

A new gall-midge genus and ten new species (Diptera: Cecidomyiidae) from succulent Aizoaceae in South Africa

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Abstract. *Ruschiola* Dorchin, **n. gen.** and ten new species are described: *Ruschiola succulenta* Dorchin & van Munster, **n. sp.**, *R. attenuata* Dorchin & van Munster, **n. sp.**, *R. cedarbergensis* Dorchin & van Munster, **n. sp.**, *R. namaqua* Dorchin & van Munster, **n. sp.**, *R. bubonis* Dorchin & van Munster, **n. sp.**, *R. quagga* Dorchin & van Munster, **n. sp.**, *R. timida* Dorchin & van Munster, **n. sp.**, *R. furtiva* Dorchin & van Munster, **n. sp.**, *R. leipoldtiae* Dorchin & van Munster, **n. sp.**, and *R. celebrata* Dorchin & van Munster, **n. sp.**

INTRODUCTION

Dorchin *et al.* (2022) in an electronic-only journal described a new genus with ten new species, but due to an oversight, the article was not registered in the Official Register of Zoological Nomenclature (ZooBank) and thus is not published for the purposes of zoological nomenclature. In order to make the names available, a succinct, Code-compliant extract from that article is published here. For further details on morphology and biology, see Dorchin *et al.* (2022).

DEPOSITORIES OF MATERIAL

EMEUC: Essig Museum of Entomology, Berkeley, CA, USA.

SAMC: Iziko South African Museum, Cape Town, South Africa.

SMNHTAU: Steinhardt Museum of Natural History, Tel Aviv University, Israel.

ZFMK: Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany.

Ruschiola Dorchin, new genus

Isid:zoobank.org:act:F42DC6A0-431C-4F8B-8B9B-1E3184E6CE95

Type species: *Ruschiola succulenta* Dorchin & van Munster, **new species**, by present designation.

Gender: Feminine.

Diagnosis: This is a medium- to large-sized lasiopterine genus, with tergites mostly covered by black scales except for a thin posterior line of white scales on each tergite. Flagellomere number is irregular within species, palpi are 1–2 segmented, vein R₄₊₅ of the wing joins C at about $\frac{3}{4}$ of wing length, the ovipositor is of medium length and rather

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morphologically uniform among species, with well-developed lateral plates that lack a distinct aculeus. The pupae have well-developed antennal “horns” but no facial horns, and larvae have either a well-developed, bidentate spatula or a vestigial spatula. For more details and figures, see Dorchin *et al.* (2022: 9–12).

Etymology: The genus name combines the plant genus name *Ruschia* Schwantes (Aizoaceae) with the diminutive suffix ‘ola’.

***Ruschiola succulenta* Dorchin & van Munster, new species**

Isid:zoobank.org:act:7F98FC2A-9E34-4302-A1DA-14B84C870C40

Diagnosis: This species induces common, succulent leaf galls, 2–6 cm long. Antennal flagellomeres barrel-shaped, 11–15 in females, 11–12 in males. Palpus 2-segmented, segment 2 usually subtending segment 1. Empodia clearly longer than bend in claws. Lateral plate of female cercal segment sheathing about half height of rectangular apical lamella, bearing about 30 long, curved setae laterally and 8–10 erect, curl-like setae on distal half, followed by group of shorter, erect setae extending to apical lamella. Gonocoxite of male terminalia widest at mid length; mediobasal lobe much shorter than wide, truncate aedeagus pointed anteriorly in lateral view. Gonostylus widest at proximal third, ending with wide apical claw. Hypoproct either entire, truncate or with shallow apical depression. Larval spatula with long, narrow shaft and two rounded teeth, on each side with four lateral papillae. Pupal antennal bases form straight horns, parallel-sided medially.

Host plants: *Ruschia caroli* (L.Bolus) Schwantes, *R. pungens* (A. Berger) H. Jacobsen, *Lampranthus haworthii* (Donn ex Haw.) N.E.Br.

