

A CHECKLIST OF THE COLEOPTERA FROM THE AZORES WITH SOME SYSTEMATIC AND BIOGEOGRAPHIC COMMENTS

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With 1 map and 5 tables

ABSTRACT. Some years ago SERRANO published an account of the distribution of Coleoptera from the Azores. Further work in the last seven years justifies an updating of the information. SERRANO listed 367 species and subspecies and now this number is approximately 522, of which 59 seem to be endemics (11.3%). In this paper the Coleoptera are first listed according to their distribution in the islands of the archipelago, being 21 species from Corvo, 182 from Flores, 212 from Faial, 155 from Pico, 101 from Graciosa, 121 from S. Jorge, 245 from Terceira, 336 from S. Miguel and 249 from S. Maria. New records for the archipelago or for each island are also given. Some islands have been more explored than others, and the present distribution should only be considered as provisional. The occurrence of each species on the other Macaronesian archipelagos and their zoogeographic distribution are given. Some systematic and nomenclatural comments are made on the new list. The species diversity and specific endemisms are compared with those of Madeira, Canaries and Cape Verde, and explanations are given for the faunistic poverty of the Azores. From a zoogeographical viewpoint the Azorean beetle fauna consists mainly of species with a wide geographical distribution (cosmopolitan, holarctic and palaearctic) and it would also appear that most of the original immigrants must have been of predominantly West-Palaearctic origin.

RESUMO. Há alguns anos SERRANO publicou um trabalho sobre a distribuição dos Coleópteros dos Açores, tendo-se verificado desde então um aumento no número de trabalhos sobre os coleópteros dos Açores. Justifica-se assim a realização de um novo ponto da situação. 367 espécies e subespécies foram listadas por SERRANO, sendo agora este número aproximadamente 522 dos quais 59 são endemismos (11.3%). Neste trabalho faz-se a listagem dos coleópteros de acordo com a sua distribuição pelas diferentes ilhas do arquipélago encontrando-se 21 espécies e subespécies no Corvo, 182 nas Flores, 212 no Faial, 155 no Pico, 101 na Graciosa, 121 em S. Jorge, 245 na Terceira, 336 em S. Miguel e 249 em S. Maria. São dadas igualmente novas citações para o arquipélago ou para cada ilha. Algumas ilhas têm sido mais exploradas do que outras pelo que a presente distribuição deverá ser vista como provisória. Dá-se igualmente a ocorrência de cada espécie nos outros arquipélagos da Macaronésia assim como a sua distribuição zoogeográfica. Faz-se igualmente uma análise sistemática e nomenclatural à lista de espécies. A diversidade de espécies e endemismos é comparada com aquela dos arquipélagos da Madeira, Canárias e Cabo Verde, sendo adiantadas algumas hipóteses para explicar a pobreza faunística dos Açores. Do ponto de vista zoogeográfico a coleopterofauna açoreana é constituída principalmente por espécies de vasta distribuição (cosmopolitas, holárticas, paleárticas) e parece que grande parte dos imigrantes iniciais terão tido uma origem predominantemente Paleártico-Occidental.

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1. INTRODUCTION

The Azorean archipelago, situated in Mid Atlantic between Portugal and North America, consists of nine islands geographically arranged in three groups distributed between 36° 55' and 39° 42' N latitude and between 25° and 31° 30' W longitude (Map. I). The north westerly group includes Corvo and Flores. The central group consists of Faial, Pico, Graciosa, São Jorge and Terceira. The south easterly group comprises São Miguel and Santa Maria.

The climate is extremely oceanic with moderate rainfall throughout the year, high relative humidity and a small temperature range.

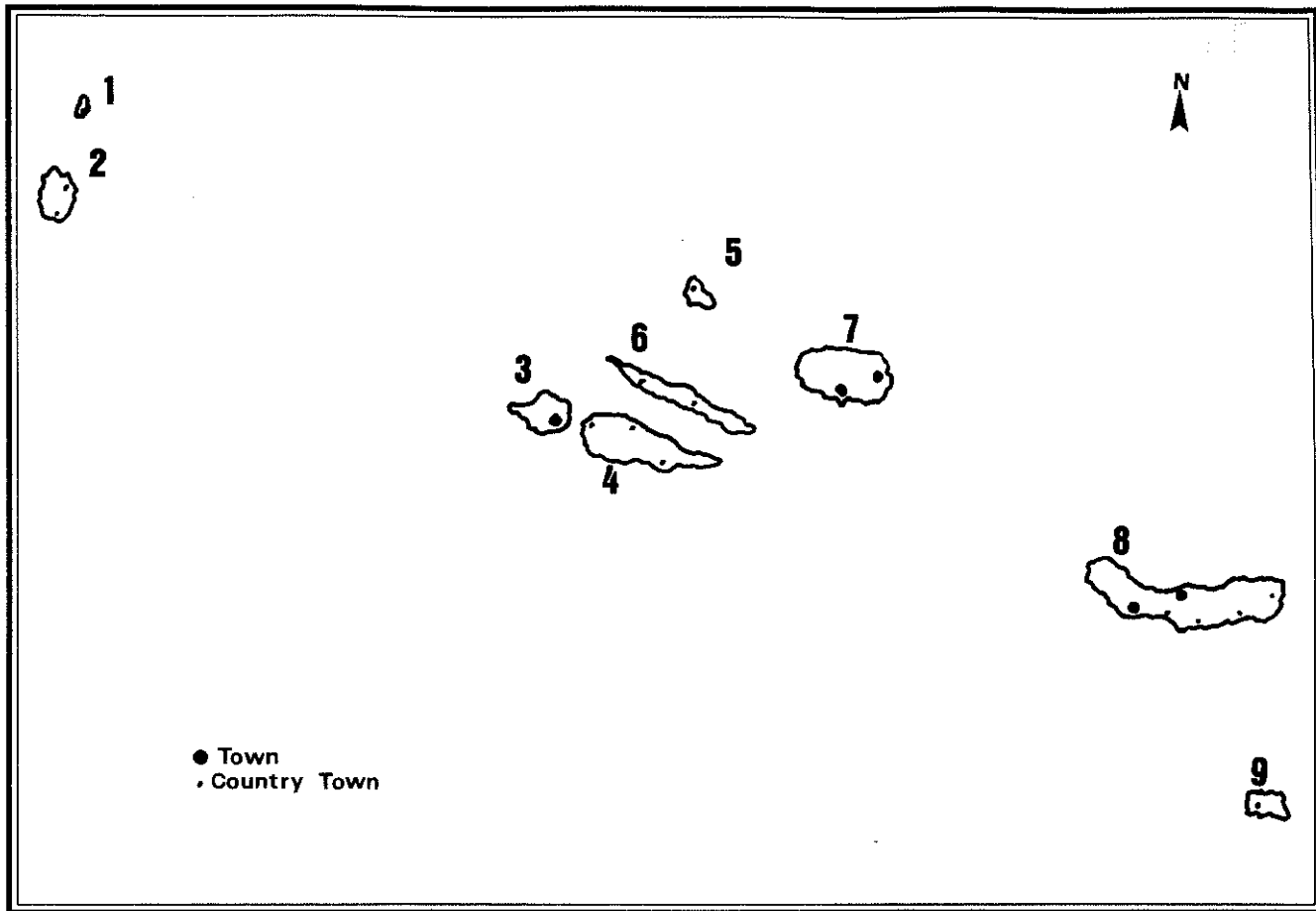
The area, geological age and maximum altitude for each island is given in Tab. IV.

The earliest recorded entomological collections on the archipelago were made by DROUET and MORELET (DROUET, 1859, 1861). CROTCH (1867, 1870) worked out the first checklist of the Azorean Coleoptera listing 212 species (Tab. I), based on the collections of DROUET, MORELET, GODMAN and BREWER. During the later part of the nineteenth century several entomologists visited the Azores: the Talisman Expedition of 1883 went to Faial; J. CLERMONT and M. SEDILLOT collected on São Miguel (1887); NODIER collected on the same island (1887) (MÉQUIGNON, 1942 a); M. DE GUERNE went to six islands (1887-89) - Corvo, Flores, Faial, Pico, Graciosa and S. Miguel (ALLUAUD, 1891).

AUTHORS	No. Families	No. Species	No. Endemic Species (%)
CROTCH (1867,1870)	31	212	14 (6.6)
MÉQUIGNON (1946)	44	296	35 (11.8)
MARSDEN (1970)	44	309	38(12.2)
SERRANO (1982)	46	367	36 (9.8)
THE AUTHOR	51	522	59 (11.3)

Table I - Evolution of the knowledge of number of species of beetles occurring in the Azorean archipelago.

The visit to the Azores by L. CHOPARD and A. MÉQUIGNON during August and September 1930 resulted in several papers by various authors, and a revised catalogue of the Azorean Coleoptera (MÉQUIGNON, 1942 a, b, 1946) (Tab. I). This catalogue included the collections of FREY and STORA made in 1938 (studied by UYTENBOOGAART), that of H. PERSSON and HOLLANDE made in 1936, but not that of SCHATZMAYR and



MAP I. Azores: 1 - Corvo, 2 - Flores, 3 - Faial, 4 - Pico, 5 - Graciosa, 6 - S. Jorge, 7 - Terceira
8 - S. Miguel, 9 - S. Maria.

Prince TORRE-TASSO who visited the eastern islands in 1935. A Lund University Expedition visited the Azores in 1957 (LANDIN, 1960; LINDROTH, 1960), resulting in several further papers by various authors.

C. A. MARSDEN and P. L. WRIGHT visited S. Jorge in 1965 (MARSDEN, 1970; MARSDEN & WRIGHT, 1967) during the Chelsea College - Azores Expedition (see Tab. I), and P. J. BOON visited S. Miguel and Pico during the summer of 1970 - Expedition of University of Newcastle (BOON, 1970).

The last catalogue of the Azorean Coleoptera was made by SERRANO (1982) (Tab. I) and since then several beetle collections have been made during expeditions to the Azores :

-G. ISRAELSON and his wife went to Flores, S. Miguel and S. Maria during the summers of 1982 and 1983 (ISRAELSON, 1984) and to the islands of Flores, Pico and S. Miguel in the summer of 1984 (ISRAELSON, 1985);

-G. GILLERFORS accompanied by A. TORNVALL visited the Azores during the summers of 1983 and 1985, during the former also in the company of G. ISRAELSON and his wife (GILLERFORS, 1986 a). The islands visited were S. Miguel and S. Maria in 1983 and in 1985 also Flores, Faial and Pico; During 1986, G. GILLERFORS visited the Azores for the 3rd time (Flores, Pico, Terceira, S. Miguel and S. Maria) accompanied by his friend B. SILVEBERG (GILLERFORS, 1988);

-The Azorean amateur entomologist D. T. POMBO, has made collections on several islands (mainly in S. Maria) and these have been studied by various authors (SERRANO, 1982; CARVALHO, 1984; SERRANO & BORGES, 1987; BORGES, 1989).

-The material collected by the Portuguese entomologists BIVAR DE SOUSA and PASSOS DE CARVALHO was studied by SERRANO (1982), CARVALHO (*op. cit.*) and SERRANO & BORGES (*op. cit.*).

-Since 1982 the author has made several expeditions to the islands of Terceira (1982 to 1986) (SERRANO & BORGES, 1986, 1987), Graciosa, S. Jorge and Terceira (1987) (BORGES & SERRANO, 1989);

-Since the end of 1988 the author established his residence in the Azores (Terceira) and made excursions to the islands of Flores (June 1989 - Expedition of University of Azores) (BORGES, 1990), Faial and Pico (May 1989 and March 1990 - Biospeleological expeditions of the Speleological group "Os Montanheiros"), S. Miguel (Pico da Vara Expedition 4-15.VIII.1989 - University of Azores, "Amigos dos Açores"; 23.VII- 15.VIII.1990 - Biospeleological expedition of the Speleological group "Os Montanheiros") and S. Maria (June 1990 - Expedition of University of Azores). The island of Terceira has been more

intensively studied.

Only a small part of the material collected during these recent excursions has been studied so far; it will be the object of future work;

-Biospeleological expeditions to the Azores directed by N.P. ASHMOLE (Edinburgh University) and P. OROMÍ (La Laguna University) and supported by the National Geographic Society, USA : July - August 1987 and 1989 (the latter also with the participation of the author) (see OROMÍ *et al.*, 1990; OROMÍ & BORGES, in press; BORGES & OROMÍ, in press).

Since the contribution of SERRANO (1982) new facts have been discovered concerning the Azorean Coleoptera and many taxonomic changes have been made. The goal of this account is to present a revised catalogue of beetles (INSECTA, COLEOPTERA) from the Azores with some Systematic and Biogeographical comments. New records for the archipelago or individual islands are also given.

