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## Establishment of a network of plant micro-reserves on the Municipality of Funchal (Madeira, Portugal)

By RÚBEN F. PAZ <sup>1</sup>\* & J. J. GONÇALVES SILVA <sup>1</sup>

With 13 figures and 3 tables

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**ABSTRACT:** This paper summarizes the results of a project developed at Funchal City Hall. The objectives were to obtain an inventory and cartography of the areas of natural or semi-natural vegetation cover, in order to propose a network of micro-reserves of the local flora and vegetation (PMRs). The main objective was, therefore, to preserve the sites of ecological interest that still remain on the limits of the municipality of Funchal below 350 m *a.s.l.*

**Keywords:** European Habitats Directive, plant micro-reserves, Funchal.

**RESUMO:** Este artigo resume os resultados de um projeto desenvolvido na Câmara Municipal do Funchal. Os objetivos foram obter um inventário e cartografar as áreas de cobertura vegetal natural ou seminatural, a fim de propor uma rede de micro-reservas da flora e vegetação locais (MRF). O principal objetivo foi, portanto, de conservar os locais de interesse ecológico que ainda permanecem nos limites do concelho do Funchal abaixo de 350 m de altitude.

**Palavras-chave:** Diretiva Habitats da Comunidade Europeia, micro-reservas de flora, Funchal.

## INTRODUCTION

The islands that make up the archipelago of Madeira (Madeira, Porto Santo, Desertas and Selvagens) are located about 900 km from mainland Portugal and 600 km from the coast of Morocco. The island of Madeira (32° 38' and 32° 52' N and 16° 39' and 17° 16' W) (PRADA, 2007) has 737 km<sup>2</sup> (58 km long and 23 km wide) and a maximum altitude of 1861 m, the Pico Ruivo. The municipality of Funchal, on the south coast of Madeira Island, occupies an area of 7630 ha.

Forest habitats existing in Madeira, which are included in the Annex I, of the Habitats Directive, are detailed in Table 1, according to the Decree-Law no. 140/99 of the 24<sup>th</sup> of April (CAPELO *et al.*, 2007). Note that the endemic Macaronesian heaths, the Macaronesian laurel forests and endemic forests with *Juniperus* spp. are priority habitats and therefore require strict protective measures.

**Table 1** – List of forest or scrub habitats and their code according to Habitat Directive.

Type	Code	Designation	Plant communities and their phytosociological correspondence
Temperate heath and scrub	4050	*Endemic macaronesian heaths	High altitude heath ( <i>Polysticho falcinelli-Ericetum arboreae</i> ) and secondary heath vegetation ( <i>Vaccinio padifoli-Ericetum madericolae</i> )
Thermo-Mediterranean and pre-steppe bush	5330	Thermo-Mediterranean and pre-desert scrub	Scrub community of Madeiran tree-spurge ( <i>Euphorbietum piscatoriae</i> )
Mediterranean sclerophyllous forests	9320	<i>Olea</i> and <i>Ceratonia</i> forests	Microforest of Madeiran oleaster ( <i>Mayteno umbellatae-Oleetum maderensis</i> )
Mediterranean sclerophyllous forests	9360	*Macaronesian Laurel Forests ( <i>Laurus</i> , <i>Ocotea</i> )	Laurisilva forests ( <i>Clethro arboreae-Ocoteetum foetentis</i> , <i>Semele androgyna-Apollonietum barbujae</i> and <i>Diplazio caudatae-Perseetum indicae</i> ); microforests of <i>Sideroxylon mirmulans</i> ( <i>Helichryso melaleuci-Sideroxyletum marmulanae</i> ); riverine vegetation; caulirosetted phanerophyte communities
Mediterranean and Macaronesian mountainous coniferous forests	9560	*Endemic forests with <i>Juniperus</i> spp.	Phoenician Juniper and Madeiran Juniper communities

\* Priority habitats

In the municipality of Funchal, that spreads from 0 to 1818 m, are present, potentially, all described communities; up to 350 m, the microforest of Madeiran oleaster, the microforest of *Sideroxylon mirmulans* R. Br. and the Canary Laurel forest (*Semele androgyna-Apollonietum barbujae*) represent the climatophyllous communities. Although most of these habitats are occupied by agricultural and urban areas, several small landscape relicts are known to exist (PAZ *et al.*, 2013).

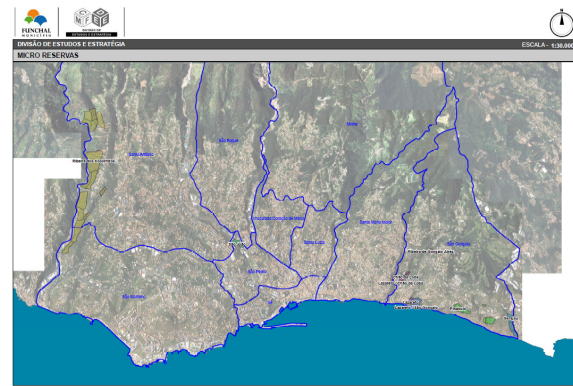
Besides the above communities, there are other endemic and indigenous vegetation series in the area of Funchal, forming rich and diverse mosaics that is

important to protect and preserve, like the riparian woods of *Salix canariensis* Ch.P.Sm. ex Link (*Scrophulario hirtae-Salicetum canariensis*), dominated by *Salix canariensis* and the *Musschiaetum aureae*, a rupicolous community dominated by *Musschia aurea* (L.f) Dumort., accompanied by plants such as *Andryala crithmifolia* Aiton, *Aeonium glandulosum* (Aiton) Webb & Berthel., *Aeonium glutinosum* (Aiton) Webb & Berthel., *Sinapidendron angustifolium* (DC.) Lowe, *Helichrysum monizii* Lowe and *Erysimum maderense* Polatschek (COSTA *et al.*, 2004).

All these communities are rich in endemic species and lack of protection by their very weak representation in protected areas of the archipelago (Natural Park of Madeira and the Natura 2000 Network).

## METHODOLOGY

In the initial phase of this work the conclusions in the report of 2008 on micro-reserves in the municipality of Funchal (PAZ *et al.*, 2008) were reviewed in order to select the areas to revisit. These were: *Garajau*, *Pináculo*, *Chão da Loba* and *Ribeira dos Socorridos*. Due to the existing vegetation and the presence of priority species the areas of *Ribeira de Gonçalo Aires*, *Lazareto* and *São João* were again surveyed; a new site was added – *Cancela* (Fig. 1 and Table 2).



**Fig. 1** – Distribution of the surveyed areas in the Municipality of Funchal.

Sinphytosociological inventories were used for landscape description using the vegetation model proposed by CAPELO *et al.* (2004). This initial approach was complemented by floristic and phytosociological inventories. The data obtained allowed a qualitative and

semi quantitative evaluation of floristic and ecological diversity, endemism, as well as the listing of each site's species and habitats included in the Habitats Directive and Bern Convention. For each site several other landscape features were registered including: constructions, trails, roads, threats (e.g. trash deposition, evidence of recent fires, etc.).

**Table 2** – Number of sinphytosociological and phytosociological inventories.

Code	Natural area	Number of sinphytosociological inventories	Number of phytosociological inventories
D	Chão da Loba	3	1
F	Garajau	3	0
G	Lazareto - São Gonçalo	3	1
H	Pináculo	6	1
M	Ribeira de São João	1	0
Soc	Ribeira dos Socorridos	15	3
P	Ribeira de Gonçalo Aires	1	2
C	Cancela	1	1
Total		33	9

The ranking parameters of sinphytosociological inventories were the native tree cover rate, the presence of endemic *taxa* (Macaronesian or Madeiran) and, within these, how many are protected by the Habitats Directive. To calculate the Natural Areas Protection Index (IPEN), the following formula was used:  $IPEN = 2ICAA + IPEDH$ , where ICAA is the Coverage Ratio of Arboreal Indigenous species (sum of the coverage percentages of *Mayteno umbellatae-Oleatum maderensis*, *Semele androgynae-Apollonietum barbujae* and *Scrophulario hirtae-Salicetum canariensis* communities) and IPEDH is the Presence of Species of the Habitats Directive Index.

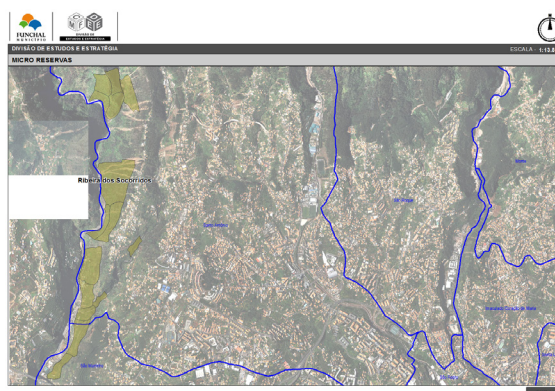
In the case of phytosociological surveys the different areas studied were prioritized taking into account three factors: the number of Madeiran and Macaronesian endemisms present, number of protected *taxa* (either by the Bern Convention and the Habitats Directive) and the native tree cover rate *versus* the exotic tree cover rate.

## OUTCOME AND CONCLUSIONS

A total of 58 Macaronesian endemic *taxa* and 36 Madeira exclusive endemisms could be found, revealing a remarkable richness (PRESS *et al.*, 1994). Nine *taxa* are included in the Habitats Directive, two being priority *taxa* (*Chamaemeles coriacea* Lindl. and *Convolvulus massonii* F. Dietr.), which are also included in the Bern Convention,

together with *Musschia aurea* (JARDIM *et al.*, 2008).

In the valleys of *Ribeira dos Socorridos* (Fig. 2), *Ribeira de São João* (Fig. 3), *Ribeira de Gonçalo Aires* (Fig. 4) and *Chão da Loba* are some groves belonging to the community *Semele androgynae-Apollonietum barbujae*, being the only priority forest habitat, protected by the Habitats Directive, found throughout the execution of this study. The highest percentage of this community found in the areas under study was 30% in *Ribeira de São João* and *Ribeira de Gonçalo Aires* (Table 3), followed by Soc4 plot, of the *Ribeira dos Socorridos*, with 25%.



**Fig. 2** – Ribeira dos Socorridos.



**Fig. 3** – Ribeira de São João.



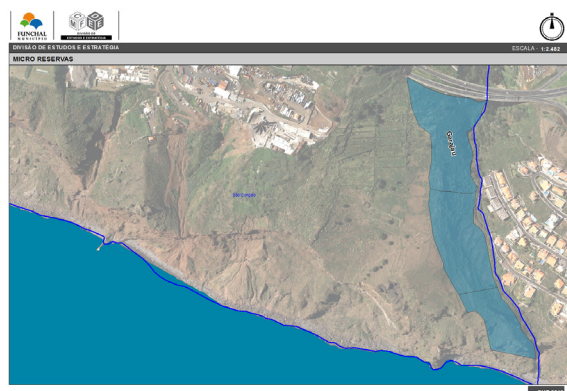
**Fig. 4** – Ribeira de Gonçalo Aires.



**Table 3** – Synphytosociological inventories higher values.

Parameter	Plots
<i>Euphorbietum piscatoriae</i>	F1
<i>Mayteno umbellatae-Oleetum maderensis</i>	D11
<i>Semele androgynae-Apollonietum barbujae</i>	M1; P1
<i>Scrophulario hirtae-Salicetum canariensis</i>	Soc4
Native arboreal coverage	Soc4
Number of protected species	H4
IPEN	D11; Soc4

The other forest habitats of the Habitats Directive and associated communities identified in the inventories are the *Euphorbietum piscatoriae* (scrub community of Madeiran tree-spurge) and the *Mayteno umbellatae – Oleetum maderensis* (microforest of Madeiran oleaster). The *Euphorbietum piscatoriae* has the highest coverage rate in the F1 portion of **Garajau**, with 62% (the three plots of **Garajau** – Fig. 5 – have a coverage of *Euphorbietum piscatoriae* ranging from 40% to 62% in 2016, values that are only matched by some plots of **Pináculo**) and the *Mayteno umbellatae – Oleetum maderensis* community has a maximum of 40% in the D11 portion of **Chão da Loba** (Table 3).

**Fig. 5** – Garajau.

In addition to forest habitats were also identified other habitats included in the Habitats Directive: *Myrto communis – Hypericetum canariensis* (DH 9360), *Artemisio argenteae – Genistetum tenerae* (DH 5330), *Scrophulario hirtae – Salicetum canariensis* (DH 9360), *Sedo nudi – Aeonietum glutinosae* (DH 1250), and *Musschiaetum aureae* (DH 1250) – Fig. 6. In vertical zones of waterfalls and walls of trickling water or weak and laminar stream, there is the *Deschampsietum argenteae*, a madicolous Madeiran endemic community, dominated by the Madeiran

endemism *Deschampsia argentea* (Lowe) Lowe.

After calculating the Natural Areas Protection Index (IPEN), it was observed that the plots with the highest value are in **Ribeira dos Socorridos** (Soc4), an area that also has the largest spot of *Scrophulario hirtae – Salicetum canariensis*, and **Chão da Loba** (D11) with IPEN = 11. Next are the H4 portion of **Pináculo**, **Ribeira de Gonçalo Aires** (P1) and Soc3, Soc7, Soc8, Soc12 and Soc13 plots of **Ribeira dos Socorridos**, with IPEN = 7. IPEN, being an index that value forest areas, depreciates all plots with vertical slopes where forests cannot occur and where soil conditions allow only the existence of rupicolous vegetation like *Musschiaetum aureae* (Fig. 6), or, in paraclimax situation, communities of *Euphorbietum piscatoriae*.

**Fig. 6** – *Musschiaetum aureae* in Pináculo.

From the ranking of phytosociological inventories it is detected that the portion with the largest number of endemic species is in **Pináculo** (H3A), with 7 taxa, followed by the valley of **Ribeira dos Socorridos** (Soc1A) and **Ribeira de Gonçalo Aires** (P1A), with 4 endemics.

When the protected rate is concerned, several plots have the presence of one of the protected species: D11A portion of **Chão da Loba**, G3A of **Lazareto**, H3A of **Pináculo**, P1A of **Ribeira de Gonçalo Aires** and Soc1A and Soc7A of **Ribeira dos Socorridos**.

As to the native tree coverage of the different areas, it was verified that, the phytosociological inventory, where a higher percentage was obtained, was held in place P1B of **Ribeira de Gonçalo Aires**, with 65% coverage. The second highest was 60%, belonging to the site D11A, in the area of **Chão da Loba**. All other values are much lower (8% in area G3A of **Lazareto**), which shows the absence of large native tree spots within the project perimeter, with rather small clumps in more inaccessible places, far from human action.

The inventories carried out in the valley of *Ribeira dos Socorridos* showed that this area has great floristic interest (higher *taxa* protected concentration by each type of inventory, the presence of a priority forest habitat in 9 of 15 sinphytosociological inventories performed, presence of riparian community of *Salix canariensis* (*Scrophulario hirtae* – *Salicetum canariensis*) (Fig. 7), the largest native tree cover by sinphytosociological inventory and the plot with higher IPEN: Soc4.



Fig. 7 – *Scrophulario hirtae* – *Salicetum canariensis* in Ribeira dos Socorridos.

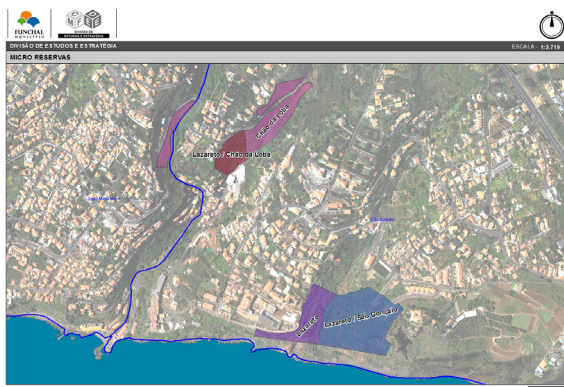


Fig. 8 – Lazareto-São Gonçalo and Chão da Loba.



Fig. 9 – Ribeira de São João.

The *Lazareto* area (Fig. 8), besides having in its floristic catalogue, the presence of *Chamaemeles coriacea*, a priority species of Habitat Directive, also has the presence of *Rumex simpliciflorus* Murb. var. *maderensis* (Murb.) Samuelson, a Madeiran endemism classified as “very rare” by JARDIM & FRANCISCO (2000).

The area under study in *Chão da Loba* (Fig. 8), consisting in two valleys, exhibits the plot with the highest percentage of Macaronesian endemic tree cover, both in sinphytosociological level as in phytosociological level. This value corresponds to a grove of *Olea maderensis* (Lowe) Rivas Mart. & Del Arco (*Mayteno umbellatae* – *Oleetum maderensis* community) disposed in the valley head, where the insolation is highest and humidity lowest. The valley floor is occupied by specimens of *Apollonias barbujana* (Cav) Bornm. and *Laurus novocanariensis* Rivas Mart., Lousã, Fern. Prieto, E. Días, J. C. Costa & C. Aguiar (*Semele androgynae* – *Apollonietum barbujanae* community) in an edapho – hygrophilous situation (with higher humidity and lower temperature).

The Canary laurel forest community (*Semele androgynae* – *Apollonietum barbujanae*), priority habitat of the Habitats Directive (the only priority habitat found during the inventory), has its maximum in the areas of *Ribeira de São João* (Fig. 9) and *Ribeira de Gonçalo Aires* (Fig. 10).



Fig. 10 – Ribeira de Gonçalo Aires.

The *Pináculo* (Fig. 11), Site of Community Importance (SCI) of the Natura 2000 Network, is the only protected space in the study area and it was the space where the largest number of *taxa* protected by sinphytosociological inventory was found.

Inventoried areas are located in stream valleys and cliffs, orographic protections that prevented their destruction by human activities, taking refuge there



examples of native vegetation that disappeared from the remaining space through the agricultural and urban development (Fig. 12). These areas need protection because, increasingly, the pressure on them is intensified, either by nearby buildings, trash and debris dumped in these areas and competition with alien species.

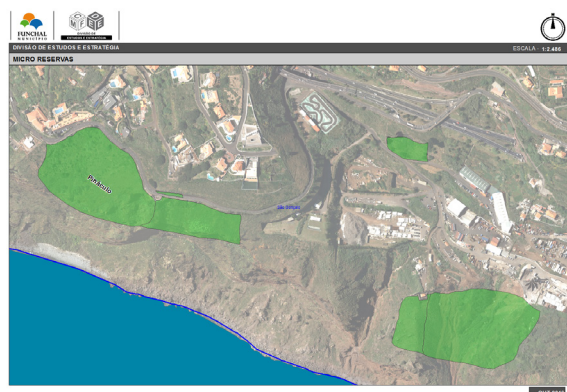


Fig. 11 – Pináculo.



Fig. 12 – Occupation of Ribeira dos Socorridos valley.



Fig. 13 – Area that suffered a landslide.

In addition to these threats, there are other factors (natural or anthropogenic) that may affect the existing *taxa* in these areas, such as landslides (Fig. 13) and droughts (MARTIN *et al.*, 2008).

The quality of these different sites can be improved through various interventions: establishment of trails and security areas, space cleaning, eradication of invasive species, introduction and reintroduction and reinforcement of native *taxa*. The implementation of these measures will contribute to the maintenance of natural flora diversity and these areas should be included in a PMR network (LAGUNA, 2001; LAGUNA *et al.*, 2004) and preserved from increasing pressures.

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## First record of the White Champion *Silene latifolia* Poir. subsp. *latifolia* (Caryophyllaceae) in the island of Madeira (Portugal)

By J. J. GONÇALVES SILVA <sup>1</sup>\* & RÚBEN F. PAZ <sup>1</sup>

With 2 figures

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**ABSTRACT:** *Silene latifolia* Poir. subsp. *latifolia* is reported for the first time for the island of Madeira. In Portuguese territory, forty-six *taxa* of the genus *Silene* L. (Caryophyllaceae) are recorded. The species *Silene latifolia* is present in mainland Portugal and in the Azores (island of Santa Maria), not being recorded in the other Macaronesian archipelagos. The presence of *S. latifolia* in Madeira can be a new threat to endemic flora and vegetation, as noted for many other non-indigenous plants over the last years.

**Keywords:** *Silene*, Caryophyllaceae, casual, Madeira.

**RESUMO:** Pela primeira vez é assinalada a ocorrência da espécie *Silene latifolia* Poir. subsp. *latifolia* na ilha da Madeira. Em território português, estão assinalados quarenta e seis *taxa* do género *Silene* L. (Caryophyllaceae). A espécie *Silene latifolia* está presente em Portugal Continental e no arquipélago dos Açores (ilha de Santa Maria), não ocorrendo nos outros arquipélagos macaronésicos. A presença de *S. latifolia* na ilha da Madeira pode constituir uma nova ameaça para a flora e vegetação endémicas, tal como tem acontecido com a introdução de outras plantas exóticas ao longo dos últimos anos.

**Palavras-chave:** *Silene*, Caryophyllaceae, casual, Madeira.

## INTRODUCTION

The flora of Madeira comprises 1.204 *taxa* of vascular plants (species and subspecies). Of these, 29 (2,4%) *taxa* are “possible introduced” and 401 (33,3%) *taxa* are introduced (JARDIM & SEQUEIRA, 2008).

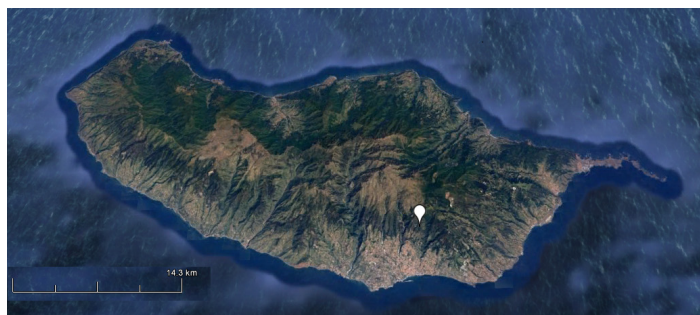
The carnation family (Caryophyllaceae) totals twenty-nine native and naturalized *taxa* in the archipelago of Madeira. Among these, one *taxon* is endemic from the island of Madeira (*Cerastium vagans* Lowe var. *vagans*), two are introduced (*Corrigiola littoralis* L. and *Saponaria officinalis* L.) and the remaining *taxa* are native (SHORT, 1994; JARDIM & SEQUEIRA, 2008). Also present in Madeira, but not naturalized or only sporadically found in nature, we have the genera *Dianthus* L., *Lychnis* L. and *Gypsophila* L., widely used as ornamentals (VIEIRA, 2002; QUINTAL, 2007).

According to MORTON (2005) the genus *Silene* L. has about 700 species found mainly in Northern Hemisphere.

In Portugal, MENEZES DE SEQUEIRA *et al.* (2012) recognises forty-six *taxa* belonging to the genus *Silene*, including the species *Silene latifolia* occurring in mainland Portugal, as native and in the Azores (island of Santa Maria), as casual (SILVA *et al.*, 2005). Until this sighting, this species hasn't been recorded in the island of Madeira (LOWE, 1868; MENEZES, 1914; SHORT, 1994; JARDIM & SEQUEIRA, 2008) not in the other Macaronesian archipelagos (ACEBES GINOVÉS *et al.*, 2004; SANCHEZ-PINTO *et al.*, 2005).

## RESULTS

The specimens of *Silene latifolia* subsp. *latifolia* reported herein are deposited in the herbarium of the Natural History Museum of Funchal (MADM) and were found on the south coast of the island of Madeira, along Caminho do Monte (Levada das Cales, between Terreiro da Luta and Monte) (Fig. 1).



**Fig. 1** – Geographical location of *Silene latifolia* Poir. on the island of Madeira.

The plants occur on the borders of a water channel, in a humanized micro-habitat with a strong presence of exotic forest species (*Acacia mearnsii* De Wild., *Eucalyptus globulus* Labill., *Pittosporum undulatum* Vent.) where potentially should exist humid laurisilva (*Clethro arboreae* – *Ocoteetum foetentis* Capelo, J. C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez) as described by COSTA *et al.* (2004).

About 5 individuals were identified along approximately 10 m.

## STUDIED MATERIAL

### *Silene latifolia* subsp. *latifolia*

Portugal, Madeira: Caminho do Monte, Monte, Funchal, 20.VI.2016, Juan Silva & Rúben Paz leg., 32° 41' 04,4" N, 16° 54' 00,7" W, 867 m *a.s.l.* (♀, MADM 6917).

Portugal, Madeira: Caminho do Monte, Monte, Funchal, 20.VII.2016, Juan Silva & Rúben Paz leg., 32° 41' 04,20" N, 16° 54' 00,27" W, 865 m *a.s.l.* (♀, MADM 6937).

Portugal, Madeira: Caminho do Monte, Monte, Funchal, 20.VII.2016, Juan Silva & Rúben Paz leg., 32° 41' 04,20" N, 16° 54' 00,27" W, 865 m *a.s.l.* (♂, MADM 6938).

### General description

The following description is based on the one given by CHATER *et al.* (1993):

Dioecius, short-lived perennial (sometimes annual) up to 80 cm, often much-branched, usually rather densely and softly hairy, and more or less glandular above. Leaves ovate or ovate-lanceolate; cauline sessile. Inflorescence a lax, compound dichasium of large flowers, opening in the evening and slightly scented. Calyx of male flowers 15-22 mm, 10-veined; of female 20-30 mm, 20-veined, glandular, inflated and strongly accrescent in fruit; calyx-teeth very long, acuminate. Petals usually white; styles 5. Capsule 10-25 mm, more or less ovoid, dehiscent with 10 teeth. Seeds with concave faces and obtuse tubercles.

Flowering (according to TALAVERA, 1990): (III) IV-VII (IX).

The above description applies to subsp. *latifolia* (Fig. 2 – A), B), C), D)).





**Fig. 2** – *Silene latifolia* Poir. (Madeiran population): **A**) general aspect; **B**) male flower; **C**) female flower; and **D**) section of the female flower.

Key of the Madeiran species of the genus *Silene* (adapted from SHORT, 1994):

1. Plant dioecius with unisexual flowers, styles 5 ----- **latifolia**  
 Plant monoecius with hermaphrodite flowers, styles 3 ----- 2.
2. Flowers in raceme-like, usually simple, monochasial cymes ----- 3.  
 Flowers in branched dichasial cymes ----- 4.
3. Calyx contracted at the mouth, pubescent with long, spreading, multicellular hairs and shorter glandular hairs; inflorescence +/- 1-sided; capsules ovoid ----- **gallica**  
 Calyx not contracted at the mouth, appressed-pubescent with very short, ascending hairs; inflorescence not as above; capsules oblong ----- **nocturna**
4. Perennial; calyx very inflated, 1 cm or more broad in fruit ----- 5.  
 Annual; calyx not or slightly inflated and then less than 1 cm broad in fruit ----- 6.
5. Bracteoles scarious; capsule teeth erect or erecto-patent; plant +/- erect ----- **vulgaris**  
 Bracteoles herbaceous; capsule teeth recurved; plant +/- procumbent ----- **uniflora**
6. Plant puberulent; stems very slender; leaves narrowly linear ----- **inaperta**  
 Plant glabrous; stems rather stout; leaves obovate or lanceolate ----- **behen**

## CONCLUSIONS

According to JARDIM & SEQUEIRA (2008), the introduction of new *taxa* is one of the main factors causing habitat fragmentation; in fact, invasive plant species are the dominant element in the landscape of the south coast of the island of Madeira, forming, in some cases, areas of monospecific vegetation (e.g. *Acacia* spp.).

During the second half of the 20<sup>th</sup> century, several new introductions and consequent naturalizations, were reported by HANSEN (e.g. 1974, 1978, 1987 and 1992) and compiled by VIEIRA (2002). Recently, *Solidago chilensis* Meyen and *Viburnum tinus* L. were confirmed as new introduced *taxa* in the island of Madeira (GONÇALVES SILVA *et al.*, 2008, 2009).

Due to poor seed dispersal (seeds are dispersed by gravity) at a local scale (BARLUENGA *et al.*, 2011) and the fact that is a dioecious species, this plant has a restricted range in Madeira. However, this weed, which can thrive in a wide array of conditions, profits from human activity for long-distance seed dispersal (BARLUENGA *et al.*, 2011). Although, for now, this plant appear to be casual (reproduces sporadically without maintaining stable populations or maintaining a small population beyond the area where it was introduced), this status can be changed by any phenomenon that stimulates the rapid increase in its distribution, triggering the process of biological invasion. This stimulus can be a natural disturbance such as the adaptation of a disperser of seeds or a pollinator, a fire or a disturbance caused by human activities (MARCHANTE *et al.*, 2014). For this reason, it should be implemented a monitoring program in order to evaluate the progress of the population of this species.

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## The four *Rubus* species of the archipelago of Madeira (Portugal)

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With 12 figures

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**ABSTRACT:** Field work and investigation of herbarium specimens of Madeiran brambles were carried out in the years 2014 to 2016. The studies revealed that the *Rubus* flora of Madeira consists of four species: (1) *Rubus serrae* Soldano, (2) *Rubus suspiciosus* Menezes, (3) *Rubus vahlii* Frid., and (4) *Rubus ulmifolius* Schott. Species 1, 2 and 3 are endemic to Madeira.

In contrary to earlier statements, *R. bollei* Focke does not occur in Madeira.

**Keywords:** *Rubus*, Rosaceae, brambles, Madeira.

**RESUMO:** Os silvados da Madeira foram estudados, entre 2014 e 2016, através de trabalhos de campo e de análise de espécimes herborizados. Estes estudos revelaram que o género *Rubus* na Madeira encontra-se representado por quatro espécies: (1) *Rubus serrae* Soldano, (2) *Rubus suspiciosus* Menezes, (3) *Rubus vahlii* Frid., e (4) *Rubus ulmifolius* Schott. As espécies 1, 2 e 3 são endémicas da ilha da Madeira.

Contrariamente ao que se pensava, *Rubus bollei* Focke não ocorre na Madeira.

**Palavras-chave:** *Rubus*, Rosaceae, silvados, Madeira.



## INTRODUCTION

During previous periods of floristic recording the genus *Rubus* in Madeira was registered rather incidentally. Earlier botanists did often not adhere to the requirements of proper *Rubus* sampling (sections of this year's shoots with fully developed leaves, plus a representative inflorescence). The worries about thickness of herbarium specimens misled to cut lateral twigs and young leaves, what made determination difficult. Hence the knowledge about taxonomy and distribution of this genus in the island was not satisfactory.

A typification of the Macaronesian brambles was published 16 years ago (MATZKE-HAJEK, 2001). At that time field studies by the author had been carried out in the Canary Islands and Azores, while samples from the Madeiran archipelago were studied mainly on the base of herbarium material.

In the meantime we took several opportunities to do more detailed observations in Madeira and to gather better material of formerly doubtful *taxa*. We also tried to trace and search historical type localities. On this base we come to new results, especially concerning the identity of *taxa* which were formerly included in *Rubus bollei* Focke.

In the following chapters we illustrate the wild Madeiran *Rubus* species with photos of living plants and we give descriptions of those that have to be discriminated from *Rubus bollei*.

Determination characters are highlighted in an identification key. Lists of herbarium specimens allow a first assessment of the distribution. The localities are given in the order of three zones (north slope, central ridge, south slope), and within these zones from west to east. Nineteenth century specimens, which lack information on their exact provenance, are mentioned at the end of the respective chapters. Public herbaria are quoted with their acronyms following *Index Herbariorum* (THIERS, 2006). The first author's private herbarium is abbreviated as GMH.

