

CONTRIBUTIONS TO THE TAXONOMY AND BIOGEOGRAPHY  
OF AFROTROPICAL *ERIBORUS* FÖRSTER, 1869  
(HYMENOPTERA: ICHNEUMONIDAE: CAMPOPLEGINAE)

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In this paper, two new species of *Eriborus* Förster, 1869 (Ichneumonidae: Campopleginae) are described from the Afrotropical region: *Eriborus elgonensis* sp. n. from Kenya and *Eriborus rubens* sp. n. from South Africa. *Eriborus pallipes* (Brullé, 1846), a species known from Mauritius and Réunion, is reported from continental Africa (South Africa) for the first time, and *Eriborus regulator* (Seyrig, 1935), a species known only from Kenya, is firstly reported from Ethiopia. Additionally, further South African distributional data on *Eriborus pomonellae* (Cameron, 1906) are also given.

Key words: parasitoids, taxonomy, distribution, new record, new species, Hymenoptera, Ichneumonidae, Afrotropical.

## INTRODUCTION

*Eriborus* Förster, 1869 is a moderately species-rich campoplegine genus of the family Ichneumonidae, with 58 valid species worldwide (including two newly described species) (ROUSSE & VILLEMANT 2012, YU *et al.* 2016, VAS 2019). The genus is most diverse in the Eastern Palearctic and Oriental regions (YU *et al.* 2016). The most recent taxonomic work on the genus focused on the Australasian species (VAS 2019). The biogeographical scope of the present work is the Afrotropical region *sensu* TOWNES and TOWNES (1973); prior to this paper, there were only six *Eriborus* species known from the region: *E. cadjee* Rouse et Villemant, 2012 from Réunion, *E. exareolatus* (Morley, 1916) from Zimbabwe, *E. niger* (Szépligeti, 1908) from Tanzania, *E. pallipes* (Brullé, 1846) from Mauritius and Réunion, *E. pomonellae* (Cameron, 1906) from South Africa, and *E. regulator* (Seyrig, 1935) from Kenya (TOWNES & TOWNES 1973, ROUSSE 2011, ROUSSE & VILLEMANT 2012, YU *et al.* 2016). Since most known species of the genus are tropical and/or subtropical, most probably several yet undescribed species occur in Africa.

In this paper, several new taxonomic and distributional records on the Afrotropical members of the genus *Eriborus* Förster, 1869 are provided: two new species are described, namely *E. elgonensis* sp. n. from Kenya and *E. rubens* sp. n. from South Africa; *E. pallipes* (Brullé, 1846) is reported from Africa mainland (South Africa) for the first time; and *E. regulator* (Seyrig, 1935) is firstly reported from Ethiopia. In addition, further South African distributional data is given

to *E. pomonellae* (Cameron, 1906) because its distributional records in literature are scarce and were published several decades ago (CAMERON 1906, TOWNES & TOWNES 1973).

## MATERIAL AND METHODS

The examined Afrotropical Campopleginae material belongs to the Hungarian Natural History Museum (HNHM, Budapest, Hungary) and to the Biological Museum of Lund University (MZLU, Lund, Sweden). The former material has resulted from HNHM collecting expeditions in Africa (e.g. DEMETER 1982, MERKL 1993). Ichneumonidae taxonomy and nomenclature follow YU *et al.* (2016). Morphological terminology follows GAULD (1991) and GAULD *et al.* (1997); however, in the cases of wing veins, the corresponding terminology of TOWNES (1969) is also indicated. Identifications were based on BRULLÉ (1846), CAMERON (1906), SZÉPLIGETI (1908), MORLEY (1916), SEYRIG (1935), TOWNES (1970), TOWNES and TOWNES (1973), ROUSSE (2011), ROUSSE & VILLEMANT (2012), VAN NOORT (2021), and on checking the necessary type materials (at least based on high-quality photos of the specimens). Label data are given verbatim (with explanatory information in square brackets if needed). The photos of the new species were taken with a 14 MP MicroQ-U3L digital camera. Post-image work was done with ToupTek ToupView v4.7 and Photoshop CS6.

