

## Revision of the Afrotropical species of *Deinodryinus* Perkins, 1907 (Hymenoptera: Dryinidae), with description of a new species from Madagascar

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### ABSTRACT

The Afrotropical species of *Deinodryinus* Perkins, 1907 are revised and in part redescribed. A new species, *D. softensis*, is described from Sofia District, Mahajanga Province, Madagascar. A new key to the females and males of the Afrotropical species of *Deinodryinus* is presented.

KEY WORDS Afrotropical Region, Mahajanga Province, Madagascar, Hymenoptera, Chrysidoidea, Dryinidae, Anteoninae, *Deinodryinus*, new species, identification key.

### INTRODUCTION

The Dryinidae (Hymenoptera: Chrysidoidea) are parasitoids of auchenorrhynchan Hemiptera (Guglielmino & Bückle 2003, 2010; Guglielmino *et al.* 2006, 2013; Guglielmino & Olmi 1997, 2006, 2007; Guglielmino *et al.* 2013; Guglielmino & Virla 1998; Mangione & Virla 2004; Virla & Mangione 2000).

Among the Dryinidae, the genus *Deinodryinus* Perkins, 1907 (Anteoninae) is one of the most interesting from a biological perspective. Species of *Deinodryinus* are known to parasitise hosts belonging to the Cicadellidae (Guglielmino & Olmi 2006, 2007). They form a typical larval cyst (=thylacium) situated dorsally between the head and pronotum (Fig. 39).

*Deinodryinus* is a cosmopolitan genus originally proposed for one species, *D. paradoxus* Perkins, 1907, inhabiting Arizona (USA). Since then, around 154 species have been described from all continents (Xu *et al.* 2013) and the genus revised by Olmi (1984). In recent years many new species have been described and a new monograph of world species is now needed.

Species of Afrotropical *Deinodryinus* were studied mainly by Olmi (1984, 1987b, 1991, 1994, 1998, 2004, 2006, 2007, 2009, 2010). In recent years we have examined specimens of Madagascan *Deinodryinus* and found a new species, described herein.

### MATERIAL AND METHODS

The descriptions follow the terminology used by Olmi (1984), Olmi and Guglielmino (2010) and Xu *et al.* (2011, 2012, 2013). The terms used to define each type of sculpture are those proposed by Olmi (1984). The measurements reported are relative, except for the total length (head to abdominal tip, without the antennae), which is expressed in millimetres.

In the descriptions, POL is the distance between the inner edges of the lateral ocelli; OL – between the inner edges of a lateral ocellus and the median ocellus; OOL – from the outer edge of a lateral ocellus to the compound eye; OPL – from the posterior edge of a lateral ocellus to the occipital carina, and TL – from the posterior edge of an eye to the occipital carina.

In figures, male genitalia usually have the right half removed.

The types of all Afrotropical *Deinodryinus* species were examined as part of the revision. The material studied in this paper are deposited in the following collections:

- AMNH – American Museum of Natural History, New York, USA;  
 BMNH – The Natural History Museum, London, UK;  
 CAS – California Academy of Sciences, San Francisco, California, USA;  
 CNC – Canadian National Collection of Insects, Ottawa, Canada;  
 DETAM – Department of Entomology, Texas A&M University, College Station, Texas, USA;  
 FAG – Faculté des Sciences Agronomiques de l'État, Gembloux, Belgium;  
 MNHN – Muséum national d'Histoire naturelle, Paris, France;  
 OLM – Department of Plant Protection, University of Tuscia, Viterbo, Italy (Massimo Olmi's collection);  
 MRAC – Musée royal de l'Afrique centrale, Tervuren, Belgium;  
 SANC – South African National Collection of Insects, Pretoria, South Africa;  
 NMNW – Namibian National Insect Collection, Windhoek, Namibia;  
 SAMC – Iziko South African Museum, Cape Town, South Africa;  
 USNM – National Museum of Natural History, Smithsonian Institution, Washington, DC, USA;  
 MZLU – Lund Museum of Zoology, Lund, Sweden.

#### TAXONOMY

Family Dryinidae Haliday, 1833

Subfamily Anteoninae Perkins, 1912

Genus *Deinodryinus* Perkins, 1907

*Deinodryinus* Perkins, 1907: 45; Kieffer 1914: 138; Olmi 1984: 118; Olmi 1999: 96; He & Xu 2002: 98; Virla & Olmi 2008: 369; Moya-Raygoza & Olmi 2010: 91; Olmi *et al.* 2010: 30; Xu *et al.* 2013: 201.

*Trisanteon* Kieffer, 1913: 300 (synonymized by Olmi 1984); type species: *Trisanteon hirticornis* (Kieffer, 1911), by monotypy and original designation; Kieffer 1914: 196.

*Electrodryinus* Ponomarenko, 1975: 126 (synonymized by Olmi 1984); type species: *Electrodryinus areolatus* Ponomarenko, 1975, by monotypy.

*Prioranteon* Olmi, 1984: 589 (synonymized by Olmi 2007); type species: *Prioranteon casalei* Olmi, 1984, by original designation; Olmi 1999: 148.

Type species: *Deinodryinus paradoxus* Perkins, 1907, designated by Muesebeck and Walkley 1951.

Diagnosis: *Female*: macropterous, or micropterous; palpal formula 6/3; occipital carina complete; vertex of head frequently with two strong oblique keels connecting posterior ocelli to occipital carina; pronotum with distinct anterior collar and posterior disc; in macropterous females, forewing usually with distal part of stigmal vein longer than proximal part, less frequently as long as, or shorter than proximal part; enlarged claw with inner proximal prominence not bearing bristles, with 1–2 bristles or peg-

like hairs located further distally than proximal prominence; tibial spurs 1/1/2. *Male*: always macropterous (even with female micropterous); palpal formula 6/3; vertex of head frequently with two strong oblique keels connecting posterior ocelli to occipital carina; antennal hairs usually much longer than breadth of segments, less frequently shorter than breadth of segments; fore wing usually with distal part of stigmal vein longer than proximal part, less frequently as long as, or shorter than proximal part; fore wing pterostigma commonly four or more times as long as broad; paramere without dorsal process, usually with one, more or less large, inner branch wrapping the penis, less frequently with one reduced inner branch; tibial spurs 1/1/2.

Distribution: Worldwide.

Hosts: Cicadellidae (Guglielmino *et al.* 2013).

World species: Presently with 155 known species (Olm & Virla 2014), of which 23 are from the Afrotropical Region.

Remarks: Fossil species of *Deinodryinus* were described by Ponomarenko (1975), Olmi *et al.* (2010), and Guglielmino and Olmi (2011).

Key to the Afrotropical species of *Deinodryinus*  
Females (species with females unknown are absent)

- |   |                                                                                                                                                                                                                            |                                  |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 1 | Micropterous (Figs 40, 41).....                                                                                                                                                                                            | 2                                |
| – | Macropterous.....                                                                                                                                                                                                          | 6                                |
| 2 | Posterior surface of propodeum transversely striate .....                                                                                                                                                                  | <b><i>richardsi</i></b> (Olm)    |
| – | Posterior surface of propodeum reticulate rugose, not transversely striate.....                                                                                                                                            | 3                                |
| 3 | Anterior surface of propodeum shiny, smooth, unsculptured .....                                                                                                                                                            | <b><i>casalei</i></b> (Olm)      |
| – | Anterior surface of propodeum reticulate rugose or granulated .....                                                                                                                                                        | 4                                |
| 4 | Anterior surface of propodeum granulated .....                                                                                                                                                                             | <b><i>capensis</i></b> Olmi      |
| – | Anterior surface of propodeum reticulate rugose.....                                                                                                                                                                       | 5                                |
| 5 | Mesosoma completely yellow-testaceous; enlarged claw with one peg-like lamella (Fig. 21).....                                                                                                                              | <b><i>paulyi</i></b> (Olm)       |
| – | Mesosoma mostly black or almost completely black; enlarged claw with two bristles (Fig. 23).....                                                                                                                           | <b><i>prinslooii</i></b> (Olm)   |
| 6 | Posterior surface of pronotum with sharp lateral margins (Figs 5, 6).....                                                                                                                                                  | 7                                |
| – | Posterior surface of pronotum with rounded lateral margins .....                                                                                                                                                           | 10                               |
| 7 | Pronotum with strong constriction between prothorax and mesothorax (Fig. 5); face sculptured by three median longitudinal keels (frontal line and two lateral keels running from posterior ocelli to antennal toruli)..... | <b><i>guineensis</i></b> Olmi    |
| – | Pronotum without strong constriction between prothorax and mesothorax (Fig. 9); face with only one complete or incomplete frontal line, without lateral keels .....                                                        | 8                                |
| 8 | Head strongly punctate, unsculptured among punctae, with anterior third of face rugose .....                                                                                                                               | <b><i>orangeanus</i></b> Olmi    |
| – | Head completely reticulate rugose, or at most with vertex not reticulate rugose ...                                                                                                                                        | 9                                |
| 9 | Notauli reaching approximately 0.65× length of scutum; head completely reticulate rugose .....                                                                                                                             | <b><i>insulanus</i></b> (Benoit) |

- Notauli reaching approximately 0.90× length of scutum; head with face completely reticulate rugose except for vertex which is punctate and unsculptured among punctae .....*pulcher* Olmi
- 10 Antennal segment 3 approximately twice as long as segment 2; segment 5 of protarsus bearing small lamellae, some of which longer than others (Fig. 16) .....*madecassus* (Benoit)
- Antennal segment 3 about three or more times as long as segment 2..... 11
- 11 Segment 5 of protarsus bearing lamellae of approximately same length (Fig. 1); species mostly black.....*benoiti* Olmi
- Segment 5 of protarsus bearing small lamellae, some of which longer than others (Fig. 15); species mostly testaceous-reddish.....*madagascariensis* (Benoit)

Males (species with males unknown are absent)

- 1 Propodeum with transverse keel between dorsal and posterior surface (Figs 25, 31) .....2
- Propodeum without transverse keel between dorsal and posterior surface.....6
- 2 Paramere much shorter than penis (Fig. 19) ..... *namorokensis* Olmi
- Paramere about as long as penis (Figs 18, 26, 32, 38).....3
- 3 Dorsal surface of propodeum much reduced; keel between dorsal and posterior surface of propodeum situated quite close to anterior margin of propodeum(Fig. 25); distal part of stigmal vein slightly longer than proximal part .....*pulcher* Olmi
- Dorsal surface of propodeum distinct and large; keel between dorsal and posterior surface of propodeum situated far from anterior margin of propodeum (Fig. 31); distal part of stigmal vein much shorter than proximal part ..... 4
- 4 Posterior surface of propodeum without longitudinal keels.....*sabaesus* Olmi & Van Harten
- Posterior surface of propodeum with two complete longitudinal keels .....5
- 5 Head granulated and reticulate rugose ..... *monticolus* Olmi
- Head punctate, unsculptured among punctae ..... *umtamvunensis* Olmi
- 6 Paramere much shorter than penis (Fig. 19) ..... *namorokensis* Olmi
- Paramere about as long as penis (Figs 4, 8, 12, 17, 22, 28, 33, 34, 37) .....7
- 7 Paramere with inner proximal branch wrapping penis (Figs 4, 22); distal part of stigmal vein much shorter than proximal part.....8
- Paramere with 1–2 inner distal branches wrapping penis or not (Figs 8, 12, 17, 28, 33, 34, 37); distal part of stigmal vein longer than, or as long as proximal part.....9
- 8 Proximal inner branch of paramere narrow (Fig. 22).....*paulyi* (Olmi)
- Proximal inner branch of paramere broad (Fig. 4).....*danielssoni* Olmi
- 9 Paramere with small distal branch (Figs 12–14).....*irreptus* Olmi
- Paramere with 1–2 large distal branches (Figs 8, 17, 28–30, 33–37) ..... 10
- 10 Paramere with two distal branches wrapping penis (Figs 8, 33) and volsellae situated between these two branches ..... 11
- Paramere with one distal branch wrapping penis (Figs 17, 28–30, 34–37) ..... 12

- 11 Posterior surface of propodeum dull, reticulate rugose; inner distal branch of paramere with distal apex small (Fig. 8)..... *harinhalai* Olmi  
 – Posterior surface of propodeum rugose, with central shiny, smooth, unsculptured area; inner distal branch of paramere with distal apex notably large (Fig. 33).....  
 ..... *sofiensis* Olmi, sp. n.
- 12 Distal branch of paramere wrapping penis hatchet blade shaped (Fig. 17) .....  
 ..... *madecassus* (Benoit)  
 – Distal branch of paramere wrapping penis not hatchet blade shaped (Figs 28–30, 34–37)..... 13
- 13 Head shiny, quite finely punctate; inner side of paramere not sculptured by papillae (Fig. 37)..... *suavis* Olmi  
 – Head strongly punctate, with punctae large, deep and similar to areolae; inner side of paramere broadly sculptured by papillae (Figs 28–30, 34)..... 14
- 14 Distal branch of paramere wrapping penis, curved, markedly long and slender (Figs 28–30)..... *rusticus* Olmi  
 – Distal branch of paramere wrapping penis not curved, short and broad (Figs 34–36) .....  
 ..... *steineri* Olmi

*Deinodryinus benoiti* Olmi, 1984

Fig. 1

*Deinodryinus benoiti* Olmi, 1984: 129; 1994: 10.

