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

By P. A. V. Borges (*)

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 58 seem to be subspecies (11.5%). In this paper the *Coleoptera* are first listed according to their distribution in the islands of the archipelago, being 21 species from Corvo, 152 from Flores, 212 from Ponta da Formosa, 155 from Pico, 101 from Graciosa, 121 from S. Jorge, 245 from Terceira, 316 from S. Miguel and 249 from S. Maria. New records for the archipelago of 107 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 geography of the Azores. From a biogeographical 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-Zalaccan origin.

RESUMO. Há alguns anos SERRANO publicou um trabalho sobre a distribuição dos *Coleopteros* das Açores, tendo-se verificado desde então um aumento no número de espécies sobre os arquipélagos das Açores, justificando assim a actualização de um novo trabalho de distribuição sobre o arquipélago das Açores. SERRANO listou 367 espécies e subespécies e agora este número é aproximadamente 522, das quais 58 são subespécies (11,5%). Neste trabalho listam-se as espécies e subespécies de acordo com a sua distribuição pelas ilhas do arquipélago, encontrando-se 21 espécies e subespécies no Corvo, 152 nas Flores, 212 no Pico, 155 no Pico, 101 na Graciosa, 121 em S. Jorge, 245 na Terceira, 316 em S. Miguel e 249 em S. Maria. São dadas igualmente novas citações para o arquipélago em geral e para cada ilha. Algumas ilhas têm sido mais exploradas do que outras pelo que a presente distribuição deverá ser vista como provisória. Da-se igualmente a ocorrência de cada espécie nos outros arquipélagos da Macaronésia, assim como a sua distribuição zoogeográfica. São dadas também algumas explicações sobre a diversidade e o endemismo das espécies e subespécies e são dadas algumas hipóteses para explicar a pobreza faunística dos Açores. Os pontos de vista zoogeográfico e nomenclatural são apresentados e comentários são feitos sobre a diversidade e o endemismo das espécies e subespécies. São dadas igualmente explicações para a geografia faunística dos Açores. A fauna dos coleopteros das Açores consiste principalmente de espécies com uma ampla distribuição geográfica (cosmopolita, holarctica e paleártica) e parece que grande parte dos imigrantes antigos terão sido de origem predominantemente West-Zalaccan.

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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.

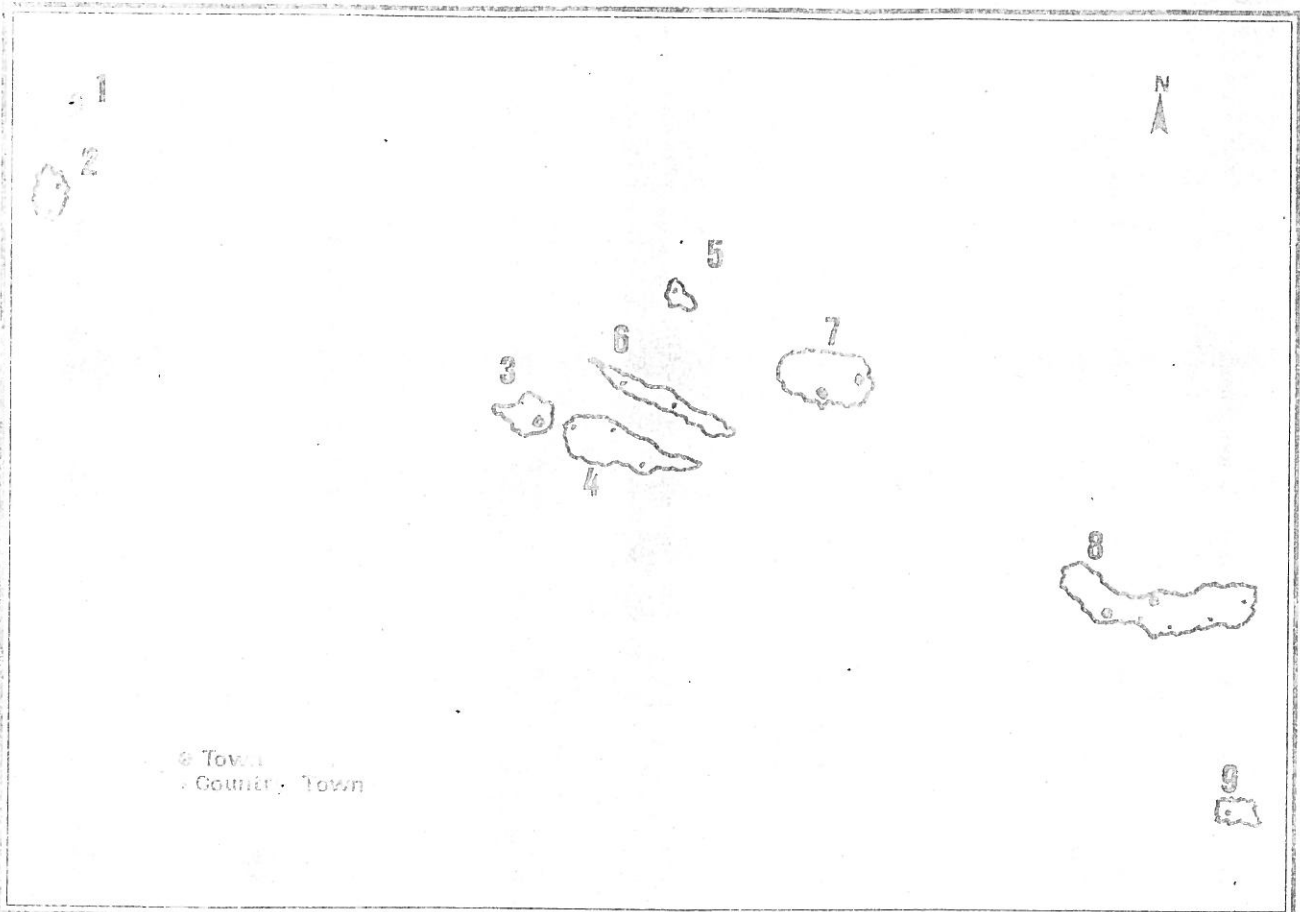
The area, geological age and maximum altitude for each island is given in Tab. IV.

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 latter 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)
THIS 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. CROFFORD 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 UYTENDBOOGAARD), that of PERSSON and HOLLANDA made in 1956, but not that of SCHATZMAYR and



MAP - 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. SILVERBERG (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, 1987);

-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 - Biogeographical 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 - Biogeographical expedition of the Speleological Group "Os Montanheiros") and S. Maria (June 1990 - Expedition of University of Azores). Assistance of Terceira has been received

1990

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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.

-Biogeological 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 of 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= biogeological 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; MT- Madeira archipelago; C- Canarian archipelago; CV- Cape Verde archipelago; DISTA- Zoogeographical distribution; C- Cosmopolitan or almost cosmopolitan; F- Foliaricid; P- Parasitic (*genus lato*); WP- Western Palaearctic; N- Nearctic; NT- Neotropical; MT- Mediterranean; E- Ethiopian; EO- Ethiopian-Central & Atlantic; MC- Macronesian; END- Endemic; PT- Palearctic; IS- *Insularis sensu lato*; COR- Corvo; PLO- Flores; FAI- Faial; PIC- Pico; GRA- Graciosa; SJG- São Jorge; TER- Terceira; SMO- São Miguel; SMA- Santa Maria; ?- Doubtful record.

