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**Abstract**. Two species of the genus *Sisyra* Burmeister (Neuroptera: Sisyridae), *S. cameroonensis*, **n. sp.**, and *S. gruwelli*, **n. sp.**, are described from the African Republic of Cameroon. *Sisyra pallida* Meinander is synonymized with *Sisyra delicata* Smithers, **new synonymy**, after comparison of the types of the former with topotypic paratypes of the latter. Type material of *Sisyra nilotica* Tjeder appears to be lost. Examples of *Sisyra* are recorded from Nigeria, Ethiopia and Uganda. A second species of the endemic African genus, *Sisyborina*, Monserrat, *S. scitula*, **n. sp.**, is described from Cameroon, Guinea, and Zambia.

**Key words**. Spongilla fly, Neuroptera, Sisyridae, *Sisyra*, *Sisyborina*, new species, new synonymy, Cameroon, Guinea, Zambia

## Introduction

The neuropteran family Sisyridae, commonly called the spongilla flies, is recorded from all the continents except Antarctica. In the New World it is represented by two genera, *Sisyra* Burmeister with 9 described species (the species *S. nigra* (Retzius) is Holarctic in distribution) and *Climacia* McLachlan with 21 species (Oswald 2011). In the Old world, in the genus *Sisyra*, 7 species are known from Australia, 19 from the Palearctic and Oriental Regions, 6 from Africa south of the Sahara (Oswald 2011). In addition there is the genus *Sisyrina* Banks with a species each in India and Australia, and the genus *Sisyborina* Monserrat with a single African species (Oswald 2011).

Four of the African species of *Sisyra* are known from southern Africa – *S. afra* Kimmins, *S. aquatica* Smithers, *S. delicata* Smithers (with new synonym *S. pallida* Meinander), and *S. producta* Tjeder, one is from Madagascar – *S. radialis* Navas, and another one is from Sudan – *S. nilotica* Tjeder. *Sisyborina marlieri* (Tjeder) is known from the Democratic Republic of the Congo and also recorded from Nigeria. With the exception of the latter species, the African sisyrids seemed to be limited to southern and eastern Africa. Two new species of *Sisyra* and a one of *Sisyborina* are described in this paper from western Africa, thereby expanding the geographical distribution of spongilla flies on the African continent.

## Material and methods

The specimens from Cameroon were collected by John A. Gruwell more than 35 years ago at black lights and preserved in alcohol. He was working with the Peace Corps on a project initiated by Dr. Paul J. Spangler of National Museum of Natural History. The specimens have remained in ethyl alcohol (estimated 80%) ever since, but because clearing of the genitalia by the usual technique with potassium hydroxide was only partially successful there are doubts as to the quality of the alcohol originally used. A pair of wings from two of the new species were removed, placed between cover slips, dried and photographed. The terminology for the wing venation is that used by Tjeder (1957, fig. 139). The genitalic terminology is based on Aspöck et al. (1980, fig. 358-359). If I have presented an interpretation in a locality cited, it is placed within brackets [ ]. Materials studied are deposited in the following collections: **CAS -** California Academy of Sciences, San Francisco, USA; **CNC** - Canadian National Collection, Ottawa, Canada; **NMNH** - National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA.

***Sisyra cameroonensis* n.sp.**
(Figures 1, 2, 8)

**Comments**. Of the described African species of *Sisyra* for which the male is known, this species seems clearly related to both *S. afra* and *S. delicata*. Both have rather short, broad coxopodites with apical points and some enlarged setae. However, they differ in the arrangement of the enlarged setae and they have an apicomesal frilled lobe that is lacking in *S. cameroonensis*.

Unfortunately, I was unable to completely clear the genitalia, and thus, some of the structures are not well delineated. Because it has been in alcohol for over 35 years, any colors it might have had have undoubtedly faded.

The females collected at the same locality as the type are associated with this species based on their wing venation being identical to the males, but their genitalia are not described due to their poor condition.