## TAXONOMY AND BIOGEOGRAPHY

Subfamily: Campopleginae Förster, 1869

Genus: *Eriborus* Förster, 1869

Type species: *Campoplex perfidus* Gravenhorst, 1829; designation by MORLEY (1913).

*Diagnosis* – Inner margin of eye weakly to moderately indented opposite toruli; clypeus relatively large, weakly convex, apical margin simple, not reflexed, usually blunt; fore wing without areolet (*3rs-m* absent); hind wing with nervellus (*cu-a* + abscissa of *Cu1* between *M* and *cu-a*) not intercepted by discoidella (*Cu1*); hind basitarsus with a midventral row of closely spaced, short hairs; suture separating first tergite from first sternite situated below mid-height at basal third of first metasomal segment; glymma present; ovipositor sheath 1–5× as long as apical depth of metasoma.

### ***Eriborus elgonensis* sp. n.**

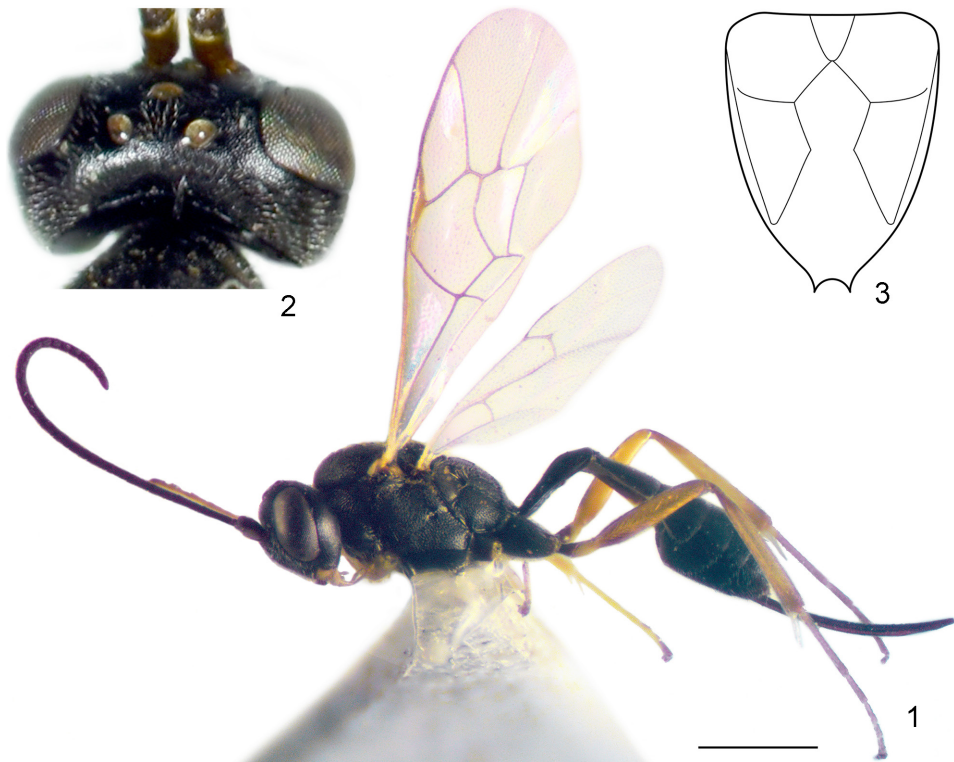
(Figs 1–3)

*Type material* – Holotype: female, Kenya, Mt. Elgon Nat. P. [= National Park], bamboo (*Arundinaria alpina*) thicket, 2740m, 20.I.1992, leg. O. Merkl & G. Várkonyi, swept, No. 491; specimen card-mounted, left flagellum, fore and middle legs on left side missing, Id. No. HNHM-HYM 155120. – Paratype: male, same locality and collecting data, specimen card-mounted, Id. No. HNHM-HYM 155121. – The holotype and the paratype are deposited in HNHM.