## RESULTS

### 1. *Rubus serrae* Soldano (= *R. grandifolius* Lowe, nom. illeg.) (Figs. 1-4)

Morphology, taxonomy and nomenclature of *R. serrae* were treated in MATZKE-HAJEK (2001) and must not be repeated here. The description however did not cover the whole variability. For example the frequency of glandular setae on the main stems may vary from none to more than

10 per cm stem side (Fig. 1). Plants growing in moist and shaded situations usually have more setae and less prickles, sometimes there are no stem prickles at all. The ability to climb several meters into trees is then due to the hooked prickles on the petiolules. These plants often have very big leaves, with broad obovate leaflets and a delicate lamina. They resemble *Rubus palmensis* Hansen, an endemic of the western Canary Islands. The latter can be distinguished from *R. serrae* by the rareness of glandular setae in the inflorescence. It has no glandular bristles on the sepals and usually only subsessile glands on the pedicels.

*R. serrae* is ecologically the most demanding bramble of Madeira. It is confined to woodland ecosystems, but not necessarily to intact laurisilva. As many brambles, it reaches full vitality in clearings, large treefall gaps, power line lanes and on north-exposed forest edges. A plant community with dominant *Rubus serrae* was recently described as *Diplazio caudati-Rubetum serrae* by VICENTE ORELLANA *et al.* (2016). On Madeira's southern slope, we found the species only above 500 m *a.s.l.*, and preferably in valleys with high humidity. On the northern slope, where fog and rainfall are frequent, it was observed down to about 250 m *a.s.l.*; maximum altitude is reached in the mountains, between Achada do Teixeira and Pico Ruivo, at about 1.600 m *a.s.l.*

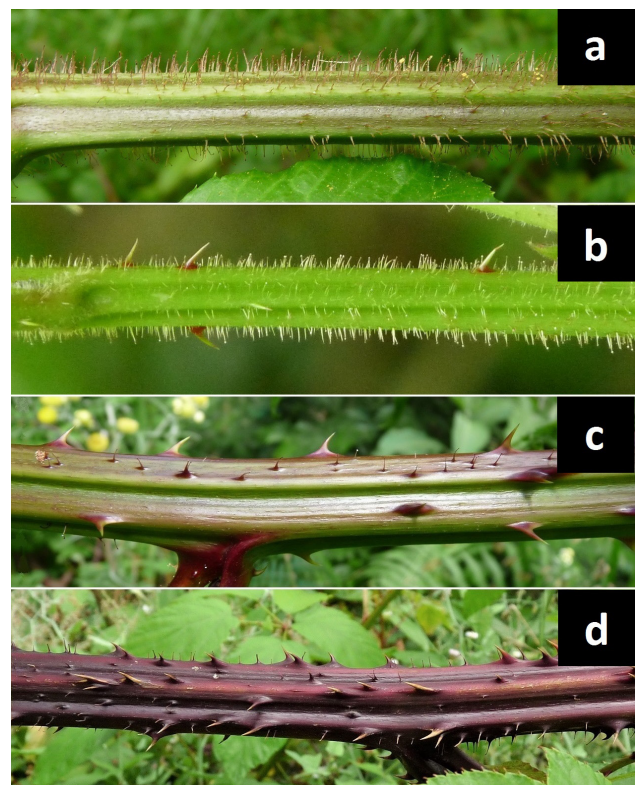
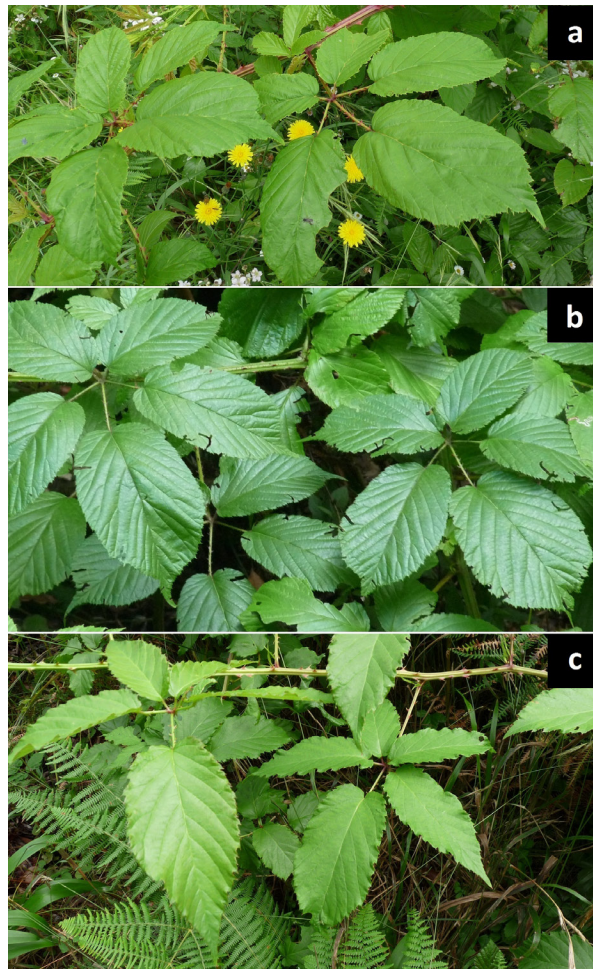


Fig. 1 – Variability of stems of *Rubus serrae* from shaded and humid (a) to fully sunny (d).



**Fig. 2** – Variability of leaves of *Rubus serrae*: (a) fully developed leaves from sunny locality; (b) fully developed leaves from shaded, humid locality; (c) leaves of side branch.



**Fig. 3** – Inflorescence of *Rubus serrae*.



**Fig. 4** – Detail of *Rubus serrae* inflorescence. Take notice of stalked glands.



The lectotype of *Rubus grandifolius* Lowe

Lowe's description of 1831 is only a few lines long. It refers to characters of the main stem, the leaves and the inflorescence. Pedicels and sepals exhibit the best determination features. Unfortunately the inflorescence which is mounted on the preliminary lectotype sheet was collected 15 years after the publication and does not belong to the 1827 gathering, which is represented only by untypical thin axis section with young leaves (MATZKE-HAJEK, 2001). These fragments were probably cut from a lateral branch or from the base of an inflorescence. This may explain why the leaf proportions do not correspond to those mentioned in Lowe's description. The length of the petiolules of the terminal leaflets, for example, measure 19,5-28,5% of the lamina length, on the lateral leaflets they are even shorter (12-20% of the lamina length). Compared to other bramble leaves, the petiolules should be characterized as "short", but in the protologue it reads "*foliolis ... longe petiolulatis*". Doubts about the identity usually are dispelled if a population still exists in the lectotype locality and can be studied there, but our endeavour to refind Lowe's plant was of no avail. The ravine west of Alegria (today an outer northern quarter of Funchal), where he collected the plant in 1827, has changed a lot during the last century. Extensive stands of *Eucalyptus globulus* Labill. have replaced the indigenous laurisilva and altered the environmental conditions. The understorey is locally dominated by *Acacia mearnsii* De Wild. and *Solanum mauritanum* Scop.. Scattered *Rubus* populations are more or less confined to the artificial embankments of forest roads.

Therefore we searched for better herbarium material that was collected and labelled by Lowe before his first publication (LOWE, 1831). Fortunately in P (Muséum national d'Histoire naturelle, Paris, France) a more complete specimen could be traced, which encloses a panicle with the characteristic glandular setae. While the preliminary lectotype was only labelled "*R. pedatus*" – a manuscript name, applied by Banks and Solander as mentioned in the protologue –, the specimen P 03134634 bears also the published epithet "*grandifolius*" in Lowe's handwriting. The unambiguous and complete specimen (P 03134634) supersedes the questionable and fragmentary gathering ("Madeira, ravine W of the Alegria" – K) as lectotype. This substitution does not have any nomenclatural consequences, quite in contrary, it secures a solid taxonomic base.

## Studied material

## Herbarium vouchers:

Lombo Barbinhas, Seixal, leg. M. Nóbrega, 3.IX.1957, MADJ 00464, 00465. – Entre o Seixal e São Vicente: margens abruptas da ribeira da Fajã da Eira, leg. Eng. Beliz & R. Santos, 8.VI.1957, MADJ 05175. – Terceira Lombada de Ponta Delgada, no nebrida as..., leg. Nóbrega, 28.IV.1987, MADJ 05179. – Boaventura, leg. ?, IV.1955, MADJ 00466. – Pico do Arco near Boaventura, leg. Matzke-Hajek, 17.VI.2016, Herb. GMH 20160617.1. – Forest road southwest Achada da Felpa, southwest of Sao Jorge, leg. Matzke-Hajek, 17.VI.2016, Herb. GMH 20160617.2. – Vereda da Bica da Cana ao Lombo do Mouro (Paúl da Serra), leg. et det. Juan Silva, 26.VI.2008 MADM 1006, 1007. – Encumeada - Levada between 1<sup>st</sup> and 2<sup>nd</sup> tunnel, leg. et det. Günther Maul, 18.VII.1971, MADM 1063, 1064, 1068, 1069. – Half way between Encumeada Pass and Vargem, left hand of the E228 (32° 45' 46" N 17° 01' 20.5" W), leg. Matzke-Hajek, 10.X.2014, Herb. GMH 20141010.3. – Half way between Encumeada Pass and Vargem, right hand of the E228 (32° 45' 47" N 17° 01' 20" W), leg. Matzke-Hajek, 10.X.2014, Herb. GMH 20141010.4. – 1 km north of Encumeada Pass, next to the E228, leg. Matzke-Hajek, 16.VI.2016, Herb. GMH 20160616.5. – Casa Florestal da Encumeada, Vereda para a Rib.<sup>a</sup> Grande S. Vicente; leg. Nóbrega, Noia, Eng.<sup>a</sup> Glória, Rui Santos e Isidoro, 14.X.1981, det. Nóbrega, MADJ 05178. – Footpath from Encumeada pass to Pico Topeiro, leg. Matzke-Hajek, 07.VI.2015, Herb. Matzke-Hajek 20150607.1. – Forest path to *Eucalyptus* plantation south of Encumeada, leg. Matzke-Hajek, 07.VI.2015, Herb. GMH 20150607.2 and 3. – Levada das Queimadas entre Casas e Caldeirão Verde onde há um caminho que passa abaixo da levada, leg. Günther Maul 5.IV.1964, MADM 1065. – Na Levada do Montado da Ilha para as Queimadas, leg. Eng. R. Vieira & R. Santos, 7.VI.1962, det. Armando Sardinha, MADJ 05182. – Achada do Teixeira - vereda para o Pico Ruivo, leg. Paulo Gouveia, 2.X.2002, MADJ 10.006 – Cova da Roda, leg. Eng. Rui Vieira, 14.5.1958, det. Armando Sardinha, MADJ 05181. – Ribeira da Metade, leg. G. Mandon, Pl. Maderenses no. 99, 15.V.1865 or 1866, P 04342649. – *In sepibus et ad rivulos*, Ribero da Metade, Jardim da Serra, 1000-1500 m, leg. G. Mandon, Pl. Maderenses no. 99, V-IX.1865 or 1866, P 03134641, P 03134642, P 03134648. – Levada Ribeiro Frio - Balcões, leg. Fontinha & R. Jardim, 2.V.1997, MADJ 08618. – *In sepibus*, Ribero Frio, 1500 m, leg. G. Mandon, Pl. Maderenses, 25.VI.1865, P 03134635, P 03134647. – Ribeiro Frio, 900 *m.s.m.*, leg.

et det. J. Bornmüller No. 582, 10.VIII.1900, P 03134643. – Ribeiro Frio, leg. Menezes *sine dat.*, COI 00075212. – Levada northeast Ribeiro Frio, leg. Matzke-Hajek, 08.X.2014, Herb. GMH 20141008.5, 20141008.6. – Levada Moinho north of Ponta do Sol, leg. Matzke-Hajek, 10.VI.2015, Herb. GMH 20150610.4. – Madeira, left hand of the road from Jardim da Serra to Boca da Corrida (32° 42' 18,5" N 16° 59' 12" W), leg. Matzke-Hajek, 20.VI.2016, Herb. GMH 20160620.3. – At the Jardim, leg. R. T. Lowe 391 [or 396?] *Rubus grandifolius* Lowe (pedatus), 27.VII.1827, P 03134634. – Jardim da Serra, bords des ruisseaux dans les hayes, leg. G. Mandon, VII-X, P 03134646. – Ribeira de Sta. Luzia, 1100 *m.s.m.*, leg. et det. J. Bornmüller, *Plantae exsicc. Maderenses* Nr. 583, VIII.1900, P 03134638, P 03134639. – Ilha da Madeira: Rib.<sup>a</sup> de Sta. Luzia, leg. C. d'A. Menezes, 1903, COI 00075211. – Ribeira de Sta. Luzia, leg. C. Menezes, 1906, COI 00075213. – Rib.<sup>a</sup> de Sta. Luzia, leg. C. Menezes, 1906, COI 00075214. – Ribeira de Santa Luzia west of Monte, north of the quarry, leg. Matzke-Hajek, 08.VI.2015, Herb. GMH 20150608.2. – Levada da Serra, leg. M. Nóbrega, VI.1954, "Rubus bollei ulmifolius?" MADJ 00450, 00451. – Ile de Madere, leg. M. Webb, *sine dat.* [1828?], P 03134650. – Madera, leg. Webb, *sine dat.* [1828?], P 03134652. – Madeira, leg. N. H. Mason, 1856, "Rubus fruticosus", P 03134527, P 03134651. – Madere, leg. M. Mason No 166A, 1857, P 03134636, P 03133640. – Madere, leg. M. Mason No 168, 1857, "R. fruticosus", P 03134637. – *sine loc. et dat.*, leg. G. Mandon, *Pl. Maderenses*, P 03134645. – *sine loc.*, leg. G. Mandon, *Pl. Maderenses* no. 99, 1865-1866, P 04342682.

## 2. Does *Rubus bollei* Focke grow in Madeira?

The first citation of *Rubus bollei*<sup>a)</sup> for Madeira, was published by the Danish geographer and botanist Martin Vahl (1869-1946) in his monograph on Madeira's plant cover (VAHL, 1904). The determination was conducted by his compatriot pharmacist Kristian Friderichsen (1853-1932), to whom Vahl had sent some of his *Rubus* specimens collected in 1901/1902. Short time later, FRIDERICHSEN (1905)

published details: Vahl's indication was based on a single "very uncomplete specimen", consisting of one leaf and a rather poor inflorescence, gathered by Vahl on 26.VII.1902 at St. Anna. In his paper of 1910, Menezes quoted this locality and added a second one given by Vahl: "Levada da Fajã dos Vinháticos".

Friderichsen's findings became adopted subsequently by other botanists and were integrated into checklists of the Macaronesian flora.

Earlier own results about the Madeiran bramble flora based on a broad species concept. It was assumed that sexually reproducing *Rubus* species usually have a greater variability than apomicts. Under this general condition three Madeiran taxa were regarded as heterotypic synonyms (MATZKE-HAJEK & WEBER, 1999; MATZKE-HAJEK, 2001) under the oldest legitimate name, *Rubus bollei*.

Our recent observations revealed, that the *R. bollei*-like plants from Madeira have their own specific characters. It is appropriate not to include them into *R. bollei*. In fact, they represent two separate species, both different from *R. bollei*: *R. suspiciosus* Menezes and *R. vahlii* Frid.; *Rubus bollei* is thus absent from Madeira.

## 3. *Rubus suspiciosus* Menezes (Figs. 5-8)

### General description

Stem: 8-22 mm in diameter, dark purple, conspicuously glossy, slightly sulcate with five rounded ridges (Fig. 5), without any glandular hairs or setae, glabrous or with very scattered small tufted hairs. Prickles 5-15 per 5 cm, ca. 6-10 mm long, with broad base, slightly inclined, straight or scarcely curved. Leaves: with 5 (exceptionally with 7) leaflets, digitate to subpedate, not coriaceous as in *R. bollei*, upper surface glabrous and often shiny (Fig. 6), underside usually with a thin layer of light grey stellate hairs (Fig. 7b), but almost glabrous in shaded stands (Fig. 7a); longer simple hairs absent. Length of terminal petiolule (25-) 36-53 (-60)% of length of terminal lamina. Lamina of terminal leaflet from a rounded or slightly heart-shaped base ovate, broad elliptical to broad obovate, often elongated with almost parallel sides, 90-135 mm long and 40-78 mm wide, with a 6-13 mm long cuspidate apex. Serration sometimes fine and even, sometimes the front margin (just next to the leaf tip) more coarse, 1,5-2,5 (-5) mm deep. Petiole (much) longer than length of lower lateral leaflets, with 9-28 strongly hooked, broad based -6 mm long prickles. Stipules 2-3 mm wide. Inflorescences: voluminous, broadly conical (Fig. 8). Basal part of main

<sup>a)</sup> The Canarian *Rubus bollei* was named by Focke (1887) after German naturalist Carl August Bolle (1821-1909). There are two other brambles with similar names which must not be confused with it:

<sup>(1)</sup> *Rubus bollae* Sabransky 1886, *Oesterr. Bot. Zeitschr.* 36: 289, is a bramble from western Slovakia that was named after Slovakian naturalist Johannes Bolla de Csáford-Jobbaháza (1806-1881).

<sup>(2)</sup> *Rubus ernesti-bollii* E. H. L. Krause 1886, *Ber. Deutsch. Bot. Ges.* 4: 80 (1886), was named in honor of the German naturalist and geographer Ernst Boll (1817-1886). It is a heterotypic synonym of *R. plicatus* W. & N.



panicle axis dark reddish or purple brown, glossy, with few sessile glands, but only with inconspicuous hairs, per 5 cm with 4-8 broad based, curved, 3-6 mm long prickles. Topmost 20-30 cm usually leafless but more densely hairy; 3- or 5- nate leaves with long elliptical terminal leaflets and fine serration. Stellate hairs of underside often forming a whitish thin layer contrasting to the light brown veins. Pedicels densely hairy, with many (up to 20) small prickles of different size (0,5-2,5 mm long), sepals greyish green, not elongated, often with few very minute prickles, reflexed during and after flowering; petals broadly obovate, white or very light pink only when opening, filaments white, styles light green, anthers, carpels and receptacle glabrous.



Fig. 5 – *Rubus suspiciosus* stems are glossy.



Fig. 6 – Typical stem and leaves of *Rubus suspiciosus*.

Diagnostic field characters: the combination of glandless panicles, glossy stems and leaves with broad based, elongated, often tongue-shaped lateral leaflets is unique in the Madeiran *Rubus* flora. Colour and hairiness of leaf undersides depends much on microclimate (especially on humidity and light conditions) of the locality. Plants from shaded humid places have glabrous leaves (Fig. 7a), while those from sunny and dryer habitats may have dense stellate hairs, that give the leaf undersides a whitish appearance (Fig. 7b) like in members of European series *Discolores*. These plants were often determined as *R. bollei* in the past. We consider it as a good species with unknown derivation. Indeed it resembles the Canarian *R. bollei*, but it differs from it by its delicate, never leathery leaves with a less fine serration and by stronger prickles on the petioles and petiolules. MENEZES (1910) described *R. suspiciosus* as a hybrid between *Rubus bollei* and *R. ulmifolius*, later he changed his interpretation to a hybrid of *Rubus vahlii* and *R. ulmifolius* (MENEZES, 1914). The name *R. suspiciosus* has not really been in use since. Actually we have never seen any herbarium specimens – except for the type – that were identified correctly. The only published photo we know is that in VICENTE ORELLANA *et al.* (2016, p. 193, fig. 4A as *R. bollei*).

The distribution in Madeira is still very insufficiently known. We found it in medium altitudes preferably on the southern and western slope of the island. The observed minimum elevation was 60 m *a.s.l.* at the Ribeira da Ponta do Sol, the maximum was 880 m *a.s.l.* north of Monte.

Interestingly this *taxon* is represented in the herbarium of Linnaeus (LINN number 653.8) with an undated voucher, labelled as "*Rubus fruticosus*" and the source "Madera". This specimen has a 7-nate leaf with the typical strongly hooked prickles of the petiole. WATSON (1958, p. 24) erroneously regarded it as the nomenclatural type of *Rubus fruticosus* L. designated by SMITH (1824, p. 399), but he confused numbers 653.5 and 653.8. Moreover sheet no. 653.8 was not in Linnaeus' herbarium in 1753 when the name *Rubus fruticosus* was published and therefore cannot serve as the lectotype. Most probably it was collected by Francis Masson in or after 1776, when Masson visited Madeira and started sending plants to Linnaeus father and son (FRANCISCO-ORTEGA *et al.*, 2008). A possible provenance of the plant is Monte above Funchal, where a population of plants with 7- nate leaves is still to be found. The type locality of *R. suspiciosus*, "Fonte da Telha" above Monte, is better known today as "Terreiro da Luta" (32° 41' 03" N 16° 53' 56" W). The *Rubus* flora near the Fonte consists mainly of *R. vahlii*, but *Rubus suspiciosus* is still growing a few hundred meters west and southwest of this place.





**Fig. 7** – Underside of *Rubus suspiciosus* leaves may be glabrous (a) or white-felted (b).



**Fig. 8** – Inflorescence of *Rubus suspiciosus*.



## Studied material

## Herbarium vouchers:

Sant'anna, leg. C. Menezes, 1906, "Rubus vahlii Fried.", COI 00075208, COI 00075209. – Sant'Anna, leg. C. Menezes, 1906, "Rubus vahlii Friederichs. ( $\beta$  estremalis characteribus)", COI 00075208, COI 00075210. – Fayal by roadside, close above the Ch[urc]h, leg. Lowe, 11.III.1861, "879. *Rubus discolor* W. & N.", K. – Forest road east of Portela (32° 44' 50" N 16° 49' 22" W), leg. Matzke-Hajek, 18.VI.2016, Herb. GMH 20160618.3. – Between Lombo do Coelho and Lombo da Velha next to road from Prazeres to Raposeira, leg. Matzke-Hajek, 16.VI.2016, Herb. GMH 20160616.3, 20160616.4. – Levada Nova east of Prazeres, 0,9 km northeast of Estacada, leg. Matzke-Hajek, 09.VI.2015, Herb. GMH 20150609.3. – Lombo dos Moinhos between Calheta and Prazeres, leg. Matzke-Hajek, 16.VI.2016, Herb. GMH 20160616.1. – Road turn of ER222 at the Ribeira San Bartolomeu west of Estrela, leg. Matzke-Hajek, 09.VI.2015, Herb. GMH 20150609.2. – Ribeira San Bartolomeu west of Estrela, north of Calheta, leg. Matzke-Hajek, 09.VI.2015, Herb. GMH 20150609.1. – Road turn of ER 222 at the Ribeira da Madalena north of Madalena do Mar, leg. Matzke-Hajek, 09.VI.2015, Herb. GMH 20150609.1. – Levada Nova northeast of Lombada do Ponta do Sol, leg. Matzke-Hajek, 10.VI.2015, Herb. GMH 20150610.5. – Between Quinta Grande and Jardim da Serra: Lombo do Pau Branco (32° 40' 80,6" N 16° 55' 37,5" W), leg. Matzke-Hajek, 08.VI.2015, Herb. GMH 20150608.1. – Forest road in ravine west of Alegria (32° 40' 80,6" N 16° 55' 37,5" W), leg. Matzke-Hajek, 08.VI.2015, Herb. GMH 20150608.1. – Forest road in ravine west of Alegria, leg. Matzke-Hajek, 12.VI.2015, Herb. GMH 20150612.1. – Ribeira de Santa Luzia west of Monte, north of the quarry, leg. Matzke-Hajek, 8.VI.2015, Herb. GMH 20150608.3. – Caminho do Arrebentão, leg. C. Menezes, VII.1909, "Rubus ulmifolius Schott var. nutritus Mnzs.", COI 00075217. – Caminho do Arrebentão, leg. C. Menezes, VIII.1909, "Rubus suspiciosus Mnzs. (*R. ulmifolius* x *Bollei*)", COI 00075215. – Madeira, ten n van Monte, in bos langs weg ER 201, leg. K. Meijer, 22.VIII.2005, HFN 3375. – Madeira: Monte, leg. C. Menezes, 1906, "Rubus ulmifolius Schott", COI 00075220. – Monte, Caminho das Lajinhas, above the junction into the Caminho do Monte (32° 40' 07" N 16° 59' 59,5" W), leg. Matzke-Hajek, 12.VI.2015, Herb. GMH 20150612.2. – Levada da Bom Sucesso southeast of Monte, leg. Matzke-Hajek, 8.VI.2015, Herb. GMH 20150608.4. – Rib.a de João Gomez, leg. C. Menezes, VII.1914, "Rubus

ulmifolius Schott ssp. rusticanus (Merc.) var. nutritus Mnzs." LISU P41848, LISU P41850. – Madera, [leg. Masson? sine dat.], Herb LINN 653.8. – Madera, leg. Webb [1828?], P 03134526 – Madera, V.1957, "R. ulmifolius ssp. rusticanus var. communis Mnzs.", MADJ 00456.

4. *Rubus vahlii* Frid. (Figs. 9-11)

## General description

**Stem:** 6-12 mm in diameter, dull purple, glabrous, sulcate, without glandular hairs or setae (Fig. 9). Prickles 3-8 per 5 cm, ca. 5-9 mm long, with broad base, slightly inclined and curved. **Leaves:** with 5 slightly convex leaflets, digitate to subpedate, sometimes imbricate, upper surface glabrous or with very few simple hairs near margin, underside green or greyish green, rarely light grey, short hairs slightly palpable. Length of terminal petiolule 30-45% of length of lamina. Lamina of terminal leaflet usually from a rounded base broad obovate, 85-120 mm long and 55-75 mm wide, with a 6-16 mm long cuspidate apex. Leaf margin conspicuously crenulate, biserrate with the main teeth sometimes retrorse, 1,5-3 mm deep. Leaf stalk longer than length of lower leaflets, with 7-12 bent and slightly curved, -6 mm long prickles. Stipules filiform or lineal, 1-1,5 mm wide. **Inflorescences:** voluminous, broadly conical, often with loose thin peduncles. Basal part of main axis dull greyish purple, with dense short tufted hairs, never glossy, with broad based, curved, 3-6 mm long prickles. Topmost 10 to 20 cm usually leafless but more densely hairy; leaves simple, 3- or 5- nate leaves with biserrate leaflets. Stellate hairs of underside often forming a light grey layer. Pedicels densely hairy, 0-8 slender prickles, 1,5-3,5 mm long, sepals light greyish green, loosely reflexed during and after flowering, petals obovate, white or very light pink when opening, filaments white, styles light green, anthers glabrous, young carpels hairy, receptacle slightly hairy.



Fig. 9 – Stems of *Rubus vahlii* are dull.





**Fig. 10** – Typical stem and leaves of *Rubus vahlii*. Take notice of crenulate margin.



**Fig. 11** – Inflorescence of *Rubus vahlii*.



**Fig. 12** – *Rubus ulmifolius*: (a) pruinose stem with leaves; (b) inflorescence with pink flowers.



Diagnostic field characters: The terminal leaflets are constantly broad obovate (Fig. 10); on the living plant, they are convex and have a crenulate margin with somewhat fringed teeth. Without consideration of the apex, the lamina of fully developed terminal leaflets is sometimes almost as wide as long. Colour and hairiness of leaf undersides can vary from green and almost glabrous to light grey and densely felted with stellate hairs. Panicles are very broad with sometimes extremely loose lateral branches and thin peduncles (Fig. 11).

Distribution: Endemic. *R. vahlii* is by far the most frequent bramble in Madeira, found in all elevations. It was first described by LOWE (1868) under the illegitimate name *Rubus concolor* (MATZKE-HAJEK, 2001).

#### Studied material

#### Herbarium vouchers:

Porto Moniz, leg. ?, VI.1922, "Rubus ulmifolius ssp. rusticanus var. concolor Lowe", MADJ 00457. – Porto Moniz, leg. ?, VII.1922, "Rubus bollei x ulmifolius var. concolor Lowe", MADJ 00458, 00459. – Santa - Porto Moniz, leg. ?, *sine dat.*, "R. ulmifolius Schott ssp. rusticanus var. nutritus Mnzs.", MADJ 00461. – Santa - Porto Moniz, leg. ?, *sine dat.*, "R. bollei Focke", MADJ 00452. – Roche das Vinhas, Santana, leg. *et det.* L. Carvalho & M. Sequeira, 21.V.2004, "Rubus ulmifolius Schott", MADJ 10.534. – Lombo do Risco, leg. K. Meijer, 25.VIII.2005, HFN 3388, 3389. – Rabaçal, langs voetpad, leg. K. Meijer, 25.VIII.2005, HFN 3390. – Voetpad naar Rabaçal, wegrand, leg. K. Meijer, 25.VIII.2005, HFN 3392. – Rabaçal region, Levada da Ribeira Grande, at about 1300 m NN, leg. Wolfgang & Rosemarie Jäger, 6.I.2015, Herb. GMH Jä S 03/15. – Road from ER 110 to Rabaçal northwest Urze (plateau of Paul da Serra), leg. Matzke-Hajek, 06.VI.2015, Herb. GMH 20150606.1. – Next to road ER 209 between Barreiro and Cristo Rei, 950 m, leg. Matzke-Hajek, 06.VI.2015, Herb. GMH 20150606.1. – Central Fajã da Nogueira, langs wegrand, riviértje, leg. K. Meijer, 23.VIII.2005, HFN 3380, 3381, 3383. – Pico do Ariero, langs voetpad, leg. K. Meijer, 24.VIII.2005, HFN 3385, 3386. – Ribeira Metade, leg. Matzke-Hajek, 13.X.2014, Herb. GMH 20141013.1, 20141013.2. – Ribeiro Frio, leg. K. Meijer, 23.VIII.2005, HFN 3379. – Ribeiro Frio, paved ramp below the pisciculture, leg. Wolfgang & Rosemarie Jäger, 3.I.2015, Herb. GMH Jä S 01/15. – Langs weg naar Portela, leg. K. Meijer, 26.VIII.2005, HFN 3393. – Forest road 0,5 km east of Portela (32° 44' 44,5" N 16° 49' 15,8" W), leg. Matzke-Hajek, 18.VI.2016, Herb. GMH 20160618.2. – Levada Nova

northeast of Lombada do Ponta do Sol, leg. Matzke-Hajek, 10.VI.2015, Herb. GMH 20150610.1, 20150610.2. – Northeast of Ribeira Brava: Levada Nova, just before the tunnel between Ribeira da Tabua and Corujeira, at about 420 m NN, leg. Wolfgang & Rosemarie Jäger, 4.I.2015, Herb. GMH Jä S 02/15. – *In dumetosis*, Jardim da Serra, 1200-1300 m, leg. G. Mandon, VII-IX, Pl. Maderenses, 1865-1866 100. "Rubus discolor Weihe et Nees; Lowe Man 847.", P03134535, P04172201. – Arrebentões, leg. C. Menezes, VIII.1914, "Rubus ulmifolius Schott subsp. rusticanus (Merc.) var. concolor (Lowe)", LISU P41845, LISU P41843, LISU P41847. – Fonte da Telha, leg. C. Menezes, VIII.1914, "Rubus vahlii, K. Frid." LISU P41841, LISU P41842. – Arrebentões, leg. C. Menezes, VIII.1914, "Rubus ulmifolius Schott subsp. rusticanus (Merc.) var. concolor (Lowe)" LISU P41846. – Arrebentão, leg. C. Menezes, VIII.1914, "Rubus ullmifolius Schott subsp. rusticanus (Merc.) var. concolor (Lowe)" LISU P41844. – Fonte da Telha = Caminho dos Pretos (ER 201) next to Terreiro da Luta (32° 41' 03" N 16° 53' 56" W), leg. Matzke-Hajek, 20.VI.2016, Herb. GMH 20160620.2. – Ten n van Monte, in bos langs weg, leg. K. Meijer, 22.VIII.2005, HFN 3376, 3377. – Ten n van Monte, in bosrand, langs weg ER 201, leg. K. Meijer, 22.VIII.2005, HFN 3378. – Quinta do Palheiro, leg. Eng. Beliz & R. Santos, 1.VI.1957, det. Armando Sardinha: "R. ulmifolius var. communis Mnzs./Rubus inermis Pourr.", MADJ 05183.

