

# THE GENUS *Sapromyza* (INSECTA, DIPTERA) IN MADEIRA

MARCOS BÁEZ

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The genus *Sapromyza* in Madeira is revised and six new species are described: *S. imitans* n. sp., *S. biscoitoi* n. sp., *S. mauli* n. sp., *S. laurisilvae* n. sp., *S. inconspicua* n. sp. and *S. ultima* n. sp.

Marcos Báez (e-mail: marbaez@ull.es), Departamento de Biología Animal, Universidad de La Laguna, ES-38206 La Laguna, Tenerife, Spain.

## INTRODUCTION

The genus *Sapromyza* was recorded for the first time at Madeira by BECKER (1908) who described the species *Sapromyza indigena* BECKER, 1908 and further recorded the species *Sapromyza infumata* Becker, 1908 and *Sapromyza hyalinata* (Meigen, 1826). CZERNY (1932) included only those records and FREY (1949) later described two new species for the island: *Sapromyza hirtiloba* Frey, 1949 (which was previously recorded as *S. infumata* by BECKER (1908), a species endemic to the Canary Islands and not present in Madeira) and *Sapromyza madeirensis* Frey, 1949 (it was previously recorded by BECKER (1908) as *S. hyalinata*). Until now, the fauna of the genus *Sapromyza* in Madeira was thus considered to comprise three endemic species: *S. indigena*, *S. hirtiloba* and *S. madeirensis* (SHATALKIN 2000).

During the last few years the author has been collecting and studying this genus in the island and as results six new species have been found. Thus, the genus *Sapromyza* is at the present time a major example of radiation in the order Diptera in the island of Madeira.

## MATERIAL AND METHODS

The present study is largely based on material collected by the author and deposited in the author's collection. In addition, material was studied from Becker's collection at Museum für

Naturkunde der Humboldt Universität zu Berlin, Germany (MNHU) and Frey's collection at the Zoological Museum Helsinki, Finland (ZMH). Unless indicated otherwise, all listed material was collected by the author.

All the material was captured sweeping vegetation in the localities cited under each species.

### Key to the species (males)\*

In most of the cases, the main and definitive character in order to separate these species are the male genitalia as well as the tibial spurs in the males. In the following key the males of all species are clearly differentiated and females of some species can be identified with characters as the colour of legs or thorax, but identification of the females of some species has not been possible.

Thorax yellow-orange .....1  
Thorax brown or black..... 2

### 1

Genitalia as Figs. 8 and 17, with characteristically divided surstyli ..... *S. indigena*  
Genitalia as Figs. 2 and 16; surtyli are much shorter than in *S. indigena* and also divided: the outer branch wider than the inner.....*S. imitans* n. sp.

- 2  
Thorax grey-brown. Arista hairy, with long rayx .....*S. madeirensis*  
Thorax black.....3
- 3  
t<sub>3</sub> with an apical pad of dense black setae or with  
apical spines or appendage.....4  
t<sub>3</sub> without setae or spines. Genitalia as Figs. 1 and  
12 .....*S. inconspicua* n. sp.
- 4  
t<sub>3</sub> with an apical pad of dense black setae (Figs.  
20 and 24).....5  
t<sub>3</sub> with apical spines or appendage (Figs. 21, 22  
and 23).....6
- 5  
Mid and hind femora black .....  
.....*S. laurisilvae* n. sp.  
Mid and hind femora yellowish .....  
.....*S. ultima* n. sp.
- 6  
t<sub>3</sub> with an appendage (Fig. 23). Frons black  
.....*S. maui* n. sp.  
t<sub>3</sub> with 1-2 apical spines. Frons reddish or brown  
.....7
- 7  
t<sub>3</sub> with 1 apical spines (Fig. 22); t<sub>1</sub> and t<sub>2</sub> black  
.....*S. biscoitoi* n. sp.  
t<sub>3</sub> with 2 apical spines (Fig. 21); t<sub>1</sub> and t<sub>2</sub> reddish  
.....*S. hirtiloba*

(\* This key can be also used for identification of females in the species *S. madeirensis*, *S. ultima*, *S. maui*, *S. biscoitoi* and *S. hirtiloba*).

## DESCRIPTION OF THE SPECIES

### *Sapromyza indigena* Becker, 1908

#### Male

Body length: 4-4.5mm. Head yellow-orange. Ocular triangle brown. Frons yellow brown, with a thin dark brown vittae extending from the inner vertical bristle to the lower fronto-orbital bristle; in some specimens this vittae is light and then

there is a thin yellow vittae close to the fronto-orbital bristles. Antenna yellow, brownish-yellow in the apical 2/3 part of the third antennal segment. Arista brown with microscopic hairs. Palpi yellowish.

