

Systematics of the genus *Euxiphocerus* Parent, 1935 (Diptera: Dolichopodidae)

Систематика рода *Euxiphocerus* Parent, 1935 (Diptera: Dolichopodidae)

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Ключевые слова: Diptera, Dolichopodidae, Medeterinae, Тропическая Африка, Южная Африка, *Euxiphocerus*, новые виды.

Abstract. Two new species and one new subspecies are described and new records for the type species of the genus *Euxiphocerus* Parent, 1935, notes on its systematic position in the family are provided. The genus comprises now three afrotropical species, *Euxiphocerus wulfi* Parent, 1935, *Euxiphocerus disjunctus* Grichanov, **sp. n.** and *Euxiphocerus savannensis* Grichanov, **sp. n.** (with a subspecies *Euxiphocerus savannensis capensis* Grichanov, **subsp. n.**). A revised key to all Afrotropical genera of Medeterinae is also presented. The genera *Euxiphocerus* and *Systemus* Loew, 1857, are considered in a tribe Systemini Robinson, 1970 (**stat. nov.**).

Резюме. Описаны два новых вида и один новый подвид рода *Euxiphocerus* Parent, 1935, приведены новый материал для типового вида и заметки о систематическом положении рода в семействе. Род включает три афротропических вида: *Euxiphocerus wulfi* Parent, 1935, *Euxiphocerus disjunctus* Grichanov, **sp. n.** и *Euxiphocerus savannensis* Grichanov, **sp. n.** (с подвидом *Euxiphocerus savannensis capensis* Grichanov, **subsp. n.**). Заново составлен определитель всех афротропических родов подсемейства Medeterinae. Роды *Euxiphocerus* и *Systemus* Loew, 1857 образуют трибу Systemini Robinson, 1970 (**stat. nov.**).

Introduction

The genus *Euxiphocerus* Parent, 1935, was described by a single species *E. wulfi* Parent, 1935, from the Rutshuru River area of the Democratic Republic of the Congo. Later it was never studied by researchers. It is also worth noting that the hypopygium of the species was never figured. Parent included the genus into the subfamily Rhabdiinae, where it was placed in by all subsequent catalogs. Ulrich [1981] included the genus into the subfamily Systeminae (with a question mark) that was created by Robinson [1970] for a single genus *Systemus* Loew, 1857. Bickel [1986a] united Systeminae with Medeterinae, but rejected placement of the *Euxiphocerus* within the subfamily.

Treating collections of Belgian and African museums, I have found a male type of *E. wulfi* and new material on the genus *Euxiphocerus*. Descriptions of two new species and one new subspecies from Namibia and South Africa are given in this paper. A revised key to all

Afrotropical genera of Medeterinae is also presented.

Materials and Methods

Material cited in this work is housed at the following institutions:

AMG – Albany Museum, Grahamstown, South Africa;

NMNW – Namibian National Insect Collection, National Museum of Namibia, Windhoek;

RBINS – Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium;

RMCA – Musee Royal de l'Afrique Centrale, Tervuren, Belgium.

The left lateral view of the hypopygium, or male genital capsule, is illustrated for known and new species. In describing the hypopygium, 'dorsal' and 'ventral' refer to morphological position prior to genitalic rotation and flexion. Thus, in figures showing a lateral view of the hypopygium, the top of the page is morphologically ventral, while the bottom is dorsal. Morphological terminology follows Grichanov [2007]. The relative lengths of the podomeres should be regarded as representative ratios and not measurements.

Taxonomy

Genus *Euxiphocerus*

Euxiphocerus Parent, 1935: 122. Type species: *Euxiphocerus wulfi* Parent, 1935 (monotypy).