#### 5. *Rubus ulmifolius* Schott (Fig. 12)

The taxonomy of *R. ulmifolius* has been studied in detail by MONASTERIO-HUELIN & WEBER (1996), hence we restrict the portrait to two representative photos (Fig. 12a, b) and abstain from an elaborate description. *Rubus ulmifolius* is recognized as an invasive plant, growing worldwide in oceanic-subtropical vegetation, particularly in man-made habitats. Its distribution in Europe was outlined by KURTTO *et al.* (2010). In Madeira, the xerotolerant *R. ulmifolius* is a frequent plant especially in lowland hedgerows, along road banks, walls and human settlements. In small numbers it grows also in less influenced vegetation and higher altitudes. We collected only very few specimens.

#### Studied material

#### Herbarium vouchers:

Porto Moniz, leg. VI.1922, "Rubus ulmifolius Schott ssp. rusticanus (Merc.) var. communis Mnzs", MADJ 00453. – Levada Nova north of Lombada do Ponta do Sol, leg.

## 6. Identification key for Madeiran *Rubus* species

Stem characters must be checked in the middle segment of this year's main stems (not side branches!), preferably on plants from open sites. Leaf characters must be checked on differentiated 5-nate leaves from the middle of this year's stems. Please look for leaves from open sites (wood margins, clearings), not from the shade.

1. Pedicels and sepals with (dense) glandular setae (Fig. 4) ----- ***serrae***.  
Pedicels and sepals without glandular setae (check on more than 5 flowers in the whole inflorescence, not only on one!) ----- 2.
2. Main stems pruinose (Fig. 12a), greyish lilac or densely covered with minute stellate hairs, terminal leaflets of 5-nate leaves usually less than 8 cm long, inflorescences narrow and cylindrical, flowers deep pink or light magenta (Fig. 12b) ----  
----- ***ulmifolius***.  
Main stems either glabrous and glossy or dull, but not pruinose or greyish from a dense cover of stellar hairs, terminal leaflets more than 8 cm long, inflorescences very broad conical with long peduncles at least at base, flowers white (only petals of freshly opening flower buds may be light pink) ----- 3.
3. Young carpels glabrous, main stems glabrous and glossy (Fig. 5), lateral leaflets of 5-nate leaves with rounded or slightly cordate base, leaf margin  $\pm$ flat (Fig. 6), prickles of petioles strongly hooked, so that yellow prickle tips point backwards parallel to petiole ----- ***suspiciosus***.  
Young carpels hairy, main stems dull (Fig. 9), lateral leaflets of 5-nate leaves with cuneate base, leaf margin conspicuously crenulate (Fig. 10) with main teeth pointing downwards, prickles of petioles bent and curved, but usually not strongly hooked, yellow prickle tips point diagonally backwards, but not parallel to petiole ----- ***vahliei***.

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## Brachiopods collected from Madeira, off Selvagem Grande Island, (NE Atlantic Ocean) by remotely operated vehicle "Luso" during the year 2010

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With 1 figure and 3 plates

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**ABSTRACT:** Brachiopods collected from the Selvagens Islands are important elements of the biodiversity developed in this well delimited portion of the eastern Atlantic. Species from deep water are not easily accessible and the use of a remotely operated vehicle was an exceptional opportunity for investigating the brachiopod fauna of the mid-part of the slope in the Madeira Archipelago. Among the material collected (6 species), the terebratulid *Acrobelesia cooperi* (D' Hondt, 1976) is recorded for the first time from the Selvagens.

**Keywords:** Brachiopoda, Salvage Islands (Selvagens), Madeira Archipelago, bathyal zone.

**RESUMO:** Os Braquiópodes colhidos nas Ilhas Selvagens são componentes importantes da biodiversidade que caracteriza esta parte bem delimitada do oceano Atlântico oriental. As espécies profundas raramente são colhidas e a utilização de um veículo operado remotamente foi uma oportunidade excepcional para observar os braquiópodes do andar batial da região da Madeira. Das 6 espécies colhidas, o terebratulídeo *Acrobelesia cooperi* (D' Hondt, 1976) é assinalado pela primeira vez para as Selvagens.

**Palavras-chave:** Brachiopoda, Selvagens, arquipélago da Madeira, batial.

## INTRODUCTION

Few brachiopods from the area of Madeira were collected in the 19<sup>th</sup> century firstly by the expedition of the “Challenger” (DAVIDSON, 1880) and then by the research cruises of the “Talisman” and the “Travailleur” during the years 1880-1883. The brachiopods collected by these last vessels have been studied by FISCHER & OEHLERT (1891). The Madeira Archipelago has also been investigated by the mission of the French ship “Jean Charcot” in 1966 (see LOGAN, 1983). However the Salvage Islands (Selvagens) were never specifically visited by these expeditions. The most recent explorations in this area were the CANCAP-I (1976) and the CANCAP-III (1978) expeditions. Brachiopods collected from these cruises were more diversified and were studied extensively by LOGAN (1983). During these missions, the Salvage Islands were visited in nine collecting stations (see LOGAN, 1983, fig. 3, p. 167) and only four brachiopod species were discovered: *Eucalthis tuberata* (Jeffreys, 1878), *Megathiris detruncata* (Gmelin, 1791), *Leptothyrella incerta* (Davidson, 1880) and *Pajaudina atlantica* Logan, 1988.

The Portuguese mission (EMEPC/M@rBis/Selvagens 2010) with the remotely operated vehicle (ROV) “LUSO” was thus a very useful occasion to investigate once again this quite isolated and rarely visited archipelago.

## MATERIAL AND METHODS

Sediment samples were collected during the 2010 oceanographic campaign EMEPC/M@rBis/Selvagens2010 of the Portuguese Task Group for the Extension of the Continental Shelf (EMEPC) to the Selvagens Islands, Madeira Archipelago (Portugal) (Fig. 1), using the suction sampler of the ROV “LUSO”, on board the research vessel N. R. P. “Almirante Gago Coutinho”. All samples are from deep water around Selvagem Grande and were collected on 23 June 2010. Sediments from six stations were sieved in order to obtain the specimens mentioned in the present account.

Specimens are deposited in the collections of the Museu Nacional de História Natural e da Ciência (muhnac), Lisbon, Portugal.

## RESULTS

Phylum Brachiopoda Duméril, 1806  
 Subphylum Craniiformea Popov *et al.*, 1993  
 Class Craniata Williams *et al.*, 1996  
 Order Craniida Waagen, 1885

Superfamily Cranioidea Menke, 1828  
 Family Craniidae Menke, 1828  
 Genus *Novocrania* Lee & Brunton, 2001

*Novocrania anomala* (Müller, 1776)

Material examined: M@rBis\_002601 – One fragment of dorsal valve, Station L10 D06S4, 23 June 2010, 30° 06' 36.100 N / 15° 54' 98.032 W, depth: 669 m. This quite common species in shallow water is represented here only by a fragment, which could be transported material.

Subphylum Rhynchonelliformea Williams *et al.*, 1996

Class Rhynchonellata Williams *et al.*, 1996

Order Thecideida Elliott, 1958

Superfamily Thecideoidea Gray, 1840

Family Thecideidae Gray, 1840

Subfamily Lacazellinae Backhaus, 1959

Genus *Pajaudina* Logan, 1988

*Pajaudina atlantica* Logan, 1988

Material examined: M@rBis\_002596 – One strongly abraded specimen, Station L10 D06 S1. 23 June 2010, 30° 06' 25.707 N / 15° 55' 00.864 W, depth: 700.39 m.

Remarks: Only one specimen has been found and it is strongly worn due to a quite long transport producing erosion of the shell. Bio-erosion (bacterial) is also observed. The brachidium and the hemispondylium are preserved allowing the determination.

Order Terebratulida Waagen, 1883

Suborder Terebratulidina Waagen, 1883

Superfamily Terebratuloidea Gray, 1840

Family Terebratulidae Gray, 1840

Subfamily Aenigmathyridinae Cooper, 1983

Genus *Acrobelesia* Cooper, 1983

*Acrobelesia cooperi* (D' Hondt, 1976)

(Plate 1, Figs. 1a-d)

Material examined: M@rBis\_002592 – Two fragments of ventral valves, Station L10 D06 B4A4, 23 June 2010, 30° 06' 25.516 N / 15° 55' 08.51 W, depth: 652.92 m; M@rBis\_002603 – Two specimens, Station L10 D06 S1, 23 June 2010, 30° 06' 25.707 N / 15° 55' 00.864 W, depth: 700.39 m; M@rBis\_002598 – Four fragments of ventral valve, Station L10 D06S2, 23 June 2010, 30° 06' 25.306 N / 15° 55' 00.636 W, depth: 700.39 m; M@rBis\_002605 – Three fragments of ventral valve, 1 abraded dorsal valve, Station L10 D06S4, 23

June 2010, 30° 06' 36.100 N / 15° 54' 98.032 W, depth: 669 m.

Remarks: Shell equibiconvex, subpentagonal in dorsal outline with a relatively truncate anterior commissure. Lateral commissure straight and anterior commissure rectimarginate. External surface of the shell with numerous, step-like, regular growth lines. Radial short capillae are visible at high magnification.

Beak pointed, triangular in dorsal view, suberect with discrete pustulose ornamentation on its lateral parts. Foramen large, subcircular, submesothyrid with disjunct deltidial plates. Pedicle collar narrow and excavate. Inner socket ridges strong. Outer hinge plates small, concave dorsally. Inner hinge plates absent. Cardinal process very small. Crura relatively thick and straight. Crural processes blunt. Brachidium with very short dyscoliid loop. Descending branches narrow and very small transverse band directed dorsally with small anterior point.

One specimen was drilled probably by a naticid mollusk. Most specimens are fragments of ventral valves.

Superfamily Cancellothyridoidea Thomson, 1926

Family Chlidonophoridae Muir-Wood, 1959

Subfamily Eucalathinae Muir-Wood, 1965

Genre *Eucalathis* Fischer & Oehlert, 1890

*Eucalathis tuberata* (Jeffreys, 1878)

(Plate 2, Figs. 1a-f)

Material examined: M@rBis\_002602 – Two specimens. Station L10 D06 S1. 23 June 2010, 30° 06' 25.707 N / 15° 55' 00.864 W, depth: 700.39 m; M@rBis\_002599 – One specimen, Station L10 D06S2. 23 June 2010, (30° 06' 25.306 N / 15° 55' 00.636 W, depth: 700.39 m.

Remarks: Shell ventribiconvex, subtriangular in outline, clearly auriculate in outline. Lateral commissure straight. Anterior commissure nearly rectimarginate. Shell surface of both valves costate with strong tubercles. Beak short, suberect. Foramen hypothyrud with wide triangular disjunct deltidial plates. Pedicle collar developed.

Inner socket ridges narrow with thick crural bases directly developed from them. Free crural processes long and pointed. Loop chlidonophorid with small transverse band dorsally directed (broken in the specimen collected here). One specimen is drilled by a naticid mollusk.

Suborder Terebratulidina Muir-Wood, 1955

Superfamily Platidioidea Thomson, 1927

Family Platidiidae Thomson, 1927

Subfamily Phaneroporinae Zezina, 1981

Genus *Leptothyrella* Muir-Wood, 1965

*Leptothyrella incerta* (Davidson, 1880)

(Plate 3, Figs. 1a-d, 2a-c)

Material examined: M@rBis\_002607 – Four articulated specimens) and one ventral valve, Station L10 D06 B1A10 23 June 2010, 30° 06' 25.516 N / 15° 55' 08.51 W, depth: 600.39 m; M@rBis\_002597 – Nine specimens, Station L10 D06 S1, 23 June 2010, 30° 06' 25.707 N / 15° 55' 00.864 W, depth: 700.39 m; M@rBis\_002600 – Four specimens, Station L10 D06S2, 23 June 2010, 30° 06' 25.306 N / 15° 55' 00.636 W, depth: 700.39 m; M@rBis\_002604 – Five specimens (1 collected living, attached to the substrate), Station L10 D06 S3, 23 June 2010, 30° 06' 27.166 N / 15° 55' 00.267 W, depth: 695 m; M@rBis\_002591 – Six specimens, Station L10 D06S4, 23 June 2010, 30° 06' 36.100 N / 15° 54' 98.032 W, depth: 669 m.

Remarks: Shell droplike in outline with pointed triangular beak devoid of tubercles on its lateral parts. Lateral commissure straight. Anterior commissure rectimarginate. The slightly ventribiconvex shell is quite thin, smooth except for several distinct growth lines. Beak suberect with hypothyrud triangular foramen limited by long, narrow, triangular, disjunct deltidial plates. Pedicle collar short. Small dental plates present. Cardinal process and hinge plates absent. Long crura with short and blunt crural processes. Developed narrow descending branches fused with a narrow, high, septal pillar.

Most specimens collected are empty shells, which are often drilled by muricid mollusks.

Superfamily Kraussinoidea Dall, 1870

Family Kraussinidae Dall, 1870

Subfamily Megerliinae Hiller, MacKinnon & Nkielsen, 2008

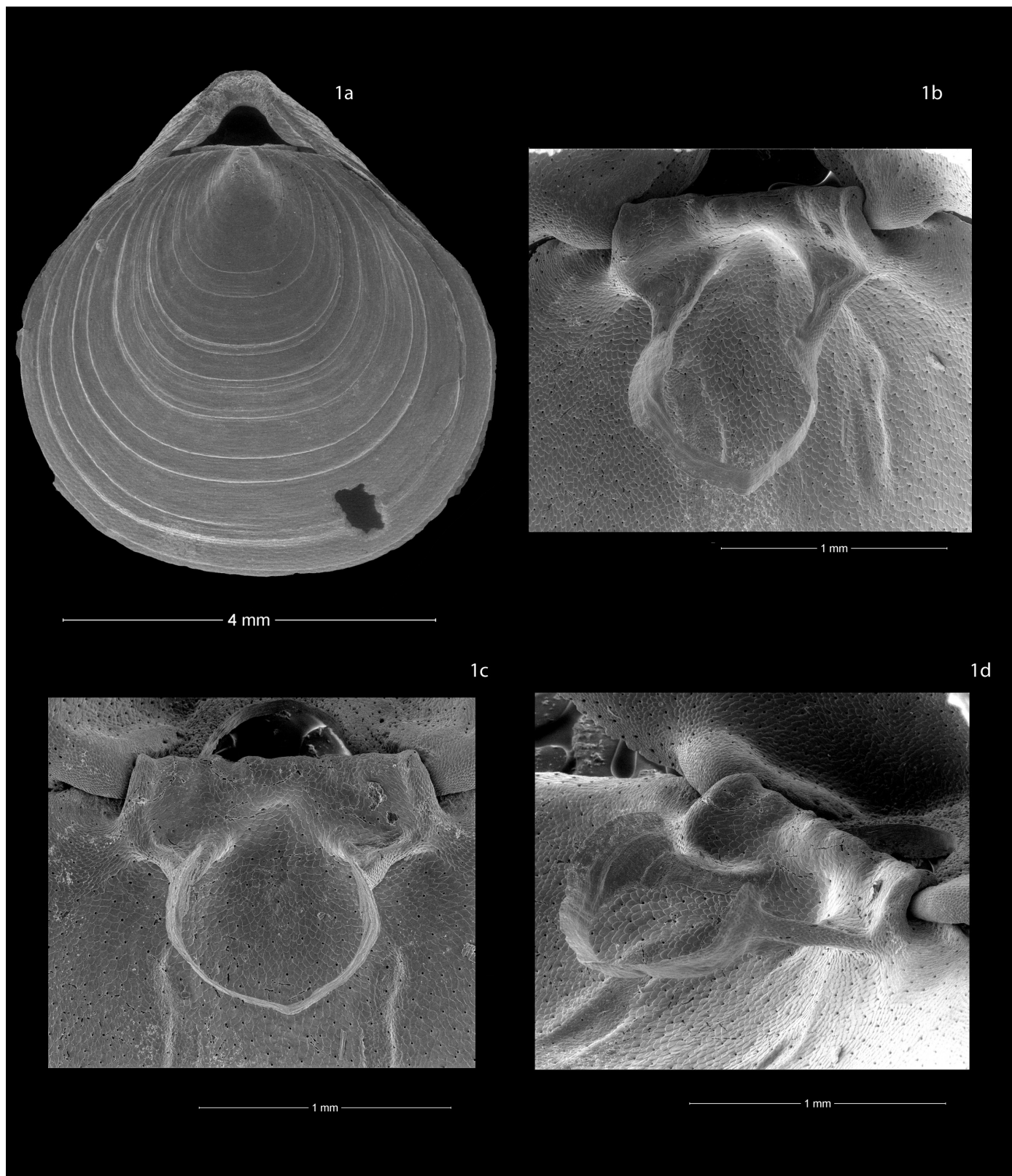
Genre *Megerlia* King, 1850

*Megerlia cf. echinata* (Fischer & Oehlert, 1890)

Material examined: M@rBis\_002606 – One juvenile with loop, Station L10 D06 B1A10. 23 June 2010, 30° 06' 25.516 N / 15° 55' 08.51 W, depth: 600.39 m; M@rBis\_002593 – One eroded dorsal valve, Station L10 D06 B4A4, 23 June 2010, 30° 06' 25.516 N / 15° 55' 08.51 W, depth: 652.92 m; M@rBis\_002594 – Two juveniles, Station L10 D06S4, 23 June 2010, 30° 06' 36.100 N / 15° 54' 98.032 W, depth: 669 m.

Remarks: The material collected is quite scarce and does not allow a more precise identification. The specimens are early juveniles (except one abraded adult dorsal valve) and they have a smooth dorsal valve and a very spiny ventral valve. The spines are distributed on the whole surface of the shell, a character visible on the type specimen of FISCHER & OEHLERT (1890). A smooth adult eroded dorsal valve show a smooth surface with lamellose growth lines.





**Plate 1** – *Acrobelesia cooperi* (D' Hondt, 1976), a rarely observed terebratulid brachiopod typical from the deep water fauna of Madeira. Collected by the Remotely Operated Vehicle “Luso” near Selvagens Islands: Station L10D06S1\_5. 30° 06' 25.707 N / 15° 55' 00.864 W; depth: 700.39 m. 23 June 2010. Specimen with damaged ventral valve, but complete preserved brachidium. [M@rBis\_002603].

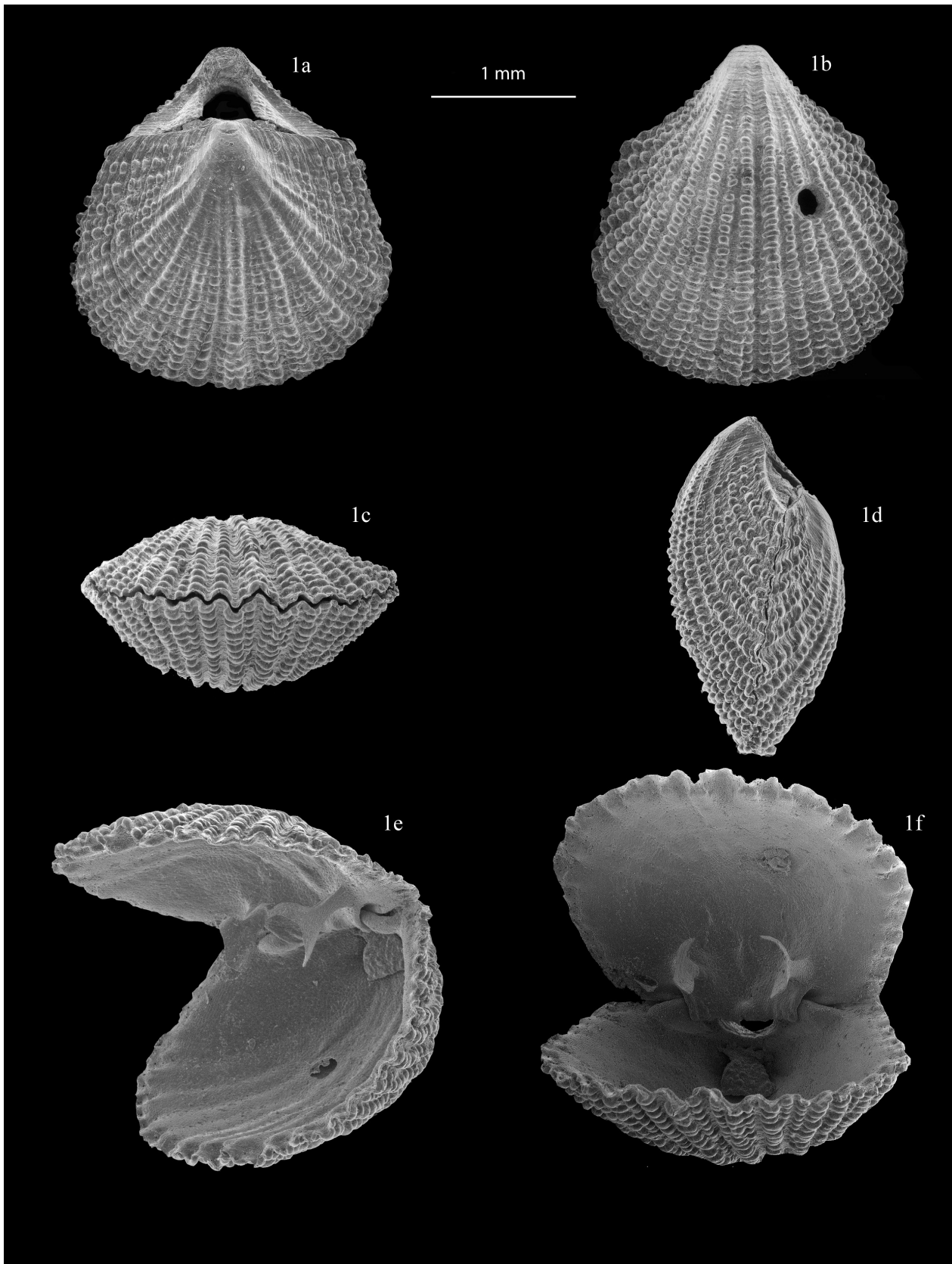
**Fig. 1a** – Specimen in dorsal view showing the triangular beak with rounded tip, the wide disjunct deltidial plates, the short pedicle collar and the numerous step-like growth lines on the shell surface.

**Fig. 1b** – Complete characteristic dyscoliid brachidium in ventral view. Note the blunt crural processes and the poor development of the cardinal process.

**Fig. 1c** – Brachidium observed in anterior view showing the extremely short transverse band. The internal view of pedicle collar in the ventral valve is clearly visible.

**Fig. 1d** – Brachidium in oblique lateral view. The straight crura relatively thick are visible with their blunt crural process.





**Plate 2** – *Eucalathis tuberala* (Jeffreys, 1878). A deep water Cancellothyridoid brachiopod collected by the Remotely Operated Vehicle “Luso” off Selvagens Islands. Station L10D06 51\_4. 23 June 2010. 30° 06′ 25.707 N / 15° 55′ 00.864 W; depth: 700.39 m. (M@rBis\_002602).

**Fig. 1a** – Dorsal view.

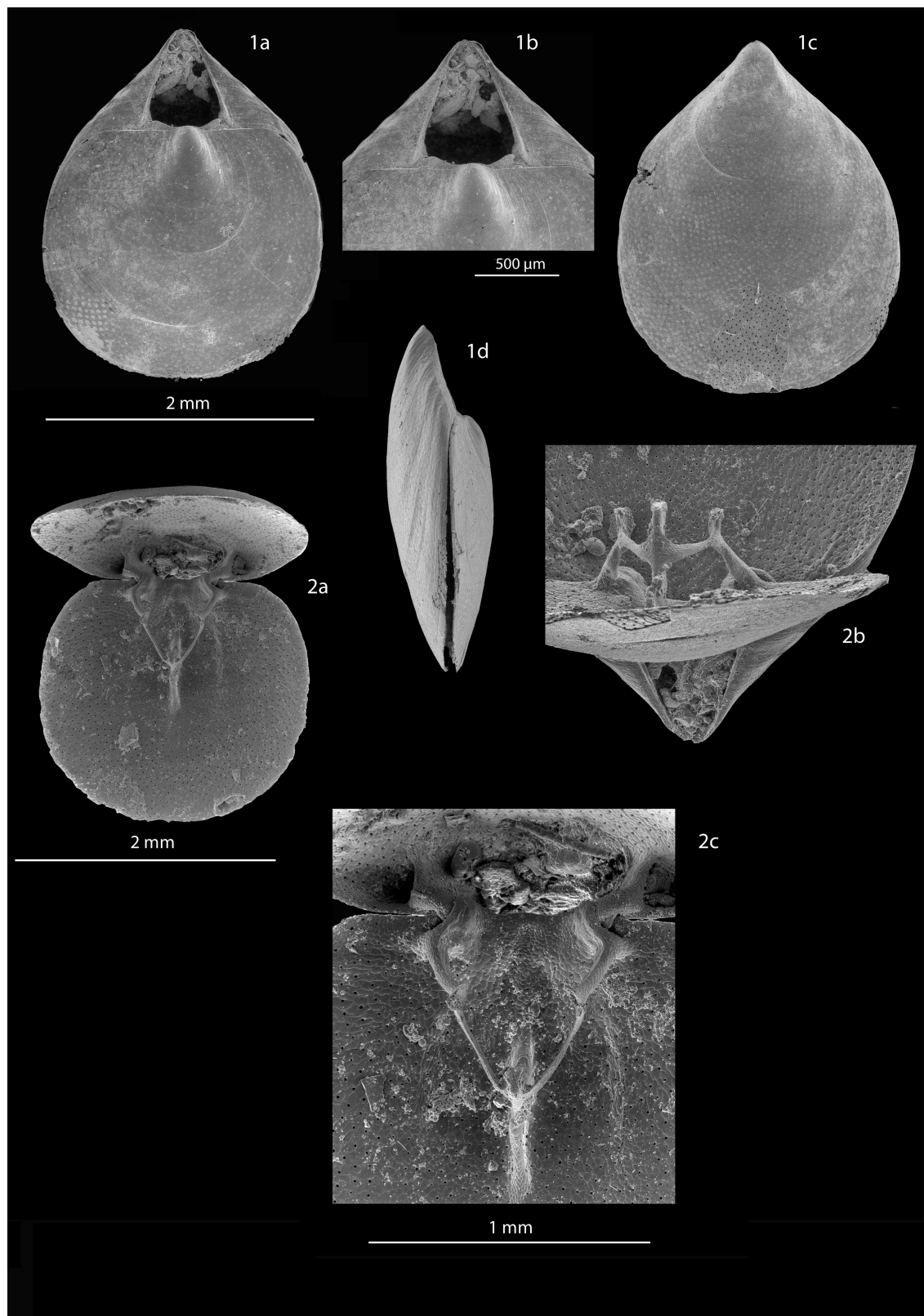
**Fig. 1b** – Ventral view.

**Fig. 1c** – Anterior view.

**Fig. 1d** – Lateral view.

**Fig. 1e** – Opened shell with enlarged lateral view of the brachidium.

**Fig. 1f** – Opened shell with enlarged anterior of the brachidium (transverse band broken).



**Plate 3** – *Leptothyrella incerta* (Davidson, 1880). Collected by the Remotely Operated Vehicle “Luso” off Selvagens Islands, Station L10D06B1A10\_2. 23 June 2010. 30° 06′ 25.516 N / 15° 55′ 08.51 W; depth: 600.39 m. (M@rBis\_002607).

**Fig. 1a** – Dorsal view.

**Fig. 1b** – Detailed of the beak and foramen in dorsal view.

**Fig. 1c** – Ventral view.

**Fig. 1d** – Lateral view.

**Fig. 2** – Opened shell with complete brachidium.

**Fig. 2a** – Dorsal view.

**Fig. 2b** – Oblique anterior view (scale bar as in Fig. 2c).

**Fig. 2c** – Detailed dorsal view.

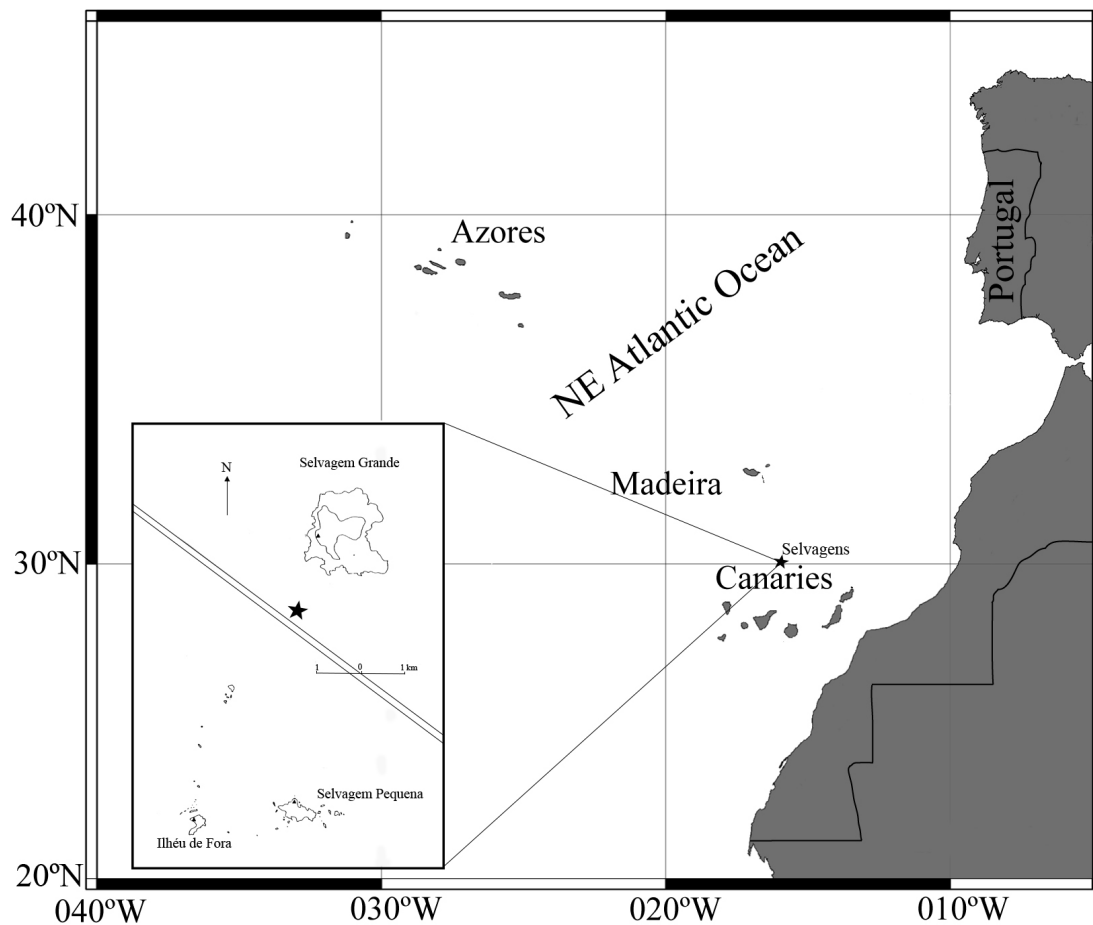


Fig. 1 – The Selvagens Islands in the NE Atlantic Ocean where the specimens were collected in 2010.

## DISCUSSION

The material studied does not include new species of brachiopods. However *Acrobelesia cooperi* is found for the first time in the Madeira Archipelago. This species was already observed in the Canary Islands during the CANCAP-II expedition (1977). *Eucalathis tuberata* and *Leptothyrella incerta* are already known from Canary Islands and from Madeira since the CANCAP II (1977) and CANCAP III (1978) expeditions (see LOGAN, 1983).

