

Afrotropical species of the genus *Dinotrema* Foerster 1862 (Hymenoptera, Braconidae, Alysiinae) with description of three new taxa and a key for determination

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Abstract

The revision of the genus *Dinotrema* Foerster, 1862 in the Afrotropical region is provided. Three new Afrotropical species are described and illustrated: *D. austroafricaense* sp. nov., *D. katbergense* sp. nov., and *D. trastoae* sp. nov. Additional taxonomic data for *D. propetauricum* Fischer, 2009 and *D. soutpansbergense* Fischer, 2009 are given. A key for determination of all the seven Afrotropical *Dinotrema* species is provided.

Key words: Braconidae, Alysiinae, *Dinotrema*, Afrotropical region, new species, key.

Introduction

Dinotrema Foerster 1862 is one of the largest genera in the tribe Alysiini (Alysiinae), which species are parasitoids of the larvae of Diptera predominantly belonging to the family Phoridae (van Achterberg, 1988). This genus comprises hundreds of species described from the Afrotropical, Australasian, Nearctic, Oceanic, Oriental, and Palaearctic regions (Fischer, 1972; 2009; van Achterberg, 1988; Tobias, 2003; 2004a; 2004b; 2006; Yu *et al.*, 2012; Munk *et al.*, 2013a; 2013b; Peris-Felipo and Belokobylskij, 2013; Peris-Felipo *et al.*, 2013a; 2013b; 2013c; 2013d; 2014a; 2014b), and recently it was recorded from the Neotropical region (Peris-Felipo and Belokobylskij, 2016).

In this paper, the genus *Dinotrema* is revised for the Afrotropical region and three new species, *D. austroafricaense* sp. nov., *D. katbergense* sp. nov., and *D. trastoae* sp. nov., are described and illustrated. Also, some additional taxonomic data for previously described species *D. propetauricum* Fischer 2009 and *D. soutpansbergense* Fischer 2009 are given.

Materials and methods

For the terminology of the morphological features, sculpture, and measurements see Peris-Felipo *et al.* (2014a). For wing venation nomenclature see Peris-Felipo *et al.* (2014a) and van Achterberg (1993) in parenthesis. The morphological groups based on the propodeal sculpture (Peris-Felipo *et al.*, 2014a) are adopted for the key to the Afrotropical *Dinotrema* species. The material was imaged using Digital Microscope Keyence® VHX-2000 and Adobe Photoshop® imaging system. The types of new and already described species are deposited in the collections of the Natural History Museum (London, UK; BMNH), Naturhistorisches Museum (Wien, Austria; NHMW), and Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia; ZISP).

Taxonomic part

Order: Hymenoptera L. 1758

Family: Braconidae Nees 1811

Subfamily: Alysiinae Leach 1815

Genus: *Dinotrema* Foerster 1862

Type species: *Dinotrema erythropa* Foerster 1862.

Diagnosis. Mandibles small, simple, tridentate. Paraclypeal fovea short, far not reaching ventral edge of eyes. Vein cu₁ (2-SR) always present and more or less distinctly sclerotized; veins recurrent (m-cu) and nervulus (cu-a) always postfurcal.

Hosts: Dipterans larvae mainly from families Anthomyiidae, Phoridae, and Platyppezidae.

***Dinotrema austroafricaense* Peris-Felipo, sp. nov.**
(figures 1, 2)

Etymology

Named after South Africa, the country where this new species was collected in high number of localities.

Description

Female

Head - In dorsal view, 1.8 times as wide as long, 1.5 times as wide as mesoscutum, smooth, with temple rounded behind eyes. Eye in lateral view 1.2 times as high as wide and 1.5 times as wide as temple medially. POL 1.9 times OD; OOL 1.7 times OD. Face 2.0 times as wide as high, completely covered by numerous setae; inner margins of eyes subparallel. Clypeus 3.0 times as wide as high, slightly curved ventrally. Paraclypeal fovea long, crossing halfway distance between clypeus and eye. Mandible 3-dentate, widened towards apex, 1.1 times as long as its maximum width. Upper tooth longer than lower teeth; middle tooth small, weakly longer than upper tooth, wide basally and pointed apically; lower tooth short, rounded. Antennae 21-segmented, 0.9 times as long as body. Scape 2.6 times as long as pedicel. First flagellar segment 3.0 times as long as its apical width, 1.1 times as long as second segment. Second to fourth flagellar segments 2.0-2.1 times as long as their maxi-



Figure 1. *Dinotrema austroafricaense* sp. nov. (A, C-F female; B male). A, B. Habitus, lateral view. C. Mandible. D. Antenna. E. Head, frontal view. F. Head, dorsal view.

mum width; 5th to 13th segments 2.3 times; 14th and 15th 2.7 times; 16th to 18th 2.3 times, and 19th (apical) segment 3.8 times as long as wide accordingly.

Mesosoma - In lateral view, 1.2 times as long as high. Mesoscutum (dorsal view) about as long as its maximum width, smooth. Notauli mainly absent on horizontal surface of mesoscutum. Mesoscutal pit present and elongate. Prescutellar depression smooth, without lateral carinae. Precoxal sulcus present, crenulate, not reaching anterior and posterior margins of mesopleuron. Posterior mesopleural furrow smooth. Propodeum smooth, with complete and distinct median longitudinal carina and with transversal short carinae never reaching sides of propodeum. Propodeal spiracles relatively small.

Wings - Length of fore wing 2.5 times its maximum width. Radial (marginal) cell ending at apex of wing, 3.8 times as long as its maximum width. Vein r2 (3-SR) 2.6 times as long as vein cuq1 (2-SR); vein r3 (SR1) 2.6 times as long as vein r2 (3-SR). Nervulus (cu-a) distinctly postfurcal. Brachial (subdiscal) cell closed dis-

tally, 3.3 times as long as its maximum width. Hind wing 5.7 times as long as its maximum width.

Legs - Hind femur 4.0 times as long as its maximum width. Hind tibia weakly widened towards apex, 8.3 times as long as its maximum subapical width, about as long as hind tarsus. First segment of hind tarsus 1.8 times as long as second segment.

Metasoma - First tergite weakly widened towards apex, twice as long as its apical width, finely striate. Ovipositor 3.6 times as long as first tergite, 0.9 times as long as metasoma, 2.2 times as long as hind femur, 0.4 times as long as fore wing.

Colour - Body, antenna, legs and pterostigma brown. Wings hyaline.

Length - Body 1.8 mm; fore wing 2.0 mm; hind wing 1.7 mm.

