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Irwinus, a new genus of long-legged flies from South Africa (Diptera: Dolichopodidae: Sympycninae)

Irwinus, новый род мух-зеленушек из Южной Африки (Diptera: Dolichopodidae: Sympycninae)

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KEY WORDS: Diptera, Dolichopodidae, new genus, new species, South Africa, coastal habitat.

КЛЮЧЕВЫЕ СЛОВА: Diptera, Dolichopodidae, новый род, новый вид, Южная Африка, прибрежная среда обитания.

ABSTRACT: The genus *Irwinus* Grichanov, **gen.n.** is described from South Africa, including one new species, *Irwinus irwini* Grichanov, **sp.n.** The new genus is believed to be most closely related to the genus *Campsicnemus* Haliday in Walker, 1851 in the subfamily Sympycninae, having also some similarity with sympycnine genera *Nurteria* Dyte et Smith, 1980, and *Tetrachaetus* Bickel et Dyte, 1989. The new genus differs from other similar genera in such peculiar characters as narrow maculated wing, body with only white setae, almost parallel-sided face with fronto-clypeal suture distinct laterally, broad and strongly flattened dorso-ventrally abdomen in both sexes, concealed male hypopygium with dorso-lateral epandrial foramen. Coastal habitat of the new species is briefly discussed.

РЕЗЮМЕ: Из Южной Африки описан новый род *Irwinus* Grichanov, **gen.n.**, включающий один новый вид, *Irwinus irwini* Grichanov, **sp.n.** Предполагается, что новый род наиболее близок к роду *Campsicnemus* Haliday in Walker, 1851 из подсемейства Sympycninae, а также имеет некоторое сходство с родами *Nurteria* Dyte et Smith, 1980, и *Tetrachaetus* Bickel et Dyte, 1989 из того же подсемейства. Новый род отличается от похожих родов такими своеобразными признаками, как узкое пятнистое крыло; тело, покрытое только белыми щетинками; лицо с почти параллельными краями, с отчетливым передне-клипеальным швом около глаз; широким и сильно уплощенным брюшком у обоих полов, скрытым гипопигием самца с верхнебоковым положением форамена эпандрия. Кратко обсуждается прибрежная среда обитания нового вида.

Introduction

Grichanov [2022a] listed 41 genera in the subfamily Sympycninae of the world fauna. A male and a female of a peculiar sympycnine species have been found in the collection of the KwaZulu-Natal Museum, Pietermaritzburg, South Africa (NMSA). A study of published keys and descriptions has been unsuccessful in seeking an appropriate genus for this species.

The following generic keys are available for sympycnine identification: Bickel [2009] for the Nearctic and Neotropical Regions, Grichanov et al. [2011] for the Palaearctic Region, Grichanov [2011] and Grichanov, Brooks [2017] for the Afrotropics, Yang *et al*. [2011] for Palaearctic and Oriental China, Bickel [1991] for New Zealand. These keys include almost all known genera of the subfamily of the world fauna.

This paper offers a description of a new sympycnine genus, being considered closest to the genus *Campsicnemus* Haliday in Walker, 1851, differing from the latter in characters of antenna, wing, abdomen, body setation and male genitalia.

Material and methods

The holotype and paratype of the new species will be deposited at the KwaZulu-Natal Museum (NMSA). Specimens were studied and photographed using a ZEISS Discovery V-12 modular stereo microscope and an AxioCam MRc5 camera. The measurement accuracy of this microscope is 0.01 mm. The preparations of the male genitalia were photographed with a ZEISS Axiostar stereo microscope and an AxioCam ICc3 camera.

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Morphological terminology and abbreviations follow Cumming, Wood [2017] and Grichanov, Brooks [2017]. The lengths of the podomeres are given in millimetres. Body length is measured from the base of the antenna to the tip of abdominal segment 6. Wing length is measured from the base to the wing apex. The figures showing the hypopygium in lateral view (e.g., Fig. 7) are oriented as it appears on the intact specimens, with the morphologically ventral surface of the genitalia facing upwards, dorsal surface downwards, anterior end facing right and posterior end facing left.

Taxonomy

Genus *Irwinus* Grichanov, **gen.n.**

Type species. *Irwinus irwini* Grichanov **sp.n.**, here designated.