Redescription:

*Female.*

Macropterous; body length 6.6 mm. *Colour:* Head black, except mandible, clypeus and anterior region of face (mainly along orbits) testaceous; antenna testaceous, except segments 9–10 brown; mesosoma black, except margins of pronotum and distal apex of propodeum testaceous; tegula testaceous; petiole black; metasoma black, except segment 1 mostly testaceous; legs testaceous-reddish, except club distal region of fore- and hindfemur brown. Antenna filiform; antennal segments in the following proportions: 18:7:30:19:16:14:13:12:12:17. Head shiny, smooth, punctate, unsculptured among punctae; face anteriorly strongly punctate, without lateral keels; frontal line incomplete; occipital carina complete; POL=6; OL=5; OOL=12; OPL=13; TL=9. Pronotum shiny, smooth, finely punctate, with transverse keels, crossed by transverse impression separating anterior collar from posterior disc; lateral margin of posterior surface of pronotum rounded; pronotal tubercle reaching tegula. Scutum, scutellum and metanotum shiny, smooth, finely punctate, unsculptured among punctae. Notauli incomplete, reaching approximately 0.65× length of scutum. Propodeum with dorsal surface reticulate rugose, without transverse keel between dorsal and posterior surface. Forewing hyaline, with three dark transverse bands; distal part of stigmal vein longer than proximal part (18:13). Protarsal segments in the following proportions: 15:5:10:32:48. Enlarged claw (Fig. 1) with one bristle situated further distally than proximal prominence. Segment 5 of protarsus (Fig. 1) with two rows of approximately 90 lamellae (all roughly the same length); distal apex with about eight lamellae. Tibial spurs 1/1/2.

*Male.* Unknown.

Holotype (examined): ♀ MADAGASCAR: Toamasina, Périnet, 19.xii.1955, in forest, E. McC. Callan (BMNH).

Distribution: Madagascar.

Hosts: Unknown.

*Deinodryinus capensis* Olmi, 2007

Fig. 2

*Deinodryinus capensis* Olmi, 2007: 206.

Redescription:

*Female.*

Micropterous, with forewing much reduced, reaching transverse furrow behind metanotum, slightly longer than scutellum (6:5); length 3.2–4.2 mm. Holotype testaceous, with antennal segments 8–10, ocellar area, prosternum, lateral regions of pronotum, posterior half of metasoma darkened; scutum, metanotum, transverse furrow behind metanotum, posterior half of propodeum and petiole black; mesopleuron and metapleuron partly darkened; legs testaceous, except mid- and hindcoxae and club of hindfemur darkened. In two paratypes from Kogelberg Nature Reserve colour broadly darkened or black (head testaceous, except ocellar region darkened; mesosoma black, with propleuron, disc and posterior collar of pronotum, scutellum, part of mesopleuron testaceous; metasoma partly testaceous and partly darkened or brown). Antenna clavate; antennal segments in the following proportions: 7:5:15:11:10:8:7.5:7:6:9.5 (holotype), 7:3:12.5:9:7:7:6:6:5:6.5 (paratype). Head shiny, smooth, slightly granulated; occipital carina complete; frontal line absent; face with slender longitudinal furrow from anterior ocellus to clypeus; anterior region of face with tuft of long hair. Head of holotype with POL=2; OL=3; OOL=8.5; OPL=5; TL=10; greatest diameter of posterior ocelli as long as POL. Head of paratype with POL=2; OL=2; OOL=7; OPL=4.5; TL=9; greatest diameter of posterior ocelli slightly shorter than POL (1.5:2). Pronotum shiny, smooth, unsculptured, not crossed by transverse impressions, with short anterior collar; pronotal tubercle reaching tegula. Scutum much reduced, rugose. Notauli present, posteriorly joint. Scutellum and metanotum shiny, smooth, unsculptured. Propodeum dull, with strong anterior transverse and rugose furrow situated behind metanotum; anterior surface of propodeum granulated; posterior surface of propodeum reticulate rugose. Mesopleuron and metapleuron granulated, dull, with few transverse keels. Meso-metapleural suture distinct and complete. Mesopleuron with tuft of long hairs situated on sides of transverse furrow behind metanotum. Protarsal segments of holotype in following proportions: 10:2:5:13:22. Protarsal segments of paratype in following proportions: 9:2:4:10:17. Enlarged claw (Fig. 2) with two peg-like lamellae situated further distally than proximal prominence. Segment 5 of protarsus (Fig. 2) with two rows of about 23–32 lamellae; distal apex with about 4 lamellae, among which one is quite long. Tibial spurs 1/1/2.

*Male.* Unknown.

Holotype (examined): ♀ SOUTH AFRICA: *Western Cape*: Walker Bay Nature Reserve, 34°27.41'S 19°21.39'E, 29.xi–26.xii.1997, yellow pan trap, S. van Noort & B. Fisher (SAMC).

Paratypes (examined): SOUTH AFRICA: *Western Cape*: 1♀ Kogelberg Nature Reserve, 34°15'S 19°05'E, 16.xii.1999–16.i.2000, pitfall trap, S. van Noort (SAMC); 1♀ same locality, 16.iv.1999, S. van Noort (OLM).

Distribution: South Africa.

Hosts: Unknown.

*Deinodryinus casalei* (Olm, 1984)

Figs 3, 40, 41

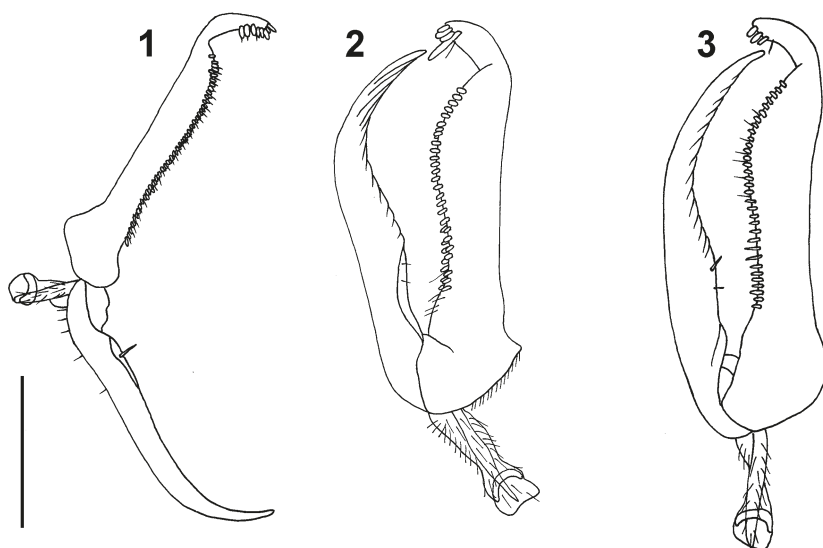
*Prioranteon casalei* Olmi, 1984: 596; 2006: 40.

*Deinodryinus casalei*: Olmi 2007: 207.

Redescription:

*Female.*

Micropterous (Figs 40, 41), with forewing much reduced, approximately as long as scutellum, reaching transverse furrow behind scutellum (Fig. 40); length 3.2–4.0 mm. Head black, except mandible testaceous and gena, clypeus and frontal longitudinal median area yellowish (occasionally only anterior margin of face near clypeus yellowish); antenna brown, except segments 1–2 partly testaceous; mesosoma black, except posterior collar and lateral margins of pronotum testaceous; tegula testaceous; metasoma brown-reddish; legs brown, except trochanters, articulations and tarsi testaceous. Antenna clavate; antennal segments in the following proportions: 8:5:13:9:8:7:5:6:5:9. Head shiny, slightly punctate, unsculptured among punctae; mandible with four teeth progressing larger from anterior one to posterior; occipital carina complete; face usually with long longitudinal median furrow from anterior ocellus to clypeus (occasionally furrow reduced to small impression); POL=3.5; OOL=9; OPL=5; TL=8. Pronotum shiny, smooth, with sides finely punctate; anterior disc of pronotum overly long and humped; posterior transverse impression separating disc from posterior collar narrower than disc; posterior margin of collar almost straight, reaching tegulae, without posterior lobes directed towards tegulae. Scutum hollow, rugose, much reduced, approximately as



Figs 1–3. (1) *Deinodryinus benoiti* Olmi, holotype – chela; (2) *D. capensis* Olmi, holotype – chela; (3) *D. casalei* (Olm), holotype – chela. Scale bar = (1) 0.28 mm; (2, 3) 0.14 mm.

long as posterior collar of pronotum. Scutellum shiny, smooth, humped, unsculptured, approximately as long and as broad as scutum. Metanotum not visible. Metathorax + propodeum humped, separated from scutellum by transverse hollow impression, transversely carinate; anterior surface of metathorax + propodeum shiny, smooth, unsculptured; posterior surface of metathorax + propodeum dull, reticulate rugose. Meso-metapleural suture distinct, strong, complete. Mesopleuron and metapleuron dull, granulated, with fine transverse keels. Protarsal segments in following proportions: 9:2:5:12:21. Segment 2 of protarsus produced into small hook. Enlarged claw (Fig. 3) with two bristles situated further distally than proximal prominence. Segment 5 of protarsus (Fig. 3) with one row of about 33 lamellae; distal apex with approximately three lamellae. Tibial spurs 1/1/2.

*Male.* Unknown.

Holotype (examined): ♀ SOUTH AFRICA: *Western Cape*: near Cape Town, Milnerton, ii.1926, R.E. Turner (BMNH).

Paratypes (examined): 6♀ same data as holotype (BMNH); 1♀ same locality as holotype, i.1926 (BMNH); 4♀ same data as holotype (AMNH).

Other material examined. 1♀ SOUTH AFRICA: *Eastern Cape*: N. of Matatiele, 20 mi. from Quacha's Nek, (MZLU).

Distribution: South Africa.

Hosts: Unknown.

#### *Deinodryinus danielssoni* Olmi, 1998

Fig. 4

*Deinodryinus danielssoni* Olmi, 1998: 37; 2006: 36.

Redescription:

*Male.*

Macropterous; length 1.9–3.1 mm. Head black, except clypeus brown and mandible partly brown and testaceous; head occasionally brown; antenna brown; mesosoma black, occasionally brown; metasoma brown; legs brown, except articulations, stalks of femora and part of tibiae and tarsi testaceous. Antenna filiform, hairy; antennal segments in the following proportions: 8:5:9:9:9:9:8:8:7:9. Head convex, shiny, finely punctate, unsculptured among punctae; frontal line absent; occipital carina complete; POL=7; OL=3; OOL=5.5; OPL=3; TL=5. Occasionally head punctate and slightly granulated. Scutum, scutellum and metanotum shiny, quite finely punctate, unsculptured among punctae. Occasionally scutum slightly rugose near posterior margin. Notauli incomplete, reaching approximately 0.6× length of scutum. Propodeum reticulate rugose, without longitudinal or transverse keels. Forewing hyaline, without dark transverse bands; distal part of stigmal vein shorter than proximal part (2:7 in holotype; 3.5:8 in paratype); pterostigma less than four times as long as broad; veins surrounding BC and SBC cells generally as pigmented as veins surrounding CC cell, occasionally less pigmented. Paramere (Fig. 4) about as long as penis, with inner broad proximal branch wrapping penis. Tibial spurs 1/1/2.

*Female.* Unknown.

Holotype (examined): ♂ SOUTH AFRICA: *Western Cape*: Koopmanskloof, 10 km S Citrusdal, 32°40'S 19°01'E, 200–270 m, Malaise trap, 4–8.x.1994, loc. 6, R. Danielsson (MZLU).



Paratype (examined): 1♂ SOUTH AFRICA: *Western Cape*: Cape Peninsula, Hout Bay, Skoorsteenkop, xii.1950, n. 78, Swedish South Africa Expedition, 1950–1951, Brinck-Rudebeck, Insect trap (AMNH).

Other material examined: SOUTH AFRICA: *Western Cape*: Kogelberg Nature Reserve, parasitized host collected 17.i.2003, dryinid larva pupated 30.i.2003, dryinid adult emergence 16.ii.2003, reared from an adult of *Colistra parvulus* (Linnavuori) feeding on *Berzelia lanuginosa* (Bruniaceae), M. Olmi reared, (OLM); 5♂ Walker Bay Nature Reserve, 34°27.41'S 19°21.39'E, 4.x–1.xi.1997, 29.xi–26.xii.1997, 8.iv–16.v.1998, yellow pan trap, S. van Noort & B. Fisher (SAMC); 21♂ same locality, 11.viii–6.ix.1997, S. van Noort, (20 SAMC, 1 OLM); 2♂ same locality, 17–31.v.1997, Malaise trap, S. van Noort (SAMC).

Distribution: South Africa.

Hosts: Cicadellidae (Guglielmino & Olmi 2006), South Africa (Kogelberg Nature Reserve): *Colistra parvulus* (Linnavuori) (M. Stiller det.).

Biology: In the only parasitized host collected in Kogelberg Nature Reserve (South Africa), the larval thylacium was situated in the dorsal side between the head and pronotum. This position is typical of *Deinodryinus* species.

### *Deinodryinus guineensis* Olmi, 1998

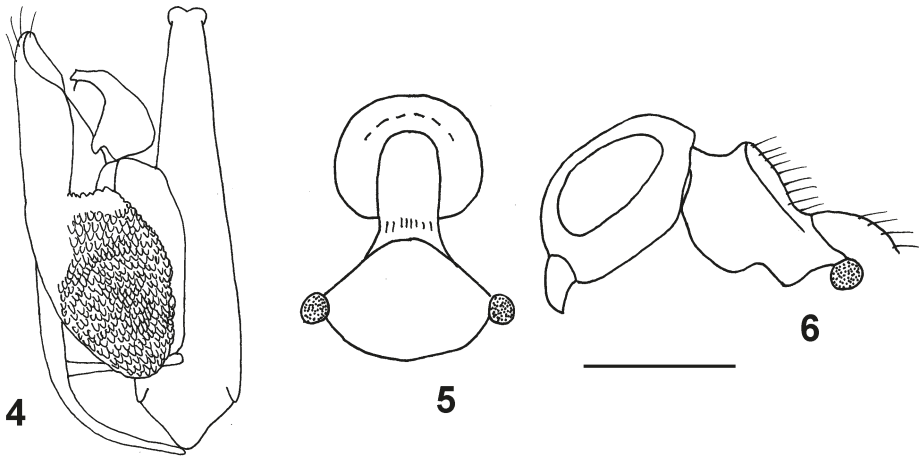
Figs 5–7

*Deinodryinus guineensis* Olmi, 1998: 39.

