



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2017; 5(4): 312-319

© 2017 JEZS

Received: 17-05-2017

Accepted: 18-06-2017

**Prudenciène A Agboho**

Department of Zoology,  
Laboratory Evolution,  
Biodiversity of the Arthropods  
and Drainage work; FAST; BP  
823 Cotonou; Benin UAC

**Ghélus L Gbedjissi**

Department of Zoology,  
Laboratory Evolution,  
Biodiversity of the Arthropods  
and Drainage work; FAST; BP  
823 Cotonou; Benin UAC

**Elisabeth T Zannou**

Department of vegetable  
production, Agricultural  
laboratory of Entomology; FSA-  
UAC; 01 BP 526 Benin Cotonou

**Rodrigue Anagonou**

Department of Zoology,  
Laboratory Evolution,  
Biodiversity of the Arthropods  
and Drainage work; FAST; BP  
823 Cotonou; Benin UAC

**Martin C Akogbeto**

Department of Zoology,  
Laboratory Evolution,  
Biodiversity of the Arthropods  
and Drainage work; FAST; BP  
823 Cotonou; Benin UAC

**Correspondence****Prudenciène A Agboho**

Department of Zoology,  
Laboratory Evolution,  
Biodiversity of the Arthropods  
and Drainage work; FAST; BP  
823 Cotonou; Benin UAC

## Faunistic data on Sciomyzidae (Diptera) in Benin, West Africa

**Prudenciène A AGBOHO, Ghélus L GBEDJISSI, Elisabeth T ZANNOU, Rodrigue ANAGONOU and Martin C AKOGBETO**

**Abstract**

The present study was aimed to know the Sciomyzidae species in Benin. The entomological analysis carried out in the south and the center of Benin in bilharzia homes allowed to inventory during the surveys between August 2014 and July 2015. Eight species were identified out of a total of 3656 specimens distributed in 3 genera (*Sepedon*, *Sepedoninus* and *Sepedonella*) and three subgenera (*Parasepedon*, *Mesosepedon* and *Sepedomyia*). Including the present contribution, there were 11 species of Sciomyzidae reported from Benin with three new species for Benin: *Sepedon (Parasepedon) straeleni* Verbeke, 1950; *Sepedon (Sepedomyia) nasuta* Verbeke, 1950; and *Sepedoninus curvisetis* Verbeke, 1950. These species have wide distribution throughout the country.

**Keywords:** Benin, Fauna, distribution, Diptera, Sciomyzidae, Schistosomiasis

**1. Introduction**

Comparatively to the European, Asian or American countries, the Sciomyzidae of the Afrotropical area and particularly in Benin are little known. The available bibliographical references are mainly the multiple publications of Verbeke <sup>[1, 2]</sup> which describes four genera, three subgenera and 42 species. Miller <sup>[3]</sup> publishes a key of the 12 known genera in geographical zone which includes two of the Palearctic fauna. Knutson <sup>[4]</sup> established a key and distribution of Ethiopian region. After Knutson's <sup>[5]</sup> list, Vala *et al.* <sup>[6]</sup> updated the data for the 64 Afrotropical species including their distribution, deposited institutes of the types, details about the life-cycles and DNA results. Previously, Vala *et al.* <sup>[7]</sup>, Gbedjissi <sup>[8]</sup>, Gbedjissi & Vala <sup>[9]</sup> identified 8 species distributed in two genera in Benin.

Following the feeding malacophagous behaviour of the Sciomyzidae larvae, Berg <sup>[10]</sup> suggested to use them against the molluscs intermediate hosts of certain parasitosis, particularly Schistosomiasis and fascioliasis which are endemic parasitic diseases of the tropical areas Ibikounlé <sup>[11]</sup>, except for three species that predate *Oligochaeta* (Murphy *et al.* <sup>[12]</sup>). Recently, Knutson & Vala <sup>[13]</sup> remembered the history of the successive studies and rare biological attempts conducted until today. That is one of our main interests beginning by the present inventory of sciomyzids at Benin. Subsequently, in the laboratory we will check off the potential species to be used as biological agent control against the molluscs involved in the listed parasitizes above. Therefore, this present study was aimed to contribute to the knowledge on the Sciomyzidae providing taxonomy in Afrotropical region.

**2. Material and Methods****2.1 Studied Area**

The present study is in the continuity of those already achieved on the Sciomyzidae in Benin located between latitude 6° 15' and 12° 25' north and between longitude 0° 45' and 4° 00' east by Gbedjissi <sup>[8]</sup> and Vala *et al.* <sup>[7]</sup> from oceanic coast to the north. Climate is considered much variable and characterized by two dry seasons and two wet seasons with the long dry season running from December to March, the long wet season from April to July, the short dry season from August to September and the short wet season from October to November. In the present study, prospectations were conducted in various locations in the centre and southern Benin from August 2014 to July 2015 (Fig. 1). They were: (1) permanent water biotopes in Akron (6°27' latitude north and 2°42' longitude east), Pahou (6°37' latitude north and 2°12' longitude east), Djidja (7°21' latitude north; 1°55' longitude east), Da-Daho (7°45' latitude north and 2°17'

longitude east). (2) in temporary water biotopes in Djéffa (6°23' latitude north and 2°36' longitude east), Cocotomey (6°21' latitude north and 2°26' longitude east), Za-zounmè (7°13' latitude north and 2°13' longitude east) and Wélé-Wélé (7°46' latitude north and 2°19' longitude east). These ecosystems were characterized by a vegetation that was dominated by the common marsh plants, *Paspalum vaginatum*; *Leersia hexandra* (Poaceae), *Cyperus articulatus*

(Cyperaceae). *Cyperus articulatus* (Cyperaceae), *Pentodon pentandrus* (Rubiaceae), *Diplazium sammatii* (Athyriaceae), *Thalia welwitschii* (Araceae) *Ipomea aquatica* (convolvulaceae), *Ludwigia abyssinica* (Onagraceae). All of those stations were selected due to the natural permanent presence of water including sufficient quantity of snails through the seasons, sociological surveys in the population and in hospitals.