DESCRIPTION. This generic description is based on one species and emphasizes characters considered to be of generic importance. *Body length* 1.5–1.7 mm, wing 1.3–1.4 x 0.3 mm. *Head.* Distinctly wider than high in anterior view; occiput concave; pair of short postvertical setae on dorsal postcranium, half as long as verticals and not in line with postocular setae; pair of strong verticals at level of ocellar bristle pair present; face as wide as small flat clypeus, concave, almost parallel-sided, and fronto-clypeal suture distinct laterally; labella with 6 pseudotracheae; eyes with microscopic hairs; eye facets uniform; palpus small; scape small, simple, bare; pedicel simple, with corona of short setae; postpedicel small, rounded, haired, with lateroapical arista-like stylus comprised of 2 segments. *Thorax.* Mesonotum convex posteriorly, flattened immediately anteriad of scutellum; acrostichal setae absent; 4 strong dorsocentrals present in almost parallel rows, slightly decreasing in size anteriorly; 1 strong postalar, 1 strong supraalar, 1 strong sutural, 1 strong humeral, 1 strong and 1 hair-like notopleurals; scutellum with pair of strong marginal bristles and pair of minute setae laterally; proepisternum with 2–3 simple setae; postnotum short. *Legs.* Coxae with short white bristles; legs simple; fore leg without strong bristles; mid and hind femora each with short anterior preapical bristle; mid and hind tibiae each with pair of strong antero- and posterodorsals at base and 1 anterodorsal bristle in middle; only mid tibia with rather strong apical bristles. *Wing.* Short and narrow; membrane grey, with hyaline windows at base and at middle; R_1 short, reaching costa at basal 1/3 of wing length; R_{2+3} and R_{4+5} weakly convex, subparallel, diverging at wing apex; M_1 weakly convex, parallel apically with R_{4+5}, and joining costa at wing apex; cross-vein dm-m straight and weak, much shorter than apical part of M_4; anal lobe absent. *Abdomen.* Broad and flattened dorso-ventrally; tergites without strong marginal bristles; male sternites 2–5 as 2 rows of sclerites along tergal margins, strongly decreasing in size caudally; tergite 6 haired; male tergite 8 large; segment 7 reduced; epandrium rounded-ovate (lateral view); hypopygial foramen dorso-lateral in position; hypandrium fused to epandrium; phallus simple; epandrial lobes absent; surstylus well developed; cercus short; female oviscapt with tergites 9+10 divided medially into two broad hemitergites, each bearing 3 thick pointed spines.

DIAGNOSIS. The genus *Irwinus* **gen.n.** described here is believed to be closest to the genus *Campsicnemus* Haliday in Walker, 1851 in the subfamily Sympycninae and can be distinguished from the latter by use of the following key (both sexes):