Redescription:

*Female*.

Macropterous; length 3.4 mm. Head black, except lateral margins, anterior surface of face, part of vertex, temple, mandible and anterior half of clypeus brown-reddish; antenna testaceous, except segments 5–7 darkened and segments 8–10 brown; mesosoma brown-reddish, with mesopleuron, metapleuron, metanotum and propodeum black; metasoma brown; legs brown-reddish. Antenna clavate; antennal segments in the following proportions: 12:5:8:6:3:5:6:6:5:9. Head shiny, with face sculptured by three median longitudinal keels (complete frontal line + two keels from posterior ocelli and to antennal toruli); surface among and on sides of frontal keels sculptured by strong transverse subparallel keels; vertex and temple punctate and unsculptured among punctae; occipital carina complete; area behind posterior ocelli sculptured by two oblique keels connecting posterior ocelli to occipital carina; POL=6; OL=4; OOL=8; OPL=6.5; TL=8. Pronotum shiny, hairy, punctate, unsculptured among punctae, crossed by one strong transverse impression (Fig. 6); disc ovoidal, flat and surrounded by sharp margin (Figs 5, 6); pronotum with strong constriction between prothorax and mesothorax (Fig. 5); pronotal tubercle reaching tegula. Scutum and scutellum shiny, smooth, hairy, finely punctate, unsculptured among punctae. Notauli absent. Metanotum shiny, smooth, unsculptured. Propodeum with strong transverse keel between dorsal and posterior surface; dorsal surface reticulate rugose; posterior surface without longitudinal keels, reticulate rugose, except median smooth and unsculptured area; median area with few irregular keels near anterior margin. Forewing with two dark transverse bands; distal part of stigmal vein much shorter than proximal part (3:7). Protarsal segments in following proportions: 6:2:6:11:24. Protarsal segment 2 produced into hook. Enlarged claw (Fig. 7) with one long bristle situated further distally than proximal prominence. Segment 5 of protarsus (Fig. 7) with two rows of 3 + 28 lamellae; distal apex with about 4 lamellae. Tibial spurs 1/1/2.



Figs 4–6. (4) *Deinodryinus danielssoni* Olmi – male genitalia from South Africa, Skoorsteenkop; (5, 6) *D. guineensis* Olmi, holotype – (5) dorsal and (6) lateral views of pronotum. Scale bar = (4) 0.12 mm; (5, 6) 0.63 mm.

*Male.* Unknown.

Holotype (examined): ♀ GUINEA: Mt. Nimba, Gouan River, 07°42'N 08°23'W, 514 m, 7–15.i.1991, FIT rainforest, L. Leblanc (CNC).

Distribution: Guinea.

Hosts: Unknown.

#### *Deinodryinus harinhalai* Olmi, 2010

Fig. 8

*Deinodryinus harinhalai* Olmi, 2010: 57.

Redescription:

*Male.*

Macropterous; length 2.4 mm. Head black, except mandible testaceous; antenna testaceous; mesosoma and metasoma black; legs testaceous, except metacoxa partly brown. Antenna filiform, with hairs shorter than breadth of segments; antennal segments in the following proportions: 9:4:8:6:5.5:5.5:5.5:5.5:5.5:8. Head shiny, strongly punctate, unsculptured among punctae; frontal line absent; occipital carina complete; POL=7; OL=4; OOL=4.5; OPL=2.5; TL=4; greatest breadth of posterior ocelli shorter than OL (3:4). Scutum shiny, as sculptured as head. Notauli incomplete, reaching approximately 0.6× length of scutum. Scutellum shiny, punctate, unsculptured among punctae. Metanotum shiny, smooth, unsculptured. Propodeum dull, reticulate rugose, without transverse keel between dorsal and posterior surface; posterior surface completely reticulate rugose, without longitudinal or transverse keels. Forewing hyaline, without dark transverse bands; distal part of stigmal vein slightly longer than proximal part (12:8). Paramere (Fig. 8) about as long as penis, with two large and long distal inner branches, one of them with few papillae situated mainly on inner margin; second branch with mosaic sculpture; volsellae situated between above two branches; inner

apical branch of paramere with distal apex small. Tibial spurs 1/1/2.

*Female*. Unknown.

Holotype (examined): ♂ MADAGASCAR: Fianarantsoa, Ranomafana National Park, Vohiparara, 21°13.57'S 47°22.19'E, at broken bridge, 1110 m, 22–28.xi.2001, Malaise trap in high altitude rainforest, R. Harin'Hala (CAS).

Distribution: Madagascar.

Hosts: Unknown.

*Deinodryinus insulanus* (Benoit, 1954)

Figs 9–11

*Prenanteon insulanum* Benoit, 1954: 419.

*Deinodryinus insulanus*: Olmi 1984: 124; 1994: 9; 1998: 40, 42.

Redescription:

*Female*.

Macropterous; length 5.0–5.6 mm. Testaceous-reddish, except ocellar triangle black, petiole black, metasoma partly brown and antennal segments 8–10 darkened. Antenna clavate; antennal segments in the following proportions: 18:5:18:10:8:8:9:9:9:11. Head shiny, strongly reticulate rugose; frontal line present; ocellar triangle convex, with keels among ocelli; occipital carina complete; POL=5; OL=3; OOL=10; OPL=10; TL=8. Pronotum (Figs 9, 10) shiny, strongly punctate, with transverse keels, crossed by transverse impression separating anterior collar from posterior disc; lateral margins of posterior surface of pronotum sharp; pronotal tubercle reaching tegula. Scutum shiny, smooth, strongly punctate, unsculptured among punctae. Notauli incomplete, reaching approximately 0.65× length of scutum. Scutellum shiny, smooth, finely punctate, unsculptured among punctae. Metanotum shiny, smooth, unsculptured, with anterior margin strongly convex and raised into carina. Mesopleuron and metapleuron rugose, with fine keels; occasionally mesopleuron and metapleuron shiny, punctate, unsculptured among punctae; occasionally anterior half of mesopleuron quite hairy. Propodeum with dorsal surface reticulate rugose, without transverse keel between dorsal and posterior surface; posterior surface without longitudinal keels, reticulate rugose, except for central smooth area. Forewing entirely darkened, or with two dark transverse bands; distal part of stigmal vein longer than proximal part (11:7). Protarsal segments in following proportions: 10:4:6:11:26. Segment 2 of protarsus produced into hook. Enlarged claw (Fig. 11) with one bristle situated further distally than proximal prominence. Segment 5 of protarsus (Fig. 11) with 2–3 rows of approximately 27 lamellae (all about same length); distal apex with about six lamellae, among which one much longer than others. Tibial spurs 1/1/2.

*Male*. Unknown.

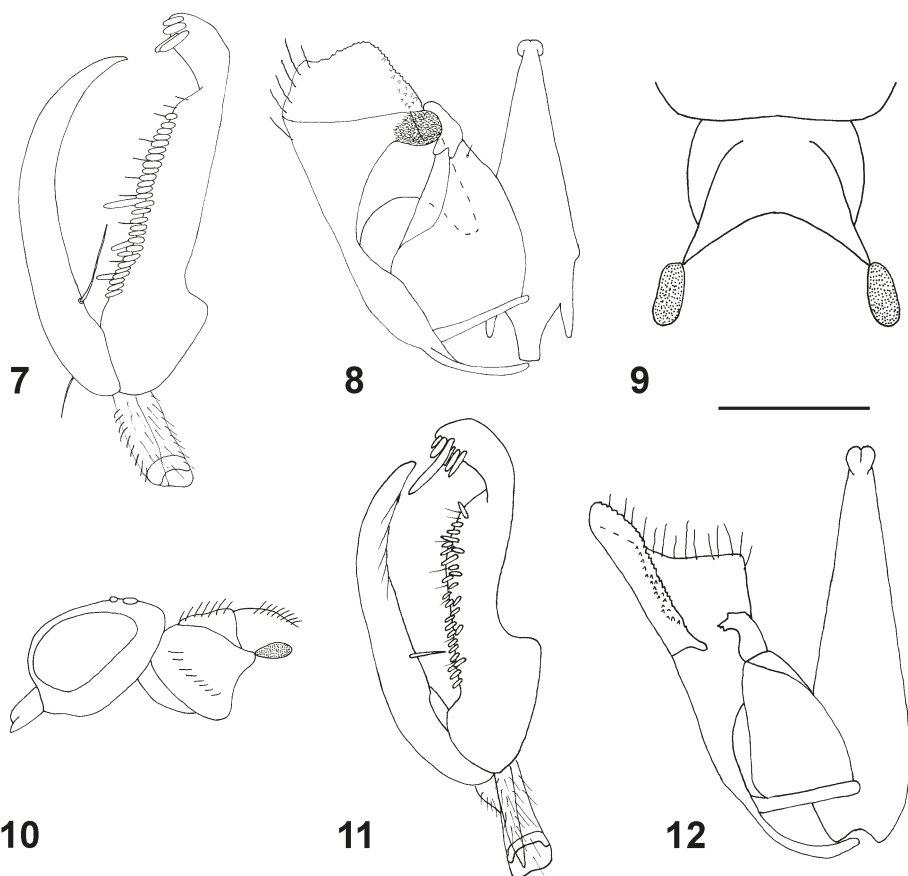
Holotype (examined): ♀ MADAGASCAR: Toamasina, Ivondro, v.1940, A. Seyrig (MNHN).

Paratype (examined): ♀ MADAGASCAR: Antananarivo, La Mandraka, iv.1944, A. Seyrig (MRAC).

Other material examined: MADAGASCAR: 1♀ Toamasina, Perinet, (AMNH); 2♀ Toamasina, Botanic garden near entrance to Andasibe National Park, 18°55.58'S 48°24.47'E, 1025 m, 1–7.xi.2001, Malaise trap, tropical forest, R. Harin'Hala (1 CAS, 1 OLM).

Distribution: Madagascar.

Hosts: Unknown.



Figs 7–12. (7) *Deinodryinus guineensis* Olmi, holotype – chela; (8) *D. harinhalai*, holotype – male genitalia; (9–11) *D. insulanus* (Benoit): (9–10) female from Madagascar, Perinet – (9) dorsal and (10) lateral views of pronotum, (11) holotype – chela; (12) *D. irreptus* Olmi, holotype – male genitalia. Scale bar = (7) 0.13 mm; (8) 0.17 mm; (9, 10) 1.3 mm; (11) 0.21 mm; (12) 0.11 mm.

*Deinodryinus irreptus* Olmi, 1994

Figs 12–14

*Deinodryinus irreptus* Olmi, 1994: 6.

Redescription:

*Male.*

Macropterous; length 1.9–3.1 mm. Head black, except mandible testaceous; antenna brown; mesosoma black; metasoma brown; legs testaceous, except metacoxa partly brown, club of metafemur and metatibia partly darkened. Antenna filiform, with hairs shorter than breadth of segments; antennal segments in the following proportions: 6:4:5:5:4:4:4:4:4:7. Head shiny, quite strongly punctate, unsculptured among punctae (punctae mostly strong and close on face, similar to areolae); frontal line absent; occipital carina complete; POL=5; OL=3; OOL=4; OPL=3; TL=3. Scutum shiny,

punctate, unsculptured among punctae (punctae well developed and dense near anterior margin of scutum). Notauli incomplete, reaching approximately  $0.6\times$  length of scutum. Scutellum and metanotum shiny, punctate, unsculptured among punctae. Propodeum reticulate rugose, without longitudinal or transverse keels. In specimen from Madagascar,  $20^{\circ}02.42'S$   $44^{\circ}39.44'E$ , propodeum with two tracks of longitudinal keels on posterior surface (area between them rugose). Forewing hyaline, without dark transverse bands; distal part of stigmal vein slightly longer than proximal part (8:7). Paramere (Figs 12–14) about as long as penis, with distal region broadened and with small inner distal branch not wrapping penis. Tibial spurs 1/1/2.

*Female.* Unknown.

Holotype (examined): ♂ MADAGASCAR: Toliary, Bereboka, 60 km NE Morondava, Bereboka, 18–23.v.1983, J.S. Noyes & M.C. Day, B.M. 1983–201 (BMNH).

Other material examined: MADAGASCAR: 4♂ *Mahajanga*: Tsingy de Bemaraha Nat. Park, 10.6 km ESE  $123^{\circ}$  Antsalova,  $19^{\circ}42.34'S$   $44^{\circ}43.5'E$ , 150 m, 16–20.xi.2001, Malaise trap, tropical dry forest on Tsingy, Fisher, Griswold *et al.* (3 CAS, 1 OLM); 1♂ Toliary, Kirindy Forest, 15.5 km  $64^{\circ}$  ENE Marofandilla,  $20^{\circ}02.42'S$   $44^{\circ}39.44'E$ , 100 m, 28.xi–3.xii.2001, Malaise trap in tropical dry forest, Fisher, Griswold *et al.* (CAS).

Distribution: Madagascar.

Hosts: Unknown.

### *Deinodryinus madagascariensis* (Benoit, 1954)

Fig. 15

*Hirtanteon madagascariensis* Benoit, 1954: 423.

