Journal *of* Melittology
Bee Biology, Ecology, Evolution, & Systematics *The latest buzz in bee biology*
No. 42, pp. 1–8 8 December 2014

A new species of *Thyreus* from northern Cameroon (Hymenoptera: Apidae)

Michael S. Engel[1,2]

Abstract. A new species of the cleptoparasitic bee genus *Thyreus* Panzer (Apinae: Melectini) is described and figured from two females captured near Garoua in northern Cameroon. ***Thyreus garouensis*** Engel, new species, is distinguished from other African *Thyreus* with pallid pastel blue pubescence. The species is most similar to *T. scotaspis* (Vachal), but can be distinguished on the basis of its pattern of coloration/pubescence and form of the mesoscutellum.

INTRODUCTION

The bee genus *Thyreus* Panzer (Apinae: Melectini) comprises approximately 109 described species of distinctive cuckoo bees, cleptoparasitic largely on species of *Amegilla* Friese (Anthophorini). The genus is distributed widely in the Old World from southern Africa and Madagascar, broadly across Europe and Asia, and into Australia (Michener, 2007), and has been the subject of various regional revisions (*e.g.*, Meyer, 1921; Lieftinck, 1958, 1959a, 1959b, 1962, 1968; Vergés, 1967; Matsumura, 1970; Eardley, 1991; Schwarz, 1993; Straka & Engel, 2012; Alqarni *et al*., 2014). Particularly important biological accounts have been provided by Cardale (1968a, 1968b), Rozen (1969), and Rozen & Özbek (2005), while Engel (2007) documented a lateral gynandromorph from southern India.

[1] Division of Entomology, Natural History Museum, and Department of Ecology & Evolutionary Biology, 1501 Crestline Drive – Suite 140, University of Kansas, Lawrence, Kansas 66045-4415, USA (msengel@ku.edu).
[2] Division of Invertebrate Zoology, American Museum of Natural History, Central Park West at 79th Street, New York, New York 10024-5192, USA (mengel@amnh.org).

ISSN 2325-4467

Here I provide the description of a new species of *Thyreus* from northern Cameroon (Fig. 1), in the East Sudanian Savanna, south of the Sahel. The Cameroonian fauna of *Thyreus* as it is presently understood consists of six previously-described species, all of which are much more broadly distributed (Eardley, 1991): *Thyreus calceatus* (Vachal), *T. interruptus* (Vachal), *T. meripes* (Vachal), *T. pictus* (Smith), *T. pretextus* (Vachal), and *T. splendidulus* (Lepeletier de Saint Fargeau). There are several other species that almost assuredly occur within the country and will be found with more extensive sampling. Such examples include *T. scotaspis* (Vachal), which has been captured in Equatorial Guinea and Gabon not far from the borders with Cameroon; *T. vachali* (Friese) which occurs broadly in sub-Saharan Africa and as far west as at least Ghana, and thereby should be found in Cameroon; and *T. bouyssoui* (Vachal) that is found across tropical Africa and has been taken in extralimital boundaries with Cameroon. The rich diversity of *Thyreus* likely mirrors an equally diverse fauna of *Amegilla*. In Cameroon the fauna has been collected largely from the more forested or forest-savanna mosaic habitats, and the northern savannas are in need of further exploration. Broadly, surveys for *Thyreus* are needed across tropical Africa, which, along with the West African and Maghreb faunas, are undersampled despite their considerable biotic diversity.