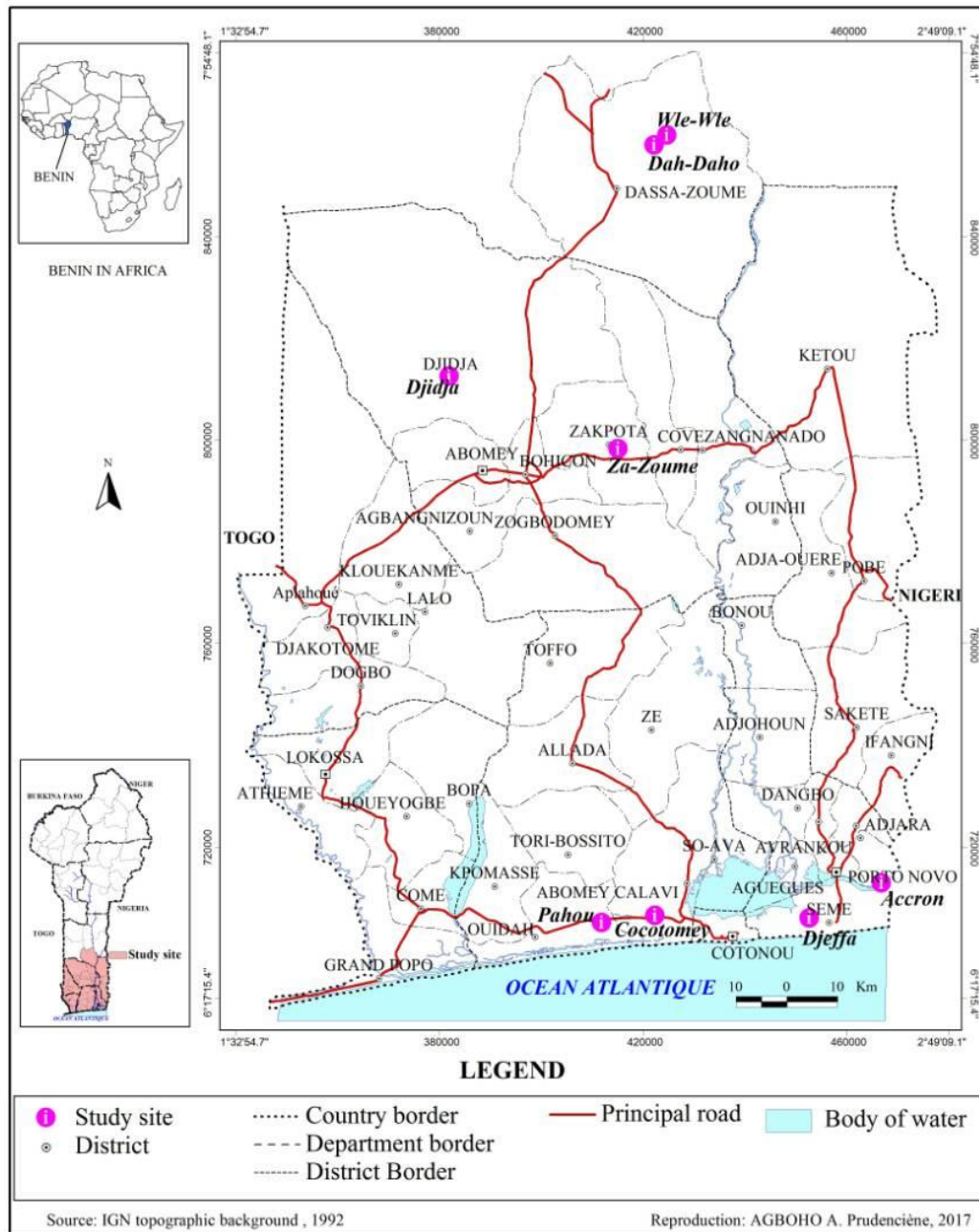


Fig 1: Locations of the studied stations

**2.2 Sampling**

The adults were captured three times (7 am, 01 pm, 06 pm) during thirty minutes every fifteen days using a traditional sweeping net. Then, the flies were transferred in a vacuum cleaner through a traditional mouth aspirator. After identification and counting, only a few couples, and rare or unidentified individuals, were well-kept-up for breeding at the laboratory. We used identification keys of Verbeke [1, 2, 14] and Vala et al. [7].

Species samples were preserved in 95% Ethanol. The relative abundance of each species was calculated using the formula:  $A = q_i / Q$  with  $q_i$  and  $Q$  representing the number of

individuals of each species and the total number of individuals captured species, respectively.

**3. Results**

**3.1 Sciomyzidae collected.**

A total of 3656 Sciomyzidae specimens were collected in all of the prospected stations. They belong to the genus *Sepedon* with 6 species distributed in three subgenera: *Sepedon* (*Parasepedon*) *ruficeps*, *S.* (*Parasepedon*) *trichroscelis*, *S.* (*Parasepedon*) *umbrosa* *S.* (*Parasepedon*) *straeleni*, *S.* (*Mesosepedon*) *knutsoni*, *S.* (*Sepedomyia*) *nasuta*, *Sepedonella*, (one species); *Sepedonella nana*; *Sepedoninus*,

(one species), and *Sepedoninus curvisetis*. This community of Sciomyzid was composed of 88.02%, 7.55% and 4.43% of the

genus *Sepedon*, *Sepedonella* and *Sepedoninus*, respectively (Table 1).

**Table1:** Total of Sciomyzidae species captured in the prospected stations.

Species	Number	Relative abundance %
<i>Sepedon (Mesosepedon) knutsoni</i>	65	1.78
<i>Sepedon (Parasepedon) ruficeps</i>	1634	44.69
<i>Sepedon (Parasepedon) trichrooscelis</i>	1224	33.48
<i>Sepedon (Parasepedon) umbrosa</i>	168	4.60
<i>Sepedon (Parasepedon) straeleni</i>	6	0.16
<i>Sepedon (Sepedomyia) nasuta</i>	121	3.31
<i>Sepedonella nana</i>	276	7.55
<i>Sepedoninus curvisetis</i>	162	4.43
Total	3656	100

### 3.2 New species for the Benin fauna

#### 3.2.1 *Sepedon (Parasepedon) straeleni* Verbeke, 1963

*Sepedon (Parasepedon) testacea* Loew is recognized as *Sepedon (Parasepedon) straeleni* (Fig. 2.1) by Verbeke [14]. Those species of yellow color. Frons and face black. Yellow lunular with reddish. Yellow ocellar triangle more or less darkened. Large frontal tasks black, rounds concerning the edge of the eye with below a small spot also silver plated against the edge of the eye. Antennae, scape elongate and yellowish, obscur yellow pedicel, brownish post-pedicel. Thorax, red; sometimes distinct pre-scutellar setae. Wings, slightly browned membrane, edge costal more clearly except the very smoked out apex. Legs, yellow with reddish; femur III, half apical slightly tinged with red; tibiae and tarsi with

variable coloring, brownish yellow with blackish; tarsi with article 4 and 5. Abdomen, reddish to blackish. Genital segments usually reddish. Body length: 7.5-8.5mm.