2. METHODS

The list of new records includes only the species that are either new for the whole archipelago (marked with an *) or individual islands. For each species the island(s), the date(s) and the number of specimens studied are given. Ecological and zoogeographical comments are also made. Some synonymic notes are given and corrections of doubtful determinations are also made. The collectors are codified as follows: A= the author, B= the author & Mr. J. PALMEIRO (see BORGES & SERRANO, 1989), C= the author & Mr. F. PEREIRA, D= biospeleological expeditions to Azores directed by N.P. ASHMOLE (Edinburgh University) and P. OROMÍ (La Laguna University); July - August 1987 and 1989 (the latter also with the participation of the author) (see OROMÍ *et al.*, 1990), E= the author & Mr. M. A. SILVA.

In the checklist of Azorean Coleoptera the following abbreviations are used:

PB- present in the author's collection; **M**- Madeira archipelago; **C**- Canarian archipelago; **CV**- Cape Verde archipelago; **DISTR**-Zoogeographical distribution; **C**- Cosmopolitan or almost cosmopolitan; **H**-Holarctic; **P**-Palaeartic (*sensu lato*); **WP**- Western Palaeartic; **N**-Nearctic; **NT**-Neotropical; **MT**-Mediterranean; **E**-Ethiopian; **EO**-Ethiopian-Oriental; **A**-Atlantic; **MC**-Macaronesian; **END**-Endemic; **PT**-Palaeotropical; *i.s.-incertae sedis*; **COR**-Corvo; **FLO**-Flores; **FAI**-Faial; **PIC**-Pico; **GRA**-Graciosa; **SJG**-São Jorge; **TER**-Terceira; **SMG**-São Miguel; **SMR**-Santa Maria; **??**-Doubtful record.

The Coleoptera families are listed in a generally accepted phylogenetic sequence, following the order used by SILFVERBERG (1979) with small modifications on nomenclature of some

families. These modifications were made following the suggestions of some specialists (SLIPINSKI, pers. comm. ; ZARAZAGA, unpubl.) (see synonymic list).

The names used for the genera and species are modernized. The order in which they are listed takes into account in most cases the sequence proposed by the specialists for each family. In the cases where no specialized work is available, we follow the sequence of WINKLER (1924-32). The nomenclature as well as the order of the genera and species of *Aleocharinae* (*Staphylinidae*) is that of SILFVERBERG (1979).

The arrangement of the geographic units is different from that of the other authors; For the archipelagos we go from N to S . The islands , although listed from S to N by SERRANO (1982) are listed here from NW to SE (COR, FLO, FAI, PIC, GRA, SJG, TER, SMG and SMR) following ISRAELSON (pers. comm.).

3. NEW RECORDS

CARABIDAE

- 3.1. *Notiophilus quadripunctatus* DEJEAN, 1826.
TERCEIRA: Terra Chã, 1 spec., -.VII.1989.(A).
Under a stone near a house.
Madeira . Western Palaearctic.
Recently recorded from Azores (S. Miguel) by SERRANO (1989).
- 3.2. *Ocydromus schmidti azoricus* LINDROTH, 1960.(= *Bembidion s. a.*).
FLORES: Caldeira Seca, 3 specs., 7.VII.1989.(C).
PICO: Piquinho, 4 specs., 14.VIII.1987; Caldeira do Pico, 1 spec., 15.VIII.1989.(D).
Under stones in a humid habitat (Flores).
Endemic.
- 3.3. *Ocys harpaloides* (AUDINET-SERVILLE, 1821).
CORVO: Caldeirão, 1 spec., 8.VII.1989 (F. PEREIRA leg.).
Madeira . Western Palaearctic.
- 3.4. *Tachys micros* (FISHER, 1828).
TERCEIRA: Alagoa, 15 specs., 4.X.1989.(C).

Under stones near the seashore.

Canaries (?). Mediterranean.

3.5. *Pseudanchomenus aptinoides* TARNIER, 1860.

PICO: Lagoa do Caiado, 1 spec., 4-19.III.1990; Cabeço do Caveiro, 1 spec., 7-19.III.1990.(E).

Captured with pitfall (Turquin and Vinegar) in the natural *Laurus* forest.
Endemic.

Described from S. Miguel and specifically identical with the specimens deposited in the Paris Museum. On account of its isolated taxonomic position this is the most interesting of all Azorean ground-beetles (LINDROTH, 1960). MACHADO (in press) restore the genus *Pseudanchomenus* TARNIER, 1860 (= *Azoranchus* ALLUAUD, 1919).

DYTISCIDAE

3.6. *Agabus bipustulatus* (LINNAEUS, 1758) (det. L. HENDRICH).

FLORES: Caldeira Seca, 10 specs., 7.VII.1989.(C).

Madeira. Palaearctic.

STAPHYLINIDAE

3.7. *Proteinus atomarius* ERICHSON, 1840.

PICO: Gruta dos Montanheiros, 4 specs., 6-18.III.1990.(E).

Pitfall (Formalin and Vinegar).

Western Palaearctic.

3.8. *Carpelimus corticinus* (GRAVENHORST, 1860) (= *Trogophloeus* c.).

S. JORGE: Mata dos Lacticineos, 3 specs., 26.VIII.1987.(B).

Under the bark of a dead trunk of *Cryptomeria japonica*..

Madeira, Canaries. Holarctic.

3.9. *Sepedophilus lusitanicus* HAMMOND, 1972.

[= *S. testaceus* (FABRICIUS, 1792); SERRANO & BORGES, 1987]

TERCEIRA: Terra Chã, 9 specs., 9.X.1983, 1 and 2.IV.1986, 10.IV.1986, 2.VIII.1986.(A); S. Carlos, 1 spec., 4.IV.1986.(A); Fonte Faneca, 4 specs., 5.V.1989, 2.VI.1989, 19.VI.1989.(C); Fontinhas, 1 spec., 5.VI.1989.(C).

Plant litter, rotten banana and pitfall traps.

Western Palaearctic.

ISRAELSON (1984) thinks that perhaps this is the *Conosoma testaceus* (FABRICIUS, 1792) of earlier authors -an opinion which the present author supports.

3.10. *Phloeopora testacea* (MANNERHEIM, 1830).

GRACIOSA: Caminho Grutão, 1 spec., 19.VIII.1987.(B).

Under the bark of a dead trunk of *Eucalyptus globulus*.

Madeira, Canaries. Western Palaearctic.

3.11. *Aloconota sulcifrons* (STEPHENS, 1832) (= *Atheta s.*).

FAIAL: Gruta Ruim, 1 spec., 9-12.VIII.1989.(D).

S. JORGE: Pico da Esperança, 1 spec., 24.VIII.1987.(B); Gruta Bocas do Fogo, 3 specs., 7.VIII.1989, 7-11.VIII.1989.(D).

TERCEIRA: Gruta dos Balcões, 11 specs., 26-30.VII.1987.(D); Gruta do Coelho, 9 specs., 28.VII-1.VIII.1987.(D); Caldeira da Serra de S. Bárbara, 6 specs., 14.VII.1989.(D).

Pitfall, colour traps and rotten banana.

Madeira, Canaries. Almost cosmopolitan.

3.12. *Atheta (Microdota) amricula* (STEPHENS, 1832).

FLORES: Lajedo, 1 spec., 10.VII.1989.(A).

S. JORGE: Barroca, 1 spec., 27.VIII.1987.(B); Gruta Bocas do Fogo, 1 spec., 7-11.VIII.1989.(D).

Pitfall with Turquin (a mixture of attractants and preservative).

Madeira, Canaries. Northern Africa, Europe, Siberia, Iceland. Introduced in North America.

3.13. *Atheta (s. str.) atramentaria* (GYLLENHAL, 1810).

S. JORGE: Pico da Esperança, 2 specs., 24.VIII.1987; Pico Carvão, 9 specs., 24.VIII.1987.(B).

Cow dung.

Madeira , Canaries. Palaearctic.

3.14. *Atheta (s. str.) acucollis* (SHARP, 1876) (= *pertyi* (HEER, 1838)).

GRACIOSA: Caldeira, 1 spec., 20.VIII.1987.(B).

S. JORGE: Barroca, 1 spec., 24.VIII.1987.(B); Gruta Bocas do Fogo, 2 specs.,
1.XI.1988 (F. PEREIRA leg.).

Canaries. Palaearctic.

3.15. *Atheta (s. str.) laticollis* (STEPHENS, 1832) (= *vernacula* ERICHSON, 1839).

GRACIOSA: Quitadouro, 1 spec., 17.VIII.1987.(B).

S. JORGE: Manadas, 6 specs., 27.VIII.1987.(B).

TERCEIRA: Gruta das Agulhas, 3 specs., 29.VII-2.VIII.1987.(D).

Rotten tomato, plant litter and dung.

Madeira , Canaries. Palaearctic.

3.16. *Atheta (s. str.) dilutipennis* MOTSCHULSKY, 1858.

FAIAL: Capelinhos, 7 specs., 16-20.VIII.1987, 12-15.VIII.1989.(D).

GRACIOSA: Vila de S. Cruz, 11 specs., 18.VIII.1987, 20.VIII.1987; Caminho
Grutão, 8 specs., 19.VIII.1987; Quitadouro, 1 spec., 19.VIII.1987;
Caldeira, 1 spec., 20.VIII.1987; Praia, 33 specs., 20.VIII.1987; Pico
Timão, 2 specs., 20.VIII.1987.(B).

S. JORGE: Terreiro da Macela, 3 specs., 24.VIII.1987; Pico Carvão,
1 spec., 24.VIII.1987; Norte Grande, 8 specs., 24.VIII.1987; S. Amaro, 9
specs., 25.VIII.1987; Barroca, 1 spec., 27.VIII.1987.(B).

S. MIGUEL: Ponta Delgada, 1 spec., 14.VII.1979 (OROMÍ leg.); Gruta da Cruz, 1
spec., 22-26.VII.1989; Rabo de Peixe, 3 specs., 24-28.VII.1989.(D).

S. MARIA: Gruta das Velhas, 30 specs., 1-3.VIII.1989.(D).

Rotting fruit and pitfall traps with Turquin.

Canaries, Cape Verde. Palaetropical.

3.17. *Atheta (s. str.) ravilla* (ERICHSON, 1839) (= *angusticollis* (THOMSON, 1856)).

S. JORGE: S. Amaro, 1 spec., 25.VIII.1987.(B).

S. MARIA: Gruta das Velhas, 2 specs., 1-3.VIII.1989.(D).

Western Palaearctic.

- 3.18. *Atheta (s. str.) divisa* (MÄRKEL, 1844).
GRACIOSA: Pico Timão, 1 spec., 20.VIII.1987.(B).
Madeira. Palaearctic.
- 3.19. *Atheta (s. str.) coriaria* (KRAATZ, 1858).
[= *Oxyroda lurida* WOLLASTON, 1857; SERRANO & BORGES, 1987].
GRACIOSA: Quitadouro, 1 spec., 18.VIII.1987.(B).
S. JORGE: Pico Carvão, 1 spec., 24.VIII.1987.(B).
TERCEIRA: Terra Chã, 1 spec., 21.VIII.1985.(A).
Atlantic islands. Cosmopolitan.
- 3.20. *Atheta (Nehemitropia) sordida* (MARSHAM, 1802).
GRACIOSA: Pico Timão, 2 specs., 17.VIII.1987.(B).
Cow dung.
Madeira, Canaries. Almost cosmopolitan.
- 3.21. *Amischa analis* (GRAVENHORST, 1802).
S. JORGE: Norte Grande, 3 specs., 24.VIII.1987.(B).
In a *Juniperus brevifolia* forest among debris.
Madeira. Holarctic.

PSELAPHIDAE

- 3.22. *Euplectus infirmus* (RAFFRAY, 1910) (= *afer* REITTER, 1881).
TERCEIRA: Fonte Faneca, 19 specs., 5.V.1989, 2.VI.1989.(C).
Under the bark of *Eucalyptus globulus*.
Palaearctic.

HISTERIDAE

- 3.23. *Carcinops pumilio* (ERICHSON, 1834).
TERCEIRA: Terra Chã, 1 spec., 22.X.1989.(A).
Madeira, Canaries. Cosmopolitan.

SCARABAEIDAE

3.24. *Trox scaber* (LINNAEUS, 1767).

S. MIGUEL: Gruta do Enforcado, 1 spec., 28.VII-2.VIII.1989.(D).
Madeira, Canaries. Cosmopolitan.

ELATERIDAE

3.25. *Conoderus posticus* (ESCHSCHOLTZ, 1822) (det. CATE).

[= *Athous obsoletus* (ILLIGER, 1807); BORGES & SERRANO, 1989].
GRACIOSA: Quitadouro, 1 spec., 18.VIII.1987; Caminho Grutão, 1 spec.,
19.VIII.1987.(B).

