

Mitt. internat. entomol. Ver.	Frankfurt a.M.	ISSN 1019-2808
Band 33 · Heft 1/2	Seiten 31 - 43	2. Juni 2008

Systematic Catalogue of the Cryptophagidae of the Madeira Archipelago and Selvagens Islands (Coleoptera: Cucujoidea)¹

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Introduction

Since T. V. WOLLASTON 1847 visited for first time the Madeiran archipelago he and other entomologists collected a lot of beetles from there. WOLLASTON published a few longer and shorter papers (WOLLASTON 1854, 1857, 1864, 1871a, 1871b) about the beetles and described a lot of beetles including a few *Cryptophagidae*. Later, some other authors collected and published about *Cryptophagidae* from the Madeiran archipelago. One further species was described by BRUCE (1940), which is no longer a valid species. So, all three endemic species from the archipelago were described by WOLLASTON. For further information about the Atlantic see ASSING & SCHÜLKE (2006).

The Cryptophagidae on the Madeiras and Selvagens

Today we know 17 species of *Cryptophagidae* recorded from the Madeiran archipelago and no species from the Selvagens Islands. Three of these species are endemic (18 %), known only from Madeira proper. There is no endemic species known from the other islands. The other 14 species are widespread in Europe or in the Mediterranean Region, the most are widespread in the Palaearctic Region, one species is cosmopolitan. There is no doubt that the most or all of the not-endemic species reached

¹ This contribution is dedicated to Dieter ERBER (1933–2004), who inspired me to this work.

the Madeira archipelago together with human settlement. Only *Cryptophagus laticollis* P. H. Lucas, 1846 may be reached the archipelago without human settlement. All of them live often in houses, barns, straw, hay and compost and other decomposing vegetable structures. So there were a lot of possibilities to import these species from the European continent to the Madeira archipelago. But the evidence for this theory has to be proved.

The three endemic species are only known from Madeira proper. They live in leaf litter or under bark in the sylvian districts of Madeira proper. For the Staphylinidae is the region with the highest diversity the central part of Madeira proper (ASSING & SCHÜLKE, 2006). Like the endemic species, the other, not-endemic species are known only from Madeira proper – except *Atomaria scutellaris* Motschulsky, 1849, which is further known from Porto Santo. Seven of the not-endemic species are known from the Azores (50 %), eight from the Canary Islands (57 %) and only one from the Cape Verde (7 %). They all are widespread in Europe, most of them in the Palaearctic Region or a wider distribution. All not-endemic species have well developed wings, meanwhile at the endemic species the wings are absent.

Abbreviations: Islands: M = Madeira proper, PS = Porto Santo, IC = Ilheu Chão, DG = Deserta Grande, IB = Ilheu Bugio, S = Selvagens, A = Azores, C = Canary Islands, CV = Cape Verde, FD = further distribution; **Presence:** + = present, but not endemic, e = endemic, x = not re-recorded since 1900, probably extinct.

No.	Species	Distribution									
		M	PS	IC	DG	IB	S	A	C	CV	FD
	Cryptophaginae										
	<i>Cryptophagus</i> Herbst, 1792										
1	<i>cellaris</i> (Scopoli, 1763)	+						+	+		+
2	<i>dentatus</i> (Herbst, 1793)	+						+	+		+
3	<i>laticollis</i> P. H. Lucas, 1846	+						+	+		+
4	<i>nitiduloides</i> Wollaston, 1854	e									
5	<i>pilosus</i> Gyllenhal, 1828	+									+

No.	Species	Distribution									
		M	PS	IC	DG	IB	S	A	C	CV	FD
6	<i>pseudodentatus</i> Bruce, 1934	+									+
7	<i>saginatus</i> Sturm, 1845	+						+			+
8	<i>scanicus</i> (Linnaeus, 1758)	+?x								+	+
	<i>Micrambe</i> Thomson, 1863										
9	<i>vini</i> (Panzer, 1797)	+									+
	Atomariinae										
	<i>Atomaria</i> Stephens, 1830										
10	<i>alternans</i> (Wollaston, 1854)	e									
11	<i>apicalis</i> Erichson, 1848	+						+	+		+
12	<i>insecta</i> Wollaston, 1857	e									
13	<i>munda</i> Erichson, 1846	+						+	+		+
14	<i>pusilla</i> (Paykull, 1798)	+							+		+
15	<i>scutellaris</i> Motschulsky, 1849	+	+						+		
	<i>Ephistemus</i> Stephens, 1829										
16	<i>globulus</i> (Paykull, 1798)	+						+	+		+
	<i>Hypocoprus</i> Motschulsky, 1839										
17	<i>latridioides</i> Motschulsky, 1839	?									

