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# Water beetles of Cabo Verde – new faunistic data and revised checklist (Coleoptera: Gyrinidae, Dytiscidae, Hydrophilidae)

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## Abstract

New faunistic data on the Gyrinidae, Dytiscidae and Hydrophilidae (Coleoptera) of the Cabo Verde Archipelago (Atlantic Ocean) are presented. Two species, *Hydroglyphus angularis* (KLUG, 1834) (Dytiscidae) and *Hydrophilus senegalensis* (PERCHERON, 1835) (Hydrophilidae), collected by the senior author, are recorded from Cabo Verde for the first time. Specimens recorded under the name *Helochares dilutus* (ERICHSON, 1843) by WOLLASTON (1867) in fact belong to *H. pallens* (MACLEAY, 1825), which is here recorded from Cabo Verde for the first time. A revised checklist of the Gyrinidae, Dytiscidae and Hydrophilidae of Cabo Verde is presented.

**Key words:** Coleoptera, Dytiscidae, Gyrinidae, Hydrophilidae, Cabo Verde, new faunistic records.

## Introduction

Cabo Verde (or Cape Verde) is an archipelago in the central Atlantic Ocean, which consists of more than 10 volcanic islands (Fig. 1), nine of which are inhabited. Located 570 kilometres off the coast of West Africa, the islands cover a combined area of slightly over 4,000 square kilometres. Three of these islands (Boa Vista, Maio, and Sal) are fairly flat, sandy and dry, while the others are generally rockier with more vegetation.

The islands are spatially divided into two groups: the Barlavento (windward) Islands: Boa Vista, Sal, Santo Antão, São Nicolau, São Vicente; and the Sotavento (leeward) Islands: Brava, Fogo, Maio, Santiago.

Few papers have so far been published about the water beetles of the Cabo Verde Archipelago. The only significant ones are those by WOLLASTON (1867), ORCHYMONT (1940), and BALFOUR-BROWNE (1976). A checklist of all beetles of Cabo Verde was compiled by OROMÍ et al. (2005).

Here we present records of aquatic beetles collected by the first author during his excursions to six different islands of Cabo Verde (Boa Vista, Brava, Fogo, Maio, Santiago, Santo Antão) between 1998 and 2013. These records include two taxa, which have so far not been recorded from Cabo Verde at all. A third unrecorded species was found in the collections of the Natural History Museum, London.

## Hydrological aspect

The Cabo Verde Archipelago lies in the western extension of the Sahel Zone. The rainy season lasts (discontinuously) from July or August to early November. In certain years, the south-west monsoon does not reach the islands at all, which results in disastrous droughts.

Perennial running waters exist only on some of the higher islands, e.g. on Santo Antão (Ribeira da Torre), on Brava (Ribeiras Faja d'Água) or on Boa Vista (Ribeira da Bofareira, Figs. 2–3). In the rainy season flat ephemeral pools may appear at the margins of Rio Grande (Fig. 4) on Boa Vista.

On the three eastern islands (Boa Vista, Maio, Sal) and on the lee side of the other islands semiarid or arid climate prevails. A more detailed account on the topography, geology, climate and vegetation of Cabo Verde was published by AISTLEITNER (2013).

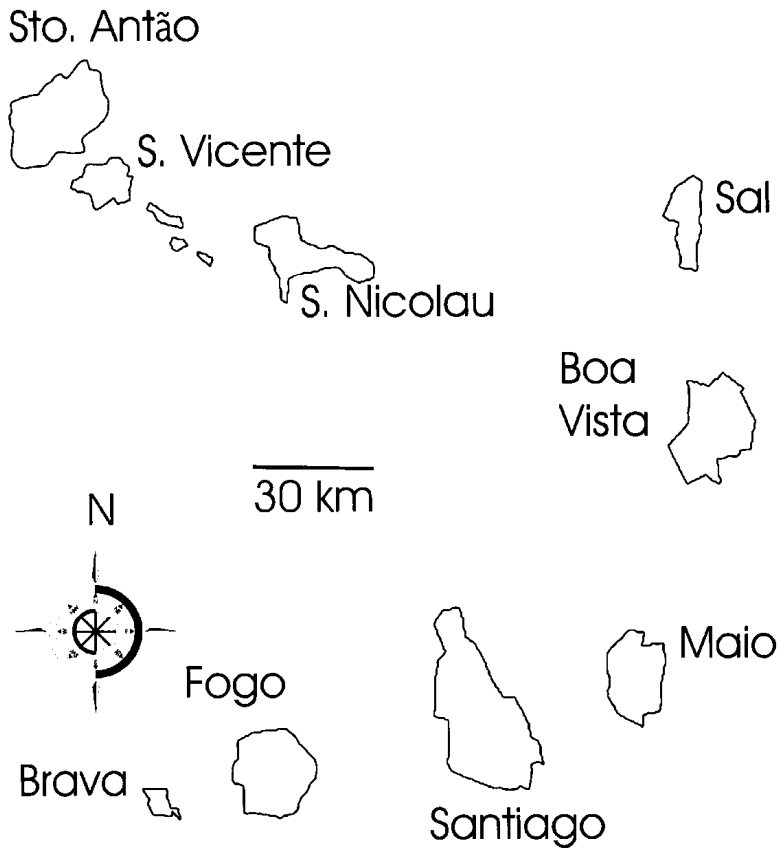


Fig. 1: Islands of the Cabo Verde Archipelago.