The Coleoptera families are listed in a generally accepted phylogenetic sequence, following the order used by SCHWENDECKE (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 synonymy 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 *Alcedininae* (*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. *Nothophilus quadrifunicatus* DEJEAN, 1826.
TERCEIRA: Terra Chã, 1 spec., -VII.1989.(A).
Under a stone near a house.
Madeira, Western Palearctic.
Recently recorded from Azores (S. Miguei) 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. *Ogys lepidoides* (AUDINET-SERVILLE, 1821).
CORVO: Caldeirão, 1 spec., 8.VII.1989 (F. PEREIRA leg.).
Madeira, Western Palearctic.

- ✓ 3.4. *Tachys minor* (FISHER, 1828).
TERCEIRA: Alagoa, 15 specs., 4.II.1989.(C).

Under stones near the seashore.
Canaries (?), Mediterranean.

- 3.5) *Pseudanachonetus aphidoides* TARNIER, 1860.

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

Captured with pitfall (Turquin and Vinegar) in the natural *Larix* 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 *Pseudanachonetus* TARNIER, 1860 (= *Azorenelus* ALLUAUD, 1919).

DYTISCIDAE

- ✓ 3.6. *Agabus bipunctatus* (LINNAEUS, 1758) (det. L. HENDRICH).
FLORES: Caldeira Seca, 10 specs., 7.VII.1989.(C).
Madeira, Palearctic.

STAPHYLINIDAE

- ✓ 3.7. *Proctenus atomarius* ERICHSON, 1840.
PICO: Gruta dos Montanheiros, 4 specs., 6-13.III.1990.(E).
Pifal (Formalin and Vinegar).
Western Palearctic.

- ✓ 3.8. *Carpelanus corticinus* (GRAVENHORST, 1860) (= *Trogophilus s. e.*).
S. JORGE: Mata dos Lactiños, 3 specs., 26.VII.1987.(B).
Under the bark of a dead trunk of *Cycasorientalis japonica*.
Madeira, Canaries, Palearctic.

- ✓ 3.9. *Sepedophilus lusitanicus* HAMMOND, 1972.
[= *S. venosus* (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 Faneira, 4 specs.,
5.V.1989, 2.VII.1989, 19.VI.1992 (C); Foinhas, 1 spec., 5.VI.1989 (C).
Plant litter, rotten banana and pitfall traps.
Western Palearctic.
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 Guaião, 1 spec., 19.VIII.1987 (B).
Under the bark of a dead trunk of *Eucalyptus globulus*.
Madeira, Canaries. Western Palearctic.

- 3.11. *Alocorina sulcifrons* (STEPHENS, 1832) (= *Athleta 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 Batótes, 11 specs., 26-30.VIII.1987 (D); Gruta do Cocho, 9
specs., 28.VIII.1987 (D); Galdeira da Serra de S. Bárbara, 6
specs., 14.VIII.1989 (D).
Pitfall, colour traps and rotten banana.
Madeira, Canaries. Almost cosmopolitan.

- 3.12. *Athleta (Microthela) antilla* (STEPHENS, 1832).
FLORES: Lajeado, 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. *Athleta (s. str.) circumscripta* (CYLINDRAL, 1810).
S. JORGE: Pico da Esperança, 2 specs., 26.VIII.1987; Pico Curvão, 9 specs.,
24.VIII.1987 (B).

Cow dung.
Madeira, Canaries. Palearctic.

- 3.14. *Athleta (s. str.) acnicollis* (SHARP, 1876) (= *pernyi* (HIER, 1838)).
GRACIOSA: Galdeira, 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. Palearctic.

- 3.15. *Athleta (s. str.) latricollis* (STEPHENS, 1832) (= *ventricula* ERICHSON, 1839).
GRACIOSA: Quiladouro, 1 spec., 17.VIII.1987 (B).
S. JORGE: Manadas, 6 specs., 27.VIII.1987 (B).
TERCEIRA: Gruta das Agulhas, 5 specs., 29.VII-2.VIII.1987 (D).
Rotten tomato, plant litter and dung.
Madeira, Canaries. Palearctic.

- 3.16. *Athleta (s. str.) diluipennis* 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
Guaião, 8 specs., 19.VIII.1987; Quiladouro, 1 spec., 19.VIII.1987;
Galdeira, 1 spec., 20.VIII.1987; Praia, 33 specs., 20.VIII.1987; Pico
Timão, 2 specs., 20.VIII.1987 (B).
S. JORGE: Turcuro da Macela, 3 specs., 24.VIII.1987; Pico Curvão,
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 (ORONÍ leg.); Gruta da Cruz, 1
spec., 22-26.VIII.1989; Rabo de Peixe, 3 specs., 24-28.VII.1989 (D).
S. MARIA: Gruta das Velhas, 50 (422), 1-3.VIII.1989 (D).
Rotting fruit and pitfall traps with Turquin.
Canaries, Cape Verde. Palearctic.

- 3.17. *Athleta (s. str.) yealla* (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 Palearctic.

✓ 3.18. *Athya* (s. str.) *divisa* (MÄRKEL, 1874).

GRACIOSA: Pico Timão, 1 spec., 20.VIII.1987.(B).
Madeira, Palaeartic.

✓ 3.19. *Athya* (s. str.) *coriaria* (KRAATZ, 1858).

[= *Oxyptola lurida* WOLLASTON, 1857; SERRANO & BORGES, 1987].

GRACIOSA: Quiladouro, 1 spec., 18.VIII.1987.(B).

S. JORGE: Pico Carvão, 1 spec., 24.VIII.1987.(B).

TERCEIRA: Terra Cal, 1 spec., 21.VIII.1985.(A).

Atlantic islands. Cosmopolitan.

✓ 3.20. *Athya* (*Nehemitropia*) *sordida* (NARSHAM, 1802).

GRACIOSA: Pico Timão, 2 specs., 17.VIII.1987.(B).

Cow dung.

Madeira, Canaries. Almost cosmopolitan.

✓ 3.21. *Arctia* *aralis* (GRAVENHORST, 1802).

S. JORGE: Norte Grande, 3 specs., 24.VIII.1987.(B).

In a *Juniperus brevifolia* forest among debris.

Madeira, Madeira.

PSELAPHIDAE

✓ 3.22. *Euplectes* *ligninus* (RAFFRAY, 1910) (=cf. REITTER, 1881).

TERCEIRA: Fonte Faneça, 19 specs., 5.V.1989, 2.VI.1989.(C).

Under the bark of *Eucalyptus globulus*.

Palearctic.

HYMENOPTERA

✓ 3.23. *Ctenopoma* *viridula* (ENICSSON, 1854).

TERCEIRA: Terra Cal, 1 spec., 20.VIII.1989.(A).

Madeira, Canaries. Cosmopolitan.

SCARABAEIDAE

✓ 3.24. *Trox scaber* (LINNAEUS, 1757).

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

ELATERIDAE

✓ 3.25. *Conoderus* *positus* (ESCHSCHOLTZ, 1822) (det. CATR).

[= *Arctus obscurus* (LITTLER, 1807); BORGES & SERRANO, 1989].

GRACIOSA: Quiladouro, 1 spec., 18.VIII.1987; Caminho Gruteiro, 1 spec., 19.VIII.1987.(B).

TERCEIRA: Lixeira (Angra do Heroísmo), 1 spec., 15.VIII.1986.(A).

Neotropical.

3.26. *Alexirus* *delosus* (CROTTCH, 1867).

TERCEIRA: Pico Alto, 4 specs., 20.IV-5.V.1990, 18.V-1.VI.1990.(C).

Midfall (Formalín, Vinegar and Turquin).

Endemic.

TYROSCIDAE

✓ 3.27. *Tyrosus* *elateroides* (HEBR, 1841).