Thorax yellow-orange but mesonotum in some specimens mostly brown. Chaetotaxy: 1 h, 2 pn, 0+3 dc, ac in 6 rows between the anterior pair of dc, 1 sa, 2 pa, 2 prsc, 4 sc, 1 mspl, 2 stpl. Scutellum yellow-orange, lightly brown in central parts. Wings clear, veins yellowish. Halteres yellow. Legs yellow; t<sub>3</sub> without preapical bristles and ventrally with apical patch of short, dense, black setae (Fig. 19).

Abdomen yellowish, with a dark band on the posterior edge of each tergite.

Genitalia (Figs. 8 and 17): epandrium short, about 1.5 times wider than high; parameres not fused basally, with two branches, one short and wide and another one long and curved; surstyli divided into two branches: the outer wide and the inner thin; aedeagal apodema short.

#### Female

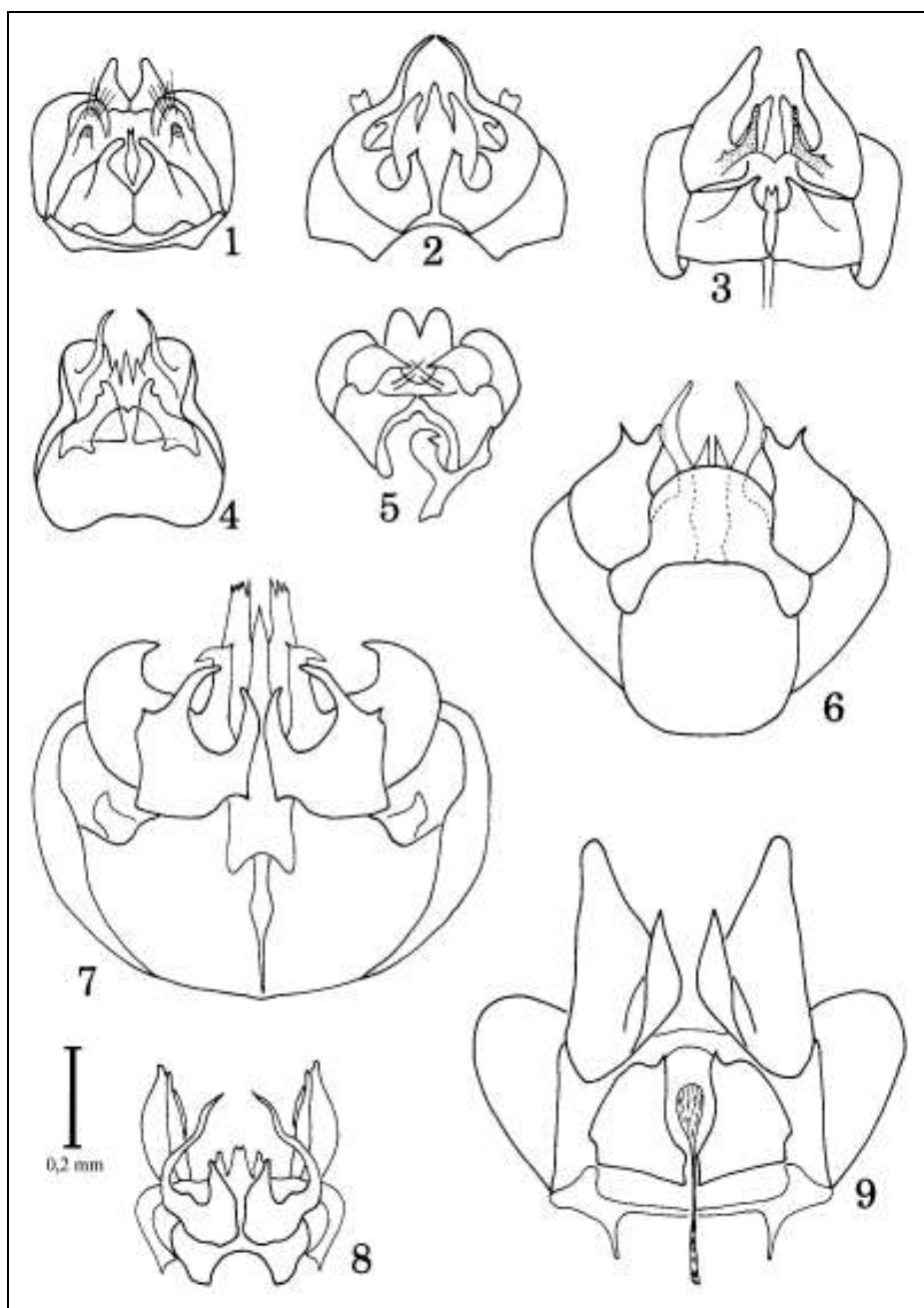
Resembling male, t<sub>3</sub> without the apical patch of short black setae. The females of this species are indistinguishable from females of *S. imitans* n. sp.