Variation - Body 1.7-1.9 mm; fore wing 1.9-2.1 mm; hind wing 1.6-1.7 mm. Antenna 19-21-segmented. First flagellar segment 2.9-3.0 times as long as its maximum width. Hind femur 4.0-4.1 times as long as its maximum width. Ovipositor 3.6-4.0 times as long as first tergite,

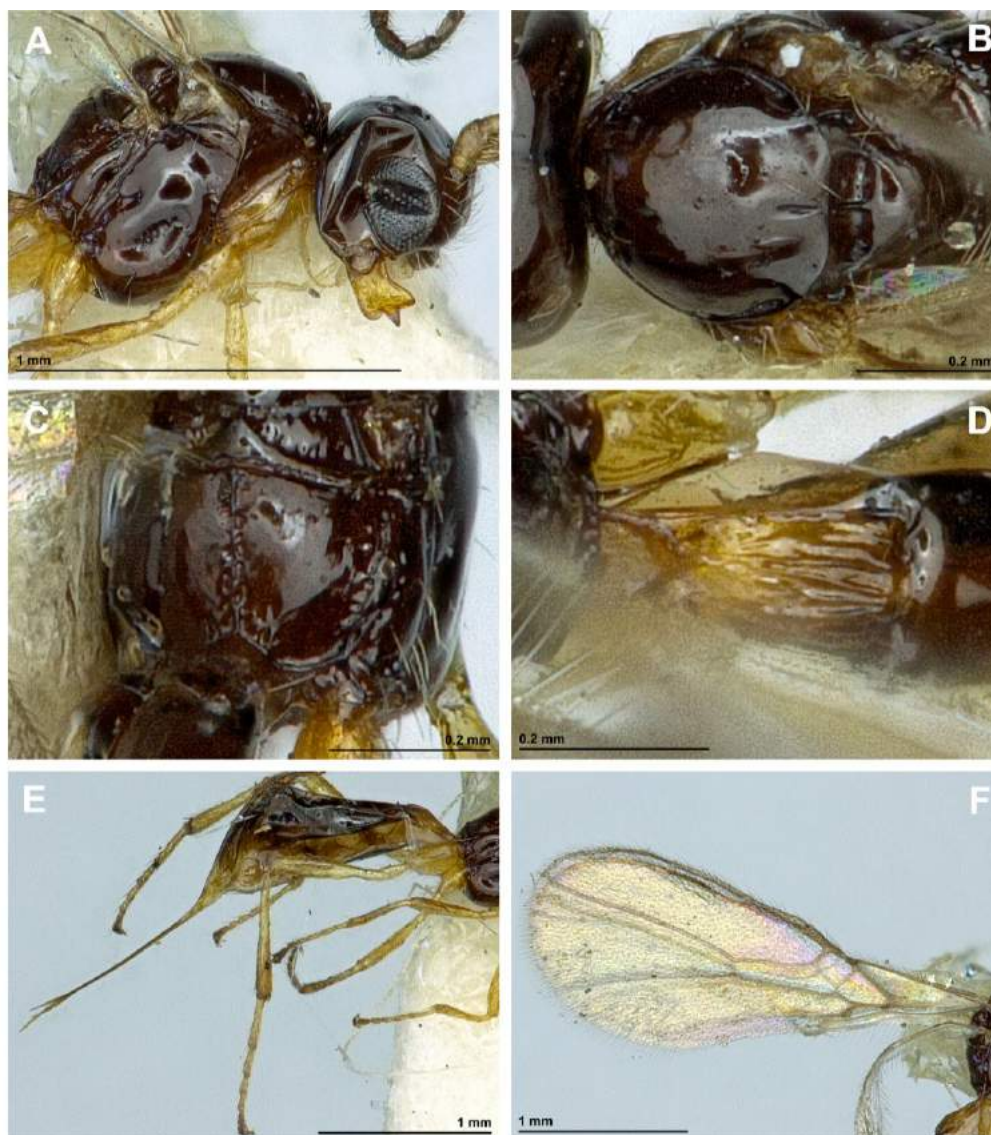


Figure 2. *Dinotrema austroafricaense* sp. nov. (female). A. Mesosoma and head, lateral view. B. Mesonotum, dorsal view. C. Propodeum, dorsal view. D. First metasomal tergite, dorsal view. E. Hind leg, metasoma and ovipositor. F. Fore wing.

0.9-1.0 times as long as metasoma, 2.2-2.6 times as long as hind femur.

Male

Body length 1.5-1.7 mm; fore wing 1.9-2.1 mm; hind wing 1.4-1.6 mm. Antenna 21-23-segmented. First flagellar segment 3.0-3.2 times as long as its maximum width. Otherwise similar to female.

Type material

Holotype: female, South Africa, Orange F. State, Harrismith, 1-20.iii.1927 (R.E. Turner leg.) [B.M. 1927-147] (BMNH). Paratypes: 5 females, 1 male, same data as in holotype (BMNH; ZISP); 1 female, same locality as holotype, but 21-26.iii.1927 [B.M. 1927-162] (BMNH); 2 males, South Africa, Port St. John, Pondoland, 15-31.viii.1923 [B.M. 1923-463] and xii.1923 (R.E. Turner) [B.M. 1924-54] (BMNH); 1 male, South Africa, False Bay, 2 m, 3.i.1972 (E. Mulzanburg leg.) [Southern African Exp. B.M. 1972-1] (BMNH); 2 fe-

males, 1 male, South Africa, Natal, Van Reener, Drakensberg, 23-26.i.1927 (R.E. Turner leg.) [B.M. 1927-62] (BMNH); 1 male, South Africa, Cape Province, Somerset East, x.1930 (R.E. Turner leg.) [B.M. 1930-561] (BMNH); 1 female, 1 male, South Africa, Cape Province, Mossel Bay, viii.1930 (R.E. Turner leg.) [B.M. 1930-416] (ZISP); 1 female, 1 male, same locality, but ii.1922 [B.M. 1922-97] (BMNH); 2 females, same locality, but 1-14.xi.1921 [B.M. 1921-476] (BMNH); 1 female, same locality, but x.1921 [B.M. 1921-450] (BMNH).