TERCEIRA: Fonte Faneça, 1 spec., 5.V.1989.(C).

Under the bark of *Eucalyptus globulus*.

Madeira, Mediterranean.

NYTIDULIDAE

✓ 3.28. * *Drychopygus* *mauli* GARDNER & CLASSEY, 1951 (= *pydicus* KIRETSCHUK & GILLERSON, 1987)

[*D. pydicus* KIRETSCHUK & GILLERSON, 1987; BORGES & SERRANO, 1989].

TERCEIRA: Terra Cal, 5 specs., 28.X.1988, 22.IV.1986, 2.VIII.1986, 1.IX.1987.

Aguçadouro, 7 specs., 9.VIII.1985.(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 *Accacia* or *Eucalyptus* and we may assume that the same happened in the Azores. *B. pudicus* is now a synonym of *Brachypteryx maui* (ISRAELSON, pers. comm.).

✓3.29. *Carpophilus fremant* DOBSON, 1956.

FLORES: Cardoso, 1 spec., 10.VIII.1989.(A).
Atlantic islands (Madeira, Canaries, Cape Verde). Cosmopolitan.

✓3.30. **Eguraea 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 Paneca, 16 specs., 8.VIII.1986; Serreta, 6 specs., 10.VIII.1986.(A).

In fruit remains (burana).
Mediterranean.

✓3.31. **Lastodactylus tibialis* (BOHEMAN, 1851) (= *maculipennis* (KRAATZ, 1895)) = *curvithus* KRAATZ, 1895) (det. KIREJTSHUK).

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

PICO: Madeira, 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 Paneca, 2 specs.,

8.VIII.1986.(A)

In fruit remains (goten burana).

Madeira (ISRAELSON, pers. comm.). Afro-tropical.

CUCUJIDAE

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

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

CRYPTOPHAGIDAE

✓3.33. *Cryptophagus saginatus* ŠTURM, 1845.

S. JORGE: Gruta Boqueiro Fogo, 4 specs., 7-11.VIII.1989.(D).
Madeira, Canaries, Palearctic.

CERYLONIDAE

✓3.34. *Anommatus diodecimstriatus* (WÖLLER, 1821).

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

COLYDIDAE

3.35. *Tarphius azoricus* GILLTERRORS, 1986.

TERCEIRA: Fontinhas, 5 specs., 8.VI.1989, 19.XII.1989, 20.IV.5.V.1990.(C).
Captured with a pitfall trap (with Turpin) in a *Pinus* sp. forest.
Endemic.
Known previously from Flores, Pico and S. Miguel.

MYCETOPHAGIDAE

✓3.36. *Licargus pilosus* VOLLASTON, 1837.

FAIAL: Capelinhas, 1 spec., 12-15.VIII.1989.(D).
Pitfall with Turpin.
Madeira, Canaries (?).

CERAMBYCIDAE

✓3.37. *Ctenophloeus pilosus* (FORSTER, 1771)

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

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

CHRYSSOMELIDAE

3.38. *Chrysomela (Chrysomela) banksi* (FABRICIUS, 1775).
 PICO: Ponta da Manhenta, 1 spec., 7.III.1990.(E).
 Madeira, Canaries, Western Palearctic.

3.39. *Chaetocnema hirtensis* (GEOFFROY, 1785).
 PICO: Cabeinhos, 2 specs., 23.V.1989.(A).
 Western Palearctic.

CURCULIONIDAE

3.40. *Lapurocerus azoricus* DROUIN, 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	SIG	TER	SMG	SMR
					CARABIDAE									
+		+	+	FO	<i>Campalita olivieri</i> (Dejean)	+		+	+	+	+	+	+	+
+				WP	<i>Notiophilus quadripunctatus</i> Dejean							+	+	
	+	+		MC	<i>Aepus gracilicornis</i> Wollaston		+							
				MT	<i>Metalina ambiguum</i> (Dejean)							+		
				i.s.	<i>Pembidion propinquum</i> Sturm									
				END	<i>Ocydromus derelictus</i> Alluaud									
				END	<i>Ocydromus schmidti azoricus</i> Lindroth				+					
				WP	<i>Oeys harpaloides</i> (Audinet-Serville)			+	+			+	+	
		?		H	<i>Tachyura parvula</i> (Dejean)			+	+			+	+	+
				MT	<i>Tachys micros</i> (Fisher)			+	+			+	+	+
				MT	<i>Tachys inaequalis</i> Kolenati			+	+			+	+	+
				END	<i>Thalassophilus azoricus</i> Orómi & Borges									
				END	<i>Trechus torretassoi</i> Jeannel									
				END	<i>Trechus piccoensis</i> Machado				+					
				END	<i>Trechus terceiranus</i> Machado							+		
				END	<i>Trechus montanheirorum</i> Orómi & Borges				+					
				END	<i>Trechus jorgensis</i> Orómi & Borges							+		
				P	<i>Lagarus vernalis</i> (Panzer)						+	+		
				MT	<i>Onasacus aterrimus nigerrimus</i> Dejean							+	+	
				END	<i>Calathus lundbladi</i> Colas								+	
				END	<i>Calathus vicenteorum</i> Schatzmayr									+
				END	<i>Calathus extensicollis</i> Putzeys				+					
				END	<i>Calathus carvalhoi</i> Serrano & Borges							+	+	
				C	<i>Laemostenus complanatus</i> (Dejean)				+			+	+	
				END	<i>Olisthopus inclavatus</i> Israelson							+	+	
				WP	<i>Agonum marginatum</i> (Linnaeus)				+			+	+	
				H	<i>Agonum mulleri</i> (Herbst)				+			+	+	
				END	<i>Pseudanchomenus apinooides</i> Tarnier							+	+	
				H	<i>Anchus ruficornis</i> (Goeze)				+			+	+	
				C	<i>Perigona nigriceps</i> (Dejean)				+			+	+	
				H	<i>Amara acnea</i> (De Geer)				+			+	+	
				H	<i>Anisodactylus binotatus</i> (Fabricius)				+			+	+	
				WP	<i>Stenolophus teutonius</i> (Schrank)				+			+	+	
				MT	<i>Bradycellus distinctus</i> (Dejean)				+			+	+	
				END	<i>Bradycellus chavesi</i> Alluaud							+	+	
				MT	<i>Acupalpus bunnipes</i> (Sturm)							+	+	
				WP	<i>Acupalpus dubius</i> 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 sticticus Stephens	+	+	+	+	+	+	+	+	+
				H	Pseudoponopus rufipes (De Geer)			+			+			+
				P	Pseudoponopus griseus (Paizer)??	+	+	+	+			+		+
				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 confluentis (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 sucticus (Linnaeus)									
					GYRINIDAE									
				P	Gyrinus distinctus Aubé				+	+				+
					HYDRAENIDAE									
				END	Ochthebius frey D'Orchymont				+	+				+
					HYDROPHILIDAE									
				C	Dactylosternum abdominale (Fabricius)				+	+				+
				P	Sphaeridium bipustulatum Fabricius				+	+				+
				H	Sphaeridium scurrahacoides (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 inguinatus (Wollaston)									+

Table II. - (Cont.)