Catalogue of the Cryptophagidae of the Madeira Archipelago

Family Cryptophagidae Subfamily Cryptophaginae

1. *Cryptophagus cellaris* (Scopoli, 1763)

References: WOLLASTON (1857: 55), (1865: 137); FAUVEL (1897: 54); SCHMITZ (1898: 55); BRUCE (1940: 3); JANSSON (1940: 58); MÉQUIGNON

(1942: 39); LUNDBLAD (1958: 465); HORION (1960: 256); BORGES (1990: 110); JOHNSON et al. (2007: 515).

Distribution: Cosmopolitan; Canaries, Azores, Madeira proper.

Bionomics: Sparingly in houses in Funchal; by Lundblad sieved from dry fern which he found in a house.

2. *Cryptophagus dentatus* (Herbst, 1793)

References: WOLLASTON (1857: 56), (1865: 137); FAUVEL (1897: 54); SCHMITZ (1898: 58); BRUCE (1940: 2); JANSSON (1940: 58); MÉQUIGNON (1942: 39); LUNDBLAD (1958: 475); HORION (1960: 245); BORGES (1990: 110); JOHNSON et al. (2007: 516).

Distribution: Palaearctic Region, Nearctic Region; Canaries, Azores, Madeira proper.

Bionomics: Widely spread over Madeira proper, not only in houses but also in sylvan districts under bark of trees (WOLLASTON, 1865).

3. *Cryptophagus laticollis* P. H. Lucas, 1846

References: WOLLASTON (1854: 170 as *C. affinis*), (1857: 57 as *C. affinis*), (1865: 137 as *C. affinis*), (1871a: 412 as *C. affinis*); FAUVEL (1897: 54 as *C. affinis*); SCHMITZ (1898: 58 as *C. affinis*); BRUCE (1940: 3 as *C. affinis*); JANSSON (1940: 58 as *C. affinis*); LUNDBLAD (1958: 475 as *C. affinis*); HORION (1960: 275 as *C. affinis*); BORGES & SERRANO (1989: 16); BORGES (1990: 110); JOHNSON et al. (2007: 518).

Unpublished records: Madeira proper: Caniço de Baixo, 80 m, from window-pane, 9.–29.IX.1988 (1), leg. PIEPER.

Distribution: Palaearctic Region, Afrotropical Region, Australian Region, Nearctic Region, Oriental Region; Canaries, Azores, Madeira proper.

Bionomics: Mainly collected in houses and gardens in the region of Funchal, but also in sylvan districts. Collected mainly in the summer months (VII, VIII), but also in IX.

4. *Cryptophagus nitiduloides* Wollaston, 1854

References: WOLLASTON (1854: 618), (1857: 58), (1865: 139); FAUVEL (1897: 54); SCHMITZ (1898: 58); WINKLER (1924-32: col.725); BRUCE (1940: 3 as *rutae*); JANSSON (1940: 58 as *nitiduloides* and *rutae*); LUNDBLAD (1958: 475 as *nitiduloides* and *rutae*); ERBER & AGUIAR (1996: 48); JOHNSON et al. (2007: 518).

Unpublished record: Madeira proper: Queimadas, Ribeira da Silveira, 22.X.1997 (5), leg. LOMPE (1 in coll. ERBER, 4 in coll. LOMPE)

Distribution: Madeira proper, endemic.

Bionomics: Extremely rare in sylvan districts, living “under bark of laurels in damp and remote spots” (WOLLASTON, 1865).