All these brachiopods are characteristic of deep water environment in Northeastern Atlantic waters. According to LOGAN (2007), *A. cooperi* has a depth range from 330 to 1000 m, *E. tuberata* from 330 to 2995 m and *L. incerta* from 335 to 5300 m. *Megerlia echinata* (*sensu stricto*) should be considered as a deep water species too (400–1970 m), but a revision of the *Megerlia* species is needed for clearing the real status of *M. echinata*. The Atlantic *M. echinata* described by ATKINS (1961) should be precisely compared with the type material collected in the Western

Sahara, off Cape Boujdour (named before “Cape Bojador”) and a phylogenetic study is also needed (see also ÁLVAREZ *et al.*, 2016).

*Pajaudina atlantica* is not a deep-water species (LOGAN, 2007). This genus and species were erected by LOGAN (1988) for material collected in the Canary Islands. Dead shells from the Salvagem islands, collected during the CANCAP-III expedition (1978; 350–400 m) and previously identified as *Lacazella mediterranea* by LOGAN (1983) are in fact representatives of *Pajaudina atlantica*. This indicates that the fauna of the Salvagem Islands is more in interaction with the Canarian Archipelago fauna than those of the Madeira area.

Collected living specimens are infrequent. Only some specimens of *L. incerta* were living when collected. The percentage of dead brachiopod specimens drilled by mollusk predators is very high reaching 50% for instance among the specimens of *L. incerta*. This indicates that the



level of competition between mollusks and brachiopods could be severe in a deep water situation. It is not commonly observed that brachiopods, which often have a heavily spiculated body, are so appreciated as prey by naticids or muricids.

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## A catalogue of the surviving insect collection of the old Funchal Seminary Museum of Natural History

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With 3 figures and 8 tables

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**ABSTRACT:** After a brief description of the history of the Funchal Seminary Museum and its collections between 1882 and 2015, the authors describe in detail the entomological collection that survived to the present day. A considerable effort is directed at the attempt to associate specimens deposited in the collection with local or foreign entomologists known to have visited the archipelago on those dates. A thorough analysis at the collection's content shows a total of 610 species (1797 specimens) distributed by the orders Coleoptera (70%), Diptera (11%), Hymenoptera (8%), Heteroptera (7%) and Lepidoptera (4%). The number of families, genera and species accounted for each Order is presented. The last and most extensive part of the work consists of an annotated checklist with all the species present in the collection, its synonymy, specimens, associated data and registration number in the current collection at the Madeira Botanical Garden. The following species are new additions to Madeira Archipelago and Selvagens Islands: the beetles *Attagenus unicolor* (Brahm), *Dermestes lardarius* (L.), *Dermestes maculatus* De Geer and *Alphitobius diaperinus* Kugel and the stinkbug *Brachynema cinctum* (F.). Additionally, the endemic bee *Andrena maderensis* Cockrell is a novelty to the Deserta Grande Island.

**Keywords:** Madeira, Selvagens, Desertas, Ernesto João Schmitz, Madeira Botanical Garden.



**RESUMO:** Após uma breve apresentação do histórico museu e das suas coleções entre 1882 e 2015, os autores descrevem em detalhe a coleção entomológica que sobreviveu até aos nossos dias. Um esforço considerável é dirigido à tentativa de associar os exemplares depositados na coleção a entomólogos locais ou a estrangeiros que se sabe terem visitado o arquipélago nessas datas. Segue-se uma análise completa ao conteúdo da coleção que totaliza 610 espécies (1797 exemplares) distribuídos pelas ordens Coleoptera (70%), Diptera (11%), Hymenoptera (8%), Heteroptera (7%) e Lepidoptera (4%). Cada uma destas Ordens é analisada em relação ao número de famílias, géneros e espécies presentes. A última parte do trabalho e também a mais extensa consiste numa checklist anotada com todas as espécies presentes na coleção, a sua sinonímia, número de exemplares, dados associados e número de registo na coleção atual existente no Jardim Botânico da Madeira. As seguintes espécies constituem citações novas para o arquipélago da Madeira e Ilhas Selvagens: os escaravelhos *Attagenus unicolor* (Brahm), *Dermestes lardarius* (L.), *Dermestes maculatus* De Geer e *Alphitobius diaperinus* Kugel, o percevejo *Brachynema cinctum* (F.); adicionalmente, a abelha endémica *Andrena maderensis* Cockrell constitui uma novidade para a Deserta Grande.

**Palavras-chave:** Madeira, Selvagens, Desertas, Ernesto João Schmitz, Jardim Botânico da Madeira.

## INTRODUCTION

The first museum of natural history in Madeira was founded in 1882 by Father ERNESTO JOÃO SCHMITZ [1845-1922] who was born as JOHAN ERNST SCHMITZ in Germany and came to Funchal in 1874, naturalizing Portuguese. He exercised chaplain functions of Hospice Princess AMELIA and professorship of Natural Sciences in the Diocesan Seminary of Funchal, between 1881 and 1898. He was also vice-rector of the later between 27 Sep. 1881 and 7 June 1908. However, it was as an ornithologist and a versatile naturalist that a large collection of plants, lichens, algae, birds and other vertebrates, fossils, minerals and invertebrates, but mostly insects (SILVA & MENEZES, 1984; SILVA, 2003; ANONYM, 2015a).

In June 1908, Father JAIME GOUVEIA BARRETO [1887-1963] was named director of the Seminary's museum. Almost immediately, the Diocesan Seminary along with the museum collections was moved into the newly built Convento da Encarnação.

In 1910, the overthrown of the monarchy and the subsequent implantation of the Portuguese Republic removed the Convento da Encarnação from the hands of the church to those of the state. As a result, the natural history museum collections were moved and stored for more than a decade at the Episcopal Seminary, but many specimens were severely damaged during the process. In 1921 the collections were again transferred and stored in a house next to the Diocesan Prelate. A few years later in 1927, a decree revoked the state ownership of the Convento da Encarnação and in 1933 the Diocesan Seminary along

with the natural sciences museum, still under the direction of Father JAIME GOUVEIA BARRETO (vice-rector of the Seminary since 1919, and effective rector since 1936, the year he was made a canon (ANONYM, 2015b), was reinstated in the building (SILVA, 2003).

The year of 1974 marks the beginning of another dark episode in the history of the Seminary Museum with the overthrow of the Portuguese dictatorship. In October of the same year, the Convento da Encarnação was forcibly occupied by revolutionary elements (NEPOMUCENO, 2010) and many specimens were destroyed. Soon after, the natural history museum collections were moved and stored in governmental premises. The poor storage conditions resulted in damage of insect collections by termites as well as by subsequent and very aggressive pest control treatments. It was estimated that half of the boxes and their contents were lost (Father MANUEL NÓBREGA, *pers. comm.*, 2013).

In 1979, a protocol was drawn between the Diocese of Funchal and the Regional Government of Madeira resulting in the relocation of the natural history museum collections of the diocese in 1981 at the Botanical Garden of Madeira for safeguard and curation. The collections were stored in the main historical building and a new natural history museum opened doors to the public in 1982 (GOUVEIA, 2011). Most of the collection was not exhibited but kept in stored boxes for purposes of preservation. In 1984, the curation of collections was given to Father MANUEL NÓBREGA [1928-2017] until his retirement in 1998 (ANONYM, 2015c).

## The Entomological Collection

There are no descriptive memories or other documents known to exist on the entomological collection since the creation of the museum by Father SCHMITZ up to the present time. However, the historical archive of the Diocese in Funchal might still hold that missing information that presently is impossible to trace and for this reason it is not possible to precise the size the collection attained in its best days. The remains from the old entomological collection, now deposited at the natural history museum of the Botanical Garden of Madeira includes 11 boxes and one exhibition case with butterflies and moths. The boxes are small (c. 26x19.5 cm) and numbered with roman numerals, *i.e.* I to XII, but box VII is missing. Box XII is totally devoted to the Selvagens Islands. The exhibition case (c. 33.5x55 cm) is dedicated only to Lepidoptera.

The conservation status of the collection is in general very poor, making it impossible to identify a considerable number of specimens / samples. Insides of boxes as well as specimens were covered with a fine dust difficult to remove from the more fragile specimens without causing damage. Many signs of pest damage are also visible but no living or fresh specimens were found. The collection of Diptera among all others is in worst state of preservation with many severely damaged specimens.

## METHODOLOGY

In many cases, we were not able to confirm taxonomical identification at the species level. In such cases, the taxonomical name on the original label was adopted and the up-to-date synonymy was used in the present work.

Each sample (one or more specimens) corresponds to a collection act of a particular species was given a specific collection entry code (JBM-AR-\*\*\*\*). In the checklist species were numbered sequentially in a way that constitutes an independent numbering system from the collection code.

There are a number of specimens of which only the labels remain. Each of these specimens was given an entry code in the collection, and incorporated in the checklist. However, were not accounted for the analysis of the collection content, *i.e.* no. of species and no. of specimens.

Several databases and catalogues were consulted for nomenclatural clarifications, *e.g.* Fauna Europaea (de JONG, Y. *et al.*, 2014), Systema Dipteriorum (PAPE & THOMPSON, 2013), the Catalogue of Palearctic Coleoptera (LÖBL &

SMETANA, 2003-2012) and The Coleoptera of the Savage Islands (STÜBEN, 2015).

Acronyms:

JBM-AR – Arthropod Collection at the Madeira Botanical Garden, Funchal.

ICLAM – Insect Collection at the Madeira Agricultural Laboratory, Camacha.

MHNF – Natural History Museum of Funchal (former Municipal Museum of Funchal).

## Linking specimens to authors

Most specimens in the collection show no additional information besides the name of species, *i.e.* information on collecting authors, dates and places, as well as hosts (whenever applied) is lacking in all specimens of Diptera but one; and in a lesser extent in all specimens of the remaining Orders.

Determination labels are only present in Diptera and show Becker [THEODOR BECKER, 1840-1928] as the determination authority. Such determination work might have been done during his only visit to the island of Madeira in 1904. It was a four week stay during which many samples were collected resulting four years later in the publication of the checklist “Dipteren der Insel Madeira” (BECKER, 1908). In the preface and in addition to his own made collections, BECKER mentioned the small batches of diptera collected and sent to him by BARRETO and SCHMITZ, *i.e.* species numbers 32, 34, 37, 39 and 65. It would be expected that voucher specimens of such species would have been kept in the Seminary collection. In fact, our present work (species no. 452 and 460) lists 2 species from BECKER’S publication (species no. 34 and 65 in BECKER, 1908a). Another interesting note goes to the fact that BECKER’S checklist only reported species from the island of Madeira as the title of the work indicates, and therefore, it can also be assumed with a high degree of certainty that all specimens of Diptera in the Seminary collection with BECKER as det. (no. 409-412, 414-460, 462-469) were collected on the island of Madeira by himself in 1904, except for 2 species collected by SCHMITZ and BARRETO between 1904 and 1908.

Dated specimens in the whole collection, with excludes all Becker’s specimens, cover the period of 1905 to 1908 and 1932 to 1944. Labelling of specimens from the first period was most probably the work of Father SCHMITZ as he was the curator of the museum between 1902 and 1908. As for the second period, labelling might have been done by father JAIME DE GOUVEIA BARRETO as he took over the

curation of the collections from 1908 onward. However, in order to conclude about the authorship of each label in the collection, a comparison needs to be done with documents of proven origin relating with the authors above.

Dated specimens collected in Selvagens, despite of the absence of any information of collecting authorship on the labels, enabled us to establish links between specimens in the Seminary collection with a restricted list of researchers or naturalists that have visited the archipelago during the first half of the twentieth century. The archipelago of Selvagens is represented in the Seminar collection by 179 specimens representing 36 taxa. Of these, 164 specimens are dated but with no mention to collectors and the remaining 15 have no associated data other than place of collection. Dated specimens can be grouped into four sets according to date of collection, namely June-July 1938, August-September 1938, July 1939 and September 1944. Labels of specimens collected on this later date (September 1944) show numbers which probably indicate that they were mentioned in a publication.

The first set of dates, June-July 1938, appears to be related to J. CUSTÓDIO DE MORAIS (1948) professor and director of the Museu Mineralógico e Geológico at the University of Coimbra who visited the Selvagens aboard the hydrographic ship "CARVALHO ARAÚJO" during the summer of 1938 (CUSTÓDIO DE MORAIS, 1948).

The second set of dates, August-September 1938, can be linked to the French entomologist CHARLES ALLUAUD (1861-1949) who is known to have visited Selvagens in 1938 (UYTTENBOOGAART, 1940; BISCOITO, *unpublished data*, 2013). Moreover, UYTTENBOOGAART (1940) that studied part of the insects collected by ALLUAUD mentioned one specimen dated 2 September 1938 and collected by ALLUAUD on Selvagem Grande.

The third set of dates, July 1939, can be linked to the naturalist RONALD LOCKLEY (1903-2000) and GÜNTHER MAUL, the director of the Municipal Museum of Funchal, who visited the Selvagens (LOCKLEY, 1952; DENIS, 1963; BISCOITO, *unpublished data*, 2013) in that particular date. The material collected by LOCKLEY & MAUL deposited in the MMF was studied by ERBER & WHEATER (1987) who mentioned several species collected in Selvagem Grande on July 1939. The Seminary collection contains mostly the same species collected on July 1939 by LOCKLEY and MAUL which indicates that duplicates of specimens at MMF were deposited in the Seminar Museum.

The fourth set of dates, September 1944, could not be traced to any known visit to the archipelago.

## New Records

Species number (Present work):

**207** [*Attagenus unicolor* (Brahm, 1791)] (Madeira);

**209** [*Dermestes lardarius* Linnaeus, 1758] (Madeira);

**210** [*Dermestes maculatus* De Geer, 1774]

(Ilhéu de Fora, Selvagens);

**279** [*Alphitobius diaperinus* Kugel, 1797] (Porto Santo);

**505** [*Brachynema cinctum* (Fabricius, 1775)] (Madeira);

**508** [*Andrena maderensis* Cockerell, 1922] (Deserta Grande).

## Type specimens present in the collection

Specimens of the species no. 424 [*Aphrosylus jucundus* Becker, 1908, JBM-AR-0418] and 437 [*Scatella major* Becker, 1908, JBM-AR-0406] were described by BECKER in 1908. In a first glance, we thought that specimens identified by Becker and held by the Seminary collections could represent types of such species. However, a more careful examination of literature showed us that these species were described based on specimens collected in the Canary Islands (BECKER, 1908b).

Specimens of the species no. 432 of the present work (*Kowarzia haemorroidalis* [Becker, 1908]; JBM-AR-0432) were originally labelled as *Kowarzia amarantha* Becker. However, the species *K. amarantha* [Becker, 1908] was described based on specimens collected in the Canary Islands (BECKER, 1908b) by himself on dates between January and March 1900 and in June 1904. The first collection in the Canary Islands preceded four years the collection on Madeira in April 1904 (BECKER, 1908a). *K. amarantha* was not included in BECKER'S checklist for Madeira produced in 1908a neither in the most up to date catalogue (BORGES *et al.*, 2008) and was considered to be endemic to the Canary Islands (BECKER, 1908b). The only species mentioned in BECKER'S Madeiran catalogue (1908a) is species "no. 36 *Kowarzia haemorroidalis* n. sp." found by the author in the north of the island of Madeira on wet rocks in April 1904. In our opinion, BECKER during his visit to the island of Madeira identified such specimens as belonging to the same species found by himself in the Canary Islands. We must assume that after a more careful examination, BECKER, considered it as a distinct taxon and ended up describing it as a new endemic species for Madeira under the name *K. haemorroidalis* (Becker, 1908a). These facts lead us to consider that specimens presently held at the Seminary collection are forgotten type specimens of *K. haemorroidalis*. A positive identification of such specimens as *K. haemorroidalis* was made by us after examination of



**Table 1** – Box content: insect order, number of species and specimens, and Jardim Botânico da Madeira collection numbers.

Box	Order	No. of species	No. of specimens	JBM Collection no.
I	Coleoptera	64	154	1-66
II	Coleoptera	62	163	67-129
III	Coleoptera	58	149	130-188
IV	Coleoptera	60	171	189-248
V	Coleoptera	55	186	249-304
VI	Coleoptera	54	157	456-510
VIII	Heteroptera	41	104	511-558
IX	Coleoptera	47	101	305-355
X	Hymenoptera	23	102	559-605
X-a	Hymenoptera	23	38	606-620; 652-663
XI	Diptera	61	274	394-455; 648-651
XII	Various Orders	35	158	356-393
Exhibition Case	Lepidoptera	27	40	621-647
<b>TOTAL</b>		<b>610</b>	<b>1797</b>	

the male genitalia against illustrations in VAILLANT (1964; Plate 1, figures c-d) and in WAGNER & STAUDER (1991; Figures 1-25).

Specimens of the species no. 482 of the present work (*Dieuches schmitzi* Reuter 1893, JBM-AR-0529) hold the handwritten label "*Dieuches schmitzi* n. sp." The use of the abbreviation "n. sp." is only understandable if the taxon would have been in the way of being described. Moreover, REUTER (1893) mentioned SCHMITZ as "coll. auctoris", honouring him in the epithet of the new species. This seems to indicate that SCHMITZ' specimens held in the Seminary collection belong to the same sample on which REUTER based his own description of the new species. Therefore, specimens in the Seminary collection are most probably forgotten types of REUTER'S new species.

### A complete analysis of the collection contents

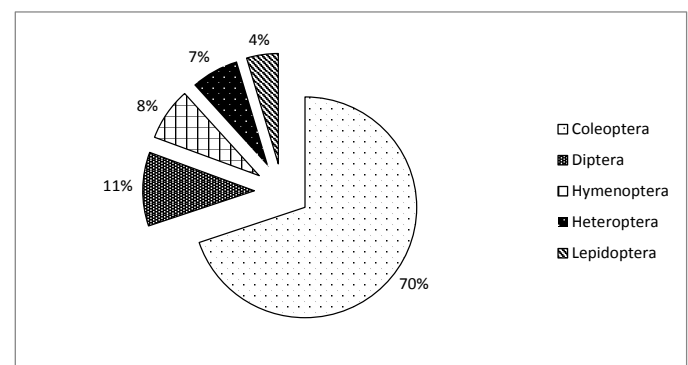
The total number of species inside the boxes and exhibition case amount to 610 in a total of 1,797 specimens (Table 1). The collection includes a specimen of *Pseudoscorpiones* in box XII (JBM-AR-666) not considered in the present catalogue.

The majority of species (426) belong to the Coleoptera and the remaining (184) includes species of Diptera, Heteroptera, Hymenoptera and Lepidoptera in the proportions shown in Fig. 1.

These are the most diverse (in terms of number of species) insect orders (CHAPMAN, 2009). However there are other orders that are present in Madeira and Selvagens that are missing from the collection, *i.e.* *Zygentoma* (silver fishes), Odonata (dragonflies and damselflies), Orthoptera (grasshoppers and katydids), Hemiptera (aphids, psyllids,

whiteflies, coccoids), Thysanoptera (thrips), Siphonaptera (fleas) and other less representative ones.

Although the relative weight of Coleoptera species in the collection reaches 70%, they represent only 42% of the species presently known for the Archipelago of Madeira and Selvagens Islands (Table 2). The number of species from the remaining Orders in the collection is even less representative of the regional insect fauna.

**Fig. 1** – Relative weight of each Order in the collection in terms of number of specimens.**Table 2** – Comparison of collection contents with the most recent up to date knowledge of Madeira and Selvagens insect fauna (BORGES *et al.*, 2008). Absolute and relative values of species numbers within each order over the total number of known species.

Order	Total of species	Species in the collection	%
Coleoptera	1011	426	42
Diptera	550	66	12
Heteroptera	171	43	25
Hymenoptera	611	47	8
Lepidoptera	331	16*	5

\* Although the total number of Lepidoptera species present in the collection is 28, only 16 are likely to have been collected in Madeira.

**Table 3** – The contents of Order Coleoptera in the collection, namely the number of genera, species and specimens per family. In straight brackets numbers reported by BORGES *et al.*, (2008) for the archipelago of Madeira and Selvagens islands.

Box(es)	Family	No. Genera	No. Species	No. Specimens	Island – No. Samples
I,IX,XII	Carabidae	36 [44]	58 [124]	147	M-36, PS-5, D-1, S-7, nd-14
I	Dytiscidae	4 [6]	6 [9]	12	M-2, nd-4
I,II,III,IX,XII	Staphylinidae	48 [85]	76 [207]	191	M-40, PS-1, S-2, nd-36
III	Bothrideridae	1 [1]	1 [2]	2	nd-1
III	Clambidae	1 [1]	1 [1]	1	nd-1
III	Corylophidae	2 [7]	2 [11]	9	M-1, nd-2
III	Cryptophagidae	3 [5]	8 [15]	13	M-1, nd-7
III	Endomychidae	3 [4]	3 [6]	6	nd-3
III	Languriidae	2 [2]	2 [2]	2	nd-2
III	Latridiidae	8 [10]	10 [26]	33	M-2, nd-8
III	Leiodidae	1 [3]	1 [4]	1	nd-1
III	Mycetophagidae	3 [4]	3 [5]	11	M-1, nd-2
III,IV	Nitidulidae	8 [11]	11 [23]	38	M-8, nd-3
III	Phalacridae	2 [2]	2 [6]	13	M-1, nd-1
III	Ptiliidae	3 [4]	2 [15]	6	nd-3
III	Scydmaenidae	1 [4]	1 [8]	2	M-1
IV	Aphodiidae	4 [5]	8 [13]	27	M-3, nd-5
IV	Cerylonidae	1 [2]	1 [3]	4	M-1
IV,V	Cleridae	2 [2]	2 [4]	5	M-2
IV	Dasytidae	1 [1]	1 [1]	4	M-1
IV,IX,XII	Dermestidae	3 [3]	5 [4]	43	M-5, S-4
IV	Dryopidae	1 [1]	1 [1]	7	M-1
IV	Histeridae	5 [11]	6 [17]	17	M-3, nd-3
IV	Hydraenidae	1 [2]	2 [6]	4	M-2
IV	Hydrophilidae	4 [8]	6 [12]	18	M-3, PS-1, nd-2
IV	Laemophloeidae	2 [4]	4 [7]	5	M-4
IV	Malachiidae	1 [2]	2 [8]	3	M-2
IV	Monotomidae	3 [3]	5 [6]	10	M-4, nd-1
IV	Salpingidae	1 [1]	1 [1]	7	M-1
IV	Silvanidae	5 [5]	5 [5]	12	M-5
IV	Trogidae	1 [1]	1 [1]	7	M-1
IV XII	Trogossitidae	2 [3]	2 [3]	4	M-2, S-1
IV	Zopheridae	1 [4]	6 [26]	14	M-6
V,XII	Anobiidae	10 [14]	13 [49]	41	M-9, S-4, nd-2
V	Anthicidae	5 [8]	5 [11]	13	M-1, nd-4
V	Ciidae	3 [3]	3 [5]	13	M-3
V,VI	Curculionidae	39 [72]	54 [183]	163	M-32, D-1, PS-1, S-11, nd-14
V	Lyctidae	1 [1]	1 [1]	4	M-1
V	Meloidae	1 [2]	2 [4]	6	PS-2
V,IX	Oedemeridae	3 [4]	3 [4]	10	M-2, S-1
V	Scraptiidae	1 [1]	1 [2]	6	M-1
V,IX,XII	Tenebrionidae	13 [21]	29 [53]	140	M-16, PS-5, S-18, nd-4
VI	Apionidae	4 [8]	4 [9]	5	M-2, nd-2
VI,IX,XII	Cerambycidae	9 [18]	11 [20]	21	M-4, S-1, nd-6
VI,IX	Chrysomelidae	11 [19]	17 [49]	37	M-9, nd-8
VI	Dryophthoridae	2 [2]	3 [4]	11	M-3
IX	Buprestidae	1 [2]	1 [2]	1	M-1
IX	Coccinellidae	11 [15]	12 [34]	30	M-11, nd-1

M – Madeira, PS – Porto Santo, D – Desertas, S – Selvagens, nd – no data available

**Table 4** – The content of Order Diptera in the collection.

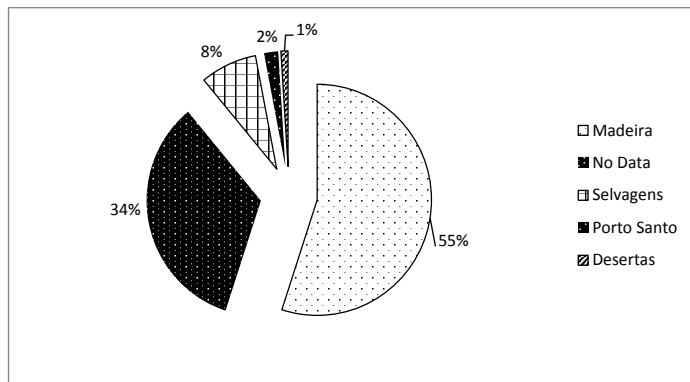
Box(es)	Family	No. Genera	No. Species	No. Specimens	Island – No. Samples
XI	Agromyzidae	2 [9]	3 [25]	9	nd-4
XII	Asilidae	1 [2]	1 [5]	1	S-1
XII	Bombyliidae	1 [2]	1 [2]	1	S-1
XI	Calliphoridae	2 [5]	2 [9]	4	nd-1, S-1
XI	Canacidae	1 [2]	2 [5]	9	nd-2
XI	Chamaemyiidae	2 [2]	2 [2]	5	nd-2
XI	Chloropidae	3 [5]	6 [9]	11	nd-6
XI	Dolichopodidae	4 [10]	5 [17]	28	nd-5
XI	Drosophilidae	1 [5]	1 [26]	4	nd-2
XI	Empididae	1 [2]	1 [6]	8	nd-1
XI	Ephydriidae	5 [14]	8 [22]	35	nd-8
XI	Heleomyzidae	1 [3]	1 [6]	9	nd-1
XI	Lonchoceridae	1 [1]	1 [2]	2	nd-1
XI	Milichiidae	1 [3]	1 [3]	4	nd-1
XI	Muscidae	4 [18]	5 [38]	37	nd-4, S-1
XI	Phoridae	2 [5]	4 [18]	16	nd-4
XI	Piophilidae	1 [2]	1 [2]	4	nd-1
XI	Scatophagidae	1 [1]	1 [2]	7	nd-3
XI	Scenopinidae	1 [1]	1 [2]	1	nd-1
XI	Sciomyzidae	1 [2]	1 [2]	1	nd-1
XI	Sepsidae	1 [2]	2 [5]	8	nd-3
XI	Sphaeroceridae	2 [19]	2 [39]	11	nd-2
XI	Syrphidae	5 [18]	5 [26]	18	nd-5
XI	Tachinidae	2 [12]	2 [13]	11	nd-3
XI	Tephritidae	5 [12]	5 [16]	45	nd-5
XII	Therevidae	1 [1]	1 [2]	1	S-1

S – Selvagens, nd – no data available

**Table 5** – The content of the Suborder Heteroptera.

Box(es)	Family	No. Genera	No. Species	No. Specimens	Island – No. Samples
VIII	Alydidae	1 [2]	1 [2]	3	nd-1
VIII	Anthocoridae	1 [9]	1 [15]	2	nd-1
VIII	Berytidae	1 [2]	1 [3]	1	nd-1
VIII	Cimicidae	1 [1]	1 [1]	3	nd-1
VIII	Coreidae	3 [8]	3 [9]	7	M-1, nd-3
VIII	Cydnidae	1 [4]	1 [6]	5	M-1, nd-1
VIII	Lygaeidae	9 [29]	10 [40]	36	M-1, D-1, S-1, nd-10
VIII	Miridae	6 [23]	6 [39]	12	nd-7
VIII	Nabidae	1 [1]	2 [3]	3	nd-2
VIII	Pentatomidae	8 [10]	8 [16]	21	nd-9
VIII	Reduviidae	3 [7]	3 [9]	12	S-1, nd-3
VIII	Rhopalidae	1 [3]	1 [5]	3	nd-1
VIII	Saldidae	1 [1]	1 [3]	1	nd-1
VIII	Stenocephalidae	1 [1]	1 [2]	3	nd-2
VIII	Veliidae	1 [3]	1 [4]	1	nd-1

M – Madeira, D – Desertas, S – Selvagens, nd – no data available



**Fig. 2** – Percentage of Coleoptera species grouped according to their place of origin based on label information.

## The contents by Order

### I. Coleoptera

The 1,210 studied specimens belong to 48 families, 279 genera and represent 426 species (Table 3). From the data extracted from the labels we can state that more than half of the samples were collected in the island of Madeira proper and much less on other islands including the Selvagens (Fig. 2). It should be stressed that a significant number of samples (34%) do not have any data associated besides the taxon name.

### II. Diptera

The content of Order Diptera in the collection is presented in Table 4 and indicates a total of 290 specimens distributed by 26 families, 53 genera and represent 66 species. Labels, unfortunately for most specimens, show no data other than the name of the taxon but all specimens were identified by Theodor Becker.

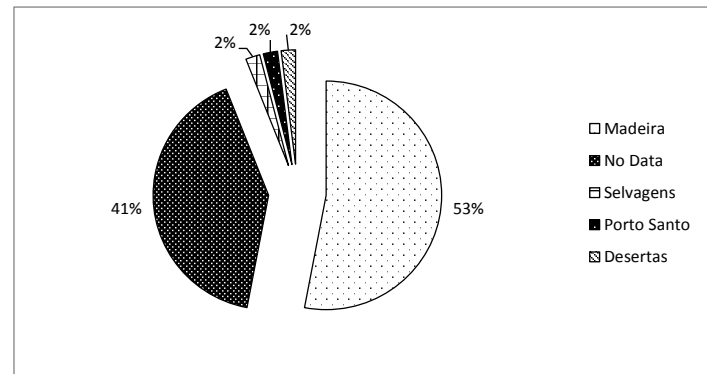
### III. Hemiptera, Suborder Heteroptera

The Heteroptera (Table 5) are represented in the collection by 113 specimens belonging to 15 families, 39 genera and 43 species. There is also a lack of data associated to the specimens of this order. Just a small amount of specimens (12%) has an indication of the place of collecting. The original labels of some species have numbers printed on, which could be related to published data of the same period that could shed some light on the missing information.

### IV. Hymenoptera

The Order Hymenoptera in the collection has 139 specimens distributed by 14 families, 25 genera and represents 29 species (Table 6). Of the specimens referred

above, we were not able to identify 24 in 19 samples due to their poor state of conservation. Most specimens have labels with the place of collecting (64%), those indicating that most sampling was done in the island of Madeira, although, again, a significant amount of specimens (41%) does not have any associated data (Fig. 3).



**Fig. 3** – Percentage of Hymenoptera species grouped according to their place of origin based on label information.

### V. Lepidoptera

There are 31 specimens of native and endemic Lepidoptera in the collection; these belong to 5 families, 15 genera and 16 species. All specimens have no label information about the place of collecting with the exception of one sample with three specimens collected on Selvagens. All specimens belong to species reported to occur in the Archipelago of Madeira except two that occur in islands of Selvagens. Among the specimens there is a pair of the presumed extinct endemic butterfly *Pieris wollastoni* Buttler (Table 7).

The remaining 12 specimens of Lepidoptera, all stored in the exhibition case are species non native to the Archipelago of Madeira or even Macaronesia. These specimens represent 4 families, 9 genera and 12 species (Table 8). Seven of these species are from the Palearctic region (*Aglais io*, *A. urticae*, *Lasiommata megera*, *Apatura ilia*, *Phengaris arion*, *Gonpteryx rhamnii* and *Pieris napi*) and one is Holarctic (*Papilio machaon*) and could have been collected on mainland Portugal or elsewhere within its vast distribution range. The remaining 4 are exotic Neotropical species belonging to family Nymphalidae: *Morpho menelaus* with a large distribution area in South America, *M. helenor achillides* native from Brazil, *M. cipris cipris* from Colombia and Brazil and *Archaeoprepona chalciope* from Brazil and Paraguay.