Diagnosis. The following character states place *Euxiphocerus* in the Medeterinae (see Yang et al. [2006]):

Occiput weakly convex backward. Eyes with tiny hairs. Male eyes narrowly separated on face. Male face narrow, narrowing downward. Vertex not excavated; upper occiput distinctly concave; vertical seta nearly at level of oculus. Postocular bristles one-rowed. Antennal stylus apical. Mesonotum with flat mid-posterior slope. Propleuron not haired, only with separate bristles on mid-lower portion. Strong dorsocentrals decreasing in size anteriorly. Hairs on legs uniformly short. Hind coxa with 1 outer bristle at middle. Mid and hind femora without anterior preapical bristles. Anal cell absent; anal vein weak. Male abdominal segment 6 large triangular, with hairs and bristles. Male

genitalia mostly exposed; surstylus strongly developed and distinctly divided; apical subepandrial processes absent and postgonite indistinct; cercus usually thickened basally.

The following character states are common to *Euxiphocerus* and *Systemus*, distinguishing them from other Medeterinae:

R_{4+5} and M_{1+2} subapically bowed; distal sector of R_{4+5} and M_{1+2} with flexion; posterior pair of acrostichals distinctly larger than preceding pair and offset laterally; 6 strong dorsocentrals; male postpedicel elongate, tapering; male 7th abdominal segment with tergite and sternite distinct.

Euxiphocerus differs from *Systemus* in the following characters (see also key):

Postocular bristles flattened; male antennal pedicel greatly reduced; male postpedicel 5–6 times longer than high at base; male 7th abdominal segment short; hypopygium sessile, with a pair of large and a pair of small epandrial lobes, with broad and deeply divided dorsal and ventral arms of surstylus.

Remarks. Three known species of *Euxiphocerus* inhabit different local regions in Central (Rutshuru), South (Eastern Cape) and South-West Africa (Caprivi Strip and Brandberg Massif). Nevertheless, *Systemus sinensis* Yang et Gaimari, 2004, was recently described from Oriental China (Yunnan), being very close to Afrotropical species of *Euxiphocerus* by the morphology of hypopygium and antennal postpedicel. Yang and Gaimari [2004] noted also similarity between this species and North Korean *Systemus slovakii* Olejníček et Kozánek, 1997. Both species were described with very long postpedicel differing from that in *Euxiphocerus* species in the presence of small flag on the apex of stylus. *S. sinensis* was figured with very large epandrial lobe, with broad and deeply divided dorsal and ventral arms of surstylus in hypopygium. All these characters are rather unusual for the *Systemus*, but corresponding to generic concept of the *Euxiphocerus*. Unfortunately, the authors have not described or not figured some important characters (e.g., epandrium of *S. slovakii*, male 7th abdominal segment, thoracic acrostichals, postocular bristles of both species), and I am not confident of associating those species with the *Euxiphocerus*.

As it has been mentioned above, Bickel [1986a] united Systemeninae with Medeterinae, but noted that the *Systemus* could deserve separate tribe. The complex of characters allows separating the genera *Euxiphocerus* and *Systemus* (type genus) in a tribe Systemenini Robinson, 1970 (**stat. nov.**).

Negrobov [1986] created a new tribe Thrypticini for a single genus *Thrypticus* Gerstaecker, 1864. Bickel [1986b] described a new genus *Corindia* from Australia, considering *Thrypticus* as evolved from *Corindia*-like ancestor, and Grichanov [1998] found *Corindia* in the Afrotropics. *Corindia*+*Thrypticus* group was separated from *Medetera* Fischer von Waldheim, 1819, and allied medeterine genera [Bickel, 1987]. The tribes of the subfamily can be diagnosed within the following key to Afrotropical genera of Medeterinae (after Bickel [1986a] and Grichanov [1999]):

Key to Afrotropical genera of Medeterinae

1. R_{4+5} and M_{1+2} subapically bowed; distal sector of R_{4+5} and M_{1+2} with flexion; posterior pair of acrostichals distinctly larger than preceding pair and offset laterally; 6 strong dorsocentrals; antenna sexually dimorphic (females of *Euxiphocerus* are unknown); male postpedicel elongate, tapering, with short (*Systemus*) or long (*Euxiphocerus*) apical stylus; male 7th abdominal segment with tergite

and sternite distinct; female terga 9+10 divided medially into 2 hemitergites, each bearing a row of 4 spines (*Systemenini*).....2