#### Material examined

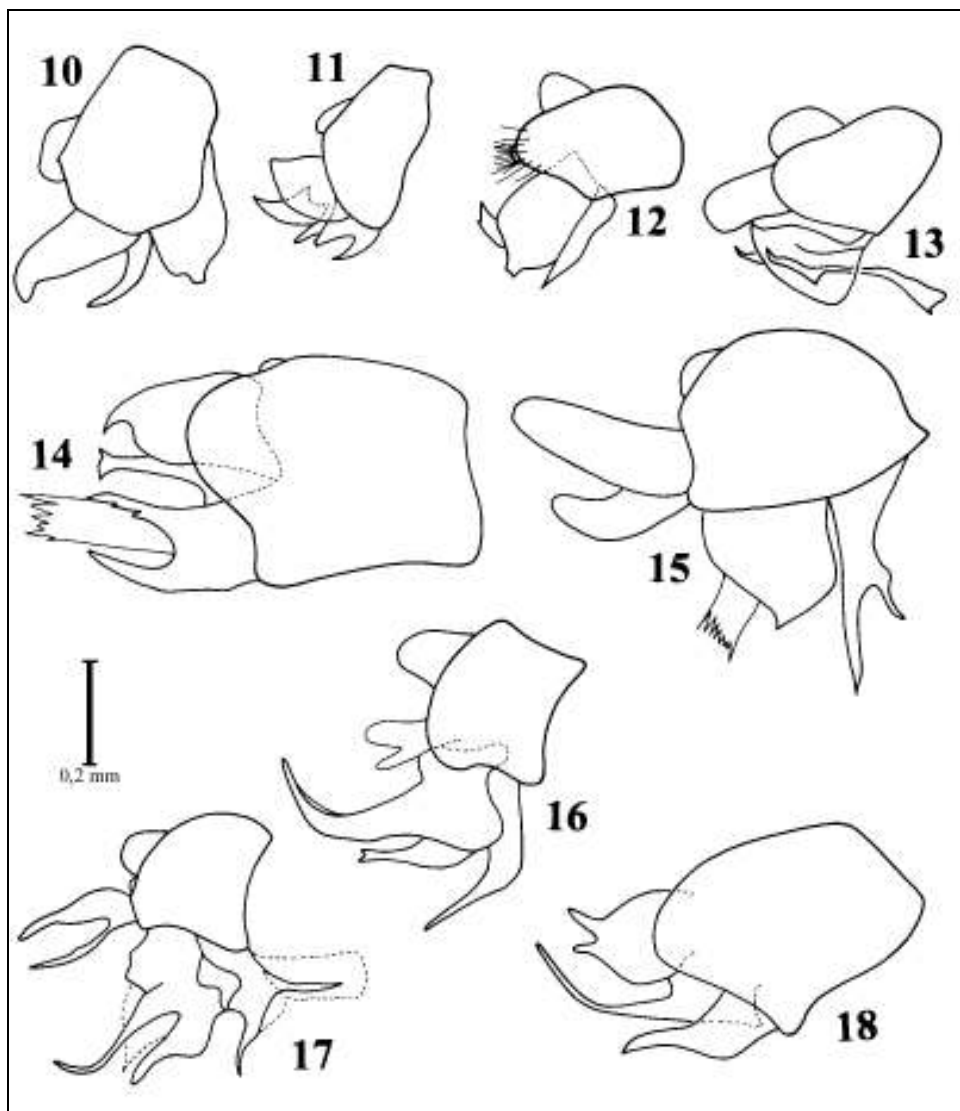
Madeira, IV-1908, no 51003, 2 ♀♀ (from typus series of Becker's collection, MNHU); Camacha-Santa da Serra, 21-VIII-1989, 25 ♂♂; Eira de Fora, 21-VIII-1987, 4 ♂♂; Encumeada, 20-VIII-1989, 2 ♂♂; Rabaçal, 10-VII-1990, 10 ♂♂; Ribeiro Frio, 7-VIII-1989, 3 ♂♂; Poiso, 9-VII-1990, 1 ♂; Fajã, 22-VII-1989, 1 ♂; Fajã da Nogueira, 22-VII-1997, 2 ♂♂; Ribeira da Janela, 24-VII-1997, 3 ♂♂; Jardim da Serra, 10-VIII-1996, 2 ♂♂, 23-IV-1997, 1 ♂; Queimadas, 9-VIII-1996, 1 ♂, 20-IV-1997, 2 ♂♂, 20-VII-1997, 1 ♂; Chão da Ribeira, 22-IV-1997, 2 ♂♂; Santo da Serra, 21-IV-1997, 1 ♂, 19-VII-1997, 2 ♂♂; Ribeiro Bonito, 23-VII-1997, 1 ♂; Balcões, 22-VII-1997, 2 ♂♂.