Etymology: The species epithet is a Latin adjective, referring to the typical succulent, sausage-like galls induced by this species.

Type material: HOLOTYPE: ♀, South Africa, Western Cape, Karoo Desert National Botanical Garden, Worcester (33°36'33"S, 19°27'01"E), 20.ix.17, N. Dorchin, S. van Munster and C. Klak, ex leaf gall on *Ruschia caroli*. On permanent microscope slide in Euparal. Deposited in SAMC. PARATYPES: 6♀, 2♂, same data as holotype (1♀ ZFMK); 5♀, 4♂, Karoo Desert National Botanical Garden, Worcester, 25.viii.17, N. Dorchin, S. van Munster and C. Klak, ex *Ruschia caroli* (1♀ EMEUC); 2♀, 3♂, Karoo Desert National Botanical Garden, Worcester, 20.ix.17, N. Dorchin and S. van Munster, ex *Lampranthus haworthii*; 5♀, 1♂, Eilandia, Robertson, 15 km W, R60 (33°46'15"S, 19°44'53"E), 20.ix.17, N. Dorchin and S. van Munster, ex *Ruschia pungens*; 5♀, 4♂, Eilandia, Robertson, 15 km W, Rt60, 4.ix.18, N. Dorchin and S. van Munster, ex *Ruschia caroli*; 5♀, 4♂, Eilandia, Robertson, 15 km W, Rt60, 6.ix.2018, N. Dorchin and S. van Munster, ex *Ruschia pungens*; 1♀, Karoo Desert National Botanical Garden, Worcester, 27.iv.19, N. Dorchin, S. van Munster and C. Klak, ex *Ruschia caroli*; 2♀, 2♂, Karoo Desert National Botanical Garden, Worcester, 14.viii.19, N. Dorchin and S. van Munster, ex *Ruschia caroli*; 4♀, 2♂, Karoo Desert National Botanical Garden, Worcester, 14.viii.19, N. Dorchin and S. van Munster, ex *Lampranthus haworthii*; 1♀, Vrolijkheid Nature Reserve (33°55'04"S, 19°52'39"E), 15.viii.19, N. Dorchin, S. van Munster and C. Klak, ex *Ruschia caroli*.

***Ruschiola attenuata* Dorchin & van Munster, new species**

Isid:zoobank.org:act:A62A2406-69D6-4119-AA90-322FA0439E30

Diagnosis: This species develops in inflated leaf galls, usually about 2 cm long and 0.5 cm wide. Antennal flagellomeres quadrate, about as long as wide, 11–15 in female, 11–12 in male. Palpus 2-segmented. Empodia as long as bend in claws. Lateral plate of ovipositor sheathing about quarter height of apical lamella. Pupal antennal bases form straight

horns, each split apically into longer lateral and shorter median tips. Larva not studied. Other characters similar to those of *R. succulenta*.

Host plant: *Mesembryanthemum splendens* L.

Etymology: The species epithet is Latin for plain or refined, referring to the thinner and less robust lateral plate of the ovipositor compared to that of other known *Ruschiola* species.

Type material: HOLOTYPE: ♀, South Africa, Western Cape, Van Wyksdorp (Watermill Farm) (33°43'50"S, 21°28'39"E), 26.iv.19, N. Dorchin, S. van Munster and C. Klak, ex leaf gall on *Mesembryanthemum splendens*. On permanent microscope slide in Euparal. Deposited in SAMC. PARATYPES: 5♀, 1♂, same data as holotype; 6♀, 1♂, Karoo Desert National Botanical Garden, Worcester, 14.viii.19, N. Dorchin, S. van Munster and C. Klak (1♀ EMEUC); 7♀, 7♂, Laingsburg, 34 km SE, R323 (33°22'52"S, 21°06'50"E), 5.ix.18, J.F. Colville and A. Melin (1♀, 1♂, ZFMK).