TERCEIRA: Lixeira (Angra do Heroísmo), 1 spec., 13.VIII.1986.(A).
Neotropical.

3.26. *Alestrus dolosus* (CROTCH, 1867).

TERCEIRA: Pico Alto, 4 specs., 20.IV.- 5.V.1990, 18.V.-1.VI.1990.(C).
Pitfall (Formalin, Vinegar and Turquin).
Endemic.

THROSCIDAE

3.27. *Throscus elateroides* (HEER, 1841).

TERCEIRA: Fonte Faneca, 1 spec., 5.V.1989.(C).
Under the bark of *Eucalyptus globulus*.
Madeira. Mediterranean.

NITIDULIDAE

3.28. * *Brachypeplus maui* GARDNER & CLASSEY, 1961(=*pudicus* KIREJTSHUK & GILLERFORS, 1987)

[*B. pudicus* KIREJTSHUK & GILLERFORS, 1987; BORGES & SERRANO, 1989].
TERCEIRA: Terra Chã, 5 specs., 28.X.1983, 22.IV.1986, 2.VIII.1986, 7.IX.1987;
Aigualva, 7 specs., 9. VIII.1986.(A).

In fruit remains and under bark of *Eucalyptus globulus*.

Madeira . Australia .

Described from Madeira and specifically identical with specimens from Australia. GARDNER & CLASSEY (1961) supposed that the Madeiran specimen was introduced with seeds of *Acacia* or *Eucalyptus* and we may assume that the same happened in the Azores. *B. pudicus* is now a synonym of *Brachypeplus maui* (ISRAELSON, pers. comm.).

3.29. *Carpophilus freemani* DOBSON, 1956.

FLORES: Cardoso, 1 spec., 10.VII.1989.(A).

Atlantic islands (Madeira , Canaries, Cape Verde). Cosmopolitan.

3.30.* *Epuraea longula* ERICHSON, 1845 (det. KIREJTSHUK).

FLORES: Cardoso, 2 specs., 10.VI.1989.(A).

S. JORGE: Terreiro da Macela, 1 spec., 24.VIII.1987; Barroca, 1 spec., 27.VIII.1987.

(B).

TERCEIRA: Terra Chã, 8 specs., 31.VII.1986, 2.VIII.1986, 5.VIII.1986.; Fonte

Faneca, 16 specs., 8.VIII.1986; Serreta, 6 specs., 10.VIII.1986.(A).

In fruit remains (banana).

Mediterranean.

3.31.* *Lasiodactylus tibialis* (BOHEMAN,1851) (= *maculipennis* (KRAATZ, 1895); = *curvitibius* KRAATZ,1895) (det. KIREJTSHUK).

[*L. maculipennis* (KRAATZ 1895) and *L. curvitibius* KRAATZ 1895; SERRANO & BORGES, 1987].

PICO: Madalena, 1 spec., 25.V.1989 (C).

TERCEIRA: Terra Chã, 198 specs., 20.VII.1983, 15.VIII.1983, 11.VIII.1985,

2.VIII.1986, 5.VIII.1986, 11.VIII.1986; Angra do Heroísmo, 3

specs., 10.VIII.1985, 30.X.1989; Fonte Faneca, 2 specs.,

8.VIII.1986.(A).

In fruit remains (rotten banana).

Madeira (ISRAELSON, pers . comm.). Afrotropical.

CUCUJIDAE

3.32. *Placonotus testaceus* (FABRICIUS, 1787) (= *Laemophloeus t.*) (det. G. ISRAELSON).

S. MIGUEL: Povoação, 1 spec., 7.X.1979 (P. OROMÍ leg.).

Palaeartic.

CRYPTOPHAGIDAE

3.33. *Cryptophagus saginatus* STURM, 1845.

S. JORGE: Gruta Bocas do Fogo, 4 specs., 7-11.VIII.1989.(D).

Madeira, Canaries. Palaeartic.

CERYLONIDAE

3.34. *Anommatus duodecimstriatus* (MÜLLER, 1821).

TERCEIRA: Fontinhas, 2 specs., 9.XII.1989.(C).

Madeira, Canaries. Palaeartic.

COLYDIIDAE

3.35. *Tarphius azoricus* GILLERFORS, 1986.

TERCEIRA: Fontinhas, 5 specs., 8.VI.1989, 19.XII.1989, 20.IV-5.V.1990.(C).

Captured with a pitfall trap (with Turquin) in a *Pinus* sp. forest.

Endemic.

Known previously from Flores, Pico and S. Miguel.

MYCETOPHAGIDAE

3.36. *Litargus pilosus* WOLLASTON, 1857.

FAIAL: Capelinhos, 1 spec., 12-15.VIII.1989.(D).

Pitfall with Turquin.

Madeira, Canaries (?).

CERAMBYCIDAE

3.37. *Chlorophorus pilosus* (FORSTER, 1771).

PICO: Costa do Cachorro, 1 spec., 10.VIII.1987. (P. OROMÍ leg.).

TERCEIRA: Terra Chã, 2 specs., 16.VI.1989, 25.VII.1990.(A).
Madeira (?). Western Palaearctic.

CHRYSOMELIDAE

3.38. *Chrysolina (Chrysomela) banksi* (FABRICIUS, 1775).

PICO: Ponta da Manhêna, 1 spec., 7.III.1990.(E).

Madeira, Canaries. Western Palaearctic.

3.39. *Chaetocnema hortensis* (GEOFFROY, 1785).

PICO: Cabecinhos, 2 specs., 23.V.1989.(A).

Western Palaearctic.

CURCULIONIDAE

3.40. *Laparocerus azoricus* DROUET, 1859.

PICO: Gruta do Henrique Maciel, 1 spec., 9-13.VIII.1989.(D).

Endemic.

4. CHECKLIST OF THE AZOREAN COLEOPTERA

This is a complete revised catalogue of Azorean Coleoptera (Tab. II) with their known distribution on the nine islands. It includes the occurrence of each species on the other Macaronesian archipelagos and their zoogeographic distribution (see Methods). On Tab. III the relation number of genera / number of species for each Family is given.

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SJG	TER	SMG	SMR
					CARABIDAE									
+		+	+	EO	Campalita olivieri (Dejean)	+	+	+	+	+	+	+	+	+
+	+			WP	Notiophilus quadripunctatus Dejean							+	+	
	+	+		MC	Aepus gracilicornis Wollaston		+							
				MT	Metallina ambiguum (Dejean)							+		
				i.s.	Bembidion propinquum Sturm									
				END	Ocydromus derelictus Alluaud		+							
+				END	Ocydromus schmidti azoricus Lindroth		+	+	+				+	
+	+			WP	Ocys harpaloides (Audinet-Serville)	+	+	+	+		+	+	+	+
+	+	?		H	Tachyura parvula (Dejean)		+	+				+	+	+
+		?		MT	Tachys micros (Fisher)		+	+				+	+	+
				MT	Tachys inaequalis Kolenati									+
+				END	Thalassophilus azoricus Oromí & Borges								+	
				END	Trechus torretassoi Jeannel								+	
+				END	Trechus picoensis Machado				+					
+				END	Trechus terceiranus Machado							+		
+				END	Trechus montanheiorum Oromí & Borges				+					
+				END	Trechus jorgensis Oromí & Borges						+			
+				P	Lagarus vernalis (Panzer)			+			+	+	+	
+	+			MT	Omasseus aterrimus nigerrimus Dejean						+	+		
+				END	Calathus lundbladi Colas								+	
+				END	Calathus vicenteorum Schatzmayr									+
				END	Calathus extensicollis Putzeys				+					
+				END	Calathus carvalhoi Serrano & Borges							+		
+	+	+		C	Laemostenus complanatus (Dejean)		+	+	+	+	+	+	+	+
+				END	Olisthopus inclavatus Israelson									+
+	+	+		WP	Agonum marginatum (Linnaeus)	+	+	+		+	+	+	+	
+				H	Agonum mulleri (Herbst)			+		+		+	+	
+				END	Pseudanchomenus aptinoides Tarnier				+			+	+	
+	+	+		H	Anchus ruficornis (Goeze)	+	+	+	+	+	+	+	+	+
+	+	+	+	C	Perigona nigriceps (Dejean)			+		+		+	+	+
+	+	+	+	H	Amara aenea (De Geer)	+	+	+	+	+	+	+	+	+
+	+			H	Anisodactylus binotatus (Fabricius)	+	+	+	+	+	+	+	+	+
+	+	+		WP	Stenolophus teutonius (Schrank)	+	+	+		+	+	+	+	+
				MT	Bradycellus distinctus (Dejean)					+			+	
				END	Bradycellus chavesi Alluaud								+	
+				MT	Acupalpus brunneipes (Sturm)		+		+		+	+	+	+
+	+			WP	Acupalpus dubius Schilsky		+	+		+		+	+	+

Table II.- Checklist of the Azorean Coleoptera.

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					CARABIDAE									
				P	Acupalpus flavicollis (Sturm)									
+	+			MT	Ophonus ardosianus (Lutshnik)		+	+		+	+	+	+	+
	+			WP	Ophonus stictus Stephens				+					
+	+			H	Pseudophonus rufipes (De Geer)	+	+	+	+	+	+	+	+	+
				P	Pseudophonus griseus (Panzer) ??				+					
+	+	+		P	Harpalus distinguendus (Duftschmidt)	+	+	+	+		+	+	+	+
				MT	Licinus punctatulus (Fabricius)							+		
+				WP	Dromius meridionalis Dejean			+	+			+	+	+
+				WP	Philorhizus melanocephalus (Dejean)								+	+
	+	+		P	Microlestes negrita Wollaston			+					+	
					DYTISCIDAE									
				WP	Coelambus pallidulus (Aubé) ??									
+	+	+		WP	Coelambus confluens (Fabricius)								+	+
				WP	Hydroporus limbatus Aubé ??								+	+
+				END	Hydroporus guernei Régimbart	+	+	+	+		+	+	+	+
+	+			P	Agabus bipustulatus (Linnaeus)		+	+	+		+	+		
				P	Agabus conspersus (Marsham) ??									
+				END	Agabus godmani Crotch		+	+	+	+	+	+	+	
+				C	Rhantus suturalis (MacLeay)	+	+	+	+	+	+	+	+	+
	+	+	+	C	Erectes sticticus (Linnaeus)									+
					GYRINIDAE									
				P	Gyrinus distinctus Aubé		+	+	+				+	+
					HYDRAENIDAE									
				END	Ochthebius frey D'Orchymont		+	+						+
					HYDROPHILIDAE									
+	+	+	+	C	Dactylosternum abdominale (Fabricius)		+	+				+	+	
+	+	+		P	Sphaeridium bipustulatum Fabricius		+	+	+	+	+	+	+	+
				H	Sphaeridium scarabaeoides (Linnaeus)								+	+
+	+	+		P	Cercyon quisquilius (Linnaeus)					+	+	+	+	
+				H	Cercyon haemorrhoidalis (Fabricius)		+		+	+	+	+	+	+
	+	+		C	Cercyon terminatus (Marsham)							+	+	
+	+	+		C	Cercyon atricapillus (Marsham)		+		+	+	+	+	+	+
	+	+		H	Cercyon litoralis (Gyllenhal)				+				+	+
+				WP	Cercyon lugubris (Olivier)		+	+	+	+	+	+	+	+
	+	+		C	Cercyon inquinatus (Wollaston)								+	+