Comparative diagnosis

This new species is similar to the Afrotopical *D. soutpansbergense* Fischer 2009, but differs from it in having the mesoscutal pit present and elongated (absent in *D. soutpansbergense*), eye in lateral view 1.5 times as wide as temple medially (1.0 times in *D. soutpansbergense*), mandible 1.1 times as long as its maximum width (1.5 times in *D. soutpansbergense*), middle flagellar

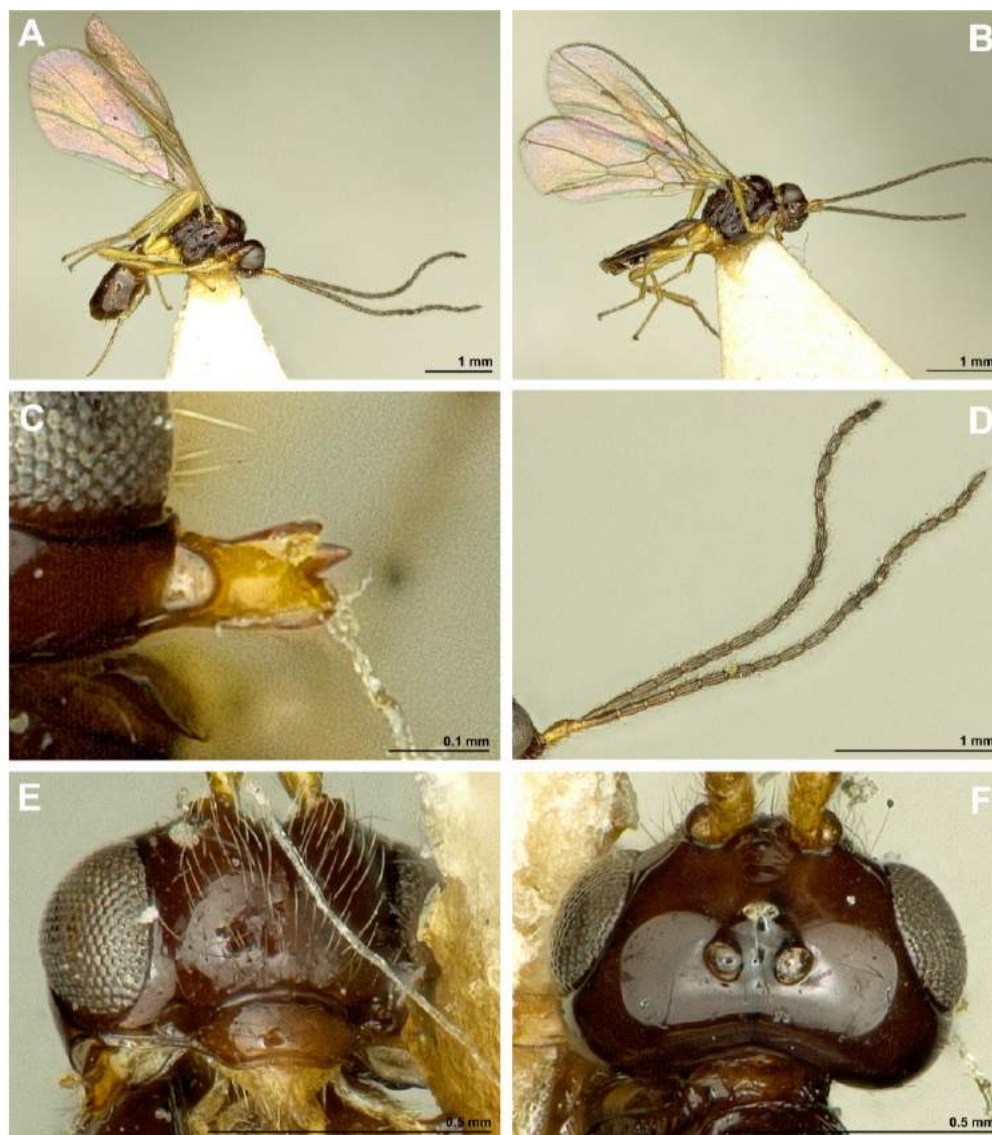


Figure 3. *Dinotrema katbergense* sp. nov. (A, C-F female; B male). A, B. Habitus, lateral view. C. Mandible. D. Antenna. E. Head, frontal view. F. Head, dorsal view.

segments 2.0-2.7 times as long as their maximum width (1.5 times in *D. soutpansbergense*), and ovipositor longer than metasoma (shorter in *D. soutpansbergense*).

According to the key by Peris-Felipo *et al.* (2014a), this new species is similar to the Palearctic *D. brevisulcus* Tobias 2003, *D. caesum* Tobias 2006 and *D. calamitosum* Tobias 2006. *Dinotrema austroafricaense* sp. nov. differs from *D. brevisulcus* in having the eye in lateral view 1.5 times as wide as temple medially (0.9 times in *D. brevisulcus*), paraclypeal fovea crossing halfway distance between clypeus and eye (not crossing it in *D. brevisulcus*), middle flagellar segments 2.0-2.7 times as long as their maximum width (1.3-1.5 times in *D. brevisulcus*), the first metasomal tergite 2.0 times as long as its apical width (1.7 times in *D. brevisulcus*), and ovipositor longer than metasoma (as long as metasoma in *D. brevisulcus*). On the other hand, the new species differs from *D. caesum* in having the eye in lateral view 1.5 times as wide as temple medially (1.0 times in *D. caesum*), paraclypeal fovea crossing halfway distance between clypeus and eye

(not crossing in *D. caesum*), the first flagellar segment 3.0 times as long as their maximum width (5.0 times in *D. caesum*), and the first metasomal tergite 2.0 times as long as its apical width (1.5 times in *D. caesum*). Finally, this new species differs from *D. calamitosum* in having the eye in lateral view 1.5 times as wide as temple medially (1.1 times in *D. calamitosum*), paraclypeal fovea crossing halfway distance between clypeus and eye (not crossing it in *D. calamitosum*), the first flagellar segment 3.0 times as long as its maximum width (3.5-3.6 times in *D. calamitosum*), middle flagellar segments 2.0-2.7 times as long as their maximum width (1.5-1.7 times in *D. calamitosum*), and ovipositor longer than metasoma (as long as metasoma in *D. calamitosum*).

***Dinotrema katbergense* Peris-Felipo, sp. nov.**
(figures 3, 4)

Etymology

Named after Katberg, the type locality of new species.



Figure 4. *Dinotrema katbergense* sp. nov. (female). A. Mesosoma and head, lateral view. B. Mesonotum, dorsal view. C. Propodeum and first metasomal tergite, dorsal view. D. Hind leg, metasoma and ovipositor. E. Fore wing.