#### Habitat

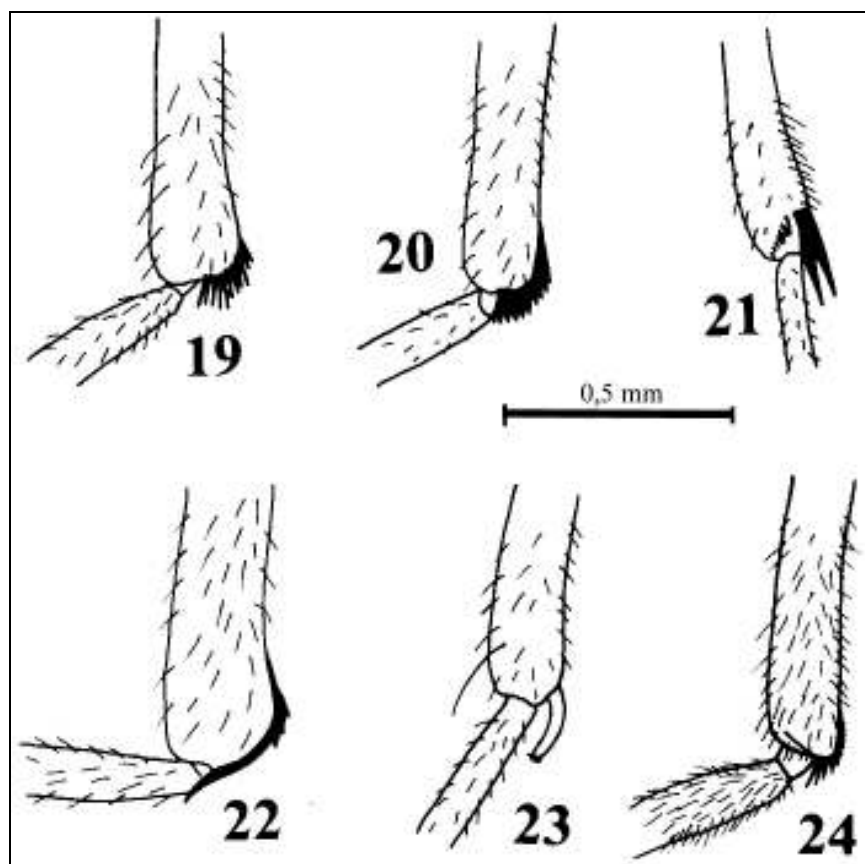
Species widespread. It can be found in laurel forest, in secondary forest and in cultivated areas.



Figs. 1-9. Male genitalia (ventral view) of *Sapromyza* spp. 1: *Sapromyza inconspicua* n. sp. 2: *Sapromyza imitans* n. sp. 3: *Sapromyza laurisilvae* n. sp. 4: *Sapromyza mauli* n. sp. 5: *Sapromyza madeirensis* Frey 6: *Sapromyza biscoitoi* n. sp. 7: *Sapromyza ultima* n. sp. 8: *Sapromyza indigena* Becker 9: *Sapromyza hirtiloba* Frey.



Figs 10-18. Male genitalia (lateral view) of *Sapromyza* spp. 10: *Sapromyza laurisilvae* n. sp. 11: *Sapromyza mauli* n. sp. 12: *Sapromyza inconspicua* n. sp. 13: *Sapromyza madeirensis* Frey 14: *Sapromyza ultima* n. sp. 15: *Sapromyza hirtiloba* Frey 16: *Sapromyza imitans* n. sp. 17: *Sapromyza indigena* Becker 18: *Sapromyza biscoitoi* n. sp.



Figs 19-24. Male hindleg, distal part of tibia and first tarsomere of *Sapromyza* spp. 19: *Sapromyza indigena* Becker 20: *Sapromyza laurisolvae* n. sp. 21: *Sapromyza hirtiloba* Frey 22: *Sapromyza biscoitoi* n. sp. 23: *Sapromyza mauli* n. sp. 24: *Sapromyza ultima* n. sp.

***Sapromyza imitans* n. sp.**

**Male**

Body length: 3.6-4.2 mm. Head yellow-orange. Ocular triangle brown. Frons yellow brown, with a thin dark brown vittae extending from the inner vertical bristle to the lower fronto-orbital bristle. Antenna yellowish, brownish-yellow in the apical 2/3 part of the third antennal segment. Arista brown with microscopic hairs. Palpi yellowish.

Thorax yellow-orange. Chaetotaxy: 1 h, 2 pn, 0+3 dc, ac in 6 rows between the anterior pair of dc, 1 sa, 2 pa, 2 prsc, 4 sc, 1 mspl, 2 stpl. Scutellum yellow-orange, lightly brown in central parts. Wings clear, veins yellowish. Halteres yellow. Legs yellow;  $t_3$  without preapical bristles

and ventrally with apical patch of short, dense, black setae.

Abdomen yellowish, with a dark band on the posterior edge of each tergite.

Genitalia (Fig. 2 and Fig. 16): epandrium short; cerci semi-oval, about  $\frac{1}{2}$  as high as epandrium; surtyli are much shorter than in *S. indigena* and also divided: the outer branch wider than the inner; parameres not fused basally, with the outer branch longer and more curved.