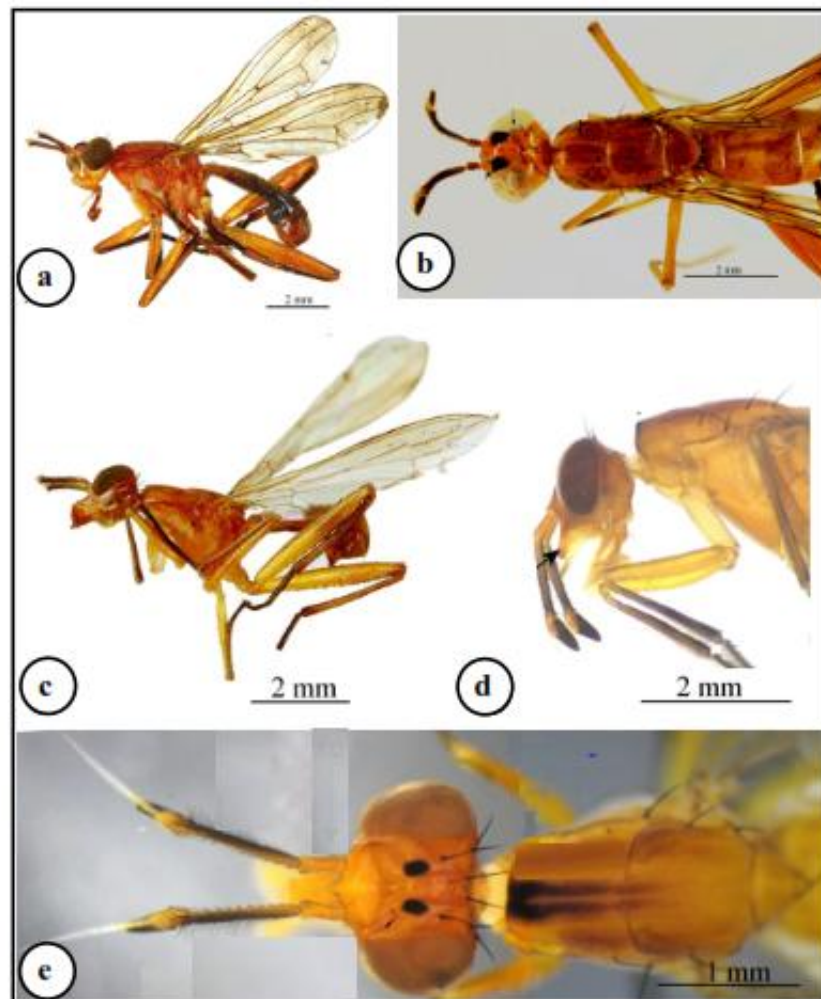
#### Habitat and Biology

Adults were collected in temporary water environments. The description of larval stages, puparium, hosts and biology were unknown.

#### Distribution

This species was described from RDC (current Democratic Republic of Congo) and in Benin presently.

*Collected material:* Za-Zoumè 26.VIII.14 (1M, 3F); 30.IX.14 (1F); 24.XI.14 (1F).



**Fig 2:** Plate showing the new collected sciomyzids species. *Sepedon (Parasepedon) straeleni* (2.a), *Sepedoninus curvisetis* (2.b), *Sepedon (Sepedomyia) nasuta* (2.c, 2.d and 2.e).

**3.3.2 *Sepedoninus curvisetis* Verbeke, 1950**

*Sepedoninus curvisetis* (2.b) were species of large sized, 5 to 9 mm, reddish yellow. Two pairs of long fronto-orbital setae, anterior proclinate, posterior reclinate. A pair of large frontal stain. Triangle ocellar yellow to brownish yellow. Antennae, upper setae of second article curved elongated and thinned. Thorax, mesonotum dorsocentral with a series of setae, long, thin, more or less lying and curved towards the apex. Suture complete mesonotal (thoracic). Wings, gray, apical shadow extended slightly towards the base of the third longitudinal vein. Legs, tibiae and tarsi a little more obscure. Abdomen yellowish posterior edge of tergita sometimes clearer, first genital segment well developed in males. Rounded genital segment in females.

**Habitat and biology**

*Sepedoninus curvisetis* occupies the aquatic biotopes. We meet it on the emerged grasses in little deep ponds shaded. The development cycle that we managed to control resulted in the egg and the three larval stages (L1-L3). No mature larva has moved at the pupa stage.

**Distribution**

This specie was described from RDC and Benin

**Collected material**

**Za-Zoumè:** 10.VIII.14 (8M, 15F); 12.IX.14 (8M, 5F); 10.X.14 (12M, 7F); 15.XI.14 (1M, 9F); 5.XII.14 (4M, 5F); 15.I.15 (1M, 2F); 13.VII.15 (3M, 5F); Djidja: 25.VIII.14 (6M, 7F); 30.IX.14 (2M, 8F); 22.X.14 (18M, 4F); 23.XI.14 (4M, 8F), 20.XII.14 (4M, 5F); 29.I.15 (1F); 29.VII.15 (1M, 9F).

**3.3.3 *Sepedon (Sepedomyia) nasuta* Verbeke, 1950**

**Synonymous.** *Sepedon (Sepedomyia) filiformis* (Verbeke, 1950 : 35), *nec* Verbeke, 1961: 7 Specimens of *Sepedon (Sepedomyia) nasuta* (2.c, 2.d and 2.e) were generally yellowish. Lengthened and very narrow body. Frons and face perpendicular or strongly oblique. Reddish frons, orbital setae placed in the quarter of make, very small ocellar setae. Two black frontal tasks located close to the median band. Antennae, basal part slightly bulging, half apical thinned. Thorax, reddish yellow, slightly shiny, small expansion med dorsal on the anterior margin of the presutural scutum; notum, two black longitudinal median striations disappearing beyond the transverse suture. Wings, narrow and long, yellowish veins. Legs, hip and uniform yellow femur; tarsus I, articles 1 and 2, hairy dorsal, widened article 5, whitish. Abdomen, shaped cape. Body Length: 5 to 7 mm.