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					HYDROPHILIDAE									
				H	Cercyon depressus Stephens				+					+
				C	Oosternum costatum Sharp									
				P	Helochares lividus (Forster)									
				WP	Enochrus bicolor (Fabricius)									
					PTILIIDAE									
				C	Ptenidium pusillum (Gyllenhal)									
				MT	Actidium coarctatum (Haliday)				+					+
				WP	Nephtes titan (Newman)									+
				WP	Acrotichis fascicularis (Herbst)				+					+
				MT	Acrotichis sericans (Herr)				+					+
				A	Acrotichis sanctaehelenae Johnson									+
				MC	Acrotichis maulhewsi (Wollaston)				+					+
				H	Acrotichis insularis (Maklin)									+
				WP	Acrotichis thoracica (Waltl)									+
				H	Actinopteryx fucicola (Allibesti)				+					+
					SILPHIDAE									
				P	Aelypea opaca (Linnaeus)									
					SCYDMAENIDAE									
				s.	Cephennum distinctum Besuchet									
				MT	Stenichnus tythonus mesmini Croissandeau				+					+
				END	Euconus auricus Franz									
				MC	Euconus unicus lindbergi Franz									
					STAPHYLINIDAE									
				WP	Proteinus atomarius Erichson									
				C	Lispinus impressicollis Motschulsky				+					+
				WP	Phloeonomus punctipennis Thomson									+
				P	Phloeonomus pusillus (Gravenhorst)				+	+				+
				END	Phloeonomus atripes Fairv.				+	+				+
				H	Carpelimus corticinus (Gravenhorst)									+
				C	Carpelimus bilineatus (Stephens)				+	+				+
				H	Carpelimus gracilis (Mannerheim)									+
				H	Carpelimus pusillus (Gravenhorst)				+					+
				H	Carpelimus subilis (Erichson)									+
				C	Anotylus nitidulus (Gravenhorst)				+					+
				P	Anotylus nitidifrons (Wollaston)				+	+				+
				WP	Anotylus complanatus (Erichson)				+	+				+

Table II. - (Cont.)

PH	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 (Sahlberg)			+					+	+
	+	+		P	Platystethus spinosus Erichson			+			+		+	+
	+	+		P	Stenus guttula Müller		+	+					+	+
+	+	+		WP	Astenus longelyrata Palm		+	+	+	+			+	+
	+	+		P	Rugilus orbiculatus (Paykell)								+	+
	+	+		WP	Medon nigricollis (Kraatz)			+					+	+
	+	+		MT	Medon apicalis (Kraatz)		+	+	+				+	+
	+	+		WP	Sunius propinquus (Brisout de Barneville)		+	+	+				+	+
+	+	+	+	C	Chloëcharis debiliticornis (Wollaston)			+					+	+
+	+	+		WP	Pseudomedon olivellus (Erichson)			+					+	+
	+	+	+	C	Lithochas ochracea (Gravenhorst)				+				+	+
	+	+		C	Lithochas nigriceps (Kraatz)								+	+
			+	WP	Scopaeus minutus Erichson			+					+	+
				MT	Scopaeus portai Luce								+	+
	+	+		WP	Lobrathium multipunctatum (Gravenhorst) ??								+	+
	+	+		C	Leptacinus pusillus (Stephens)				+				+	+
	+	+	+	C	Phacophallus parumpunctatus (Gyllenhal)								+	+
	+	+		MT	Lepidophallus hesperius (Erichson)			+	+	+	+	+	+	+
	+	+		H	Gyrophysus fraeicornis (Müller)		+	+	+	+	+	+	+	+
	+	+	?	P	Xantholus linearis (Olivier)			+			+	+	+	+
	+	+	?	WP	Xantholus longiventris Heer			+			+	+	+	+
				END	Xantholus longiventris miguelensis (Méquignon)			+	+		+	+	+	+
	+	+	+	C	Gabrieus nigritulus (Gravenhorst)			+	+	+			+	+
	+	+	+	C	Gabrieus thermanum (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 Fäxel ??								+	+
	+	+	+	P	Philonthus ochropus (Gravenhorst)								+	+
	+	+	+	P	Philonthus immundus (Gyllenhal)								+	+
	+	+	+	H	Philonthus umbratilis (Gravenhorst)			+	+				+	+
	+	+	+	C	Spatularchus laevicornis (Stephens)			+	+				+	+

Table II. - (Cont.)

PH	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					STAPHYLINIDAE									
		+		P	Neobisnius lamprobioides (Baud)								+	
		+		C	Neobisnius procerulus (Gravenhorst)								+	
				WP	Remus pruinatus (Erichson)			+						+
				WP	Cafius xanthosoma (Gravenhorst)			+	+					+
+	+	+		WP	Ocyopus olens (Müller)		+	+	+				+	+
+	+	+		P	Pseudocypus aethiops (Walt)			+		+			+	+
+	+	+		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 cephalicornis (Gravenhorst)				+				+	+
+	+	+		NT	Coproporus patchellus (Erichson)			+	+	+			+	+
+	+	?		H	Sepedophilus lateris (Linnaeus)								+	+
+	?	?		H	Sepedophilus testaceus (Fabricius) ??			+	+	+			+	+
+	+	+		WP	Sepedophilus lusitanicus Hammond			+	+	+			+	+
+	+	+		H	Tachyporus nidulus (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	Oxyopoda lurida Wollaston								+	+
				WP	Phloeopora angustiformis Baudi			+					+	+
				WP	Phloeopora ferris (Gravenhorst)				+				+	+
				MT	Phloeopora corticalis (Gravenhorst) ??								+	+
				MC	Phloeopora corticalis Wollaston				+				+	+
				WP	Phloeopora testacea (Mannerheim)					+			+	+
				P	Meotica exilis (Erichson)								+	+
				WP	Hydrosmea thoboides (Kraatz)			+					+	+
				C	Aleoconota sulcifrons (Stephens)			+	+				+	+
				WP	Aleoconota insecta (Thomson)			+	+				+	+
				END	Geostiba melanoccephala (Crotch)								+	+
				C	Atheta (Philhyria) calvus (Kluge)			+	+				+	+

Table II. - (Cont.)

