

Discovery of *Systemus* in the Afrotropical Region with a description of a new species (Diptera: Dolichopodidae)

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The genus *Systemus* Loew, 1857 is recorded from Afrotropical Region for the first time. A description of a new species, *Systemus africanus* Grichanov **sp. nov.**, and notes on females of another probably new Afrotropical species are provided. The genus is considered now as cosmopolitan. A key to species and species groups of the *Systemus* worldwide is compiled.

Key words: South Africa, Diptera, Dolichopodidae, *Systemus*, new species

INTRODUCTION

Until recently, the genus *Systemus* Loew, 1857 has been only known from the Holarctic Realm. Several new Palearctic (Negrobov & Shamshev, 1985; Macgowan, 1997; Olejníček & Kozánek, 1997; Grichanov, 2002; Negrobov, 2005), Australian (Bickel, 1986), Neotropical (Naglis, 2000) and Oriental (Yang & Gaimari, 2004) species have been described during the last decades. The genus is also present in the Nearctic region, but has been yet unknown from the Afrotropics. Following Robinson (1970), Negrobov (1991) regarded the genus in Systeminae. Bickel (1986) and Evenhuis (1994) placed the genus in the subfamily Medeterinae. A key to all the species then known was provided by Steyskal (1970). The last key to Palearctic species of *Systemus* was published by Negrobov (2005). Keys to Australian and Neotropical species were provided by Bickel (1986) and Naglis (2000). After the description of the first Afrotropical species in this paper, *Systemus africanus* Grichanov **sp. nov.**, the genus is considered now as cosmopolitan with 30 extant species. Here we compile a key to species and species groups of the *Systemus* world fauna for the first time and give notes

on females of other probably new Afrotropical species.

MATERIAL AND METHODS

The left lateral view of the hypopygium, or male genital capsule, is illustrated for the new species. In describing the hypopygium, 'dorsal' and 'ventral' refer to morphological position prior to 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 Robinson and Vockeroth (1981), Stuckenberg (1999), and Grichanov (2007). The relative lengths of the podomeres should be regarded as representative ratios and not measurements.

The holotype of the new species and other material examined are housed in the collection of the Natal Museum, Pietermaritzburg, South Africa (NMSA).

***Systemus africanus* Grichanov, sp. nov.**
(Figs 1–4)

Holotype (in glycerol). Male ; **South Africa:** KwaZulu-Natal Prov., Kosi Bay (2632DD), 30 Nov. – 12 Dec. [1982?] (NMSA).

Description. Male.

Head. Vertex, frons, face dark metallic blue-green; face under antenna half as wide as postpedicel height; palpi yellow with strong apical seta; proboscis brownish, projecting anteriorly, keel-like; single row of strong pale postoculars; antennal scape and pedicel yellow, postpedicel mostly brown, broadly yellow at base and ventrally; pedicel short, with ring of apical setae; postpedicel large, tapering, 3 times as long as basal width, densely pubescent; stylus short, bare. Length ratio of scape to pedicel to postpedicel to stylus, 40:10:165:80.

Thorax. Dorsum metallic dark-brown; pleura brown with black spot on pteropleuron; metepimeron yellow; posterior third of mesonotum distinctly flattened; thoracic setae brown; biseriate acrostichals of equal length; posterior two pairs offset laterad; 6 strong dorsocentrals, decreasing in size anteriorly; 2 pairs scutellars, laterals hairlike, about 1/4 length of medians; 1 pale proepisternal just above fore coxa.

Legs including coxae yellow, 5th tarsomeres darkened; fore and mid coxae with pale anterior setae; hind coxa with 1 strong pale lateral bristle; major leg setae black or brown; mid tibia with strong anterodorsal and posterodorsal at 1/5, weaker anterodorsal and posterodorsal at 2/3, an apical ring of 4 bristles; hind tibia with row of 4 very short dorsal setae, with short anterodorsal at base; length ratio of fore tarsus (segments from first to fifth), 61:38:25:11:10; same ratio for mid leg, 103:55:38:23:20; same ratio for hind leg, 45:90:45:28:20.

Wing simple; R_{2+3} and R_{4+5} diverging to wing apex; R_{4+5} slightly bowed outwards; M_{1+2} with weak curvature behind middle of distal part; both veins distinctly convergent in third quarter of wing. M_{1+2} joining costa at 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 , 40:12:23:65. 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 metallic, mainly brown; 1st tergum yellow; 2nd tergum yellow except distal margin; 3rd tergum yellow ventrally; posterior margin of first tergum with row of long brown setae; 2nd to 6th sterna membranous or only weakly sclerotised, somewhat recessed. Segment 7 elongate-pedunculate, brownish; segment 8 brown, with setae. Hypopygium brownish; hypandrium fused with epandrium, asymmetrical; two pedunculate epandrial setae; cercus yellow, long and slender, about as long as epandrium, bearing subapical tooth and yellow setae; surstylus moderately long and broad, flat, yellow, shorter than cercus, with a dorsal and an apical projections bearing long setae.

Measurements (mm): body length 3.3, antenna length 0.9, wing 3.0, wing width 0.5, hypopygium length 0.6.