**Description**. Male: Forewing length 4mm. Preserved in 80% ethyl alcohol, almost uniformly brown. Antenna with 29 segments, 20 basal segments (including scape and pedicel) dark brown, next segment intermediate in color, 8 terminal segments pale. Head and body light brown. Wings light brown; all cells with darkened stripe in center (Fig. 8). Forewing with 2 radial crossveins; Rs with only 2 forks; no crossvein between $R_3$ and $R_4$, with strong crossvein between $R_4$ and$R_5$; $R_1$ clearly forked apically, each branch ending in 1 or 2 short marginal forks; $R_2$, $R_3$, and $R_4$ not forked apically, each ending in a short, marginal fork; $R_5$ with a deep apical fork, each branch ending in a short fork at margin; $Cu_1$ with a slightly elongated marginal fork and 2 more basal branches reaching wing margin. Male genitalia (Fig. 1, 2): Eighth sternite not apparent, but sternum a large trianguloid lobe. Epiproct not clearly distinguishable from membrane. Gonarcus a dark band connecting bases of coxopodites, and extending anteriad from their mesal bases. Parameres not seen. Coxopodite about twice as long as broad; in lateral aspect slightly curved apicodorsad, tapering to a sharp apical point; in dorsal aspect tapering to a sharp apical point, with a small, pointed seta apicomesally (making the tip of the coxopodite appear as two points); with 2 large and 1 small setae arising from enlarged bases on dorsal surface, mesal margin with 1 very large seta; basomesally convexly curved with a row of short mesal setae; outer margin with 2 slightly enlarged setae; bulging basolaterally.

**Type material. Holotype**, male: CAMEROON: [Centre Prov.] Libamba, 10km E Makak [3°37'N, 11°2'E], 10-11 Jan 1974, J.A. Gruwell, at black light (NMNH). **Paratypes**: Same data, 1M (NMNH); same, but 15 Dec 1973, at black light, 1F (NMNH), same, but 12-13 May 1974, filtered back light, 1F (NMNH).

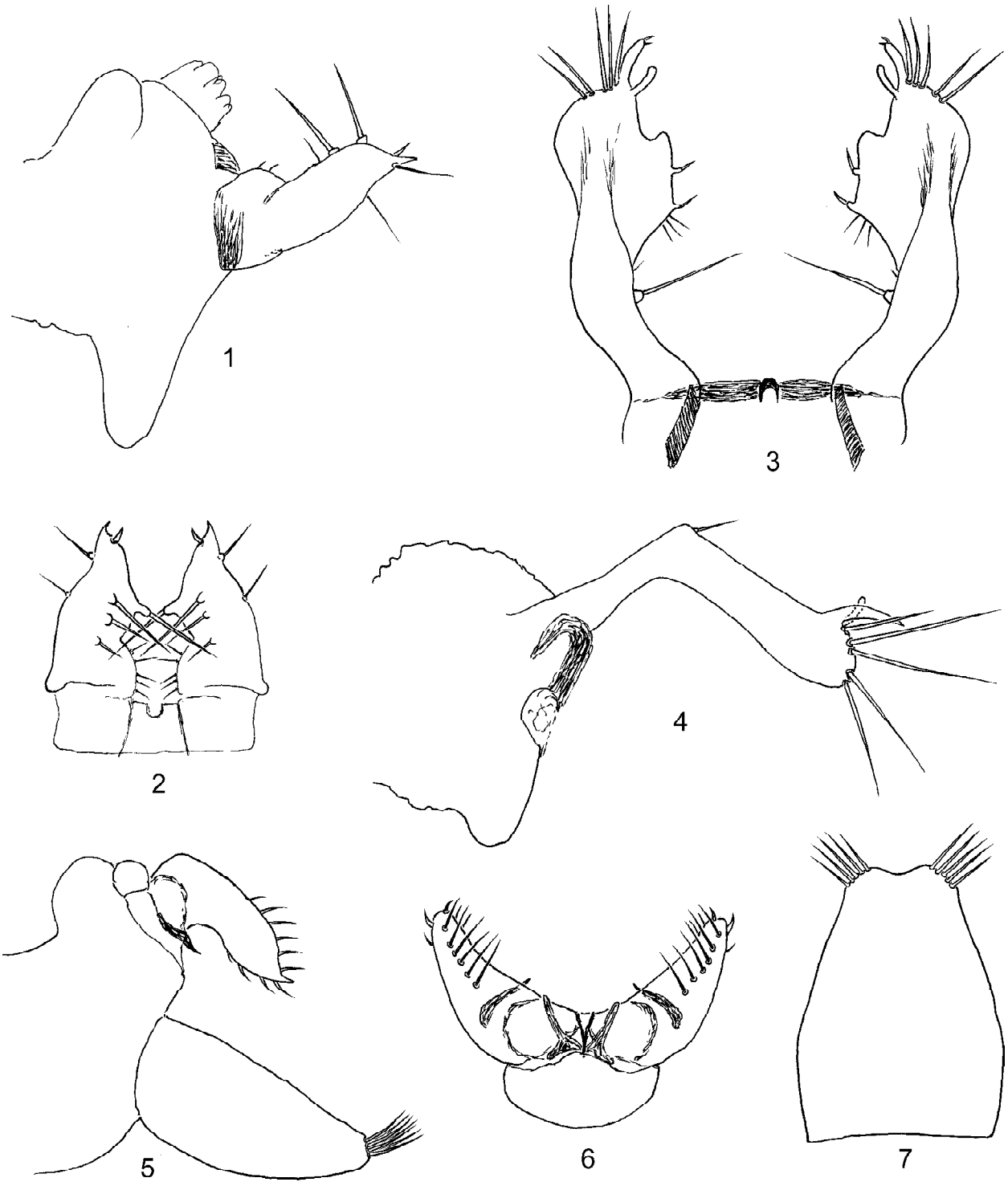
**Etymology.** The species is named after the country of its origin.