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SJG	TER	SMG	SMR
					HYDROPHILIDAE									
				H	<i>Cercyon depressus</i> Stephens				+					+
				C	<i>Oosternum costatum</i> Sharp								+	
		+		P	<i>Helochaeres lividus</i> (Forster)							+		
		+		WP	<i>Enochrus bicolor</i> (Fabricius)					+		+		
					PTILIIDAE									
+	+	+		C	<i>Ptenidium pusillum</i> (Gyllenhal)		+	+	+			+	+	+
+				MT	<i>Actidium coarctatum</i> (Haliday)									+
		+		WP	<i>Nephanes titan</i> (Newman)		+							
				WP	<i>Acrotrichis fascicularis</i> (Herbst)		+						+	+
		+		MT	<i>Acrotrichis sericans</i> (Heer)		+	+	+				+	+
		+		A	<i>Acrotrichis sanctaehelenae</i> Johnson							+	+	+
		+		MC	<i>Acrotrichis matthewsi</i> (Wollaston)		+						+	+
				H	<i>Acrotrichis insularis</i> (Maklin)								+	+
				WP	<i>Acrotrichis thoracica</i> (Waltl)				+			+		+
				H	<i>Actinopteryx fucicola</i> (Allibest)			+						+
					SILPHIDAE									
				P	<i>Aclypea opaca</i> (Linnaeus)								+	
					SCYDMAENIDAE									
				i.s.	<i>Cephennium distinctum</i> Besuchet			+						
		+	+	MT	<i>Stenichnus thythonus mesmini</i> Croissandeau				+					+
				END	<i>Euconnus azoricus</i> Franz							+		
		+		MC	<i>Euconnus unicus lindbergi</i> Franz								+	
					STAPHYLINIDAE									
+				WP	<i>Proteinus atomarius</i> Erichson		+		+			+	+	
		+		C	<i>Lispinus impressicollis</i> Motschulsky								+	
+		+		WP	<i>Phloeonomus punctipennis</i> Thomson		+			+	+	+	+	+
		+		P	<i>Phloeonomus pusillus</i> (Gravenhorst)		+	+	+					+
+				END	<i>Phloeonomus azoricus</i> Fauvel		+		+			+	+	+
+		+		H	<i>Carpelimus corticinus</i> (Gravenhorst)		+	+		+	+	+	+	+
		+		C	<i>Carpelimus bilineatus</i> (Stephens)		+	+		+	+	+	+	+
				H	<i>Carpelimus gracilis</i> (Mannerheim)			+						+
				H	<i>Carpelimus pusillus</i> (Gravenhorst)		+					+	+	
		+		H	<i>Carpelimus subtilis</i> (Erichson)			+					+	
		+		C	<i>Anotylus nitidulus</i> (Gravenhorst)			+	+		+	+	+	+
+		+		P	<i>Anotylus nitidifrons</i> (Wollaston)		+	+				+	+	+
+		+		WP	<i>Anotylus complanatus</i> (Erichson)		+	+	+	+	+	+	+	+

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					STAPHYLINIDAE									
+				MT	Anotylus speculifrons (Kraatz)							+		
+	+	+		C	Oxytelus sculptus Gravenhorst		+	+			+	+	+	+
	+	+		P	Platystethus nitens (Salhberg)		+	+				+	+	+
	+	+		P	Platystethus spinosus Erichson			+				+	+	+
+	+	+		P	Stenus guttula Müller		+				+	+	+	+
+	+			WP	Astenus longelytrata Palm		+	+				+	+	+
+	+	+		P	Rugilus orbiculatus (Paykull)		+	+	+	+	+	+	+	+
	+			WP	Medon ripicola (Kraatz)								+	+
	+			MT	Medon apicalis (Kraatz)			+				+	+	+
+	+	+		WP	Sunius propinquus (Brisout de Barneville)		+	+	+			+	+	+
+	+	+	+	C	Chloëcharis debilicornis (Wollaston)		+	+	+			+	+	+
	+			WP	Pseudomedon obscurellus (Erichson)			+					+	+
+	+	+	+	C	Lithocharis ochracea (Gravenhorst)			+				+	+	+
				C	Lithocharis nigriceps (Kraatz)		+		+				+	+
		+		WP	Scopaeus minutus Erichson								+	+
				MT	Scopaeus portai Luze				+				+	+
	+	+		WP	Lobrathium multipunctatum (Gravenhorst) ??									
	+	+		C	Leptacinus pusillus (Stephens)								+	+
	+	+	+	C	Phacophallus parumpunctatus (Gyllenhal)				+					+
	+	+		MT	Lepidophallus hesperius (Erichson)			+					+	+
+	+	+		H	Gyrophypnus fracticornis (Müller)		+	+	+	+	+	+	+	+
	+	?		P	Xantholinus linearis (Olivier)			+				+	+	+
+	+	?		WP	Xantholinus longiventris Heer	+		+		+	+	+	+	+
				END	Xantholinus longiventris miguelensis (Méquignon)			+		+	+	+	+	+
+	+	+		C	Gabrius nigritulus (Gravenhorst)		+	+	+	+	+	+	+	+
	+	+		C	Gabronthus thermarum (Aubé)								+	+
+	+	+		H	Philonthus rectangulus Sharp		+		+	+				
+	+	+	+	C	Philonthus discoideus (Gravenhorst)							+	+	+
	+	+		H	Philonthus quisquiliarius (Gyllenhal)								+	+
+	+	+	+	MC	Philonthus ventralis proximus Wollaston			+		+	+			
+	+	+		H	Philonthus politus (Linnaeus)			+	+		+	+	+	+
+	+	+		C	Philonthus pachycephalus Nordmann		+	+	+			+	+	+
	+	+		WP	Philonthus fenestratus Fauvel ??									
	+	+		P	Philonthus ochropus (Gravenhorst)								+	+
	+	+		P	Philonthus immundus (Gyllenhal)								+	+
+	+	+		H	Philonthus umbratilis (Gravenhorst)			+				+	+	+
+	+	+		C	Spatulonthus longicornis (Stephens)		+	+	+	+	+	+	+	+

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SJG	TER	SMG	SMR
					STAPHYLINIDAE									
				P	Neobisnius lathrobioides (Baudi)									
	+	+		C	Neobisnius procerulus (Gravenhorst)			+					+	
				WP	Remus pruinosis (Erichson)									
				WP	Cafius xantholoma (Gravenhorst)		+		+					+
+	+	+		WP	Ocypus olens (Müller)	+	+	+	+	+	+	+	+	+
+	+			P	Pseudocypus aethiops (Waldl)					+		+	+	
+	+	+		C	Creophilus maxillosus (Linnaeus)		+	+	+	+	+	+	+	+
				WP	Heterothops minutus Wollaston				+	+	+	+	+	+
+	+	+		WP	Quedius simplicifrons (Fairmaire)				+	+	+	+		
+				P	Quedius curtipennis Bernhauer								+	+
				P	Quedius fuliginosus (Gravenhorst)		+						+	+
	+	+		MT	Trichophya pilicornis (Gyllenhal)								+	+
	+	+		WP	Habrocerus capillaricornis (Gravenhorst)				+		+	+	+	+
+	+	+		NT	Coproporus pulchellus (Erichson)		+	+		+	+	+	+	+
				H	Sepedophilus littoreus (Linnaeus)					+		+	+	+
	+	?		H	Sepedophilus testaceus (Fabricius) (??)		+		+	+		+	+	+
+	?	?		WP	Sepedophilus lusitanicus Hammond			+	+			+	+	+
	+	+		H	Tachyporus nitidulus (Fabricius)		+	+	+			+	+	+
+	+	+		H	Tachyporus chrysomelinus (Linnaeus)		+			+				
+	+	?	+	H	Cilea silphoides (Linnaeus)		+	+	+			+		
	+	+		WP	Aleochara clavicornis Redtenbacher							+	+	+
+	+	+	+	C	Aleochara puberula Klugman			+				+	+	+
+	+	+		H	Aleochara bipustulata (Linnaeus)		+	+	+	+	+	+	+	+
				END	Aleochara freyi Bernhauer				+		+	+	+	+
	+	+		MT	Emplenota albopila (Mulsant & Rey)		+	+	+				+	+
	+	+		MT	Oxypoda lurida Wollaston									+
	+	+		WP	Phloeopora angustiformis Baudi		+							+
	+	+		WP	Phloeopora teres (Gravenhorst)				+				+	
	+	+		MT	Phloeopora corticalis (Gravenhorst) ??									
	+	+		MC	Phloeopora corticina Wollaston		+		+					+
+	+	+		WP	Phloeopora testacea (Mannerheim)					+		+		
	+	+		P	Meotica exilis (Erichson)								+	
	+	+		WP	Hydrosmecta thinobioides (Kratz)			+					+	
+	+	+		C	Aloconota sulcifrons (Stephens)		+	+	+		+	+	+	+
+	+			WP	Aloconota insecta (Thomson)		+		+		+	+	+	+
				END	Geostiba melanocephala (Crotch)								+	
+	+	+		C	Atheta (Philhygra) palustris (Kiesenwetter)		+	+			+	+	+	+

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SJG	TER	SMG	SMR
					STAPHYLINIDAE									
	+			H	Atheta (Philhygra) luridipennis (Mannerheim)		+						+	
+	+	+		P	Atheta (Microdota) amicola (Stephens)		+	+			+	+	+	+
+		+		C	Atheta (Datomicra) nigra (Kraatz)		+					+	+	+
+	+	+	+	WP	Atheta (Mocyta) fungi (Gravenhorst)				+			+	+	+
				END	Atheta (Nothotecta) caprariensis Israelson								+	
				END	Atheta (Nothotecta) dryochares Israelson								+	
				MT	Atheta (Rhagocneme) zealandica Cameron								+	+
+	+	+		P	Atheta (s. str.) atramentaria (Gyllenhal)	+	+	+	+		+	+	+	+
				WP	Atheta (s. str.) castanoptera (Mannerheim)			+					+	
				WP	Atheta (s. str.) triangulum Kraatz						+			
+		+		P	Atheta (s. str.) acucollis (Sharp)		+	+		+	+		+	+
+	+	+		P	Atheta (s. str.) laticollis (Stephens)		+	+	+	+	+	+	+	+
+	+	+	+	PT	Atheta (s. str.) dilutipennis Motschulsky		+	+	+	+	+	+	+	+
+				WP	Atheta (s. str.) ravilla (Erichson)					+	+		+	+
				P	Atheta (s. str.) oblita (Erichson)								+	
+				P	Atheta (s. str.) divisa (Märkel)				+	+	+	+	+	+
+	+	+	+	C	Atheta (s. str.) coriaria (Kraatz)		+	+	+	+	+	+	+	+
+	+	+		C	Atheta (Nehemitropia) sordida (Marsham)		+	+	+	+		+	+	+
				END	Atheta (Hummleriella) azorica Bernhauer ? ?									
				END	Atheta (Geostibops) aptera Israelson		+							
				C	Halobrecta flavipes Thomson								+	
+	+			H	Amischa analis (Gravenhorst)		+	+	+	+	+	+	+	+
		+		C	Falagria concinna Erichson		+						+	
		?		WP	Xenusa sulcata (Kiesenwetter)				+					+
				MT	Xenusa uvida (Erichson)									+
+	+	+		P	Cordalia obscura (Gravenhorst)		+	+	+	+	+	+	+	+
				P	Gyrophaena bihamata Thomson									+
+		+		WP	Heterota plumbea (Waterhouse)		+		+					+
				END	Phytosus schatzmayeri Bernhauer									+
	+			MT	Oligota pumilio Kiesenwetter								+	
+	+	+	+	C	Oligota parva Kraatz		+	+				+	+	+
		+		i.s.	Oligota pusillima (Gravenhorst)		+	+					+	+
		+		i.s.	Cypha pulicaria (Erichson)		+		+					+
					PSELAPHIDAE									
				MT	Pseudoplectus perplexus (Jacquelin du Val)								+	+
+				WP	Euplectus infirmus (Raffray)				+			+	+	

Table II. - (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					HISTERIDAE									
		+		MT	Halacritus punctum (Aubé)									+
	+	+	+	C	Acritus nigricornis (Hoffmann)								+	+
	+		+	P	Saprinus semipunctatus (Fabricius)							+	+	
+	+	+		P	Saprinus semistriatus (Scriba)		+	+	+	+	+	+	+	+
+		+		H	Saprinus subnitescens (Bickhardt)			+	+			+	+	
+				P	Saprinus planiusculus (Motschulsky)					+	+	+	+	
				P	Saprinus acuminatus (Fabricius)							+	+	
		+	+	C	Hypocaccus brasiliensis (Paykull)			+				+	+	
				P	Hypocaccus rugifrons (Paykull)							+		
		+	+	MT	Hypocaccus dimidiatus (Illiger)			+				+	+	
+	+	+	+	C	Carcinops pumilio (Erichson)			+				+	+	
	+			NT	Carcinops troglodytes (Paykull)								+	
					SCARABAEIDAE									
		+	+	C	Trox scaber (Linnaeus)			+					+	
+				P	Onthophagus taurus (Schreber)	+	+	+	+	+	+	+	+	+
+				MT	Onthophagus vacca (Linnaeus)	+				+		+		
				MT	Onthophagus illyricus (Scopoli)						+			
				WP	Aegialia arenaria (Fabricius)								+	
	+	+		C	Aphodius granarius (Linnaeus)			+	+			+	+	
+	+	+	+	C	Aphodius lividus (Olivier)			+		+		+	+	
				C	Ataenius gracilis (Melsheimer)								+	
				MT	Psammodytes laevipennis Costa			+						
	+	+		MT	Psammodytes porcicollis (Illiger)			+					+	
	+	+		MT	Diastictus tibialis (Fabricius)							+		
+	+	+		C	Pleurophorus caesus (Creutzer)		+	+				+	+	
+				Japan	Popillia japonica Newman							+		
					DRYOPIIDAE									
	+	+		MT	Dryops algericus Lucas							+	+	+
				P	Dryops luridus (Erichson)		+			+			+	+
					ELATERIDAE									
+				NT	Conoderus posticus (Eschscholtz)			+		+		+		
+				END	Heteroderes azoricus Tarnier	+	+	+	+	+	+	+	+	+
+				END	Heteroderes melliculus moreleti Tarnier			+		+	+	+		+
+				END	Alestrus dolosus (Crotch)		+					+	+	
+		+		MT	Melanotus dichrous Erichson		+	+	+	+	+	+		+
+				MT	Athous obsoletus (Illiger)							+	+	+
+				C	Athous haemorrhoidalis (Fabricius)								+	