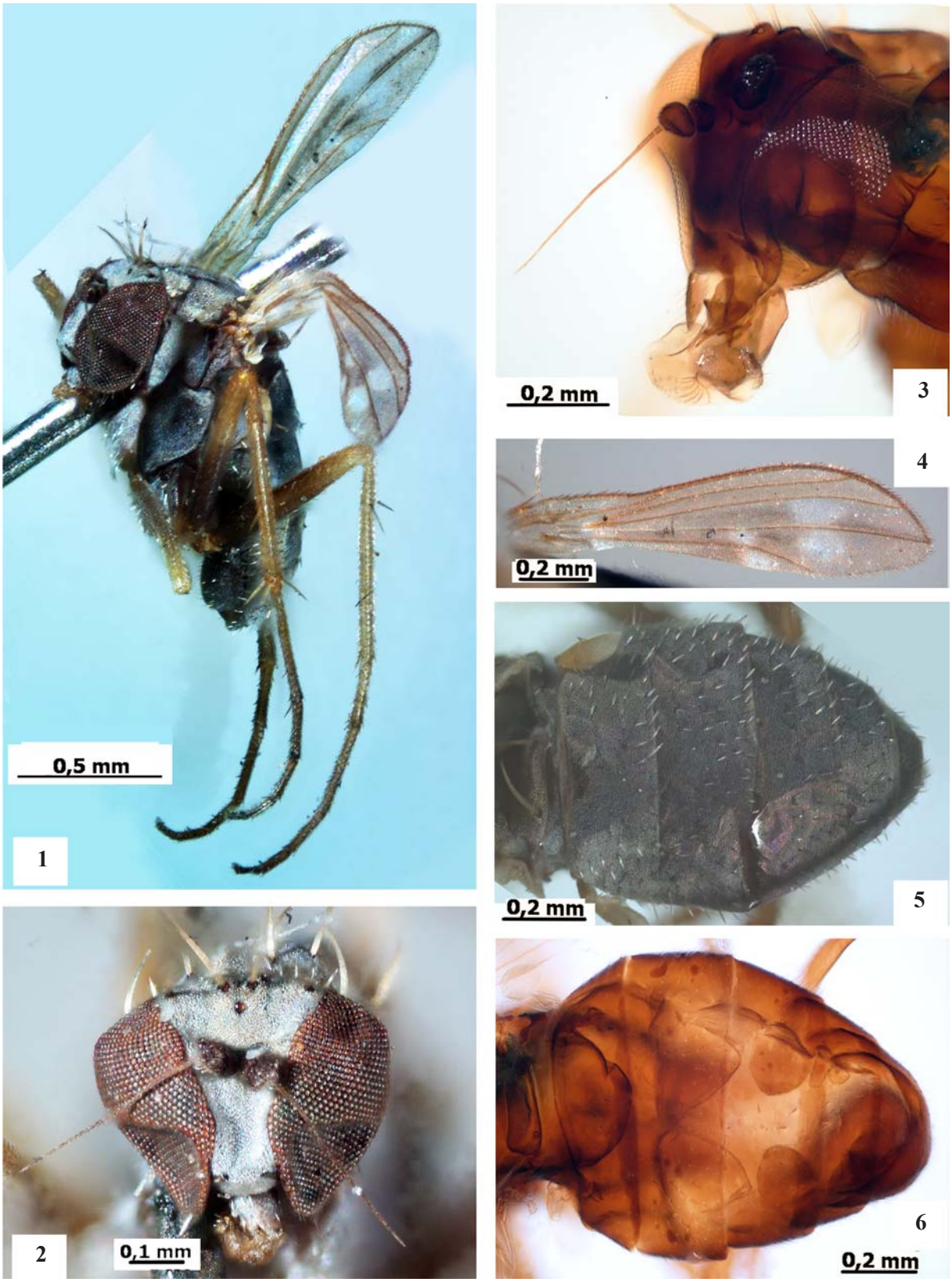
1. Face almost parallel-sided with fronto-clypeal suture distinct laterally; arista-like stylus latero-apical; body with only white setae; wing narrow and maculated; abdomen broad and strongly flattened dorso-ventrally; female cercus short, not extending beyond hemitergites .... *Irwinus* **gen.n.**
— Face narrowest near middle with indistinct fronto-clypeal suture; arista-like stylus usually distinctly dorsal; body with black setae; wing rarely narrow and maculated; abdomen moderately broad and flattened dorso-ventrally; female cercus elongated, extending beyond hemitergites ..... *Campsicnemus*

ETYMOLOGY: The name of the new genus and new species is dedicated to the collector of the type series, Dr. M.E. Irwin (Emeritus, University of Illinois, Urbana-Champaign, Illinois, USA, and University of Arizona, Tucson, USA). The gender is masculine.

Irwinus irwini Grichanov, **sp.n.**
Figs 1–15.

MATERIAL. Holotype ♂, South Africa: [Northern] Cape Prov., Hondeklipbaai, [27°24′70″N, 052°40′9.0″E], 8.IX.1972, sea level, coastal dunes, 3017Ad, M.E & B.J. Irwin leg. (NMSA). Paratype: 1 ♀, same data as for holotype (NMSA).