– R_{4+5} and M_{1+2} subparallel or convergent with M arched anteriorly; M_{1+2} without flexion; acrostichals absent or aligned in two rows; usually 5 or fewer dorsocentrals; antenna usually similar in male and female (except *Grootaertia*); male 7th abdominal segment with tergite and sternite fused or sternite greatly reduced; female hemitergites with (*Paramedetera*) or without spines3

2. Postocular bristles flattened; male antennal pedicel greatly reduced; male postpedicel 5–6 times longer than high at base; male 7th abdominal segment short; hypopygium sessile, with large epandrial lobe, with broad and deeply divided dorsal and ventral arms of surstylus.....
.....*Euxiphocerus* Parent, 1935

– Postocular bristles simple; male antennal pedicel not reduced; male postpedicel at most 3–4 times longer than high at base; male 7th abdominal segment long, forming peduncle for hypopygium; epandrial lobe usually reduced to 2 pedunculate setae; dorsal and ventral arms of surstylus usually fused, with emargination at apex, or only ventral arm broad.....*Systemus* Loew, 1857

3. R_{4+5} and M_{1+2} parallel to apex4

– R_{4+5} and M_{1+2} convergent, at most subparallel at apex; if R_{4+5} and M_{1+2} weakly convergent, then antennal postpedicel with distinctly dorsal stylus or hind coxa with only one lateral seta (*Medeterini*).....7

4. Acrostichal setae present; hind coxa with 2 lateral setae; body coloration usually bright metallic green (**Thrypticini**).....5

– Acrostichal setae absent; hind coxa with 1 lateral seta; body coloration usually dark (*Medeterini*).....6

5. Female oviscapt blade-like, sclerotized, narrow in dorsal view; male surstylus strongly deflexed dorsad, usually lying conformably with similarly deflexed, oblong-shaped cerci **Thrypticus** Gerstaecker, 1864

– Female oviscapt soft, male surstylus and cercus usually not deflexed dorsad.....*Corindia* Bickel, 1986

6. Arista apicolateral; distal sectors of R_{4+5} and M_{1+2} straight; male 7th abdominal segment forming pedicel; hypopygium symmetrical; hypandrial lobes present; aedeagus without lateral lobes.....
.....*Paramedetera* Grootaert et Meuffels, 1997

– Arista apical; distal sectors of R_{4+5} and M_{1+2} weakly arched anteriorly; 7th abdominal segment semicircular, narrow; hypopygium sessile, asymmetrical; hypandrial lobes absent; aedeagus with large lateral lobes.....

.....*Grootaertia* Grichanov, 1999

7. Male 1st tergite with a pair of dorsal bulbs; female with several strong bristles at the same place; 5 dorsocentral setae of approximately equal length, no

acrostichals.....*Craterophorus* Lamb, 1921

– Male and female 1st tergite unmodified, at most with several long lateral hairs; no more than 4 dorsocentrals of equal length, if 5 or 6 setae, then setae gradually decreasing in size anteriorly; acrostichals usually present, biseriate.....7

7. R_{4+5} and M_{1+2} weakly convergent, almost subparallel; male anterior 3rd tarsomere usually flattened and enlarged or, if simple, then apical part of CuA_1 at least 2.5 times longer than *m-cu*, *m-cu* equal to or longer than maximum distance between R_{4+5} and M_{1+2} , and 3rd section of costa at least 4 times longer than 4th.....

.....*Saccophoronta* Becker, 1914

– R_{4+5} and M_{1+2} strongly convergent or, if subparallel at apex, then male anterior 3rd tarsomere simple, apical part of CuA_1 no more than twice longer than *m-cu*, *m-cu* shorter than maximum distance between R_{4+5} and M_{1+2} , and 3rd section of costa no more than 4 times longer than 4th.....

.....*Medetera* Fischer von Waldheim, 1819

Key to *Euxiphocerus* species (males)

1. Major bristles on head and thorax pale, white or brownish; fore and hind coxae entirely or almost entirely yellow; epandrial lobe with narrow rounded apex; dorsal lobe of surstylus without ventral projection.....

.....*disjunctus* sp. n.

– Head and thorax with black major bristles; dorsal lobe of surstylus with ventral projection.....2

2. Fore and hind coxae mainly yellow; epandrial lobe rounded-ovate, covered with setulae.....

.....*savannensis capensis* subsp. n.