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SJG	TER	SMG	SMR
					ELATERIDAE									
				MT	<i>Drapetes cinctus</i> (Panzer)								+	
					THROSCIDAE									
+	+			P	<i>Throscus dermestoides</i> (Linnaeus)									+
				MT	<i>Throscus elateroides</i> (Heer)		+					+		+
					BUPRESTIDAE									
				MT	<i>Agrilus derasofasciatus</i> Lacordaire				+				+	
				WP	<i>Agrilus angustulus</i> (Illiger)								+	
				P	<i>Buprestis novemmaculata</i> Linnaeus									+
					DERMESTIDAE									
	+	+	+	C	<i>Dermestes maculatus</i> De Geer						+	+		
+	+	+	+	P	<i>Dermestes frischii</i> Kugelann		+	+	+	+		+	+	+
				P	<i>Dermestes murinus</i> Linnaeus								+	
+				H	<i>Dermestes undulatus</i> Brahm			+	+			+	+	
	+			WP	<i>Attagenus unicolor</i> (Brahm)			+						
	+			C	<i>Anthrenus verbasci</i> (Linnaeus)		+	+						
				C	<i>Anthrenus museorum</i> (Linnaeus)								+	
					LYCTIDAE									
	+	+	+	P	<i>Lyctus brunneus</i> (Stephens)								+	
					BOSTRICHIDAE									
	+	+	+	C	<i>Rhizopertha dominica</i> (Fabricius)								+	
	+			MC	<i>Scobicia barbata</i> (Wollaston)				+			+		+
					ANOBIIDAE									
+	+	+		P	<i>Ernobius mollis</i> (Linnaeus)							+	+	
	+	+	+	C	<i>Stegobium paniceum</i> (Linnaeus)		+	+				+		+
+				MT	<i>Nicobium hirtum</i> Illiger							+	+	+
+	+	+		WP	<i>Anobium punctatum</i> (De Geer)		+	+	+			+	+	+
	+	+		MC	<i>Anobium velatum</i> Wollaston ??									
+	+			WP	<i>Ptilinus pectinicornis</i> (Linnaeus)			+	+	+	+	+	+	
	+			MC	<i>Ptilinus cylindripennis</i> Wollaston		+	+	+				+	+
		+		WP	<i>Lasioderma serricorne</i> (Fabricius)								+	
			+	WP	<i>Lasioderma haemorrhoidalis</i> (Illiger)									+
				NT	<i>Thaptor oblongus</i> Gorham								+	
					PTINIDAE									
	+	+		MT	<i>Mezium sulcatum</i> (Fabricius)			+				+	+	+
	+	+	+	MT	<i>Mezium americanum</i> Castelnau			+				+	+	
+				END	<i>Sphaericus velhocabralli</i> Israelson									+
				MT	<i>Sphaericus gibboides</i> (Boieldieu)		+							

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					PTINIDAE									
				C	<i>Pinus fur</i> (Linnaeus)			+					+	+
	+	+		WP	<i>Pinus clavipes</i> Panzer			+						
					TROGOSITIDAE									
	+	+	+	C	<i>Tenebroides mauritanicus</i> (Linnaeus)			+				+	+	
				MT	<i>Tenebroides maroccanus</i> Reitter							+		
					CLERIDAE									
				C	<i>Opilo domesticus</i> (Sturm)								+	
				C	<i>Opilo mollis</i> (Linnaeus)								+	
				C	<i>Necrobia rufipes</i> (De Geer)			+						
+				C	<i>Necrobia ruficollis</i> (Fabricius)				+	+		+		
					MELYRIDAE									
+				WP	<i>Psilothrix viridicaeruleus</i> (Fourcroy)	+	+	+				+	+	+
				MT	<i>Attalus minimus</i> Rossi								+	
+				MT	<i>Attalus lusitanicus</i> Erichson		+	+	+	+	+	+		+
				MT	<i>Clanoptilus spinosus</i> (Erichson)									+
					NITIDULIDAE									
+				WP	<i>Brachypterus glaber</i> (Stephens)								+	
+				P	<i>Brachypterus pulicarius</i> (Linnaeus)								+	
+	+			WP	<i>Brachypterus villiger</i> (Reitter)								+	
				WP	<i>Meligethes incanus</i> Sturm			+						
+				H	<i>Meligethes aeneus</i> (Fabricius)		+	+	+		+		+	
				MT	<i>Meligethes planiusculus</i> (Heer)									+
+	+			Austral.	<i>Brachypeplus maui</i> Gardner & Classey							+	+	
+	+			C	<i>Carpophilus mutilatus</i> Erichson								+	
+	+			C	<i>Carpophilus dimidiatus</i> (Fabricius)		+					+	+	+
+	+			C	<i>Carpophilus hemipterus</i> (Linnaeus)					+	+	+	+	+
+	+			NT	<i>Carpophilus succisus</i> Erichson (??)								1	
+	+			C	<i>Carpophilus fumatus</i> Boheman		+	+	+	+	+	+	+	+
+	+			WP	<i>Carpophilus quadrisignatus</i> Erichson					+	+	+	+	+
+	+			C	<i>Carpophilus freemani</i> Dobson		+			+	+	+	+	+
+	+			EO	<i>Carpophilus marginellus</i> Motschulsky				+	+	+	+	+	+
+	+	+		P	<i>Nitidula carnaria</i> (Schaller)		+	+	+	+		+	+	
+	+			H	<i>Omosita colon</i> (Linnaeus)		+	+	+	+		+	+	
+	+			P	<i>Omosita discoidea</i> (Fabricius)							+		
+	+			P	<i>Epuraea depressa</i> (Illiger)		+							
+	+	+		P	<i>Epuraea biguttata</i> (Thunberg)			+	+	+	+	+	+	+
+				MT	<i>Epuraea longula</i> Erichson		+				+	+		

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					NITIDULIDAE									
+				NT	Stelidota geminata (Say)		+							
+	+			E	Lasiodactylus tibialis (Boheman)				+			+		
			+	WP	SPHINDIDAE Sphindus dubius (Gyllenhal)									+
					MONOTOMIDAE									
+	+	+		MT	Monotoma picipes Herbst		+	+				+		
		+		P	Monotoma quadrioveolata Aubé			+						
		+		WP	Monotoma longicollis (Gyllenhal)								+	+
+	+	+	+	WP	Monotoma spinicollis Aubé		+	+	+	+		+	+	+
		+		WP	Monotoma bicolor Villa								+	
					CUCUJIDAE									
+	+	+	+	C	Oryzaephilus surinamensis (Linnaeus)							+	+	
+			+	C	Oryzaephilus mercator (Fauvel)							+	+	
	+	+		C	Ahasverus advena (Waltl)		+	+	+			+	+	+
+	+	+		A	Cryptamorpha desjardinsi (Guérin Méneville)		+	+	+	+	+	+	+	+
		+		C	Nausibius clavicornis (Kugelann)		+							
			+	C	Silvanus unidentatus (Olivier) ??								+	
+	+			C	Silvanus lateritius (Broun)*							+		+
+	+	+		MT	Psammoecus personatus Grouvelle							+	+	
				C	Cryptolestes turcicus (Grouvelle)								+	
+	+	+	+	C	Cryptolestes ferrugineus (Stephens)							+		+
			+	C	Cryptolestes pusillus (Schönherr)				+					
	+	+	+	WP	Cryptolestes capensis (Waltl)		+		+		+		+	+
+				P	Placonotus testaceus (Fabricius)		+						+	
	+	+		MC	Placonotus granulatus (Wollaston)		+	+	+			+	+	+
				END	Leptophloeus azoricus Ratti									+
					CRYPTOPHAGIDAE									
+	+	+		P	Cryptophagus saginatus Sturm		+				+			
	+	+	+	P	Cryptophagus dentatus (Herbst)			+					+	
		+		WP	Cryptophagus cellaris (Scopoli)			+					+	
+	+	+		H	Cryptophagus laticollis Lucas					+		+	+	
				WP	Cryptophagus pilosus Gyllenhal		+							
				P	Cryptophagus schmidti Sturm ??		??							
	+	+		WP	Ephistemus globulus (Paykull)		+	+	+				+	+
	+	+		WP	Atomaria munda Erichson			+						
	+	+		P	Atomaria apicalis Erichson			+					+	

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SJG	TER	SMG	SMR
	+	?		WP	EROTYLIDAE <i>Cryptophilus interger</i> (Heer)			+	+				+	+
				N	PHALACRIDAE <i>Phalacrus politus</i> Melsheimer							+		
			+	WP	<i>Phalacrus coruscus</i> (Panzer)									+
	+			MT	<i>Olibrus liquidus</i> Erichson								+	
	+			P	<i>Olibrus affinis</i> (Sturm)								+	
+	+	+		WP	<i>Stilbus testaceus</i> (Panzer)		+	+		+	+	+	+	+
					CERYLONIDAE <i>Euxestus parki</i> Wollaston								+	
+	+	+		P	<i>Anommatus duodecimstriatus</i> (Müller)							+	+	+
				H	ENDOMYCHIDAE <i>Mycetaea subterranea</i> (Fabricius)		+	+					+	
				P	COCCINELLIDAE <i>Chilocorus bipustulatus</i> (Linnaeus)								+	+
	+			WP	<i>Clitostethus arcuatus</i> (Rossi) ??									
	+		+	MC	<i>Stethorus punctillum</i> (Weise)			+			+		+	+
+	+			P	<i>Scymnus haemorrhoidalis</i> Herbst									+
+	+	+		P	<i>Scymnus subvillosus</i> (Goeze)			+			+	+	+	+
	+			P	<i>Scymnus suturalis</i> (Thunberg)									+
	+		+	P	<i>Scymnus rubromaculatus</i> (Goeze) ??									
+	+			P	<i>Scymnus interruptus</i> (Goeze)			+	+		+	+	+	+
+	+		+	MT	<i>Scymnus levaillanti</i> Mulsant		+	+	+	+		+	+	+
+	+			MC	<i>Scymnus flavopictus</i> (Wollaston)						+	+	+	
				MT	<i>Nephus helgae</i> Fürsh									+
				i.s.	<i>Nephus bisignatus</i> (Boheman)									+
+	+		+	C	<i>Rodolia cardinalis</i> (Mulsant)		+			+	+	+	+	+
	+			C	<i>Lindorus lophantae</i> Blaisdall		+						+	+
+	+			WP	<i>Rhyzobius litura</i> (Fabricius)			+		+		+	+	+
	+			WP	<i>Rhyzobius chrysomeloides</i> (Herbst)								+	
	+			P	<i>Adalia decempunctata</i> (Linnaeus) ??									
	+	+		P	<i>Adalia bipunctata</i> (Linnaeus)			+						
+	+			H	<i>Coccinella undecimpunctata</i> Linnaeus	+	+	+	+	+	+	+	+	+
+	+			P	<i>Coccinella septempunctata</i> Linnaeus							+		+
				P	<i>Myrrha octodecimmaculata formosa</i> (Costa)									+
				NT	<i>Eriopsis connexa</i> (Germar)								+	
					CORYLOPHIDAE <i>Sacium densatum</i> (Reitter)						+			+