PB	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					STAPHYLINIDAE									
	+			H	Atheta (Phillyra) luridipennis (Mannerheim)			+					+	+
	+			P	Atheta (Microloa) macula (Stephens)			+					+	+
	+			C	Atheta (Datomicra) nigra (Kraatz)								+	+
	+		+	WP	Atheta (Mocytia) fungi (Gravenhorst)				+				+	+
				END	Atheta (Nothotecta) capraciensis 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.) acuticollis (Sharp)			+	+				+	+
	+			P	Atheta (s. str.) laeticollis (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 (Hummeriella) azorica Bernhauer ??								+	+
				END	Atheta (Geostibops) aptera Israelson			+					+	+
				C	Halobrocta flavipes Thomson								+	+
				H	Amischa analis (Gravenhorst)			+	+				+	+
				C	Falagria concinna Erichson								+	+
			?	WP	Xenusa sulcat. (Kiesenwetter)								+	+
				MT	Xenusa uvida (Erichson)								+	+
				P	Cordulia obscura (Gravenhorst)			+	+				+	+
				P	Gyrophaena bhamata 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)								+	+
					PSYLAPHIDAE								+	+
				MT	Pseudoplectus perplexus (Jacquetin du Val)								+	+
				WP	Fuplectus 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 (Hofmann)									+
				P	Saprinus semipunctatus (Fabricius)								+	+
				P	Saprinus semistriatus (Scriba)								+	+
				H	Saprinus subnitescens (Bickhardt)			+	+				+	+
				P	Saprinus planusculus (Motschulsky)			+	+				+	+
				P	Saprinus acuminatus (Fabricius)								+	+
				C	Hypocaccus brasiliensis (Paykull)								+	+
				P	Hypocaccus rugifrons (Faykull)								+	+
				MT	Hypocaccus dimidiatus (Illiger)								+	+
				C	Carcinops pumilio (Erichson)				+				+	+
				NT	Carcinops troglodytes (Paykull)				+				+	+
					SCARABAEIDAE									
				C	Trox scaber (Linnaeus)									
				P	Onthophagus taurus (Schrober)				+				+	+
				MT	Onthophagus vacca (Linnaeus)		+		+				+	+
				MT	Onthophagus illyricus (Scopoli)								+	+
				WP	Aegialia arenaria (Fabricius)								+	+
				C	Aphodius granarius (Linnaeus)								+	+
				C	Aphodius lividus (Olivier)				+				+	+
				C	Aiaenius gracilis (Melsheimer)								+	+
				MT	Psammodius laevipennis Costa				+				+	+
				MT	Psammodius poicicollis (Illiger)				+				+	+
				MT	Diastictus tibialis (Fabricius)				+				+	+
				C	Pleurophorus caesus (Creutzer)								+	+
				Japan	Popillia japonica Newman			+	+				+	+
					DRYOPIDAE									
				MT	Dryops algericus Lucas								+	+
				P	Dryops luridus (Erichson)								+	+
					ELATERIDAE									
				NT	Conoderus posticus (Eschscholtz)								+	+
				END	Heteroderes azoricus Tamier				+				+	+
				END	Heteroderes melliculus moreleti Tamier				+				+	+
				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	SIG	TER	SMG	SMR
					NITIDULIDAE									
+				NT	Stelidota geminata (Say)		+							
+	+			E	Lasiodactylus tibialis (Boheman)				+					
					SPHINDIDAE									+
			+	WP	Sphindus dubius (Gyllenhal)									
					MONOTOMIDAE									
+	+	+		MT	Monotoma picipes Herbs		+	+						
	+	+		P	Monotoma quadrioveolata Aubé			+						+
	+	+		WP	Monotoma longicollis (Gyllenhal)									+
+	+	+	+	WP	Monotoma spintecollis Aubé		+	+	+	+				
	+	+		WP	Monotoma bicolor Villa									
					CUCULIDAE									
+	+	+	+	C	Oryzaephilus surinamensis (Linnaeus)								+	+
+	+	+	+	C	Oryzaephilus mercator (Fauvel)								+	+
	+	+		C	Ahasverus advena (Wald)		+	+	+				+	+
+	+	+		A	Cryptanorpha desjardinsi (Guérin Méneville)		+	+	+	+			+	+
	+	+		C	Nausibius clavicornis (Kugelann)		+							+
	+	+		C	Silvanus unidentatus (Olivier) ??									+
	+	+		C	Silvanus laterivius (Brom)									+
+	+	+		MT	Psaminocerus personatus Grouvelle									+
	+	+		C	Cryptolestes turcius (Grouvelle)									+
+	+	+	+	C	Cryptolestes ferrugineus (Stephens)									+
	+	+		C	Cryptolestes pusillus (Schubler)									+
	+	+	+	WP	Cryptolestes capensis (Wald)		+		+					+
	+	+		P	Placonotus testaceus (Fabricius)		+							+
+	+	+		MC	Placonotus granulatus (Wollaston)		+							+
				END	Leptophloeus azoricus Raté									
					CRYPTOPHAGIDAE									
+	+	+		P	Cryptophagus saginatus Sturm		+							+
	+	+	+	P	Cryptophagus dentatus (Herbst)			+						+
	+	+		WP	Cryptophagus cellaris (Scopoli)			+						+
+	+	+		H	Cryptophagus latifollis Lucas					+				+
	+	+		WP	Cryptophagus pilosus Gyllenhal		+							+
	+	+		F	Cryptophagus schmidti Sturm ??		2+							+
	+	+		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	SIG	TER	SMG	SMR
					EROTYLIDAE									
		?		WP	Cryptophilus interger (Eier)			+	+					+
					PHALACRIDAE									
			+	N	Phalacrus politus Melsheimer									+
				WP	Phalacrus consueus (Panzer)									+
				MT	Olibrus liquidus Erichson									+
				P	Olibrus affinis (Sturm)									+
+	+	+		WP	Silbus testaceus (Panzer)		+	+		+				+
					CERYLONIDAE									
			+	WP	Euxestus parki Wollaston									+
+	+	+		P	Anommatus duodecimsulcatus (Müller)									+
					ENDOMYCHIDAE									
			+	H	Mycetana subterranea (Fabricius)		+	+						+
					COCCINELLIDAE									
			+	P	Chilocorus bipustulatus (Linnaeus)									+
			+	WP	Clitostethus arcuatus (Rossi) ??									+
			+	MC	Stethorus punctillum (Warse)			+						+
			+	P	Scymnus haemorrhoidalis Herbst									+
			+	P	Scymnus subvillosus (Geze)									+
			+	P	Scymnus suturalis (Thunberg)									+
			+	P	Scymnus rubromaculatus (Geze) ??									+
			+	P	Scymnus interruptus (Geze)									+
			+	MT	Scymnus levillanti Mulsant		+	+	+	+				+
			+	MC	Scymnus flavopictus (Wollaston)									+
				MT	Nephus helgae Fusch									+
				i.s.	Nephus bisignatus (Boheman)									+
			+	C	Rodolia cardinalis (Mulsant)		+							+
			+	C	Linatulus lophantae (Blattell)		+							+
			+	WP	Rhyzobius litura (Fabricius)			+		+				+
			+	WP	Rhyzobius chrysemeloides (Herbst)									+
			+	P	Adalia decempunctata (Linnaeus) ??									+
			+	P	Adalia bipunctata (Linnaeus)									+
			+	H	Coccinella undecimpunctata Linnaeus		+	+	+	+				+
			+	P	Coccinella septempunctata Linnaeus									+
			+	P	Myrrha octodecimpunctata formosa (Costa)									+
				NT	Eriopis connexa (Germar)									+
					CORYTHIDAE									
				i.s.	Sacium densatum (Reitter)									+

Table II. (Cont.)

PH	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					CORYLOPHIDAE									
				WP	Arthrolips piceus (Comolli)							+	+	+
				WP	Arthrolips aequalis Wollaston							+	+	+
				P	Sericodectrus lateralis (Gyllenhal)		+	+	+	+	+	+	+	+
				WP	Corylophus sublaevipennis Jacquelin du Val			+						+
				A	Orthoperus nitidulus Allen									+
					MEROPHYSIDAE									
				END	Holoparamecus azoricus Mésquignon									+
				C	Holoparamecus caularum Aubé									+
				END	Gietella faialensis Menier & Constantini				+					
					LATRIDIIDAE									
				C	Aridius nodifer (Westwood)		+	+	+			+	+	+
				C	Aridius australicus (Belton)								+	+
				C	Latridius minutus (Linnaeus)		+							
				WP	Dienerella ruficollis (Marsden)							+		
				END	Metopodialinus occidentalis Melsdon				+			+	+	
				C	Corticaria fulva Comolli				+			+	+	
				C	Corticaria serrata (Paykull)				+			+	+	
				A	Corticaria maculosa Wollaston							+	+	
				P	Corticaria elongata (Gyllenhal)					+		+	+	
				WP	Corticaria fagi Wollaston			+	+				+	+
				MT	Corticaria fulvipes (Comolli)									+
				MT	Migneauxia parvicollis Peyerimhoff									+
					CISIDAE									
				END	Atlantocis gillerforsi Isardson				+					+
					COLYDIDAE									
				END	Tarphius wollastoni Crotch		+	+						+
				END	Tarphius rufonodulosus Melsdon									+
				END	Tarphius depressus Gillerforsi									+
				END	Tarphius tornvalli Gillerforsi					+				+
				END	Tarphius azoricus Gillerforsi		+			+				+
				END	Tarphius acuminatus Gillerforsi					+				+
				WP	Prostheca aspera Wollaston									+
					MYCETOPHAGIDAE									
				MC	Litargus pilosus Wollaston		+	+	+	+	+	+	+	+
				C	Litargus balteatus Lecc			+	+	+	+	+	+	+
				C	Typhoea stercorea (Linnaeus)		+	+	+	+	+	+	+	+
				MT	Berginus tamarisci Wollaston					+				+

Table II - (Cont.).