*Diagnosis* – The new species can be identified by the combination of the following characters: gena in dorsal view  $0.6\text{--}0.7\times$  as long as eye width, weakly, roundly narrowed behind eyes; malar space  $0.6\times$  as long as basal width of mandible; propodeal carinae complete, except the median section of posterior transverse carina; area basalis triangular; area superomedia pentagonal, relatively wide, slightly longer than its greatest width, posteriorly opened; fore wing without areolet,  $2rs\text{--}m$  shorter than abscissa of  $M$  between  $2rs\text{--}m$  and  $2m\text{--}cu$ , nervulus weakly postfurcal; ovipositor sheath  $1.5\times$  as long as hind tibia; scapus and pedicellus ventrally more or less yellowish; tegula yellow; metasoma black; fore and middle legs predominantly orange; hind coxa black, femur and tibia predominantly orange, more or less infusate.

*Description* – Female (Figs 1–3). Body length ca. 4.5 mm, fore wing length ca. 3.5 mm.

Head: Antenna with 24 flagellomeres; first flagellomere  $4\times$  as long as its apical width; preapical flagellomeres longer than wide. Head transverse, matt, granulate with weak, indistinct punctures on clypeus; hairs rather short, on face and clypeus somewhat longer. Ocelli small, ocular-ocellar distance  $1.3\times$  as long as ocellus diameter, distance between



**Figs 1–3.** *Eriborus elgonensis* sp. n., holotype female: 1 = lateral habitus (scale bar = 1 mm); 2 = gena in dorsal view; 3 = propodeum in dorsal view

lateral ocelli  $1.5\times$  as long as ocellus diameter. Inner eye orbits slightly indented opposite toruli, slightly convergent ventrally. Gena relatively long, in dorsal view  $0.6\text{--}0.7\times$  as long as eye width, weakly, roundly narrowed behind eyes. Occipital carina complete, reaching hypostomal carina little before base of mandible; hypostomal carina elevated. Frons flat, slightly impressed above toruli, median longitudinal carina not developed. Face and clypeus almost flat in profile, clypeus very weakly separated from face, moderately wide, its apical margin weakly convex, moderately blunt. Malar space  $0.6\times$  as long as basal width of mandible. Mandible moderately strong, lower margin with a relatively narrow flange from base towards teeth, flange gradually narrowed before teeth; upper mandibular tooth slightly longer and wider than lower tooth.

Mesosoma: Mesosoma matt, granulate with weak, indistinct punctures, except punctures on mesopleuron stronger, more distinct; hairs short, dense, on propodeum little longer. Pronotum with weak traces of transverse wrinkles on ventral half, epomia discernible. Mesoscutum about as long as wide, convex in profile; notaulus absent. Scuto-scutellar groove wide and deep. Scutellum convex in profile, lateral carinae absent. Speculum relatively small, finely granulate to almost smooth, subpolished. Epicnemial carina complete, pleural part bent to anterior margin of mesopleuron reaching it at about its middle height, transversal part (i.e., the part at the level of sternaulus running through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) strong. Sternaulus indistinct. Posterior transverse carina of mesosternum complete. Metanotum  $0.5\times$  as long as scutellum. Metapleuron without juxtacoxal carina; submetapleural carina complete, elevated. Pleural carina of propodeum strong; propodeal spiracle small, circular, separated from pleural carina by less than its length, connected to pleural carina by a distinct, short ridge. Propodeum convex in profile, granulate with mostly transverse rugosity on posterior half. Propodeal carinae complete, except the median section of posterior transverse carina. Area basalis triangular, slightly longer than its basal width. Area superomedia pentagonal, relatively wide, only slightly longer than its greatest width, posteriorly opened, its lateral carinae posterior to costulae convergent. Area petiolaris confluent with area superomedia, relatively wide. Fore wing without areolet,  $3rs\text{--}m$  absent, second recurrent vein ( $2m\text{--}cu$ ) postfurcal, intercubitus ( $2rs\text{--}m$ ) shorter than abscissa of  $M$  between  $2rs\text{--}m$  and  $2m\text{--}cu$ ; distal abscissa of  $Rs$  almost straight, at extreme apex weakly curved towards wing margin; nervulus ( $cu\text{--}a$ ) postfurcal by about its width, slightly inclivous; postnervulus (abscissa of  $Cu1$  between  $1m\text{--}cu$  and  $Cu1a + Cu1b$ ) intercepted little above its middle by  $Cu1a$ ; lower external angle of second discal cell acute. Hind wing with nervellus ( $cu\text{--}a +$  abscissa of  $Cu1$  between  $M$  and  $cu\text{--}a$ ) about vertical, not intercepted by discoidella ( $Cu1$ ); discoidella spectral, proximally not connected to nervellus. Coxae granulate. Hind femur ca.  $5.5\times$  as long as high. Inner spur of hind tibia ca.  $0.6\times$  as long as first tarsomere of hind tarsus. Hind basitarsus with a midventral row of closely spaced, short hairs (appearing as a darker, more or less scaly, inconspicuous line). Tarsal claws small, about as long as arolium, basal half pectinate.