MATERIAL AND METHODS

The material discussed herein is deposited in the Division of Entomology, University of Kansas Natural History Museum, Lawrence, Kansas, USA (SEMC). The description of this isolated new species is provided in the context that such works have inherent value, constitute the foundations for biological patterns and hypotheses of species diversity (Grimaldi & Engel, 2007; Gonzalez *et al*., 2013), contribute to future species-level revisions (Engel, 2011), and assist with efforts to conserve and understand global biodiversity. The format for the descriptions generally follows that used elsewhere for Melectini (*e.g*., Rightmyer & Engel, 2003; Straka & Engel, 2012; Engel & Michener, 2012; Alqarni *et al*., 2014), while morphological terminology follows that of Engel (2001) and Michener (2007). The system of abbreviations for patches of white pubescence on the mesosoma developed by Lieftinck (1962, 1968) are followed, although following the precedent of Straka & Engel (2012) and Alqarni *et al*. (2014) these have also been written out to avoid confusion but at the same time preserve continuity with Lieftinck's extensive monographs. An ocular micrometer on an Olympus SZX-12 stereomicroscope was used to take measurements, while photographs were taken with a Canon EOS 7D digital camera affixed to an Infinity K-2 long-distance microscope lens and illuminated by a Xenon flash mechanism.

SYSTEMATICS

Genus *Thyreus* Panzer

Thyreus garouensis Engel, new species

ZooBank: urn:lsid:zoobank.org:act:30B0A40B-C8FB-44E3-BED9-21206D12AB5D

(Figs. 1–4)

DIAGNOSIS: The new species can be recognized by the following combination of characters: maxillary palpus with two minute palpomeres; a slightly medioapically produced sternum V with a short medial carina; the form of the mesoscutellum (Fig. 4); and pattern of whitish and palid pastel blue pubescence as described below (*vide infra*).

Figures 1–2. Female of *Thyreus garouensis*, new species, from northern Cameroon. **1.** Lateral habitus. **2.** Facial view.

Description: ♀: Total body length 10.6 mm; forewing length 8.8 mm. Head wider than long, length 2.6 mm, width 3.3 mm; maxillary palpus with two minute palpomeres; upper interorbital distance 1.8 mm; lower interorbital distance 1.5 mm. Intertegular distance 2.8 mm; mesoscutellar posterior margin with broad concavity, concavity not distinctly sinuate, posterior margin from median notch to posterolateral angle relatively straight (only faintly arched lateral to median notch), depth of concavity about one-half length of posterior margin from median notch to posterolateral angle; posterolateral angles almost orthogonal, not projected as spine. Pygidial plate relatively narrow, margins straight and converging apically, apex narrowly rounded, surface imbricate and impunctate, apical half with slightly raised medial ridge and

Figures 3–4. Dorsal views of female of *Thyreus garouensis*, new species, from northern Cameroon. **3.** Direct dorsal view on mesosoma for view of setal patch pattern, with metasoma slightly angled into the background. **4.** Direct dorsal view on metasoma for view of setal patch pattern, with mesosoma slightly angled away.

apically with slightly swollen surface; metasomal sternum V slightly produced medioapically, with short, longitudinal, median carina apically and extending onto medioapically produced margin.

Labrum smooth with scattered, irregularly-sized punctures, such punctures separated by a puncture width or less except medially more sparse and laterally slightly more dense, basally surface weakly swollen paramedially, surface apically with short, triangular point; clypeus and supraclypeal area with small contiguous punctures, integument between (where evident) smooth; face as on clypeus except punctures becoming slightly more spaced, separated by less than a puncture width; punctures on vertex and gena similar to those on upper frons, separated by a puncture width or less, integument between smooth to faintly imbricate. Pronotum with coarse, shallow, nearly contiguous punctures; mesoscutum with well-defined punctures separated by a puncture width or less, integument between punctures smooth and shining; mesoscutellum, including axilla, with punctures as on mesoscutum; pleura with coarse, nearly contiguous punctures, integument between punctures (where evident) smooth and shining, such punctures becoming more widely spaced ventrally; lateral and posterior surfaces of propodeum with coarse, nearly contiguous punctures. Metasoma with small punctures separated by a puncture width or less, integument between faintly imbricate, narrow imbricate and impunctate zones along apical margins of terga except tergum V with broad, slightly depressed, imbricate and impunctate zone in apical half; sterna with punctures separated by more than a puncture width medially, becoming gradually more closely spaced laterally until contiguous, integument between finely imbricate to imbricate, apical margins impunctate and imbricate.