Description

Female

Head - In dorsal view, 1.8 times as wide as long, 1.4 times as wide as mesoscutum, smooth, with temple rounded behind eyes. Eye in lateral view 1.4 times as high as wide and 1.8 times as wide as temple medially. POL 0.9 times OD; OOL 2.5 times OD. Face 1.6 times as wide as high, completely covered by numerous setae; inner margins of eyes subparallel. Clypeus 2.3 times as wide as high, slightly curved ventrally. Paraclypeal fovea long, crossing halfway distance between clypeus and eye but far not reaching margin of eye. Mandible 3-dentate, not widened towards apex, 1.3 times as long as its maximum width. Upper tooth shorter than lower and middle teeth; middle tooth small, weakly longer than upper tooth, wide basally and pointed apically; lower tooth wide and rounded. Antennae 21-segmented, 1.2 times as long as body. Scape 2.0 times as long as pedicel. First flagellar segment 3.6 times as long as its apical width, 1.3 times as long as second segment. Second to eighth flagellar segment 2.6 times as long as their

maximum width, 9th to 11th segments 2.4 times, 12th to 15th segments 2.2 times, 16th to 18th segments 2.0 times, and 19th (apical) segment 3.0 times as long as their width accordingly.

Mesosoma - In lateral view, 1.1 times as long as high. Mesoscutum (dorsal view) about as long as its maximum width, smooth, with long setae on middle part. Notauli mainly absent on horizontal surface of mesoscutum. Mesoscutal pit present and oval. Prescutellar depression smooth, with lateral carinae. Precoxal sulcus present, crenulate, not reaching anterior and posterior margins of mesopleuron. Posterior mesopleural furrow smooth. Propodeum completely sculptured with distinct median longitudinal carina. Propodeal spiracles relatively small.

Wings - Length of fore wing 2.5 times its maximum width. Radial (marginal) cell ending on apex of wing, 3.9 times as long as its maximum width. Vein r2 (3-SR) 2.5 times as long as vein cuq1 (2-SR); vein r3 (SR1) 2.2 times as long as vein r2 (3-SR). Nervulus (cu-a) distinctly postfurcal. Brachial (subdiscal) cell closed distally,



Figure 5. *Dinotrema trastoae* sp. nov. (A, C-F female; B male). A, B. Habitus, lateral view. C. Mandible. D. Antenna. E. Head, frontal view. F. Head, dorsal view.

2.8 times as long as its maximum width. Hind wing 5.8 times as long as its maximum width.

Legs - Hind femur 4.0 times as long as its maximum width. Hind tibia weakly widened towards apex, 8.8 times as long as its maximum subapical width, about as long as hind tarsus. First segment of hind tarsus 1.6 times as long as second segment.

Metasoma - First tergite weakly widened towards apex, 2.4 times as long as its apical width, entirely striate. Ovipositor 2.0 times as long as first tergite, 0.6 times as long as metasoma, 1.3 times as long as hind femur, 0.3 times as long as fore wing.

Colour - Body dark brown, scape and pedicel of antenna and legs yellowish brown. Wings hyaline. Pterostigma brown.

Length - Body 1.9 mm; fore wing 2.1 mm; hind wing 1.7 mm.

M a l e

Body length 2.2 mm; fore wing length 2.1 mm; hind wing length 1.6 mm. Antenna 21-segmented. Otherwise similar to female.

Type material

Holotype: 1 female, South Africa, E. Cape Prov., Katberg, 4000 ft, xii.1932 (R.E. Turner leg.) [B.M. 1933-69] (BMNH). Paratypes: 2 males, same locality as holotype, but x.1932 [B.M. 1932-521] (BMNH) and 1-13.xi.1932 [B.M. 1932-551] (ZISP).

Comparative diagnosis

According to the key by Peris-Felipo *et al.* (2014a), this new species is similar to the Palearctic *D. acompressum* Munk et Peris-Felipo 2014 and *D. converginerve* (Fischer 1973). *Dinotrema katbergense* sp. nov. differs from *D. acompressum* in having the eye in lateral view 1.8 times as wide as temple medially (1.2 times in *D. acompressum*), paraclypeal fovea crossing halfway distance between clypeus and eye (not crossing in *D. acompressum*), first flagellar segment 3.6 times as long as its maximum width (3.0 times in *D. acompressum*), middle flagellar segments 2.4 times as long as their maximum width (1.4-1.5 times in *D. acompressum*), hind femur 4.0 times as long as its maximum width (3.5 times in *D. acompressum*), and the first metasomal tergite 2.4