– At least hind coxa entirely black.....3

3. Femora entirely yellow; epandrial lobe elongate-triangular, with pointed apex and row of strong setae.....

.....*wulfi* Parent, 1935

– Fore femur except distal 1/4 and mid femur in basal half black; epandrial lobe rounded-ovate, covered with setulae.....*savannensis savannensis* sp. n.

Euxiphocerus wulfi Parent, 1935

(Fig. 1)

Type material examined. Holotype ♂, [DR Congo:] Musée du Congo: Rutshuru, 01.1934, Dr De Wulf / en réalité: *Euxiphocerus wulfi* Parent / *Xiphoceras Wulfi* n. sp. [unavailable name]. Type. O. Parent / R. Det. J 2966 [RMCA].

Material examined. 1♂ [figured], [DR Congo:] Rutshuru, 6.01.1934, G.F. de Witte, Parc Nat. Albert, 159 / *Saccophoronta quinta* Parent, P. Vanschuytbroeck det. 1951 [RBINS]; 1♂ [measured], [DR Congo:] Kivu, Rutshuru, 1285 m, 2.07.1935, G.F. de Witte, 1685 [RBINS].

Remarks and diagnosis. The holotype studied is partly damaged, having broken abdomen and 3rd–5th segments of hind tarsi. Additional material collected in the same area (Rutshuru) is practically identical to the holotype and to original description and figures of antenna and wing [Parent, 1935]. Antennal stylus biarticulate (rather than unarticulate as stated in the original description of *Euxiphocerus*). Bristles on thorax and abdomen black. M_{1+2}

with weak but distinct curvature behind middle of distal part. Ratio of part of costa between R_{2+3} and R_{4+5} to this between R_{4+5} and M_{1+2} to *m-cu* to distal part of CuA_1 , 23:13:15:26. Mid and hind coxae black except apex. Tarsomere length ratio: fore tarsus (from first to fifth): 28:15:8:7:8, mid tarsus: 49:29:20:15:9, hind tarsus: 20:48:23:15:8. Epandrial lobe elongate-triangular, with pointed apex and row of strong setae; surstylus deeply bifurcated, with relatively broad lobes, longer than cercus; dorsal lobe with long ventral process; ventral lobe bearing strong and long apical seta, several short preapical setae.

Length (mm): body without antennae 2.5, antenna 2.1, wing 2.4–2.5/0.9, hypopygium 0.4.

Euxiphocerus disjunctus Grichanov, sp. n.

(Fig. 2–4)

Type material. Holotype ♂, South Africa: E. Cape, Grahamstown, Albany Museum Grounds, 33°18'822"S / 26°31'315"E, 9–15.10.2007, Malaise trap, A.H. Kirk-Spriggs [AMG]. Paratypes: 1♂, same label with collection date 15–23.10.2007 [AMG]; 1♂ [figured], Namibia: Brandberg, Mason Shelter, 21°04'39"S / 14°05'43"E, 5–14.03.2002, 1750 m, A.H. Kirk-Spriggs & E. Marais, Malaise trap riverbed [NMNW].

Description. Male. Head: with white or pale-brownish bristles and cilia; vertex, frons, face dark metallic blue-green, whitish pollinose; vertex not excavated; upper occiput concave; vertical bristle strong and long, positioned at upper corner of head; shorter postvertical seta as a linear continuation of postocular setal row; eyes with tiny hairs between facets; face under antenna nearly as wide as postpedicel height, gradually narrowing towards clypeus; face at clypeus half as wide as face under antenna; palpus yellow with strong apical seta; proboscis brownish, small; single row of strong flattened postoculars; antenna mainly black; scape and pedicel brown ventrally; pedicel very short, reduced, with ring of apical setae; postpedicel swollen at base, then tapering, more than 6 times as long as basal height, densely pubescent; stylus long, microscopically haired, bisegmented; its 1st segment very short. Length ratio of scape to pedicel to postpedicel to stylus (1st and 2nd segments), 10:2:58:2:46.