5. *Cryptophagus pilosus* Gyllenhal, 1827

References: WOLLASTON (1871b: 246); FAUVEL (1897: 54); SCHMITZ (1898: 58); BRUCE (1940: 3); JANSSON (1940: 58); LUNDBLAD (1958: 475), JOHNSON et al. (2007: 519 as *Cryptophagus pilosus* sensu auct./ *C. punctipennis* C. N. F. Brisout de Barneville, 1863).

Distribution: Palaearctic Region, Nearctic Region, Australian Region; Madeira proper.

Bionomics: Very rare on Madeira proper. Collected by Wollaston at San Antonio da Serra amongst rotten corn in company of *C. laticollis*, *C. dentatus* and *C. saginatus*. Lundblad sieved it from dry fern in a house at Caramucho.

Remarks: JOHNSON et al. (2007) mentioned this species under the name *Cryptophagus punctipennis* C. N. F. Brisout de Braneville, 1863. *Cryptophagus pilosus* Gyllenhal, 1827 nec auct. is the following species.

6. *Cryptophagus pseudodentatus* Bruce, 1934

References: BRUCE (1940: 3); LUNDBLAD (1958: 475).

Unpublished record: Madeira proper: Encumeada, Levada do Norte, southern slope, 1000 m, in a natural cover of lichens and mosses on the stem of a deciduous tree, 5.I.1996 (1), leg. ERBER, det. JOHNSON.

Distribution: Palaearctic Region, Nearctic Region, Afrotropical Region, Australian Region; Madeira proper.

Bionomics: Very rare, collected together with *C. dentatus* by BRUCE (1940).

Remarks: JOHNSON et al. (2007) mentioned this species under the name *Cryptophagus pilosus* Gyllenhal, 1827. *Cryptophagus pilosus* sensu auct. nec Gyllenhal, 1827 is the *Cryptophagus punctipennis* C. N. F. Brisout de Barneville, 1863.

7. *Cryptophagus saginatus* Sturm, 1845

References: WOLLASTON (1857: 54), (1865: 136), (1871b: 246); FAUVEL (1897: 54); SCHMITZ (1898: 58); BRUCE (1940: 2); JANSSON (1940: 58); MÉQUIGNON (1942: 39); LUNDBLAD (1958: 475); HORION (1960: 242); ERBER & HINTERSEHER (1988: 161); BORGES (1990: 110); ERBER (1990: 168); JOHNSON et al. (2007: 520).

Unpublished record: Madeira proper: Encumeada, souther slope, Levada do Norte, 1030 m, 14.IX.1988 (2, in Barber trap), leg. C. Lange.
Distribution: Palaearctic Region, Nearctic Region, Australian Region, Neotropical Region; Azores, Madeira proper.
Bionomics: Abundant on Madeira proper. Widely spread over the island, mainly found in vegetable refuse.

8. *Cryptophagus scanicus* (Linnaeus, 1758)

References: FAUVEL, (1897: 54); SCHMITZ (1898: 58); LUNDBLAD (1958: 475); JOHNSON et al. (2007: 520).

Distribution: Palaearctic Region, Nearctic Region, Afrotropical Region; Cap Verdes, Madeira proper.

Remark: It is unknown where FAUVEL (1897) got the information that the species was found on Madeira.

9. *Micrambe ulicis* (Stephens, 1830)

References: ERBER & HINTERSEHER (1988: 161, 192 as *M. vini*); JOHNSON et al. (2007: 522).

Unpublished records: Madeira proper: Boca do Cerro, 1030 m, 12.IX.1992, on *Ulex europaeus* (1); Levada de Calderão Verde, Venda Nova, 860 m, in flowers of *Hydrangea*, 20.IX.1992 (1); all leg. ERBER; Paul da Serra, Estanquinhos, 1500 m, 14.IX.1992 (3); Levada da Serra do Fajal, near Agua Mansas, 860 m, 30.XII.1995 on *Ulex europaeus*; near Poiso, 1430 m, on *Ulex europaeus*, 10.I.1996 (2); all leg. ERBER, det. JOHNSON; Cova de Corrida to Boca da Serra, 1250 m, at *Castanea sativa*, 17.IX.2001 (1); above Rabaçal, Levada do Paul, 2.5 km E of water-pool, 1400 m, 29.I.2003, on *Ulex europaeus* (6); all leg. ERBER.