Integument black except labrum, mandible, labiomaxillary complex, legs, and portions of metasomal sterna and tergum VI dark brown, nearly black in some places. Wing membranes hyaline and infumate except white just apical to third submarginal and second medial cells and some small spots apically within these cells (Fig. 1); veins dark brown to black.

Pubescence generally dark fuscous to black over entire body except in presence of plumose white or pallid pastel blue setae as noted below. Clypeus, supraclypeal area, and face except for central and upper frons, largely obscured by dense pubescence (Fig. 2), clypeus and supraclypeal area with short, plumose, pallid blue setae as well as longer more whitish setae; face with some shorter, pallid blue setae but with longer whitish setae more prominent, such setae becoming more sparse by paraocular area and in central and upper frons and ocellar area (Figs. 2, 3); vertex, occiput, and gena with longer, more erect, whitish setae along on face although still some with pallid pastel blue coloration (Figs. 1–4); postgena with long, whitish setae more sparse than on gena. Mesosoma with pallid pastel blue patches (blue coloration subtle and can appear more white depending on intensity of lighting and orientation, or at times intermingled with white setae and intensity varies as a degree of predominance of one setal color form versus the other) as follows (following annotation of Lieftinck, 1968, and refined by Straka & Engel, 2012): *lpn* (lateral pronotal patch) present and prominent, separated medially by about apical width of *ms* (median mesoscutal patch); *deps* (dorsal mesepisternal patch) and *hypm* (hypoepimeral area patch) present and prominent, former occupying entire upper half of mesepisternum below scrobal groove, lateral covering entire hypoepiermal area (Fig. 1), *deps* (dorsal mesepisternal patch) and *hypm* (hypoepimeral area patch) separated by thin band of black along scrobal groove, otherwise effectively contiguous (Fig. 1); *veps* (ventral mesepisternal patch) ill-defined, composed of scattered whitish to pallid blue setae (Fig. 1); *als* (anterolateral mesoscutal) present but thin, not extending as far medially as *lpn* (lateral pronotal patch) (Fig. 3); *ms* (median mesoscutal patch) present and prominent (Fig. 3), extending posteriorly to about midlength of *mls* (mediolateral mesoscutal patch); *mls* (mediolateral me-

soscutal patch) present, well defined, nearly as large as *pls* (posterolateral mesoscutal patch) (Figs. 3, 4); *plsa* (anterior posterolateral mesoscutal patch) present from anterior of tegula to near border with axilla (Figs. 3, 4), thinly separated by black from axilla, not but almost meeting *pls* (posterolateral mesoscutal patch) posteriorly; *t* (tegular patch) present and prominent posteriorly on tegula (Figs. 3, 4), very small, secondary patch at anterior border of tegula (Fig. 3); *pls* (posterolateral mesoscutal patch) present, large and prominent (Figs. 3, 4), separated medially by slightly more than width, not extending laterally to meet *plsa* (anterior posterolateral mesoscutal patch). Mesoscutellum with dense patch of long, plumose, white setae extending posteriorly from undersurface of mesoscutellum medially (Fig. 4), patch not reaching to posterolateral corners; setal patches *ps* (parascutellar patch) and *s* (mesoscutellar patch) absent, without apical, medioscutellar patch of whitish setae, thus mesoscutellar dorsal surface entirely black (Fig. 4); *lp* (lateral propodeal patch) present around propodeal spiracle. Legs with patches present on outer surface of protibia (Fig. 1); small patch apically on posterior surface of profemur; few pallid blue setae intermixed on outer surface of probasitarsus; patch on upper three-quarters of outer surface of mesotibia (Fig. 1); on apical half of posterior surface of mesofemur; few pallid blue setae intermixed on outer surface of mesobasitarsus; patch on upper half of outer surface of metatibia (Fig. 1); pallid blue setae scattered on outer surface of metabasitarsus (Fig. 1). Metasomal terga with prominent patches of appressed, plumose pallid blue setae (pale blue pastel coloration subtle and under strong light can bleach out and appear almost white) (Figs. 3, 4) as follows: first metasomal tergum with large, mostly L-shaped patches laterally, anteriorly patches only slightly extended medially (and thus not truly C-shaped), posteriorly extended more medially (giving L-shape), but not approaching midline, separation between patches about as large as posterior length of patch (Figs. 3, 4); second metasomal tergum with lateral patch largely transverse, slightly extended anteriorly at extreme lateral margin (Fig. 4), patch wider than twice length; third and fourth metasomal terga with similar lateral, transverse patches, third patch wider than twice length, fourth about twice as wide as long, neither with anterior extensions laterally; fifth tergum with small lateral patches except white setae more dominant relative to pallid blue setae; sixth tergum without patches; second and third sterna with thin, lateral, transverse patches of pallid blue setae (Fig. 1), patch of second sternum more prominent, that of third poorly defined; fourth sternum with a couple of white to pallid blue setae in similar lateral position to patches of second and third sterna but not composed into a distinct patch.