**Habitat and Biology**

This species has been captured in a rice plantation, temporary water environment.

The present study established the development cycle of this species for the first time. Its larvae were malacophagous where their description and their ethology food were reported.

**Distribution**

This species was described from RDC, Angola, Botswana, Côte d'Ivoire, Malawi, Nigeria, Rhodesia, South Africa, Tanzania, Uganda, and Benin.

**Collected material:**

**Dah-Daho (Dassa):** 5 and 23.VIII.14 (17M, 3F); 10 and 28.IX.14 (16M, 9F); 8 and 20.X.14 (12M, 15F); 13 and 21.XI.14 (11M, 17F); 3 and 19.XII.14 (15M, 6F).

**3.4 Other captured species****3.4.1 *Sepedonella nana* Verbeke, 1950**

Small species, from 3.5 to 4.25. A pair of fronto-orbital setae, postocellar setae absent. Different from other species of the same genus in the 3rd and 4th longitudinal veins parallel to the apex of the wing, presence of a reddish ring in the apical half yellow of femur III. Wings, apical part well smoked to 1/3. Genital filament absent in the male.

**Habitat and biology**

Strictly aquatic species. Adults were caught more the permanent water environments. According to (Vala & Gbédjissi <sup>[15]</sup>; Murphy *et al.* <sup>[12]</sup>, the feed annelids (Oligochaeta: Naididae). Larval stages, pupa, habitat, hosts, biology and distribution are given in (Vala & Gbédjissi <sup>[15]</sup>).

**Distribution**

This specie was described from Zaire, Lesotho, Nigeria, Togo, and Benin.

**Collected material:**

**Cocotomey:** 6 and 15.VIII.14 (13M, 18F); 7 and 22. VIV.14 (12M, 1F); 8 and 23.X.14 (9M, 15F); 3 and 18.XI.14 (13M, 14F); 2 and 17.XII.14 (8M, 5F); 5 and 20.I.15 (10M, 4F); 1 and 16.II.15 (2F); 3 and 18.VII.15 (3M, 11F); Za –zounmè: 13 and 29.VIII.14 (4M, 9F); 14 and 30.VIV.14 (2M, 7F); 15 and 30.X.14 (10M, 20F); 10 and 26.XI.14 (14M, 6F) 9 and 29.XII.14 (3M, 7F); 12 and 28.I.15 (2F); 8 and 24.II.15 (3M); Djidja: 14 and 30.VIV.14 (1M, 10F); 15 and 30.X.14 (2M, 1F); 10 and 26.XI.14 (4M, 4F); 10 and 28.VII.14 (13M, 7F).

**3.4.2 *Sepedon (Mesosepedon) knutsoni* Vala, Gbédjissi and Dossou, 1994.**

Size between 5.5 and 7.0 mm. General color yellow ocher. Yellow concave frons with a median band. Ocellar triangle with a yellowish-white pruinosity. Strong posterior fronto-orbital setae, posterior vertical setae intern and external strong. Yellowish face, glaze with a whitish pruinosity. Antennae narrow and elongated. Thorax, yellowish, presence of light longitudinal brown nets on the mesonotum, strongly accentuated median suture, dorsocentral and apical prescutellar setae well developed. Wings, bottom fauna and slightly brownish. Legs, coxa and femur yellow femurs II and III with two ventral rows of very short strong setae on the femur 3. Abdomen: light yellow. Absence of genital capsule.

**Habitat and biology**

A little rare species alive in shaded aquatic biotopes. Larvae of this species feed, *Aulophorus furcatus*, (Oligochaeta Naididae), as *Sepedonella nana* according to Vala & Gbédjissi <sup>[15]</sup>.

**Distribution**

Described only in Benin.

**Collected material: Djidja:** 13 and 29 VIII.14 (1M, 8F); 14 and 30 VIV.14 (4M, 7F); 15 and 30 X.14 (3M, 5F); 10 and 26.XI.14 (6M, 3F); 9 and 29.XII.14 (3M, 1F); 10 and 28.VII.15 (3M, 7F).Za –zounmè: 10 and 28.VII.15 (9M, 5F).

**3.4.3 *Sepedon (Parasepedon) ruficeps* Becker, 1923**

Described from Sudan, with *adamsi* Steyskal in Steyskal and Verbeke (1956:3) from south Yemen and *spectabilis* Frey (1958:25) from Cap Vert Islands as junior synonyms.

Body Length between 6.1 and 8.0 mm. Head, yellow with

linear frontal patches with whitish pruinosity, the inner edge of which is often bordered with black in the male. Uniformly reddish frons, dark brown calus. Thorax, thoracic setae presutural weak or absent mesonotum blue with blackish blue. Wing, slightly tinged with brown. Legs: Yellowish femurs in their basal half, the rest reddish or sometimes weakly red-tinted in particular the femurs III. Abdomen: brown red.

#### Habitat and biology

*Sepedon (P) ruficeps* occupies a variety of water bodies (Permanent and temporary). It is a multivoltine species. Life-cycle, from egg to adult, and descriptions of all immature stages has been elucidated by Gbedjissi & Vala<sup>[9]</sup>. The larvae of *S. (P) ruficeps* are malacophagous and incidentally annelidophagous Vala & Gbedjissi<sup>[15]</sup>, Murphy *et al.*<sup>[12]</sup>.

#### Distribution

This species was widespread in the Afrotropical Region, where it attacks aquatic snails  
Yemen, Egypt, Afrotropical Africa.