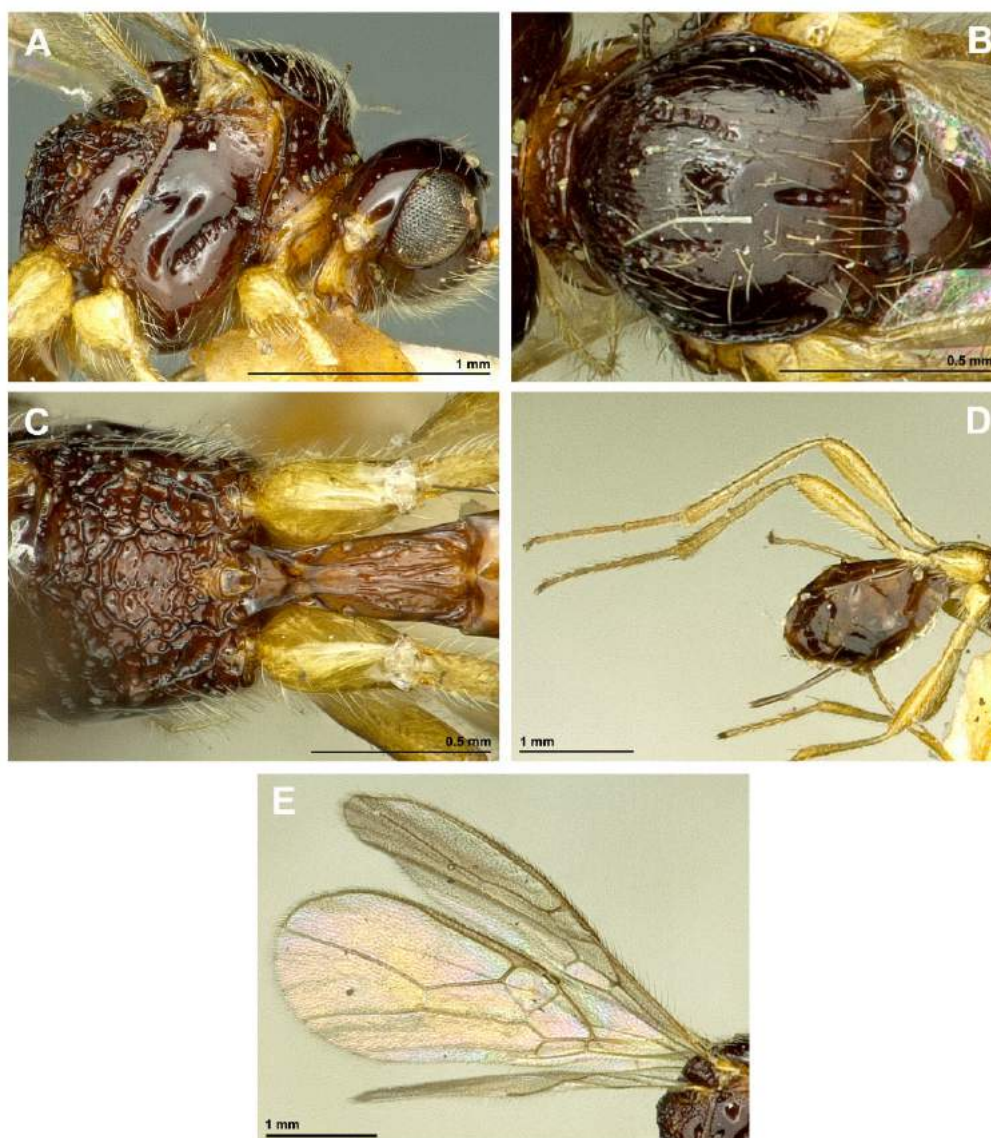


Figure 6. *Dinotrema trastoae* sp. nov. (female). A. Mesosoma and head, lateral view. B. Mesonotum, dorsal view. C. Propodeum and first metasomal tergite, dorsal view. D. Hind leg, metasoma and ovipositor. E. Fore wing.

times as long as its apical width (2.1 times in *D. acompressum*). This new species is also similar to *D. converginerve* but differs from it in having the eye in lateral view 1.8 times as wide as temple medially (1.2 times in *D. converginerve*), mandible 1.3 times as long as its maximum width (1.6 times in *D. converginerve*), middle flagellar segments 2.4 times as long as their maximum width (1.7-1.8 times in *D. converginerve*), and hind femur 4.0 times as long as its maximum width (3.7 times in *D. converginerve*).

Differences of *D. katbergense* sp. nov. from other Afrotropical species are shown in the key below.

***Dinotrema trastoae* Peris-Felipo, sp. nov.**
(figures 5, 6)

Etymology

Named in honour of Noelia Barrachina “Trasto” for her effort during the study.

Description

Female

Head - in dorsal view twice as wide as long, 1.4 times as wide as mesoscutum, smooth, with temple rounded behind eyes. Eye in lateral view 1.4 times as high as wide and 1.3 times as wide as temple medially. POL 1.1 times OD; OOL 3.3 times OD. Face 1.9 times as wide as high, completely covered by numerous setae; inner margins of eyes subparallel. Clypeus 2.3 times as wide as high, slightly curved ventrally. Paraclypeal fovea short, not reaching halfway distance between clypeus and eye. Mandible 3-dentate, widened towards apex, 1.2 times as long as its maximum width. Upper tooth longer than lower and middle teeth; middle tooth small, wide basally and pointed apically; lower tooth short, wide, rounded. Antennae 19-segmented, 0.7 times as long as body. Scape 2.0 times as long as pedicel. First flagellar segment 2.8 times as long as its apical width, 1.3 times as long as second segment; second segment 2.0 times as long as its maximum width. Third to seventh flagellar

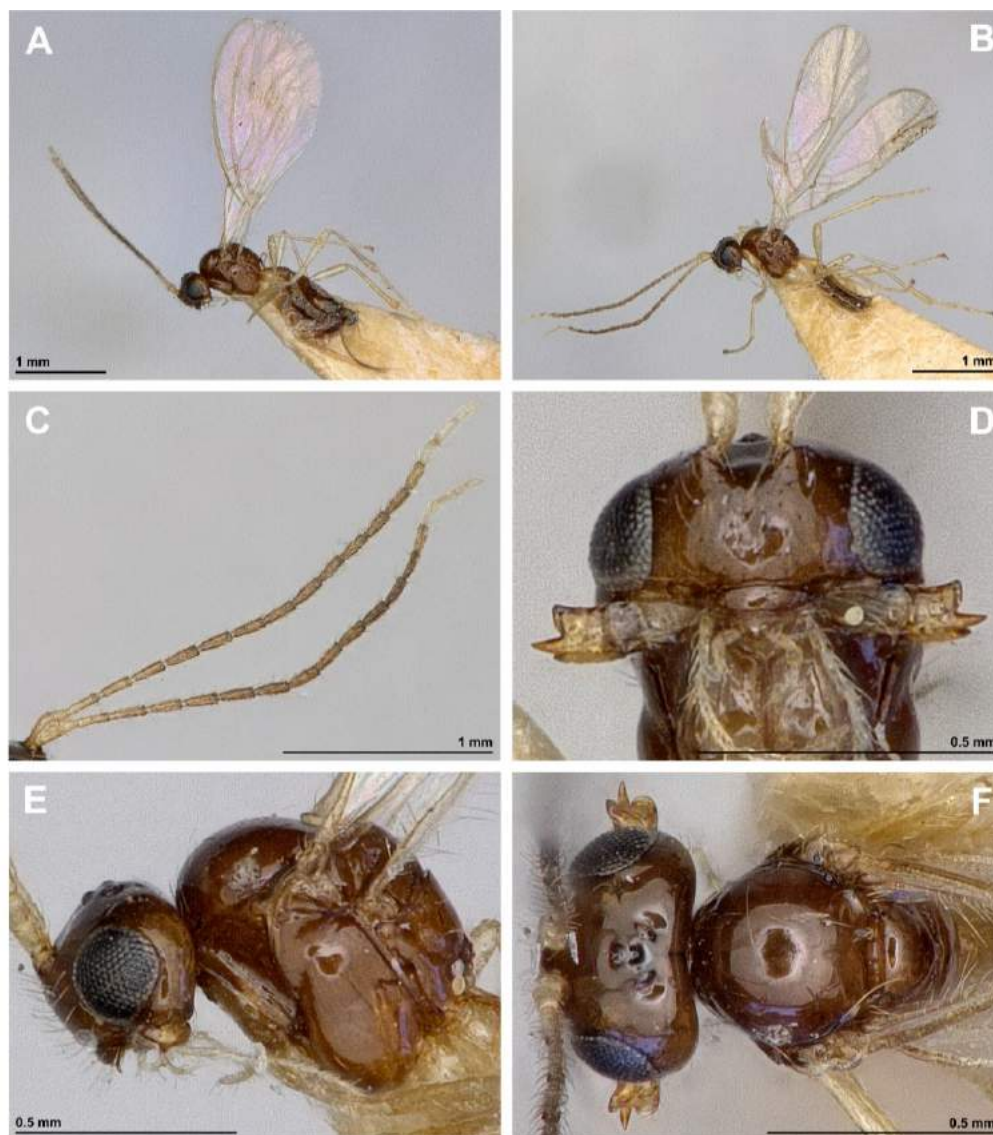


Figure 7. *Dinotrema propetauricum* Fischer (A, C-F holotype, female; B male). A, B. Habitus, lateral view. C. Antenna. D. Head, frontal view. E. Mesosoma and head, lateral view. F. Head, mandible and mesonotum, dorsal view.

segments 1.7-1.9 times, 8th to 13th segments 1.5-1.6 times, 14th to 16th segments 2.0 times, and 17th (apical) segment 2.7 times as long as their width accordingly.