Ruschiola cedarbergensis Dorchin & van Munster, new species

lsid:zoobank.org:act:E3ABD113-2E26-4D33-8529-456B5632EFB8

Diagnosis: This species induces uncommon succulent, sausage-like leaf galls, usually 5–7 cm long. Antennal flagellomeres 12–14 in female, 11–12 in male. Palpus comprises one large segment, usually with vestigial second segment. Gonostylus widest at base, with constriction around mid-length, posterior margin almost straight rather than curved. Larval spatula about as long as wide, with short, wide shaft. Otherwise mostly similar to *R. succulenta*.

Host plants: *Ruschia cymosa* L.Bolus, *R. schollii* (Salm-Dyck) Schwantes, *R. cf. caroli*, *R. cf. cedarbergensis*.

Etymology: The species name refers to the distribution of this species, which is restricted to the Cedarberg region in the Western Cape of South Africa.

Type material: HOLOTYPE: ♂, South Africa, Western Cape, Bushmans Kloof Wilderness Reserve (32°06'22"S, 19°06'42"E), 8.viii.19, N. Dorchin and S. van Munster, ex leaf gall on *Ruschia cymosa*. On permanent microscope slide in Euparal. Deposited in SAMC. PARATYPES: 3♀, same data as holotype; 1♀, 1♂, Bushmans Kloof Wilderness Reserve, 14.ix.17, N. Dorchin and S. van Munster, ex *Ruschia cf. caroli*; 3♀, 3♂, Travellers Rest (Wolfdrif), Cedarberg (32°01'47"S, 19°03'19"E), 11.ix.18, N. Dorchin and S. van Munster, ex *Ruschia cymosa*; 3♀, 3♂, Bushmans Kloof Wilderness Reserve, 12.ix.18, N. Dorchin and S. van Munster, ex *Ruschia cf. cedarbergensis*; 1♀, 1♂, Bushmans Kloof Wilderness Reserve, 12.ix.18, N. Dorchin and S. van Munster, ex *Ruschia cymosa*; 5♀, Heuningvlei Nature Reserve (32°09'59"S, 19°01'46"E), 13.ix.18, N. Dorchin and S. van Munster, ex *Ruschia schollii*; 7♀, 3♂, Bushmans Kloof Wilderness Reserve, 8.viii.19, N. Dorchin and S. van Munster, ex *Ruschia cf. caroli*; 3♀, 1♂, Bushmans Kloof Wilderness Reserve, 8.viii.19, N. Dorchin and S. van Munster, ex *Ruschia cymosa*; 4♀, 4♂, Travellers Rest (Wolfdrif), Cedarberg, 8.viii.19, N. Dorchin and S. van Munster, ex *Ruschia cf. caroli*.

Ruschiola namaqua Dorchin & van Munster, new species

lsid:zoobank.org:act:05E1157D-A235-4CF9-81F3-0B0062A92E32

Diagnosis: This species induced smooth, succulent, often reddish leaf galls, 3–4 cm long. Antennal flagellomeres 12–13 in female, 10–12 in male. Palpus usually 1-segmented, occasionally 2 -segmented. Larval spatula vestigial, irregularly pigmented. Other characters similar to those of *R. succulenta*.

Host plants: *Ruschia viridifolia* L.Bolus, *R. goodiae* L.Bolus.

Etymology: The species is named after the Namaqualand region of South Africa, to which its distribution is restricted. The name is a noun in apposition.

Type material: HOLOTYPE: ♀, South Africa, Northern Cape, Namaqua National Park (Skilpad Camp), (30°09'58"S, 17°46'09"E), 26.vii.19, N. Dorchin, S. van Munster and C. Klak, ex leaf gall on *Ruschia goodiae*. On permanent microscope slide in Euparal. Deposited in SAMC. PARATYPES: 9♀, 9♂, same data as holotype. 1♀, 1♂, Kamieskroon (30°12'00"S, 17°56'06"E), 9.viii.17, N. Dorchin, S. van Munster and C. Klak, ex *Ruschia viridifolia*; 10♀, 10♂, Grootvlei Pass, eastern base (30°12'53"S, 17°46'07"E), 10.viii.17, N. Dorchin, S. van Munster and C. Klak ex *Ruschia goodiae*; 12♀, 18♂, Kamieskroon, 26.vii.19, N. Dorchin and S. van Munster, ex *Ruschia viridifolia* (1♀, 1♂ ZMFK, 1♀, 1♂ EMEUC).