♂: Unknown.

HOLOTYPE: ♀, Cameroun [République du Cameroun]: rég. du Nord [Région du Nord] Garoua. 17 XI 1979 [17 November 1979]. G. Popov (SEMC).

PARATYPES: 1♀, same data as holotype (SEMC).

ETYMOLOGY: The specific epithet is based on the type locality, a savanna area in the Région du Nord (North Province) of Cameroon.

COMMENTS: In Eardley's (1991) key to the sub-Saharan species of *Thyreus*, *T. garouensis* will run to couplet 21 and since it fails to agree with *T. pictus* (Smith), will run out to *T. scotaspis* (Vachal), more on the lack of features rather than any positive evidence to assign it. *Thyreus scotaspis* is one of those species lacking a thoroughly modern, detailed description but there are sufficiently understood details to exclude this as a possibility for the present taxon. *Thyreus garouensis* may be distinguished from *T. scotaspis* by the entire clypeus and lower half of supraclypeal area densely clothed in whitish and pallid blue plumose setae (Fig. 2) (clypeus medially and entire

supraclypeal area black in *T. scotaspis*); the *plsa* and *pls* coming close to contact (widely separated in *T. scotaspis*); the *hypm* very narrowly divided from *deps* by black setae along scrobal groove (these widely divided by black setae in area of scrobal groove in *T. scotaspis*); mesoscutellar concavity broad, its depth about one-half distance from notch to posterolateral angle (concavity deeper, more distinctly V-shaped, its depth about as long as distance from notch to posterolateral angle in *T. scotaspis*), and the more extensively white and pallid blue setae of the gena, postgena, and occiput (posteriorly more black in *T. scotaspis*). Modified couplets for females in Eardley's (1991) key to accommodate *T. garouensis* are (male portions are excluded as the male remains unknown for *T. garouensis*):

21. Dorsal surface of mesoscutellum partly black, posteromedially with pale blue setal patch ..... *T. pictus* (Smith)
—. Dorsal surface of mesoscutellum entirely black 21a
21a. Clypeus entirely and supraclypeal area largely covered in whitish and pallid blue plumose setae (Fig. 2); *plsa* and *pls* nearly contacting (Figs. 3, 4); *hypm* and *deps* barely separated by thin line of black along scrobal groove (Fig. 1); mesoscutellar concavity broad, depth about one-half distance from median notch to posterolateral angle (Fig. 4) ..... *T. garouensis*, n. sp.
—. Clypeus medially and supraclypeal area entirely black; *plsa* and *pls* widely separated; *hypm* and *deps* broadly divided by black across region of scrobal groove; mesoscutellar concavity deep, depth subequal to distance from median notch to posterolateral angle ..... *T. scotaspis* (Vachal)

If one were to ignore the lack of a distinctly sinuate margin to the mesoscutellum and the fact that the pubescence patterns of the first tergum do not match the second part of Eardley's (1991) couplet 20, then the new species could be confused with *T. vachali* or even *T. brachyaspis* (Cockerell), the latter of which is confined to southern Africa. Neither of these species approximate to *T. garouensis* in the form of the mesoscutellum or patterns of coloration (Eardley, 1991).