Thorax: with all setae dirty white or pale-brown; metallic dark bluish-green; mesonotum with black setal sockets; posterior third of mesonotum distinctly concave; biseriate acrostichals of about equal length, posterior pair offset laterally; 6 strong dorsocentrals decreasing in size anteriorly; 2 pairs of scutellars, laterals small, about 1/3 length of medians; 1 proepisternal just above fore coxa.

Legs including coxae yellow, mid coxa in basal half, hind coxa at base and 5th tarsomeres brown; fore and mid coxae with pale anterior setae; hind coxa with 1 strong yellow lateral bristle; major leg setae brown; mid tibia with strong anterodorsal and posterodorsal at 1/3, weaker anterodorsal and posterodorsal at 2/3, an apical ring of 4 setae; hind tibia with 3 very short dorsal setae, with 3 apical setae; tarsomere length ratio: fore tarsus (from first to fifth): 22:10:6:5:5, mid tarsus: 35:19:15:10:7, hind tarsus: 15:34:16:11:9.

Wing simple, hyaline, with yellow-brownish veins; R_{2+3} and R_{4+5} diverging to wing apex; R_{4+5} slightly bowed outwards; M_{1+2} with weak but distinct curvature behind middle of distal part; both veins parallel at wing apex. M_{1+2} joining costa just behind wing apex. Ratio of part of costa between R_{2+3} and R_{4+5} to this between R_{4+5} and M_{1+2} to *m-cu* to distal part of CuA_1 , 20:13:12:26. Crossvein *m-cu* straight, forming right angle with CuA_1 and with M_{1+2} longitudinal veins. Anal vein fold-like; anal lobe present; alula absent. Lower calypter yellow, with pale setae. Halter yellow.

Abdomen: entirely metallic, greenish copper-black, with light setae; 2nd–6th sterna membranous or only weakly sclerotized. Segment 7 small, invisible; segment 8 large, black, with short setae. Hypopygium brown; hypandrium fused with epandrium, simple; epandrial lobe broad, yellow, narrow at apex, with setae along ventral margin; cercus yellow, long and slender, swollen at base,