***Ruschiola bubonis* Dorchin & van Munster, new species**

lsid:zoobank.org:act:05FFCBB8-910E-4E65-B7FF-D1E6B3C2BEBE

Diagnosis: This species develops in leaves without discernible gall formation. Antennal flagellomeres 12–14 in female, 11–13 in male. Palpus morphology variable, usually 2-segmented, occasionally 1-segmented. Aedeagus narrow, parallel-sided, hypoproct entire. Larval spatula absent. Pupal antennal bases widely separated, abruptly splayed from mid length. Other characters mostly similar to *R. succulenta*.

Host plants: *Jordaaniella spongiosa* (L.Bolus) H.E.K. Hartmann.

Etymology: The species epithet is the genitive singular of the Latin *bubo* (owl) – with reference to the shape of the pupal antennal bases, reminiscent of a horned owl.

Type material: HOLOTYPE: ♂, South Africa, Northern Cape, Namaqua National Park (coastal section), (30°24'40"S, 17°24'59"E), 28.viii.18, N. Dorchin, S. van Munster and C. Klak, ex *Jordaaniella spongiosa*. On permanent microscope slide in Euparal. Deposited in SAMC. PARATYPES: 4♀, 2♂, same data as holotype; 10♀, 3♂, Namaqua National Park (coastal section), 25.vii.19, N. Dorchin, S. van Munster and C. Klak.

***Ruschiola quagga* Dorchin & van Munster, new species**

lsid:zoobank.org:act:B62D2692-F2AC-4E1F-845A-3121C5249A6B

Diagnosis: This species develops in succulent leaf galls, 2-3 cm long. Antennal flagellomeres 13 in female, unknown in male (no males with complete antennae were available). Palpus 1-segmented. Male hypoproct truncate apically. Larval spatula with long, narrow shaft and short teeth separated by shallow notch. Other characters similar to *R. succulenta*.

Host plants: *Ruschia holensis* L.Bolus.

Etymology: This species is named after the extinct South African subspecies of the Plains Zebra, the Quagga. The name is a noun in apposition.

Type material: HOLOTYPE: ♀, South Africa, Western Cape, Quaggaskop Farm, Knersvlakte Nature Reserve (31°24'59"S, 18°35'43"E), 26.viii.18, N. Dorchin, S. van Munster and C. Klak, ex leaf gall on *Ruschia holensis*. On permanent microscope slide in Euparal. Deposited in SAMC. PARATYPES: 7♀, 3♂, 2 larvae, 2 exuviae, same data as holotype.

***Ruschiola timida* Dorchin & van Munster, new species**

lsid:zoobank.org:act:B4B8A5CD-E097-4359-9868-AAF2E89A5623

Diagnosis: This species develops in leaves without obvious gall formation. Antennal flagellomeres 13–14 in female, 10–12 in male. Palpus 1–2-segmented. Other characters similar to those of *R. succulenta*. Larva and pupa unknown.

Host plants: *Scopelogena bruynsii* Klak.

Etymology: The species name is a Latin adjective that refers to the lack of external signs of infestation on leaves and to the difficulty of locating this species

Type material: HOLOTYPE: ♀, South Africa, Western Cape, Travellers Rest, Clanwilliam (32°05'03"S, 19°05'24"E), 13.ix.18, N. Dorchin and S. van Munster, ex leaf of *Scopelogena bruynsii*. On permanent microscope slide in Euparal. Deposited in SAMC. PARATYPES: 6♀, 4♂, same data as holotype. 2♀, Travellers Rest, Clanwilliam, 15.ix.17, N. Dorchin and S. van Munster.