Distribution: Europe, North-Africa, northern parts of the Afrotropical Region; Madeira proper.

Subfamily Atomariinae

10. *Atomaria alternans* (Wollaston, 1854)

References: WOLLASTON (1854: 177), (1857: 62), (1865: 145); FAUVEL (1897: 54); SCHMITZ (1898: 58); JANSSON (1940: 58); LUNDBLAD (1958: 476); JOHNSON (1970: 155), (1975: 34), (2007: 524).

Unpublished records: Madeira proper: Rabaçal, 1000 m, Laurisilva, 23.III.1996 (58), leg. ZERCHE, in coll. DEI (56), coll. JOHNSON, Manchester (1), coll ERBER (1).

Distribution: Madeira proper, endemic.

Bionomics: The few specimens have been collected in sylvan districts; Wollaston (1854) speaks of “moist sylvan districts”.

11. *Atomaris apicalis* Erichson, 1846

References: WOLLASTON (1857: 61), (1865: 143); FAUVEL (1897: 54); SCHMITZ (1898: 58); JANSSON (1940: 58); UYTENBOOGAART (1947: 13); LUNDBLAD (1958: 476); JOHNSON (1970: 150), (1975: 34); ERBER & HINTERSEHER (1988: 193); JOHNSON et al. (2007: 524).

Unpublished record: Madeira proper. Caniço de Bauxo, 80 m, 4.–25.IX.1986 (14), leg. PIEPER, vid. JOHNSON.

Distribution: Palaearctic Region, Nearctic Region; Canaries, Azores, Madeira proper.

Bionomics: Rather rare; except the specimens PIEPER found only some single specimens have been detected.

12. *Atomaria insecta* Wollaston, 1857

References: WOLLASTON (1857: 61), (1865: 145), FAUVEL (1897: 54); SCHMITZ (1898: 58); WINKLER (1924-32: col.730); JANSSON (1940: 31/32, 58); LUNDBLAD (1958: 476); JOHNSON (1970: 154), (2007: 525).

Distribution: Madeira proper, endemic.

Bionomics: Very rare. The only few specimens recorded up to now have been found in dense forest under leaves.

13. *Atomaria munda* Erichson, 1846

References: WOLLASTON (1857: 60), (1865: 143); FAUVEL (1897: 54); SCHMITZ (1898: 58); JANSSON (1940: 58); MÉQUIGNON (1942: 40); LUNDBLAD (1958: 476); HORION (1960: 274); JOHNSON (1970: 149); BORGES (1990: 110); JOHNSON et al. (2007: 526).

Distribution: Palaearctic Region; Canaries, Azores, Madeira proper.

Bionomics: Extremely rare: Since the only specimen found by Wollaston at San Antonio da Serra in June 1855 no further record in the literature.

14. *Atomaria pusilla* (Paykull, 1798)

References: WOLLASTON (1865: 143); FAUVEL (1897: 54); SCHMITZ (1898: 58); JANSSON (1940: 58); LUNDBLAD (1958: 476); JOHNSON (1970: 149), (2007: 527).

Unpublished record: Madeira proper: Caniço de Baixo, on window-pane, 80 m, 5.–24.IX.1986 (1), leg. PIEPER, vid. JOHNSON.

Distribution: Palaearctic Region, Nearctic Region; Canaries, Madeira proper.

Bionomics: Extremely rare on Madeira proper: Since the only specimen, collected by WOLLASTON, only one further specimen (see unpublished record).

15. *Atomaria scutellaris* Motschulsky, 1849

References: JOHNSON (1970: 152); ERBER (1990: 168); JOHNSON et al. (2007: 527).

Distribution: Europe, Mediterranean Area; Canaries, Madeira proper, Porto Santo.

Bionomics: Though there are only few records from the Madeiras, JOHNSON (1970) judges the species “to be the commonest and most universal member of the genus in the Madeiras and Canaries”. WOLLASTON (1864) has recorded the species as *A. canariensis* only from the Canaries. Johnson synonymized it with *A. scutellaris*.

16. *Ephistemus globulus* (Paykull, 1798)

References: WOLLASTON (1854: 176), (1857: 63), (1865: 145), FAUVEL (1897: 54); SCHMITZ (1898: 58); JANSSON (1940: 33, 58); MÉQUIGNON (1942: 40); LUNDBLAD (1958: 476); BORGES (1990: 110).