**Table 6** – The content of the Hymenoptera.

Box(es)	Family	No. Genera	No. Species	No. Specimens	Island – No. Samples
X	Andrenidae	1 [1]	1 [2]	1	D-1
X	Anthophoridae	1 [1]	1 [1]	12	M-1, nd-1
X	Apidae	2 [2]	2 [3]	8	M-3, nd-2
X, XII	Braconidae	2 [53]	2 [119]	3	M-1, S-1
X	Chrysididae	1 [1]	2 [2]	4	M-2
X	Crabronidae	1 [9]	1 [11]	7	M-1, nd-1
X	Formicidae	1 [17]	1 [25]	3	M-1
X	Halictidae	2 [2]	2 [3]	3	M-1, nd-1
X	Ichneumonidae	7 [58]	10 [97]	40	M-15, PS-1, nd-14
X	Siricidae	1 [1]	1 [1]	2	nd-1
X	Sphecidae	2 [2]	2 [3]	8	M-1, nd-1
X	Vespidae	3 [4]	3 [6]	24	M-12, nd-1

M – Madeira, PS – Porto Santo, D – Desertas, S – Selvagens, nd – no data available

**Table 7** – The content of the native Lepidoptera.

Box(es)	Family	No. Genera	No. Species	No. Specimens	Island – No. Samples
Exhibition case	Lycaenidae	2 [3]	2 [3]	6	nd-2
Exhibition case	Nymphalidae	6 [6]	7 [9]	11	nd-7
Exhibition case	Pieridae	3 [4]	3 [5]	8	nd-3
XII	Tineidae	1 [13]	1 [21]	3	S-1
Exhibition case	Noctuidae	3 [43]	3 [62]	3	nd-3

S – Selvagens, nd – no data available

**Table 8** – The content of the non-native Lepidoptera.

Box(es)	Family	No. Genera	No. Species	No. Specimens	Geographic origin
Exhibition case	Lycaenidae	1	1	1	Palearctic
Exhibition case	Nymphalidae	5	8	8	Palearctic, Neotropical
Exhibition case	Papilionidae	1	1	1	Holarctic
Exhibition case	Pieridae	2	2	2	Palearctic

## Annotated Checklist

### Order COLEOPTERA

#### Familiy **Anobiidae**

1. *Anobium punctatum* (De Geer, 1774)

As *Anobium domesticum* Fourc. – Synonym [Funchal, Madeira, 7 specimens; **JBM-AR-0256**]

2. *Clada oromii* Español, 1978

[Selvagem Pequena, 6 specimens (no. 3), September 1944; **JBM-AR-0365**]

There are 6 specimens of this endemic species of the Selvagens, collected in September 1944, more than 3 decades before its formal description. Moreover, ERBER & WHEATER, 1987, mention one specimen held by the Natural History Museum of Funchal collected on 4 June 1957 by MAUL with the catalogue number 11758A. These same authors refer Maul as the first to collect this species. However, specimens held in the Seminary collections indicate that collection of this endemic species had already been done 13 years earlier.

3. *Gibbium psylloides* (Czenpinsky, 1778)

As *Gibbium psylloides* Czn. - Misspelling of species epithet [2 specimens; **JBM-AR-0250**]

4. *Lasioderma serricorne* (Fabricius, 1792)

As *Lasioderma testaceum* Duft. – Synonym [Funchal, Madeira, 1 specimen; **JBM-AR-0260**]

5. *Mezium americanum* (Laporte, 1840)

As *Mezium americanum* Lap [Funchal, Madeira, 1 specimen; **JBM-AR-0252**]

6. *Mezium sulcatum* (Fabricius, 1781)

As *Mezium sulcatum* [Funchal, Madeira, 3 specimens; **JBM-AR-0251**]

7. *Nicobium velatum* (Wollaston, 1854)

As *Anobium velatum* Woll. – Change of combination [Funchal, Madeira, 6 specimens, **JBM-AR-0258**; Selvagem Grande, 2 specimens without id. (no. 10), 16.july.1939, **JBM-AR-0374**]

ERBER & WHEATER, 1987, mention one specimen collected on the 20 October 1939 by MAUL on Selvagem Grande that is held in the collections of the Natural History Museum of Funchal with the catalogue no. 562. The 2 specimens held in the Seminary collection correspond to the same date and they are clearly from the same collector representing the same sample.

8. *Ptilinus pectinicornis* (Linnaeus, 1758)

As *Ptilinus pectinicornis* L. [1♂, 1♀ without further data, **JBM-AR-0259**]

9. *Ptinus latro* Fabricius, 1775

As *Ptinus brunneus* Duft. – Misidentification [Funchal, Madeira, 1 specimen, **JBM-AR-0254**]

10. *Ptinus variegatus* Rossi, 1792

As *Ptinus variegatus* Rossi [Funchal, Madeira, 2 specimens **JBM-AR-0255**]

11. *Sphaericus bicolor* Belles, 1982

[Ilhéu de Fora, Selvagens, 1 specimen, September 1938, **JBM-AR-0377**; Selvagem Pequena, 2 specimens (no. 4), September 1944, **JBM-AR-0376**]

ERBER & WHEATER, 1987, mention this species to be represented in the collection of the Natural History Museum of Funchal by 30 specimens collected on Selvagem Pequena by MAUL on 6-8 April 1968, thirty years later than those held by the Seminar collection.

Specimens held in the Seminary collection dated from September 1938 were most probably collected by CHARLES ALLUAUD (UYTTENBOOGAART, 1940; BISCOITO, *unpublished data*, 2013).

12. *Sphaericus pinguis* (Wollaston, 1854)

As *Sphaericus gibboides* Boiel. – Synonym [Funchal, Madeira, 3 specimens, 1907, **JBM-AR-0253**]

According to ZAHRADNIK (2004) *S. pinguis* is a synonym of *S. gibboides*. However, ERBER & HINTERSEHER (2000) in their revision of genus *Sphaericus* consider the name *S. pinguis* Wollaston to have priority over the name *S. gibboides*.

13. *Stegobium paniceum* (Linnaeus, 1758)

As *Anobium paniceum* L. – Change of combination [Funchal, Madeira, 3 specimens (1 lost) **JBM-AR-0257**]

### Family Anthicidae

14. *Anthelephila pedestris* (Rossi, 1790)

As *Formicomus pedestris* Rossi – Change of combination [3 specimens, without further data, **JBM-AR-0292**]

15. *Anthicus lubbockii* Wollaston, 1857

As *Anthicus lobocki* Woll. - Misspelling of species epithet [Poiso, Madeira, 1 specimen, **JBM-AR-0296**]

16. *Cordicollis instabilis instabilis* (Schmidt, 1842)

As *Anthicus instabilis* Schmidt – Change of combination [2 specimens, without further data, **JBM-AR-0295**]

17. *Hirticollis hispidus* (Rossi, 1792)

As *Anthicus hispidus* Rossi – Change of combination [3 specimens, without further data, **JBM-AR-0294**]

18. *Omonadus floralis* (Linnaeus, 1758)

As *Anthicus floralis* L. – Change of combination [4 specimens, without further data, **JBM-AR-0293**]

### Family Aphodiidae

19. *Aphodius granarius* (Linnaeus, 1767)

As *Aphodius granarius* L. [Funchal, Madeira, 6 specimens, **JBM-AR-0235**]

20. *Aphodius pseudolividus* Balthasar, 1941

As *Aphodius lividus* Ol. – Misidentification [3 specimens, without further data, **JBM-AR-0236**]

21. *Aphodius hydrochaeris* (Fabricius, 1798)

As *Aphodius hidrochoeris* - Misspelling of species epithet [2 specimens, without further data, **JBM-AR-0237**]

22. *Aphodius ghardimaouensis* Balthasar, 1929

As *Aphodius nitidulus* F. – Synonym [Arrebetão, Madeira, 5 specimens, **JBM-AR-0238**]

23. *Ataenius stercorator* (Fabricius, 1775)

As *Ataenius stercorator* F. [Funchal, Madeira, 5 specimens, **JBM-AR-0240**]

24. *Ataenius brevicollis* (Wollaston, 1854)

As *Ataenius brevivollis* Woll. [2 specimens, without further data, **JBM-AR-0241**]



25. *Brindalus maderae* (Pittino, 1983)

As *Psammobius porricollis* Ill. – Misidentification [1 specimen, without further data, **JBM-AR-0246**]

26. *Pleurophorus caesus* (Creutzer, 1796)

As *Pleurophorus caesus* Panz. [Funchal, Madeira, 3 specimens, **JBM-AR-0242**]

### Family **Apionidae**

27. *Apion haematodes* Kirby, 1808

As *Apion haematodes* Kirby – Misidentification [1 specimen, without further data, **JBM-AR-0494**]

28. *Holotrichapion rotundipenne* (Wollaston, 1854)

As *Apion rotundipenne* Woll. – Change of combination [Bom Sucesso, Funchal, Madeira, 1 specimen, February 1908, **JBM-AR-0493**]

29. *Kalcapion semivittatum* (Gyllenhal, 1833)

As *Apion semivittatum* Gyll. – Change of combination [Bom Sucesso, Funchal, Madeira, 1 specimen, **JBM-AR-0492**]

30. *Malvapion malvae* (Fabricius, 1775)

As *Apion malvae* F. – Change of combination [2 specimens, without further data, **JBM-AR-0491**]

### Family **Bothrideridae**

31. *Anommatus duodecimstriatus* (Müller, 1821)

As *Anommatus 12-striatus* Müll. – Synonym [3 specimens, without further data, **JBM-AR-0165**]

### Family **Buprestidae**

32. *Buprestis bertheloti* Laporte & Gory, 1837

[Funchal, Madeira, nas barças da casa Wilson vindas de Canárias, 1 specimen, **JBM-AR-0355**]

This is an endemic species of the Canary Islands. The label of the sole specimen in the collection indicates that it was collected on barges of the Wilson Company from the Canary Islands that arrived in Funchal. This could be the British coaling company Wilson & Ocean Merthy Ltd that had a subsidiary in Las Palmas and business interests in various ports in Africa, South America and Madeira (SUAREZ BÓSA, 2008). This species was never found to be resident in Madeira and should therefore be kept out of the introduced species list.

### Family **Carabidae**

33. *Acupalpus brunnipes* (Sturm, 1825)

As *Stenolophus luridus* – Misidentification [Funchal, Madeira, 1 specimen; without further data, **JBM-AR-0048**]

As *S. luridus* v. *exiguus* – Misidentification [Funchal, Madeira, 2 specimens; without further data, **JBM-AR-0049**]

34. *Acupalpus notatus* Mulsant & Rey, 1861

As *Stenolophus dorsalis* – Misidentification [1 specimen without further data, **JBM-AR-0047**]

35. *Aepus gracilicornis gracilicornis* Wollaston, 1860

As *Aepus gracilicornis* – Synonym [São Vicente, Madeira, 1 specimen, **JBM-AR-0015**]

36. *Agonum marginatum* (Linnaeus, 1758)

As *Platynus marginatus* – Synonym [Porto Moniz, Madeira, 3 specimens, **JBM-AR-0022**]

37. *Amara aenea* (De Geer, 1774)

As *Amara aenea* – [Poiso, Madeira, 7 specimens, **JBM-AR-0038**]

38. *Amara cottyi cottyi* Coquerel, 1859

As *Amara cottyi* Coquerel – Synonym [Selvagens, 1 specimen, **JBM-AR-0342**; Selvagem Grande, 1 specimen without id., 16 July 1939, **JBM-AR-0378**]

ERBER & WHEATER, 1987, mention that in the collection of the Natural History Museum of Funchal there is one specimen collected on Selvagem Grande by MAUL on 20 July 1939 with the catalogue number 511 and identified as *A. cottyi* Coque. The specimen held in the Seminary collection is clearly from the same visit of MAUL to Selvagem Grande but dated differently so we must assume that it belongs to a separate sample.

39. *Anisodactylus binotatus* (Fabricius, 1787)

As *Anisodactylus binotatus* [Arrebentão, Madeira, 4 specimens, **JBM-AR-0044**]

40. *Apotomus chaudoirii* Wollaston, 1860

As *Apotomus rufus* – Misidentification [Funchal, Madeira, 6 specimens, **JBM-AR-0007**]

41. *Bembidion atlanticum atlanticum* Wollaston, 1854

As *Bembidion atlanticum* Wol.- Misspelling of species epithet, synonym [São Vicente, Madeira, 3 specimens, **JBM-AR-0008**]

42. *Bembidion elongatus* (Dejean, 1831)

As *Bembidion elongatum* – Synonym [Funchal, Madeira, 1 specimen, **JBM-AR-0009**]

43. *Bradycellus harpalinus* (Audinet-Serville, 1821)

As *Bradycellus harpalinus* Serv. [Poiso, Madeira, 1 specimen, **JBM-AR-0045**]

44. *Calathus complanatus complanatus* Dejean, 1828

As *Calathus complanatus* Dej. – Synonym [11 specimens without further data, **JBM-AR-0028**]

45. *Calathus complanatus obesus* Colas, 1938

As *Calathus obesus* Fvl. – Synonym [Arrebentão, Madeira, 2 specimens, **JBM-AR-0029**]

46. *Calathus fimbriatus* Wollaston, 1858

As *Calathus fimbriatus* Woll. [Porto Santo, 2 specimens, **JBM-AR-0030**]

47. *Calathus subfuscus* Wollaston, 1865

As *Calathus subfuscus* Woll. [São Vicente, Madeira, 1 specimen, **JBM-AR-0026**]

48. *Calathus vividus* (Fabricius, 1801)

As *Calathus vividus* F. [Rabaçal, Madeira, 1 specimen, **JBM-AR-0027**]

49. *Calosoma maderae maderae* (Fabricius, 1775)

As *Calosoma maderae* – Synonym [Porto Santo, 2 specimens, **JBM-AR-0001**, **JBM-AR-0002**]

50. *Cymindis maderae* Wollaston, 1857

As *Cymindis maderae* Woll. [3 specimens without further data, **JBM-AR-0057**]

51. *Cymindis paivana* (Wollaston, 1860)

As *Cymindis paivana* Woll. – [Selvagens, 1 specimen, **JBM-AR-0341**; Selvagem Grande, 2 specimens without id., 16 July 1939, **JBM-AR-0370**]

ERBER & WHEETER, 1987, mention no specimens collected in 1939 in the collection of the Natural History Museum of Funchal. All specimens held in such collection were collected on dates later than 1939. The collection date for both specimens held in the Seminary collection can be traced to MAUL based on information of scientific field trips to the Selvagens (BISCOITO, *unpublished data*, 2013).

52. *Cymindis suturalis pseudosuturalis* Bedel, 1906

As *Cymindis suturalis* Dj. – Synonym [2 specimens without further data, **JBM-AR-0056**]

53. *Eurygnathus latreillei latreillei* (Laporte, 1834)

As *Eurygnathus Latreillei* – Synonym [Porto Santo, 1 specimen, 1932, **JBM-AR-0003**]

54. *Harpalus attenuatus* Stephens, 1828

As *Harpalus attenuatus* Steph. [Arrebetão, Madeira, 8 specimens, **JBM-AR-0042**]

55. *Harpalus distinguendus distinguendus* (Duftschmid, 1812)

As *Harpalus distinguendus* – Synonym [Arrebetão, Madeira, 8 specimens, **JBM-AR-0041**]

56. *Harpalus tenebrosus* Dejean, 1829

As *Harpalus tenebrosus* [Porto Santo, 3 specimens, **JBM-AR-0043**]

57. *Laemostenus complanatus* (Dejean, 1828)

As *Laemostenus complanatus* Dj. [Funchal, Madeira, 5 specimens, **JBM-AR-0031**]

58. *Loricera wollastonii* Javet, 1852

As *Elliptosoma Wollastoni* – Change of combination [2 specimens without further data, **JBM-AR-0005**]

59. *Microlestes corticalis* (Dufour, 1820)

As *Blechrus plagiatus* – Misidentification [Funchal, Madeira, 1 specimen, **JBM-AR-0052**]

60. *Microlestes luctuosus chobauti* Jeannel, 1942

As *Blechrus obscuroguttatus* – Misidentification [Poiso, Madeira, 4 specimens, **JBM-AR-0053**]

61. *Microlestes negrita negrita* Wollaston, 1854

As *Blechrus glabratus* Dft. – Misidentification [1 specimen without further data, **JBM-AR-0051**]

62. *Nesacinopus pelagicus* (Wollaston, 1860)

[Selvagens, 1 specimen, without id., June 1938, **JBM-AR-0343**; Selvagem Grande, 2 specimens, without id., 16 July 1939, **JBM-AR-0369**]

ERBER & WHEATER, 1987, mention one sample with one specimen of this species held in the Natural History Museum of Funchal collected on Selvagem Grande by MAUL on 20 July 1939. With most certainty the sample held in the Seminary collection dated 16 July 1939 belongs to the same sample collected by MAUL.

There are no samples dated from 1938 in the collection of the Natural History Museum of Funchal. However, based on the information from BISCOITO (*unpublished data*, 2013), such specimen held in the Seminary collection can be traced to CHARLES ALLUAUD (UYTTENBOOGAART, 1940; BISCOITO, *unpublished data*, 2013)

63. *Nesarpalus gregarius* (Fauvel, 1897)

As *Harpalus gregarius* Fvl. – Change of combination [Madeira, 3 specimens, **JBM-AR-0040**]

64. *Notiophilus geminatus* Dejean, 1831

As *Notiophilus geminatus* Dj. [5 specimens without further data, **JBM-AR-0004**]



65. *Ocys harpaloides* Audinet-Serville, 1821

As *Bembidion harpaloides* – Change of combination [2 specimens without further data, **JBM-AR-0011**]

66. *Olisthopus elongatus* Wollaston, 1854

As *Olisthopus fuscatus* – Misidentification [Arrebetão, Madeira, 3 specimens, **JBM-AR-0023**]

67. *Olisthopus ericae* Wollaston, 1854

As *Olisthopus ericae* Woll. [Ribeiro Frio, Madeira, 2 specimens, **JBM-AR-0025**]

68. *Olisthopus maderensis maderensis* Wollaston, 1854

As *Olisthopus maderensis* – Synonym [Arrebetão, Madeira, 2 specimens, **JBM-AR-0024**]

69. *Ophonus ardosiacus* (Lutshnik, 1922)

As *Ophonus rotundicollis* Fairm. – Synonym [1 specimen without further data, **JBM-AR-0039**]

70. *Orthomus bedelianus* (Lutshnik, 1915)

As *Haptoderus robustus* – Synonym [Arrebetão, Madeira, 2 specimens, **JBM-AR-0034**]

71. *Orthomus berytensis* (Reiche & Saulcy, 1854)

As *Orthomus haligena* Woll. – Synonym [Selvagens, 2 specimens, **JBM-AR-0344**]

72. *Orthomus curtus* (Wollaston, 1854)

As *Haptoderus curtus* – Change of combination [Arrebetão, Madeira, 3 specimens, **JBM-AR-0037**]

73. *Orthomus dilaticollis* (Wollaston, 1854)

As *Haptoderus dilataticollis* Woll. – Change of combination, misspelling of species epithet [Madeira, 2 specimens, **JBM-AR-0036**]

74. *Orthomus gracilipes* (Wollaston, 1854)

As *Haptoderus gracilipes* – Change of combination [Arrebetão, Madeira, 1 specimen with the no. 71, **JBM-AR-0035**]

75. *Paradromius insularis insularis* Wollaston, 1854

As *Dromius insularis* – Change of combination [Santana, Madeira, 1 specimen, **JBM-AR-0054**]

76. *Paranchus albipes* (Fabricius, 1796)

As *Platynus ruficornis* – Synonym [Ribeiro Frio, Madeira, 6 specimens, **JBM-AR-0021**]

77. *Perigona nigriceps* (Dejean, 1831)

As *Perigona nigriceps* [Funchal, Madeira, 1 specimen, **JBM-AR-0020**]

78. *Phylorhizus* sp.

As *Dromius nigriventris* – Misidentification [1 specimen without further data, **JBM-AR-0055**]

79. *Porotachys bisulcatus* (Nicolai, 1822)

As *Tachys bisulcatus* – Change of combination [1 specimen without further data, **JBM-AR-0012**]

80. *Scarites abbreviatus cimensis* Cockerell, 1922

As *Scarites abbreviatus* – Synonym [Porto Santo, 1 specimen, **JBM-AR-0006**]

81. *Stenolophus teutonius* (Schrank, 1781)

As *Stenolophus teutonius* [Poiso, Madeira, 1 specimen, **JBM-AR-0046**]

82. *Syntomus fuscomaculatus* (Motschulsky, 1844)

As *Metabletus fuscomaculatus* – Change of combination [1 specimen without further data, **JBM-AR-0050**]

83. *Tachys bistriatus* Duftschmid, 1812

As *Tachys bistriatus* [Santana, Madeira, 1 specimen, **JBM-AR-0014**]

84. *Tachyura lucasi* (Jacquelin du Val, 1852)

As *Tachys lucasi* Duv. – Change of combination [Santana, Madeira, 1 specimen, **JBM-AR-0013**]

85. *Thalassophilus whitei whitei* Wollaston, 1854

As *Thalassophilus longicornis* – Misidentification [1 specimen without further data, **JBM-AR-0016**]

86. *Trechus custos* Wollaston, 1854

As *Trechus custos* [Rabaçal, Madeira, 1 specimen, **JBM-AR-0019**]

87. *Trechus flavomarginatus* Wollaston, 1854

As *Threcus flavomarginatus* Woll. – Misspelling of genus name [Santana, Madeira, 1 specimen, **JBM-AR-0018**]

88. *Trechus obtusus asturicus* Jeannel, 1921

As *Bembidion obtusum* Serv. – Misidentification [Arrebetão, Madeira, 2 specimens, **JBM-AR-0010**]

89. *Trechus umbricola* Wollaston, 1854

As *Threcus umbricola* Woll. – Misspelling of genus name [Santana, Madeira, 1 specimen, **JBM-AR-0017**]

90. *Zargus desertae* Wollaston, 1854

As *Zargus desertae* [Deserta Grande, 2 specimens, **JBM-AR-0033**]

91. *Zargus schaumii* Wollaston, 1854

As *Zargus Schaumi* Woll. – Synonym [Arrebetão, Madeira, 2 specimens, **JBM-AR-0032**]

### Family **Cerambycidae**

92. *Arhopalus ferus* (Mulsant, 1839)

As *Criocephalus polonicus* Mots. – Change of combination, synonym [Arrebetão, Madeira, 2 specimens, **JBM-AR-0307**]

93. *Arhopalus rusticus* (Linnaeus, 1758)

As *Criocephalus rusticus* – Change of combination [1 specimen without further data, **JBM-AR-0308**]

94. *Arhopalus syriacus* (Reitter, 1895)

[3 specimens without id. or further data, **JBM-AR-0309**]

95. *Clytus arietis* (Linnaeus, 1758)

As *Clytus arietis* [2 specimens without further data, **JBM-AR-0311**]

96. *Deucalion oceanicus* Wollaston, 1854

[Ilhéu de Fora, Selvagens, 1 damaged specimen, **JBM-AR-0364**]

97. *Gracilia minuta* (Fabricius, 1781)

As *Gracilia minuta* F. [1 specimen without further data, **JBM-AR-0508**]

98. *Hylotrupes bajulus* (Linnaeus, 1758)

As *Hylotrupes bajulus* L. [Madeira, 3 specimens without further data, **JBM-AR-0310**]

99. *Phymatodes testaceus* (Linnaeus, 1758)

As *Phymatodes testaceus* L. [2 specimens without further data, **JBM-AR-0312**]

100. *Pogonocherus hispidulus* Piller & Mitterpacher, 1783

As *Pogonocherus hispidulus* Piller [Funchal, Madeira, 1 specimen, **JBM-AR-0313**]

101. *Stromatium unicolor* (Olivier, 1795)

As *Stromatium fulvum* Villers – Synonym [Madeira, 3 specimens, **JBM-AR-0305**]

102. *Trichoferus fasciculatus senex* (Wollaston, 1854)

As *Hesperophanes griseus* F. – Misidentification [Madeira, 2 specimens, **JBM-AR-0509**]

### Family **Cerylonidae**

103. *Euxestus parkii* Wollaston, 1858

As *Euxestus parki* Woll. – Synonym [Funchal, Madeira, 4 specimens, **JBM-AR-0202**]

### Family **Chrysomelidae**

104. *Acanthoscelides obtectus* (Say, 1864)

As *Bruchus obtectus* Say – Change of combination [Madeira, 4 specimens, **JBM-AR-0497**]

105. *Bruchus pisorum* (Linnaeus, 1758)

As *Bruchus pisorum* L. [3 specimens without further data, **JBM-AR-0495**]

106. *Bruchus rufimanus* Boheman, 1833

As *Bruchus rufimanus* Boh. [4 specimens without further data, **JBM-AR-0496**]

107. *Cassida hemisphaerica* Herbst, 1799

As *Cassida hemisphaerica* Herbst [3 specimens without further data, **JBM-AR-0339**]

108. *Cryptocephalus crenatus* Wollaston, 1854

As *Cryptocephalus crenatus* Woll. [Arrebentão, Madeira, 3 specimens, **JBM-AR-0320**]

109. *Chrysolina bankii* (Fabricius, 1775)

As *Chrysolina banksi* F. – Change of combination, synonym [Madeira, 1 specimen, 1930, leg. Father Barreto, det. A. d'Orchymon, **JBM-AR-0321**]

110. *Chrysolina fragariae* (Wollaston, 1854)

As *Chrysolina fragariae* – Change of combination [Madeira, 1 specimen, **JBM-AR-0322**]

111. *Longitarsus cinerariae* Wollaston, 1854

As *Thyamis cinerariae* Woll. – Change of combination [Rabaçal, Madeira, 2 specimens, **JBM-AR-0315**]

112. *Longitarsus isoplexidis* Wollaston, 1854

As *Thyamis isoplexidis* Woll. – Change of combination [Madeira, 1 specimen, **JBM-AR-0317**]



113. *Longitarsus nervosus* Wollaston, 1854

As *Thyamis exoleta* L. – Misidentification [1 specimen without further data, **JBM-AR-0319**]

114. *Longitarsus parvulus* (Paykull, 1799)

As *Thyamis parvula* Payk. - Change of combination, synonym [2 specimens without further data, **JBM-AR-0323**]

115. *Mniophilosoma laeve* Wollaston, 1854

As *Mniophilosoma laeve* L. [Santana, 1 specimen, **JBM-AR-0334**]

116. *Ochrosis ventralis* (Illiger, 1807)

As *Ochrosis ventralis* Ill. [2 specimens without further data, **JBM-AR-0330**]

117. *Oulema melanopus* (Linneus, 1761)

As *Ulema melanopus* - Misspelling of genus name [Bom Sucesso, Funchal, Madeira, 7 specimens, **JBM-AR-0318**]

118. *Podagrica fuscicornis* (Linnaeus, 1766)

As *Podagrica fuscicornis* L. [2 specimens without further data, **JBM-AR-0324**]

According to ERBER, (1986), this species was first listed by FAUVEL, (1897) and later by SCHMITZ, (1898). All further citations were based on these two latter authors that failed to give any details on the number of specimens collected, the date and the locality.

In conclusion, the two specimens in the Seminary collection, unfortunately without any label information besides the taxon name, appear to be linked either to FAUVEL or SCHMITZ. A recent unpublished record of this species collected at São Gonçalo, Funchal may indicate that *P. fuscicornis* albeit infrequent is established on the island.