***Ruschiola furtiva* Dorchin & van Munster, new species**

lsid:zoobank.org:act:F73E6F66-B64F-4610-9E9A-996C87B8E33E

Diagnosis: This species develops in leaves without external deformation other than a slight change of color from green to red. Antennal bases 12–13 in male, 11–12 in female. Palpus 1-segmented. Male hypoproct truncate. Other characters similar to those of *R. succulenta*. Larva unknown.

Host plants: *Ruschia dichroa* (Rolfe) L.Bolus.

Etymology: The species epithet is a Latin adjective for “hidden”, with reference to the lack of obvious signs of infestation in the leaves occupied by larvae.

Type material: HOLOTYPE: ♀, South Africa, Western Cape, Bushmans Kloof Wilderness Reserve (32°06'22"S, 19°06'42"E), 14.ix.17, N. Dorchin and S. van Munster, ex leaf gall on *Ruschia dichroa*. On permanent microscope slide in Euparal. Deposited in SAMC. PARATYPES: 4♀, 4♂, same data as holotype.

***Ruschiola leipoldtia* Dorchin & van Munster, new species**

lsid:zoobank.org:act:FB327D11-B5E7-4EC8-9931-C747509DBC34

Diagnosis: This species induces succulent, pinkish leaf galls, usually 2–3 cm long. Antennal flagellomeres 11–13 in female, 11–12 in male. Palpus 1–2-segmented, labella conspicuously elongate; frons with dense group of long hair-like setae. Distal margin of gonostylus almost straight. Pupal antennal bases separated by rectangular gap. Other characters as for *R. succulenta*.

Host plants: *Leipoldtia laxa* L.Bolus, *L. schultzei* (Schltr. and Diels) Friedrich.

Etymology: This species is named after its host-plant genus, *Leipoldtia*, which in turn is named after the famous South African doctor, poet and botanist C. Louis Leipoldt.

Type material: HOLOTYPE: ♂, South Africa, Northern Cape, Namaqua National Park (Skilpad camp) (30°09'58"S, 17°46'09"E), 21.vii.19, N. Dorchin, S. van Munster and C. Klak, ex leaf gall on *Leipoldtia schultzei*. On permanent microscope slide in Euparal. Deposited in SAMC. PARATYPES: 12♀, 12♂, same data as holotype; 17♀, 10♂, Springbok (29°40'53"S, 17°53'03"E), 5.viii.17, N. Dorchin, S. van Munster and C. Klak.

***Ruschiola celebrata* Dorchin & van Munster, new species**

lsid:zoobank.org:act28CC1A06-D27A-4DAD-B888-0FBD68BBC826

Diagnosis: This species develops in inflated leaf galls, where mostly the basal part of the leaf is occupied by the larval chambers. Antennal flagellomeres 12–15 in female, 11–12 in male. Palpus 1-segmented, fusiform. Pupal antennal bases with small proximal bulge. Other characters similar to those of *R. succulenta*. Larva unknown.

Host plants: *Mitrophyllum mitratum* (Marloth) Schwantes, *M. clivorum* (N.E.Br.) Schwantes.

Etymology: The species epithet is a Latin adjective for crowded, with reference to the large number of individuals developing in the same gall.

Type material: HOLOTYPE: ♀, South Africa, Northern Cape, Vyftienmyl se Berg Inselberg, Port Nolloth, 20 km E (29°14'41"S, 17°06'32" E), 22.vii.19, N. Dorchin, S. van Munster and C. Klak, ex leaf gall on *Mitrophyllum clivorum*. On permanent microscope slide in Euparal. Deposited in SAMC. PARATYPE: 5♀, 3♂, same data as holotype. 7♀, same data as holotype, from *Mitrophyllum mitratum*.

REFERENCE

- Dorchin, N., van Munster, S., Klak C., Bowie R.C.K., Colville, J.F. 2022. Hidden diversity – a new speciose gall midges genus (Diptera: Cecidomyiidae) associated with succulent Aizoaceae in South Africa. *Insects* **13**, 75.
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