DESCRIPTION. **Male** (Fig. 1). Body length 1.5 mm; wing 1.3 x 0.3 mm; antenna 0.5 mm. *Head* (Figs 2–3). Postcranium, vertex, frons and face black, covered with grey pruinosity; head (excluding proboscis) distinctly wider than high in anterior view; all setae white; postoculars forming single row of setae around posterior orbit; uppermost seta longer; lower postoculars about as long as lateral setae; ventral postcranium with few sparse setae; face concave, almost parallel-sided; clypeus flat, short, 3 times wider than high, as wide as face under antennae (14/13); palpus small, rounded, black, with short setae; proboscis brown-black; antenna black; postpedicel rounded, haired, slightly wider than long (4/3); arista-like stylus long, filiform, lateroapical, bare, bi-segmented, with segment 1 very short; length (mm) of scape, pedicel, postpedicel, stylus, 0.02/0.02/0.06/0.42. *Thorax.* Mesonotum, scutellum, and pleura dark bluish black, covered with grey pruinosity; all setae white; mesonotum without acrostichals, with 4 strong dorsocentrals slightly decreasing in size anteriorly; scutellum with pair of strong marginal bristles and pair of minute setae laterally; proepisternum with 2–3 lower strong setae and 1–2 minute upper setae. *Legs.* Fore and mid coxae black, brownish apically, hind coxa black, and femora mostly black-brown, yellow in distal 1/2 or 1/3, tibiae and tarsi yellow with last 2–3 tarsomeres brown; fore and mid coxae with white setae anteriorly, longer on mid coxa; hind coxa with short white bristle at middle; legs covered with yellow-brown bristles and white setulae, without black vestiture; fore femur simple, with 2 ventral rows of short white semi-erect setae, at most 1/3 as long as femur height; fore tibia simple, with few short apicals; fore tarsomeres 1–4 each with 1–2 short apical setae; fore tarsomere 5 with small pulvilli and claws; mid femur simple, ventrally bare, with short preapical anterior bristle, as long as femur height; mid tibia with pair of strong antero- and posterodorsals at base, 3–4 times as long as tibia width, 1 anterodorsal bristle, 4 strong apical bristles; tarsomeres 1–4 each with 2 apical setae; tarsomere 5 with small pulvilli and claws; hind femur simple, slightly curved, without strong ventral setae, with short preapical anterior bristle, as long as femur height; hind tibia with pair of strong antero- and posterodorsals at base, about 2 times as long as tibia width, 1 anterodorsal bristle in middle, with few short apicals; tarsomeres 1–4 each



Figs 1–6. *Irwinus irwini*, **sp.n.**, male. 1 — habitus; 2 — head, anterior view; 3 — head, antero-lateral view; 4 — wing; 5 — abdomen, dorsal view; 6 — abdomen after maceration, dorsal view.

Рис. 1–6. *Irwinus irwini*, **sp.n.**, самец. 1 — внешний вид; 2 — голова, спереди; 3 — голова, спереди сбоку; 4 — крыло; 5 — брюшко, сверху; 6 — брюшко, после размягчения, сверху.