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SJG	TER	SMG	SMR
					CORYLOPHIDAE									
	+	+		WP	<i>Arthrolips piceus</i> (Comolli)							+	+	+
	+			WP	<i>Arthrolips aequalis</i> Wollaston						+		+	
+	+	+	+	P	<i>Sericoderus lateralis</i> (Gyllenhal)		+	+	+	+	+	+	+	+
				WP	<i>Corylophus sublaevipennis</i> Jacquelin du Val			+						
			+	A	<i>Orthoperus nitidulus</i> Allen									+
					MEROPHYSIDAE									
				END	<i>Holoparamesus azoricus</i> Méquignon								+	
			+	C	<i>Holoparamesus caularum</i> Aubé									+
				END	<i>Gietella faialensis</i> Menier & Constantin			+						
					LATRIDIIDAE									
+	+	+		C	<i>Aridius nodifer</i> (Westwood)		+	+	+			+	+	+
				C	<i>Aridius australicus</i> (Belon)								+	+
		+	+	C	<i>Latridius minutus</i> (Linnaeus)		+							
	+	+		WP	<i>Dienerella ruficollis</i> (Marsham)							+		
+	+	+		END	<i>Metopthalmus occidentalis</i> Israelson			+						+
+	+	+		C	<i>Corticaria fulva</i> Comolli			+				+	+	
+	+	+	+	C	<i>Corticaria serrata</i> (Paykull)			+				+	+	
	+	+		A	<i>Corticaria maculosa</i> Wollaston								+	+
+			+	P	<i>Corticaria elongata</i> (Gyllenhal)					+		+	+	
	+			WP	<i>Corticaria fagi</i> Wollaston									+
+	+	+		MT	<i>Corticarina fulvipes</i> (Comolli)		+	+	+			+	+	+
				MT	<i>Migneauxia parvicollis</i> Peyerimhoff									+
					CISIDAE									
+				END	<i>Atlantocis gillerforsi</i> Israelson		+		+				+	+
					COLYDIIDAE									
+				END	<i>Tarphius wollastoni</i> Crotch		+	+						
+				END	<i>Tarphius rufonodulosus</i> Israelson									+
+				END	<i>Tarphius depressus</i> Gillerfors									+
+				END	<i>Tarphius tornvalli</i> Gillerfors				+				+	
+				END	<i>Tarphius azoricus</i> Gillerfors		+		+			+	+	
				END	<i>Tarphius acuminatus</i> Gillerfors				+					
		+		WP	<i>Prostheca aspera</i> Wollaston									+
					MYCETOPHAGIDAE									
+	+	?		MC	<i>Litargus pilosus</i> Wollaston		+	+	+	+	+	+	+	+
				C	<i>Litargus balteatus</i> Lecc			+				+	+	
+	+	+		C	<i>Typhaea stercorea</i> (Linnaeus)		+	+	+	+		+	+	+
	+			MT	<i>Berginus tamarisci</i> Wollaston				+					

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SJG	TER	SMG	SMR
					OEDEMERIDAE									
	+	+		H	<i>Nacerda melanura</i> (Linnaeus)			+	+			+		+
					ANTHICIDAE									
+		+		MT	<i>Hirticomus quadriguttatus</i> (Rossi)		+	+		+	+	+	+	+
+	+	+	+	C	<i>Omonadus floralis</i> (Linnaeus)		+	+		+	+	+	+	+
+				C	<i>Omonadus formicarius</i> (Goeze)						+			
	+	+	+	WP	<i>Cordicomus instabilis</i> (Schmidt)									+
+			+	P	<i>Cyclodinus humilis</i> (Germar)							+		+
					TENEBRIONIDAE									
		+	+	H	<i>Aglenus brunneus</i> (Gyllenhal)			+						
		+	+	MC	<i>Hegeter tristis</i> (Fabricius)			+				+	+	+
+	+	+		MT	<i>Blaps gigas</i> (Linnaeus)			+		+		+	+	
+	+	+		P	<i>Blaps lethifera</i> Marsham		+	+			+	+	+	
+	+	+		P	<i>Gonocephalum rusticum</i> Olivier			+				+	+	
			+	MT	<i>Trachyscelis aphodioides</i> Latreille			+					+	
+				WP	<i>Phaleria cadaverina</i> (Fabricius)			+				+	+	
	+			WP	<i>Phaleria bimaculata</i> (Linnaeus)			+						+
+	+	+	+	C	<i>Gnatoцерus cornutus</i> (Fabricius)		+	+	+			+	+	+
+	+	+		C	<i>Tribolium ferrugineum</i> (Fabricius)							+	+	+
		+	+	C	<i>Tribolium castaneum</i> (Herbst)				+			+	+	
		+	+	C	<i>Tribolium confusum</i> Jacquelin du Val			+				+	+	
	+	+		P	<i>Palorus ratzeburgi</i> (Wissman)			+						
	+	+	+	P	<i>Palorus subdepressus</i> (Wollaston)							+		
	+	+	+	P	<i>Alphitobius diaperinus</i> (Panzer)			+				+	+	+
	+	+	+	C	<i>Alphitobius laevigatus</i> (Fabricius)								+	
	+	+		C	<i>Tenebrio obscurus</i> Fabricius			+		+		+	+	+
				END	<i>Helops azoricus</i> Crotch								+	
					ANASPIDAE									
+	+	+		MC	<i>Anaspis proteus</i> Wollaston		+	+	+	+	+	+	+	+
					CERAMBYCIDAE									
				P	<i>Corymbia rubra</i> (Linnaeus) ??								+	?
+				WP	<i>Corymbia fontenayi</i> (Mulsant)								+	+
+	?	+		MT	<i>Arhopalus syriacus</i> (Reitter)				+			+	+	+
+	+	+		H	<i>Gracilia minuta</i> (Fabricius)			+				+	+	+
			+	MT	<i>Nathrius brevipennis</i> (Mulsant)								+	
				END	<i>Aromia thea</i> Reitter								+	
	+	+	+	C	<i>Hylotrupes bajulus</i> (Linnaeus)		+	+			+		+	+
+	?			WP	<i>Chlorophorus pilosus</i> (Forster)		+		+		+	+	+	+

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					CERAMBYCIDAE									
+				NT	Taeniotes scalaris Fabricius			+				+	+	
+				NT	Acanthoderes jaspidea (Germar)							+	+	
				END	Crotchiella brachyptera Israelson				+				+	+
					CHRYSOMELIDAE									
				MT	Cryptocephalus sulphureus Olivier									+
+	+	+		WP	Chrysolina (Chrysomela) banksi (Fabricius)		+		+	+	+	+	+	+
+	+			WP	Chrysolina (Chrysomela) hyperici (Forster)					+				
				MT	Chrysolina americana (Linnaeus) ??								+	+
				NT	Polyspilla polyspilla Germar			+	+					
				P	Asiorestia ferruginea (Scopoli)								+	+
				P	Epitrix pubescens (Koch)						+			
+				N	Epitrix cucumeris Harris		+	+	+	+	+	+	+	+
+				N	Epitrix hirtipennis Melsham				+	+		+	+	+
				i.s.	Epitrix parvula Fabricius							+	+	+
				END	Mniophilosoma obscurum Gillerfors		+							
+				WP	Chaetocnema hortensis (Fourcroy)				+			+	+	+
				END	Psylliodes vehemens azorica Jacobson				+			+	+	+
		+		P	Psylliodes chrysocephala (Linnaeus)		+	+				+	+	+
				MT	Psylliodes marcida (Illiger)		+						+	+
+				END	Longitarsus azoricus Israelson							+		+
				MT	Altica ampelophaga Guérin-Méneville									+
					BRUCHIDAE									
			+	MT	Bruchus tristiculus Fahraeus				+	+		+	+	+
+	+	+		H	Bruchus rufimanus Boheman				+		+	+	+	+
	+	+		C	Bruchus pisorum (Linnaeus)		+					+	+	+
	+	+		WP	Bruchus rufipes Herbst							+	+	+
+	+	+	+	C	Acanthoscelides obtectus (Say)							+	+	+
+	+	+	+	P	Callosobruchus maculatus (Fabricius)							+	+	+
+	+	+	+	WP	Bruchidius foveolatus (Gyll)									+
					APIONIDAE									
+	+	+		P	Aspidapion radiolus (Marsham)		+	+			+	+	+	+
	+	+		WP	Kalcapion semivittatum semivittatum (Gyllenhal)		+		+		+	+	+	+
					RHYNCHOPHORIDAE									
	+	+	+	C	Sitophilus granarius (Linnaeus)		-	+				+	+	+
	+	+	+	C	Sitophilus zeamais Motschoulsky		+	+	+	+	+	+	+	+
+	+	+	+	C	Sitophilus oryzae (Linnaeus)		+	+	+	+	+	+	+	+
+				WP	Sphenophorus abbreviatus (Fabricius)			+		+		+	+	+

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					CURCULIONIDAE									
	+	+	+	C	Cosmopolites sordidus (Germar)								+	
+				MT	Otiorhynchus rugosostriatus (Goeze)							+	+	+
				WP	Otiorhynchus singularis (Linnaeus)								+	
+				C	Otiorhynchus sulcatus (Fabricius)		+	+	+		+	+	+	+
+				END	Otiorhynchus trophonius azoricus Uyttenboogaart			+	+		+	+	+	+
+				END	Laparocerus azoricus Drouet	+	+	+	+	+	+	+	+	+
	+			MT	Cathormiocerus curvipes (Wollaston)		+	+					+	+
				END	Cathormiocerus lepidopterus Uyttenboogaart ??						+			+
				N	Graphognathus peregrinus (Buchanan)		+							
+	+			C	Asynonychus godmani Crotch		+	+	+	+	+	+	+	+
				END	Neocnemis occidentalis Crotch									+
				H	Strophosoma melanogrammum (Forster)								+	
				WP	Philopodon plagiatus (Schaller)			+					+	
		+		P	Sitona discoideus Gyllenhal									
+	+	+		WP	Sitona lineatus (Linnaeus)		+	+	+	+	+	+	+	+
+	+	+		MT	Sitona puberulus Reitter		+	+		+	+	+	+	+
				WP	Sitona puncticollis Stephens									+
				H	Sitona flavescens (Marshall)		+	+			+	+	+	+
				MT	Sitona cinnamomeus Allard									+
				WP	Sitona gressorius (Fabricius)		+	+			+	+	+	+
+	+	+		H	Hypera postica (Gyllenhal)		+	+		+	+	+		+
				END	Hypera multifida Israelson									+
				END	Pseudechinosa nodosum Hustache		+		+				+	+
				WP	Pissodes castaneus (De Geer)			+	+				+	
		+		MT	Coniocleonus excoriatus (Gyllenhal)									+
+	+	+		WP	Acalles dromedarius Boheman									+
				END	Acalles droueti Crotch		+							
+				END	Acalles subcarinatus Israelson		+		+			+	+	+
				WP	Mogulones geographicus (Goeze)									+
		+		MC	Sirocalodes nigroterminatus (Wollaston)			+					+	+
				WP	Ceutorhynchus assimilis (Paykull)			+				+	+	
				MT	Amaurorhinus monizianus punctipennis Folwaczny									+
				WP	Brachytemnus porcatus (Germar)									+
				C	Pselactus spadix (Herbst)			+	+					
				WP	Rhopalomesites tardyi (Curtis)		+		+				+	+
+				END	Caulotrupsis parvus Israelson									+
	+			MT	Pseudophloeophagus aenopiceus (Boheman)		+	+	+		+	+	+	+

Table II.- (Cont.).

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SJG	TER	SMG	SMR
					CURCULIONIDAE									
+	+			MC	<i>Pseudophloeophagus tenax</i> (Wollaston)		+	+	+	+	+	+	+	+
				MT	<i>Orthochaetes insignis</i> (Aubé)		+							
				WP	<i>Tychius cuprifer</i> (Panzer)								+	
				WP	<i>Tychius picirostris</i> (Fabricius)							+		
+				E	<i>Derelomus</i> sp.							+		
+		+		WP	<i>Gymnetron pascuorum</i> (Gyllenhal)							+		
					SCOLYTIDAE									
				WP	<i>Scolytus rugulosus</i> (Ratzeburg)								+	
+				MT	<i>Hylastes attenuatus</i> Erichson							+	+	
				MT	<i>Hylastes ater</i> Paykull				+	+				
+	+	+		MT	<i>Hylurgus ligniperda</i> (Fabricius)				+	+		+	+	+
				END	<i>Phloeosinus gillerforsii</i> Bright				+	+			+	+
+	+			MC	<i>Liparthrum curtum</i> Wollaston				+	+			+	+
+	+	+		C	<i>Coccotrypes carpophagus</i> (Hornung)		+	+	+		+	+	+	+
		+	+	A	<i>Hypothenemus eruditus</i> Westwood			+	+		+	+	+	+
+				NT	<i>Hypothenemus crudiae</i> (Panzer)						+	+	+	+
+	+	+		H	<i>Xyleborus saxeseni</i> Ratzeburg				+	+	+	+	+	+
+	+	+		MT	<i>Orthotomicus erosus</i> (Wollaston)		+		+	+	+	+	+	+
									+			+		
238	286	257	67		Number of species= 522	21	182	212	155	101	121	245	336	249

Table II. (Cont.).