***Sisyra gruwelli* n.sp.**
(Figures 3, 4)

**Comments**. Of the known species of *Sisyra* there is no other with such a narrow, elongate, angulate coxopodite bearing abroad mesal flange.

As with the preceding species, this example appears to have faded over time, and the wings are badly broken with various fragments missing. It, too, has not cleared well.

**Description.** Male: Forewing length 3.5mm. Preserved in 80% ethyl alcohol, almost uniformly light brown. Antenna with 33 segments, 24 basal segments (including scape and pedicel) dark brown, 9 terminal segments pale. Head and body light brown. Wings light brown; cells not noticeably marked. Forewing with radial and medial venation appearing the same as in *S. cameroonensis* but $Cu_1$ has 3 branches reaching the wing margin in addition to the apical fork. Male genitalia (Fig. 3, 4): Epiproct not clearly distinguishable from membrane. Eighth sternite not apparent, but sternum a large irregular lobe extending ventrad. Gonarcus a dark band connecting bases of coxopodites with a small mesal knob, and extending ventrad from their mesal bases. Parameres not seen. Coxopodite 8-9 times as long as




**Figures 1-7.** Male genitalia. **1-2)** *Sisyra cameroonensis* n. sp. **1)** Lateral view. **2)** Dorsal view of gonarcus and coxopodites. **3-4)** *Sisyra gruwelli* n. sp. **3)** Dorsal view of gonarcus and coxopodites. **4)** Lateral view. **5-7)** *Sisyborina scitula* n. sp. **5)** Lateral view. **6)** Dorsal view of gonarcus and coxopodites. **7)** Ventral view of ninth sternite.

broad, and angulate at midlength in lateral aspect; in dorsal aspect, basal half narrow, of uniform width, beyond midlength with a broad mesal flange and a smaller rounded margin laterally, apex with a pair of fingerlike processes (1 seemingly with a small apical seta); basal section with a large mesally directed seta arising from an enlarged base, mesal margin of flange with 2 small setae from enlarged bases and a few small setae, apex of coxopodite with 5-6 long, enlarged setae arising from conspicuous bases.

**Type material. Holotype**, male: CAMEROON: [Centre Prov.] Libamba, 10km E Makak [3°37'N, 11°2'E], 11 Feb 1974, J.A. Gruwell, at black light (NMNH).

**Etymology.** The species is dedicated to Dr. John A. Gruwell who collected this most unusual species and other interesting aquatic insects in Cameroon.