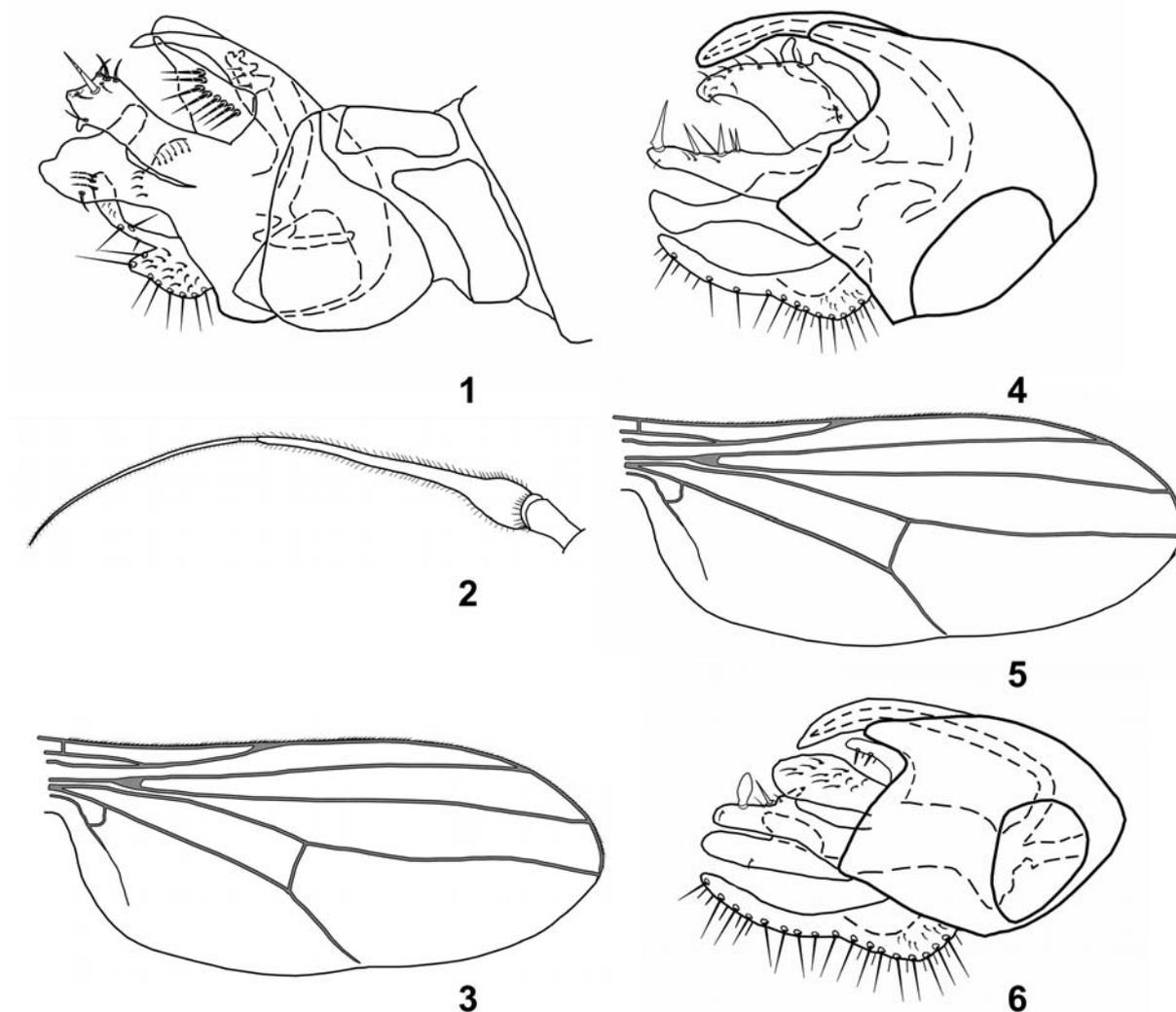


Fig. 1–6. Genus *Euxiphocerus*

1 – *Eu. wulfi* Parent, 1935, hypopygium (left lateral view); 2–4 – *Eu. disjunctus* Grichanov, **sp. n.**: 2 – antenna (lateral view), 3 – wing, 4 – hypopygium; 5–6 – *Eu. savannensis* Grichanov, **sp. n.**: 5 – wing, 6 – hypopygium.

Рис. 1–6. Род *Euxiphocerus*

1 – *Eu. wulfi* Parent, 1935, гипопигий (вид слева); 2–4 – *Eu. disjunctus* Grichanov, **sp. n.**: 2 – усик (вид сбоку), 3 – крыло, 4 – гипопигий; 5–6 – *Eu. savannensis* Grichanov, **sp. n.**: 5 – крыло, 6 – гипопигий.

bearing ventral setae; surstylus deeply bifurcated, with moderately long and relatively narrow lobes, brown, as long as cercus; dorsal lobe bare; ventral lobe bearing strong and long preapical seta, several long ventral setae.

Length (mm): body without antennae 2–2.5, antenna 1.6, wing 1.9–2.4/0.7, hypopygium 0.3.

Female unknown.

Etymology. The species name means disjunction in area of the species distribution.

Diagnosis and variability. The described here species differs from *Euxiphocerus wulfi* and *Euxiphocerus savannensis* **sp. n.** in colour and morphological characters, first of all, in entirely pale body setation, in mainly yellow coxae. In the paratype collected from Brandberg Massif, scape and pedicel are light-brown ventrally; postpedicel is broadly orange-brown at base ventrally; and body setation paler, practically whitish. The species is easily distinguished by hypopygium morphology; the epandrial lobes, cercus

and arms of surstylus are rather specific in their shape and setation pattern (compare figs. 1, 4 and 6).

Euxiphocerus savannensis Grichanov, **sp. n.**

(Fig. 5–6)

Type material. Holotype ♂, Namibia: Katima Mulilo Dist., Ndopu village, 1 km SE Bukalo, SE 1724Da, 14–20.06.2006, A.H. Kirk-Spriggs [AMG]. Paratype ♂, same label [AMG].

Description. Male. Similar to *E. disjunctus* **sp. n.** in all respects except as noted.