### **Checklist of the Gyrinidae, Dytiscidae, and Hydrophilidae of Cabo Verde**

Species or subspecies, which were collected by the senior author are underlined.

Taxa which are regarded as endemic to Cabo Verde are marked with an asterisk.

**Gyrinidae:**

*Dineutes aereus* (KLUG, 1934)

*Dineutes subspinosus* KLUG, 1934 – OROMÍ et al. (2005: 82) regarded this species as extinct in Cabo Verde.

**Dytiscidae:**

*Copelatus erichsonii* GUÉRIN-MÉNEVILLE, 1847 – OROMÍ et al. (2005: 82) regarded this species as extinct in Cabo Verde.

*Cybister tripunctatus africanus* (LAPORTE, 1834) – OROMÍ et al. (2005: 82) regarded this taxon as extinct in Cabo Verde.

*Eretes sticticus* (LINNAEUS, 1767)

*Hydaticus leander* (ROSSI, 1790) – OROMÍ et al. (2005: 82) regarded this species as extinct in Cabo Verde.

*Hydroglyphus angularis* (KLUG, 1834) – **first record for Cabo Verde!**

*Hyphydrus maculatus* BABINGTON, 1841 – *Hyphydrus africanus* SHARP, 1882 and *H. crassus* WOLLASTON, 1867, both recorded by OROMÍ et al. (2005: 82) as distinct species, are in fact synonyms of *H. maculatus*.

*Laccophilus taeniolatus* RÉGIMBART, 1889

**Hydrophilidae:**

*Amphiops senegalensis* (CASTELNAU, 1840) – recorded from Cabo Verde by ORCHYMONT (1941: 6), but not listed in OROMÍ et al. (2005)

*Berosus nigriceps* (FABRICIUS, 1801)

*Coelostoma rutarum* ORCHYMONT, 1936

*Enochrus hesperidum* (SHARP, 1870)

*Enochrus wollastoni* (SHARP, 1870) \* – OROMÍ et al. (2005: 83) regarded this species as extinct.

*Helochaeres pallens* (MACLEAY, 1825) – eight specimens from São Vicente, identified by J. Balfour-Browne, are deposited in the Natural History Museum, London (C. Taylor, pers. comm.); these specimens were originally recorded from Cabo Verde under the name *H. dilutus* (ERICHSON, 1843) by WOLLASTON (1867: 43) and under the name “*Helochaeres dilutus* WOLLASTON, 1867” by OROMÍ et al. (2005: 83), who regarded this wide-spread species as extinct in Cabo Verde – **first record for Cabo Verde!**

*Hydrophilus senegalensis* (PERCHERON, 1835) – **first record for Cabo Verde!**

*Laccobius minor* (WOLLASTON, 1867) – OROMÍ et al. (2005: 83) regarded this species as extinct in Cabo Verde, and erroneously regarded it as endemic to Cabo Verde.

*Laccobius revelieri* PERRIS, 1864 – OROMÍ et al. (2005: 83, sub “*revelierei*”) regarded it as extinct in Cabo Verde.

*Laccobius subpictus subpictus* (WOLLASTON, 1867) \* – OROMÍ et al. (2005: 83) regarded this taxon as extinct in Cabo Verde, and erroneously did not regard it as endemic to Cabo Verde.

*Paracymus phalacroides* (WOLLASTON, 1867) – erroneously regarded as endemic to Cabo Verde by OROMÍ et al. (2005: 83).

*Sternolophus solieri* CASTELNAU, 1840

### Doubtful and erroneous records of Hydrophilidae from Cabo Verde:

- Coelostoma rufitarse* (BOHEMAN, 1851) was listed by OROMÍ et al. (2005: 107) in “Anexo I (unconfirmed species)” without referring to a source; this species is mainly distributed in central, eastern and southern Africa.
- Enochrus alluaudi* (RÉGIMBART, 1906) was recorded from Cabo Verde (Boa Vista) by ORCHYMONT (1940: 81) and OROMÍ et al. (2005: 83) without referring to a source. This species is, however, known with certainty only from Kenya (HANSEN 1999: 178).
- Enochrus picinus* (RÉGIMBART, 1903) was listed by OROMÍ et al. (2005: 107) in “Anexo I (unconfirmed species)” without referring to a source; this species is known only from eastern Africa (HANSEN 1999: 186).
- Helochaeres dilutus* (ERICHSON, 1843) was erroneously recorded from Cabo Verde by WOLLASTON (1867: 43) – see above, under *Helochaeres pallens*.
- Laccobius subpictus erlangeri* RÉGIMBART, 1905 was erroneously recorded from Cabo Verde by OROMÍ et al. (2005: 83); this subspecies is known only from eastern Africa and the Arabian Peninsula (HANSEN 1999: 137).
- Regimbartia inflata* (BRULLÉ, 1835) was listed by OROMÍ et al. (2005: 107) in “Anexo I (unconfirmed species)” without referring to a source; this species is known only from eastern Africa (HANSEN 1999: 98).