*Deinodryinus madagascariensis*: Olmi 1984: 128; 1994: 10.

Redescription:

*Female.*

Macropterous; length 2.7–5.0 mm. Testaceous-reddish; antenna testaceous, except segments 3–10, or 5–10, or 6–10 brown; petiole black; metasoma totally testaceous, or partly brown. In small specimen (2.7 mm) from Madagascar, Ankarana, colour totally testaceous, except petiole black, metanotum brown and last antennae segment darkened. Antenna clavate; antennal segments in the following proportions: 12:7:25:10:8:8:8:8:11. Head shiny, with face quite strongly punctate and almost reticulate rugose; vertex and temple strongly punctate, not reticulate rugose; frontal line complete or incomplete (then present only on anterior half of face); occipital carina complete; ocellar triangle convex; POL=5; OL=4; OOL=13; OPL=12; TL=8. Pronotum shiny, smooth, strongly punctate, unsculptured among punctae, crossed by transverse impression separating anterior collar from posterior disc; lateral margins of posterior surface of pronotum rounded; pronotal tubercle reaching tegula. Scutum shiny, smooth, strongly punctate, unsculptured among punctae. Notauli incomplete, reaching approximately  $0.4$ – $0.5\times$  length of scutum. Scutellum and metanotum shiny, smooth, unsculptured. Anterior margin of metanotum strongly convex and raised into carina. Mesopleuron strongly punctate, with tuft of hairs on anterior third. Metapleuron strongly punctate, not reticulate rugose. Propodeum with dorsal surface reticulate rugose, without transverse keel between dorsal and posterior surface; posterior surface without longitudinal keels, reticulate rugose, except central smooth area. In specimen from Madagascar,  $24^{\circ}39.13'S$   $43^{\circ}59.48'E$ , posterior surface of propodeum with few transverse keels near posterior

extremity; in small specimen (2.75 mm) from Madagascar, Ankarana, posterior surface of propodeum completely reticulate rugose. Forewing hyaline, with two dark transverse bands; distal part of stigmal vein longer than proximal part (12:9 in specimen from Madagascar, 24°39.13'S 43°59.48'E). Protarsal segments in following proportions: 11:4:7:16:30. Protarsus without segments produced into hook. Enlarged claw (Fig. 15) with one bristle situated further distally than proximal prominence. Segment 5 of protarsus (Fig. 15) with 2–3 rows of lamellae (about 30–40 small and 7–9 longer); distal apex with about 9–15 lamellae, among which one much longer than others and pointed. Tibial spurs 1/1/2.

*Male.* Unknown.

Holotype (examined): ♀ MADAGASCAR: Antananarivo (=Tananarive), Ch. Lambertson (MRAC).

Other material examined: MADAGASCAR: 1♀ Diego-Suarez, Ankarana, ix.1986, Malaise trap, Jane Wilson (BMNH); 1♀ *Mahajanga*: Tsimembo Forest, 8.7 km 336° NNW of Soatana, 19°01.17'S 44°26.26'E, 20 m, Malaise trap in tropical dry forest, 21–25.xi.2001, Fisher, Griswold *et al.* (CAS); 1♀ Toliary, Mahafaly Plateau, 6.2 km 74° ENE of Itampolo, 24°39.13'S 43°59.48'E, 80 m, Malaise trap, spiny forest thicket, 21–25.ii.2002, Fisher, Griswold *et al.* (OLM).

Distribution: Madagascar.

Hosts: Unknown.

### *Deinodryinus madecassus* (Benoit, 1954)

Figs 16, 17

*Hirtanteon madecassum* Benoit, 1954: 422.

*Deinodryinus madecassus*: Olmi 1984: 125; 1994: 10.

Redescriptions:

*Female.*

Macropterous; length 3.0–5.0 mm. Reddish-darkened; mandible testaceous, with teeth brown; antenna testaceous, except segments 7–10 brown; propodeum black; metasoma brown. Antenna clavate; antennal segments in the following proportions: 11:5:11:6:6:6:6:6:5:7. Head shiny, strongly punctate, especially anterior region, unsculptured among punctae; occipital carina complete; POL=7; OL=5; OOL=9; OPL=7; TL=7. Pronotum shiny, smooth, strongly punctate, unsculptured among punctae, crossed by transverse impression separating anterior collar from posterior disc; lateral margins of posterior surface rounded; pronotal tubercle reaching tegula. Scutum shiny, smooth, finely punctate, unsculptured among punctae. Notauli incomplete, reaching approximately 0.65× length of scutum. Scutellum and metanotum shiny, smooth, finely punctate, unsculptured among punctae; anterior margin of metanotum shiny, smooth, unsculptured, with anterior margin strongly convex and raised into carina. Mesopleuron shiny, strongly punctate, with tuft of hairs on anterior third. Metapleuron partly smooth and unsculptured. Propodeum with dorsal surface reticulate rugose, without transverse keel between dorsal and posterior surface; posterior surface without longitudinal keels, reticulate rugose, except central smooth area. Forewing hyaline, with two dark transverse bands; distal part of stigmal vein longer than proximal part (14:8). Protarsal segments in following proportions: 8:3:4:8:19. Protarsus without segments produced into hook. Enlarged claw (Fig. 16) with one bristle situated further distally than proximal prominence. Segment 5 of protarsus (Fig. 16) with two rows of lamellae (about eight

longer and 21 shorter); distal apex with about seven lamellae, among which one much longer than others. Tibial spurs 1/1/2.

*Male.* (tentatively associated, not reared).

Macropterous; length 2.4 mm. Head black; mandible testaceous, with teeth brown; antenna brown, except segments 1–2 or only 1 testaceous; mesosoma black; tegula testaceous; metasoma brown; legs brown, except tarsi and meso- and metatibia testaceous; occasionally legs totally brown. Antenna filiform, with hairs at most as long as breadth of segments; antennal segments in the following proportions: 8:4:7:5:5:5:5:8. Head shiny, strongly punctate, unsculptured among punctae; frontal line incomplete, not present in front of anterior ocellus; occipital carina complete; POL=8; OL=4; OOL=6; OPL=5; TL=4. Scutum shiny, finely punctate, unsculptured among punctae. Notauli incomplete, reaching approximately 0.5–0.6× length of scutum. Scutellum shiny, punctate, unsculptured among punctae. Metanotum shiny, smooth, finely punctate, unsculptured among punctae. Propodeum dull, reticulate rugose, without transverse keel between dorsal and posterior surface; posterior surface completely reticulate rugose, or with more or less large central smooth area, occasionally situated near distal extremity. Forewing hyaline, without dark transverse bands; distal part of stigmal vein slightly longer than proximal part (10:9). Paramere (Fig. 17) about as long as penis, with large hatchet blade distal branch wrapping penis, without dorsal proximal membranous process. Tibial spurs 1/1/2.

Holotype (examined): ♀ MADAGASCAR: Toliary, Bekily, x.1940, A. Seyrig (MNHN).

Allotype (examined): ♂ same locality as holotype, ix.1938, A. Seyrig (MRAC).

Paratypes (examined): all with the same locality as holotype: 1♀, vi.1936 (MNHN); 1♀, x.1936 (MNHN); 1♀, x.1938 (MNHN); ♀, iv.1938 (MRAC).

Other material examined: MADAGASCAR: 2♂ Fianarantsoa, Ranomafana National Park, Belle Vue at Talatakely, 21°15.99'S 47°25.21'E, 1020 m, 15–22.xi.2001, Malaise trap, secondary tropical forest, R. Harin'Hala (CAS); 1♂ Fianarantsoa, Ranomafana National Park, Vohiparara, 21°13.57'S 47°22.19'E, at broken bridge, 1110 m, 22–28.xi.2001, Malaise trap in high altitude rainforest, R. Harin'Hala (CAS); 1♂ Toliary, Andohahela National Park, 1.7 km 61° ENE of Tsimelahy, 36.1 km 308° NW of Tolagnaro, 24°55.48'S 46°38.44'E, 300 m, 16–20.i.2002, Malaise trap, in tropical dry forest, Fisher, Griswold *et al.* (CAS).

Distribution: Madagascar.

Hosts: Unknown.

### *Deinodryinus monticolus* Olmi, 1984

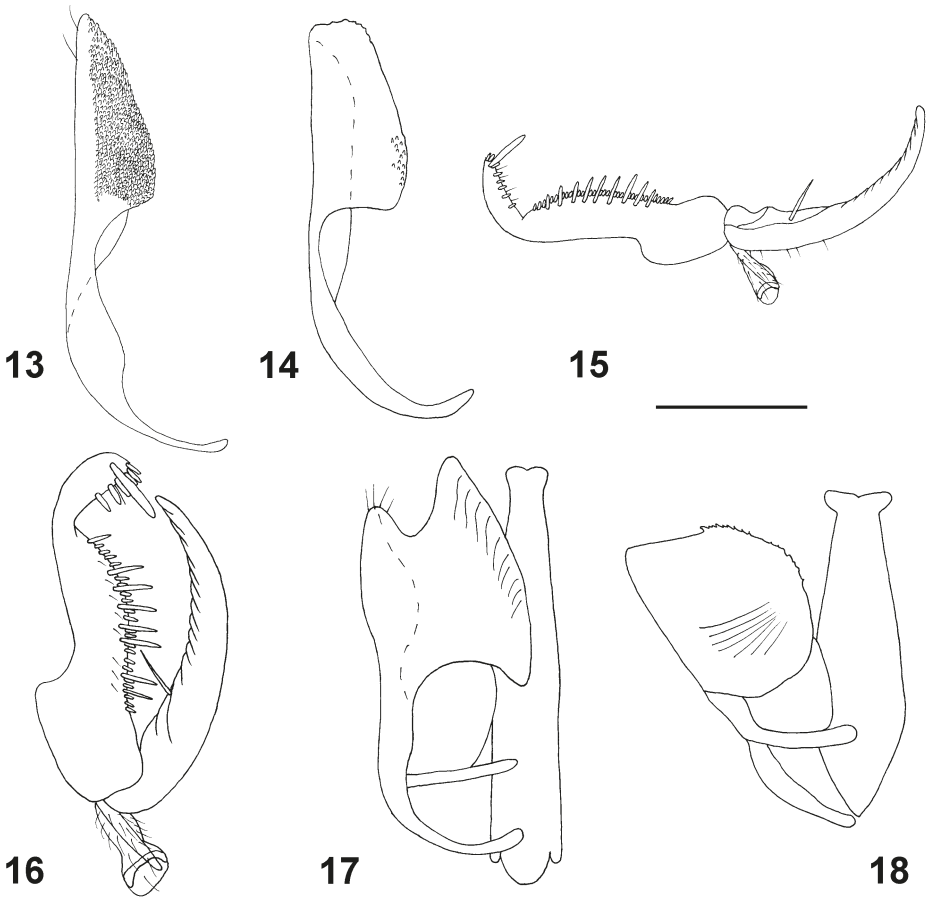
Fig. 18

*Deinodryinus monticolus* Olmi, 1984: 130.

Redescription:

*Male.*

Macropterous; length 2.4 mm. Head black; mandible testaceous; antenna brown; mesosoma and metasoma black; legs testaceous, except metacoxa and metafemur partly brown. Antenna filiform, with hairs at most as long as breadth of segments; antennal segments in the following proportions: 9:5:6:6:6:6:5.5:5:6:8. Head dull, granulated and reticulate rugose; frontal line present; occipital carina complete; POL=7; OL=3; OOL=5; OPL=2; TL=3. Scutum shiny, hairy, finely punctate, unsculptured among punctae. Notauli incomplete, reaching approximately 0.5× length of scutum. Scutellum



Figs 13–18. (13, 14) *Deinodryinus irreptus* Olmi, distal apex of paramere of Madagascan male from (13) 19°42.34'S 44°43.5'E, (14) 20°02.42'S 44°39.44'E; (15) *D. madagascariensis* (Benoit), holotype – chela; (16, 17) *D. madecassus* (Benoit): (16) holotype – chela, (17) allotype – male genitalia; (18) *D. monticolus* Olmi, holotype – male genitalia. Scale bar = (13) 0.10 mm; (14) 0.11 mm; (15) 0.23 mm; (16, 18) 0.17 mm; (17) 0.13 mm.

and metanotum shiny, smooth, finely punctate, unsculptured among punctae. Propodeum with strong transverse keel between dorsal and posterior surface; dorsal surface large, reticulate rugose; posterior surface with two longitudinal keels and with median and lateral areas reticulate rugose. Forewing hyaline, without dark transverse bands; distal part of stigmal vein much shorter than proximal part (3.5:8.5). Paramere (Fig. 18) with large distal branch wrapping penis, without dorsal proximal membranous process. Tibial spurs 1/1/2.

*Female.* Unknown.

Holotype (examined): ♂ RWANDA: Kisenyi (=Gisenyi), Kayove, 2000 m, 14.ii.1953, P. Basilewsky (MRAC).

Distribution: Rwanda.

Hosts: Unknown.



*Deinodryinus namorokensis* Olmi, 2010

## Fig. 19

*Deinodryinus namorokensis* Olmi, 2010: 59.