Unpublished records: Madeira proper: Seixal, Chão da Ribeira, 450 m, within grass, 31.IX.1996 (6), leg. ZERCHE, in coll.ERBER (1) and coll.DEI (5); Caniço de Baixo, 80 m, on window-pane, 5.–24.IX.1986 (10), leg. PIEPER, in coll. ERBER (7), coll. HINTERSEHER (2), coll. POGGI (1); all det. JOHNSON.

Distribution: Palaearctic Region, Nearctic Region, Australian Region; Canaries, Azores, Madeira proper.

Bionomics: “Widely spread on the Atlantic Islands, nowhere very abundant, by intensive searching, however, nearly universal” (WOLLASTON, 1865). The species has been found at damp moist points in the forest as well as on dead fungi and has been sieved from dry fern.

Remarks: JOHNSON et al. (2007) not mentioned this species for the Madeira archipelago.

17. *Hypocopus latridioides* Motschulsky, 1839

References: JOHNSON et al. (2007: 531).

Distribution: West of the Palaearctic Region, Nearctic Region; Canaries, Madeira archipelago.

Remarks: JOHNSON et al. (2007) only mentioned the species for the archipelago.

Remarks about species not resembling to the fauna of the Madeira Archipelago, species not resembling to the Cryptophagidae, synonyms, homonyms and invalid names

For further information about the Cryptophagidae see also JOHNSON et al. (2007), about *Leucohimatium* (Erotylidae) see WĘGRZYNOWICZ (2007).

1. *Leucohimatium arundinaceum* (Forskål, 1775): Resembles to the Erotylidae.

2. *Leucohimatium elongatum* (Erichson, 1846): The name is a junior synonym of *Leucohimatium arundinaceum* (Forskål, 1775), which resembles to the Erotylidae. The original combination in ERICHSON (1846) is *Paramecosoma elongatum*.

3. *Paramecosoma simplex* Wollaston, 1857: Is a junior synonym of *Cryptophilus integer* (Heer, 1841) and resembles to the Erotylidae.

4. *Cryptophagus affinis* Sturm, 1845: The name is homonym to *Cryptophagus affinis* R. F. Sahlberg, 1834 (= *Atomaria affinis* (R. F. Sahlberg, 1834)). The valid name is *Cryptophagus laticollis* P. H. Lucas, 1846 (see above).

5. *Cryptophagus rutae* Bruce, 1940: The name is a junior synonym of *Cryptophagus nitiduloides* Wollaston, 1854 (see above).

6. *Micrambe vini* (Panzer, 1797): The name is a homonym. The valid name is *Micrambe ulicis* (Stephens, 1830) (see above).

7. *Atomaria canariensis* Wollaston, 1864: The name is a junior synonym of *Atomaria scutellaris* Motschulsky, 1849 (see above).

8. *Atomaria maderensis* Jansson, 1940: The name is a junior synonym of *Atomaria insecta* Wollaston, 1857 (see above).

9. *Atomaria marginicollis* Reitter, 1888: WINKLER (1924-27) mentioned the species for the Madeira archipelago. There are no other references, the statement must be wrong. The species resembles not to the fauna of the Madeira archipelago.

10. *Atomaria rubricollis* Wollaston, 1865: The name is a homonym of *Atomaria rubricollis* C. N. F. Brisout de Barneville, 1863. The valid name is *Atomaria marginicollis* Reitter, 1888. The species resembles not to the fauna of the Madeira archipelago.

11. *Atomaria ruficollis* Wollaston, 1864: The name is a homonym of *Cryptophagus ruficollis* Panzer, 1805 (= *Atomaria nigripennis* Kugelann, 1794). The valid name is *Atomaria marginicollis* Reitter, 1888. The species resembles not to the fauna of the Madeira archipelago.

12. *Microum alternans* Wollaston, 1854: The genus is a junior synonym of *Atomaria* Stephens, 1829. The valid name is *Atomaria alternans* (Wollaston, 1854).