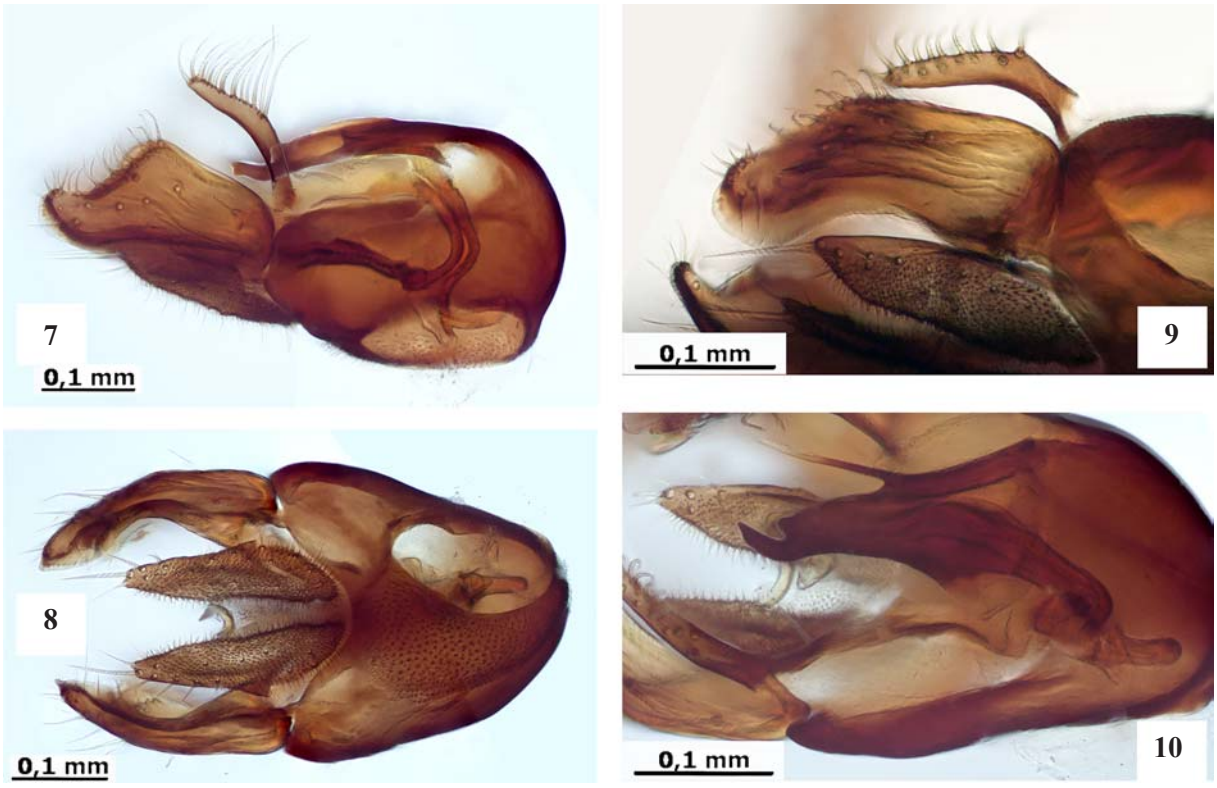
with 1–2 short setae; tarsomere 5 with small pulvilli and claws; femur, tibia and tarsomere (from first to fifth) length ratio (mm): fore leg: 0.49/0.49/0.29/0.14/0.11/0.07/0.07, mid leg: 0.78/0.78/0.39/0.19/0.16/0.11/0.07, hind leg: 0.84/0.87/0.24/0.32/0.17/0.11/0.09. *Wing* (Fig. 4). Grey, with hyaline windows at base and at middle as figured, veins brown, cross-vein dm-m white; wing plate widest at distal 3/4; ratio of parts of costa between R_{2+3} and R_{4+5} to this between R_{4+5} and M_1 (in mm), 0.18/0.13; cross-vein dm-m weak, straight; ratio of dm-m to apical part of M_4, 0.04/0.22; anal lobe absent; anal vein reduced; posterior wing margin between base and M_4 without hairs; lower calypter yellow, with very short white cilia; haltere pale yellow. *Abdomen* (Figs 5–6). Broad and strongly flattened dorso-ventrally, about 1.2 times longer than wide, bluish black, with weak pruinosity, with only short white setae; tergites 1–3 wide; tergites 4–6 gradually narrowed; tergite 6 hardly visible, haired; only tergite 8 and dorsal side of epandrium visible partly in dry specimen under tergites 3–6; tergite 8 covered with very short sparse white setae; sternites 1 and 6 absent; sternites 2–5 (Fig. 6) as 2 rows of sclerites along tergal margins, strongly decreasing in size caudally; sclerites of sternite 2 rounded-triangular, touching each other; sclerites of sternite 3 semicircular; sclerites of sternite 4 small, fingerlike; sclerites of sternite 5 very small, rounded; tergum 7 hidden, semicircular, small and narrow; epandrium rounded-ovate (lateral view; Fig. 7), slightly longer than high; hypopygial foramen dorso-lateral in position (Fig. 8); hypandrium asymmetrical, broad, narrow and curved at apex, with long spine-like straight process raising from middle of hypandrium (ventral view; Fig. 10); phallus narrow, slightly curved, simple; ventral lobe of surstylus articulated, long, fingerlike, with 2 ventral rows of long curved setae (Fig. 9); dorsal lobe of surstylus long and wide, widest at middle (lateral view), with some outer setae and row of short dense setae along distal margin; cercus short and narrow, and covered with setulae and some short setae, 1 long apical seta (Fig. 8).