PH	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					HEDEMERIDAE									
				H	Nacerda melanus (Linnaeus)				+	+			+	+
					ANTHICIDAE									
				MT	Hiridionus quadriguttatus (Rossi)			+	+			+	+	+
				C	Omonadus floralis (Linnaeus)			+	+			+	+	+
				C	Omonadus foenicarius (Goeze)							+	+	+
				WP	Cordicomus instabilis (Schmidt)									+
				P	Cyclodinus humilis (Germar)									+
					TENEBRIONIDAE									
				H	Aglenus brunneus (Gyllenhal)				+					
				MC	Hegeler tristis (Fabricius)				+					+
				MT	Blaps gigas (Linnaeus)				+					+
				P	Blaps lethifera Marsham				+					+
				P	Gonocephalum ruscicum Olivier				+					+
				MT	Trachyscelis aphodoides Latreille				+					+
				WP	Phaleria cadaverina (Fabricius)				+					+
				WP	Phaleria bimaculata (Linnaeus)				+					+
				C	Gnathocerus cornutus (Fabricius)			+	+					+
				C	Tribolium ferrugineum (Fabricius)									+
				C	Tribolium castaneum (Herbst)					+				+
				C	Tribolium confusum Jacquelin du Val					+				+
				P	Palorus ratzeburgi (Wissman)					+				+
				P	Palorus subdepressus (Wollaston)									+
				P	Alphitobius diaperinus (Pavani)				+					+
				C	Alphitobius laevigatus (Fabricius)									+
				C	Tenebrio obscurus Fabricius				+					+
				END	Holops azoricus Crotch									+
					ANASPIDAE									
				MC	Anaspis proteus Wollaston			+	+	+	+	+	+	+
					CERAMBYCIDAE									
				P	Corymbia rubra (Linnaeus) ??									+
				WP	Corymbia fontenayi (Mulsant)									+
				MT	Arhopalus syriacus (Reuter)				+					+
				H	Gracilia minuta (Fabricius)				+					+
				MT	Nathrius brevipennis (Mulsant)									+
				END	Aromia thea Reitter									+
				C	Hyletrupes bajulus (Linnaeus)			+	+					+
				WP	Chlorophorus pilosus (Forster)			+	+					+

Table II - (Cont.).

W	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) ??									+2
				NT	Polyspilla polyspilla Germar				+					+
				P	Asioestria 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	Longiarus azoricus Israelson									+
				MT	Altica ampelophaga Guérin-Méneville									+
					BRUCHIDAE									
				MT	Bruchus tristiculus Fahræus									+
				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	Kalcepon semivittatum semivittatum (Gyllenhal)									+
					RHYNCHOPHORIDAE									
				C	Sitophilus granarius (Linnaeus)									+
				C	Sitophilus zeamais Motschoulsky									+
				C	Sitophilus oryzae (Linnaeus)									+
				WP	Sphenophorus abbreviatus (Fabricius)									+

Table II. - (Cont.).

PS	M	C	CV	DISTR	SPECIES LIST	COR	FLO	FAI	PIC	GRA	SIG	TER	SMG	SMR
					CURCULIONIDAE									
				C	Cosmopolites sordidus (Germar)									+
+				MT	Otiorhynchus rugosostriatus (Goerz)									+
				WP	Otiorhynchus singularis (Linnaeus)									+
				C	Otiorhynchus sulcatus (Fabricius)									+
				END	Otiorhynchus trophonius azoricus Uyttenboogaart									+
+				END	Laparocetus azoricus Drouet		+							+
				MT	Carbonicoccus curvipes (Wollaston)									+
				END	Carbonicoccus lepidopterus Uyttenboogaart ??									+
				N	Graphognathus peregrinus (Boheman)									+
				C	Asynonychus godmani Crotch									+
				END	Necanemis occidentalis Crotch									+
				H	Strophosoma melenogrammum (Forster)									+
				WP	Philopedon plagiatus (Schaller)									+
				P	Sitona discoides Gyllenhal									+
				WP	Sitona lineatus (Linnaeus)									+
				MT	Sitona pubentulus Reiter									+
				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	Pseudochinosoma nodosum Hustache									+
				WP	Pissodes castaneus (De Geer)									+
				MT	Conicoleonus excoriatus (Gyllenhal)									+
				WP	Acalles dromedarius Boheman									+
				END	Acalles drometi Crotch									+
				END	Acalles subrinatus Israelson									+
				WP	Mogulones geographicus (Goeze)									+
				MC	Sitona nigroterminatus (Wollaston)									+
				WP	Ceuthorrhynchus assimilis (Paykull)									+
				MT	Amazurorhinus moazitanus punctipennis Folwaczny									+
				WP	Brachytemnus porcatus (Germar)									+
				C	Pselactus spodix (Herbst)									+
				WP	Rhopalomesites tardyi (Curtis)									+
				END	Caulotrumpis parvus Israelson									+
				MT	Pseudophloeobius aeneocephalus (Boheman)									+

Table II. - (Cont.).

5. SYNONYMIC LIST.

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

5.1. FAMILIES

- Scarrabacidae (=Trogidae).
- Trogositidae (=Ostromidae, =Ostromiidae).
- Melyridae (=Malachidae, =Dasyidae).
- Mordomoniidae (=Cucujidae, part).
- Lathridiidae (=Lathridiidae)
- Anaspidae (=Mordelidae, =Scaphidae).
- Apionidae (=Curculionidae, part).
- Rhynchophoridae (=Curculionidae, part).

5.2. GENERA / SPECIES

CARABIDAE

- Mutillina* MOTSCHULSKY, 1850 (= *Bembidion* LATREILLE, 1802).
- Oxytronus* CLAIRVILLE, 1918 (= *Bembidion* LATREILLE, 1802).
- Oeys* STEPHENS, 1829 (= *Bembidion* LATREILLE, 1802).
- Tachyura* MOTSCHULSKY, 1862 (= *Trochys* STEPHENS, 1829).
- Lagurus* CHAUDOT, 1899 (= *Perosiclus* STEPHENS, 1827).
- Onasus* STEPHENS, 1828 (= *Perosiclus* STEPHENS, 1827).
- Laemosiellus* BONELLI, 1810 (= *Pristerichius* DEJEAN, 1820).
- Anchus* LE CONTE, 1854 (= *Agonum* BONELLI, 1810).
- Pseudolichonotus* TYRRETT, 1860 (= *Szerocichus* ALLUAUD, 1919; = *Anchus* LE CONTE, 1854).
- Ophonus* DEJEAN, 1821 (= *Farpellus* LATREILLE, 1802)
- Ophonus* *arcosianus* (LUTSHNIK, 1922) (= *Farpellus* *rotundicollis* FAIRMAIRE & LAPOUGE, 1854)
- Pseudophaedon* MOTSCHULSKY, 1844 (= *Farpellus* *rotundicollis* LATREILLE, 1802)

DYTISCIDAE

-*Rhinus sinuatus* (MACLEAY, 1825) (= *punicatus* (FOURCROY, 1785); = *pulverosus* (STEPHENS, 1828)).