## Redescription:

*Male.*

Macropterous; length 2.2–2.6 mm. Head black, except mandible testaceous; antenna testaceous; mesosoma black; metasoma brown; legs brown, except articulations, tarsi, tibiae and trochanters testaceous. Antenna filiform; antennal segments in the following proportions: 9:4:8:6:5:6:5:5:8; antennal segment 6 about twice as long as broad (6:3); antennal segment 8 less than three times as long as broad (5:2.5). Head convex, dull, reticulate rugose; frontal line absent; occipital carina complete; POL=7; OL=4; OOL=5; OPL=7.5; TL=4; greatest breadth of posterior ocelli about as long as OL. Scutum shiny, strongly punctate, unsculptured among punctae. Notauli incomplete, reaching approximately 0.6× length of scutum. Scutellum shiny, punctate, unsculptured among punctae. Metanotum shiny, unsculptured. Mesopleuron shiny, punctate, unsculptured among punctae. Metapleuron shiny, unsculptured. Propodeum apparently without strong transverse keel between dorsal and posterior surface; under good light transverse keel hardly visible; dorsal surface quite short, dull, reticulate rugose; posterior surface of propodeum dull, with two complete irregular longitudinal keels, with median and lateral areas completely reticulate rugose. Forewing hyaline, without dark transverse bands; distal part of stigmal vein slightly shorter than proximal part (12:13). Paramere much shorter than penis, with long and narrow inner branch (Fig. 19). Tibial spurs 1/1/2.

*Female.* Unknown.

Holotype (examined): ♂ MADAGASCAR: *Mahajanga*: Namoroka National Park, 9.8 km 300° WNW Vilanandro, 16°28.00'S 45°21.00'E, 140 m, 4–8.xi.2002, Malaise trap in tropical dry forest, Fisher, Griswold *et al.* (CAS).

Paratype (examined): ♂ same data holotype (CAS).

Distribution: Madagascar.

Hosts: Unknown.

*Deinodryinus orangeanus* Olmi, 2004

## Fig. 20

*Deinodryinus orangeanus* Olmi, 2004: 87.

## Redescription:

*Female.*

Macropterous; length 3.9 mm. Completely testaceous-reddish, except petiole black, antennal segments 7–10 brown and small black spots on ocellar triangle. Antenna clavate; antennal segments in the following proportions: 9:6:15:7:7:7:7:7:8. Head flat, shiny, strongly punctate, unsculptured among punctae; anterior third of face quite strongly punctate, almost reticulate rugose; frontal line incomplete, only present in anterior half of face; face without lateral keels; vertex behind ocellar triangle without two oblique keels connecting posterior ocelli to occipital carina; occipital carina complete; POL=4; OL=2; OOL=10; OPL=10; TL=7.5. Pronotum anteriorly crossed by strong transverse

impression, shiny, smooth, finely punctate, unsculptured among punctae; posterior surface of pronotum approximately as long as broad, shorter than scutum (10:23), with lateral margins sharp; pronotal tubercle reaching tegula. Scutum and scutellum shiny, punctate, unsculptured among punctae. Notauli incomplete, reaching approximately  $0.65\times$  length of scutum. Metanotum shiny, smooth, unsculptured. Propodeum reticulate rugose, without transverse keel between dorsal and posterior surface; posterior surface almost completely dull and reticulate rugose, except for markedly small central smooth and unsculptured area. Forewing with two dark transverse bands; distal part of stigmal vein longer than proximal part (16:11). Protarsal segments in following proportions: 10:3:6:11:24. Enlarged claw (Fig. 20) with one bristle situated further distally than proximal prominence. Segment 5 of protarsus (Fig. 20) with three rows of approximately 44 lamellae (many lamellae much longer than others); distal apex with about 15 lamellae, among which one much longer than others. Tibial spurs 1/1/2.

*Male.* Unknown.

Holotype (examined): ♀ MADAGASCAR: Diego-Suarez, Orangea Forest, 3.6 km 128° SE of Ramena, 12°15.32'S 49°22.29'E, 90 m, 22–28.ii.2001, beating low vegetation, in littoral rainforest, Fisher, Griswold *et al.* (CAS).

Distribution: Madagascar.

Hosts: Unknown.

### *Deinodryinus paulyi* (Olmi, 1987)

Figs 21, 22, 39

*Prioranteon paulyi* Olmi, 1987a: 409.

*Deinodryinus nigerensis* Olmi, 1991: 131 (synonymized by Olmi 2007); type locality: Tarna goulbin (Niger).

*Deinodryinus paulyi*: Olmi 2007: 206; Guglielmino & Olmi 2007: 125–126.

Redescriptions:

*Female.*

Micropterous, with forewing much reduced, reaching transverse furrow behind scutellum. Length 2.5–2.9 mm. Completely yellow-testaceous, except antennal segments 6–10 or 7–10, petiole and distal half of metasoma brown-dark. Antenna clavate; antennal segments in the following proportions: 7:4:18:8:8:8:7:7:6:8. Head shiny, smooth, punctate, unsculptured among punctae; occipital carina complete; frontal line absent; POL=3; OL=2; OOL=8; OPL=5; TL=9. Pronotum shiny, smooth, finely punctate, unsculptured among punctae, not crossed by transverse impressions, with short anterior collar; pronotal tubercle reaching tegula. Scutum much reduced, unsculptured. Notauli present, posteriorly joint. Scutellum and metanotum shiny, smooth, unsculptured. Metathorax + propodeum dull, reticulate rugose. Enlarged claw (Fig. 21) with one peg-like lamella situated further distally than proximal prominence. Segment 5 of protarsus (Fig. 21) with two rows of about 18–28 lamellae; distal apex with about 3–5 lamellae, among which one markedly long. Tibial spurs 1/1/2.

*Male.*

Macropterous; length 1.9–2.2 mm. Head black; mandible testaceous; antenna brown; mesosoma and metasoma black; legs brown, except tarsi and protibia testaceous. Antenna filiform, with hairs shorter than breadth of segments; antennal segments in the

following proportions: 6:4:7:7:7:6:6:6:7. Head shiny, smooth, punctate, unsculptured among punctae; frontal line absent; face with longitudinal median furrow; occipital carina complete. Head of holotype with POL=4; OL=2.5; OOL=6; OPL=5; TL=5.5; in specimen from Senegal, 15 km S Guignol, POL=OPL; in specimen from Namibia, 23°34'S 15°03'E, POL=5; OL=2.5; OOL=5. Scutum shiny, smooth, punctate, unsculptured among punctae. Notauli incomplete, reaching approximately 0.3–0.5× length of scutum. Scutellum and metanotum shiny, smooth, finely punctate, unsculptured among punctae. Propodeum completely reticulate rugose, without longitudinal or transverse keels, with posterior surface sculptured by areolae smaller than those of dorsal surface. Forewing hyaline, without dark transverse bands; distal part of stigmal vein much shorter than proximal part (3:7). Paramere (Fig. 22) about as long as penis, with inner narrow proximal branch wrapping penis. Tibial spurs 1/1/2.

Holotype of *P. paulyi* (examined): ♀ SENEGAL: Tattaguine (FAG); holotype of *D. nigerensis* (examined): ♂ NIGER: Maradi, Tarna goulbin, G.J. Steck, 2–6.ix.1985 (USNM).

Paratype of *P. paulyi* (examined): 1♀ CAPE VERDE ISLANDS: Saõ Tiago Island, Moia-Moia (AMNH). Paratypes of *D. nigerensis* (examined): 2♂ NIGER: same locality as holotype, 10–13.ix.1985 (AMNH, DETAM).

Other material examined: NAMIBIA: 1♀ 40 km W Keetmanshoop, along Rd B 4, parasitized host collected 10.iii.2006, dryinid larva pupated 16.iii.2006, dryinid adult emerged 7.iv.2006, reared from an adult of *Exitianus nanus* (Distant), M. Olmi (OLM); 1♀ same collecting information, dryinid larva pupated 14.iii.2006, dryinid adult emerged 7.iv.2006, reared from an adult of *Aconurella compta* (Naudé) (NNIC); 1♂ same collecting information and host, dryinid larva pupated 10.iii.2006, dryinid adult emerged 3.iv.2006 (OLM); 1♂ same collecting information and host, dryinid larva pupated 11.iii.2006, dryinid adult emerged 4.iv.2006 (OLM); 1♂ same collecting information and host, dryinid larva pupated 12.iii.2006, dryinid adult emerged 5.iv.2006 (SAMC); 1♂ same collecting information and host, dryinid larva pupated 18.iii.2006, dryinid adult emerged 6.iv.2006 (OLM); 2♂ same collecting information and host, dryinid larva pupated 18.iii.2006, dryinid adult emerged 7.iv.2006 (1 SAMC, 1 OLM); 1♂ same collecting information, dryinid larva pupated 13.iii.2006, dryinid adult emerged 5.iv.2006, reared from an adult of *Exitianus okahandia* Ross (OLM); 1♂ Namib-Naukluft Park, Kuiseb River near Gobabeb, 23°34'S 15°03'E, 18.ii–20.iii.1983 (SANC); 1♂ Namib-Naukluft Park, Namib Desert Research Station, Kuiseb River, 23°33.45'S 15°02.38'E, 420 m, 17–24.ii.1998, Malaise trap in riparian vegetation, Kapofi & Irwin (DETAM); 1♂ Windhoek, Hoffnung Farm, 7.ii.1972, lark side vegetation, Southern African Expedition, B.M. 1972–1 (BMNH). NIGER: ♂ Maradi, Tarna goulbin, G.J. Steck, 5.viii.1985 (DETAM). SENEGAL: ♂ 15 km S of Guignol, 6.x.1978 (USNM).

Distribution: Cape Verde Islands, Namibia, Niger, Senegal.

Hosts: Cicadellidae (Guglielmino & Olmi 2007), Namibia: *Aconurella compta* (Naudé); *Exitianus okahandia* Ross; *Exitianus nanus* (Distant). All identified by M. Stiller.

### *Deinodryinus prinsloo* (Olmi, 1987)

Fig. 23

*Prioranteon prinsloo* Olmi, 1987b: 44; 2006: 40.

*Deinodryinus prinsloo*: Olmi 2007: 207.

Redescription:

*Female*.

Micropterous, with forewing much reduced, approximately as long as scutellum, reaching transverse furrow behind scutellum. Hindwing absent. Length 4.4 mm. Head black, except mandible, clypeus and anterior margin of face testaceous; antenna black, except segments 1–2 and partly 3 testaceous; mesosoma black, except posterior collar of pronotum testaceous; metasoma black; legs brown, except tarsi and meso- and metatibia testaceous. Antenna clavate; antennal segments in the following proportions:

8:5:17:11:11:9:8:7:7:9. Head dull, flat, strongly punctate, unsculptured among punctae, or only slightly granulated; frontal line absent; face without median furrow; occipital carina complete; POL=5; OL=3; OOL=10; OPL=5; TL=8. Pronotum shiny, only slightly granulated, with conspicuously humped and long anterior disc, and posterior transverse impression; posterior collar short; posterior margin of collar almost straight, reaching tegulae, without posterior lobe directed towards tegula. Scutum hollow, rugose, much reduced, longer than posterior collar of pronotum. Scutellum shiny, smooth, humped, unsculptured, approximately as long and as broad as scutum. Metanotum not visible. Metathorax + propodeum humped, separated from scutellum by transverse hollow impression transversely carinate; anterior and posterior surfaces of metathorax + propodeum reticulate rugose. Meso-metapleural suture distinct, strong, complete. Mesopleuron and metapleuron reticulate rugose. Protarsal segments in following proportions: 11:1.5:8:13:25. Segment 2 of protarsus produced into small hook. Enlarged claw (Fig. 23) with two bristles situated further distally than proximal prominence. Segment 5 of protarsus (Fig. 23) with one row of about 44 lamellae; distal apex with about three lamellae. Tibial spurs 1/1/2.

*Male.* Unknown.

Holotype (examined): ♀ SOUTH AFRICA: *Eastern Cape*: Alexandria, 33°39'S 26°25'E (SANC).

Distribution: South Africa.

Hosts: Unknown.

### *Deinodryinus pulcher* Olmi, 2010

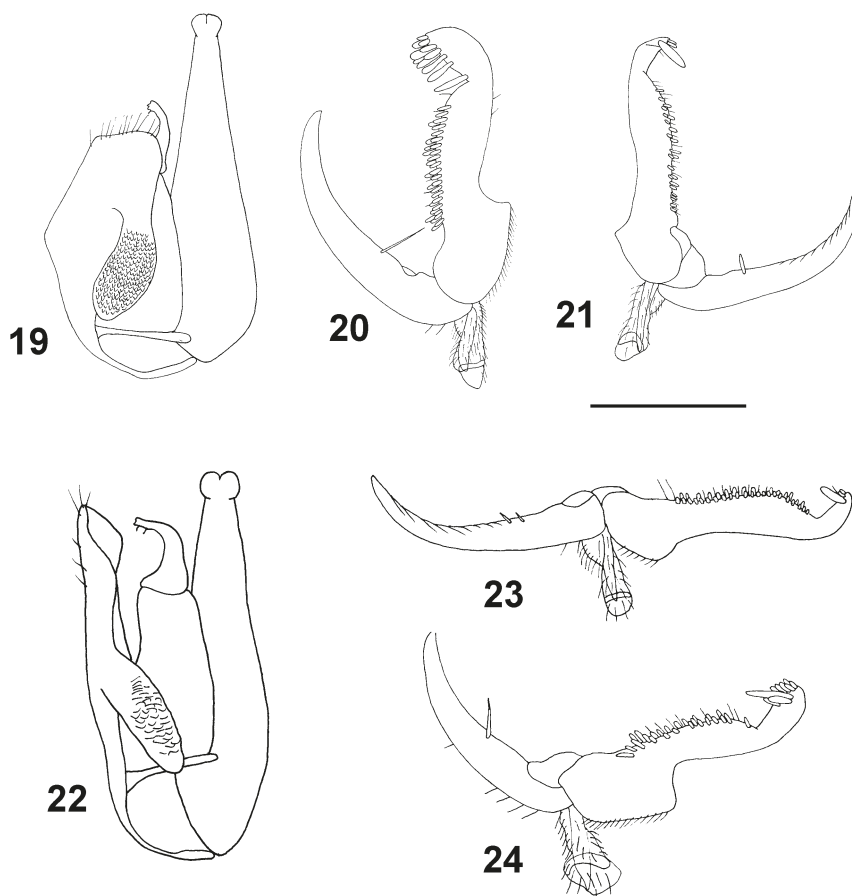
Figs 24–26

*Deinodryinus pulcher* Olmi, 2010: 55.