#### Collected material

Cocotomey:6 and 15.VIII.14 (26M, 15F); 7 and 22.VIV.14 (12M, 22F); 8 and 23.X.14 (14M, 32F); 3 and 18.XI.14 (11M, 16F); 2 and 17.XII.14 (9M, 16F); 5 and 20.I.15 (3M, 4F); 1 and 16.II.15 (3M, 5F); 4 and 19.III.15 (8M, 6F); 9 and 24.IV.15 (2M, 3F); 5 and 20.V.15 (1F); 8 and 23.VI.15 (2M, 2F); 3 and 18.VII.15 (27M, 15F).Pahou: 6 and 15.VIII.14 (11M, 17F); 7 and 22.VIV.14 (10M, 9F); 8 and 23.X.14 (9M, 15F); 3 and 18.XI.14 (15M, 8F); 2 and 17.XII.14 (17M, 9F); 5 and 20.I.15 (8M, 2F); 1 and 16.II.15 (11M, 6F); 4 and 19.III.15 (2M, 4F); 9 and 24.IV.15 (4M, 4F); 5 and 20.V.15 (3M, 2F); 8 and 23.VI.15 (3F).Dah-Daho (Dassa): 10 and 22.VIII.14 (16M, 21F); 11 and 23.VIV.14 (14M, 19F); 12 and 24.X.14 (8M, 18F); 7 and 23.XI.14 (9M, 3F); 6 and 22.XII.14 (2M, 7F); 9 and 25.I.15 (3M, 5F); 5 and 21.II.15 (1M, 5F); 8 and 20.III.15 (4M, 1F); 9 and 21.V.15 (1F); 12 and 24.VI.15 (2F); 7 and 21.VII.15 (2M, 4F). Wlé-Wlé (Dassa); 10 and 22.VIII.14 (12M, 19F); 11 and 23.VIV.14 (9M, 9F); 12 and 24.X.14 (3M, 12F); 7 and 23.XI.14 (1M, 6F); 6 and 22.XII.14 (1M, 4F); 9 and 25.I.15 (3M, 2F); 5 and 21.II.15 (1M, 2F); 8 and 20.III.15 (1F); 13 and 25.IV.15 (3F) 9 and 21.V.15 (1F); 12 and 24.VI.15 (2M, 4F); 7 and 21.VII.15 (10M, 11F). Akron: 7 and 26.VIII.14 (24M, 55F); 8 and 27.VIV.14 (18M, 19F); 9 and 28.X.14 (13M, 46F); 4 and 19.XI.14 (15M, 26F); 3 and 18.XII.15 (3M, 9F); 6 and 21.I.15 (8M, 10F); 2 and 17.II.15 (4M, 6F); 5 and 24.III.15 (4M, 3F); 10 and 29.IV.15 (4M, 5F); 6 and 25.V.15 (5M, 2F); 9 and 28.VI.15 (3M, 7F); 4 and 23.VII.15 (23M, 18F). Djeffa: 7 and 26.VIII.14 (23M, 15F); 8 and 27.VIV.14 (8M, 10F); 9 and 28.X.14 (10M, 19F); 4 and 19.XI.14 (11M, 10F); 3 and 18.XII.15 (9M, 6F); 6 and 21.I.15 (5M, 6F); 2 and 17.II.15 (6M, 4F); 5 and 24.III.15 (1M, 2F); 10 and 29.IV.15 (1M, 2F); 6 and 25.V.15 (3F); 9 and 28.VI.15 (3M, 6F); 4 and 23.VII.15 (18M, 8F). Za - zounmè: 13 and 29.VIII.14 (6M, 25F); 14 and 30.VIV.14 (7M, 17F); 15 and 30.X.14 (22M, 19F); 10 and 26.XI.14 (12M, 15F); 9 and 29.XII.14 (8M, 9F); 12 and 28.I.15 (2M, 8F) 8 and 24.II.15 (4M, 2F); 11 and 27.III.15 (2M, 4F); 16 and 30.IV.15 (2M, 3F); 12 and 28.V.15 (1M, 1F); 15 and 20.VI.15 (5M, 4F); 10 and 28.VII.15 (12M, 15F). Djidja:13 and 29.VIII.14 (15M, 16F); 14 and 30.VIV.14 (18M, 25F); 15 and 30.X.14 (20M, 11F); 10 and 26.XI.14 (17M, 12F); 9 and 29.XII.14 (10M, 8F); 12 and 28.I.15 (9M, 5F) 8 and 24.II.15 (5M, 3F); 11 and 27.III.15 (3M, 8F); 16 and 30.IV.15 (2M, 6F); 12 and 28.V.15 (1F); 15 and 20.VI.15 (4M, 7F); 10 and

28.VII.15 (19M, 5F).

**3.4.4 *Sepedon (Parasepedon) trichrooscelis* Verbeke, 1950**  
*Sepedon senegalensis* var. *unicolor* Brunetti, 1929: 34. Sierra Leone.

Species of black color. Average size (6 mm). Black's frons and face. Reduced presutural seta. One notopleurale seta (posterior). Wings: Largely smoky apex. Legs: Femur III half apical of a very bright red.

#### Habitat and biology

The adults were found in different types of habitats ranging from wetlands to dry areas. According to Vala *et al.*<sup>[16]</sup>, the duration of the various stages and the cycle, show that *S. trichrooscelis* was a semiaquatic and multivoltine species. The larvae were parasitoids or parasitoids/predators of Succineidae mollusc.

#### Distribution

Described from Zaire, Nigeria, South Africa, Botswana, Cameroon, Ethiopia, Sierra Leone, Ghana, Côte d'Ivoire, Liberia, Mozambique, Rhodesia, Tanzania and Benin.