119. *Psylliodes hospes* Wollaston, 1854

As *Psylliodes hospes* Woll. [1 specimen without further data, **JBM-AR-0314**]

120. *Psylliodes vehemens vehemens* Wollaston, 1854

As *Psylliodes vehemens* Woll. – Synonym [Monte, Madeira, 5 specimens, **JBM-AR-0316**]

### Family Ciidae

121. *Atlantocis lauri* (Wollaston, 1854)

As *Cis lauri* Woll. – Change of combination [Santana, Madeira, 8 specimens, **JBM-AR-0263**]

122. *Cis wollastoni* Mellié, 1848

As *Cis wollastoni* Woll. – Wrong authority [Ribeiro Frio, Madeira, 2 specimens, **JBM-AR-0262**]

123. *Octotemnus opacus* (Mellié, 1848)

As *Octotemnus opacus* Mell. [Santana, Madeira, 3 specimens, **JBM-AR-0264**]

### Family Clambidae

124. *Calyptomerus dubius* (Marsham, 1802)

As *Calyptomerus dubius* Marsh. [1 specimen without further data, **JBM-AR-0143**]

### Família Cleridae

125. *Necrobia ruficollis* (Fabricius, 1775)

As *Necrobia ruficollis* F. [Funchal, Madeira, 3 specimens, **JBM-AR-0249**]

126. *Opilo domesticus* (Sturm, 1837)

As *Opilo domesticus* Strm. [Funchal, Madeira, 2 specimens, **JBM-AR-0248**]

#### Family **Coccinellidae**

127. *Adalia decempunctata* (Linnaeus, 1758)

As *Coccinella 10-punctata* L. – Synonym [Madeira, 4 specimens, **JBM-AR-0337**]

As *Coccinella v 4-punctata* L. – Synonym [1 specimen, **JBM-AR-0337a**]

128. *Chilocorus bipustulatus* (Linnaeus, 1758)

As *Chilocorus bipustulatus* L. [Funchal, Madeira, 2 specimens, **JBM-AR-0332**]

129. *Clitostethus arcuatus* (Rossi, 1794)

As *Scymnus arcuatus* Rossi – Change of combination [Bom Sucesso, Funchal, Madeira, 1 specimen, **JBM-AR-0328**]

130. *Coccinella algerica* Kovár, 1977

As *Coccinella 7-punctata* L. – Misidentification [Bom Sucesso, Funchal, Madeira, 4 specimens, **JBM-AR-0335**]

131. *Harmonia quadripunctata* (Pontoppidan, 1763)

As *Coccinella 5-punctata* – Misidentification [1 specimen without further data, **JBM-AR-0338**]

132. *Hippodamia variegata* (Goeze, 1777)

As *Adonia variegata* Goeze – Change of combination [Bom Sucesso, Funchal, Madeira, 4 specimens, **JBM-AR-0336**]

133. *Nephus flavopictus* (Wollaston, 1854)

As *Scymnus flavopictus* Woll. – Change of combination [Funchal, Madeira, 1 specimen, **JBM-AR-0326**]

134. *Pharoscymnus decemplagiatus* (Wollaston, 1857)

As *Pharus decemplagiatus* Woll. – Change of combination [Rabaçal, Madeira, 1 specimen, **JBM-AR-0333**]

135. *Rhyzobius litura* (Fabricius, 1787)

As *Rhizobius litura* L. – Wrong authorship, misspelling of genus name [Bom Sucesso, Funchal, Madeira, 4 specimens, **JBM-AR-0331**]

136. *Scymnus subvillosus* (Goeze, 1777)

As *Scymnus subvillosus* Goeze [Funchal, Madeira, 2 specimens, **JBM-AR-0325**]

137. *Scymnus interruptus* (Goeze, 1777)

As *Scymnus interruptus* L. [Bom Sucesso, Funchal, Madeira, 4 specimens, **JBM-AR-0329**]

138. *Stethorus tenerifensis* Fürsch, 1987

As *Scymnus gilvifrons* Mots. – Misidentification [Praia Formosa, Madeira, 1 specimen, **JBM-AR-0327**]

#### Family **Corylophidae**

139. *Orthoperus* cf. *nigrescens* Stephens, 1829

As *Orthoperus picatus* – Uncertain synonymy [1 specimen without further data, **JBM-AR-0145**]

140. *Orthoperus atomus* (Gyllenhal, 1808)

As *Orthoperus punctum* – Synonym [5 specimens without further data, **JBM-AR-0146**]

141. *Sericoderus lateralis* (Gyllenhal, 1827)

As *Sericoderus lateralis* Gyll. [Santana, Madeira, 3 specimens, **JBM-AR-0144**]

### Family **Cryptophagidae**

142. *Atomaria pusilla* (Paykull, 1798)

As *Atomaria pusilla* Payk. [1 specimen without further data, **JBM-AR-0161**]

143. *Atomaria apicalis* Erichson, 1846

As *Atomaria apicalis* Er. [1 specimen without further data, **JBM-AR-0162**]

144. *Cryptophagus pilosus* Gyllenhal, 1827

As *Cryptophagus pilosus* Gyll. [1 specimen without further data, **JBM-AR-0155**]

145. *Cryptophagus laticollis* Lucas, 1846

As *Cryptophagus affinis* Stm. – Synonym [2 specimens without further data, **JBM-AR-0156**]

146. *Cryptophagus dentatus* (Herbst, 1793)

As *Cryptophagus dentatus* Herbst [3 specimens without further data, **JBM-AR-0157**]

147. *Cryptophagus saginatus* Sturm, 1845

As *Cryptophagus saginatus* Stm. [2 specimens without further data, **JBM-AR-0158**]

148. *Cryptophagus scanicus* (Linnaeus, 1758)

As *Cryptophagus scanicus* L. [1 specimen without further data, **JBM-AR-0159**]

149. *Ephistemus globulus* (Paykull, 1798)

As *Ephistemus globulus* Payk. [Arrebentão, Madeira, 2 specimens, **JBM-AR-0163**]

### Family **Curculionidae**

150. *Aeoniocalles neptunus* (Wollaston, 1854)

As *Acalles neptunus* Woll. – Change of combination [Ilhéu de Fora, Selvagens, 2 specimens, September 1938, **JBM-AR-0372**]

151. *Amaurorhinus clermonti* Desbrochers, 1908

[Selvagem Pequena, 2 specimens (no. 5 and 7), September 1944, **JBM-AR-0386**]

152. *Amaurorhinus monizianus* (Wollaston, 1860)

As *Amaurorhinus monizianus* Woll. – Synonym [Funchal, Madeira, 1 specimen, **JBM-AR-0485**]

153. *Aphanarthrum bicolor* Wollaston, 1860

As *Aphanarthrum bicolor* Woll. [1 specimen, **JBM-AR-0503**]

154. *Aphanarthrum piscatorium* Wollaston, 1860

As *Aphanarthrum piscatorium* Woll. [Madeira, 5 specimens, **JBM-AR-0504**]

155. *Caenopsis waltoni* (Boheman, 1843)

As *Caenopsis waltoni* Boh. [Santana, Madeira, 4 specimens, **JBM-AR-0458**]

156. *Calacalles wollastoni* (Chevrolat, 1852)

As *Acalles wollastoni* Chevr. – Change of combination [Madeira, 2 specimens, **JBM-AR-0473**]



157. *Cathormiocerus curvipes* (Wollaston, 1854)  
As *Cathormiocerus curvipes* Woll. [Santana, Madeira, 6 specimens, **JBM-AR-0465**]
158. *Caulotrupis lacertosus* Wollaston, 1854  
As *Caulotrypes lacertosus* Woll. – Misspelling of genus name [Santana, Madeira, 2 specimens, **JBM-AR-0486**]
159. *Caulotrupis chevrolatii* Wollaston, 1854  
As *Caulotrypes chevrolati* Woll. – Misspelling of genus name, synonym [Santana, Madeira, 3 specimens, **JBM-AR-0487**]
160. *Caulotrupis terebrans* Wollaston, 1854  
As *Caulotrupis terebrans* Woll. [Porto Santo, 1 specimen, 1932, **JBM-AR-0488**]
161. *Ceutorhynchus pallidactylus* (Marsham, 1802)  
As *Ceutorhynchus quadridens* Panz. – Synonym [1 damaged specimens, **JBM-AR-0476**]
162. *Charagmus gressorius* (Fabricius, 1792)  
As *Sitona gressorius* F. – Change of combination [Madeira, 3 specimens, **JBM-AR-0460**]
163. *Cleopus pulchellus* (Herbst, 1795)  
As *Cionus pulchellus* Herbst – Change of combination [Madeira, 1 specimen, **JBM-AR-0479**]
164. *Coelositona latipennis latipennis* Gyllenhal, 1834  
As *Sitona latipennis* Gyll. – Change of combination [Arrebentão, Madeira, 3 specimens, **JBM-AR-0461**]
165. *Coelositona puberulus* Reitter, 1903  
As *Sitona cambricus* Steph. – Misidentification [Madeira, 8 specimens, **JBM-AR-0462**]
166. *Dryocoetes villosus* (Fabricius, 1792)  
As *Dryocoetes villosus* F. [4 specimens, **JBM-AR-0506**]
167. *Ficusacalles oceanicus* (Stueben, 2002)  
[Selvagem Pequena, 3 specimens (no. 4), September 1944, **JBM-AR-0373**]
168. *Hylastinus obscurus* (Marsham, 1802)  
As *Hylastinus obscurus* Marsh. [1 specimen, **JBM-AR-0498**]
169. *Hylurgus ligniperda* (Fabricius, 1787)  
As *Hylurgus ligniperda* F. [Arrebentão, Madeira, 3 specimens, **JBM-AR-0499**]
170. *Hypera postica* (Gyllenhal, 1813)  
As *Hypera variabilis* Herbst – Synonym [5 specimens, **JBM-AR-0471**]
171. *Hypoborus ficus* Erichson, 1836  
As *Hypoborus ficus* Er. [7 specimens, **JBM-AR-0502**]
172. *Laparocerus noctivagans* (Wollaston, 1854)  
As *Atlantis noctivagans* Woll. – Change of combination [Monte, Madeira, 1♂ specimen, **JBM-AR-0299**]
173. *Laparocerus vespertinus* (Wollaston, 1854)  
As *Atlantis picea* Gyll. – Change of combination, synonym [Poiso, Madeira, 1 specimen, **JBM-AR-0300**]

174. *Laparocerus excelsus* (Wollaston, 1854)

As *Atlantis excelsa* Woll. - Change of combination, synonym [Madeira, 1 specimen, **JBM-AR-0301**]

175. *Laparocerus ventrosus* (Wollaston, 1854)

As *Atlantis ventrosa* Woll. - Change of combination, synonym [Poiso, Madeira, 2 specimens, **JBM-AR-0302**]

176. *Laparocerus waterhousei* (Wollaston, 1854)

As *Atlantis waterhousei* Woll. - Change of combination [ Madeira, 6 specimens, **JBM-AR-0303**]

177. *Laparocerus morio* Boheman, 1834

As *Laparocerus morio* Boh. [Caniçal, Madeira, 1♂, 2♀, February 1908, **JBM-AR-0456**]

178. *Laparocerus cryptus* Machado, 2008

[Desertas, 1♂, without id or further data, **JBM-AR-0457**]

179. *Leipommata oromiana* Osella, 1978

[Selvagem Grande, 1 damaged specimen without further data, **JBM-AR-668**]

180. *Liparthrum curtum* Wollaston, 1854

As *Liparthrum curtum* Woll. [Funchal, Madeira, 1 specimen, 1907, **JBM-AR-0501**]

181. *Lixus cheiranthi* Wollaston, 1854

As *Lixus cheiranthi* Woll. [Madeira, 2 specimens, **JBM-AR-0466**]

182. *Lixus pulverulentus* (Scopoli, 1763)

As *Lixus algeris* L. – Synonym [Porto Moniz, Madeira, 2♂, 1♀, **JBM-AR-0467**]

183. *Lixus filiformis* (Fabricius, 1781)

As *Lixus elongatus* Goeze – Synonym [Madeira, 3 specimens, **JBM-AR-0468**]

184. *Lixus juncii* Boheman, 1835

As *Lixus jurinei* Boh. – Misspelling of species epithet [2 specimens without further data, **JBM-AR-0469**]

185. *Magdalis barbicornis* (Latreille, 1891)

As *Magdalis barbicornis* Latr. [1 specimen without further data, **JBM-AR-0478**]

186. *Mogulones geographicus* (Goeze, 1777)

As *Ceutorhynchus geographicus* Goeze – Change of combination [2 specimens without further data, **JBM-AR-0475**]

187. *Orthotomicus erosus* (Wollaston, 1857)

As *Ips erosus* Woll. – Change of combination [1 specimen without further data, **JBM-AR-0505**]

188. *Pentatemnus arenarius* Wollaston, 1861

[Selvagem Pequena, 2 specimens (no. 2 and 8), September 1944, **JBM-AR-0387**; Ilhéu de Fora, Selvagens, 1 specimen, **JBM-AR-0388**; Selvagem Pequena, 1 damaged specimen, **JBM-AR-667b**]

189. *Pentatemnus* cf. *arenarius* Wollaston, 1861

[Ilhéu de Fora, 4 damaged specimens, 2 September 1938, **JBM-AR-665**; Selvagem Pequena, 3 damaged specimens, September 1938, **JBM-AR-667a**]

190. *Pissodes castaneus* (De Geer, 1775)

As *Pissodes notatus* F. – Misidentification [Madeira, 6 specimens, **JBM-AR-0472**]

191. *Pselactus spadix sulcipennis* (Wollaston, 1854)

As *Codiosoma spadix* Herbst – Misidentification [Madeira, 4 specimens, **JBM-AR-0490**]

192. *Pseudophloeophagus tenax* (Wollaston, 1854)

As *Rhyncholus tenax* Woll. – Change of combination [Monte, Funchal, Madeira, 5 specimens, **JBM-AR-0489**]

193. *Rhamphus subaeneus* Illiger, 1807

As *Ramphus subaeneus* Ill. – Misspelling of genus name [Bom Sucesso, Funchal, Madeira, 2 specimens, **JBM-AR-0477**]

194. *Rhopalomesites maderensis maderensis* (Wollaston, 1854)

As *Rhopalomesites maderensis* Woll. – [Madeira, 2 damaged specimens, **JBM-AR-0483**]

195. *Rhopalomesites euphorbiae* (Wollaston, 1854)

As *Rhopalomesites euphorbiae* Woll. [Madeira, 3 specimens; **JBM-AR-0484**]

196. *Rhytideres plicatus* (Olivier, 1790)

As *Rhytidoderes plicatus* Ol. – Misspelling of genus name [Livramento, Funchal, Madeira, 4 specimens, **JBM-AR-0470**]

197. *Salvagopselactus mauli* Folwaczny, 1972

[Selvagem Grande, 1 specimen, 16.july.1939, **JBM-AR-0384**; Selvagem Grande, 1 specimen, 17.july.1939, **JBM-AR-0385**]

198. *Sibinia albosquamosa* Pic, 1904

[Selvagem Pequena, 2 specimens without id. (no. 6 and no. 9), September 1944, **JBM-AR-0383**]

199. *Sibinia primita* (Herbst, 1795)

[Selvagem Grande, 1 specimen, 16.july.1939, **JBM-AR-0381**; Selvagem Grande, 1 specimen, 17.july.1939, **JBM-AR-0382**]

GÜNTHER MAUL (ERBER & WHEATER, 1987) collected 2 specimens on 20 July 1939 deposited in the MHNF (former MMF) which indicates that the specimens at JBM are of the same collecting event.

200. *Sitona lineatus* (Linnaeus, 1758)

As *Sitona lineatus* L. [Madeira, 2 specimens, **JBM-AR-0463**]

201. *Sitona humeralis* Stephens, 1831

As *Sitona humeralis* Steph. [2 specimens without further data, **JBM-AR-0510**]

202. *Stenocarus ruficornis* (Stephens, 1831)

As *Ceutorhynchus fuliginosus* Marsh. – Synonym [2 specimens without further data, **JBM-AR-0474**]

203. *Strophosoma melanogrammum melanogrammum* (Forster, 1771)

As *Strophosomus coryli* F. – Synonym [Madeira, 5 specimens, **JBM-AR-0459**]

204. *Temnorhinus mixtus* (Fabricius, 1792)

[Selvagem Grande, 9 specimens, 16.july.1939, **JBM-AR-0366**]

205. *Tomicus destruens* (Wollaston, 1865)

As *Myolophilus piniperda* L. – Misidentification [Santana, Madeira, 6 specimens, **JBM-AR-0500**]

206. *Trachyphloeus angustisetulus* Hansen, 1915

As *Trachyphloeus bifoveatus* Beck. – Misidentification [2 specimens without further data, **JBM-AR-0464**]

207. *Xyleborinus saxesenii* (Ratzeburg, 1837)

As *Xyleborus saxesini* Ratz. – Change of combination, misspelling of species epithet [2 specimens without further data, **JBM-AR-0507**]

### Family **Dasytidae**

208. *Psilothrix illustris* (Wollaston, 1854)

As *Psilothrix illustris* Woll. [Calheta, Madeira, 4 specimens, **JBM-AR-0247**]

### Family **Dermestidae**

209. *Anthrenus verbasci* (Linnaeus, 1767)

As *Anthrenus verbasci* L. [Funchal, Madeira, 14 specimens on bird wings of the museum, **JBM-AR-0213**]

210. *Attagenus unicolor* (Brahm, 1791)

As *Attagenus piceus* Ol. – Synonym [Funchal, Madeira, 2 specimens, **JBM-AR-0212**]

This is a new record for Madeira as it is absent from the checklist of BOIEIRO *et al.* (2008) and ZHANTIEV (2011).

211. *Dermestes frischii* Kugelann, 1792

As *Dermestes frischii* Kugel. [Funchal, Madeira, 2 specimens (1 lost), **JBM-AR-0210**]

212. *Dermestes lardarius* Linnaeus, 1758

As *Dermestes lardarius* L. [Funchal, Madeira, 1 specimen, **JBM-AR-0211**]

This is a new record for Madeira as it is absent from the checklist of BOIEIRO *et al.* (2008) and ZHANTIEV (2011).

213. *Dermestes maculatus* De Geer, 1774

As *Dermestes vulpinus* F. – synonym [Funchal, Madeira, 2 specimens, **JBM-AR-0209**; Selvagens, 1 specimen without further data, **JBM-AR-0345**]

As *Dermestes vulpinus* [Selvagem Grande, 20 specimens, August 1938, **JBM-AR-0367**]; [Ilhéu de Fora, Selvagens, 1 specimen without id., September 1938, **JBM-AR-0368**]; [Selvagem Grande, 1 specimen without id. and further data, **JBM-AR-0375**]

New record for Ilhéu de Fora, although already known from Selvagem Grande. Absent from Selvagem Pequena.

### Family **Dryophthoridae**

214. *Cosmopolites sordidus* (Germar, 1824)

As *Sphenophorus sordidus* Germ. – Change of combination [Funchal, Madeira, 3 specimens, **JBM-AR-0480**]

215. *Sitophilus granarius* (Linnaeus, 1758)

As *Calandra granaria* L. – Change of combination, synonym [Funchal, Madeira, 5 specimens, **JBM-AR-0481**]

216. *Sitophilus oryzae* (Linnaeus, 1763)

As *Calandra oryzae* L. – Change of combination, synonym [Funchal, Madeira, 3 specimens, **JBM-AR-0482**]

### Family **Dryopidae**

217. *Dryops luridus* (Erichson, 1847)

As *Dryops luridus* Er. [Ribeiro Frio, Madeira, 7 specimens, **JBM-AR-0234**]



### Family **Dytiscidae**

218. *Agabus nebulosus* (Forster, 1771)

As *Agabus nebulosus* [4 specimens without further data, **JBM-AR-0061**]

219. *Agabus wollastoni* Sharp, 1882

As *Agabus wollastoni* [Poiso, Madeira, 1♂, 1♀, **JBM-AR-0062**]

220. *Hygrotus confluens* (Fabricius, 1787)

As *Coelambus confluens* – Change of combination [1 specimen without further data, **JBM-AR-0058**]

221. *Meladema lanio* (Fabricius, 1775)

As *Meladema lanio* F. [Madeira, 2 specimens, **JBM-AR-0063**]

222. *Nebrioporus ceresyi* (Aubé, 1838)

As *Hydroporus ceresyi* – Change of combination [Madeira, 1 specimen, **JBM-AR-0059**]

NILSSON (2003) listed this species to Madeira, and later on stated the contrary in *Fauna Europaea* (NILSSON, 2004). *N. ceresyi* was not included in the list of SERRANO & BOIEIRO (2008), but was listed to Madeira in the last version of NILSSON's online Catalogue of Palaearctic Dytiscidae (NILSSON, 2010). Herein, we follow NILSSON (2010) and consider *N. ceresyi* a resident species.

223. *Nebrioporus dubius* (Aubé, 1838)

As *Hydroporus dubius* – Change of combination [Santana, Madeira, 3 specimens without further data, **JBM-AR-0060**]

### Family **Endomychidae**

224. *Holoparamecus niger* (Aubé, 1843)

As *Holoparamecus niger* Aubé [1 specimen without further data, **JBM-AR-0164**]

225. *Mycetaea subterranea* (Fabricius, 1801)

As *Myceataea hirta* Marsh. – Synonym [3 specimens without further data, **JBM-AR-0153**]

226. *Symbiotes gibberosus* (Lucas, 1849)

As *Symbiotes gibberosus* Lucas [3 specimens without further data, **JBM-AR-0152**]

### Family **Histeridae**

227. *Acritus nigricornis* (Hoffmann, 1803)

As *Acritus seminulum* Kust. – Synonym [Funchal, Madeira, 2 specimens, **JBM-AR-0228**]

228. *Carcinops pumilio* (Erichson, 1834)

As *Carcinops pumilio* Er. [6 specimens without further data, **JBM-AR-0224**]

229. *Kissister minimus* (Laporte, 1840)

As *Carcinops picipes* Ol. – Misidentification [Arrebetão, Madeira, 3 specimens, **JBM-AR-0225**]

230. *Pactolinus major* (Linnaeus, 1767)

As *Hister major* – Change of combination [?Santo da Serra or Santa do Porto Moniz, Madeira, 2 specimens, **JBM-AR-0223**]

231. *Saprinus chalcites* (Illiger, 1807)

As *Saprinus chalcites* Ill. [1 specimen without further data, **JBM-AR-0227**]

232. *Saprinus subnitescens* Bickhardt, 1909

As *Saprinus nitidulus* Payk. – Synonym [5 specimens without further data, **JBM-AR-0226**]

#### Family **Hydraenidae**

233. *Ochthebius heeri* (Wollaston, 1854)

As *Calobius heeri* Woll. – Change of combination [Gorgulho, Funchal, Madeira, 2 specimens, 1907, **JBM-AR-0231**]

234. *Ochthebius quadrifoveolatus* Wollaston, 1854

As *Ochthebius 4-foveolatus* Woll. – Synonym [São Jorge, Madeira, 2 specimens, **JBM-AR-0232**]

#### Family **Hydrophilidae**

235. *Cercyon nigriceps* (Marsham, 1802)

As *Cercyon nigriceps* Marsh. [Monte, Madeira, 2 specimens, **JBM-AR-0233**]

236. *Cercyon quisquilius* (Linnaeus, 1760)

As *Cercyon quisquilius* L. [Monte, Madeira, 4 specimens, **JBM-AR-0221**]

237. *Cercyon terminatus* (Marsham, 1802)

As *Cercyon terminatus* Marsh. [Monte, Madeira, 3 specimens, **JBM-AR-0222**]

238. *Dactylosternum abdominale* (Fabricius, 1792)

As *Dactylosternum insulare* Lap. – Synonym [5 specimens without further data, **JBM-AR-0230**]

239. *Enochrus politus* (Küster, 1849)

As *Philydrus politus* Kust. – Change of combination [Porto Santo, 1 specimen, **JBM-AR-0229**]

240. *Sphaeridium bipustulatum* Fabricius, 1801

As *Sphaeridium bipustulatum* F. – [3 specimens without further data, **JBM-AR-0239**]

#### Family **Laemophloeidae**

241. *Cryptolestes capensis* (Waltl, 1834)

As *Laemophloeus capensis* Waltl – Change of combination [Funchal, Madeira, 1 specimen, **JBM-AR-0206**]

242. *Cryptolestes ferrugineus* (Stephens, 1831)

As *Laemophloeus ferrugineus* Steph. – Change of combination [Funchal, Madeira, 2 specimens, **JBM-AR-0205**]

243. *Cryptolestes pusillus* (Schoenherr, 1817)

As *Laemophloeus pusillus* Schh. – Change of combination [Funchal, Madeira, 1 specimen, **JBM-AR-0204**]

244. *Placonotus granulatus* (Wollaston, 1854)

As *Laemophloeus granulatus* Woll. – Change of combination [Monte, Funchal, Madeira, 1 specimen, **JBM-AR-0203**]

#### Family **Languriidae**

245. *Cryptophilus integer* (Heer, 1841)

As *Cryptophilus integer* Heer [1 specimen without further data, **JBM-AR-0154**]

246. *Leucohimatium arundinaceum* (Forskål, 1775)

As *Leucohimatium elongatum* Er. – Synonym [1 specimen without further data, **JBM-AR-0160**]

#### Family **Latridiidae**

247. *Cartodere nodifer* (Westwood, 1839)

As *Lathridius nodifer* Westw. – Change of combination [4 specimens without further data, **JBM-AR-0168**]

248. *Corticaria fulva* (Comolli, 1837)

As *Melanophthalma fulvipes* Com. – Misidentification [1 specimen without further data, **JBM-AR-0177**]

249. *Corticaria pubescens* (Gyllenhal, 1827)

As *Corticaria pubescens* Gyll. [4 specimens without further data, **JBM-AR-0172**]

250. *Corticaria serrata* (Paykull, 1798)

As *Corticaria serrata* Payk. [2 specimens without further data, **JBM-AR-0173**]

251. *Corticaria gibbosa* (Herbst, 1793)

As *Melanophthalma gibbosa* Herbst – Change of combination [1 specimen without further data, **JBM-AR-0176**]

252. *Dienerella ruficollis* (Marsham, 1802)

As *Cartodere ruficollis* Marsh. – Change of combination [9 specimens without further data, **JBM-AR-0171**]

253. *Enicmus transversus* (Olivier, 1790)

As *Enicmus transversus* Ol. [5 specimens without further data, **JBM-AR-0170**]

254. *Latridius minutus* (Linnaeus, 1767)

As *Lathridius minutus* L. – Synonym [3 specimens without further data, **JBM-AR-0167**];

As *Enicmus minutes* L. – wrong genus, misspelling of species epithet [2 specimens without further data, **JBM-AR-0169**]

255. *Latridius* cf. *transversalis* (Gyllenhal, 1827)

As *Melanophthalma transversalis* Gyll. – Change of combination [1 specimen without further data, **JBM-AR-0174**]

256. *Melanophthalma distinguenda* (Comolli, 1837)

As *Melanophthalma distinguenda* Com. [1 specimen without further data, **JBM-AR-0175**]

257. *Metophthalmus sculpturatus* Wollaston, 1862

As *Metophthalmus sculpturatus* [Palheiro (probably Palheiro Ferreiro in Funchal), Madeira, 1 specimen, **JBM-AR-0166**]

#### Family **Leiodidae**

258. *Nargus* cf. *velox* (Spence, 1915)

As *Choleva velox* Spence – [1 specimen without further data, **JBM-AR-0142**]

BLAS (2004) gives this species as existing in Madeira. PERREAU (2004) says the contrary and BOIEIRO *et al.* (2008) follow the latter opinion. The identity of this specimen is thus dubious and needs further confirmation.

#### Family **Lyctidae**

259. *Lyctus brunneus* (Stephens, 1830)

As *Lyctus brunneus* Steph. [Santana, Madeira, 4 specimens, **JBM-AR-0261**]

**Family Malachiidae**

260. *Attalus minimus* (Rossi, 1790)

As *Attalus lateralis* Er. – Synonym [Funchal, Madeira, 2 specimens, **JBM-AR-0245**]

261. *Attalus rugosus* (Wollaston, 1854)

As *Attalus rogosus* Woll. – Misspelling of species epithet [Praia Formosa, Madeira, 1 specimen, **JBM-AR-0244**]

**Family Meloidae**

262. *Meloe flavicomus* Wollaston, 1854

As *Meloe nanus* Lucas – Misidentification [Porto Santo, 2 specimens, **JBM-AR-0291**]

263. *Meloe mediterraneus* Müller, 1925

As *Meloe rugosus* Marsham – Misidentification [Porto Santo, 4 specimens, **JBM-AR-0290**]

**Family Monotomidae**

264. *Europs impressicollis impressicollis* Wollaston, 1854

As *Europs impressicollis* Woll. – Synonym [1 specimen on Euphorbia branch, **JBM-AR-0192**]

265. *Monotoma picipes* Herbst, 1793

As *Monotoma picipes* Hrbst. [Monte, Madeira, 2 specimens, **JBM-AR-0218**]

266. *Monotoma quadrioveolata* Aubé, 1837

As *Monotoma 4-foveolata* Aubé – Synonym [Funchal, Madeira, 2 specimens, **JBM-AR-0220**]

267. *Monotoma spinicollis* Aubé, 1837

As *Monotoma spinicollis* Aubé [Funchal, Madeira, 3 specimens, **JBM-AR-0219**]

268. *Rhyzophagus bipustulatus* (Fabricius, 1792)

As *Rhyzophagus bipustulatus* F. [Monte, Madeira, 2 specimens, **JBM-AR-0191**]

**Family Mycetophagidae**

269. *Berginus tamarisci* Wollaston, 1854

As *Berginus tamarisci* Woll. [5 specimens without further data, **JBM-AR-0180**]

270. *Litargops pictus* (Wollaston, 1854)

As *Litargus pictus* – Change of combination [1 specimen without further data, **JBM-AR-0178**]

271. *Typhaea stercorea* (Linnaeus, 1758)

As *Typhaea fumata* L. – Synonym [Funchal, Madeira, 5 specimens, **JBM-AR-0179**]

**Family Nitidulidae**

272. *Carpophilus dimidiatus* (Fabricius, 1792)

As *Carpophilus dimidiatus* F. [Funchal, Madeira, 6 specimens, **JBM-AR-0182**]

273. *Carpophilus hemipterus* (Linnaeus, 1758)

As *Carpophilus hemipterus* L. [Funchal, Madeira, 3 specimens, **JBM-AR-0183**]



274. *Carpophilus mutilatus* Erichson, 1843

As *Carpophilus mutillatus* Er. – Misspelled specific epithet [Funchal, Madeira, 7 specimens, **JBM-AR-0181**]

275. *Epuraea unicolor* (Olivier, 1790)

As *Epuraea obsoleta* Er. – Synonym and wrong authority [Santana, Madeira, 6 specimens, **JBM-AR-0184**]

276. *Fabogethes nigrescens* (Stephens, 1830)

As *Meligethes picipes* Stm. – Change of combination, synonym [Arrebentão, Madeira, 3 specimens, **JBM-AR-0189**]

277. *Meligethes planiusculus* (Heer, 1841)

As *Meligethes planiusculus* Heer [2 specimens without further data, **JBM-AR-0207**]

278. *Nitidula carnaria* (Schaller, 1783)

As *Nitidula carnaria* Schall. [Funchal, Madeira, 2 specimens, **JBM-AR-0185**]

279. *Omosita colon* (Linnaeus, 1758)

As *Omasita colon* L. – Misspelled genus epithet [4 specimens without further data, **JBM-AR-0186**]

280. *Omosita discoidea* (Fabricius, 1775)

As *Omasita discoidea* F. – Misspelled genus epithet [Funchal, Madeira, 2 specimens, **JBM-AR-0187**]

281. *Pria dulcamarae* (Scopoli, 1763)

As *Pria dulcamarae* Scop. [2 specimens without further data, **JBM-AR-0188**]

282. *Xenostrogylus histrio* Wollaston, 1854

As *Xenostrogylus histrio* Woll. [Arrebentão, Madeira, 1 specimen, **JBM-AR-0190**]

#### Family **Oedemeridae**

283. *Alloxantha fulva* (Wollaston, 1854)

As *Holoxantha concolor* Bru. – Misidentification [Selvagens, 2 specimens, June 1938, **JBM-AR-0306**]

284. *Nacertes melanura* (Linnaeus, 1758)

As *Nacertes melanura* L. [Madeira, 3 specimens, **JBM-AR-0297**]

285. *Stenostoma lowei* (Wollaston, 1854)

As *Oedemera lowei* Woll. – Change of combination [Madeira, 5 specimens, **JBM-AR-0298**]

#### Family **Phalacridae**

286. *Olibrus affinis* (Sturm, 1807)

As *Olibrus affinis* [Bom Sucesso, Madeira, 9 specimens, **JBM-AR-0150**]

287. *Stilbus testaceus* (Panzer, 1797)

As *Eustibus testaceus* Panz – Change of combination [4 specimens without further data, **JBM-AR-0151**]

#### Family **Ptiliidae**

288. *Acrotrichis* cf. *atomaria* (De Geer, 1774)

As *Trichopteryx atomaria* Dej. – Change of combination, wrong authority [1 specimen without further data, **JBM-AR-0149**]

289. *Nephanes titan* (Newman, 1834)

As *Nephanes titan* Newman [2 specimens without further data, **JBM-AR-0148**]

290. *Ptenidium pusilum* (Gyllenhal, 1808)

As *Ptenidium evanescens* – Doubtful synonym [3 specimens without further data, **JBM-AR-0147**]

#### Family **Salpingidae**

291. *Aglenus brunneus* (Gyllenhal, 1813)

As *Aglenus brunneus* Gyl. [Funchal, Madeira, 7 specimens, **JBM-AR-0201**]

#### Family **Scraptiidae**

292. *Anaspis proteus* Wollaston, 1854

As *Anaspis proteus* Woll. [Bom Sucesso, Madeira, 6 specimens, **JBM-AR-0289**]

#### Family **Scydmaenidae**

293. *Stenichnus helferi helferi* Schaum, 1841

As *Scydmaenus helferi* Schaum – Change of combination, synonym [Santana, Madeira, 2 specimens, **JBM-AR-0141**]

#### Family **Silvanidae**

294. *Ahasverus advena* (Waltl, 1834)

As *Cathartus advena* Woll. – Change of combination, wrong authority [Funchal, Madeira, 2 specimens, **JBM-AR-0217**]

295. *Cryptamorpha desjardinsii* (Guerin-Meneville, 1844)

As *Cryptamorpha desjardinsi* Guér. [Funchal, Madeira, 2 specimens, **JBM-AR-0214**]

296. *Nausibius clavicornis* (Kugelann, 1794)

As *Nausibius clavicornis* Kug. [Funchal, Madeira, 4 specimens, **JBM-AR-0215**]

297. *Oryzaeophilus surinamensis* (Linnaeus, 1758)

As *Silvanus surinamensis* L. – Change of combination [Funchal, Madeira, 1 specimen, **JBM-AR-0216**]

This species is a common pest of stored products with a wide world distribution. Although HALSTEAD *et al.* (2007) and BOIEIRO *et al.* (2008) did not include it on their listings, this old specimen and several recent ones justify the inclusion of *O. surinamensis* as a resident species in Madeira.

298. *Psammoecus personatus* Grouvelle, 1919

As *Psammoecus personatus* [?Fanal, Levada, Madeira, 1 specimen, 1907, **JBM-AR-0208**]

#### Family **Staphylinidae**

299. *Aleochara* cf. *bipustulata* (Linnaeus, 1761)

As *Aleochara nitida* Grav. – Dubious synonym [Santana, Madeira, 2 specimens, **JBM-AR-0139**]

According to ASSING & SCHÜLKE (2006), all the material examined from Madeira proved to be either *A. lindbergi* or *A. verna*. The presence of *A. bipustulata* in Madeira is dubious and needs confirmation.