Etymology. African in Latin.

Diagnosis. The new species resembles a Palearctic species *S. tener* Loew, 1859 (Grichanov, 2002; Negrobov, 2005) that has a narrow rather than broad surstylus, a pointed rather than widened at apex cercus, and an entirely black antennal postpedicel. The hypopygium morphology has some similarity with a number of Neotropical species, and *S. flaviatus* Naglis, 2000 is a species closest to *S. africanus*. However, the two species differs in morphology of the wing, antenna, hypopygial cercus and surstylus (see the key below).

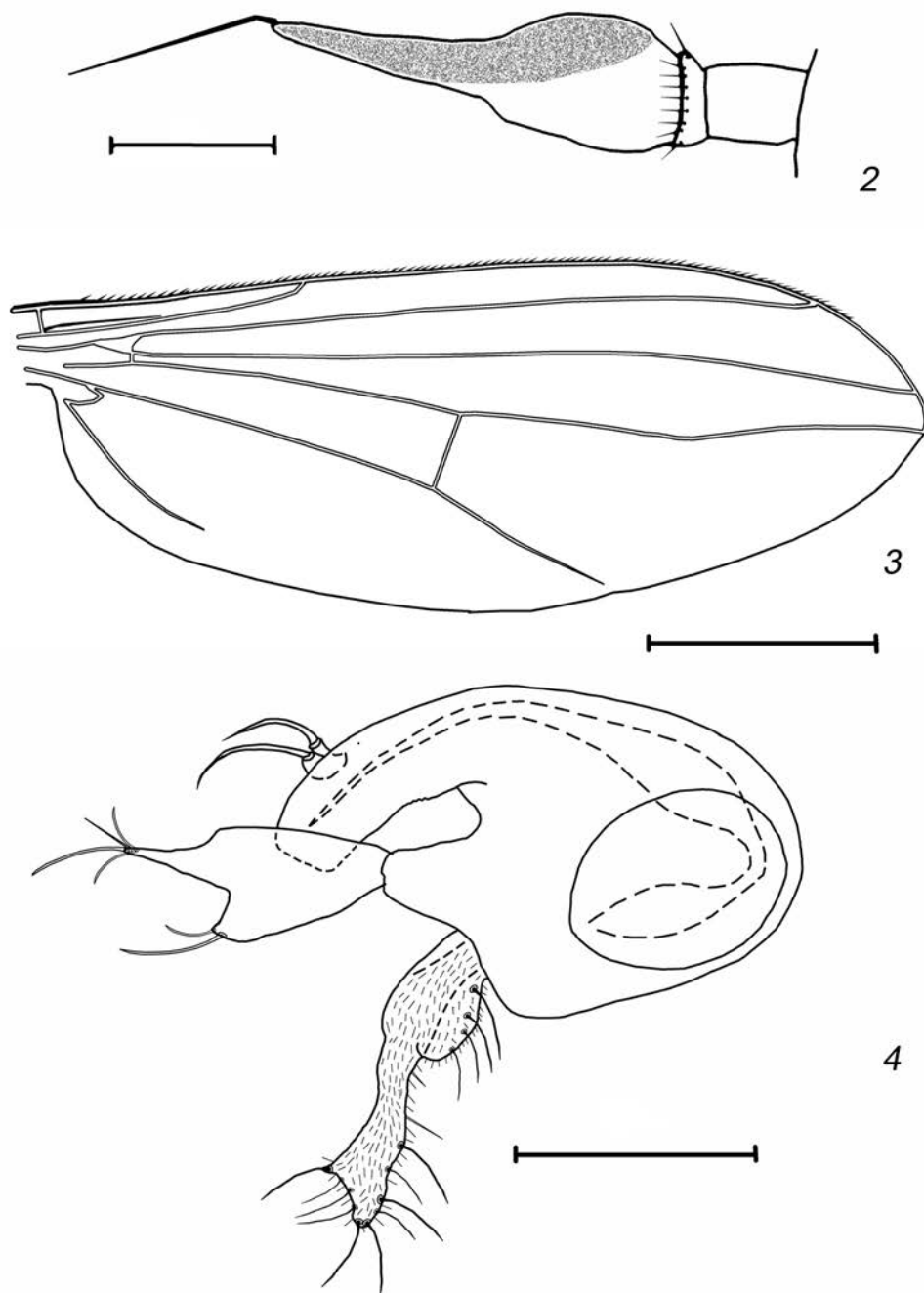
***Systemus* species unidentified**

Material examined (in alcohol). Three females; **South Africa:** *KwaZulu-Natal Prov.*, Kosi Bay (2632DD), 30 Nov. – 12 Dec. [1982?] (NMSA); two females, **South Africa:** *KwaZulu-Natal Prov.*, Louwsburg, Sanyati Farm, 27°34'00''S 31°17'57''E, alt. 1090 m, 30 Oct. – 18 Dec. 2005, Malaise trap, coll. M. Mostovski (NMSA).