#### Collected material.

Cocotomey:6 and 15.VIII.14 (12M, 17F); 7 and 22.VIV.14 (11M, 9F); 8 and 23.X.14 (7M, 8F); 3 and 18.XI.14 (10M, 10F); 2 and 17.XII.14 (14M, 13F); 5 and 20.I.15 (6M, 4F); 1 and 16.II.15 (4M, 5F); 4 and 19.III.15 (3M, 5F); 9 and 24.IV.15 (1F); 8 and 23.VI.15 (1M); 3 and 18.VII.15 (15M, 8F).Pahou:6 and 15.VIII.14 (8M, 11F); 7 and 22.VIV.14 (3M, 13F); 8 and 23.X.14 (9M, 5F); 3 and 18.XI.14 (9M, 13F); 2 and 17.XII.14 (19M); 5 and 20.I.15 (2M, 3F); 1 and 16.II.15 (2M, 7F); 4 and 19.III.15 (1M); 9 and 24.IV.15 (3M, 1F); 5 and 20.V.15 (1M); 8 and 23.VI.15 (1M, 1F); 3 and 18.VII.15 (8M, 15F). Dah-Daho (Dassa):10 and 22.VIII.14 (23M, 7F); 11 and 23.VIV.14 (15M, 13F); 12 and 24.X.14 (21M, 4F); 7 and 23.XI.14 (4M, 10F); 6 and 22.XII.14 (8M, 3F); 9 and 25.I.15 (7M, 2F); 5 and 21.II.15 (6M, 4F); 8 and 20.III.15 (2M, 1F); 9 and 21.V.15 (2M, 2F); 12 and 24.VI.15 (1M); 7 and 21.VII.15 (3M, 2F). Wlé-Wlé (Dassa):10 and 22.VIII.14 (14M, 26F); 11 and 23.VIV.14 (17M, 18F); 12 and 24.X.14 (9M, 15F); 7 and 23.XI.14 (18M, 14F);6 and 22.XII.14 (4M, 7F); 9 and 25.I.15 (1M, 5F); 5 and 21.II.15 (8M, 5F); 8 and 20.III.15 (1M, 2F); 12 and 24.VI.15 (1M, 4F); 7 and 21.VII.15 (7M, 11F). Akron:7 and 26.VIII.14 (17M, 22F); 8 and 27.VIV.14 (4M, 18F); 9 and 28.X.14 (18M, 42F); 4 and 19.XI.14 (6M, 18F); 3 and 18.XII.15 (4M, 5F); 6 and 21.I.15 (4M, 6F); 2 and 17.II.15 (7M, 2F); 5 and 24.III.15 (1M, 4F); 10 and 29.IV.15 (1M); 6 and 25.V.15 (1M); 9 and 28.VI.15 (1M, 2F)4 and 23.VII.15 (14M, 12F).Djefja: 7 and 26.VIII.14 (17M, 12F); 8 and 27.VIV.14 (10M, 6F); 9 and 28.X.14 (18M, 4F); 4 and 19.XI.14 (5M, 3F); 3 and 18.XII.15 (7M, 5F); 6 and 21.I.15 (4M, 3F); 2 and 17.II.15 (5M, 4F); 5 and 24.III.15 (2M, 1F); 10 and 29.IV.15 (1F); 6 and 25.V.15 (1F); 9 and 28.VI.15 (2M, 2F); 4 and 23.VII.15 (12M, 9F). Za - zounmè:13 and 29.VIII.14 (20M, 8F); 14 and 30.VIV.14 (11M, 9F); 15 and 30.X.14 (11M, 6F); 10 and 26.XI.14 (15M, 2F); 9 and 29.XII.14 (10M, 7F); 12 and 28.I.15 (7M, 6F) 8 and 24.II.15 (1M, 2F); 11 and 27.III.15 (1M, 1F); 16 and 30.IV.15 (1M, 2F); 12 and 28.V.15 (1F); 15 and 20.VI.15 (1M, 1F); 10 and 28.VII.15 (8M, 4F). Djidja:13 and 29.VIII.14 (10M, 9F); 14 and 30.VIV.14 (11M, 8F); 15 and 30.X.14 (17M, 15F); 10 and 26.XI.14 (9M, 13F); 9 and 29.XII.14 (8M, 4F); 12 and 28.I.15 (5M, 4F) 8 and 24.II.15 (3M, 1F); 11 and 27.III.15 (2M, 6F); 16 and 30.IV.15 (1M,

1F); 12 and 28.V.15 (1F); 15 and 20.VI.15 (1M, 2F); 10 and 28.VII.15 (5M, 8F).

**3.4.5 *Sepedon (Parasepedon) umbrosa* Verbeke, 1950**

Coloring gray blackish or brown blackish. Concave face completely black. Antennae: article 1 gray, articles 2-3 blacks; whitish arista in its half apical and grayish in its basal half. Ocellar setae absent. Fronto-orbital setae present. A pair of black orbital tasks separated from the base of antennae. Thorax: gray notum sinks shining; yellowish cry with dark gray with white pruinosity. Wings: yellowish gray with smoky apex. Legs: Femur I robust gray short with black. Femur II with ochre base on approximately the third of its overall length follow-up of a black band dorsolateral leading to the apex. Femur III grayish on the basal third followed by a dark band black. Shiny black abdomen.

**Habitat and biology**

Species moving in the wetlands. We can meet it as well in dry season as in rainy season. The complete cycle has been carried out by Gbedjissi [8]. The larvae are perfect example of land or semi aquatic land.

**Distribution**

This specie was described from Zaire, Nigeria, Côte d'Ivoire, and Benin

**Collected material: Pahou:** 6 and 15.VIII.14 (6M, 21F); 7 and 22.VIV.14 (8M, 11F); 8 and 23.X.14 (13M, 17F); 3 and 18.XI.14 (17M, 6F); 2 and 17.XII.14 (11M, 14F); 5 and 20.I.15 (1M, 7F); 1 and 16.II.15 (4M, 7F); 9 and 24.IV.15 (1M); 3 and 18.VII.15 (11M, 13F).

**3.5 Distribution of Sciomyzidae**

The results obtained in the various localities, lead us to supplement the first geographical distribution of Sciomyzides of Benin established by Gbedjissi [8]. The distribution of the captured species confirmed that *Sepedon (P) ruficeps*, *Sepedon (P) trichrooscelis* and *Sepedonella nana* were widespread and were found in the same circles of capture (Fig. 2).

Another species like *Sepedon (P) umbrosa*, *Sepedon (M) knutsoni*, *Sepedon (P) straeleni*, *Sepedon (S) nasuta*, *Sepedoninus curvisetis* had a focalizing distribution.