ACKNOWLEDGEMENTS

I am grateful to I.A. Hinojosa-Díaz for assistance with photomicrography and support from the Engel Illustration Fund of the University of Kansas College of Liberal Arts and Sciences, and to two reviewers who kindly commented on the manuscript. Kinsey, Zoe, Piper, and Bree provided constant support through the composition of the manuscript. This is a contribution of the Division of Entomology, University of Kansas Natural History Museum.

REFERENCES

Alqarni, A.S., M.A. Hannan, & M.S. Engel. 2014. A new species of the cleptoparasitic bee genus *Thyreus* from northern Yemen and southwestern Saudi Arabia (Hymenoptera, Apidae). *ZooKeys* 428: 29–40.

Cardale, J. 1968a. Parasites and other organisms associated with nests of *Amegilla* Friese (Hymenoptera: Anthophorinae). *Australian Journal of Entomology* 7(1): 29–34.

Cardale, J. 1968b. Immature stages of Australian Anthophorinae (Hymenoptera: Apoidea). *Australian Journal of Entomology* 7(1): 35–41.

Eardley, C.D. 1991. The Melectini in Subsaharan Africa (Hymenoptera: Anthophoridae). *Entomology Memoir, Department of Agricultural Development, Republic of South Africa* 82: 1–49.

Engel, M.S. 2001. A monograph of the Baltic amber bees and evolution of the Apoidea (Hymenoptera). *Bulletin of the American Museum of Natural History* 259: 1–192.

Engel, M.S. 2007. A lateral gynandromorph in the bee genus *Thyreus* and the sting mechanism in the Melectini (Hymenoptera: Apidae). *American Museum Novitates* 3553: 1–11.

Engel, M.S. 2011. Systematic melittology: Where to from here? *Systematic Entomology* 36(1): 2–15.

Engel, M.S., & C.D. Michener. 2012. The melectine bee genera *Brachymelecta* and *Sinomelecta* (Hymenoptera, Apidae). *ZooKeys* 244: 1–19.

Gonzalez, V.H., T. Griswold, & M.S. Engel. 2013. Obtaining a better taxonomic understanding of native bees: Where do we start? *Systematic Entomology* 38(4): 645–653.

Grimaldi, D., & M.S. Engel. 2007. Why descriptive science still matters. *BioScience* 57(8): 646–647.

Lieftinck, M.A. 1958. Revision of the Indo-Australian species of the genus *Thyreus* Panzer (= *Crocisa* Jurine) (Hym., Apoidea, Anthophoridae) Part 1. Introduction and list of species. *Nova Guinea* 9(1): 21–30.

Lieftinck, M.A. 1959a. Revision of the Indo-Australian species of the genus *Thyreus* Panzer (= *Crocisa* Jurine) (Hym., Apoidea, Anthophoridae) Part 2. *Thyreus nitidulus* (Fabricius). *Nova Guinea* 10(1): 99–130, +2 pls.

Lieftinck, M.A. 1959b. Notes on some eighteenth century bees of the genus *Thyreus* Panzer, with description of a new species (Hymenoptera, Apoidea). *Tijdschrift voor Entomologie* 102(1): 17–34, +2 pls.

Lieftinck, M.A. 1962. Revision of the Indo-Australian species of the genus *Thyreus* Panzer (= *Crocisa* Jurine) (Hym., Apoidea, Anthophoridae) Part 3. Oriental and Australian species. *Zoologische Verhandelingen* 53: 1–212, +3 pls.

Lieftinck, M.A. 1968. A review of Old World species of *Thyreus* Panzer (= *Crocisa* Jurine) (Hym., Apoidea, Anthophoridae) Part 4. Palearctic species. *Zoologische Verhandelingen* 98: 1–139, +4 pls.