**Females**

Females of *S. imitans* are indistinguishable from females of *S. indigena*. Males of this species are also very similar to those of *S. indigena* in coloration and chaetotaxy (even the patch of short black setae in  $t_3$ ), although both species can easily be separated by the distinct male genitalia.

The name of the new species refers to the close similarity to *S. indigena*.

#### Holotype

Queimadas, 20-VII-1997, 1 ♂.

#### Paratypes

Camacha-Santo da Serra, 21-VIII-1989, 5 ♂♂; Encumeada, 21-VII-1997, 1 ♂; Fajã da Nogueira, 22-VII-1997, 2 ♂♂; Ribeira do Faial, 20-IV-1997, 1 ♂; Chão da Ribeira, 22-IV-1997, 1 ♂; Jardim da Serra, 23-IV-1997, 1 ♂; Ribeira da Janela, 24-VII-1997, 1 ♂.

Holotype and paratypes deposited in the collection M. Báez. One paratype (Balcões, 22-VII-1997, 1 ♂) deposited in the Museu Municipal do Funchal.

#### Habitat

This species has been found in laurel forest and in secondary forest.

### *Sapromyza madeirensis* Frey, 1949

#### Male

Body length: 4.5-5.5mm. Head yellow-brown. Ocellar triangle black. Frons brownish, with a dark grey vitta extending from the inner vertical bristle to the lower fronto-orbital bristle; anterior part yellow. Antenna yellowish, third segment brownish; arista brown with long hairs. Parafacials with a black line on the lateral margin and with a brown spot in the dorsal part, close to antennal socket. Palpi dark.

Thorax grey. Mesonotum with some parts yellowish, although the dominant colour is grey. Chaetotaxy: 1 h, 2 pn, 0+3 dc, ac in 6 rows between the anterior pair of dc, 1 sa, 2 pa, 2 prsc, 4 sc, 1 mspl, 2 stpl. Scutellum yellowish-brown laterally and grey in the central part. Wings yellowish infuscated. Legs yellow-brown, grey dusted;  $t_2$  with 2 long preapical bristles.

Abdomen yellowish, with a pair of linear black bands on the terga 3 to 6.

Genitalia (Figs. 5 and 13): epandrium wide ventrally; cerci semi-oval, about 1/3 as high as

epandrium; surstyli wide and square; parameres short and pointed at the apex; hypandrium asymmetrical and in the form of a Y.

#### Female

Resembling male but easily distinguishable from females of the other species for the ground colour pattern and the long hairs on arista.

#### Material examined

Rabaçal, 17.VII-4.VIII-1935 1 ♂ (O. Lundblad leg., ZMH); Levada do Tornos, 17-VIII-1989, 2 ♂♂, 2 ♀♀; Estreito-Garachico, 15-VIII-1989, 2 ♂♂, 6 ♀♀; Chão dos Louros, 13-VII-1990, 5 ♂♂, 4 ♀♀; Faja, 22-VIII-1989, 2 ♀♀; Encumeada, 20-VIII-1989, 1 ♂; Ribeira da Janela, 19-VIII-1989, 1 ♂; Rochão, 13-VII-1990, 2 ♂♂, 2 ♀♀; Levada da Serra, 14-VII-1990, 1 ♂; Campanário, 15-VIII-1989, 1 ♀.; Jardim da Serra, 10-VIII-1996 1 ♂.

#### Habitat

Species not abundant but widespread. It can be found in laurel forest, secondary forest and in cultive areas.

### *Sapromyza hirtiloba* Frey, 1949

#### Male

Body length: 4-5 mm. Head brownish. Ocellar triangle black. Frons dark brown, with two black lateral stripes extending from the inner vertical bristles to the lower fronto-orbital bristle; the posterior part of these stripes are fused with the black ocellar triangle; anterior part of frons yellowish. Antennae brownish, darker in the apical 2/3 part of the third antennal segment; arista brown with microscopic hairs. Palpi dark.

Thorax black. Mesonotum black. Chaetotaxy: 1 h, 2 pn, 0+3 dc, ac in 6 rows between the anterior pair of dc, 1 sa, 2 pa, 2 prsc, 4 sc, 1 mspl, 2 stpl. Scutellum black. Wings clear, veins yellowish. Halteres yellow. Femora black; trochanter, tibia and tarsi yellowish or brownish;  $t_3$  with two very close apical spines (Fig. 21).

Abdomen black. Genitalia (Figs. 9 and 15): epandrium about twice as wide as high; cerci

short; surstyli divided in two branches: the inner smaller than the outer; parameres not fused basally, short and pointed; aedeagal apodeme wide and short.

#### Female

Resembling male but  $t_3$  without spines. The females can be separated from females of *S. biscoitoi* n. sp. by the reddish colour of tibiae of front and mid legs.

#### Material examined

Lectotype: Funchal, Monte, 1-V-1938, 1 ♂♂ (R. Stora leg.) here designated from the types series in Frey's collection (ZMH).