Metasoma: Metasoma moderately compressed, finely granulate to shagreened, and with dense, short hairs. First tergite almost  $3\times$  as long as width of its apical margin; glymma moderately strong; dorsomedian carinae of first tergite weak. Second tergite relatively stout,  $1.2\text{--}1.3\times$  as long as its apical width; thyridium oval, relatively large, its distance from basal margin of tergite ca.  $0.7\times$  as long as its length. Posterior margins of apical tergites not excised. Ovipositor sheath long,  $1.5\times$  as long as hind tibia; ovipositor compressed, strong, evenly upcurved, dorsal preapical notch distinct.

Colour: Antenna dark brown, except scapus and pedicellus ventrally partly yellowish. Head black, except palpi and mandible yellow, mandibular teeth dark reddish

brown. Mesosoma black, except tegula yellow. Metasoma black. Wings hyaline, wing veins brown, pterostigma light brown. Fore leg orange, except coxa, trochanter and trochantellus yellowish, apical tarsomeres darkened. Middle leg orange, except coxa black, apically narrowly yellowish, trochanter and trochantellus yellowish, apical tarsomeres darkened. Hind leg: coxa black; trochanter dark brown, apically very narrowly yellowish; trochantellus yellowish; femur reddish orange, basally weakly darkened; tibia orange, basally and apically slightly darkened; tarsus orange-brown, apical tarsomeres darkened.

Male: Similar to female in all characters described above, except: ocular-ocellar distance  $1.5\times$  as long as ocellus diameter, distance between lateral ocelli  $1.2\times$  as long as ocellus diameter; punctures on mesopleuron weaker, speculum larger and smoother than in female; costulae partly obsolescent; area superomedia somewhat narrower and more elongate than in female; thyridium smaller, its distance from basal margin of tergite about as long as its length; scapus and pedicellus ventrally predominantly brownish; middle coxa extensively orange; middle and hind femora and tibiae more or less infuscate.

*Distribution* – Kenya.

*Etymology* – The specific epithet *elgonensis* is the masculine form of the Latin adjective *elgonensis*, *-is*, *-e* meaning from (Mt.) Elgon; it refers to the type locality of the new species.

*Remarks on identification* – Among the Afrotropical *Eriborus* species the new species is most similar to *Eriborus pallipes* (Brullé, 1846); however, the new species can be readily distinguished from that species by its well-developed propodeal carinae and long, weakly narrowed gena (propodeal carination strongly reduced and gena short, strongly narrowed in *Eriborus pallipes* (Brullé, 1846)).

#### *Eriborus pallipes* (Brullé, 1846)

*Material* – One female, South Africa, Cape Prov., Tzitzikama Coastal N. P.,  $34^{\circ}02'S$ ,  $23^{\circ}53'E$ , XI–XII.1995, leg. M. Söderlund, Malaise trap; deposited in MZLU.

*Remarks* – First record from South Africa (and from continental Africa). This species was known from Mauritius and Réunion (BRULLÉ 1846, BENOIT 1957, TOWNES & TOWNES 1973, ROUSSE 2011, ROUSSE & VILLEMANT 2012).