Mesosoma - In lateral view, 1.2 times as long as high. Mesoscutum (dorsal view) as long as its maximum width, with numerous setae. Notauli present on horizontal surface of mesoscutum but not reaching mesoscutal pit. Mesoscutum pit present and elongate. Prescutellar depression smooth, with median and lateral carinae. Precoxal sulcus present, crenulate, reaching anterior margin of mesopleuron. Posterior mesopleural furrow crenulate. Propodeum completely sculptured, without distinct median longitudinal carina. Propodeal spiracles relatively small.

Wings - Length of fore wing 2.9 times its maximum width. Radial (marginal) cell ending on apex of wing, 3.4 times as long as its maximum width. Vein r2 (3-SR) 1.9 times as long as vein cuq1 (2-SR); vein r3 (SR1) 2.0 times as long as vein r2 (3-SR). Nervulus (cu-a) distinctly postfurcal. Brachial (subdiscal) cell closed distally, 3.3 times as long as its maximum width. Hind

wing 6.4 times as long as its maximum width.

Legs - Hind femur 4.0 times as long as its maximum width. Hind tibia weakly widened towards apex, 9.0 times as long as its maximum subapical width, 0.9 times as long as hind tarsus. First segment of hind tarsus 2.0 times as long as second segment.

Metasoma - First tergite weakly widened towards apex, 2.3 times as long as its apical width, striate. Ovipositor 1.4 times as long as first tergite, 0.4 times as long as metasoma, 0.9 times as long as hind femur, 0.2 times as long as fore wing.

Colour - Body, antenna and pterostigma dark brown. Legs yellowish brown. Wings hyaline.

Length - Body 2.4 mm; fore wing 2.8 mm; hind wing 2.2 mm.

Variation - Body 2.3-2.4 mm; fore wing 2.7-2.8 mm. Antenna 19-20-segmented.

Male

Body length 2.4-2.5 mm; fore wing 2.2-2.3 mm; hind wing 1.8 mm. Antenna 18-segmented. First flagellar



Figure 8. *Dinotrema propetauricum* Fischer (holotype, female). A. Propodeum, dorsal view. B. First metasomal tergite, dorsal view. C. Hind leg, metasoma and ovipositor. D. Fore wing.

segment 2.6 times as long as its maximum width. Otherwise similar to female.

Type material

Holotype: female, South Africa, Katberg, 4000 ft, xii.1932 (R.E. Turner leg.) [B.M. 1933-69] (BMNH). Paratypes: 1 female, 1 male, same data as in holotype (BMNH; ZISP); 1 female, South Africa, Zululand, Eshowe, vi.1926 (R.E. Turner leg.) [B.M. 1926-277] (BMNH); 1 male, South Africa, Port St. John, Pondoland, 15-31.viii.1923 (R.E. Turner leg.) [B.M. 1923-462] (BMNH).

Comparative diagnosis

According to the key by Peris-Felipo *et al.* (2014a), this new species is similar to the Palearctic *D. concinnum* (Haliday 1838) and *D. perlustrandum* (Fischer 1973). *Dinotrema trastoae* sp. nov. differs from *D. concinnum* in having the eye in lateral view 1.3 times as wide as temple medially (0.7 times in *D. concinnum*), paraclypeal fovea short and not reaching the halfway distance between clypeus and eye (reaching it in *D. concinnum*), notauli present on horizontal surface of mesoscutum but not reaching mesoscutal pit (absent here in *D. concinnum*), precoxal sulcus reaching anterior margin of mesopleuron (not reaching in *D. concinnum*), and hind femur 4.0 times as long as its maximum width (3.7 times in *D. concinnum*). Also this new species differs from *D. perlustrandum* in having the paraclypeal fovea short and not reaching the halfway distance between clypeus and eye (reaching it in *D. perlustrandum*), mesoscutal pit elongate (rounded in *D. perlustrandum*), notauli present on horizontal surface of mesoscutum but not reaching mesoscutal pit (absent in

D. perlustrandum), precoxal sulcus reaching anterior margin of mesopleuron (not reaching in *D. perlustrandum*), posterior mesopleural furrow crenulate (smooth in *D. perlustrandum*), and hind femur 4.0 times as long as its maximum width (3.6 times in *D. perlustrandum*).

Differences of *D. trastoae* sp. nov. from other Afro-tropical species are shown in the key below.

Dinotrema propetauricum Fischer 2009

(figures 7, 8)

Dinotrema propetauricum Fischer 2009: 112; Yu *et al.*, 2012.

Material examined

1 female (holotype), South Africa, Knysna, Storms River, C.P. Forest, 13.xiii.1964 (Haeselbarth leg.) (NHMW); 1 female (paratype), South Africa, Sothbroom, Natal, 3-4.xii.1963 (Haeselbarth leg.) (NHMW); 1 male (paratype), South Africa, Knysna, Deepwalls Forest, 450m, 9.xii.1964 (Haeselbarth leg.) (NHMW); 9 females, South Africa, Port St. John, Pondoland, xii.1923 (R.E. Turner leg.) [B.M. 1924-54] (BMNH, ZISP); 4 females, same locality, but i.1924 [1924-97] (BMNH); 1 female, South Africa, E. Cape Province, Katberg, 1-13.ix.1932 (R.E. Turner leg.) [B.M. 1932-551] (BMNH).