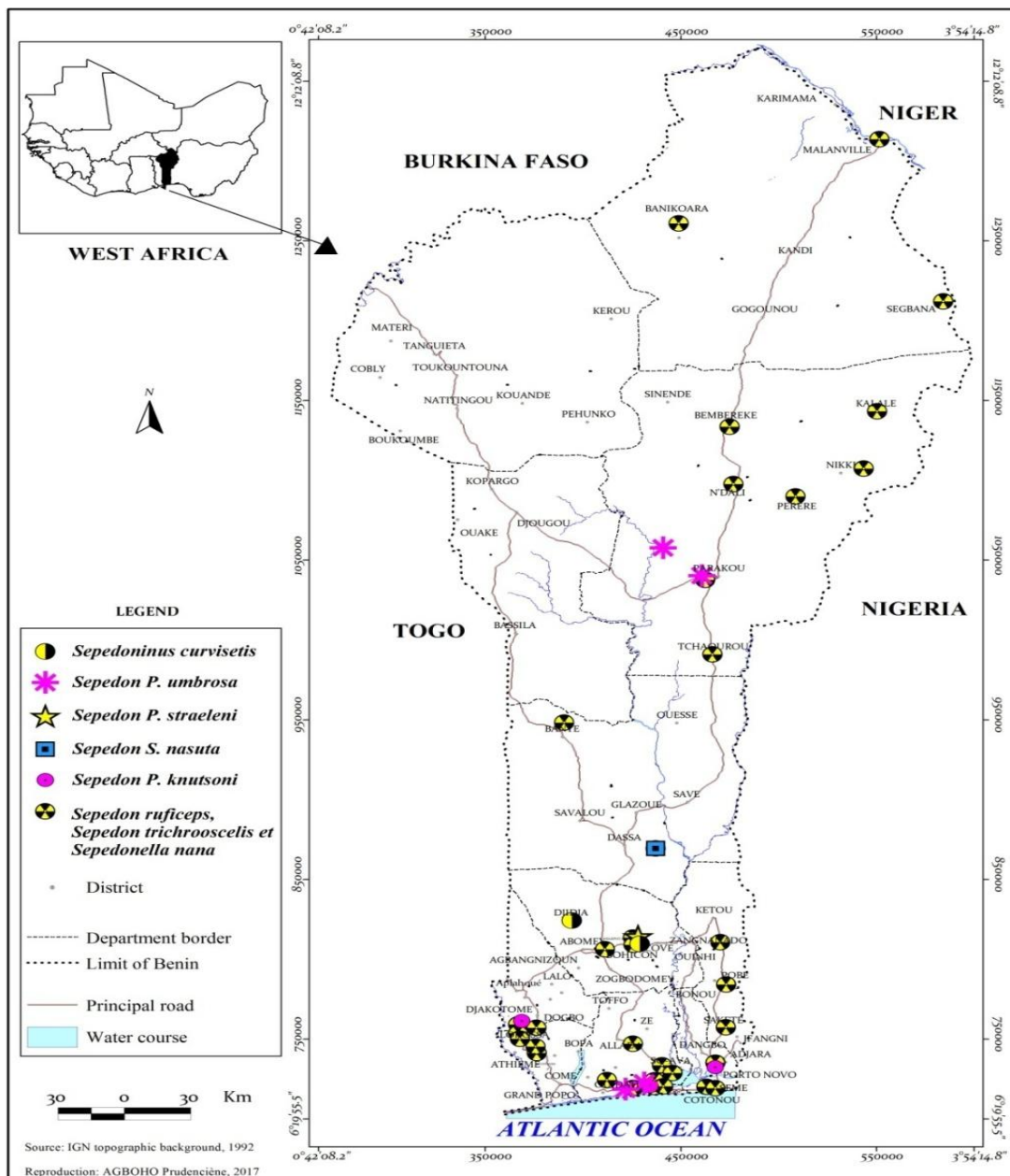


Fig 2: Geographical distribution of the species caught.

### 3.6 Collected molluscs sympatric

The aquatic mollusc species collected in the various biotopes have been determined by determination key of Brown & Kristensen [17].

Akron: *Bulinus globosus* (Morelet, 1866), *Indoplanorbis exustus* (Deshayes, 1834), *Physa acuta* (Draparnaud, 1805), *Subulina octona* (Bruguère, 1789), *Lymnaea natalensis* (Krauss, 1948), *Melanoides tuberculata* (Muller, 1774). Djeffa: *Indoplanorbis exustus*, *Physa acuta*. Cocotomey: *Bulinus forskali* (Ehrenberg, 1831), *Lanistes varicus* (Müller, 1774), *Physa acuta*. Pahou: Unspecified *Planorbidae*, *Bulinus forskali*. Djidja: *Bulinus globosus*, *Melanoides tuberculata*, *Bulinus forskali*, *Physa acuta*.

### 4. Discussion

The present investigation, identified eight (8) species of Sciomyzidae fit into the subfamily Tetanocerinae, Tribe Tetanocerini, dispersed in the three genera *Sepedoninus*, *Sepedon* and *Sepedonella* in Benin. Also, the present study added three new species among the fauna of Bénin, *Sepedoninus curvisetis*, *Sepedon* (*Parasepedon.*) *straeleni* and *Sepedon* (*Sepedomyia*) *nasuta*.

This result confirms that of Gbedjissi [8] according to which many other localities shelter several genera and/or species of Sciomyzids. The existence of *Sepedon* and *Sepedonella* genes with *Sepedon* (*P.*) *ruficeps*, *Sepedon* (*M.*) *knutsoni*, *Sepedon* (*P.*) *trichrooscelis*, *Sepedon* (*P.*) *umbrosa* and *Sepedonella nana* confirms the results of Vala *et al.* [7] and Gbedjissi [8]. Two species, *Sepedon* (*P.*) *ruficeps* and *Sepedon* (*P.*) *trichrooscelis*, account for more than two thirds of the catches. In contrast, the species *Sepedon* (*P.*) *straeleni* has been captured in less than 20 specimens. Among the eight collected species, three have a wide distribution. This is of *Sepedon* (*P.*) *ruficeps*, with 44.69% of catches, *Sepedon* (*P.*) *trichrooscelis* (33.48%) and *Sepedonella nana* 7.55%. Gbedjissi, [8] and Assogba *et al.* [18] confirm their wide distribution in Benin. The presence of molluscs in the same environment as Sciomyzidae confirms the malacophagy of the larvae and the existence of Schistosomiasis and fascioliasis. This feeding behavior has been reported by several authors Berg [19], Neff & Berg [20], Manguin *et al.* [21], Vala *et al.* [22], Gbedjissi [8], Barker *et al.* [23], Knutson & Vala [13], and Murphy *et al.* [12]. But some species are exceptions of the rule and are annelidophagous such is the case of *Sepedon knutsoni* and *Sepedonella nana*, whose larvae feed on *Aulophorus furcatus*, Vala & Gbedjissi, [15]. In the prospected biotopes, the fluctuations of the populations vary slightly or very remarkably way. They depend on environmental and biotic factors such as rainfall, temperature, available prey and the impact of human presence. According to Vala *et al.* [6], 62 species of Afrotropical Sciomyzids are described. This study will enable us to evaluate the impact of these diptera on mollusc-preys populations and to follow their spatio-temporal dynamics.