Female (Fig. 11). Body length 1.7 mm; wing 1.4 x 0.3 mm; antenna 0.6 mm. Similar to male except lacking male secondary sexual characters. *Head.* (Figs 12–13). *Legs.* Lighter, with femora mostly brown, yellow in distal 1/2 or 1/3; fore femur with very short ventral setulae; femur, tibia and tarsomere (from first to fifth) length ratio (mm): fore leg: 0.54/0.51/0.29/0.14/0.12/0.08/0.08, mid leg: 0.79/0.89/0.39/0.22/0.17/0.11/0.07, hind leg: 0.81/0.92/0.25/0.33/0.21/0.13/0.09. *Wing* (Fig. 14). Ratio of parts of costa between R_{2+3} and R_{4+5} to this between R_{4+5} and M_1 (in mm), 0.19/0.12; ratio of dm-m to apical part of M_4, 0.04/0.23. *Abdomen*. Flattened dorso-ventrally, concave ventrally; with 5 visible tergites; tergite 6 small; sternites entire, undivided; oviscapt concealed; terga 9+10 divided medially into two broad hemitergites, each bearing 3 thick pointed spines and 2 simple setae (Fig. 15); cercus short, non-extending beyond hemitergites.

Discussion

The following character states place *Irwinus* **gen.nov.** in the Sympycninae (modified after Yang et al. [2006]):

Occiput convex backward; upper occiput flat; one vertical at level of ocellar tubercle, two postverticals;