Redescriptions:

*Female.*

Macropterous; length 4.1 mm. Testaceous-reddish, except head brown-reddish, median region of metasoma brown and petiole black; antenna testaceous-reddish, except segment 10 brown. Antenna clavate; antennal segments in the following proportions: 13:7:17:9:7:8:8:8:7.5:11. Head convex, shiny, with face completely reticulate rugose and vertex and temple strongly punctate, unsculptured among punctae; frontal line complete; face without lateral keels; vertex behind ocellar triangle with tracks of two incomplete oblique keels connecting posterior ocelli to occipital carina; occipital carina complete; POL=4; OL=3; OOL=7; OPL=9; TL=5; greatest breadth of posterior ocelli longer than OL (4.5:3). Pronotum anteriorly crossed by strong transverse impression, shiny, smooth, finely punctate, unsculptured among punctae; posterior surface of pronotum broader than long, shorter than scutum (11:24), with lateral margins sharp; pronotal tubercle reaching tegula. Scutum and scutellum shiny, punctate, unsculptured among punctae. Notauli incomplete, reaching approximately 0.9× length of scutum. Metanotum shiny, smooth, unsculptured. Propodeum reticulate rugose, without transverse keel between dorsal and posterior surface; posterior surface almost completely dull and reticulate rugose, except for quite small central smooth area punctate and unsculptured among punctae. Forewing with two dark transverse bands; distal part of stigmal vein longer than proximal part (20:14). Fore tarsal segments in following proportions: 11:3.5:6:9:22. Enlarged claw



Figs 19–24. (19) *Deinodryinus namorokensis* Olmi, holotype – male genitalia; (20) *D. orangeanus* Olmi, holotype – chela; (21, 22) *D. paulyi* (Olmi): (21) holotype – chela, (22) genitalia of male from Niger, Tarna goulbin; (23) *D. prinslooi* (Olmi), holotype, chela; (24) *D. pulcher* Olmi, holotype, chela. Scale bar = (19) 0.16 mm; (20) 0.21 mm; (21) 0.14 mm; (22) 0.12 mm; (23, 24) 0.42 mm.

(Fig. 24) with one bristle situated further distally than proximal prominence. Segment 5 of protarsus (Fig. 24) with three rows of approximately 31 lamellae (many lamellae much longer than others); distal apex with about eight lamellae, among which one much longer than others. Tibial spurs 1/1/2.

#### *Male.*

Macropterous; length 2.1 mm. Head black, except mandible testaceous; antenna brown-testaceous; mesosoma and metasoma black; legs testaceous, except metacoxa partly brown. Antenna filiform, with hairs shorter than breadth of segments; antennal segments in the following proportions: 6:3.5:6.5:5:5:5:5:4:8. Head shiny, finely punctate, unsculptured among punctae; vertex without two oblique keels from posterior ocelli to occipital carina; frontal line absent; occipital carina complete; POL=5; OL=3; OOL=5; OPL=2; TL=3; greatest breadth of posterior ocelli shorter than OL (2.5:3). Scutum shiny, as sculptured as head. Notauli incomplete, reaching approximately 0.5× length

of scutum. Scutellum and metanotum shiny, punctate, unsculptured among punctae. Propodeum dull, reticulate rugose, with transverse keel between dorsal and posterior surface (keel situated quite near anterior margin of propodeum); dorsal surface much reduced (Fig. 25); posterior surface completely reticulate rugose, without longitudinal or transverse keels. Forewing hyaline, without dark transverse bands; distal part of stigmal vein slightly longer than proximal part (9:8). Paramere (Fig. 26) about as long as penis, with markedly large distal inner branch, showing many small papillae on margins. Tibial spurs 1/1/2.

Holotype (examined): ♀ MADAGASCAR: Fianarantsoa, Ranomafana National Park, Vohiparara, 21°13.57'S 47°22.19'E, at broken bridge, 1110 m, 21–28.i.2002, Malaise trap in high altitude rainforest, R. Harin'Hala coll. (CAS).

Paratype (examined): ♂ same data as holotype (CAS).

Distribution: Madagascar.

Hosts: Unknown.

*Deinodryinus richardsi* (Olm, 1984)

Fig. 27

*Prioranteon richardsi* Olmi, 1984: 594; 2006: 40.

*Deinodryinus richardsi*: Olmi 2007: 207; 2009: 456.

Redescription:

*Female.*

Micropterous, with forewing much reduced, approximately as long as scutellum, not reaching transverse furrow behind scutellum. Length 4.7 mm. Head black; mandible testaceous with teeth brown; clypeus testaceous; antenna brown, except segments 1–2 and proximal half of 3 testaceous; mesosoma black, except posterior collar and anterior margin of pronotum testaceous; tegula testaceous; metasoma black; legs brown, except distal part of coxae, trochanters, stalks of femora, tibiae and tarsi testaceous. Antenna clavate; antennal segments in the following proportions: 8:5:17:12:10:10:8:7:7:9. Head shiny, smooth, strongly punctate, unsculptured among punctae; mandible with four teeth progressing larger from anterior one to posterior; occipital carina complete; vertex flat; POL=4; OL=3; OOL=12; OPL=6; TL=11. Pronotum shiny, smooth, slightly punctate, unsculptured among punctae, with lateral regions granulated; pronotum with conspicuously humped and long anterior disc; posterior transverse impression separating disc from posterior collar narrower than disc; posterior margin of collar almost straight, reaching tegulae, without posterior lobe directed towards tegula. Scutum hollow, rugose, much reduced, approximately as long as posterior collar of pronotum. Scutellum shiny, smooth, humped, unsculptured, approximately as long and as broad as scutum. Metanotum not visible. Metathorax + propodeum humped, separated from scutellum by transverse hollow impression transversely carinate; anterior surface of metathorax + propodeum dull, slightly granulated; posterior surface of metathorax + propodeum strongly transversely striate. Meso-metapleural suture distinct, strong, complete. Mesopleuron and metapleuron strongly transversely striate. Protarsal segments in following proportions: 11:3:7:12:24. Segment 2 of protarsus produced into small hook. Enlarged claw (Fig. 27) with two bristles situated further distally than proximal prominence. Segment 5 of protarsus (Fig. 27) with one row of about 43 lamellae; distal apex with about four lamellae. Tibial spurs 1/1/2.

*Male*. Unknown.

Holotype (examined): ♀ SOUTH AFRICA: *KwaZulu-Natal*: Drakensberg, Van Reenen, xi.1926, R.E. Turner (BMNH).

Distribution: South Africa.

Hosts: Unknown.

*Deinodryinus rusticus* Olmi, 2004

Figs 28–30

*Deinodryinus rusticus* Olmi, 2004: 88.

## Redescription:

*Male*.

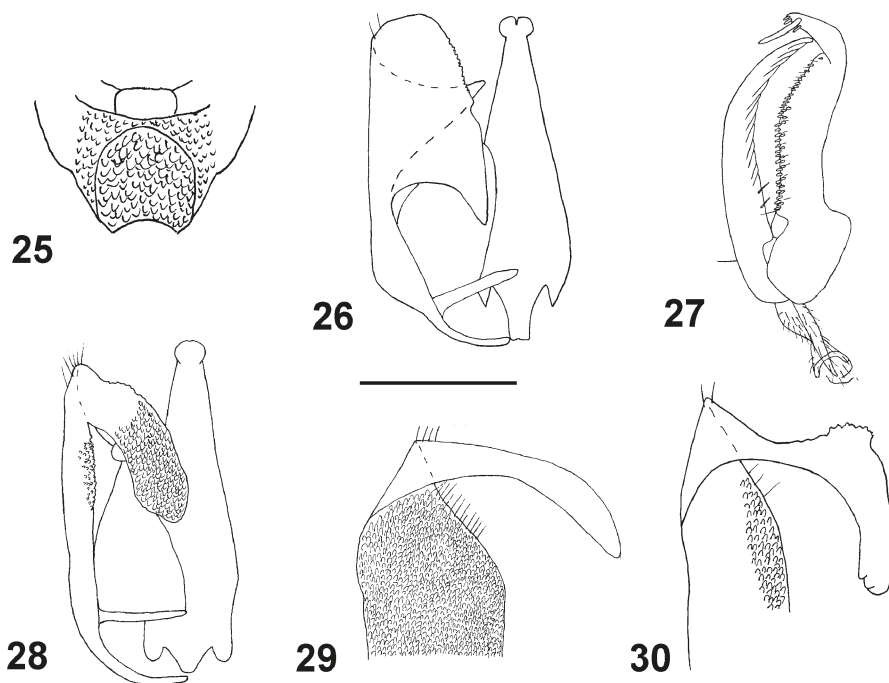
Macropterous; length 2.9–4.6 mm (holotype 2.9 mm; paratypes from Madagascar, 18°28.24'S 47°57.36'E, longer than holotype (3.8–4.6 mm)). Colour of holotype: head black, except mandible testaceous; antenna testaceous; mesosoma and metasoma black; legs testaceous, except coxae, clubs of femora and part of metatibia brown. Paratypes from Madagascar, 18°28.24'S 47°57.36'E, with legs completely testaceous, except brown basal spot on metacoxa. Antenna filiform, with hairs shorter than breadth of segments; antennal segments in the following proportions: 11:4:11:7:8:7:6.5:6.5:7:9. Head shiny, strongly punctate, unsculptured among punctae (punctae strong; face apparently rugose); vertex without two oblique keels from posterior ocelli to occipital carina; frontal line usually almost complete, missing only in front of anterior ocellus; frontal line occasionally only visible in anterior half of face; occipital carina complete; POL=8; OL=4; OOL=6.5; OPL=9; TL=5; in some specimens OPL shorter than OOL, or approximately as long as OOL. Scutum shiny, as sculptured as the head. Notauli incomplete, usually reaching approximately 0.5–0.6× length of scutum; notauli rarely reaching 0.8× length of scutum (eg. specimen from Madagascar, 21°15.05'S 47°24.43'E). Scutellum shiny, punctate, unsculptured among punctae. Metanotum shiny, smooth, unsculptured. Propodeum dull, reticulate rugose, without transverse keel between dorsal and posterior surface; posterior surface almost completely reticulate rugose, with small central smooth and shiny area, without longitudinal or transverse keels; occasionally posterior surface with two tracks of longitudinal keels and median area completely dull and reticulate rugose. Forewing hyaline, without dark transverse bands; distal part of stigmal vein slightly longer than proximal part (13:12), or as long as proximal part. Paramere of holotype and specimen from Madagascar, 12°17.17'S 49°22.00'E, with quite large and long distal inner branch showing mosaic sculpture (Fig. 28). In few paratypes (from 18°28.24'S 47°57.36'E and 24°39.13'S 43°59.48'E) mosaic sculpture on inner branch absent (Figs 29, 30). In all specimens inner side of paramere with large area sculptured by numerous papillae (Figs 28–30). Tibial spurs 1/1/2.

*Female*. Unknown.

Holotype (examined): ♂ MADAGASCAR: *Mahajanga*: Ankoririka Reserve, 10.6 km 13° NE of Tsaramandroso, 16°16.2'S 46°2.55'E, 210 m, 9–14.iv.2001, Malaise trap, Tropical dry forest, Fisher, Griswold *et al.* (CAS).

Paratypes (examined): 6♂ MADAGASCAR: Antananarivo, 11.5 km 47° SSE of Anjozorobe, 3 km 41° NE of Andranomay, 18°28.24'S 47°57.36'E, 1300 m, 5–13.xii.2000, Malaise trap, montane rainforest, Fisher, Griswold *et al.* (4 CAS, 2 OLM).

Other material examined: MADAGASCAR: 1♂ Diego-Suarez, 3 km W of Sakalava Beach, white dunes, 12°17.17'S 49°22.00'E, 40 m, 27–30.i.2001, Malaise trap, M.E. Irwin, E.I. Schlinger & R. Harin'Hala (CAS);



Figs 25–30. (25, 26) *Deinodryinus pulcher* Olmi, paratype male: (25) propodeum dorsal view, (26) male genitalia; (27) *D. richardsi* (Olmi), holotype – chela; (28–30) *D. rusticus* Olmi: (28) holotype – male genitalia, (29, 30) distal apex of paramere of Madagascar male – (29) 18°28.24'S 47°57.36'E and (30) 24°39.13'S 43°59.48'E. Scale bar = (25) 0.41 mm; (26) 0.15 mm; (27) 0.25 mm; (28) 0.20 mm; (29, 30) 0.12 mm.