FAMILIES	NO. GENERA		NO. SPECIES	
	TOTAL	ENDEMIC	TOTAL	ENDEMIC(%)
CARABIDAE	32	1	47	15(31.9)
DYTISCIDAE	5	-	9	2(22.2)
GYRINIDAE	1	-	1	-
HYDRAENIDAE	1	-	1	1(100)
HYDROPHILIDAE	6	-	14	-
PTILIIDAE	5	-	10	-
SILPHIDAE	1	-	1	-
SCYDMAENIDAE	3	-	4	1(25.0)
STAPHYLINIDAE	58	-	121	9(7.4)
PSELAPHIDAE	2	-	2	-
HISTERIDAE	5	-	12	-
SCARABAEIDAE	9	-	13	-
DRYOPIDAE	1	-	2	-
ELATERIDAE	6	1	8	3(37.5)
THROSCIDAE	1	-	2	-
BUPRESTIDAE	2	-	3	-
DERMESTIDAE	3	-	7	-
LYCTIDAE	1	-	1	-
BOSTRICHIDAE	2	-	2	-
ANOBIIDAE	7	-	10	-
PTINIDAE	3	-	6	1(16.7)
TROGOSITIDAE	1	-	2	-
CLERIDAE	2	-	4	-
MELYRIDAE	3	-	4	-
NITIDULIDAE	10	-	23	-
SPHINDIDAE	1	-	1	-
MONOTOMIDAE	1	-	5	-
CUCUJIDAE	9	-	15	1(6.7)
CRYPTOPHAGIDAE	3	-	9	-
EROTYLIDAE	1	-	1	-
PHALACRIDAE	3	-	5	-
CERYLONIDAE	2	-	2	-
ENDOMYCHIDAE	1	-	1	-
COCCINELLIDAE	12	-	22	-
CORYLOPHIDAE	5	-	6	-
MEROPHYSIDAE	2	-	3	2(66.6)
LATRIDIIDAE	7	-	12	1(8.3)
CISIDAE	1	-	1	1(100)
COLYDIIDAE	2	-	7	6(85.7)
MYCETOPHAGIDAE	3	-	4	-
OEDEMERIDAE	1	-	1	-
ANTHICIDAE	4	-	5	-
TENEBRIONIDAE	12	-	18	1(5.6)
ANASPIDAE	1	-	1	-
CERAMBYCIDAE	10	1	11	2(20.0)
CHRYSOMELIDAE	10	-	17	3(17.6)
BRUCHIDAE	4	-	7	-
APIONIDAE	2	-	2	-
RHYNCHOPHORIDAE	3	-	4	-
CURCULIONIDAE	27	2	42	9(21.4)
SCOLYTIDAE	9	-	11	1(9.1)
TOTAL=	306	5	522	59(11.3)

Table III. - Number of genera and species of each family of the Azorean Coleoptera.

5. SYNONYMIC LIST.

Below we present only the nomenclatural changes made to the list of SERRANO (1982) and later records.

5.1. FAMILIES

- Scarabaeidae (= Trogidae).
- Trogoxetidae (=Ostomidae, =Ostomatidae).
- Melyridae (=Malachiidae, =Dasytidae).
- Monotomidae (=Cucujidae, part).
- Lathridiidae (=Lathridiidae)
- Anaspidae (=Mordellidae, =Scraptiidae).
- Apionidae (=Curculionidae, part).
- Rhynchophoridae (=Curculionidae, part).

5.2. GENERA / SPECIES

CARABIDAE

- Metallina* MOTSCHULSKY, 1850 (= *Bembidion* LATREILLE, 1802).
- Ocydromus* CLAIRVILLÉ, 1918 (= *Bembidion* LATREILLE, 1802).
- Ocys* STEPHENS, 1829 (= *Bembidion* LATREILLE, 1802).
- Tachyura* MOTSCHULSKY, 1862 (= *Tachys* STEPHENS, 1829).
- Lagarus* CHAUDOIR, 1899 (= *Pterostichus* STEPHENS, 1827).
- Omaseus* STEPHENS, 1828 (= *Pterostichus* STEPHENS, 1827).
- Laemostenus* BONELLI, 1810 (= *Pristonychus* DEJEAN, 1820).
- Anchus* LE CONTE, 1854 (= *Agonum* BONELLI, 1810).
- Pseudanchomenus* TARNIER, 1860 (= *Azoranchus* ALLUAUD, 1919; = *Anchus* LE CONTE, 1854).
- Ophonus* DEJEAN, 1821 (= *Harpalus* LATREILLE, 1802)
- Ophonus ardosianus* (LUTSHNIK, 1922) (= *Harpalus rotundicollis* FAIRMAIRE & LABOULBENE, 1854).
- Pseudophonus* MOTSCHULSKY, 1844 (= *Harpalus* LATREILLE, 1802)

DYTISCIDAE

-*Rhantus suturalis* (MACLEAY, 1825) (= *punctatus* (FOURCROY, 1785); = *pulverosus* (STEPHENS, 1828)).

HYDROPHILIDAE

-*Dactylosternum abdominale* (FABRICIUS, 1792) (= *insulare* LAPOUGE, 1840).

-*Cercyon atricapillus* (MARSHAM, 1802) (= *nigriceps* (MARSHAM, 1802)).

-*C. lugubris* (OLIVIER, 1790) (= *obsoletus* (GYLLENHAL, 1808)).

SILPHIDAE

-*Aclypea* REITTER, 1884 (= *Blitophaga* REITTER, 1884).

SCYDMAENIDAE

-*Stenichnus tythonus mesmini* CROISSANDEAU, 1897 (= *guardanus* REITTER, 1887).

STAPHYLINIDAE

-*Carpelimus* LEACH, 1819 (= *Trogophloeus* MANNERHEIM, 1831).

-*Anotylus* THOMSON, 1859 (= *Oxytelus* GRAVENHORST, 1802).

-*Astenus longelytrata* PALM, 1936 (= *angustatus* auct (nec PAYKULL); = *gracilis* (PAYKULL, 1789)).

-*Rugilus* SAMOUELLE, 1819 (= *Stilicus* LATREILLE, 1825).

-*Sunius* STEPHENS, 1833 (= *Medon* STEPHENS, 1833).

-*Chloëcharis* LYNCH, 1884 (= *Medon* STEPHENS, 1833).

-*Pseudomedon* MULSANT & REY, 1878 (= *Medon* STEPHENS, 1833).

-*Lithocharis* LACORDAIRE, 1835 (= *Medon* STEPHENS, 1833).

-*Labrathium* MULSANT & REY, 1878 (= *Lathrobium* GRAVENHORST, 1802).

-*Phacophallus* COIFFAIT, 1956 (= *Leptacinus* ERICHSON, 1839).

-*Lepidophallus* COIFFAIT, 1956 (= *Xantholinus* SERVILLE, 1815).

-*Xantholinus longiventris miguелensis* (MÉQUIGNON, 1942) (= *X. miguелensis* MÉQUIGNON, 1942).

-*Gabronthus* TOTTENHAM, 1955 (= *Philonthus* STEPHENS, 1832).

-*Philonthus pachycephalus* NORDMAN, 1837 (= *sordidus* (GRAVENHORST, 1802)).

-*Spatulonthus* TOTTENHAM, 1955 (= *Philonthus* STEPHENS, 1832).

-*Remus pruinosis* (ERICHSON, 1839-40) [= *sericeus* HOLME in ISRAELSON, 1984]

-*Ocypus* LEACH, 1819 (= *Staphylinus* LINNAEUS, 1758).

-*Pseudocypus* MULSANT & REY, 1875 (= *Staphylinus* LINNAEUS, 1758).

-*Quedius simplicifrons* (FAIRMAIRE, 1861) (= *hispanicus* BERNHAUER, 1898).

-*Sepedophilus* GISTEL, 1856 (= *Conosomus* MOTSCHULSKY, 1857).

- Cilea* JACQUELIN DU VAL, 1857 (= *Leucoparyphus* KRAATZ, 1858).
- Emplenota* CASEY, 1905 (= *Aleochara* GRAVENHORST, 1802)
- Hydrosmecta* THOMSON, 1858 (= *Atheta* THOMSON, 1858).
- Aloconota* THOMSON, 1858 (= *Atheta* THOMSON, 1858).
- Geostiba* THOMSON, 1858 (= *Sipalia* auct., nec MULSANT & REY, 1853).
- Atheta nigra* (KRAATZ, 1858) (= *zosteræ* auct., nec THOMSON, 1856).
- Atheta acucollis* (SHARP, 1876) (= *pertyi* auct., nec HEER, 1838).
- Atheta ravilla* (ERICHSON, 1839) (= *angusticollis* (THOMSON, 1856)).
- Halobrecta* THOMSON, 1858 (= *Atheta* THOMSON, 1858).
- Xenusia* MULSANT & REY, 1875 (= *Myrmecopora* SAULCY, 1878).
- X. sulcata* (KIESENWETTER, 1850) (= *Myrmecopora lohmanderi* BERNHAUER, 1899).

PSELAPHIDAE

- Euplectus infirmus* (RAFFRAY, 1910) (= *afæ* REITTER, 1881).

HISTERIDAE

- Saprinus subnitescens* (BICKHARDT, 1909) (= *S. semistriatus* auct.).
- Hypocaccus brasiliensis* (PAYKULL, 1811) (= *Saprinus apricarius* ERICHSON, 1834).
- Hypocaccus rugifrons* (PAYKULL, 1798) (= *Saprinus r.*).
- Hypocaccus dimidiatus* (ILLIGER, 1807) (= *Pachylopus d.*).

SCARABAEIDAE

- Psammodius porcicollis* (ILLIGER, 1803) (= *Phycochus azoricus* LANDIN, 1960).

ELATERIDAE

- Drapetes* sp. was changed from Throscidae to Elateridae.
- D. cinctus* (PANZER, 1796) (= *biguttatus* PILLER & MITTERPACHER, 1783 nec FABRICIUS, 1777).

DERMESTIDAE

- Attagenus unicolor* (BRAHM, 1791) (= *piceus* OLIVIER, 1790 nec THUNBERG, 1781).

PTINIDAE

- Ptinus clavipes* PANZER, 1795 (= *testaceus* OLIVIER, 1790).

NITIDULIDAE

- Brachypeplus mauli* GARDNER & CLASSEY, 1961 (= *pudicus* KIREJTSHUK & GILLERFORS, 1987).

-*Carpophilus marginellus* MOTSCHULSKY, 1858 [= *immaculatus* LUCAS, 1849 in SERRANO, 1982].

-*Epuraea depressa* (ILLIGER, 1798) (= *aestiva* LINNAEUS, 1758).

-*E. biguttata* (THUNBERG, 1784) (= *unicolor* (OLIVIER, 1790)).

-*Lasiodactylus tibialis* (BOHEMAN, 1851) (= *maculipennis* (KRAATZ 1895) and *curvitihius* KRAATZ 1895).

CUCUJIDAE

-*Cryptolestes* GANGLBAUER, 1797 (= *Laemophloeus* CASTELVAU, 1840).

-*C. capensis* (WALTL, 1832) (= *Laemophloeus elongatulus* LUCAS, 1849).

-*Placonotus testaceus* (FABRICIUS, 1787) (= *Laemophloeus t.*).

-*Placonotus granulatus* (WOLLASTON, 1865) (= *Laemophloeus g.*).

CRYPTOPHAGIDAE

-*Cryptophagus laticollis* LUCAS, 1849 (= *affinis* STURM, 1845).

-*C. pilosus* GYLLENHAL, 1828 (= *punctipennis* BRISOUT, 1863).

CERYLONIDAE

-*Euxestus* sp. was changed from Euxestidae to Cerylonidae.

ENDOMYCHIDAE

-*Mycetaea subterranea* (FABRICIUS, 1801) (= *hirta* MARSHAM, 1802 nec SCHAEFFER, 1769).

COCCINELLIDAE

-*Stethorus punctillum* (WEISE, 1891) (= *wollastoni* KAPUR, auct.).

MEROPHYSIDAE

-*Holoparamecus* spp. was changed from Latridiidae to Merophysidae.

-*Gietella faialensis* MENIER & CONSTANTIN, 1988 was changed from Melyridae to Merophysidae.

LATRIDIIDAE

-*Aridius* MOTSCHULSKY, 1866 (= *Latridius* HERBST, 1793).

-*Latridius* HERBST, 1793 (= *Enicmus* THOMSON, 1859).

-*Dienerella* REITTER, 1911 (= *Cartodere* THOMSON, 1863 nec THOMSON, 1859).

COLYDIIDAE

-*Prostheca aspera* WOLLASTON, 1860 (= *Doderonymus lusitanicus* BINAGHI, 1937).

OEDEMERIDAE

-*Nacerda* STEPHENS, 1839 (= *Nacerdes* DEJEAN, 1834).

ANTHICIDAE

- Hirticomus* PIC, 1894 (= *Anthicus* PAYKULL, 1798).
- Omonadus* MULSANT & REY, 1866 (= *Anthicus* PAYKULL, 1798).
- Cordicomus* PIC, 1894 (= *Anthicus* PAYKULL, 1798).
- Cyclodinus* MULSANT & REY, 1866 (= *Anthicus* PAYKULL, 1798).