300. *Aleochara clavicornis* Redtenbacher, 1849

As *Aleochara clavicornis* [1 specimen without further data, **JBM-AR-0134**]

301. *Aleochara funebris* Wollaston, 1864

As *Aleochara moesta* Grav. – Misidentification [Arrebetão, Madeira, 2 specimens, **JBM-AR-0138**]

302. *Aleochara moesta* Gravenhorst, 1802

As *Aleochara crassiuscula* – Misidentification [2 specimens without further data, **JBM-AR-0137**]

303. *Aleochara puberula* Klug, 1832

As *Aleochara puberula* [Funchal, Madeira, 1 specimen, **JBM-AR-0135**]

304. *Aloconota gregaria* (Erichson, 1839)

As *Athleta gregaria* Er. – Change of combination and misspelling of the genus name [2 specimens without further data, **JBM-AR-0129**]

305. *Aloconota sulcifrons* (Stephens, 1832)

As *Atheta sulcifrons* Steph. – Change of combination [Rabaçal, Madeira, 4 specimens, **JBM-AR-0128**]

306. *Amischa analis* (Gravenhorst, 1802)

As *Athleta analis* – Change of combination and misspelling of the genus name [Funchal, Madeira, 3 specimens, **JBM-AR-0126**]

307. *Anotylus complanatus* (Erichson, 1839)

As *Oxytelus complanatus* Woll. – Change of combination, wrong authority [Funchal, Madeira, 10 specimens, **JBM-AR-0078**]

308. *Anotylus insignitus* (Gravenhorst, 1806)

As *Oxytelus insignitus* – Change of combination [3 specimens without further data, **JBM-AR-0075**]

309. *Anotylus nitidifrons* (Wollaston, 1871)

As *Oxytelus nitidifrons* – Change of combination [Funchal, Madeira, 3 specimens, **JBM-AR-0076**]

310. *Anotylus nitidulus* (Gravenhorst, 1802)

As *Oxytelus nitidulus* – Change of combination [Funchal, Madeira, 4 specimens, **JBM-AR-0077**]

311. *Astenus bimaculatus* (Erichson, 1840)

As *Astenus bimaculatus* [2 specimens without further data, **JBM-AR-0085**]

312. *Astenus lyonessius* (Joy, 1908)

As *Astenus angustatus* – Misidentification [3 specimens without further data, **JBM-AR-0087**]

313. *Atheta atramentaria* (Gyllenhal, 1810)

As *Athleta atramentaria* Gyll. – Misspelling of the genus name [Monte, Madeira, 3 specimens, **JBM-AR-0123**]

314. *Atheta coriaria* (Kraatz, 1856)

As *Athleta coriaria* – Misspelling of the genus name [Santana, Madeira, 3 specimens, **JBM-AR-0124**]

315. *Atheta longicornis* (Gravenhorst, 1802)

As *Athleta longicornis* – Misspelling of the genus name [Arrebetão, Madeira, 2 specimens, **JBM-AR-0122**]

316. *Atheta luridipennis* (Mannerheim, 1830)

As *Athleta luridipennis* – Misspelling of the genus name [Lost specimen, **JBM-AR-0127**]

317. *Atheta palustris* (Kiesenwetter, 1844)

As *Athleta palustris* – Misspelling of the genus name [3 specimens without further data, **JBM-AR-0125**]

318. *Bisnius sordidus* (Gravenhorst, 1802)

As *Philonthus sordidus* – Change of combination [Madeira, 4 specimens, **JBM-AR-0105**]

319. *Carpelimus bilineatus* Stephens, 1834

As *Trogophoeus bilineatus* – Change of combination [2 specimens without further data, **JBM-AR-0070**]

320. *Carpelimus corticinus* (Gravenhorst, 1806)

As *Trogophoeus corticinus* – Change of combination [4 specimens without further data, **JBM-AR-0071**]

321. *Carpelimus exilis* (Wollaston, 1860)

As *Trogophoeus pusillus* – Misidentification [2 specimens without further data, **JBM-AR-0072**]

322. *Cilea silphoides* (Linnaeus, 1767)

As *Cilea silphoides* [Funchal, Madeira, 3 specimens, **JBM-AR-0114**]

323. *Cordalia obscura* (Gravenhorst, 1802)

As *Falagria obscura* Grav. – Change of combination [Funchal, Madeira, 3 specimens, **JBM-AR-0130**]

324. *Creophilus maxillosus* (Linnaeus, 1758)

As *Emus maxillosus* – Change of combination [Porto Santo, 3 specimens, **JBM-AR-0101**]

325. *Gabrius nigrutilus* (Gravenhorst, 1802)

As *Philonthus nigrutilus* – Change of combination [Funchal, Madeira, 3 specimens, **JBM-AR-0109**]

326. *Habrocerus capillaricornis* (Gravenhorst, 1806)

As *Habrocerus capillaricornis* Grav. [Rabaçal, Madeira, 3 specimens, **JBM-AR-0113**]

327. *Heterothops minutus* Wollaston, 1860

As *Heterothops dissimilis* – Misidentification [2 specimens without further data, **JBM-AR-0112**]

328. *Holobus ignoratus* Assing, 1998

As *Oligota flavicornis* – Misidentification [1 specimen without further data, **JBM-AR-0117**]

329. *Hypomedon debilicornis* (Wollaston, 1857)

As *Medon debilicornis* – Change of combination [1 specimen without further data, **JBM-AR-0094**]

330. *Ischnoglossa prolixa* (Gravenhorst, 1802)

As *Stichoglossa prolixa* Gyll. – Synonym [1 specimen without further data, **JBM-AR-0140**]

331. *Lepidophalus hesperius* (Erichson, 1839)

As *Xantholinus hesperius* – Change of combination [1 specimen without further data, **JBM-AR-0100**]

332. *Leptacinus pusillus* (Stephens, 1833)

As *Leptacinus batychrus* – Misidentification [3 specimens without further data, **JBM-AR-0099**]

333. *Leptobium paivae* (Wollaston, 1865)

As *Dolicaon paivae* Woll. – Change of combination [Selvagens, 1 specimen, **JBM-AR-0340**; Selvagem Grande, 4 specimens without id., 16 July 1939, **JBM-AR-0371**]

334. *Lithocharis ochracea* (Gravenhorst, 1802)

As *Medon ochraceus* – Synonym [Funchal, Madeira, 1 specimen, **JBM-AR-0092**]



335. *Lobrathium multipunctum* (Gravenhorst, 1802)

As *Lathrobium multipunctum* – Change of combination [Santana, Madeira, 4 specimens, **JBM-AR-0096**]

336. *Medon apicalis* (Kraatz, 1857)

As *Medon apicalis* Kr. [Porto da Cruz, Madeira, 1 specimen, **JBM-AR-0091**]

337. *Medon ripicola* (Kraatz, 1854)

As *Medon ripicola* [1 specimen without further data, **JBM-AR-0090**]

338. *Megarthus longicornis* Wollaston, 1854

As *Megarthus longicornis* [Funchal, Madeira, 1 specimen, **JBM-AR-0066**]

339. *Metopsia ampliata* Wollaston, 1854

As *Phloeobium ampliatum* – Change of combination, synonym [Ribeiro Frio, Madeira, 1 specimen, **JBM-AR-0065**]

340. *Nacaeus impressicollis* (Motschulsky, 1858)

As *Lispinus impressicollis* – Change of combination [Funchal, Madeira, 3 specimens, **JBM-AR-0064**]

341. *Nehemitropia lividipennis* (Mannerheim, 1830)

As *Athleta sordida* – Synonym and misspelling of the genus name [Funchal, Madeira, 2 specimens, **JBM-AR-0121**]

342. *Neobismius lathrobioides* (Baudi, 1848)

As *Actobius procerulus* – Misidentification [2 specimens without further data, **JBM-AR-0102**]

343. *Oligota parva* Kraatz, 1852

As *Oligota parva* [1 specimen without further data, **JBM-AR-0119**]

344. *Oligota punctulata* Heer, 1839

[1 specimen without further data]

345. *Oligota pusillima* (Gravenhorst, 1806)

As *Oligota pusillima* [2 specimens without further data, **JBM-AR-0120**]

346. *Othius strigulosus* Wollaston, 1854

As *Othius strigulosus* [Arrebetão, Madeira, 1 specimen, **JBM-AR-0097**]

347. *Oxytelus piceus* (Linnaeus, 1767)

As *Oxytelus piceus* [3 specimens without further data, **JBM-AR-0073**]

348. *Oxytelus sculptus* (Linnaeus, 1767)

As *Oxytelus sculptus* [Funchal, Madeira, 1 specimen, **JBM-AR-0074**]

349. *Parocyusa longitarsis* (Erichson, 1839)

As *Calodera longitarsis* – Change of combination [2 specimens without further data, **JBM-AR-0133**]

350. *Phacophalus parumpunctatus* (Gyllenhal, 1827)

As *Leptacinus parumpunctatus* – Change of combination [2 specimens without further data, **JBM-AR-0098**]

351. *Philonthus cf. concinnus* (Gravenhorst, 1802)

As *Philonthus ebeninus* – ?Misidentification [Funchal, Madeira, 4 specimens, **JBM-AR-0108**]

The identity of these specimens need confirmation as *P. concinnus* is a species from the Canary Islands and was removed from the list of species existing in Madeira by ASSING & SCHÜLKE (2006).

352. *Philonthus discoideus* (Gravenhorst, 1802)

As *Philonthus discoideus* [Funchal, Madeira, 2 specimens, **JBM-AR-0107**]

353. *Philonthus longicornis* Stephens, 1832

As *Philonthus varians* var. *agilis* – Misidentification [Monte, Funchal, 1 specimen, **JBM-AR-0111**];

As *Philonthus longicornis* [Funchal, Madeira, 2 specimens, **JBM-AR-0110**]

354. *Philonthus politus* (Linnaeus, 1758)

As *Philonthus politus* [Funchal, Madeira, 5 specimens, **JBM-AR-0103**]

355. *Philonthus umbratilis* (Gravenhorst, 1802)

As *Philonthus umbratilis* [1 specimen without further data, **JBM-AR-0104**]

356. *Philonthus ventralis* (Gravenhorst, 1802)

As *Philonthus ventralis* [Funchal, Madeira, 4 specimens, **JBM-AR-0106**]

357. *Philorinum sordidum* (Stephens, 1834)

As *Philorinum sordidum* [1 specimen without further data, **JBM-AR-0069**]

358. *Phloeonomus pusillus* (Gravenhorst, 1806)

As *Homalium pusillum* – Change of combination, synonym [Arreentão, Madeira, 5 specimens, **JBM-AR-0068**]

359. *Phloeopora corticalis* (Gravenhorst, 1802)

As *Phloeopora corticalis* Grav. [Santana, Madeira, 2 specimens, **JBM-AR-0132**]

360. *Phytosus balticus* (Kraatz, 1859)

As *Phytosus balticus* [Lost specimen, **JBM-AR-0131**]

361. *Platystethus degener* Mulsant & Rey, 1878

As *Platystethus cornutus* – Misidentification [Funchal, Madeira, 3 specimens, **JBM-AR-0079**]

As *Platystethus cornutus* v. *alutaceus* – misidentification [1 specimen without further data, **JBM-AR-0080**] (See VOLKER & SCÜLKE, 2006)

362. *Platystethus nitens* (C. R. Sahlberg, 1832)

As *Platystethus nitens* [Santana, Madeira, 3 specimens, **JBM-AR-0082**]

363. *Platystethus spinosus* Erichson, 1840

As *Platystethus spinosus* [1 specimen without further data, **JBM-AR-0081**]

364. *Pseudomedon obscurellus* (Erichson, 1840)

As *Medon obsoletus* – Misidentification [4 specimens without further data, **JBM-AR-0093**]

365. *Rugilus orbiculatus* (Paykull, 1789)

As *Stilicus orbiculatus* – Change of combination [4 specimens without further data, **JBM-AR-0088**]

366. *Sepedophilus testaceus* (Fabricius, 1793)

As *Conurus pubescens* – Synonym [Arreentão, Madeira, 3 specimens, **JBM-AR-0116**]

367. *Stenus cicindeloides* (Schaller, 1783)

As *Stenus cicindeloides* [4 specimens without further data, **JBM-AR-0086**]

368. *Stenus guttula* Müller, 1821

As *Stenus guttula* Müll [Santana, Madeira, 2 specimens, **JBM-AR-0083**]

369. *Stenus providus* Erichson, 1839

As *Stenus providus* [3 specimens without further data, **JBM-AR-0084**]

370. *Sunius propinquus* (Brisout, 1867)

As *Medon propinquus* – Change of combination [Santana, Madeira, 2 specimens, **JBM-AR-0095**]

371. *Tachyporus nitidulus* (Fabricius, 1781)

As *Tachyporus nitidulus* [Funchal, Madeira, 5 specimens, **JBM-AR-0115**]

372. *Tinotus morion* (Gravenhorst, 1802)

As *Aleochara morion* Grav.– Change of combination [2 specimens without further data, **JBM-AR-0136**]

373. *Xantholinus longiventris* Heer, 1839

As *Xantholinus linearis* – Misidentification [Poiso, Madeira, 4 specimens, **JBM-AR-0089**]

374. *Xylodromus concinnus* (Marsham, 1802)

As *Homalium concinum* – Change of combination, synonym [1 specimen without further data, **JBM-AR-0067**]

#### Family **Tenebrionidae**

375. *Alphitobius diaperinus* Kugel, 1797

As *Alphitobius ovatus* Herbst – Synonym [Porto santo, 5 specimens, **JBM-AR-0279**]

The latest list of Tenebrionidae from Madeira by OROMÍ (2008) does not include Porto Santo in the distribution of *A. diaperinus*, which should be updated based on these old specimens.

376. *Alphitobius laevigatus* (Fabricius, 1781)

As *Alphitobius piceus* Ol. – Synonym [Funchal, Madeira, 3 specimens, **JBM-AR-0280**]

377. *Belopus elongatus* (Herbst, 1797)

As *Calcar elongatum* Herbst – Change of combination, synonym [Garajau, Madeira, 8 specimens, **JBM-AR-0283**]

378. *Blaps gigas* (Linnaeus, 1767)

As *Blaps gigas* L. [2 specimens without further data, **JBM-AR-0266**; Selvagens, 2 specimens, **JBM-AR-0352**; Selvagem Grande, 2 specimens without id., 16 July 1939, **JBM-AR-0353**; Selvagem Grande, 1 specimen without id., September 1938, **JBM-AR-0354**]

379. *Blaps lethifera* Marsham, 1802

As *Blaps lethifera* Marsh. [Porto Santo, 2 specimens, **JBM-AR-0267**]

380. *Boromorpha tagenioides* (Lucas, 1849)

As *Boromorpha tagenioides* Lucas [Praia Formosa, Madeira, 5 specimens **JBM-AR-0275**]

381. *Cnemeplatia laticeps* (Wollaston, 1857)

As *Cnemeplatia atropos* Costa – Misidentification [Monte, Madeira, 1 specimen, **JBM-AR-0274**]

382. *Ellipsodes glabrata glabrata* (Fabricius, 1792)

As *Ellipsodes glabratus* F. – Synonym [Santana, Madeira, 4 specimens, **JBM-AR-0268**]

383. *Gnathocerus cornutus* (Fabricius, 1798)

As *Echocerus cornutus* F. – Change of combination [Funchal, Madeira, 3 ♂♂, 2 ♀♀, **JBM-AR-0278**]

384. *Gonocephalum affine* (Billberg, 1815)

As *Gonocephalum hispidum* Brullé – Synonym [Funchal, Madeira, 15 specimens, **JBM-AR-0269**]

385. *Gonocephalum dilatatum* (Wollaston, 1854)

[Selvagens, 1 specimen, without id., July 1938, **JBM-AR-0347**; Ilhéu de Fora, Selvagens, 1 specimen, 2 September 1938, **JBM-AR-0363**; Selvagem Grande, 16 specimens, 16 July 1939, **JBM-AR-0362**]

386. *Hadrus* cf. *alpinus* Wollaston, 1854

As *Hadrus alpinus* Woll. [Funchal, Madeira, 1 badly damaged specimen and 1 lost, **JBM-AR-0270**]

387. *Hadrus carbonarius carbonarius* (Quensel, 1806)

As *Hadrus carbonarius* Quens. – Synonym [Funchal, Madeira, 7 specimens, **JBM-AR-0271**]

388. *Hadrus carbonarius paivae* Wollaston, 1860

As *Hadrus Paivae* Woll. – Synonym [Ponta da Cruz, Madeira, 8 specimens, **JBM-AR-0273**]

389. *Hadrus illotus* Wollaston, 1854

As *Hadrus illotus* Woll. [Porto Santo, 3 specimens, **JBM-AR-0272**]

390. *Hegeter latebricola* Wollaston, 1854

As *Hegeter latebricola* Woll. [Selvagens, 1 specimen, **JBM-AR-0348**; Ilhéu de Fora, Selvagens, 1 specimen, September 1938, **JBM-AR-0358**; Selvagem Grande, 1 specimen, August 1938, **JBM-AR-0359**; Ilhéu de Fora, Selvagens, 2 specimens without id., 2 September 1938, **JBM-AR-0360**; Selvagem Grande, 2 specimens without id., 16 July 1939, **JBM-AR-0357**]

391. *Hegeter tristis* (Fabricius, 1792)

As *Hegeter tristis* Fbr. [Selvagens, 1 specimen, **JBM-AR-0349**; ?Selvagens, 1 specimen without id., **JBM-AR-0351**; Selvagens, 2 specimens without id., June 1938, **JBM-AR-0350**; Selvagem Grande, 3 specimens without id., 16 July 1939, **JBM-AR-0356**]

As *Hegeter tristis* F. [Funchal, Madeira, 2 specimens, **JBM-AR-0265**]

392. *Nesotes asper maderensis* Cockerell, 1923

As *Helops asper* – Change of combination [Madeira, 2 specimens, **JBM-AR-0284**]

393. *Nesotes gagatinus* (Küster, 1850)

As *Helops gagatinus* Küst. – Change of combination [Santo da Serra, Madeira, 1 specimen, **JBM-AR-0287**]

394. *Nesotes graniger* (Küster, 1850)

As *Helops graniger* Küst. – Change of combination [Pico de São Martinho, Madeira, 1 specimen, **JBM-AR-0288**]

395. *Nesotes leacoccianus* (Wollaston, 1854)

As *Helops Leacokianus* Woll. – Change of combination, synonym [Selvagens, 1 specimen, **JBM-AR-0346**; Selvagem Grande, 8 specimens without id., 16 July 1939, **JBM-AR-0361**]

396. *Nesotes lucifugus lucifugus* (Wollaston, 1854)

As *Helops lucifugus* Woll. – Change of combination [Porto Santo, 1 specimen, **JBM-AR-0286**]

397. *Nesotes monodi* Alluaud, 1935

[Selvagem Grande, 3 specimens without id., 16 July 1939, **JBM-AR-0379**]



398. *Nesotes obliteratus* (Wollaston, 1871)

As *Helops* v. *obliterates* Woll. – Change of combination, synonym [4 specimens without further data, **JBM-AR-0285**]

399. *Nesotes portosanctanus* (Wollaston, 1854)

As *Helops portosanctanus* Woll. – Change of combination [Porto Santo, 1 specimen, **JBM-AR-0304**]

400. *Tenebrio molitor* Linnaeus, 1761

As *Tenebrio molitor* L. [1 specimen without further data, **JBM-AR-0282**]

401. *Tenebrio obscurus* Fabricius, 1792

As *Tenebrius obscurus* F. – Change of combination [Funchal, Madeira, 3 specimens, **JBM-AR-0281**]

402. *Tribolium castaneum* (Herbst, 1797)

As *Tribolium ferrugineum* F. – Synonym [Funchal, Madeira, 4 specimens, **JBM-AR-0276**]

403. *Tribolium confusum* (Duval, 1868)

As *Tribolium confusum* Duv. [1 specimen without further data, **JBM-AR-0277**]

### Family **Trogidae**

404. *Trox scaber* (Linnaeus, 1767)

As *Trox scaber* L. [Funchal, Madeira, 7 specimens, **JBM-AR-0243**]

### Family **Trogossitidae**

405. *Leipaspis caulicola oceanica* Wollaston, 1865

[Ilhéu de Fora, Selvagens, 1 specimen without id., September 1938, **JBM-AR-0380**]

406. *Tenebroides mauritanicus* (Linnaeus, 1758)

As *Tenebroides mauritanicus* L. [Funchal, Madeira, 2 specimens, **JBM-AR-0193**]

407. *Tenebroides* sp.

As *Tenebroides serratus* L. – Misidentification [Funchal, Madeira, 1 specimen, **JBM-AR-0194**]

### Family **Zopheridae**

408. *Tarphius compactus* Wollaston, 1854

As *Tarphius compactus* Woll. [Santana, Madeira, 1 specimen, **JBM-AR-0198**]

409. *Tarphius lauri* Wollaston, 1854

As *Tarphius lauri* Woll. [Santana, Madeira, 7 specimens, **JBM-AR-0199**]

410. *Tarphius lowei* Wollaston, 1854

As *Tarphius lowei* Woll. [Santana, Madeira, 2 specimens, **JBM-AR-0195**]

411. *Tarphius lutulentus* Wollaston, 1871

As *Tarphius lutulentus* Woll. [Monte, Madeira, 2 specimens, **JBM-AR-0196**]

412. *Tarphius nodosus* Wollaston, 1854

As *Tarphius nodosus* Woll. [São Jorge, Madeira, 1 specimen, **JBM-AR-0197**]

413. *Tarphius rotundatus* Wollaston, 1854

As *Tarphius rotundatus* Woll. [Ribeiro Frio, Madeira, 1 specimen, **JBM-AR-0200**]

## Order DIPTERA

### Family Agromyzidae

414. *Cerodontha denticornis* (Panzer, 1806)

As *Ceratomyza acuticornis* Meig. – Synonym [3 specimens, T. Becker det., **JBM-AR-0429**] (Species no. 201 in BECKER, 1908a)

415. *Cerodontha* sp.

As *Domomyza lateralis* Zett. – [2 damaged specimens, T. Becker det., **JBM-AR-0440**] (Species not present in BECKER, 1908a)

416. *Phytomyza obscurella* Fallén, 1823

As *Phytomyza obscurella* Fall. [2 specimens, T. Becker det., **JBM-AR-0439**] (Species no. 207 in BECKER, 1908a)

417. *Phytomyza ranunculi* (Schrank, 1803)

As *Phytomyza flava* Fall. – Synonym [2 specimens, T. Becker det., **JBM-AR-0431**] (Species no. 208 in BECKER, 1908a)

### Family Asilidae

418. *Machimus* sp.

[Ilhéu de Fora, Selvagens, 1♀, 2 September 1938, **JBM-AR-0389**]

There are no reliable keys to species of Asilidae from Madeira and neighbouring islands and the family is in the need of a thorough revision. This is the only known record of an Asilid fly from the Selvagens.

### Family Bombyliidae

419. *Phthiria* sp.

[Ilhéu de Fora, Selvagens, 1 damaged specimen, 2 September 1938, **JBM-AR-0670**]

This is the first record of this family for the Selvagens Islands. Genus *Phthiria* Meigen, 1820 is not referenced for Madeira but is represented in the Canary Islands by 3 species (BÁEZ & OROMÍ, 2010). Unfortunately the specimen's state of preservation does not allow to check if it is conspecific with any of them.

### Family Calliphoridae

420. *Stomorhina lunata* (Fabricius, 1805)

As *Idia maculata* Mcq. – Non existing combination [2 damaged specimens, T. Becker det., **JBM-AR-0448**]

As *Idia lunata* Fbr. Species no. 115 In BECKER, 1908a. The specimen in the Seminary collection could have been identified initially by BECKER as *I. maculata* but subsequently treated as *I. lunata* in BECKER, 1908a. *Idia* Wiedmann, 1820 is a synonym of the valid name *Stomorhina* Rondani, 1861.

### Family Canacidae

421. *Canace actites* Mathis, 1982

As *Canace salonitana* Strobl – Misidentification [5 specimens, T. Becker det., **JBM-AR-0402**]

422. *Canace nasica* (Haliday, 1839)

As *Canace nasica* Halid. [4 specimens, T. Becker det., **JBM-AR-0403**] (Species no. 189 in BECKER, 1908a)

### Family **Chamaemyiidae**

423. *Chamaemyia polystigma* (Meigen, 1830)

As *Ochthiphila polystigma* Meig. – Change of combination [3 specimens, T. Becker det., **JBM-AR-0427**] (Species no. 196 in BECKER, 1908a)

424. *Leucopis griseola* (Fallén, 1823)

As *Leucopis griseola* Fall. [2 specimens, T. Becker det., **JBM-AR-0430**] (Species no. 195 in BECKER, 1908a)

### Family **Chloropidae**

425. *Elachiptera bimaculata* Loew, 1845

As *Crassiseta bimaculata* Lw. – Change of combination [2 specimens, T. Becker det., **JBM-AR-0413**] (Species no. 172 in BECKER, 1908a)

426. *Elachiptera megaspis* Loew, 1858

As *Crassiseta megaspis* Lw. – Change of combination [2 specimens, T. Becker det., **JBM-AR-0415**] (Species no. 174 in BECKER, 1908a)

427. *Melanochaeta pubescens* (Thalhammer, 1898)

As *Crassiseta trisulcata* Becker – Misidentification [2 specimens, T. Becker det., **JBM-AR-0414**]

As *Pachycheta pubescens* Thalh. Species no. 173 in BECKER, 1908a. BECKER, 1908a. BECKER during his visit to Madeira considered the specimens from Madeira to be of *C. trisulcata*, a species described by him from Egypt. BECKER (1908a) considered *C. trisulcata* Becker as synonym of *P. pubescens* Thalh. At the present time *C. trisulcata* Becker (valid name: *Elachiptera rufescens* Walker, 1871) is considered to be restricted to Egypt.

428. *Oscinella frit* (Linnaeus, 1758)

As *Oscinis frit* L. – Change of combination [3 specimens, T. Becker det., **JBM-AR-0410**] (Species no. 177 in BECKER, 1908a)

429. *Oscinella maura* (Fallén, 1820)

As *Oscinis Maura* Fall. – Change of combination [1 lost specimen, T. Becker det., **JBM-AR-0411**] (Species no. 175 in BECKER, 1908a)

430. *Oscinella pusilla* (Meigen, 1830)

As *Oscinis pusilla* Meig. – Change of combination [1 lost specimen, T. Becker det., **JBM-AR-0409**] (Species no. 176 in BECKER, 1908a)

### Family **Dolichopodidae**

431. *Aphrosylus jucundus* Becker, 1908

As *Aphrosylus jucundus* Bec [3 specimens, T. Becker det., **JBM-AR-0418**] (Species no. 43 in BECKER, 1908a)

432. *Aphrosylus venator* Loew, 1857

As *Aphrosylus venator* Lw. [11 specimens, T. Becker det., **JBM-AR-0417**] (Species no. 42 in BECKER, 1908a)

433. *Campsicnemus curvipes* (Fallén, 1823)

As *Campsicnemus curvipes* Fall. [9 specimens, T. Becker det., **JBM-AR-0416**] (Species no. 44 in BECKER, 1908a)

434. *Liancalus virens* (Scopoli, 1763)

As *Liancalus virens* Scop [1♂, 1♀, T. Becker det., **JBM-AR-0420**] (Species no. 40 in BECKER, 1908a)

435. *Syntormon pallipes* (Fabricius, 1794)

As *Syntormon pallipes* Fbr. [3 specimens, T. Becker det., **JBM-AR-0419**] (Species no. 45 in BECKER, 1908a)

### Family **Drosophilidae**

436. *Scaptomyza graminum* (Fällén, 1823)

As *Scaptomyza tetrasticha* Becker – Synonym [2 specimens, T. Becker det., **JBM-AR-0433**] (Species no. 168 in BECKER, 1908a).

As *Scaptomyza graminum* Fall. – [2 specimens, T. Becker det., **JBM-AR-0434**] (Species no. 167 in BECKER, 1908a)

### Family **Empididae**

437. *Kowarzia haemorrhoidalis* (Becker, 1908)

As *Kowarzia amarantha* Becker – Misidentification [3♂, 5♀, T. Becker det., **JBM-AR-0432**] (It corresponds to species no. 36 in BECKER, 1908a)

### Family **Ephydriidae**

438. *Hyadina guttata* (Fallén, 1813)

As *Hyadina guttata* Fall. [3 specimens, T. Becker det., **JBM-AR-0405**] (Species no. 186 in BECKER, 1908a)

439. *Hydrellia griseola* (Fallén, 1813)

As *Hydrellia griseola* Fall. [4 specimens, T. Becker det., **JBM-AR-0404**] (Species no. 185 in BECKER, 1908a)

440. *Hydrellia maura* Meigen, 1838

As *Hydrellia modesta* Lw. – Synonym [1 specimen, T. Becker det., **JBM-AR-0453**] (Species no. 185 in BECKER, 1908a)

441. *Mosillus subsultans* (Fabricius, 1794)

As *Gymnopa subsultans* Fbr. – Change of combination [2 specimens, T. Becker det., **JBM-AR-0401**] (Species no. 183 in BECKER, 1908a)

442. *Parydra coarctata* (Fallén, 1813)

As *Parydra coarctata* Fall. [4 specimens, T. Becker det., **JBM-AR-0412**] (Species no. 188 in BECKER, 1908a)

443. *Parydra fossarum* (Haliday, 1833)

As *Parydra fossarum* Hal. [10 specimens, T. Becker det., **JBM-AR-0408**] (Species no. 187 in BECKER, 1908a)

444. *Scatella major* Becker, 1908

As *Scatella major* Becker [1 specimen, T. Becker det., **JBM-AR-0406**] (Species no. 181 in BECKER, 1908a)

445. *Scatella stagnalis* (Fallén, 1813)

As *Scatella stagnalis* Fall. [10 specimens, T. Becker det., **JBM-AR-0407**] (Species no. 182 in BECKER, 1908a)

### Family **Heleomyzidae**

446. *Suillia variegata* (Loew, 1862)

As *Helomyza rufa* Fall. – misidentification [9 specimens, T. Becker det., **JBM-AR-0395**] (Species no. 143 in BECKER, 1908a)

It might happen that in a first observation of the specimens held the Seminary collection, BECKER identified those as belonging to the species *Helomyza rufa* Fall. However, we can assume that after a more careful examination he ended considering it as a distinct taxon in BECKER, 1908a, i.e. *Helomyza variegata* Lw.

### Family **Lonchopteridae**

447. *Lonchoptera bifurcata* (Fällén, 1810)

As *Lonchoptera lacustris* Meig. – Invalid name / junior synonym [2 specimens, T. Becker det., **JBM-AR-0424**]



Probably *Lonchoptera lacustris* Scop., species no. 46 in BECKER, 1908a. The authority assumed by BECKER is a mistake as the author of *L. lacustris* is MEIGEN and not SCOPOLI.

### Family **Milichiidae**

448. *Desmometopa m-nigrum* (Zetterstedt, 1848)

As *Desmometopa niloticum* Becker – Misidentification [4 specimens, T. Becker det., **JBM-AR-0428**] (Species no. 197 in BECKER, 1908a)

The species *D. niloticum* is not mentioned in BECKER, 1908a for Madeira. We can assume that his initial observation of such specimens held in the Seminary collection made him assume to be *D. niloticum* described by him a year earlier (1903) of his visit to Madeira. And that, after a more careful examination, he concluded (BECKER, 1908a) to be of *D. m-nigrum* (Zett.)