3♂ Fianarantsoa, Ranomafana National Park, radio tower at forest edge, 21°15.05'S 47°24.43'E, 1130 m, 16.x–8.xi.2001, Malaise trap, mixed tropical forest, R. Harin'Hala (2 CAS, 1 OLM); 6♂ *Mahajanga*: Namoroka National Park, 16.9 km 317° NW Vilanandro, 16°24.24'S 45°18.36'E, 100 m, 12–16.xi.2002, Malaise trap in tropical dry forest, Fisher, Griswold *et al.* (CAS); 1♂ *Mahajanga*: Sofia District, 45 km S Antsohihy, 5 km W of Anjiamangirana, elev 97 m, 5–8.v.2011, 15°09.42'S 47°47.05'E, M.Irwin & R.Harin'Hala, Malaise, Analagnambe dry degraded forest (CAS); 1♂ Toamasina, Andasibe National Park, 18°55.58'S 48°24.47'E, botanic garden near entrance to park, 1025 m, 16–23.xi.2001, Malaise trap, tropical forest, R. Harin'Hala (CAS); 2♂ Toliary, Mahafaly Plateau, 6.2 km 74° ENE of Itampolo, 24°39.13'S 43°59.48'E, 80 m, Malaise trap, spiny forest thicket, 21–25.ii.2002, Fisher, Griswold *et al.* (1 CAS, 1 OLM); 15♂ Toliary, Andohahela Nat. Park, Manantalinho Forest, 33.6 km 63° ENE Amboasary, 7.6 km 99° E Hazofotsy, 24°49.1'S 46°36.36'E, 150 m, 12–16.i.2002, Malaise trap in spiny forest thicket, Fisher, Griswold *et al.* (13 CAS, 2 OLM).

Distribution: Madagascar.

Hosts: Unknown.

*Deinodryinus sabaeus* Olmi & Van Harten, 2006

Figs 31, 32

*Deinodryinus sabaeus* Olmi & Van Harten, 2006: 314.

Redescription:

*Male.*

Macropterous; length 1.5–1.8 mm. Head black, except mandible testaceous; antenna brown, except segment 1 testaceous; mesosoma and metasoma black; legs brown, except



tarsi, protibia and stalk of profemur testaceous. Antenna filiform, with hairs longer than breadth of segments; antennal segments in the following proportions: 7:4.5:4.5:4.5:4.5:4.5:4.5:6.5. Head shiny, slightly granulated and slightly rugose (in specimen from Madagascar, 12°13.97'S 49°21.99'E, head strongly granulated and rugose); vertex without two oblique keels from posterior ocelli to occipital carina; frontal line complete; occipital carina complete; POL=7; OL=3.5; OOL=5; OPL=2; TL=2. Scutum shiny, somewhat slightly granulated and partly punctate and unsculptured among punctae. Notauli thin, incomplete, reaching approximately 0.25× length of scutum. Scutellum and metanotum shiny, smooth, unsculptured. Propodeum (Fig. 31) dull, reticulate rugose, with transverse keel between dorsal and posterior surface situated far from anterior margin of propodeum (Fig. 31); dorsal surface distinct and large (Fig. 31); posterior surface completely reticulate rugose, without longitudinal or transversal keels. Forewing hyaline, without dark transverse bands; distal part of stigmal vein much shorter than proximal part (1.5:7). Paramere (Fig. 32) about as long as penis, with overly large and long inner branch not showing mosaic drawing. Tibial spurs 1/1/2.

*Female.* Unknown.

Holotype (examined): ♂ YEMEN: Ar Rujum, 15°26'N 43°40'E, 9.iv–5.vi.2001, Malaise trap, A. van Harten (OLM).

Paratypes (examined): 13♂ same locality as holotype (OLM).

Other material examined: MADAGASCAR: 1♂ Antsiranana, Diana Region, Orangea dry forest, Ramena, Baie de dune, 900m E of Camp Minier, 23.ii–2.iii.2011, 12°13.97'S 49°21.99'E, M. Irwin & R. Harin'Hala, Malaise trap, dry forest, elev. 152 m (CAS); 1♂ Fianarantsoa, Ranomafana National Park, Vohiparara, 21°13.57'S 47°22.19'E, at broken bridge, 1110 m, 21–28.i.2002, Malaise trap in high altitude rainforest, R. Harin'Hala (CAS); 1♂ *Mahajanga*: Sofia District, 45 km S Antsohihy, 5 km W of Anjiamangirana, elev 97 m, 27.i–2.ii.2011, 15°09.42'S 47°47.05'E, M. Irwin & R. Harin'Hala, Malaise, Analagnambe dry degraded forest (OLM).

Distribution: Madagascar, Yemen.

Hosts: Unknown.

### *Deinodryinus softensis* sp. n.

Fig. 33

Etymology: Named after the type locality, Sofia district (now a region) in Madagascar.

Description:

*Male.*

Macropterous; length 1.6–1.9 mm. Head black, except mandible testaceous; antenna testaceous-brown, except segments 1–2 testaceous; mesosoma black; metasoma brown; fore- and midleg yellow; hindleg testaceous-brown, except coxa brown. Antenna filiform, with hairs about as long as breadth of segments; antennal segments in the following proportions: 5:3.5:6:5:5:4:5:5:4.5:7. Head shiny, quite strongly punctate, unsculptured among punctae; areolae of face and vertex notably deep, so that the head seems to be rugose; frontal line absent; occipital carina complete; POL=5; OL=3; OOL=5; OPL=2.5; TL=2; greatest breadth of posterior ocellus as long as OPL. Scutum and scutellum shiny, punctate, unsculptured among punctae. Notauli incomplete, reaching approximately 0.6× length of scutum. Metanotum shiny, smooth, unsculptured. Propodeum dull, reticulate rugose, without transverse keel between dorsal and posterior surface; posterior surface reticulate rugose, without longitudinal or transverse keels,

with median area partly smooth, shiny and unsculptured Forewing hyaline, without dark transverse bands; distal part of stigmal vein longer than proximal part (9:7). Paramere (Fig. 33) with 2 large and long apical inner branches; one of these branches shows a few papillae situated mainly on the inner margin; the second branch shows a mosaic sculpture; the volsellae are situated between the two above branches; inner apical branch of paramere with distal apex considerably large. Tibial spurs 1/1/2.

*Female.* Unknown.

Holotype (examined): ♂ MADAGASCAR: *Mahajanga*: Sofia District, 45 km S Antsohihy, 5 km W of Anjiamangirana, elev 97 m, 5–8.v.2011, 15°09.42'S 47°47.05'E, M. Irwin & R. Harin'Hala, Malaise trap, Analagnambe dry degraded forest (CAS).

Paratypes (examined): 2♂ same data as holotype (1 CAS, 1 OLM).

Distribution: Madagascar.

Hosts: Unknown.

### *Deinodryinus steineri* Olmi, 1994

Figs 34–36

*Deinodryinus steineri* Olmi, 1994: 7.

Redescription:

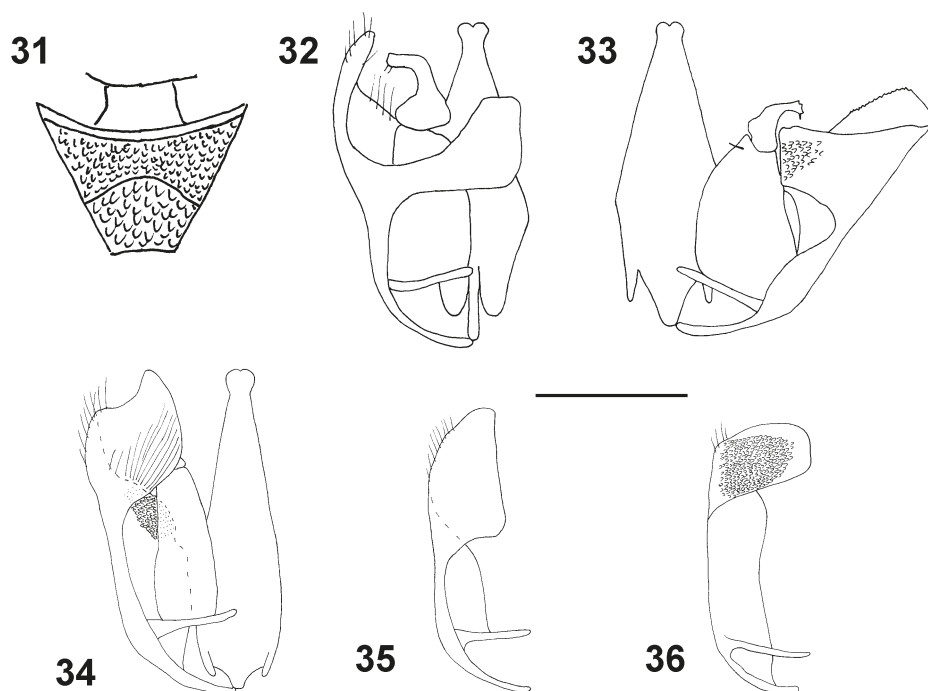
*Male.*

Macropterous; length 2.9–3.2 mm. Head black, except mandible testaceous; antenna testaceous; mesosoma black; metasoma brown; legs testaceous, except pro- and metacoxa partly black; occasionally legs testaceous, except only metacoxa partly black. Antenna filiform, with hairs at most as long as breadth of segments; antennal segments in the following proportions: 11:6:11:8:8:7:7:7:7:12. Head shiny, strongly punctate, with punctae large and deep, similar to areolae (some regions of head appear to be reticulate rugose); in specimen from Madagascar, 21°15.99'S 47°25.21'E, face completely reticulate rugose; frontal line complete; occipital carina complete; POL=8.5; OL=4; OOL=7; OPL=6; TL=3. Scutum shiny, punctate, unsculptured among punctae. Notauli incomplete, reaching approximately 0.7–0.8× length of scutum. Scutellum and metanotum shiny, punctate, unsculptured among punctae. Mesopleuron punctate, unsculptured among punctae. Metapleuron shiny, smooth, unsculptured. Propodeum reticulate rugose, without strong transverse keel between dorsal and posterior surface; posterior surface without longitudinal keels, with central shiny area unsculptured. Forewing with one dark distal transverse band; distal part of stigmal vein longer than proximal part (17:13). Paramere (Figs 34–36) about as long as penis, with large, short and broad distal band wrapping penis; inner side of paramere broadly sculptured by papillae. Tibial spurs 1/1/2.

*Female.* Unknown.

Holotype (examined): ♂ MADAGASCAR: Fianarantsoa, 7 km W Ranomafana, 900 m, 1–7.iii.1990, Malaise trap in small clearing, montane rain forest, W.E. Steiner (USNM).

Other material examined: MADAGASCAR: 1♂ Diego-Suarez, Montagne d'Ambre National Park, 12°30.52'S 49°10.53'E, 960 m, 21–26.i.2001, Malaise trap, M.E. Irwin, E.I. Schlinger & R. Harin'Hala (CAS); 1♂ Fianarantsoa, Ranomafana National Park, Belle Vue at Talatakely, 21°15.99'S 47°25.21'E, 1020 m, 15–22.xi.2001, Malaise trap, secondary tropical forest, R. Harin'Hala (CAS); 1♂ Fianarantsoa, Ranomafana National Park, radio tower at forest edge, 21°15.05'S 47°24.43'E, 1130 m, 16.x–8.xi.2001, Malaise trap, mixed tropical forest, R. Harin'Hala (OLM); 2♂ Toamasina, Andasibe National Park, 18°55.58'S 48°24.47'E, botanic garden near entrance to park, 1025 m, 1–5.ix.2001, Malaise trap, tropical forest, R. Harin'Hala (CAS).



Figs 31–36. (31, 32) *Deinodryinus sabaesus* Olmi & Van Harten, paratype male: (31) propodeum dorsal view, (32) holotype – male genitalia; (33) *D. softensis* sp. n., holotype – male genitalia; (34–36) *D. steineri* Olmi: (34) holotype – male genitalia, (35, 36) paramere of Madagascan male – (35) 12°30.52'S 49°10.53'E and (36) 21°15.99'S 47°25.21'E. Scale bar = (31) 0.28 mm; (32, 33) 0.13 mm; (34) 0.21 mm; (35) 0.24 mm; (36) 0.25 mm.

Distribution: Madagascar.

Hosts: Unknown.

*Deinodryinus suavis* Olmi, 2004

Fig. 37

*Deinodryinus suavis* Olmi, 2004: 89.

Redescription:

*Male.*

Macropterous; length 2.7–2.9 mm. Head black, except mandible testaceous; antenna testaceous; mesosoma and metasoma black; legs testaceous, except metacoxa partly brown. Antenna filiform, with hairs shorter than breadth of segments; antennal segments in the following proportions: 9:6:8:6:6:7:7:7:11. Head shiny, finely punctate, unsculptured among punctae; vertex without two oblique keels from posterior ocelli to occipital carina; frontal line markedly thin, almost complete, missing only in front of anterior ocellus; occipital carina complete; POL=7.5; OL=3; OOL=6; OPL=4; TL=2. Scutum shiny, as sculptured as head. Notauli incomplete, reaching approximately 0.6× length of scutum. Scutellum shiny, punctate, unsculptured among punctae. Metanotum shiny, smooth, unsculptured. Propodeum dull, reticulate rugose, without transverse keel between dorsal and posterior surface; posterior surface almost completely reticulate

rugose, with small central smooth and shiny area, without longitudinal or transverse keels. Forewing hyaline, with one slight small dark spot just beneath stigmal vein; distal part of stigmal vein slightly longer than proximal part (13:12). Paramere (Fig. 37) about as long as penis, with quite large apical inner branch. Tibial spurs 1/1/2.

*Female.* Unknown.

Holotype (examined): ♂ MADAGASCAR: Antananarivo, 11.5 km 147° SSE of Anjozorobe, 3 km 41°NE of Andranomay, 18°28.24'S 47°57.36'E, 1300 m, 5–13.xii.2000, Malaise trap in montane rainforest, Fisher, Griswold *et al.* (CAS).

Other material examined: 1♂ MADAGASCAR: Fianarantsoa, Ranomafana National Park, Vohiparara, at broken bridge, 21°13.57'S 47°22.19'E, 1110 m, 4–12.ii.2002, Malaise trap in high altitude rainforest, R. Harin'Hala (CAS).