#### *Eriborus pomonellae* (Cameron, 1906)

*Material* – One female, RSA [= Republic of South Africa], Cape Province, Koomplanskloof, 10 km S Citrusdal,  $32^{\circ}40'S$ ,  $19^{\circ}01'E$ , 200–270m, 4–8.X.1994, leg. R. Danielsson, Malaise trap, loc. 6; deposited in MZLU.

*Remarks* – This species was already known from South Africa; however, as its distributional records in literature are scarce and were published several decades ago (CAMERON 1906, TOWNES & TOWNES 1973), it may be worthwhile to report more recent records.

*Eriborus regulator* (Seyrig, 1935)

*Material* – One female, Ethiopia, 8 km S of Dessie, 20.IX.1980, leg. A. Demeter, swept, No. 17; deposited in HNHM.

*Remarks* – First record from Ethiopia. This species was known from Kenya (SEYRIG 1935, TOWNES & TOWNES 1973).

***Eriborus rubens* sp. n.**

(Figs 4–6)

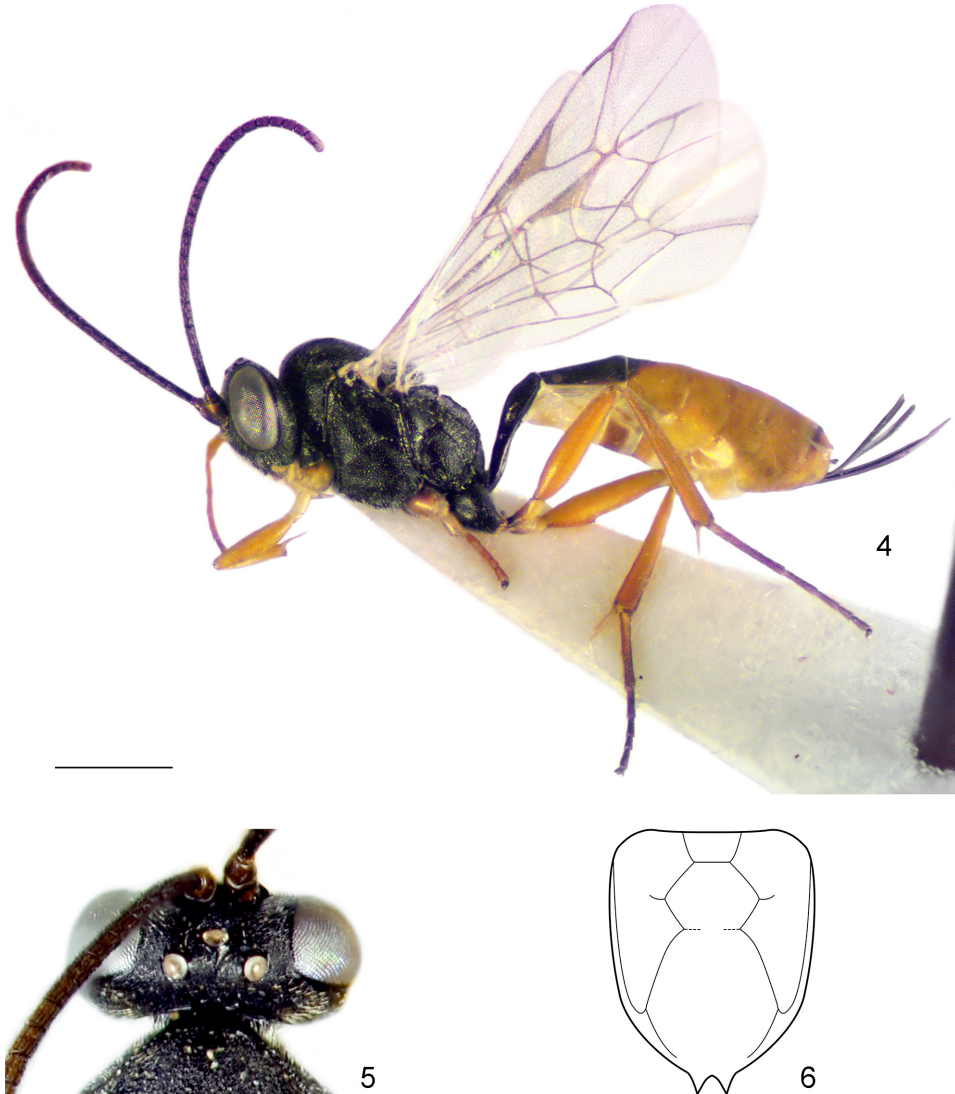
*Type material* – Holotype: female, South Africa, KwaZulu Natal, S Drakensberg, Garden Castle, under overhanging rocks, 21.829°44'59.4", 29°12'42.1", 1811m, 23.I.2007, leg. L. Papp & M. Földvári, No. 36; specimen card-mounted, apices of antennae broken, left middle leg from femur on missing, Id. No. HNHM-HYM 155122. – Paratype: male, same locality and collecting data, specimen card-mounted, Id. No. HNHM-HYM 155123. – The holotype and the paratype are deposited in HNHM.

