Clypeus with three small tubercles, two laterals and one medio-apical (Fig. 25c). Hind tarsi and apex of hind tibias with red pubescence (Figs 24a,b). Male. Pale yellow marks of the face rising above antennal sockets. Colouration of the setae of the legs like that of the female. Hind tibia without calcar.

OLD MATERIAL. Bischoftu, 6500ft, 31.X.1945, 1♀, leg. K.M. Guichard (NHML). – Managasha, 9.XI.1945, 1♀, leg. K.M. Guichard (NHML).

NEW MATERIAL. ADDIS ABEBA. Entoto, 9°06'N 38°42'E, 14.X.2010, *Trifolium decorum*, BW14, 1♀.
OROMIA. Holeta, 9°04'N 38°30'E, 2450m, 4.XI.2010, *Salvia leucantha*, 1♀.


Fig. 25. *Xylocopa wellmani*, female; a, dorsal view; b, lateral view.

**c**

Fig. 25 (continued). *Xylocopa wellmani*, female; c, head; d, clypeus.

## ***Xylocopa higosamuloensis*** Pauly **sp. nov.** (Fig. 26)

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*Xylocopa (Xylomelissa) higosamuloensis*

HOLOTYPE: 1♀, "Abyssinia", Higo Samulo, 30.X.1911, leg. R.J. Stordy (NHML).

DESCRIPTION. Female. Small species (13 mm). Black. Mesosoma with grey pubescence. Hind leg with grey yellow pubescence. Terga with apical whitish hair bands, reduced or interrupted in the middle (Fig. 26b). Head (Fig. 26d): clypeus with dense punctures and without carina. Scutum with punctures spaced by one puncture width. Terga shining with punctures spaced by one puncture width. Wings translucent with dark apical margin. Posterior side of the mesosoma rounded as in other species of *Xylomelissa*. Basitibial plate of the hind leg terminated on the 3/5 of the tibia.

ETYMOLOGY. The name is based on the typical locality, Higo Samulo. This locality is situated SE of Lake Abaya (= Margherita) (following ALFKEN, 1932) [ca 5°57'N 37°44'E]


**a** **b**

Fig. 26. *Xylocopa higosamuloensis,* female holotype; a, dorsal view; b, metasoma

**c** **d**

Fig. 26 (continued). *Xylocopa higosamuloensis,* female holotype; c, lateral view; d, head.

## Acknowledgments

We thank the Belgian Directorate-General for Development Cooperation (partim GTI) and the King Léopold III Fund for Nature Exploration and Conservation for funding three collecting trips in Ethiopia (2010-2012). We thank also Jean-Luc Boevé (O.D. Taxonomy and Phylogeny, RBINS) and Seyoum Mengistou, Director of the Zoological Museum of the University of Addis Ababa (ZMUA), for the managment of the GTI project, Kibebew Wakjira, Director of the Holeta Bee Research Center (HBRC), for organisation of meetings, as well as the Ethiopian Wildlife Conservation Authority (EWCA) and the Institute of Biodiversity Conservation (IBC) in Addis Ababa for collecting and export permits. We thank the curators of the NHLM in London (David Notton), the MNHN in Paris (Agnèle Touret-Alby) and the MNHU in Berlin (Franck Koch and Viola Richter), as well as Gerard Schulten (RMNH Leiden) for the loan of types or old specimens. We thank also Isabelle Coppée and Isabelle Sauvage of the SRBE for reading the final version of the manuscript.

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