Comparative diagnosis

Dinotrema propetauricum Fischer 2009 is similar to *D. nonareolatum* Fischer 2009, but differs from it in having the head in dorsal view 2.0 times as wide as long (1.7 times in *D. nonareolatum*), eye in lateral view 2.5 times as wide as temple medially (1.2 times in *D. nonareolatum*), the first flagellar segment 4.4-5.0 times as long as its maximum width (3.0 times in *D. nonareola-*

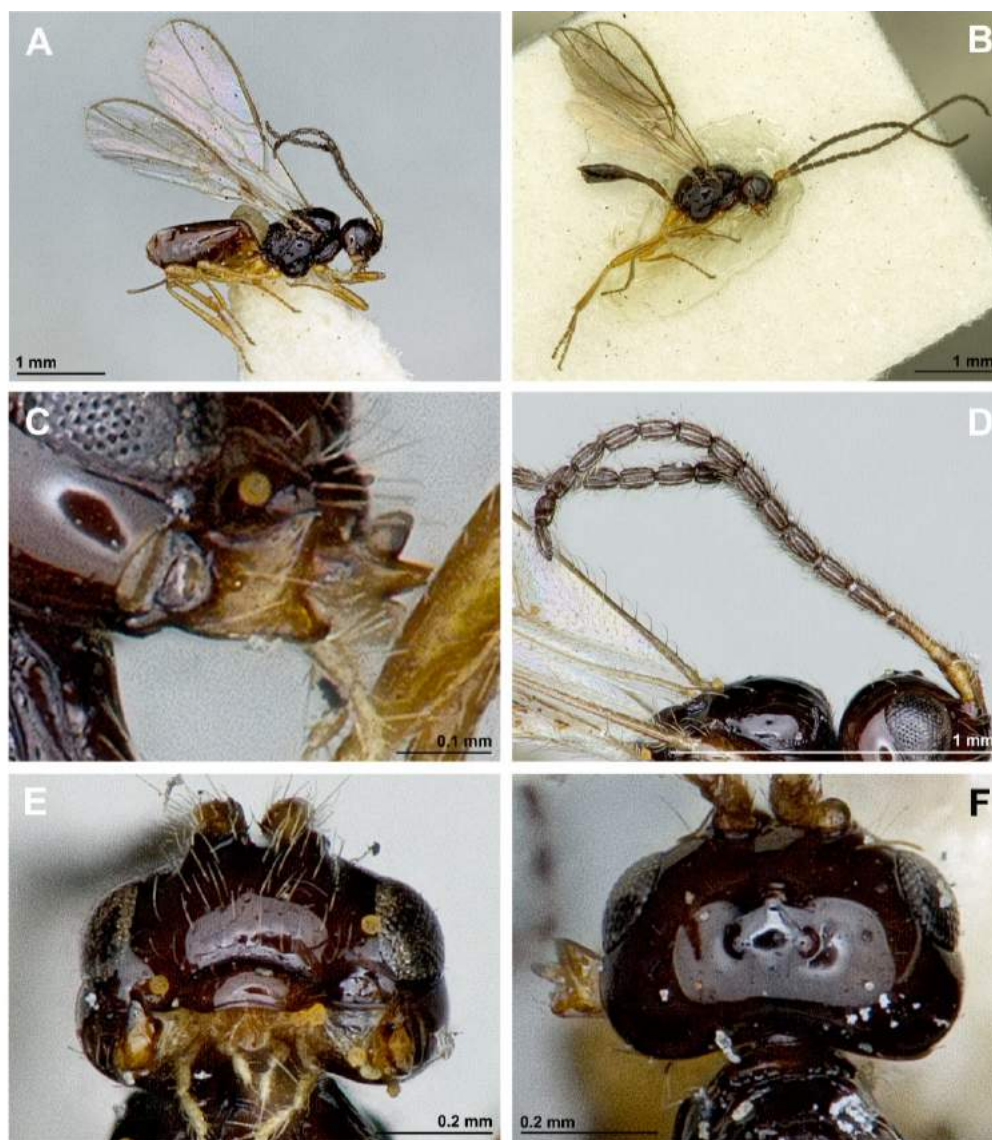


Figure 9. *Dinotrema soutpansbergense* Fischer (A, C-F holotype, female; B male). A, B. Habitus, lateral view. C. Mandible. D. Antenna. E. Head, frontal view. F. Head, dorsal view.

tum), middle flagellar segments 3.7-4.0 times as long as their maximum width (2.0 times in *D. nonareolatum*), and the first metasomal tergite 1.6 times as long as its apical width (3.0 times in *D. nonareolatum*).

According to the key by Peris-Felipo *et al.* (2014a), this new species is similar to the Palearctic *D. sylvestre* Tobias 2003, but differs from it having the eye in lateral view 2.5 times as wide as temple medially (1.5 times in *D. sylvestre*), paraclypeal fovea crossing halfway distance between clypeus and eye (not crossing it in *D. sylvestre*), apical flagellar segments paler than middle segments (same colour in *D. sylvestre*), the first flagellar segment 4.5-5.0 times as long as its maximum width (3.0 times in *D. sylvestre*), middle flagellar segments 3.7-4.0 times as long as their maximum width (2.0 times in *D. sylvestre*), precoxal sulcus absent (present in *D. sylvestre*), hind femur 4.8-5.0 times as long as its maximum width (4.3 times in *D. sylvestre*), and ovipositor longer than metasoma (shorter in *D. sylvestre*).

Distribution

South Africa.

***Dinotrema soutpansbergense* Fischer 2009** (figures 9, 10)

Dinotrema soutpansbergense Fischer 2009: 116; Yu *et al.*, 2012.

Material examined

1 female (holotype), South Africa, Entabeni Forest, Soutpansberg, Tvl. 4-5000', 3-7.vi.1964 (Haeselbarth leg.) (NHMW); 7 females, 3 males, South Africa, Cape Province, Somerset East, xi.1930 (R.E. Turner leg.) [B.M. 1930-593] (BMNH, ZISP); 8 females, 1 male, same locality, but ix.1930 [B.M. 1930-480] (BMNH); 2 females, same locality, but x.1930 [1930-561] (B.M. 1930-561) (BMNH); 1 male, same locality, but 15-31.viii.1923 [B.M. 1923-403] (BMNH); 1 female, same locality, but 27-31.i.1931 [B.M. 1931-102]



Figure 10. *Dinotrema soutpansbergense* Fischer (holotype, female). A. Mesosoma and head, lateral view. B. Mesonotum, dorsal view. C. Propodeum and first metasomal tergite, dorsal view. D. Hind leg, metasoma and ovipositor. E. Fore wing.

(BMNH); 1 female, South Africa, E. Cape Province, Katberg, 4000 ft, xii.1932 (R.E. Turner leg.) [1933-69] (BMNH); 2 females, 2 males, South Africa, Natal, Van Reener, Drakensberg, 1-22.i.1927 (R.E. Turner leg.) [B.M. 1927-54] (BMNH); 1 male, South Africa, Orange F. State, Harrismith, 1-20.iii.1927 (R.E. Turner leg.) [B.M. 1927-147] (BMNH); 1 male, South Africa, Mossel Bay, Cape Province, 1-14.xi.1921 [B.M. 1921-476] (BMNH); 1 female, South Africa, False Bay, 2 m, 3.i.1972 [Southern African Exp. B.M. 1972-1] (BMNH).