Remarks. All specimens collected at Kosi Bay are rather lightened due to long-term storage in alcohol; pollen on their heads and the thorax is indistinguishable. Females taken from the same trap as *Systemus africanus* male holotype belong apparently to two species, which may be different from



Fig. 1. Habitus of *Systemenus africanus* Grichanov **sp. nov.**, holotype. Scale bar: 1 mm.



Figs 2–4. *Systemus africanus* Grichanov **sp. nov.**, holotype : antenna (2), wing (3), hypopygium (4). Scale bars: 0.2 mm (2), 0.2 mm (3), 0.5 mm (4).

the male. They differ between each other in *m-cu* to distal part of CuA_1 ratio, postpedicel length, mid coxa coloration (yellow or brown) etc. Females taken from Louwsburg (Sanyati Farm) differ in darker body, distinctly fumose wing and brownish hind femur. These characters could be related to a weaker fixing agent used in the last locality. The specimens from Sanyati Nature Farm were collected together with *Meuffelsia erasmusorum* Grichanov, 2008 in the primarily indigenous riverine bush; the habitat was described by the authors (Grichanov & Mostovski, 2008). It is worth mentioning that all six new Neotropical species of the genus were taken from a single Malaise trap (Naglis, 2000). They were described by males only. Nevertheless, Palearctic *S. flavimaculatus* Negrobov, 2005 and Neotropical *S. raptor* Becker, 1922 are known by females, while some other species are known by males only.

Key to species and species groups of *Systemus*

1. M_{1+2} and R_{4+5} veins distinctly divergent from base to apex (Nearctic) *californicus* Harmston, 1968
 - M_{1+2} and R_{4+5} veins convergent or parallel in distal half 2
2. Postpedicel very long, at least 5 times longer than high at base, with stylus about as long as postpedicel; antennal stylus with apical flag (males) 3
 - Postpedicel relatively short, at most 3.5 times longer than high at base; antennal stylus without apical flag 5
3. M_{1+2} and R_{4+5} veins strongly convergent, their tips separated by not more than 1/3 length of *m-cu* (Palearctic) *slovaki* Olejnichek & Kozanek, 1997
 - M_{1+2} and R_{4+5} veins gently convergent, their tips separated by more than half length of *m-cu* (Oriental) *sinensis* Yang & Gaimari, 2004
5. M_{1+2} and R_{4+5} veins strongly convergent, their tips separated by not more than 1/3 length of *m-cu* Palearctic *flavimaculatus* Negrobov, *mallochi* Macgowan, 1997, *pallipes* (von Roser, 1840), *sachalinensis* Negrobov & Shamshev, 1985, *scholtzi* (Loew, 1850), Nearctic *minutus* (Van Duzee, 1913) and Neotropical *raptor* Becker
 - M_{1+2} and R_{4+5} veins gently convergent or parallel, their tips separated by more than half length of *m-cu* 6
6. Wing apex white, preceded by blackish transverse bar (Nearctic) ... *apicalis* Wirth, 1952
 - Wing hyaline or slightly, evenly infumate ... 7
7. Antennal stylus approximately as long as postpedicel 8
 - Stylus much shorter than postpedicel 9
8. Antennal scape and pedicel yellow, postpedicel mostly black-brown, broadly yellow at base (Palearctic) ... *vasilii* Grichanov, 2002
 - Antenna wholly black, at most yellowish on mesal side of pedicel and at base of postpedicel (Nearctic) *albimanus* Wirth, 1952, *eucercus* Steyskal, 1970
9. Antenna wholly black Australian *australis* Bickel, 1986, *curryi* Bickel, 1986, Neotropical *nigriatus* Naglis, 2000, *rafaeli* Naglis, 2000 and Palearctic *bipartitus* (Loew, 1850), *leucurus* Loew, 1859, *vikhundi* (Grichanov, 2004)
 - At least scape partly yellow (including female of an undescribed Australian species) ... 10
10. At least first two abdominal segments yellow 11
 - Abdomen entirely dark 12
11. Distal part of CuA_1 nearly 3 times longer than crossvein *m-cu*; antennal stylus half as long as postpedicel (Afrotropical) *africanus* Grichanov, **sp. nov.**
 - Distal part of CuA_1 slightly longer than crossvein *m-cu*; antennal stylus 1/5 as long as postpedicel (Neotropical) *flaviatus*
12. Postpedicel broadly yellow at base and ventrally (Neotropical) *amazonicus* Naglis, 2000, *beatae* Naglis, 2000, *rarus* Naglis, 2000
 - Postpedicel entirely black 13
13. Hind femur broadly black at apex (Palearctic) *tener*
 - Hind femur wholly yellowish (Nearctic) ... *shannoni* Wirth, 1952

ACKNOWLEDGMENTS

Our appreciation extends to Thea and Cobus Erasmus (Sanyati Nature Farm), who allowed collecting on their property, professionally helped with servicing a Malaise trap, and provided additional information on the local floral assemblage and weather conditions over the col-

lecting period at Sanyati. We also grateful to V. Kolyada (Zoological Museum, Moscow) for his invaluable help in sorting bulk samples when he was visiting the Natal Museum. Senior author has got financial support from NMSA for his work in Pietermaritzburg, South Africa.

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Received 12 April 2009 / Accepted 1 December 2009.