#### Paralectotypes

Rabaçal, 6-7.V.1938, 2 ♀♀ (R. Frey and R. Stora leg.); Ribeira Frio, 3-V-1938, 1 ♀ (R. Stora leg.); Santo da Serra, 5-V-1938, 2 ♀♀ (R. Stora and R. Frey leg.), Other material: Camacha-Santo da Serra, 20-VIII-1989, 1 ♂; Encumeada, 20-VIII-1989, 1 ♂; Campanário, 15-VIII-1989, 1 ♂; Levada do Tornos, 17-VIII-1989, 2 ♀♀; Rabaçal, 10-VII-1990, 1 ♂; Poiso, 9-VII-1990, 1 ♂; Ribeira da Janela, 19-VIII-1989, 1 ♂.

#### Habitat

Species living in laurel forest and in low humid areas.

#### *Sapromyza biscoitoi* n. sp.

#### Male

Body length: 4-5 mm. Head brownish. Ocellar triangle black. Frons dark brown, with two black lateral stripes extending from the inner vertical bristles to the lower fronto-orbital bristle; the posterior part of these stripes are fused with the black ocellar triangle; anterior part of frons yellowish. Antennae brownish, darker in the apical 2/3 part of the third antennal segment; arista brown with microscopic hairs. Palpi dark.

Thorax black. Mesonotum black. Chaetotaxy: 1 h, 2 pn, 0+3 dc, ac in 6 rows between the anterior pair of dc, 1 sa, 2 pa, 2 prsc, 4 sc, 1 mspl,

2 stpl. Scutellum black. Wings clear, veins yellowish. Halteres yellow. Femora black; fore tibia black; mid and hind tibia and tarsi yellowish or brownish;  $t_3$  ventrally with a long curved spine (Fig. 22)

Genitalia (Figs. 6 and 18): epandrium about 1.5 times as wide as high; surstyli rounded and divided into two branches, the inner smaller than the outer; parameres thin and curved apically; hypandrium short and widened ventrally.

#### Females

Resembling male but  $t_3$  without spines. These females can be distinguished from those of *S. hirtiloba* by the black colour of  $t_1$  and  $t_2$ .

The male and female of this species are very similar to those of *S. hirtiloba*, but the male of *S. biscoitoi* has black fore tibiae and tarsi and has only one long curved spine on the  $t_3$  and its genitalia is very different.

The species is named in honour of Manuel Biscoito, director of the Museu Municipal do Funchal, for his encouragement and assistance during my visits to the island of Madeira.

#### Holotype

Chão dos Louros, 13-VII-1990, 1 ♂.

#### Paratypes

Levada do Tornos, 17-VIII-1989, 4 ♂♂, Poiso, 9-VII-1990, Encumeada, 20-VIII-1989, 1 ♂, 21-VII-1997, 1 ♀; Camacha-Santo da Serra, 21-VIII-1989, 3 ♂♂, 1 ♀; Campanário, 15-VIII-1989, 1 ♂, 2 ♀; Ribeiro Frio, 27-VIII-1989, 1 ♀; Estreito-Garachico, 15-VIII-1989, 1 ♂; Pico do Arieiro, 12-VIII-1989, 2 ♀♀; Levada da Serra, 14-VII-1990, 2 ♂♂; Poiso, 9-VII-1990, 3 ♂♂, 3 ♀♀; Rabaçal, 10-VII-1990, 10 ♂♂, 21-VII-1997, 2 ♂♂; Camacha, 9-VII-1990, 1 ♂, 1 ♀; Balcões, 22-VII-1997, 4 ♂♂; Riberira da Janela, 24-VII-1997, 6 ♂♂, Jardim da Serra, 10-VIII-1996, 2 ♂♂, 23-IV-1997, 2 ♂♂, 21-VII-1997, 2 ♂♂; Queimadas, 9-VII-1996, 2 ♂♂, 20-VII-1997, 1 ♂♂; Ribeiro Bonito, 23-VII-1997, 4 ♂♂, 1 ♀; Ribeira do Faial, 20-IV-1997, 5 ♂♂; Santo da Serra, 21-IV-1997, 2 ♂♂, 1 ♀, 19-VII-1997, 3 ♂♂.

Holotypes and paratypes deposited in the collection of M. Báez. Two paratypes (Rabaçal, 10-VII-1990, 1 ♂; Poiso, 9-VII-1990, 1 ♀) deposited in the collection of the Museu Municipal do Funchal.

#### Habitat

Species widespread, can be found in laurel forest, secondary forest and in cultive areas.

#### *Sapromyza mauli* n. sp.

##### Male

Body length: 3-4.5 mm. Head brownish. Ocellar triangle black. Frons dark brown or completely black; anterior part of frons yellowish. Antennae brownish, darker in the apical 2/3 part of the third antennal segment; arista brown with microscopic hairs. Palpi dark.