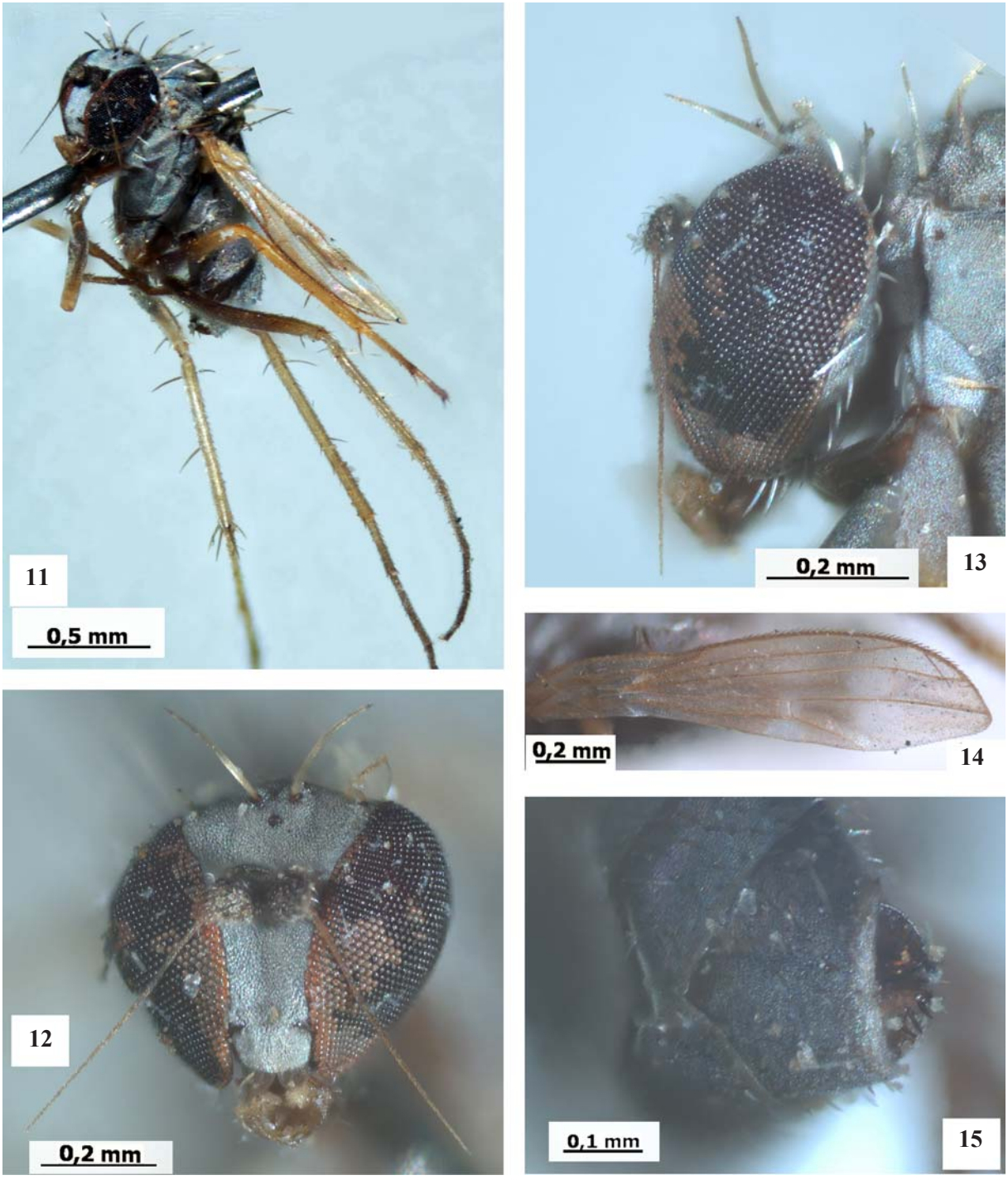


Figs 7–10. *Irwinus irwini*, **sp.n.**, male, after maceration. 7 — hypopygium, left lateral view; 8 —hypopygium, dorsal view; 9 — surstylus and cercus, dorso-lateral view; 10 — epandrium and hypandrium, ventral view.

Рис. 7–10. *Irwinus irwini***, sp.n.**, самец, после размягчения. 7 — гипопигий, слева сбоку; 8 — гипопигий, сверху; 9 — сурстиль и церка, сверху сбоку; 10 — эпандрий и гипандрий, снизу.

postocular bristles one-rowed; eyes with tiny hairs; male eyes close on face; male face narrow; arista-like stylus subapical; mesonotum with round mid-posterior slope; propleuron sparsely haired; hind coxa with 1 outer bristle; mid and hind femora with anterior preapical bristle; male tergite 6 subtriangular in lateral view, with hairs and bristles; segment 7 hidden in tergite 6, invisible laterally; hypopygium small and encapsulated; epandrial lobe very short and located at base of surstylus; postgonite indistinct; hypandrium long and thick; female tergite 9+10 divided into two hemitergites, each with row of spines.

The use of keys of Evenhuis [2005], Bickel [2009], Grichanov [2011], Grichanov et al. [2011] and Gricha-



Figs 11–15. *Irwinus irwini*, **sp.n.**, female. 11 — habitus; 12 — head, anterior view; 13 — head, lateral view; 14 — wing; 15 — tergites 4, 5, 9+10 of abdomen, dorsal view.

Рис. 11–15. *Irwinus irwini*, **sp.n.**, самка. 11 — внешний вид; 12 — голова, спереди; 13 — голова, сбоку; 14 — крыло; 15 — тергиты 4, 5, 9+10 брюшка, сверху.

nov, Brooks [2017] leads *Irwinus* **gen.n.** to the sympycnine genus *Campsicnemus*, which differs in face strongly narrowed in middle, almost always dorsal or basodorsal arista, usually modified or ornamented male tibiae or tarsomeres, usually simple wings, morphology of hypopygium; etc. The genus *Campsicnemus* is not specious in the Afrotropics in comparison with the Holarctic Region (90 species) and Pacific islands of the Hawaii and French Polynesia (203 species) [Grichanov, 2022a]. Only four species are known from the continental Afrotropics, i.e. from the Republic of South Africa and Namibia (two species), Democratic Republic of the Congo (one) and Cameroon (one) [Grichanov, 2022b].

Irwinus **gen.n.** is somewhat similar to the Afrotropical sympycnine genus *Nurteria* Dyte et Smith, 1980, which differs in convex occiput, normally developed wing, black setation on body, cylindrical abdomen, undivided abdominal sternites, morphology of hypopygium, etc. [Parent, 1935; Grichanov, 2011]. The new genus is also somewhat similar to the New Zealand sympycnine genus *Tetrachaetus* Bickel et Dyte, 1989, which differs in the convex occiput, two pairs of postverticals, six dorsocentrals, normally developed wing with sinuate vein M_{1+2} and short distal part of M_4, black setation on body, etc. [Parent, 1933; Bickel, 1991].

Both male and female of *Irwinus irwini*, **sp.n.** were captured at a sea level, apparently on a beach with coastal dunes, and having their body dark, non-shining, covered with grey pruinosity, like other beach-dwellers from some other dolichopodid subfamilies (e.g., Naglis et al. [2013]. The adults of the new species have distinctly narrowed and somewhat shortened wings in both sexes, but they could hardly be classified as stenopterous [Hardy, Delfinado, 1974] like a few Hawaiian stenopterous *Campsicnemus* species inhabiting forest floor under dense vegetation or on the ground and leaf litter [Evenhuis, 1997].