***Sisyra delicata* Smithers 1957: 225.**

*Sisyra pallida* Meinander 1978: 234. ***New Synonymy.***

**Comments**. I have compared the male type and topotypic paratypes of these two species, side-by-side, and can see no specific differences between them. The coxopodites of both share the apical, tooth-like seta; apicomesal, fimbriate lobe with another tooth-like seta at its mesal base; two enlarged setae dorsomesally and another enlarged setae apicolaterally, and, small basomesal lobe with a few apical setae. The type localities are both in south-central Africa: *S. delicata* from the environs of Salisbury [now Harare] in Zimbabwe and *S. pallida* from about 600 miles north at Mpulungu at the south end of Lake Tanganyika in Zambia.

***Sisyra nilotica* Tjeder 1957: 161.**

*Sisyra terminalis* Esben-Petersen, 1915: 83, fig.6 (*nec*. Curtis, 1854).
*Sisyra nilotica* Tjeder, 1957: 161 (*nom. nov*. for above).

**Comments**. Esben-Petersen (1915) described a species of *Sisyra* from various localities in Sudan that he believed to be the European *S. terminalis* Curtis. Much later Tjeder recognized these were not the true *S. terminalis*, and gave the name *S. nilotica* to the Sudanese material, and designated a male from Lake Ambadj (Bahr el Ghazal) as the type. He apparently did not have any examples in front of him as he gave no further description or figures, as almost certainly he would have had he actually seen any material.

The type material of *S. nilotica* was supposedly in the collection of the Museum Koenig, Bonn, Germany. In an attempt to obtain examples so that the species could be illustrated in more detail, I contacted authorities at this museum. Dr. Netta Dorchin, the curator in charge, was unable to locate any examples in their collection. She also wrote colleagues in Denmark and Sweden (where Esben-Petersen and Tjeder worked, respectively), with no positive results. I must assume, unfortunately, that the type series is lost, and the species will remain a *species inquirenda*, at least until new material is found from these regions in Sudan.

***Sisyra* spp.**

**Comments**. In addition to the species mentioned above there are a number of examples in the collection of the NMNH from various parts of Africa, but females only and thus not suitable for description. They are mentioned below to help fill in the overall distribution of the family in Africa.

Nigeria: Ibadan, IITA, Golf Course Lake, 6-10 Feb 1978, Don & Mignon Davis, 4F. Antenna with basal 22 segments (including scape and pedicel) dark brown, following 18 segments yellow, of which the final 6 are increasingly infuscate. Wings brown, cells, especially basally in the wing with a darkened central stripe; costal crossveins darkened. Legs yellow, hind tibia darkened at midlength.
In addition, Tjeder (1976) mentions that he had 1 specimen of a species of *Sisyra* from Nigeria sent by John T. Medler. No specific locality is mentioned.

Ethiopia: Bahar Dar, 4 Jul 1965, A.B. Gurney, 1F. Antenna, including scape and pedicel of about 38 segments, dark brown. Wings pale brown (faded?); all crossveins surrounded by a darker brown cloud in the membrane. Legs brown.

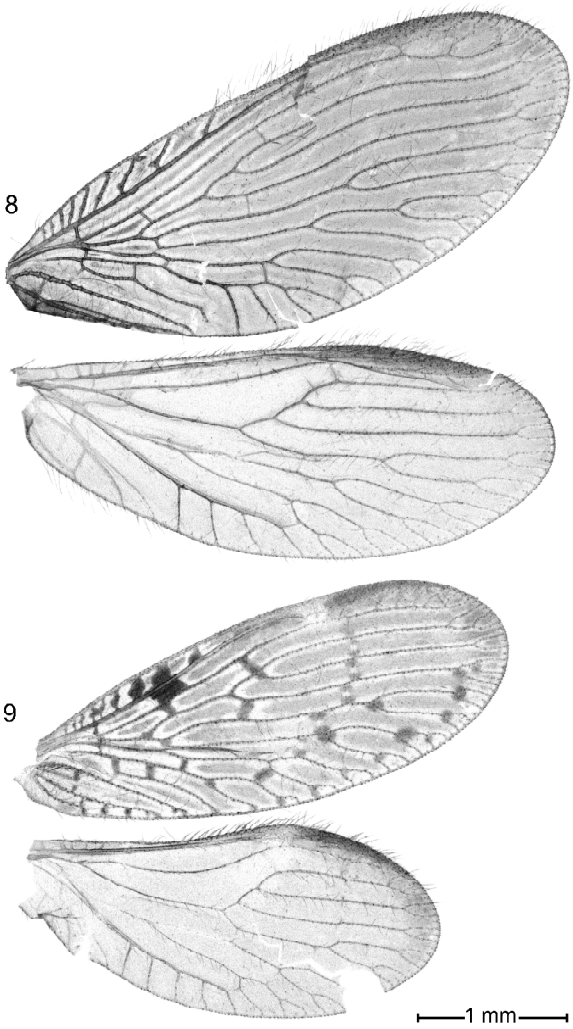
Uganda: Arua, 4-6 May 1996, Joseph J. Anderson, 1F. Antennae and most legs broken off and missing. Wings brown, with slightly darker central stripe in most cells