Thorax black. Mesonotum black. Legs dark; mid and hind tibia and tarsi yellowish or brownish; t<sub>3</sub> has ventrally a conspicuous curved projection (Fig. 23).

Abdomen black. Genitalia (Fig. 4 and Fig. 11): epandrium widened ventrally; cerci short; surstyli wide and with an inner thin process slightly curved; parameres of triangular form and the apex pointed and curved; aedeagus short.

The males of this species are very similar to those of *S. hirtiloba* and *S. biscoitoi* but in the male of *S. mauli* the frons is darker, the t<sub>3</sub> has an curved projection and the male genitalia is very different.

##### Females

The females can also be distinguished by the black colour of the frons.

The species is named in honour of the late G. E. Maul, first director of the Museu Municipal do Funchal and a great expert on the natural history of Madeira.

##### Holotype

Encumeada, 20-VIII-1989, 1 ♂.

##### Paratypes

Encumeada, 20-VIII-1989, 2 ♂♂, 2 ♀♀; Ribeiro Frio, 12-VII-1990, 1 ♀; Rabaçal, 10-VII-1990, 1 ♀; Camacha, 9-VII-1990, 1 ♀; Balcões, 22-VII-1997, 1 ♂, Jardim da Serra, 21-VII-1997, 1 ♂; Fajã da Nogueira, 22-VII-1997, 1 ♂; Queimadas, 20-VII-1997, 1 ♂.

Holotype and paratypes deposited in the collection of M. Báez. Two paratypes (Encumeada, 20-VIII-1989, 1 ♂, 1 ♀) deposited in the collection of the Museu Municipal do Funchal.

##### Habitat

Species found in laurel forest, secondary forest and humid habitats.

#### *Sapromyza laurisilvae* n. sp.

##### Male

Body length: 3.5-4 mm. Head brownish. Ocellar triangle black. Frons dark brown, with two black lateral stripes extending from the inner vertical bristles to the lower fronto-orbital bristle; the posterior part of these stripes are fused with the black ocellar triangle; anterior part of frons yellowish. Antennae brownish, darker in the apical 2/3 part of the third antennal segment; arista brown with microscopic hairs. Palpi dark.

Thorax black. Mesonotum black. Chaetotaxy: 1 h, 2 pn, 0+3 dc, ac in 6 rows between the anterior pair of dc, 1 sa, 2 pa, 2 prsc, 4 sc, 1 mspl, 2 stpl. Scutellum black. Wings clear, veins yellowish. Halteres yellow. Femora black; tibia and tarsi yellowish or brownish; t<sub>3</sub> ventrally with short bristles on the apex (Fig. 20). Abdomen black.

Genitalia (Figs. 3 and 10): very different from the other mentioned species. Epandrium about twice as wide as high; cerci semi-oval and short; surstyli in lateral view as long as the epandrium, with a characteristic inner brown process; parameres wide and square, with pointed apex.



As in *S. biscoitoi* and *S. mauli*, males and females of *S. laurisilvae* are very similar to *S. hirtiloba* but *S. laurisilvae* males have short bristles on apex of  $t_3$  and their genitalia are very different from the other mentioned species. The females are not distinguishable from females of *S. hirtiloba*.

The name of this species refers to the laurel forests where it lives.

#### Holotype

Ribeiro Frio, 27-VIII-1989, 1 ♂.

#### Paratypes

Santo da Serra, 5-V-1938 1 ♂ (R. Frey leg., ZMH); Ribeiro Frio, 27-VIII-1989, 4 ♂♂; Encumeada, 20-VIII-1989, 3 ♂♂; Fajã da Nogueira, 22-VII-1997, 2 ♂♂; Balcões, 22-VII-1997, 3 ♂♂; Queimadas, 9-VIII-1989, 3 ♂♂, 20-VII-1997, 1 ♂; Jardim da Serra, 23-IV-1997, 4 ♂♂; Santo da Serra, 21-IV-1997, 4 ♂♂, 19-VII-1997, 3 ♂♂; Rabaçal, 21-VII-1997, 2 ♂♂; Ribeiro Bonito, 23-VII-1997, 5 ♂♂.

Holotype and paratypes deposited in the collection of M. Báez. One paratype deposited in the collection of the Zoological Museum of Helsinki (Santo da Serra, 5-V-1938 1 ♂ (R. Frey leg.) and one paratype deposited in the Museu Municipal do Funchal (Ribeiro Bonito, 23-VII-1997, 1 ♂).

#### Habitat

Species found in laurel forest, secondary forest and humid habitats in low regions.

### *Sapromyza inconspicua* n. sp.

#### Male

Body length: 3.5-4mm. Head brownish. Ocellar triangle black. Frons dark brown, with two black lateral stripes extending from the inner vertical bristles to the lower fronto-orbital bristle; the posterior part of these stripes are fused with the black ocellar triangle; frequently the anterior part of frons yellowish. Antennae brownish, darker in the apical 2/3 part of the third antennal segment; arista brown with microscopic hairs. Palpi dark.