13. *Ootypus alternans* sensu WOLLASTON (1857), JANSSON (1940), LUNDBLAD (1958): The cited authors used the name for *Atomaria alternans* (Wollaston, 1854).

14. *Ephistemus alternans* sensu WOLLASTON (1854), FAUVEL (1897), SCHMITZ (1898): The cited authors used the name *Ephistemus alternans* for *Atomaria alternans* (Wollaston, 1854). WOLLASTON (1857) used *Atomaria alternans*.

15. *Ephistemus dimidiatus* (Sturm, 1807): The name is a junior synonym of *Ephistemus globulus* (Paykull, 1798) (see above). WOLLASTON (1854) used this name for *Ephistemus globulus*.

16. *Ephistemus gyrioides* (Marsham, 1802): The name is a junior synonym of *Ephistemus globulus* (Paykull, 1798) (see above). WOLLASTON (1857, 1865) used this name for *Ephistemus globulus*.

17. *Ephistemus insectus* sensu FAUVEL (1897), SCHMITZ (1898), WINKLER (1924-27): The cited authors used the name *Ephistemus insectus* for *Atomaria insecta* Wollaston, 1857. Wollaston never used the name *Ephistemus insectus*.

List of synonyms, invalid names, names of non-cryptophagid species and non-madeiran species used in the cited literature

Synonym, homonym, invalid name	Valid name	Madeira arch.	crypto-phagid
<i>Atomaria canariensis</i> Wollaston, 1864	<i>Atomaria scutellaris</i> Motschulsky, 1849	+	+
<i>Atomaria maderensis</i> Jansson, 1940	<i>Atomaria insecta</i> Wollaston, 1857	+	+
<i>Atomaria marginicollis</i> Reitter, 1888	dito		+

Synonym, homonym, invalid name	Valid name	Madeira arch.	crypto-phagid
<i>Atomaria rubricollis</i> Wollaston, 1865	<i>Atomaria marginicollis</i> Reitter, 1888		+
<i>Atomaria ruficollis</i> Wollaston, 1864	<i>Atomaria marginicollis</i> Reitter, 1888		+
<i>Cryptophagus affinis</i> Sturm, 1845	<i>Cryptophagus laticollis</i> P. H. Lucas, 1846	+	+
<i>Cryptophagus pilosus</i> sensu auct.* nec Gyllenhal, 1827	<i>Cryptophagus punctipennis</i> Brisout, 1863*	+	+
<i>Cryptophagus pseudodentatus</i> Bruce, 1934	<i>Cryptophagus pilosus</i> Gyllenhal, 1827 nec auct.	+	+
<i>Cryptophagus rutae</i> Bruce, 1940	<i>Cryptophagus nitiduloides</i> Wollaston, 1854	+	+
<i>Ephistemus alternans</i> sensu auct.	<i>Atomaria alternans</i> (Wollaston, 1854)	+	+
<i>Ephistemus dimidiatus</i> (Sturm, 1807)	<i>Ephistemus globulus</i> (Paykull, 1798)	+	+
<i>Ephistemus gyrinoides</i> (Marsham, 1802)	<i>Ephistemus globulus</i> (Paykull, 1798)	+	+
<i>Ephistemus insectus</i> sensu auct.	<i>Atomaria insecta</i> (Woll.)	+	+
<i>Leucohimatium arundinaceum</i> (Forskål, 1775)	dito	+	
<i>Leucohimatium elongatum</i> (Erichson, 1846)	<i>Leucohimatium arundinaceum</i> (Forskål, 1775)	+	
<i>Microum alternans</i> Wollaston, 1854	<i>Atomaria alternans</i> (Wollaston, 1854)	+	+
<i>Ootypus alternans</i> sensu auct.	<i>Atomaria alternans</i> (Woll.)	+	+
<i>Paramecosoma simplex</i> Wollaston, 1857	<i>Cryptophilus integer</i> (Heer, 1841)	+	

* JOHNSON et al. (2007)

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Jahr/Year: 2008

Band/Volume: [33 2008](#)

Autor(en)/Author(s): Esser Jens

Artikel/Article: [Systematic Catalogue of the Cryptophagidae of the Madeira Archipelago and Selvagens Islands \(Coleoptera: Cucujoidea\) 31-43](#)