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

Francisco Javier PERIS-FELIPO¹, Sergey A. BELOKOBYLSKIJ²,³

¹Basel, Switzerland  
²Zoological Institute Russian Academy of Sciences, St. Petersburg, Russia  
³Museum and Institute of Zoology Polish Academy of Sciences, Warszawa, Poland

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 Afrotopical, Australsian, 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), Naturhistorishes 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 long, crossing halfway distance between clypeus and eye. Mandibles small, simple, tridentate. Paraclypeal fovea short, far not reaching ventral edge of eyes. Veins 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 Platypezidae.

**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

**F e m a l e**

*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. Scapa 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 maxim-
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.

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. Mesocutal 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 distally, 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.

- 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 females, 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. soutpansbergensis Fischer 2009, but differs from it in having the mesoscutal pit present and elongated (absent in D. soutpansbergensis), eye in lateral view 1.5 times as wide as temple medially (1.0 times in D. soutpansbergensis), mandible 1.1 times as long as its maximum width (1.5 times in D. soutpansbergensis), middle flagellar...
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 Palaearctic *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 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 cuql (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.


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

Male

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


Comparative diagnosis

According to the key by Peris-Felipo et al. (2014a), this new species is similar to the Palaearctic D. acompressum Munk et Peris-Felipo 2014 and D. convergerve (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
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.

---

**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.

**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
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 mesocutal 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**

**Comparative diagnosis**
According to the key by Peris-Felipo et al. (2014a), this new species is similar to the Paleaeartic *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 (3.6 times in *D. perlustrandum*).

**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); 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-
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 Palaearctic *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)


**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]

According to the key by Peris-Felipo et al. (2014a), this new species is also similar to the Palaearctic *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*).

**Comparative diagnosis**

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

**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 ........................................................................................................ V
5(4) - Propodeum without complete median longitudinal carina or only with short basal carina remove ........ VI
   -- Propodeum with complete and distinct median longitudinal carina following from its base to apex ................................................................. 

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. austroatricaense 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. austroatricaense 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).

**Acknowledgements**

We are very thankful to Gavin Broad, Senior Curator of Natural History Museum of London, for his kindness during our stay in London. Also, we want to thank Dominique Zimmermann and Maximilian Fischer, Naturhistorisches Museum Wien, Austria, for their gentleness and the supplied facilities during our stay in Vienna. Finally, we want to thank Isabelle Zuecker and Daniel Burckhardt, Naturhistorisches Museum Basel, Switzerland, and Hannes Bauer, Naturhistorisches Museum Bern, Switzerland, for their kindness and help during our work with photosystems in the Museums. The present work was supported for the last author by grants given by the Russian Foundation for Basic Research (projects No. 16-04-00197) and the Russian State Research Project No. 01201351189.

**References**


TOBIAS V. I., 2003.- Species of the genus *Dinotrema* Foerster, 1862 (Hymenoptera, Braconidae, Alysiinae) without prescutellar pit and with smooth or only medially sculptured propodeum from Russia and adjacent territories.- *Entomological Review*, 83 (3): 279-294.

TOBIAS V. I., 2004a.- Species of the genus *Dinotrema* Foerster (Hymenoptera, Braconidae, Alysiinae) without prescutellar pit and with a widely sculptured propodeum and short mandibles from Russia and neighboring territories.- *Entomological Review*, 84 (2): 216-232.


**Authors’ addresses:** Francisco Javier Peris-Felipo (corresponding author, peris.felipo@gmail.com), Bleichestrasse 15, CH–4058 Basel, Switzerland; Sergey A. Belokobylskij, Zoological Institute Russian Academy of Sciences, St. Petersburg 199034, Russia; Museum and Institute of Zoology Polish Academy of Sciences, Wilcza 64, Warszawa 00-679, Poland.

Received November 27, 2015. Accepted February 17, 2016.