Thorax black. Mesonotum black. Chaetotaxy: 1 h, 2 pn, 0+3 dc, ac in 6 rows between the anterior pair of dc, 1 sa, 2 pa, 2 prsc, 4 sc, 1 mspl, 2 stpl. Scutellum black. Wings clear, veins yellowish. Halteres yellow. Femora black; mid and hind tibia and tarsi yellowish or brownish. Abdomen black. Genitalia (Fig. 1 and Fig. 12): epandrium square, about as wide as high; cerci semi-oval, bigger than the surstyli; surstyli very short with characteristic bristles at its apex and with a short inner process; in lateral view the surstyli is hidden by the epandrium; parameres fused ventrally and with pointed apex.

Species very similar to *S. laurisilvae* but it can be distinguished because males have not bristles on the apex of  $t_3$  and by the very different structure of the male genitalia

#### Females

Females are indistinguishable from the females of closely related species.

The name of the species refers to its close similarity with *S. laurisilvae* and others species resulting in its inconspicuous appearance.

#### Holotype

Balcões, 22-VII-1997, 1 ♂.

#### Paratypes

Eira de Fora, 21-VIII-1987, 2 ♂♂; Jardim da Serra, 23-IV-1997, 1 ♂.

Holotype and paratypes deposited in the collection of M. Báez.

#### Habitat

The few specimens known have been collected in laurel forest and in secondary forest.

### *Sapromyza ultima* n. sp.

#### Male

Body length: 4-4.5 mm. Head brownish. Ocellar triangle black. Frons dark brown, with two black lateral stripes extending from the inner vertical bristles to the lower fronto-orbital bristle; the posterior part of these stripes are fused with the black ocellar triangle; frequently the anterior part of frons yellowish. Antennae brownish, darker in

the apical 2/3 part of the third antennal segment; arista brown with microscopic hairs. Palpi dark.

Thorax black. Mesonotum black. Chaetotaxy: 1 h, 2 pn, 0+3 dc, ac in 6 rows between the anterior pair of dc, 1 sa, 2 pa, 2 prsc, 4 sc, 1 mspl, 2 stpl. Scutellum black. Wings clear, veins yellowish. Halteres yellow. Fore femora and tarsi black; mid and hind femora yellow; fore tibia brownish or yellowish; mid and hind tibia and tarsi yellowish or brownish. Abdomen black.

Genitalia (Figs. 7 and 14): bigger than the others species mentioned; epandrium wide and square; surstyli with the outer branch wide and pointed, the inner branch with apex pointed and hook-like; parameres with the two branches curved and convergent; aedeagus long and wide.

Species very similar to *S. laurisilvae* and *S. inconspicua*, but both males and females differ from both because the mid and hind femora are yellow and not black, and because the male genitalia are bigger and have very different characteristics.

The name of this species was chosen because it was the last species found in this study.

#### Hototype

Queimadas, 9-VIII-1996, 1 ♂.

#### Paratypes

Fajã da Nogueira, 22-VII-1997, 1 ♂; Chão da Ribeira, 23-I-98, 1 ♂ (R. Capela leg.), 2-II-98, 1 ♂ (R. Capela leg.), 14-IV-98, 8 ♂♂ (R. Capela leg.).

Holotype and paratypes deposited in the collection of M. Báez. One paratype (Chão da Ribeira, 14-IV-98, 1 ♂) deposited in the collection of the Museu Municipal do Funchal.

#### Habitat

Species found only in the laurel forests.

#### DISCUSSION

From the taxonomical point of view there are three apparent groups of species in the genus *Sapromyza* in Madeira. One group is composed of "yellow-orange species" colour (*S. indigena* and *S. imitans*). The presence of these two closely related species in the same localities and habitats

is a notable example of secondary sympatry, though it should be noted that *S. indigena* is more widespread and abundant than *S. imitans*.

The second group is constituted by the single species with grey-brown thorax, hairy arista and asymmetrical genitalia (*S. madeirensis*), and the third group is composed of black species (*S. inconspicua*, *S. laurisilvae*, *S. ultima*, *S. mauli*, *S. biscoitoi* and *S. hirtiloba*), a group that radiated in the island.

The presence of nine endemic species of the genus *Sapromyza* in the island of Madeira is a remarkable case of speciation in the Atlantic islands, and a probable example of sympatric speciation in insects with very high mobility and similar biology. Some authors express that speciation under sympatric conditions is a very rare event in nature (MAYR 1968; BARTON & HEWITT 1985), although others as TAUBER & TAUBER (1989) or KONDRASHOV & MINA (1986) present data on this phenomenon in different animals groups. BUSH (1992, 1994) suggested that sympatric speciation may be common among small animals such as insects.

In the future, a molecular analysis (in preparation) may enable a reconstruction of the phylogeny of this group and yield knowledge of the relationships among the species.

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