HYDROPHILIDAE

- Dactyloctenium abnormale* (FAERICUS, 1792) (= *insulare* LAPOUGE, 1840).
- Coryon antequilus* (MARSHAM, 1802) (= *angusticus* (MARSHAM, 1802)).
- C. lugubris* (OLIVIER, 1790) (= *obsolens* (CYLLENHAL, 1808)).

SILPHIDAE

-*Aclypsa* REITTER, 1884 (= *Blephaga* REITTER, 1884)

SCYDAMENIDAE

STAPHYLINIDAE

- Stenichus pilorus mesmini* CROISSANDEAU, 1897 (= *guardanus* REITTER, 1887)
- Carphilius* LEACH, 1819 (= *Trogophilus* MANNHEIM, 1831).
- Anoryctus* THOMSON, 1859 (= *Oxytelus* GRAVENHORST, 1802).
- Astenus longelytra* PALM, 1936 (= *angustatus* auct. (nec PAYKULL); = *gracilis* (PAYKULL, 1789)).
- Rugilus* SAMOUELLE, 1819 (= *Stilicus* LATREILLE, 1825).
- Santus* STEPHENS, 1833 (= *Melidon* STEPHENS, 1833).
- Chloëcharis* LYNCH, 1884 (= *Melidon* STEPHENS, 1833).
- Pseudomelidon* MULSANT & REY, 1878 (= *Melidon* STEPHENS, 1833).
- Tilocheris* LACORDAINE, 1835 (= *Melidon* STEPHENS, 1833).
- Lathochilus* MULSANT & REY, 1878 (= *Lathrobium* GRAVENHORST, 1802).
- Pterocophilus* COIFFAIT, 1955 (= *Leptacius* ERICHSON, 1839).
- Leptodipylus* COIFFAIT, 1956 (= *Xanthochilus* SFRVILLE, 1815).
- Xanthochilus longiventris niguelensis* (MÉQUIGNON, 1942) (= *X. niguelensis* MÉQUIGNON, 1942).
- Gabrorchus* TOTTEHAM, 1955 (= *Philonthus* STEPHENS, 1832).
- Philonthus pachycephalus* NORDMAN, 1837 (= *sordidus* (GRAVENHORST, 1802)).
- Spelionchus* TOTTEHAM, 1955 (= *Philonthus* STEPHENS, 1832)
- Renus* *parvulus* (ERICHSON, 1839-40) [= *sordicus* HOLME in ISRAELSON, 1984]
- Ocypus* LEACH, 1819 (= *Staphylinus* LINNAEUS, 1758)
- Pseudocypus* MULSANT & REY, 1875 (= *Staphylinus* LINNAEUS, 1758).
- Quatius anguliferus* (FAIRMAIRE, 1861) (= *insularis* BERNHAUER, 1893).
- Sepeolophilus* CISTEL, 1856 (= *Conosomus* MOTSCHULSKY, 1857).

- Cilia* JACQUELIN DU VAL, 1857 (= *Leucoparyphus* KRAATZ, 1858).
 -*Emplema* CASEY, 1905 (= *Aleochara* GRAVENHORST, 1802)
 -*Hydrostene* THOMSON, 1858 (= *Athea* THOMSON, 1858).
 -*Alconora* THOMSON, 1858 (= *Athea* THOMSON, 1858).
 -*Geosiba* THOMSON, 1858 (= *Sipalia* auct., nec Mulsant & Rey, 1853).
 -*Athea nigra* (KRAATZ, 1858) (= *zeoterax* auct., nec THOMSON, 1856).
 -*Athea acuticollis* (SHARP, 1876) (= *peryi* auct., nec Heer, 1838).
 -*Athea rufilla* (ERICHSON, 1839) (= *angusticollis* (THOMSON, 1856)).
 -*Hidobracia* THOMSON, 1858 (= *Athea* THOMSON, 1858).
 -*Xenusia* Mulsant & Rey, 1875 (= *Hydroscopora* SAULCY, 1878).
 -*X. sulcata* (KIESENWETTER, 1850) (= *Hydroscopora lomanderi* BERNHAUER, 1899).
 PSELEPHRIDAE
 -*Diplectes rufinus* (RAFFRAY, 1910) (= *ger* REITTER, 1881).
 HISTERIDAE
 -*Saprinus subniveus* (BICKHARDT, 1909) (= *S. semivivans* auct.).
 -*Hypocaccus brasiliensis* (PAYKULL, 18. ?) (= *Saprinus gorticarius* ERICHSON, 1834).
 -*Hypocaccus rufifrons* (PAYKULL, 1798) (= *Saprinus* ?).
 -*Hypocaccus dimidiatus* (ILLIGER, 1807) (= *Pachylopus* d.).
 SCARABAEIDAE
 -*Pannochius porcolithis* (ILLIGER, 1803) (= *Phycophilus acroisus* LANDIN, 1960).
 ELATERIDAE
 -*Draperes* sp. was changed from Tiroscidae to Elateridae.
 -*D. cinctus* (PANZER, 1796) (= *biguttatus* PILLER & MITTERPACHER, 1783 nec FABRICIUS, 1777).
 DERMESTIDAE
 -*Atagenus unicolor* (BRAHM, 1791) (= *Pilates* OLIVIER, 1790 nec THOMSON, 1781).
 PUNIDAE
 -*Pitius carytes* PANZER, 1795 (= *sericus* OLIVIER, 1790).
 NYMPHIDAE
 -*Archelypeplus mauli* GARDNER & CLASSEY, 1951 (= *pedulus* KIREITSINUK & CHILBERTORS, 1987).

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- Carpophilus marginellus* MOTSCHULSKY, 1858 (= *immaculatus* LUGAS, 1849 SERRANO, 1982).
 -*Fipretus depressa* (ILLIGER, 1793) (= *serena* LINNAEUS, 1758).
 -*E. biguttata* (THUNBERG, 1784) (= *unicolor* (OLIVIER, 1790)).
 -*Lastodactylus tibialis* (BOHEMAN, 1851) (= *maculipennis* (KRAATZ, 1895) = *curvithus* KRAATZ, 1895).
 CUCULIDAE
 -*Cypriolus* GANGLBAUER, 1797 (= *Laemophloeus* CASTELVAU, 1849).
 -*C. capensis* (WALTL, 1832) (= *Laemophloeus elongatus* LUGAS, 1849).
 -*Placonotus testaceus* (FABRICIUS, 1787) (= *Laemophloeus* ?).
 -*Placonotus granatus* (WOLLASTON, 1865) (= *Laemophloeus* g.).
 CRYPTOPHAGIDAE
 -*Cryptophagus latellus* LUGAS, 1849 (= *agilis* STURM, 1845).
 -*C. pilosus* CYLLENHAL, 1828 (= *penicillatus* BRISOUT, 1863).
 CERYLONIDAE
 -*Cerastus* sp. was changed from Tenebridae to Cerylonidae.
 ENDOMYCHIDAE
 -*Myetana subterranea* (FABRICIUS, 1801) (= *litta* MARSHALL, 1802 nec SCHAEFFER, 1769).
 COCCINELLIDAE
 -*Stethorus punctillum* (WEISE, 1891) (= *volkstoni* KAPUR, auct.).
 MEROPTHYSIDAE
 -*Holopternecus* spp. was changed from Latrididae to Meropthyidae.
 -*Giazella faldensis* MENIER & CONSTANTIN, 1988 was changed from Meloidae to Meropthyidae.
 LATRIDIDAE
 -*Aridius* MOTSCHULSKY, 1866 (= *laridius* HERBST, 1793).
 -*Laridius* HERBST, 1793 (= *lucanus* THOMSON, 1859).
 -*Dieroneis* KENTON, 1811 (= *lucanus* THOMSON, 1863 nec THOMSON, 1859).
 COLYDIDAE
 -*Psostica aspera* WOLLASTON, 1860 (= *Doderogonus insularis* BINAGLIA, 1937).
 OMBROPHAGIDAE
 -*Neoceta* STEPHENS, 1839 (= *nicotida* DEJEAN, 1834).