TENEBRIONIDAE

Aglenus sp. was changed from Colydiidae to Tenebrionidae.

CERAMBYCIDAE

- Corymbia* DES GOZIS, 1886 (= *Leptura* LINNAEUS, 1758).
- Arhopalus syriacus* (REITTER, 1895) [= *Criocephalus rusticus* (LINNAEUS, 1758) in SERRANO, 1982].

CHRYSOMELIDAE

- Chrysolina* MOTSCHULSKY, 1850 (= *Chrysomela* auct., nec LINNAEUS, 1758).
- Asiorestia* JACOBSON, 1925 (= *Crepidodera* auct., nec CHEVROLAT, 1837).
- Epitrix cucumeris* HARRIS, 1851 (= *azorica* GRUEV, 1981).
- Altica* MÜLLER, 1764 (= *Halitica* auct.).

APIONIDAE

- Aspidapion* SCHILSKY, 1901 (= *Apion* HERBST, 1797).
- Kalcapion* SCHILSKY, 1906 (= *Apion* HERBST, 1797).

RHYNCHOPHORIDAE

- Sphenophorus* SCHÖNHERR, 1826 (= *Calandra* CLAIRVILLE, 1798).

CURCULIONIDAE

- Asynonychus* CROTCH, 1867 (= *Pantomorus* SCHÖNHERR, 1859).
- Strophosoma* BILLBERG, 1820 (= *Strophosomus* SCHÖNHERR et auct..)
- Sitona discoideus* GYLLENHAL, 1834 (= *humeralis* STEPHENS, 1831).
- S. puberulus* REITTER, 1903 (= *cambricus* auct., nec STEPHENS, 1831).
- Hypera postica* (GYLLENHAL, 1813) (= *variabilis* auct.)
- Pissodes castaneus* (DE GEER, 1775) (= *notatus* (FABRICIUS, 1787).)
- Mogulones* REITTER, 1916 (= *Ceutorhynchus* GERMAR, 1824).
- Sirocalodes* VOSS, 1958 (= *Ceutorhynchus* GERMAR, 1824).
- Rhopalomesites tardyi* (CURTIS, 1825) (= *Mesites azoricus* (MÉQUIGNON, 1942)).
- Pseudophloeophagus aenopiceus* (BOHEMAN, 1845) (= *chopardi* MÉQUIGNON, 1942).
- P. tenax* (WOLLASTON, 1854) (= *variabilis* (CROTCH, 1867)).

SCOLYTIDAE.

-*Hypothenemus eruditus* WESTWOOD, 1826 (= *aspericollis* WOLLASTON, 1860).

-*Coccotrypes carpophagus* (HORNUNG, 1842) (= *canariensis* EGGERS, 1828).

6. SYSTEMATIC COMMENTS.

Concerning the catalogue of Coleoptera from the Azores the following points should be noted:

-Some species were recorded from the Azores without the island being specified: *Bembidion propinquum* (STURM, 1825) (MACHADO, pers. comm.), *Acupalpus flavicollis* (STURM, 1825) (FREUDE in FREUDE *et al.*, 1976); *Sphaericus gibboides* (BOIELDIEU, 1754) (HORION, 1961); *Sitona discoideus* GYLLENHAL, 1834 (ROUDIER, 1980).

-*Philorhizus notatus* (STEPHENS, 1828) recorded from S. Maria by GILLERFORS (1986) is an erroneous determination (GILLERFORS, pers. comm.).

-*Acrotrichis thomsoni* ERICHSON, 1908 is a *nomen nudum* (no description) and cannot be used (JOHNSON, 1987). The identity of the Azorean specimens determined by UYTENBOOGAART (1947) needs checking (JOHNSON, pers. comm.).

-*Sepedophilus littoreus* (LINNAEUS, 1758) was recorded from S. Miguel by SCHATZMAYR (1945).

-*Brachypeplus mauli* GARDNER & CLASSEY, 1961 (= *pudicus* KIREJTSHUK & GILLERFORS, 1987) (ISRAELSON, pers. comm.; concluded from descriptions, types not examined).

-*Hypoborus ficus* ERICHSON, 1836 recorded from Faial by CROTCH (1870) is an erroneous determination (ISRAELSON, pers. comm.) being *Liparthrum curtum* WOLLASTON, 1854.

This paper documents new records for several islands: 1 species is new to Corvo, 5 species are new to Flores, 3 to Faial, 8 to Pico, 12 to S. Jorge, 8 to Graciosa, 17 to Terceira, 3 to S. Miguel and 2 to S. Maria. Three species of Nitidulidae are new to the entire archipelago: *Brachypeplus mauli* (= *B. pudicus*), *Epuraea longula* and *Lasiodactylus tibialis* (= *B. curvitiibus*; = *B. maculipennis*).

There has been a marked increase in the rate of addition of new taxa in the past 7 years (see Tabs. I and IV). There is no indication that the discovery rate is beginning to reach a plateau and

ISLAND	AREA	ALTITUDE (Max.)	AGE	SPECIES		END (PROPER)		% END		% PROP.	
	(sq. metre)	(metre)	(MY)	A	B	A	B	A	B	A	B
COR	17	718	?	19	21	4(-)	3(-)	21.1	14.2	-	-
FLO	142	915	0.62	97	182	11(4)	17(4)	11.3	9.3	36.4	23.5
FAI	172	1043	0.73	164	212	11(1)	12(2)	6.7	5.6	9.1	16.6
PIC	433	2351	0.037	41	155	5(2)	20(5)	13.2	12.9	40.0	25.0
GRA	62	402	0.62	23	101	2(-)	4(-)	8.7	4.0	-	-
SJG	246	1053	0.55	71	121	8(1)	8(1)	11.3	6.6	12.5	12.5
TER	402	1023	0.30	102	245	9(1)	14(3)	8.9	5.7	11.1	21.4
SMG	757	1103	4.01	255	336	21(13)	28(12)	8.3	8.3	61.9	42.9
SMR	97	587	8.12	79	249	6(2)	21(10)	7.6	8.4	33.3	47.6
Western Group	159	915	0.62	99	184	11(4)	17(4)	11.1	9.2	36.4	23.5
Central Group	1315	2351	0.037-0.73	219	356	15(5)	33(11)	6.8	9.3	33.3	33.3
Eastern Group	854	1103	4.01-8.12	277	416	23(15)	44(22)	8.3	10.6	65.2	50.0
AZORES	2328	2351	0.037-8.12	367	522	36	59	9.8	11.3	-	-
MADEIRA(1)	814	1860	60-70	-	1000	-	390	-	39	-	-
CANARIES(2)	7542	3717	35-40	-	1700	-	935	-	55	-	-
C. VERDE(3)	4033	2829	>100	-	407	-	146	-	31	-	-

Table IV. - Comparisons of characteristics of Macaronesian islands and their coleopterous fauna. A = SERRANO (1982); B = The author; (1) and (2) ISRAELSON (pers. comm.); (3) GEISTHARDT (1988).

probably, with the development of more effective sampling technics for specific habitats such as unexplored natural vegetation areas and caves, some new species will be discovered.

The number of known species for each island is now: 21 species from Corvo, 182 from Flores, 212 from Faial, 155 from Pico, 101 from Graciosa, 121 from S. Jorge, 245 from Terceira, 336 from S. Miguel and 249 from S. Maria. Compared with the list of SERRANO (1982) these figures represent an increase of : 10% in Corvo, 88% in Flores , 30% in Faial , 273% in Pico, 334% in Graciosa , 72% in S. Jorge , 139% in Terceira ,32% in S. Miguel and 214% in S. Maria .

The Azorean beetle fauna is now known to consist of 522 species , in 306 genera, in 51 families (Tab. III). This makes the beetles the most diverse of all the orders of the insects (The Dipterous insects with 415 species (SOUSA, 1985) being second most diverse order).

The most diverse families are Staphylinidae (58 genera, 121 species), Carabidae (32 genera, 47 species), Curculionidae (27 genera, 42 species) , Nitidulidae (10 genera, 23 species) and Coccinellidae (12 genera, 22 species).

Compared with the other Macaronesian archipelagos few families (4) contain endemic genera (Tab. III). These may represent earlier colonizations representing the fauna of the ancient Azorean laurel forests. Palaeo-endemics (*sensu* LINDROTH, 1960) are represented in the Azores by the following species: *Ocydromus derelictus* ALLUAUD, 1926, *Pseudanchomenus aptinoides* TARNIER, 1860, *Atheta (Geostibops) aptera* ISRAELSON, 1985, *Alestrus dolosus* (CROTCH, 1867), *Leptophloeus azoricus* RATTI, 1972, *Crotchiella brachyptera* ISRAELSON, 1985, *Neocnemis occidentalis* CROTCH, 1867, *Hypera multifida* ISRAELSON, 1984, *Pseudechinosoma nodosum* HUSTACHE, 1936, *Acalles droueti* CROTCH, 1867, and perhaps still others.

The genera with most endemic species are *Trechus* (5 , four of them cavernicolous), *Calathus* (4) (both Carabidae) and *Tarphius* (6) (Colydiidae). These are the only possible cases in the Azores of development of "swarms" of endemic species from one or a few ancestral stocks. Probably more new species in these genera will be discovered in the future, particularly of cave-inhabiting *Trechus* . It is interesting that all these three genera are well represented by many related endemic species in Madeira and the Canaries .

Of the 522 species of beetles now known to occur in the Azores 195 species have not been

recorded in the other archipelagos in Macaronesia ; 59 of them are Azorean endemics. The remaining 327 occur also on one or more of the other archipelagos in Macaronesia, such as : -64 only on Madeira, 35 only on the Canaries, 4 only on the Cape Verde Islands, 162 on Madeira and the Canaries, 3 on Madeira and the Cape Verde Islands, 4 on the Canaries and the Cape Verde Islands and 55 on Madeira, Canaries and Cape Verde Islands.

7. DISCUSSION.

SOME REFLEXIONS ABOUT THE DISTRIBUTION AND ORIGIN OF AZOREAN COLEOPTERA FAUNA.

1- Some islands are better known than others (the eastern ones are the best studied) and the present information on distribution should be considered as provisional.

2- Some older records will need confirmation and some earlier descriptions of endemics probably need revising.

3- The number of known species amounts to 522, which is somewhat less than half the number for Madeira and one -third that for the Canaries.

4- The extreme faunal poverty of the Azores is an interesting problem, and contrasts with the abundance of peculiar very old endemics in Madeira and the Canaries. This paucity is more

	NO. SPECIES	%
COSMOPOLITAN OR ALMOST COSMOP.	98	18.8
HOLARCTIC	43	8.2
PALAEARCTIC (SENSU LATO)	85	16.3
WESTERN PALAEARCTIC	109	20.9
NEARCTIC	4	0.77
NEOTROPICAL	11	2.1
MEDITERRANEAN	76	14.6
ETHIOPIAN	2	0.38
ETHIOPIAN-ORIENTAL	2	0.38
ATLANTIC	5	0.96
MACARONESIA	17	3.3
ENDEMIC	59	11.3
OTHER (Incertae Sedis, etc)	11	2.1

Table V. - Biogeographical origin of the Azorean Coleoptera.

marked if the comparison is restricted to the percentage of endemics: 39 % for Madeira; 55 % for the Canaries and only 11.3 % for the Azores. The possible reasons for this poverty are:

-Unfavourable climate for many species. Constant high humidity causes a general levelling of abiotic conditions, with a resulting pronounced poverty of biotopes (LINDROTH, 1960).

-Volcanic activity with the destruction of local faunas (LINDROTH, *op. cit.*).

-The influence of human activity with the loss of natural habitats.

-Great distances to the nearest mainland - Geographical isolation - (Atlantic effect).

-The recent geological age of the Azores - 8 Million years. The Azores probably were the object of a secondary colonization, receiving their fauna not from the mainland but from the intermediate islands.

-Insufficient exploration may also be important: in the last seven years 26 species of Coleoptera from the Azores were described as new to science.

5- The geological age of each island seems to be equally (or more) important than its area (Tab. IV) in the distribution of endemic species. The older islands, S. Maria and S. Miguel, have more endemics (and "proper endemics") than the younger ones, in spite of the area of S. Maria being smaller than most of the other islands.

6- From a zoogeographic viewpoint the Azorean beetle fauna consists mainly of species with a wide geographical distribution (cosmopolitan, holarctic and palaeartic) and it would also appear that most of the immigration must have been of predominantly West-Palaeartic origin (Tab. V).

We can never know the original richness of the beetle fauna of the Azores, since the islands have been changed so much by man.

In future contributions a more detailed biogeographic analysis will be made when more data are available concerning the distribution of endemic, native and introduced species on the nine islands of the Azorean archipelago.

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