Comparative diagnosis

This species is similar to *Dinotrema austroafricaense* sp. nov.; differences between these species are showed in the diagnosis of the last species.

According to the key by Peris-Felipo *et al.* (2014a), this new species is also similar to the Palearctic *D. partimrufum* Fischer 2009, but differs from it having the eye in lateral view as wide as temple medially (1.4 times in *D. partimrufum*), the first flagellar segment 3.0 times as long as its maximum width (4.0 times in *D. partimrufum*), middle flagellar segments 1.5 times as long as their maximum width (3.0 times in *D. partimrufum*), hind femur 4.0 times as long as its maximum width (4.5 times in *D. partimrufum*), the first metasomal tergite 2.0 times as long as its apical width (2.5 times in *D. partimrufum*), and ovipositor shorter than metasoma (longer in *D. partimrufum*).

Distribution

South Africa.

Key to the Afrotropical species of *Dinotrema*
(According to the key system by Peris-Felipo *et al.*, 2014b)

- 1 - Propodeum entirely or mainly smooth, often with complete or short median carinae, sometimes additionally with short subtransverse carinae emerging from median carina, but far separated from propodeal edges 2
- - Propodeum widely or entirely sculptured, often with numerous subtransverse carinae reaching propodeal edges; sometimes additionally with complete longitudinal median carina or large and distinctly delineated areola 4
- 2(1) - Propodeum completely smooth, without any median carina I
- - Propodeum with short or complete median carinae 3
- 3(2) - Propodeum with short median carinae, which is sometimes divergent posteriorly in two carinae II
- - Propodeum with complete median longitudinal carinae following from its base to apex III
- 4(1) - Propodeum with large pentagonal areola IV
- - Propodeum without areola 5
- 5(4) - Propodeum without complete median longitudinal carina or only with short basal carina V
- - Propodeum with complete and distinct median longitudinal carina following from its base to apex VI

I. PROPODEUM COMPLETELY SMOOTH

- 1 - Eye in lateral view 1.2 times as wide as temple medially. Head in dorsal view 1.7 times as wide as long. First flagellar segment 3.0 times as long as its maximum width; middle segments 2.0 times as long as wide. First metasomal tergite 3.0 times as long as its apical width. Antenna 17-segmented. Body length 1.7 mm. South Africa *D. nonareolatum* Fischer
- - Eye in lateral view 2.5 times as wide as temple medially. Head in dorsal view 2.0 times as wide as long. First flagellar segment 4.4-5.0 times as long as its maximum width; middle segments 3.7-4.0 times as long as wide. First metasomal tergite 1.6 times as long as its apical width. Antenna 16-17-segmented. Body length 1.4-1.5 mm. South Africa *D. propetauricum* Fischer

III. PROPODEUM MAINLY OR WIDELY SMOOTH AND WITH COMPLETE MEDIAN LONGITUDINAL CARINA

- 1 - Mesoscutal pit present and elongate. Eye in lateral view as wide as temple medially. Mandible as long as its maximum width. Middle flagellar segments 2.0-2.7 times as long as its maximum width. Antenna 19-21-segmented. Body length 1.5-1.9 mm. South Africa *D. austroafricaense* sp. nov.
- - Mesoscutal pit absent. Eye in lateral view 1.5 times as wide as temple medially. Mandible 1.5 times as long as its maximum width. Middle flagellar segments 1.5 times as long as its maximum width. Antenna 16-22-segmented. Body length 1.6-1.9 mm. South Africa *D. soutpansbergense* Fischer

IV. PROPODEUM WIDELY OR ENTIRELY SCULPTURED AND WITH DISTINCTLY DELINEATED LARGE AREOLA

- 1 - Mesoscutal pit present and oval. Eye in lateral view 2.0 times as wide as temple medially. Mandible 1.5 times as long as its maximum width. First flagellar segment 4.0 times as long as its maximum width; middle segments 3.0 times as long as wide. Hind femur 5.0 times as long as its maximum width. First metasomal tergite 2.0 times as long as its apical width. Antenna 17-24-segmented. Body length 1.6-1.7 mm. South Africa *D. dilleri* Fischer

V. PROPODEUM WIDELY OR ENTIRELY SCULPTURED, WITHOUT AREOLA AND MEDIAN LONGITUDINAL CARINA OR ONLY WITH SHORT CARINA

- 1 - Notauli mainly present on horizontal surface of mesoscutum, but not reaching mesoscutal pit. Mesoscutal pit present and elongate. Eye in lateral view 1.3 times as wide as temple medially. Mandible 1.2 times as long as its maximum width. First flagellar segment 2.8 times as long as its maximum width; middle segments 1.5-1.6 times as long as wide. Precoxal sulcus present, reaching anterior margin of mesopleuron. Hind femur 4.0 times as long as its maximum width. First metasomal tergite 2.3 times as long as its apical width. Antenna 18-20-segmented. Body length 2.3-2.5 mm. South Africa *D. trastoae* sp. nov.

VI. PROPODEUM MAINLY SCULPTURED AND WITH COMPLETE MEDIAN LONGITUDINAL CARINA

- 1 - Mesoscutal pit present and oval. Eye in lateral view 1.8 times as wide as temple medially. Mandible 1.3 times as long as its maximum width. First flagellar segment 3.6 times as long as its maximum width; middle segments 2.4 times as long as wide. Hind femur 4.0 times as long as its maximum width. First metasomal tergite 2.4 times as long as its apical width. Antenna 21-segmented. Body length 1.9-2.2 mm. South Africa *D. katbergense* sp. nov.

Until now any species belonging to the group II is not recorded from Afrotropical region.

Discussion

The worldwide genus *Dinotrema* with approximately 350 described species (Yu *et al.*, 2012; Peris-Felipo *et al.*, 2016) seems comparatively poor in the Afrotropical region with only seven known species, *D. dilleri* Fischer 2009, *D. katbergense* sp. nov., *D. nonareolatum* Fischer 2009, *D. propetauricum* Fischer 2009, *D. austroafricaense* sp. nov., *D. soutpansbergense* Fischer 2009, and

D. trastoae sp. nov. Furthermore, analysis of distribution on these species showed that all of them were collected from the South Africa and even at only seven localities in the eastern and southern parts (figure 11). We consider that additional studies on the Afrotropical region are required to increase our knowledge about real composition and diversity of the genus *Dinotrema* as well as provide the background for applicability of these parasitoids in further biological control programs.



Figure 11. Distribution of all the Afrotropical species of *Dinotrema*. The colours and size of the circles indicate the number of examined specimens; the number inside the circles indicate the number of species recorded in the territories (Copyright of map: Iziko Museums of South Africa and Google Earth).

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