ANTHICIDAE

- Hirticornis* PIC, 1894 (= *Amblicus* PAYKULL, 1798).
 -*Omonodus* MOLSANT & REY, 1866 (= *Amblicus* PAYKULL, 1798).
 -*Corticornis* PIC, 1894 (= *Amblicus* PAYKULL, 1798).
 -*Cyclodius* MOLSANT & REY, 1866 (= *Amblicus* PAYKULL, 1798).
 TENEBRIONIDAE
Aglenus sp. was changed from Colydiidae to Tenebrionidae.

CERAMBYCIDAE

- Corymbis*, DES GOZIS, 1886 (= *Leptura* LINNAEUS, 1758).
 -*Archopallus sylvicus* (REITTER, 1895) [= *Craecophyllus ruficornis* (LINNAEUS, 1758)] in SERRANO, 1982].
 CHRYSOMELIDAE

- Chrysolina* MOTSCHULSKY, 1850 (= *Chrysonella* auct., nec LINNAEUS, 1758).
 -*Asiorivata* JACOBSON, 1925 (= *Crepidodera* auct., nec CHEVROLAT, 1837).
 -*Epirix cucumeris* HARRIS, 1851 (= *azorica* GRUEY, 1981).
 -*Allica* MÜLLER, 1764 (= *Hallica* auct.).
 APIONIDAE

- Apitapiation* SCHULSKY, 1901 (= *Apion*, HERBST, 1797).
 -*Kalceopion* SCHULSKY, 1906 (= *Apion*, HERBST, 1797).
 RHYNCHOPHORIDAE

- Sphitophorus* SCHÖNHERR, 1826 (= *Cidanea*, CLAIRVILLE, 1798).

CROCELEONIDAE

- Asynonychia* CROTCHE, 1867 (= *Pantemora* SCHÖNHERR, 1859).
 -*Strophosoma* BILLBERG, 1820 (= *Strophosenus* SCHÖNHERR et auct.).
 -*Stena discoides* GYLLENHAL, 1834 (= *humeralis* STEPHENS, 1831).
 -*S. puberulus* REITTER, 1903 (= *curviorius* auct., nec STEPHENS, 1831).
 -*Hypena postica* (GYLLENHAL, 1813) (= *vertebilis* auct.).
 -*Prasodes castaneus* (DE GEEB, 1775) (= *caesus* (FABRICIUS, 1787)).
 -*Megidorus* REITTER, 1916 (= *Ceatoromyia* GERMAR, 1824).
 -*Stroctolides* VOSS, 1958 (= *Ceatoromyia* GERMAR, 1824).
 -*Rhopalomesites raroni* (COURTIS, 1845) (= *Asius azoricus* (MÉQUIGNON, 1942)).
 -*Pseudeophaenogonus azoricus* (BOHEMAN, 1945) (= *capardi* MÉQUIGNON, 1942).
 -*F. tenax* (WOLLASTON, 1854) (= *praelis* (CROTCHE, 1867)).

SCOLYIIDAE

- Hypelcenus erudius* WESTWOOD, 1826 (= *aperlicollis* WOLLASTON, 1866).
 -*Coccytypus carpophagus* (HORNUNG, 1842) (= *canariensis* FICQERS, 1828).

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: *Tranibidus propinquum* (STURM, 1825) (MACHADO, pers. comm.), *Asynopis flavicollis* (STURM, 1825) (FREUDE in FREUDE et al., 1976), *Sphacelus gibboides* (BOIELDIEU, 1754) (HORION, 1961); *Stena discoides* GYLLENHAL, 1837 (ROUDIÉ, 1980).

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

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

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

-*Brachysiphus aeneus* GARDNER & CLASSEY, 1961 (= *pubescens* KRITTSCHUK & GILLERFORS, 1987) (ISRAELSON, pers. comm., concluded from descriptions, types not examined).

-*Hypoborus fuscus* ERICSSON, 1836 recorded from Faial by CROTCHE (1870) is a erroneous determination (ISRAELSON, pers. comm.) being *Ligarthrus curvica* WOLLASTON, 1854.

This paper documents new records for several islands: 1 species is new to Corvo; 5 species are new to Flores, 9 to Faial, 3 to Pico, 12 to S. Jorge, 8 to Graciosa, 17 to São Miguel, 5 to S. Maria. Three species of Nitidulidae are new to the entire archipelago: *Brachysiphus rufus* (= *S. pubescens*), *Epitaxus longula* and *Lactodryinus hirsutus* (= *H. curvica*) (= *H. maculipennis*).

There has been a marked increase in the rate of addition of new taxa in the past 7 years (see Table 1 and 17). There is no indication that the discovery rate is beginning to reach a plateau and

ISLAND	AREA (sq. metre)	ALTIITUDE (Max.) (metre)	AGE (MY)	SPECIES		END (PROPER)		% END		% PROP.	
				A	B	A	B	A	B	A	B
COR	17	718	?	19	21	4(-)	3(-)	21.1	14.2	-	-
FLD	142	915	0.62	97	182	11(4)	17(4)	11.3	9.3	36.4	23.5
FAL	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	0.52	23	101	2(-)	4(-)	8.7	4.0	-	-
SJC	246	1053	0.5	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	43.9
SMP	91	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(13)	44(22)	8.3	10.6	65.2	50.0
AZORES	2328	2351	0.057-8.12	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).

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probably, with the development of more effective sampling techniques 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 5 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, 25 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 northern Azorean laurel forests. Palaeo-endemics (sensu LITVOROV, 1960) are represented in the Azores by the following species: *Corytomus derelictus* ALLUAUD, 1926, *Pseudonclonemus aphidoides* TARNIER, 1860, *Athysa (Geostrophus) aperta* ISRAELSON, 1985, *Alestrus dolosus* (CROTCH, 1867), *Leptophloeus azoricus* RAITTI, 1972, *Chrociella brachyptera* ISRAELSON, 1985, *Neocentrus octidens* CROTCH, 1867, *Hypera multigida* ISRAELSON, 1984, *Pseudochalcidiora nodosum* HUSTACHE, 1936, *Acalles drouei* CROTCH, 1867, and perhaps still others.

The genera with most endemic species are *Trechus* (5, four of them endemic), *Ceclidius* (4) (gen. *Ceclidius*) and *Tortulidius* (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, the following are

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 REFLECTIONS 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 coincides with the abundance of peculiar very old endemics in Madeira and the Canaries. This poverty is more

	NO. SPECIES	%
COSMOPOLITAN OR ALMOST COSMOP.	92	18.8
HOLARCTIC	45	8.2
PALAEARCTIC (SENSU LATO)	65	16.3
WESTERN PALAEARCTIC	169	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
MACARONISIA	89	11.3
OTHER (Arctic, South, etc)	11	2.1

Table V. - Biogeographical origin of the Azorean Coleoptera.

marked in the comparison is restricted to the percentage of endemics: 29 % 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 level of abiotic conditions, with a resulting pronounced poverty of biotopes (LINDROTH, 1950).
- 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 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 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 immigration must have been of predominantly West-Palaearctic 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 of the nine islands of the Azorean archipelago.

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