Matsumura, T. 1970. Bees from Nepal. I. *Thyreus* Panzer (Hymenoptera, Apoidea). *Kontyû* 38(4): 314–317.

Meyer, R. 1921. Apidae – Nomadinae I. Gattung *Crocisa* Jur. *Archiv für Naturgeschichte, Abteilung A* 87(1): 67–178.

Michener, C.D. 2007. *The Bees of the World* [2nd Edition]. Johns Hopkins University Press; Baltimore, MD; xvi+[i]+953 pp., +20 pls.

Rightmyer, M.G., & M.S. Engel. 2003. A new Palearctic genus of melectine bees (Hymenoptera: Apidae). *American Museum Novitates* 3392: 1–22.

Rozen, J.G., Jr. 1969. The biology and description of a new species of African *Thyreus*, with life history notes on two species of *Anthophora* (Hymenoptera: Anthophoridae). *Journal of the New York Entomological Society* 77(1): 51–60.

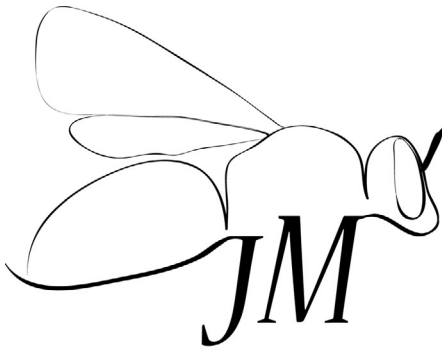
Rozen, J.G., Jr., & H. Özbek. 2005. Notes on the egg and egg deposition of the cleptoparasite *Thyreus ramosus* (Hymenoptera: Apidae: Melectini). *Journal of the Kansas Entomological Society* 78(1): 34–40.

Schwarz, M. 1993. Eine neue *Thyreus*-Art von der Kanarischen Inseln: *Thyreus hohmanni* n. sp. (Insecta: Hymenoptera: Apoidea: Anthophoridae). *Veröffentlichungen aus dem Übersee-Museum Bremen* 12(2): 869–873.

Straka, J., & M.S. Engel. 2012. The apid cuckoo bees of the Cape Verde Islands (Hymenoptera, Apidae). *ZooKeys* 218: 77–109.

Vergés, F. 1967. Estudio monográfico de los *Thyreus* Panzer (*Crocisa* Jurine) de España (Hym. Apidae). *Miscelánea Zoológica, Museo de Zoología, Barcelona* 2(2): 101–110.

ZooBank: urn:lsid:zoobank.org:pub:AD2C29CC-FF81-4B6C-9406-C68B4D7F1928



Journal of Melittology

A Journal of Bee Biology, Ecology, Evolution, & Systematics

The *Journal of Melittology* is an international, open access journal that seeks to rapidly disseminate the results of research conducted on bees (Apoidea: Anthophila) in their broadest sense. Our mission is to promote the understanding and conservation of wild and managed bees and to facilitate communication and collaboration among researchers and the public worldwide. The *Journal* covers all aspects of bee research including but not limited to: anatomy, behavioral ecology, biodiversity, biogeography, chemical ecology, comparative morphology, conservation, cultural aspects, cytogenetics, ecology, ethnobiology, history, identification (keys), invasion ecology, management, melittopalynology, molecular ecology, neurobiology, occurrence data, paleontology, parasitism, phenology, phylogeny, physiology, pollination biology, sociobiology, systematics, and taxonomy.

The *Journal of Melittology* was established at the University of Kansas through the efforts of Michael S. Engel, Victor H. Gonzalez, Ismael A. Hinojosa-Díaz, and Charles D. Michener in 2013 and each article is published as its own number, with issues appearing online as soon as they are ready. Papers are composed using Microsoft Word® and Adobe InDesign® in Lawrence, Kansas, USA.

Journal of Melittology is registered in ZooBank (www.zoobank.org), and archived at the University of Kansas and in Portico (www.portico.org).

http://journals.ku.edu/melittology
ISSN 2325-4467