### 5. Conclusion

Various prospections in the permanent and temporary biotopes of the Centre and Southern Benin have permitted to capture three new species among the 8 collected species. It also revealed that total number of the captured Sciomyzids depends on the stations which previously are abounding in molluscs implying Schistosomiasis' occurrence. Then, increasing favorable factors like duration of the catches, number of sampling and sampling areas of sampling could allow identifying another species in Benin. However, before

integrating the use of Sciomyzids in a control program, it is essential to perform deeply studies. Our next investigation will focus on their bioclimatic requirements, the spatio-temporal dynamics of their population and the biology of the new species.

### 6. Acknowledgments

Authors would like to thank the Ministry of Higher Education and the Scientific Research of Benin Republic which has granted a doctoral research grant to Prudenciène Ablawa AGBOHO. We thank ASSOGBA Gildas, AHODI Chantal, GNIYETON Bienvenu, HOUNSOU Saturnin and DENAKPO Christel whose assistance was much appreciable during the sampling.

### 7. References

1. Verbeke J. Sciomyzidae (Diptera Cyclorrhapha). In: Exploration du Parc National Albert. Mission G.F. de Witte (1933-1935). Fascicule 66. Institut des Parcs Nationaux du Congo Belge. 1950; 66:97.
2. Verbeke J. Contribution à l'étude des diptères malacophages. I. Sciomyzidae nouveaux ou peu connus d'Afrique du Sud et de Madagascar. Bulletin de l'Institut royal des Sciences naturelles de Belgique. 1962a; 38:1-16.
3. Miller RM. Key to genera of Afrotropical Sciomyzidae (Diptera: Acalyptatae) with new records, synonymies and biological notes. Annals of the Natal Museum. 1995; 36:189-201.
4. Knutson LV. A new genus and species of Sciomyzidae from Tanzania with a key to the genera of the Ethiopian region and distributional notes (Diptera: Acalyptatae). *Journal of Entomology*. Society of South Africa. 1968; 31(1):175-180.
5. Knutson, LV. Family Sciomyzidae. In: R. W. Crosskey (Ed.). Catalogue of the Diptera of the Afrotropical Region. British Museum (Nat. Hist.), London. 1980; 1437, 597-600.
6. Vala JC Murphy, WL, Knutson L, Rozkošný R. A cornucopia for Sciomyzidae (Diptera). – *Studia dipterologica*. 2013; 19(1-2), 2012, 67-137.
7. Vala JC, Gbedjissi LG, Dossou C. Les Sciomyzidae du Bénin, description de *Sepedon* (*Mesosepedon*) *knutsoni* n.sp. (Diptera, Sciomyzidae). Bulletin de la Société Entomologique de France. 1994; 99(5):497-504.
8. Gbedjissi LG. Relations mollusques-Diptères Sciomyzidae, implications dans la lutte contre les distomatoses au Bénin. Thèse de Doctorat. Université d'Avignon et des Pays de Vaucluse, 2003.
9. Gbedjissi LG, Vala JC. Life-cycle of the Afrotropical snail-killing fly *Sepedon* (*Parasepedon*) *ruficeps* Becker, 1923. *African Invertebrates*. 2014; 55(1):1-17.
10. Berg CO. Sciomyzid larvae that feed in snails. *Journal of Parasitology*. 1953; 39:630-636.
11. Ibikounle M, Mone H, Sakiti NG, Massougbodji A, Mouahid G. Fresh water snail diversity in Bénin (West Africa) with a focus on human schistosomiasis. *Acta tropica*. 2009; 111:29-34.
12. Murphy WL, Knutson LV, Chapman EG, Mc Donnell RJ, Williams CD, Foote BA *et al.* Key aspects of the biology of snail-killing Sciomyzidae flies. *Annual Review Entomology*. 2012; 57:425-447.
13. Knutson LV, Vala JC. Biology of snail-Killing Sciomyzidae flies. Cambridge, University Press, Cambridge, 2011.

14. Verbeke J. Sciomyzidae Sepedoninae (Diptera: Brachycera). Exploration du Parc national de Garamba Mission H. de Saeger. 1963; 39:51-86.
15. Vala JC, Gbedjissi LG. Biology of the Afrotropical *Sepedonella nana* (Diptera: Sciomyzidae), whose larvae feed only on freshwater *Aulophorus furcatus* (Oligochaeta: Naididae). Zootaxa.2011; 3102, 50-68.
16. Vala JC, Gasc C, Gbedjissi G, Dossou C. Life history, immature stages and sensory receptors of *Sepedon (Parasepedon) trichrooscelis* an Afrotropical snail-killing fly (Diptera: Sciomyzidae). Journal of Natural History. 1995; 29:1005-1014.
17. Brown DS, Kristensen TK. A field guide to African freshwater snails. West African Species. Danish Bilharziasis Laboratory. 1993, 1-53.
18. Assogba MN, Youssao AK. Epidémiologie de la fasciole à *Fasciola gigantica* (Cobbold, 1885), de la dicrocoeliose et de la paramphistomose bovine au Bénin. Annales de Médecine Vétérinaire. 2001; 145:260-268.
19. Neff SE, Berg CO. Biology and immature stages of malacophagous Diptera of the genus *Sepedon* (Sciomyzidae). Virginia Agricultural Experiment Station Bulletin. 1966; 566:1-113.
20. Manguin S, Vala JC, Reindenbach JM. Prédation de mollusques dulçaquicoles par les larves malacophages de *Tetanocera ferruginea* Fallen, 1820 (Diptera, Sciomyzidae). Canadian Journal of Zoology. 1986; 64:2832-2836.
21. Vala JC, Gbedjissi LG, Knutson L, Dossou C. Extraordinary feeding behavior in Diptera Sciomyzidae, snail-killing flies. Comptes Rendus de l'Académie des Sciences Paris. Sciences de la vie/ Life Sciences. 2000b; 323(3):299-304.
22. Baker GM, Knutson LV, Vala JC, Coupland JB, Barnes JK. Overview of the biology of marsh flies (Diptera: Sciomyzidae) with special references to predators and parasitoids of terrestrial gastropods. In. Baker, G.M (Ed.). Natural Enemies of Terrestrial Molluscs. CABI Publishing, Wallingford. 2004; [X] + 644, 159–225.