### Family **Muscidae**

449. *Lispe nana* Macquart, 1835

As *Lispa nana* Mcq. – Misspelled genus name [7 specimens, some damaged, T. Becker det., **JBM-AR-0443**] (Species no. 91 in BECKER, 1908a)

450. *Lispe tentaculata* (De Geer, 1776)

As *Lispa tentaculata* Deg. – Misspelled genus name [9 specimens, some damaged, T. Becker det., **JBM-AR-0442**] (Species no. 90 in BECKER, 1908a)

451. *Musca domestica* Linnaeus, 1758

As *Musca domestica* L. [5 specimens, T. Becker det., **JBM-AR-0447**] (Species no. 105 in BECKER, 1908a)

452. *Stomoxys calcitrans* (Linnaeus, 1758)

As *Stomoxys calcitrans* L. [5 specimens, some damaged, T. Becker det., **JBM-AR-0444**] (Species no. 102 in BECKER, 1908a)

### Family **Phoridae**

453. Undetermined taxon

As *Conicera atra* Meig. – Synonym [1 damaged specimen beyond identification, T. Becker det., **JBM-AR-0436**]

The species *Conicera atra* Meig. is not mentioned in BECKER, 1908a. On the other hand, BECKER in the same work mentioned and described one single species of *Conicera*, i.e. the Madeiran endemic *Conicera puerilis* no. 73. Therefore, we can assume that his initial observation of the specimen held in the Seminary collection led him to consider it as *C. atra*, however, he concluded in 1908 that specimens found in Madeira should be of *C. puerilis* that is a synonym of the presently accepted name *Puliciphora borinquenensis* Wheeler, 1906. If so, then we would have to presume that the specimen in the Seminary collection might be considered a type specimen of *C. puerilis* Becker, 1908. However, it may also happen that BECKER has collected one *Conicera atra* specimen held in the seminar museum's collection and the samples which brought with him was the new species. To confirm this possibility it would be necessary to observe the type specimen of *C. puerilis* and confront with the existing specimen in the collection of the seminar. Unfortunately, the specimen in the Seminar collection is in a state of preservation which prevents its identification.

454. *Megaselia longicostalis* (Wood, 1912)

As *Phora pulicaria* Fall. – Synonym [6 specimens, T. Becker det., **JBM-AR-0438**] (Species no. 71 in BECKER, 1908a)

455. *Megaselia ruficornis* (Meigen, 1830)

As *Phora ruficornis* Meig. – Change of combination [1 specimen, T. Becker det., **JBM-AR-0437**] (Species no. 70 in BECKER, 1908a)

456. *Megaselia rufipes* (Meigen, 1804)

As *Phora rufipes* Meig. – change of combination [8 specimens, T. Becker det., **JBM-AR-0435**] (Species no. 69 in BECKER, 1908a)

### Family **Piophilidae**

457. *Piophila casei* (Linnaeus, 1758)

As *Piophila casei* L. [4 specimens, T. Becker det., **JBM-AR-0426**] (Species no. 165 in BECKER, 1908a)

### Family **Scatophagidae**

458. *Scatophaga stercoraria* (Linnaeus, 1758)

As *Scatophaga stercoraria* L. – Generic name misspelled [4 damaged specimens, T. Becker det., **JBM-AR-0450**] (Species no. 127 in BECKER, 1908a)

As *Scatophaga merdaria* Fbr. – Synonym [2 damaged specimens, T. Becker det., **JBM-AR-0451**]

[1♂ without id. and no further data, **JBM-AR-0650**]

### Family **Scenopinidae**

459. *Scenopinus albicinctus* (Rossi, 1794)

As *Scenopinus zelleri* Lw. – Synonym [1 specimen, T. Becker det., **JBM-AR-0452**] (Species no. 34 in BECKER, 1908a)

Identification based on the multiple specimens collected by SCHMITZ and sent to BECKER. The specimen in the Seminary collection could be one of those later resent by BECKER to SCHMITZ.

### Family **Sciomyzidae**

460. *Pherbellia inclusa* (Wollaston, 1758)

As *Sciomyza inclusa* Woll. – Change of combination [1 very damaged specimen, T. Becker det., **JBM-AR-0394**] (Species no. 142 and figure 61 in BECKER, 1908a)

### Family **Sepsidae**

461. *Sepsis lateralis* Wiedemann, 1830

As *Sepsis impunctata* Mcq. – Misidentification [1 specimen, T. Becker det., **JBM-AR-0425**] (This species is not mentioned in BECKER, 1908a)

As *Sepsis rufa* Mcq. – Synonym [1 specimen, T. Becker det., **JBM-AR-0441**] (Species no. 162 in BECKER, 1908a)

462. *Sepsis* cf. *biflexuosa* Strobl, 1893

As *Sepsis flavimana* Meig. – Misidentification [6 specimens, T. Becker det., **JBM-AR-0423**] (Species no. 161 in BECKER, 1908a)

The species *S. flavimana* was never proven to be present in Macaronesia and according to PONT & MEIER (2002) due its variability in size and colour it can't be easily distinguished from *S. biflexuosa*, a species previously recorded from Madeira. We assume the material deposited in the Seminary collection might belong to the later species.

### Family **Sphaeroceridae**

463. *Copromyza equina* Fällén, 1820

As *Borborus equinus* Fall. – Change of combination, synonym [3 specimens, T. Becker det., **JBM-AR-0422**] (Species no. 130 in BECKER, 1908a)

464. *Lotophila atra* (Meigen, 1830)

As *Borborus geniculatus* Meig. – Synonym [8 specimens, T. Becker det., **JBM-AR-0421**] (This species is not mentioned in BECKER, 1908a)

### Family **Syrphidae**

465. *Eumerus hispidus* Smit, Aguiar & W.-Dawson, 2004

As *Eumerus purpureus* Meig. – Misidentification [4 specimens damaged in part, T. Becker det., **JBM-AR-0454**] (Species no. 64 in BECKER, 1908a)

466. *Meliscaeva auricollis* (Meigen, 1822)

[1♀ without further data., **JBM-AR-0651**] (This species is not mentioned in BECKER, 1908a)

467. *Milesia crabroniformis* (Fabricius, 1775)

[1♂, 1♀ without further data., **JBM-AR-0648**] (Species no. 65 in BECKER, 1908)

Identification based on a specimen collected by BARRETO. The specimen held in the Seminary collection could be one resented by BECKER to BARRETO.

468. *Myathropa usta* (Wollaston, 1858)

[1♂ without further data., **JBM-AR-0649**]

469. *Neoascia podagrica* (Fabricius, 1775)

As *Ascia podagrica* Fbr. – Change of combination [10 specimens damaged in part, T. Becker det., **JBM-AR-0455**] (Species no. 61 in BECKER, 1908a)

### Family Tachinidae

470. *Gonia bimaculata* (Wiedemann, 1819)

As *Gonia capitata* Deg. – Misidentification [7 specimens damaged in part, T. Becker det., **JBM-AR-0445**] (Species no. 125 in BECKER, 1908a)

As *Gonia nana* Beck. – Dwarf form of *G. bimaculata* [1 damaged specimen, T. Becker det. **JBM-AR-0446**] (Species no. 126 in BECKER, 1908a)

The specimen in the Seminary collection could be a type specimen of such new species described by BECKER in 1908a.

471. *Siphona maderensis* Smit & Zeegers, 2002

As *Siphona cristata* Fbr. – Misidentification [3 specimens damaged in part, T. Becker det., **JBM-AR-0449**] (Species no. 121 in BECKER, 1908a)

### Family Tephritidae

472. *Acanthiophilus walkeri* (Wollaston, 1858)

As *Acanthiophilus walkeri* Wollaston [11♂, 7♀, T. Becker det., **JBM-AR-0396**] (Species no. 151 in BECKER, 1908a)

473. *Campiglossa producta* (Loew, 1844)

As *Oxyna tessellata* Lw. – Misidentification [8 specimens, T. Becker det., **JBM-AR-0400**]

474. *Dioxyna sororcula* (Wiedemann, 1830)

As *Oxyna sororcula* Wied. – Change of combination [6 specimens, T. Becker det., **JBM-AR-0397**] (Species no. 150 in BECKER, 1908a)

475. *Sphenella marginata* (Fallén, 1814)

As *Sphenella marginata* Fll. [10 specimens, T. Becker det., **JBM-AR-0399**] (Species no. 152 in BECKER, 1908a)

476. *Tephritis praecox* (Loew, 1844)

As *Tephritis praecox* Lw. [3 specimens, T. Becker det., **JBM-AR-0398**] (Species no. 153 in BECKER, 1908a)

## Order HEMIPTERA

### Suborder HETEROPTERA

### Family Alydidae

477. *Camptopus lateralis* (Germar, 1817)

As *Camptopus lateralis* Germ. [1♂, 2♀, without further data, **JBM-AR-0515**]

### Family **Anthocoridae**

478. *Lyctocoris campestris* (Fabricius, 1794)

As *Lyctocoris campestris* F. [2 specimens, no. 277, **JBM-AR-0543**]

### Family **Berytidae**

479. *Berytinus hirticornis pilipes* (Puton, 1875)

As *Berytus hirticornis* Brullé – Change of combination [1 specimen without further data, **JBM-AR-0552**]

### Family **Cimicidae**

480. *Cimex lectularius* Linnaeus, 1758

As *Acanthia lectularia* – Change of combination, synonym [3 specimens without further data, **JBM-AR-0551**]

### Family **Coreidae**

481. *Arenocoris waltlii* (Herrich-Schaeffer, 1835)

As *Pseudophloeus waltlii* – Change of combination [1♂, 1♀, no. 261, **JBM-AR-0537**]

482. *Haploprocta sulcicornis* (Fabricius, 1794)

As *Syromastes sulcicornis* F. – Change of combination [3 specimens without further data, **JBM-AR-0525**]

483. *Syromastus rhombeus* (Linnaeus, 1767)

As *Syromastes sinuatus* Fieb. – Synonym [1 specimen, Porto Moniz, Madeira, **JBM-AR-0523**]; 1 specimen, without further data, **JBM-AR-0524**]

### Family **Cydnidae**

484. *Cydnus aterrimus* (Forster, 1771)

As *Cydnus aterrimus* [1♂, No. 150, 2♀♀ **JBM-AR-0532**; 1♂, 1♀, Porto Moniz, Madeira, **JBM-AR-0533**]

### Family **Lygaeidae**

485. *Aphanus rolandri* (Linnaeus, 1758)

As *Aphanus rolandri* L. [1♂, 1♀, No. 171, **JBM-AR-0556**; 1 specimen, without id. or further data, **JBM-AR-0527**]

486. *Dieuches schmitzi* Reuter, 1893

As *Dieuches schmitzi* n. sp. [2♂♂, 1♀, 1 specimen damaged, without further data, **JBM-AR-0529**]

Specimens in the Seminary collection are most probably types of REUTER'S new species (see section: "Type specimens present in the collection" in the present work).

487. *Emblethis angustus* Montandon, 1890

As *Emblethis angustus* Mont. [2♂, No. 270, without further data, **JBM-AR-0536**]

488. *Eremocoris maderensis* (Wollaston, 1858)

[Livramento, Funchal, Madeira, 3♂♂, 1♀, 1 nymph, without id., September 1907, **JBM-AR-0555**]

There is one single taxon in the genus reported to occur in Madeira (RIBES & HEISS, 2008), *i.e.* the Macaronesian endemic *E. maderensis* (Wollaston, 1858).



489. *Hyalochilus ovatulus* (A. Costa, 1853)

[Desertas, 4 specimens (3♂), without id., August 1905, **JBM-AR-0557**]

490. *Nysius contiguus* Walker, 1872

As *Pilophorus pusilus* Reuter – ?Mixed labels [1♂, No. 191, **JBM-AR-0547**; 1♀, No. 168, without id, **JBM-AR-0548**]

491. *Nysius cymoides* (Spinola, 1837)

As *Nysius cogmoides* – Misspelled species epithet [1 damaged specimen, No. 164, **JBM-AR-0546**]

492. *Scolopostethus pilosus maderensis* Reuter, 1881

[1♀, No. 271, without id. or further data, **JBM-AR-0554**]

There is one single taxon reported to occur in Madeira (RIBES & HEISS, 2008), i.e. *S. pilosus maderensis* Reuter 1881. The protologue mentions specimens held by the Museum Holmiense (Stocholm, Sweeden) LINDBERG (1961) refers the existence of 2 specimens “(coll. Wollaston), REUTER, 2 Exx. (leg. SCHMITZ, in Mus. Hels.)”. This means that specimens might be presently hold by the Finish Museum of Natural History (LUOMUS), Finland. The original protologue (REUTER, 1881) makes no mention to number 271. This led us to different hypotheses that 271 might refer to WOLLASTON collection number or it can simply be related with the Seminary collection cataloguing system. But the doubt remains. Could the specimen in the Seminary collection be one of the same sample collected by SCHMITZ and included in WOLLASTON collection? If so the specimen in the Seminary collection could be a forgotten type. Images of the lectotype held at the Natural History Museum of Stckolm indicates that the specimen in the Seminary colletions is *S. pilosus maderensis* (see GUSTAFSSON, 2006).

493. *Spilostethus pandurus* (Scopoli, 1763)

As *Lygaeus pandurus* Scop. – Change of combination [3♂, 1♀, no further data, **JBM-AR-0514**]

494. *Xanthochilus saturnius* (Rossi, 1790)

As *Aphanus reuteri* Horv. – Misidentification [2 specimens without further data, **JBM-AR-0528**]

495. Genus & species undet.

[Selvagem Grande, 8 specimens in nymphal stage, without id., September 1938, **JBM-AR-0391**]

### Family **Miridae**

496. *Closterotomus norwegicus* (Gmelin, 1790)

As *Calocoris norwegicus* Gmel. – Change of combination, synonym [1♂, No. 29, **JBM-AR-0539**]

497. *Creontiades pallidus* (Rambur, 1839)

As *Panthiliodes punctum* Reut. – Synonym [2 specimens without further data, **JBM-AR-0531**]

As *Phytocoris punctum* Reut. – Synonym [1♂, No. 278, **JBM-AR-0544**]

498. *Deraeocoris punctum* (Rambur, 1839)

As *Deraeocoris punctum* Ramb. [1 damaged specimen, No. 230, **JBM-AR-0558**]

499. *Orthops kalmii* (Linnaeus, 1758)

[1♀, No. 190, without id., **JBM-AR-0553**]

500. *Pilophorus perplexus* Douglas & Scott, 1875

As *Pilophorus* sp. [1 specimen, without further data, **JBM-AR-0549**]

501. *Stenodema guentheri* Heiss & Ribes, 2007

As *Miris laevigatus* L. – Misidentification [2 nymphs, 2♀ damaged, 1♂, No. 186, **JBM-AR-0535**]

**Family Nabidae**

502. *Nabis capsiformis* Germar, 1838

As *Nabis capsiformis* Germ. [2 specimens, No. 275, **JBM-AR-0541**]

503. *Nabis pseudoferus ibericus* (Remane, 1962)

As *Nabis fera* L. – Misidentification [1♀ damaged, No. 276, **JBM-AR-0542**]

**Family Pentatomidae**

504. *Aelia acuminata acuminata* (Linnaeus, 1758)

As *Aelia acuminata* L. [2♂, 2♀, without further data, **JBM-AR-0526**]

505. *Brachynema cinctum* (Fabricius, 1775)

As *Brachynema cinctum* F. – New record for Madeira [1♀, No. 156, without further data, **JBM-AR-0540**]

Although not previously recorded from Madeira, the absence of collecting data on the present specimen could shed doubts over its provenance, but the fact that another living specimen was recently photographed at Ponta de São Lourenço, 18 April 2015 on *Suaeda vera* allow us to unmistakably state it as a new record for Madeira. This photograph can be seen at: <http://natureza-em-movimento.blogspot.pt/search/label/percevejo%20%2F%20%20bugs> (accessed: 10 October 2016).

506. *Dolycoris numidicus* Horváth, 1907

As *Dolycoris baccarum* L. – Misidentification [1♂, 1♀, without further data, **JBM-AR-0520**]

507. *Eurydema ornata* (Linnaeus, 1758)

As *Eurydema festivum* var. *decoratum* – Synonym [2♀ without further data, **JBM-AR-0521**]

As *Eurydema* var. *pictum* – Synonym [1♂, 2♀ without further data, **JBM-AR-0522**]

508. *Holcostethus strictus* (Fabricius, 1803)

As *Peribalus strictus* F. – Change of combination [1♂, No. 253, **JBM-AR-0538**]

509. *Nezara viridula* (Linnaeus, 1758)

As *Nezara viridula* L. [1♂ without further data, **JBM-AR-0511**]

510. *Piezodorus lituratus* (Fabricius, 1794)

As *Piezodorus* var. *alliaceus* – Misidentification [3♂ without further data, **JBM-AR-0512**]

511. *Sciocoris helferi* Fieber, 1851

As *Sciocoris huferi* – Misspelled specific epithet [1♂, 3♀ without further data, **JBM-AR-0534**]

**Family Reduviidae**

512. *Coranus aegyptius* (Fabricius, 1775)

As *Coranus aegyptius* F. [3♂ without further data, **JBM-AR-0519**]

513. *Ectomocoris chiragra* (Fabricius, 1803)

As *Pirates chiragra* – Change of combination [3♂, 2♀ without further data, **JBM-AR-0516**]

514. *Reduvius personatus* (Linnaeus, 1758)

As *Reduvius personatus* L. [3♂ without further data, **JBM-AR-0513**]

[Selvagem Grande, 1♂, 16.july.1939, **JBM-AR-0390**]

### Family **Rhopalidae**

515. *Stictopleurus pictus* (Fieber, 1861)

[1♂, 2♀, No. 179, without id. or further data, **JBM-AR-0530**]

### Family **Saldidae**

516. *Saldula pallipes* (Fabricius, 1794)

As *Acanthia pallipes* F. – change of combination [1 specimen, No. 193, **JBM-AR-0550**]

### Family **Stenocephalidae**

517. *Dicranocephalus agilis* (Scopoli, 1763)

As *Stenocephalus agilis* Scop. – Change of combination [1♀ without further data, **JBM-AR-0517**]

As *S. agilis* var. *femoralis* – Synonym [2♀ without further data, **JBM-AR-0518**]

### Family **Veliidae**

518. *Microvelia pygmaea* (Dufour, 1833)

As *Microvelis* sp. – Misidentification [1 specimen, No. 194 without further data, **JBM-AR-0545**]

## Order HYMENOPTERA

### Family **Andrenidae**

519. *Andrena maderensis* Cockerell, 1922

New record [Deserta Grande, 1♀, without id., 8 May 1938, **JBM-AR-0568**]

According to KRATOCHWIL *et al.* (2008), this species is recorded only from Madeira and Porto Santo Islands, being this a new record for Deserta Grande.

### Family **Anthophoridae**

520. *Amegilla quadrifasciata maderae* (Sichel, 1868)

As *Podalirius 4-fasciatus* Villers var. *maderae* Sichel – Change of combination, synonym [3♂, 6♀ without further data, **JBM-AR-0563**]

[Funchal, Trapiche, 3♀, without id., August 1917, **JBM-AR-0564**]

### Family **Apidae**

521. *Apis mellifera* Linnaeus, 1758

[1 worker without id. or other data, **JBM-AR-0567**]

522. *Bombus ruderatus* (Fabricius, 1775)

As *Bombus hortorum* Fab. – Misidentification [1♂, 3♀, without further data, **JBM-AR-0560**]

As *Bombus hortorum* L. – Misidentification [Funchal, Trapiche, 1♂, August 1917, **JBM-AR-0561**]

[Porto Moniz, Lombo dos Pecegueiros, 1♀, without id., August 1938, **JBM-AR-0559**]

[Funchal, Santo António, 1♂, without id., July 1936, **JBM-AR-0562**]

### Family **Braconidae**

523. *Apanteles* sp.

[Selvagem Grande, 1938, 1 specimen, without further data, **JBM-AR-0393**]

Probably a parasitoid of Tineid moth *Trichophaga bipartitella*, **JBM-AR-0392**.

524. Macrocentrinae with Genus & species undet.

[Seixal, Madeira, 1♀ without id, August 1936, **JBM-AR-0620**]

525. Macrocentrinae with Genus & species undet.

[1 damaged specimen without id or other data, **JBM-AR-0657**]

### Family **Chrysididae**

526. *Chrysis ignita* Linnaeus, 1761

[Funchal, Monte, 3 specimens, without id., August 1935, **JBM-AR-0583**]

527. *Chrysis magnidens magnidens* Perez, 1895

As *Chrysis magnidens* [Porto Moniz, 1♀, 1933, **JBM-AR-0582**]

As *Chrysis magnidens* [Tenerife, Canary Islands, 1♀ damaged, det. A. Cabrera, **JBM-AR-0663**]

### Family **Crabronidae**

528. *Ectemnius cephalotes* (Olivier, 1791)

As *Thyreopus cribrarius* L. var. – Misidentification [2♀ without further data, **JBM-AR-0586**]

[Funchal, Monte, 5♂, without id. or other data, May 1938, **JBM-AR-0594**]

### Family **Formicidae**

529. *Lasius grandis* Forel, 1909

[Porto Moniz, Fanal, 3♀, without id., 19 July 1938, **JBM-AR-0565**]

### Family **Halictidae**

530. *Halictus frontalis* Smith, 1853

[1♂ without id. or other data, **JBM-AR-0584**]

531. *Lasioglossum villosulum* (Kirby, 1802)

[Funchal, Santo António, 2♀, without id., 1938, **JBM-AR-0566**]

### Family **Ichneumonidae**

532. *Amblyteles armatorius* (Forster, 1771)

As *Amblyteles armatorius* Forst. [1♂ without other data than id., **JBM-AR-0589**]; [Santa Cruz, Camacha, 1♂ without id., May 1938, **JBM-AR-0590**]; [Funchal, Monte, 1♂ without id., March 1938, **JBM-AR-0591**]; [Porto Moniz, Fanal, 2♀ without id., 19 July 1938, **JBM-AR-0592**]

533. *Ctenichneumon hermaphroditus* (Taschenberg, 1870)

[1♂ without id. or other data, **JBM-AR-0609**]

534. *Dusona* sp.

[2♀ without id, **JBM-AR-0612**]

535. *Enicospilus obtusangulus* Roman, 1938

[1♂ without id. or other data, **JBM-AR-0608**]



536. *Ichneumon nubigenus* Roman, 1938

[Seixal, 1♂, without id or other data, **JBM-AR-0603**]

Identification was made possible by comparing with specimens held at ICLAM (Det. Gavin Broad, The Natural History Museum, London).

537. *Ichneumon sarcitorius* Linnaeus, 1758

[Funchal, Caminho dos Tornos, 1♀, without id., December 1932, **JBM-AR-0602**]

538. *Ichneumon xanthorius* Forster, 1771

[Porto Moniz, 1♂, 1♀, without id., October 1932, **JBM-AR-0588**]

539. *Netelia testacea* (Gravenhorst, 1829)

As *Paniscus testaceus* Gr. – Change of combination, synonym [1♂ without further data, **JBM-AR-0607**]; [Porto Moniz, Fanal, 1♂, without id., 19 July 1938, **JBM-AR-0605**]; [3♂, 3♀ without id. or other data, **JBM-AR-0606**]

540. *Netelia thoracica* (Woldstedt, 1880)

[Porto Santo, 1♂, 1♀, without id., 1943, **JBM-AR-0604**]

541. *Pimpla* sp.

[1♂ without id. or other data, **JBM-AR-0601**]

542. *Pimpla rufipes* (Miller, 1759)

As *Pimpla instigator* Fabr. – Synonym [1♂ without other data than id., **JBM-AR-0595**]; [Funchal, Trapiche, 3♀, without id., August 1917, **JBM-AR-0596**]; [Ribeira Brava, Campanário, 1♀, without id., September 1938, **JBM-AR-0597**]; [Funchal, Santo António, 1♂, without id., 20-1938, **JBM-AR-0598**]; [Funchal, Santo António, 1♀, without id., 26-1938, **JBM-AR-0599**]; [2♂, 8♀ without id. or other data, **JBM-AR-0600**]

543. Mesochorinae with Genus & Species undet.

[Seixal, Madeira, 2♂ without id, 1♀ without id, August 1936, **JBM-AR-0610**]

544. *Scambus monticola* Roman, 1938

[1♂ without id, **JBM-AR-0611**]

545. Ichneumoninae with Genus & Species undet.

[Câmara de Lobos, Madeira, 1♂ without id, August 1936, **JBM-AR-0613**]

546. Ichneumoninae with Genus & Species undet.

[Santo António, Madeira, 2♀ without id, 1938, **JBM-AR-0614**]

547. Cryptinae with Genus & Species undet.

[Seixal, Madeira, 2♀ without id, August 1936, **JBM-AR-0615**]

548. Cryptinae with Genus & Species undet.

[1♀ damaged, without id or other data, **JBM-AR-0616**]

549. Mesochorinae with Genus & Species undet.

[1♂ and 1♀ partially damaged without id or other data, **JBM-AR-0617**]

550. Ichneumoninae with Genus & Species undet.

[1♀ without id or other data, **JBM-AR-0618**]

551. Campopleginae with Genus & Species undet.

[1♀ without id or other data, **JBM-AR-0619**]

552. Genus & Species undet.

[1♂ damaged without id or other data, **JBM-AR-0652**]

553. Genus & Species undet.

[1 damaged specimen without id or other data, **JBM-AR-0653**]

554. Genus & Species undet.

[1♂ damaged without id or other data, **JBM-AR-0654**]

555. Genus & Species undet.

[1 damaged specimen without id or other data, **JBM-AR-0655**]

556. Genus & Species undet.

[1 damaged specimen without id or other data, **JBM-AR-0656**]

557. Genus & Species undet.

[1 damaged specimen without id or other data, **JBM-AR-0658**]

558. Genus & Species undet.

[1 damaged specimen without id or other data, **JBM-AR-0659**]

559. Genus & Species undet.

[1 damaged specimen without id or other data, **JBM-AR-0660**]

560. Genus & Species undet.

[1 damaged specimen without id, 1936, **JBM-AR-0661**]

### Family **Scoliidae**

561. *Micromeriella hyalina* (Klug, 1832)

As *Scolia elegans* Brulle – Synonym [Tenerife, Canary Islands, 1♂, det. A. Cabrera, **JBM-AR-0662**]

### Family **Siricidae**

562. *Sirex noctilio* Fabricius, 1773

[2♀ without id. or other data, **JBM-AR-0587**]

### Family **Sphecidae**

563. *Podalonia rothi* (de Beaumont, 1951)

[Porto Moniz, Seixal, 3♀, without id., August 1936, **JBM-AR-0593**]

564. *Sceliphron caementarium* (Drury, 1773)

As *Sceliphron tubifex* Latr. – Misidentification [5 specimens without further data, **JBM-AR-0585**]

### Family **Vespidae**

565. *Ancistrocerus madaera* (Saussure, 1852)

[Santana, 1♀, without id., August 1936, **JBM-AR-0580**]; [Porto Moniz, Seixal, 2♂, without id., August 1936, **JBM-AR-0581**]

566. *Polistes dominulus* (Christ, 1791)

[Funchal, Ribeira da Lapa, 1 specimen, without id., 4 September 1917, **JBM-AR-0579**]; [Câmara de Lobos, 1♀, 2 damaged specimens, without id., August 1936, **JBM-AR-0578**]; [Ribeira Brava, Campanário, 1♂, 2♀, without id., September 1938, **JBM-AR-0577**]

567. *Vespula germanica* (Fabricius, 1793)

As *Vespa germanica* Fabr. – Change of combination [Porto Moniz, 1♀, **JBM-AR-0569**]; [Funchal, ?Seminário, 1 worker, without id., August 1935, **JBM-AR-0574**]; [Funchal, Arieiro, 3♀, without id., July 1936, **JBM-AR-0570**]; [Porto Moniz, Fanal, 1 worker, without id., 19 July 1938, **JBM-AR-0572**]; [Porto Moniz, Lombo dos Pecegueiros, 2 workers, without id., August 1938, **JBM-AR-0573**]; [Porto Moniz, Lombo dos Pecegueiros, 1 worker, without id., 2 August 1938, **JBM-AR-0576**]; [Funchal, Trapiche, 4 workers, without id., 25 August 1938, **JBM-AR-0571**]; [1♂ without id. or other data, **JBM-AR-0575**]

## Order LEPIDOPTERA

Família **Lycaenidae**568. *Lampides boeticus* (Linnaeus, 1767)

Almost certainly from Madeira – [1♂, 3♀, without further data, **JBM-AR-0639**]

569. *Lycaena phlaeas phlaeoides* (Staudinger, 1901)

Almost certainly from Madeira – [2♀, without further data, **JBM-AR-0638**]

570. *Phengaris arion* (Linnaeus, 1758)

Not collected in Madeira – [1♀, without further data, **JBM-AR-0640**]

Family **Noctuidae**571. *Caradrina clavipalpis pinkeri* Kobes, 1975

Almost certainly from Madeira – [1♂ without further data, **JBM-AR-0636**]

572. *Ophiusa tirhaca* (Cramer, 1773)

Almost certainly from Madeira – [1♂ without further data, **JBM-AR-0637**]

573. *Thysanoplusia orichalcea* (Fabricius, 1775)

Almost certainly from Madeira – [1♀ without further data, **JBM-AR-0635**]

Family **Nymphalidae**574. *Aglais io* (Linnaeus, 1758)

Not collected in Madeira – [1♀, without further data, **JBM-AR-0627**]

575. *Aglais urticae* (Linnaeus, 1758)

Not collected in Madeira – [1♂ without further data, **JBM-AR-0628**]

576. *Apatura ilia* (Denis & Schiffermuller, 1775)

Not collected in Madeira – [1♂ without further data, **JBM-AR-0647**]

577. *Archaeoprepona chalciope* (Hubner, [1823])

Not collected in Madeira – [1♀, without further data, **JBM-AR-0624**]

578. *Danaus plexippus* (Linnaeus, 1758)

Could have been collected in Madeira – [1♂ without further data, **JBM-AR-0625**]

579. *Hipparchia maderensis* (Bethune-Baker, 1891)

Madeiran endemic species [1♀, without further data, **JBM-AR-0632**]

580. *Issoria lathonia* (Linnaeus, 1758)

Could have been collected in Madeira – [2♂, 1♀ without further data, **JBM-AR-0631**]

581. *Lasiommata megera* (Linnaeus, 1767)

Not collected in Madeira – [1♂ without further data, **JBM-AR-0643**]

582. *Morpho cypris cypris* Westwood, 1851

Not collected in Madeira – [1♂ without further data **JBM-AR-0623**]

583. *Morpho helenor achillides* Felder & Felder, 1867

Not collected in Madeira – [1♀, without further data, **JBM-AR-0622**]

584. *Morpho menelaus* (Linnaeus, 1758)

Not collected in Madeira – [1♂, without further data, **JBM-AR-0621**]

585. *Pararge xiphia* (Fabricius, 1775)

Madeiran endemic species [1♂, 1♀, without further data, **JBM-AR-0633**]

586. *Vanessa atalanta* (Linnaeus, 1758)

Could have been collected in Madeira – [1♀ without further data, **JBM-AR-0629**]

587. *Vanessa cardui* (Linnaeus, 1758)

Could have been collected in Madeira – [1♂, 1♀ without further data, **JBM-AR-0634**]

588. *Vanessa vulcania* (Godart, 1819)

Almost certainly from Madeira – [1♀ without further data, **JBM-AR-0630**]

### Family **Papilionidae**

589. *Papilio machaon* (Linnaeus, 1758)

Not collected in Madeira – [1♀, without further data, **JBM-AR-0626**]

### Family **Pieridae**

590. *Colias croceus* (Fourcroy, 1875)

Almost certainly from Madeira – [1♂, 1♀ without further data, **JBM-AR-0642**]

591. *Gonepteryx maderensis* Felder, 1862

Madeiran endemic species [2♂, 2♀, without further data, **JBM-AR-0644**]

592. *Gonepteryx rhamni* (Linnaeus, 1758)

Not collected in Madeira – [1♀, without further data, **JBM-AR-0645**]

593. *Pieris napi* (Linnaeus, 1758)

Not collected in Madeira – [1♀, without further data, **JBM-AR-0646**]



594. *Pieris wollastoni* Butler, 1886

Madeiran endemic species, probably extinct – [1♂, 1♀, without further data, **JBM-AR-0641**]

### Family **Tineidae**

595. *Trichophaga bipartitella* (Ragonot, 1892)

[Selvagem Grande, 3♀, 1938, **JBM-AR-0392**]

Specimens had no label but were found in an envelope with the collection data. The envelope was kept in the box.

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