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References

Bickel D.J. 1991. Sciapodinae, Medeterinae (Insecta: Diptera), with a generic review of the Dolichopodidae // Fauna of New Zealand. Vol.23. P.1–74.

Bickel D.J. 2009. Chapter 49. Dolichopodidae (long-legged flies) // Brown B.V., Borkent A., Cumming J.M., Wood D.M., Woodley N.E., Zumbado M.A. (eds). Manual of Central American Diptera. Vol.1. Ottawa: NRC Research Press. P.671–694.

Cumming J.M., Wood D.M. 2017. 3. Adult morphology and terminology // A.H. Kirk-Spriggs, B.J. Sinclair (eds.). Manual of Afrotropical Diptera. Vol.1. Introductory chapters and keys to Diptera families. Suricata 4. Pretoria: SANBI Graphics and Editing. P.89–134.

Evenhuis N.L. 1997. Review of the flightless Dolichopodidae of the Hawaiian Islands (Insecta: Diptera) // Bishop Museum Occasional Papers. Vol.53. P.1–29.

Evenhuis N.L. 2005. A review of the genera comprising species of the genus *Eurynogaster* sensu Hardy & Kohn, 1964 in Hawai´i (Diptera: Dolichopodidae) // Zootaxa. Vol.1017. P.39–60.

Grichanov I.Ya. 2011. An illustrated synopsis and keys to Afrotropical genera of the epifamily Dolichopodoidae (Diptera: Empidoidea) // Priamus Serial Publication of the Centre for Entomological Studies Ankara Supplement. Vol.24. P.1–99. [Available from: http://www.archive.org/details/CentreForEntomologicalStudiesAnkaraPriamusSupplement24]. (Accessed 31 December 2022).

Grichanov I.Ya. 2022a. Alphabetic list of generic and specific names of predatory flies of the epifamily Dolichopodoidae (Diptera). [Online version] // St. Petersburg: All-Russian Research Institute of Plant Protection. Available from: http://grichanov.aiq.ru/genera3.htm. (Accessed 31 December 2022).

Grichanov I.Ya. 2022b. A new species of *Campsicnemus* Haliday (Diptera: Dolichopodidae) from South Africa and a key to continental Afrotropical species // Euroasian Entomological Journal. Vol.21. No.4. P.239–242. https://doi.org/10.15298/euroasentj.21.4.10.

Grichanov I.Ya., Brooks S.E. 2017. 56. Dolichopodidae (longlegged dance flies) // Kirk-Spriggs A.H., Sinclair B.J. (eds.). Manual of Afrotropical Diptera. Vol.2. Nematocerous Diptera and lower Brachycera. Suricata 5. Pretoria: SANBI Graphics and Editing. P.1265–1320.

Grichanov I.Ya., Negrobov O.P., Selivanova O.V. 2011. Keys to Palaearctic subfamilies and genera of the family Dolichopodidae (Diptera) // CESA News. Vol.62. P.13–46. [Available from: http://www.archive.org/details/CentreForEntomologicalStudiesAnkaraCesaNewsNr.62]. (Accessed 31 December 2022).

Hardy D.E., Delfinado M.D. 1974. Flightless Dolichopodidae (Diptera) in Hawaii // Proceedings of the Hawaiian Entomological Society. Vol.21. P.365–371.

Naglis S., Grootaert P., Brooks S.E. 2013. *Phoomyia*, a new genus of Dolichopodinae from the Oriental Region (Diptera: Dolichopodidae) // Zootaxa. Vol.3666. No.1. P.93–99.

Parent O. 1933. Étude monographique sur les Diptères Dolichopodides de Nouvelle Zélande // Annales de la Société scientifique de Bruxelles. Sér.B. Vol.53. P.325–441.

Parent O. 1935. Diptères Dolichopodidés du Congo Belge. Nouvelle contribution // Rev. Zool. et Bot. Africaine. Vol.27. P.112–129.

Yang D., Zhang L., Wang M., Zhu Y. 2011. Fauna Sinica, Insecta, Vol.53, Dolichopodidae. Beijing: Science Press. 1912 pp. [in Chinese, with English summary].

Yang D., Zhu Y.J., Wang M.Q., Zhang L.L. 2006. World catalog of Dolichopodidae (Insecta: Diptera). Beijing: China Agricultural University Press. 704 pp.