Head: with mainly black bristles; palpus black with strong apical seta; proboscis brown; postoculars white; antenna entirely black; length ratio of scape to pedicel to postpedicel to stylus (1st and 2nd segments), 15:2:65:2:50.

Thorax: with all setae black; lateral scutellars about 1/3 length of medians.

Legs mainly yellow; all coxae, fore femur except distal 1/4 and mid femur in basal half black; 5th tarsomeres brown; fore and mid coxae with black anterior setae; hind coxa with 1 strong black lateral bristle; major leg setae black; mid tibia with strong anterodorsal and posterodorsal at 1/3, weaker posterodorsal at 2/3; tarsomere length ratio: fore tarsus (from first to fifth): 26:11:9:6:7, mid tarsus: 39:21:16:10:7, hind tarsus: 14:33:19:13:8.

Wing with yellow-brown veins. Ratio of part of costa between R_{2+3} and R_{4+5} to this between R_{4+5} and M_{1+2} to *m-cu* to distal part of CuA_1 , 23:10:14:25.

Abdomen with black setae; hypopygium black; appendages brown; hypandrium fused with epandrium, simple; epandrial lobe broad, oval, regularly rounded in distal half, with setulae along inner surface; surstylus deeply bifurcated, with moderately long and broad lobes, as long as cercus; dorsal lobe with broad and low ventral projection; ventral lobe bearing strong and long preapical seta, several shorter ventral setae and midventral curved tooth.

Length (mm): body without antennae 2.1–2.2, antenna 1.7, wing 2.1–2.2/0.8, hypopygium 0.4.

Female unknown.

Etymology. The species is named for the dominant ecosystem in the region.

Diagnosis. The described here species differs from the *Euxiphocerus wulfi* and *Euxiphocerus disjunctus* **sp. n.** in colour and morphological characters. The species is easily distinguished by hypopygium morphology; the epandrial lobes, cercus and arms of surstylus are rather specific in their shape and setation pattern (compare figs. 1, 4 and 6).

Euxiphocerus savannensis capensis Grichanov, **subsp. n.**

Type material. Holotype ♂, South Africa: E. Cape, Grahamstown, Albany Museum Grounds, 33°18'822"S / 26°31'315"E, 15–23.10.2007, Malaise trap, A.H. Kirk-Spriggs [AMG].

Description. Male. Similar to *E. s. savannensis* **sp. n.** in all respects except as noted.

Head: with ocellar, vertical, postvertical and 1–2 upper postocular bristles black; palpus light-brown with strong apical seta; proboscis brown; postoculars white; antenna entirely black; length ratio of scape to pedicel to postpedicel to stylus (1st and 2nd segments), 11:2:6:2:5:5:2.

Thorax: with almost all setae black; only propleural setae white; lateral scutellars about 1/2 length of medians.

Legs mainly yellow; fore coxa at extreme base, mid coxa mostly and hind coxa in basal half blackish-brown; 5th tarsomeres brown; major leg setae dark-brown; mid tibia with strong anterodorsal and posterodorsal at 1/3, weaker posterodorsal at 2/3; tarsomere length ratio: fore tarsus (from first to fifth): 25:14:9:6:7, mid tarsus: 40:24:15:9:7, hind tarsus: 17:37:20:13:7.

Wing with yellow-brown veins. Ratio of part of costa between R_{2+3} and R_{4+5} to this between R_{4+5} and M_{1+2} to *m-cu* to distal part of CuA_1 , 23:11:16:31.

Abdomen with black setae; hypopygium black; appendages brown, almost identical in shape and setation to hypopygial appendages of nominotypical subspecies (see fig. 6).

Length (mm): body without antennae 2.4, antenna 1.7, wing 2.4/0.8, hypopygium 0.4.

Female unknown.

Etymology. The subspecies is named for the Cape, South Africa.

Diagnosis. *E. savannensis capensis* **subsp. n.** differs from the nominotypical subspecies in somewhat bigger size, in colour of coxae and femora, first of all, in mainly yellow fore coxa, entirely yellow fore and mid femora. The other differences are considered here to be associated with the individual variability of characters.

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