Distribution: Madagascar.

Hosts: Unknown.

*Deinodryinus umtamvunensis* Olmi, 2007

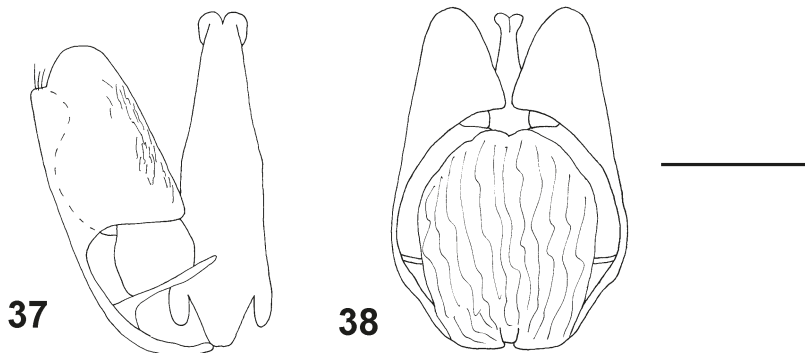
Fig. 38

*Deinodryinus umtamvunensis* Olmi, 2007: 207; 2009: 457.

Redescription:

*Male.*

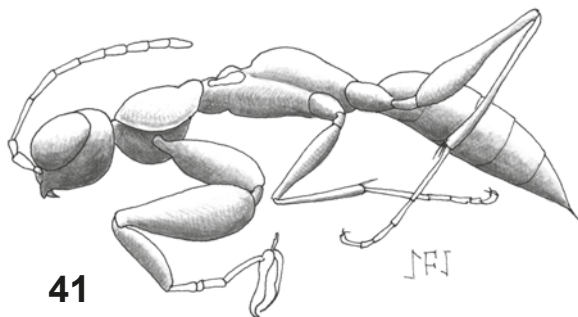
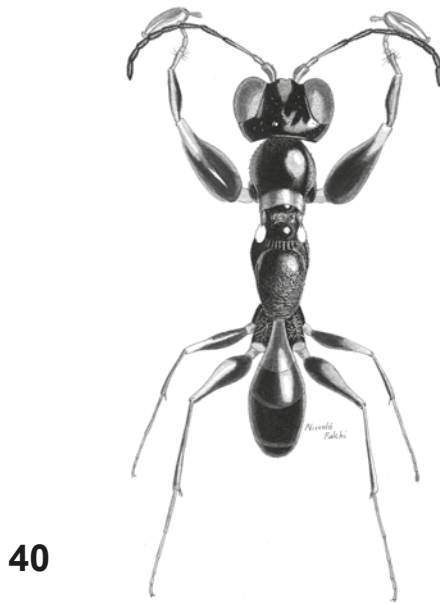
Macropterous; length 1.6–1.8 mm. Head black; mandible testaceous; antenna brown, except segment 1 testaceous; mesosoma and metasoma black; legs testaceous. Antenna filiform, with hairs at most as long as breadth of segments; antennal segments in the following proportions: 7:5:6:6:6:6:5:5:5:7. Head shiny, punctate, unsculptured among punctae; frontal line absent; occipital carina complete; POL=5; OL=3; OOL=4; OPL=2.5; TL=4; greatest breadth of posterior ocelli shorter than OL (2:3). Scutum shiny, finely punctate, unsculptured among punctae. Notauli incomplete, reaching approximately 0.6× length of scutum. Scutellum and metanotum shiny, smooth, unsculptured. Propodeum with strong transverse keel between dorsal and posterior surface; dorsal surface large, reticulate rugose; posterior surface with two longitudinal keels and median and lateral areas reticulate rugose. Forewing hyaline, without dark transverse bands; distal part of stigmal vein much shorter than proximal part (3.5:8).



Figs 37, 38. (37) *Deinodryinus suavis* Olmi, holotype – male genitalia; (38) *D. umtamvunensis* Olmi, holotype – male genitalia. Scale bar = (37) 0.19 mm; (38) 0.11 mm.



Fig. 39. Adult of *Aconurella compta* (Naudé), (length 3.4 mm) with larval exuviae of *Deinodryinus paulyi* (Olm); collected from Namibia, 40 km W Keetmanshoop.



Figs 40, 41. *Deinodryinus casalei* (Olm), holotype female: (40) dorsal view; (41) lateral view; (from Olmi, 1984). Length: 3.7 mm.

Paramere (Fig. 38) about as long as penis, with large apical branch wrapping penis and large dorsal proximal membranous process. Tibial spurs 1/1/2.

*Female.* Unknown.

Holotype (examined): ♂ SOUTH AFRICA: *KwaZulu-Natal*: Umtamvuna Nature Reserve, 31°03.509'S 30°10.484'E, 160 m, 11–12.xi.2000, Malaise trap, Coastal forest/Pondoland Coastal Plateau, sour Grassland margin, S. van Noort (SAMC).

Paratype (examined): 1♂ same data as holotype (SAMC).

Distribution: South Africa.

Hosts: Unknown.

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#### REFERENCES

- BENOIT, P.L.G. 1954. Monographie des Dryinides Malgaches (Hym.-Acul.). *Mémoires de l'Institut Scientifique de Madagascar*, Sér E, 4: 383–430.
- GUGLIELMINO, A. & BÜCKLE, C. 2003. Description of larval instars of *Neodryinus typhlocybae* (Ashmead, 1893) (Hymenoptera Dryinidae), with remarks on its biology. *Mitteilungen aus dem Museum fuer Naturkunde in Berlin – Deutsche Entomologische Zeitschrift* 50 (1): 143–150.
- 2010. Description of larval instars of *Mystrophorus formicaeformis* Ruthe (Hymenoptera: Dryinidae). *Zootaxa* 2602: 57–66.
- GUGLIELMINO, A., BÜCKLE, C. & MOYA-RAYGOZA, G. 2006. Description of the larval instars of *Gonatopus bartletti* Olmi, 1984 (Hymenoptera: Dryinidae). *Zootaxa* 1226: 51–60.
- GUGLIELMINO, A. & OLM, M. 1997. A host-parasite catalog of world Dryinidae (Hymenoptera: Chrysoidea). *Contributions on Entomology, International* 2 (2): 165–298.
- 2006. A host-parasite catalog of world Dryinidae (Hymenoptera: Chrysoidea): first supplement. *Zootaxa* 1139: 35–62.
- 2007. A host-parasite catalog of world Dryinidae (Hymenoptera: Chrysoidea): second supplement. *Bollettino di Zoologia Agraria e di Bachicoltura* (Ser. II) 39 (2): 121–129.
- 2011. Revision of fossil species of *Deinodryinus*, with description of a new species (Hymenoptera, Dryinidae). *ZooKeys* 130: 495–504.
- GUGLIELMINO, A., OLM, M. & BÜCKLE, C. 2013. An updated host-parasite catalogue of world Dryinidae (Hymenoptera: Chrysoidea). *Zootaxa* 3740: 1–113.
- GUGLIELMINO, A. & VIRLA, E.G. 1998. Postembryonic development of *Gonatopus lunatus* Klug (Hymenoptera: Dryinidae: Gonatopodinae), with remarks on its biology. *Annales de la Société entomologique de France* (Nouvelle Série) 34 (3): 321–333.
- HALIDAY, A.H. 1833. An essay on the classification of the Parasitic Hymenoptera of Britain, which correspond with the Ichneumonones minuti of Linnaeus. *The Entomological Magazine* 1: 259–276.
- HE, J. & XU, Z. 2002. *Fauna Sinica*: Insecta, Volume 29: Hymenoptera: Dryinidae. Beijing, Science Press [In Chinese].
- KIEFFER, J.-J. 1911. Nouveaux Bethylides et Dryinides exotiques du British Museum de Londres. *Annales de la Société scientifique de Bruxelles* 35: 200–233.
- 1913. Division des Anteoniinae (Hym.). *Bulletin de la Société entomologique de France*: 300–301.
- 1914. Bethylidae. In: *Das Tierreich* 41. Berlin, R. Friedländer und Sohn, pp. 1–595.
- MANGIONE, S. & VIRLA, E.G. 2004. Morfologia de los estados preimaginales de *Gonatopus bonaerensis*, y consideraciones sobre la morfología interna de sus larvas inmaduras (Hymenoptera, Dryinidae). *Acta Zoológica Lilloana* 48 (1–2): 91–102.
- MOYA-RAYGOZA, G. & OLM, M. 2010 [2008]. A catalogue of Dryinidae of Mexico, with descriptions of the opposite sexes of some species (Hymenoptera Chrysoidea). *Frustula entomologica*, N. Ser. 31: 77–112.

- MUESEBECK, C.F.W. & WALKLEY, L.M. 1951. Family Dryinidae. In: Muesebeck C.F.W., Krombein K.V. & Townes H.K., eds, *Hymenoptera of America North of Mexico. Synoptic catalogue*. Agriculture Monograph 2. Washington: U.S. Department of Agriculture, pp. 1034–1043.
- OLMI, M. 1984. A revision of the Dryinidae (Hymenoptera). *Memoirs of the American Entomological Institute* **37**: 1–1913.
- 1987a. New species of Dryinidae (Hymenoptera, Chrysidoidea). *Fragmenta Entomologica* **19**: 371–456.
- 1987b. Descrizione di nuove specie di Dryinidae (Hymenoptera Chrysidoidea). *Bollettino di Zoologia Agraria e di Bachicoltura* (Ser. II) **19**: 31–70.
- 1991 [1989]. Supplement to the revision of the world Dryinidae (Hymenoptera Chrysidoidea). *Frustula entomologica* N. Ser. **12**: 109–395.
- 1994. New species of Dryinidae from Madagascar (Hymenoptera Chrysidoidea). *Frustula entomologica* N. Ser. **17**: 1–12.
- 1998 [1997]. New Embolemidae and Dryinidae (Hymenoptera Chrysidoidea). *Frustula entomologica* N. Ser. **20**: 30–118.
- 1999. Hymenoptera Dryinidae-Embolemidae. *Fauna d'Italia* **37**: 1–425.
- 2004 [2002]. New species of Dryinidae and Embolemidae from Madagascar (Hymenoptera Chrysidoidea). *Frustula entomologica* N. Ser. **25**: 86–109.
- 2006 [2005]. A catalogue of Dryinidae and Embolemidae of South Africa, with descriptions of new species (Hymenoptera Chrysidoidea). *Frustula entomologica* N. Ser. **28–29**: 1–57.
- 2007. New species of Afrotropical Dryinidae (Hymenoptera: Chrysidoidea), with description of a new genus and a new subfamily. *African Invertebrates* **48** (2): 199–232.
- 2009. New species of South African Dryinidae (Hymenoptera: Chrysidoidea). *African Invertebrates* **50** (2): 447–460.
- 2010 [2008]. Descriptions of new species of Dryinidae and Embolemidae from Madagascar (Hymenoptera Chrysidoidea). *Frustula entomologica* N. Ser. **31** (44): 53–76.
- OLMI, M. & GUGLIELMINO, A. 2010. Description of Erwiniinae, new subfamily of Dryinidae from Ecuador (Hymenoptera: Chrysidoidea). *Zootaxa* **2605**: 56–62.
- OLMI, M., RASNITSYN, A.P. & GUGLIELMINO, A. 2010. Revision of rock fossils of Dryinidae and Embolemidae (Hymenoptera: Chrysidoidea). *Zootaxa* **2499**: 21–38.
- OLMI, M. & VAN HARTEN, A. 2006. Dryinidae, Sclerogibbidae and Embolemidae (Hymenoptera: Chrysidoidea) of Yemen, with revised keys to the species of the Arabian peninsula. *Fauna of Arabia* **21**: 307–337.
- OLMI, M. & VIRLA, E.G. 2014. Dryinidae of the Neotropical Region (Hymenoptera: Chrysidoidea). *Zootaxa* **3792** (1): 1–534.
- PERKINS, R.C.L. 1907. Parasites of leaf-hoppers. *Report of Work of the Experiment Station of the Hawaiian Sugar Planters' Association, Division of Entomology, Bulletin* **4**: 5–59.
- 1912. Parasites of the Family Dryinidae. *Report of Work of the Experiment Station of the Hawaiian Sugar Planters' Association, Division of Entomology, Bulletin* **11**: 5–20.
- PONOMARENKO, N.G. 1975. New hymenopteran species from Baltic amber. *Paleontological Journal* **9** (1): 124–126.
- VIRLA, E.G. & MANGIONE, S. 2000. Morfología de los estados preimaginales de *Gonatopus chilensis* y consideraciones sobre las estructuras relacionadas a la nutrición de sus larvas inmaduras (Insecta: Hymenoptera: Dryinidae). *Neotrópica* **46**: 37–49.
- VIRLA, E.G. & OLMÍ, M. 2008. Dryinidae. In: Claps, L.E., Debandi, G. & Roig-Juñent, S., eds, *Biodiversidad de Artrópodos Argentinos*. Vol. 2. Mendoza: Sociedad Entomológica Argentina, pp. 357–372.
- XU, Z., OLMÍ, M., GUGLIELMINO, A. & CHEN, H. 2011. A new species of Dryinidae (Hymenoptera: Chrysidoidea) from China. *Florida Entomologist* **94** (4): 848–852. DOI: <http://dx.doi.org/10.1653/024.094.0418>
- 2012. Checklist of Dryinidae (Hymenoptera) from Shaanxi province, China, with descriptions of two new species *Zootaxa* **3164**: 1–16.
- XU, Z., OLMÍ, M. & HE, J. 2013. Dryinidae of the Oriental region (Hymenoptera: Chrysidoidea). *Zootaxa* **3614** (1): 1–460.