*Diagnosis* – The new species can be identified by the combination of the following characters: gena in dorsal view 0.4× as long as eye width, strongly narrowed behind eyes; malar space about as long as basal width of mandible; propodeal carinae complete, except costulae obsolete, median section of posterior transverse carina only partly, weakly developed in female, entire and more strongly developed in male; area basalis trapezoidal; area superomedia hexagonal, wider than long, posteriorly only partly and weakly closed in female, entirely and distinctly closed in male; fore wing without areolet, *2rs-m* longer than abscissa of *M* between *2rs-m* and *2m-cu*, nervulus weakly postfurcal; ovipositor sheath 0.8× as long as hind tibia; scapus dark brown, apically yellowish brown, pedicellus dark brown; tegula pale yellow; basal tergites of metasoma dark, middle and apical tergites orange; legs predominantly orange, hind coxa black.

*Description* – Female (Figs 4–6). Body length ca. 5 mm, fore wing length ca. 3.5–4 mm.

Head: First flagellomere ca. 3.5× as long as its apical width; preapical flagellomeres little longer than wide. Head transverse, matt, granulate with rather weak, indistinct punctures on clypeus; hairs short, on clypeus somewhat longer. Ocelli small, ocular-ocellar distance as long as ocellus diameter, distance between lateral ocelli 2× as long as ocellus diameter. Inner eye orbits slightly indented opposite toruli, about parallel. Gena short, in dorsal view 0.4× as long as eye width, strongly narrowed behind eyes. Occipital carina complete, reaching hypostomal carina distinctly before base of mandible; hypostomal carina elevated. Frons flat, slightly impressed above toruli, median longitudinal carina not developed. Face weakly convex, clypeus almost flat in profile, clypeus very weakly separated from face, moderately wide, its apical margin convex, moderately blunt. Malar space about as long as basal width of mandible. Mandible relatively short, lower margin with a moderately wide flange from base towards teeth, flange obliquely narrowed before teeth; upper mandibular tooth slightly longer and wider than lower tooth.

Mesosoma: Mesosoma matt, granulate with rather weak, indistinct punctures; hairs short, dense, on propodeum slightly longer. Pronotum with weak transverse wrinkles on ventral half, epomia indistinct. Mesoscutum about as long as wide, convex in profile; notaulus not developed. Scuto-scutellar groove wide and moderately deep. Scutellum convex in profile, lateral carinae not developed. Speculum finely granulate to smooth, subpolished. Epicnemial carina complete, pleural part bent to anterior margin of mesopleuron reaching it at about its middle height, transversal part (i.e., the part at the level of sternaulus running