Tjeder also mentions (1976) that Dr. Marlier found 3 specimens of 3 species of African *Sisyra* in the collection of the Institut des Parcs Nationaux, Brussels. There was no indication of the countries of origin of these specimens.

***Sisyborina scitula* n.sp.**
(Figures 5-7, 9)

**Comments**. This species is very similar to *Sisyborina marlieri* (Tjeder). The new species differs in the male genitalia in the coxopodite being narrower and more curved in lateral aspect and in having a large spine basoventrally, and in the ninth sternite being broader apically and bearing 2 clusters of large, pale spines apicolaterally.

The male from Guinea differs somewhat from the male from Cameroon: the coxopodites in dorsal view are nearly parallel and their large spinous setae are more mesad, and the ninth sternite is evenly rounded apicad. However, the overall appearance is so similar in the two males that I am confident that they are the same species and the differences are due to mechanical displacement of the structures.




**Figures 8- 9.** Wings, forewing above, hindwing below. **8)** *Sisyra cameroonensis* n. sp. from female paratype. **9)** *Sisyborina scitula* n. sp. from female paratype.

**Description**. Male: Forewing length 3mm. Preserved in 80% ethyl alcohol, almost uniformly light brown. Antenna with 26-28 segments, 19 basal segments (including scape and pedicel) dark brown, next 7-9 segments pale, 1-3 terminal segments may be dark again. Head and body light brown; foreleg pale, midleg with femur darkened, hindleg with femur and tibia darkened, but pale on ends. Forewing (Fig. 9) light brown, with dark spots on all crossveins, and especially so on costal crossveins; a large dark spot between Sc and $R_1$ and $R_1$ and $R_s$; all cells with dark median bands. Forewing with 3 radial crossveins; Rs with only 2 forks; no crossvein between $R_3$ and $R_4$; with a series of 5 gradate crossveins, each with a central pale spot. Male genitalia (Fig. 5-7): Epiproct not clearly distinguished from membrane. Gonarcus a lightly sclerotized band connecting bases of coxopodites. Parameres roughly H-shaped, connected ventrad of middle. Coxopodite about 3 times as long as broad in lateral aspect; in dorsal aspect, widest basally, tapering to a rounded apex, widely divergent (but nearly parallel in Guinean example), with a row of 5-6 enlarged, pale setae on dorsomesal surface each arising from an enlarged base, with a number of smaller, pale setae around apex, apex of coxopodite with a small, pale mesal tooth. Ninth sternite very large, twice as long as broad in lateral aspect, in ventral aspect 2/3 as wide as long at widest, tapering slightly to a broad apex slightly indented mesally (rounded in Guinean specimen); apicolaterally with a cluster of 4-5, contiguous, pale, long, enlarged setae.

Female: Length of forewing, 3.5mm. Antenna of 29 segments, basal 22 segments dark, apical 7 pale. Coloration as in male. Genitalia appearing as figured for *S. marlieri*.

**Type material**. **Holotype**, male: CAMEROON: [Centre Prov.] Libamba, 10km E Makak [3°37'N, 11°2'E], 10-11 Jan 1974, J.A. Gruwell. (NMNH). **Paratypes**: Same data, 3F (NMNH). Guinée franc. [now REPUBLIC OF GUINEA], Kindia, 1-15 May 1955, F. Schmid, 1M (CNC). Rhodesia [now ZAMBIA], Victoria Falls, 3000', 5 Feb 1970, M.E. Irwin, E.S. Ross, 1M (CAS).

**Etymology.** From the Latin *scitulus* meaning beautiful, pretty, and neat, in reference to the appearance of the species.

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