Figs 4–6. *Eriborus rubens* sp. n., holotype female: 4 = lateral habitus (scale bar = 1 mm); 5 = gena in dorsal view; 6 = propodeum in dorsal view

through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) strong, slightly elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete, little elevated. Metanotum  $0.5\times$  as long as scutellum. Metapleuron without juxtacoxal carina; submetapleural carina complete, elevated. Pleural carina of propodeum strong; propodeal spiracle small, circular, separated from pleural carina by about its length, connected to pleural carina by a distinct ridge. Propodeum convex in profile, granulate with weak transverse rugosity on posterior half. Propodeal carinae complete, except costulae obsolete, and median section of posterior transverse carina only partly, weakly developed, its short lateral parts discernible, median part obsolete. Area basalis trapezoidal, shorter than its basal width. Area superomedia hexagonal, little shorter than its greatest width, posteriorly only partly and weakly closed, its lateral carinae posterior to costulae convergent. Area petiolaris wide, widely but not entirely confluent with area petiolaris, posteriorly slightly impressed. Fore wing without areolet,  $3rs-m$  absent, second recurrent vein ( $2m-cu$ ) postfurcal, intercubitus ( $2rs-m$ ) longer than abscissa of  $M$  between  $2rs-m$  and  $2m-cu$ ; distal abscissa of  $Rs$  about straight; nervulus ( $cu-a$ ) weakly postfurcal, inclivous; postnervulus (abscissa of  $Cu1$  between  $1m-cu$  and  $Cu1a + Cu1b$ ) intercepted at about its middle by  $Cu1a$ ; lower external angle of second discal cell acute. Hind wing with nervellus ( $cu-a +$  abscissa of  $Cu1$  between  $M$  and  $cu-a$ ) vertical, not intercepted by discoidella ( $Cu1$ ); discoidella spectral, proximally not connected to nervellus. Coxae granulate. Hind femur relatively stout, ca.  $4.5\times$  as long as high. Inner spur of hind tibia ca.  $0.6-0.7\times$  as long as first tarsomere of hind tarsus. Hind basitarsus with a midventral row of closely spaced, short hairs (appearing as a darker, more or less scaly, inconspicuous line). Tarsal claws small, about as long as arolium, basal two-third distinctly pectinate.

Metasoma: Metasoma moderately compressed, finely granulate to shagreened, and with moderately dense, short hairs. First tergite about  $3\times$  as long as width of its apical margin; glymma moderately strong; dorsomedian carinae of first tergite distinct. Second tergite  $1.5\times$  as long as its apical width; thyridium oval, relatively large, its distance from basal margin of tergite ca.  $0.7\times$  as long as its length. Posterior margins of apical tergites excised. Ovipositor sheath  $0.8\times$  as long as hind tibia; ovipositor compressed, strong, evenly upcurved, dorsal preapical notch distinct.

Colour: Antenna dark brown, except scapus apically yellowish brown. Head black, except palpi and mandible yellow, mandibular teeth reddish brown. Mesosoma black, except tegula pale yellow. Metasoma: petiolus and postpetiolus black; second tergite blackish; basal half of third tergite blackish to dark brown, apical half orange; following tergites orange. Wings hyaline, wing veins brown, pterostigma light brown. Fore and middle legs light orange, except trochanters and trochantelli pale yellow, apical tarsomeres darkened. Hind leg: coxa black; trochanter dark brown; trochantellus yellowish; femur orange; tibia and tarsus orange to orange-brown, apical tarsomeres brownish.

Male: Antenna with 28 flagellomeres. Similar to female in all characters described above, except: punctures of head and mesosoma even weaker than in female; median section of posterior transverse carina entire and more strongly developed than in female, area superomedia distinctly closed posteriorly; distance between thyridium and basal margin of second tergite ca.  $0.5\times$  as long as thyridium; fore and middle coxae apically yellowish, medially orange, basally darkened.

*Distribution* – South Africa.

*Etymology* – The specific epithet *rubens* is a Latin one-termination participle treated as an adjective, meaning tinged with red; it refers to the colouration of metasoma and legs of the new species.



*Remarks on identification* – *Eriborus rubens* sp. n. is not quite similar to any known Afrotropical species of the genus; it can be readily identified by its extensively orange metasoma and legs, and short ovipositor.

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