### Predominantly terrestrial hydrophilids of Cabo Verde:

- Cercyon fimicola* WOLLASTON, 1867 \* – “cattle dung” (WOLLASTON 1867: 49).
- Cercyon putricola* WOLLASTON, 1867 – “beneath decaying vegetable refuse” (WOLLASTON 1867: 49), erroneously regarded as endemic to Cabo Verde by OROMÍ et al. (2005: 83).
- Cryptopleurum suturatum* RÉGIMBART, 1907 – “beneath wet vegetable refuse in damp spots”, “occasionally in the dung of cattle” (WOLLASTON 1867: 50, sub “*Cryptopleurum sulcatum*”).
- Dactylosternum abdominale* (FABRICIUS, 1792) – “beneath putrid vegetable substances” (WOLLASTON 1867: 48).

### Material collected by E. Aistleitner in Cabo Verde (1998–2013)

Most of the specimens are deposited in the collection of the first author (EFMEA) and in the Naturhistorisches Museum Wien (NMW).

### Gyrinidae:

#### *Dineutes aereus*

- Boa Vista:** Ribeira da Bofareira, 100–200 m, 25.XI.2013, several exs. (EFMEA, NMW) – see Figs. 2–3.
- Brava:** Ribeira da Fajã d’Água, 20 m, 28.I.2001, 5 exs. (EFMEA).
- Santiago:** Picos, 15.IX.2001, 20 exs.; São Jorge de Orgãos, 9.XII.2003, concrete pool (tanque), several exs. (EFMEA, NMW); Ribeira Principal, 150 m, 6.IX.2001 and 12.X.2007, several exs. (EFMEA).
- Santo Antão:** Ribeira da Torre, Xoxo, 30 m, 6.I.1999, several exs. (EFMEA) – see Fig. 5; Ribeira Grande, Orgãos, 50–200 m, 5.I.1999, 18 exs. (EFMEA).

Widely distributed in Africa. In Cabo Verde known from six islands (Boa Vista, Brava, Santiago, Santo Antão, São Nicolau, and São Vicente).

#### *Dineutes subspinosus*

- Boa Vista:** Ribeira do Rabil, Rio Grande, ca. 10 m, 6.I.2001, in temporary pool, 5 exs. (EFMEA, NMW).

Widely distributed in Africa. In Cabo Verde known only from Boa Vista and Santiago.

### Dytiscidae:

#### *Cybister tripunctatus africanus*

- Boa Vista:** Ribeira do Rabil, Rio Grande, ca. 10 m, 7.I.2001, in temporary pool, 7 exs. (EFMEA, NMW), 1 ex. (coll. Geisthardt) – see Fig. 4.

Wide-spread in the Afrotropical and Palearctic Regions. In Cabo Verde known only from Boa Vista and São Vicente.

### *Eretes sticticus*

**Boa Vista:** Ribeira do Rabil, Rio Grande, ca. 10 m, 7.I.2001, in temporary pool, 28 exs. (EFMEA, NMW); Sal Rei south, dunes, 3 m, 20.–24.XI.2009, at light, several exs. (EFMEA, NMW); same locality, 13.XI.2012, at light, 2 exs. (EFMEA) – see Fig. 4.

**Fogo:** São Filipe, 50 m, 19.XII.1998, 1 ex. (EFMEA).

**Maio:** Cascabulho, Praia Real, 2 m, 11.XII.2010, at light, 1 ex. (EFMEA).

Wide-spread in the Afrotropical, Palearctic, Nearctic and Neotropical Regions. In Cabo Verde known from eight islands (Boa Vista, Fogo, Maio, Sal, Santiago, Santo Antão, São Nicolau, and São Vicente). First record for Maio.

### *Hydroglyphus angularis*

**Boa Vista:** Ribeira do Rabil, Rio Grande, 20 m, 6.I.2001, in temporary pool, 4 exs. (EFMEA, NMW).

Widely distributed in the Afrotropical and Palearctic Region. In Cabo Verde known only from Boa Vista. First record for Cabo Verde.

### *Hyphydrus maculatus*

**Boa Vista:** Ribeira do Rabil, 10 m, 2.–6.I.2001, ground water pool, numerous specimens (EFMEA, NMW).

Distributed in the Afrotropical and Palearctic Regions. In Cabo Verde known from six islands (Boa Vista, Sal, Santiago, Santo Antão, São Nicolau, and São Vicente).

### *Laccophilus taeniolatus*

**Boa Vista:** Ribeira do Rabil, Rio Grande, 20 m, 6.I.2001, in ground water pool, 1 ex. (EFMEA).

Widely distributed in Africa. In Cabo Verde known only from Boa Vista.

## Hydrophilidae:

### *Berosus nigriceps*

**Boa Vista:** Ribeira do Rabil, Rio Grande, 6.I.2001, 1 ex. (EFMEA) – see Fig. 4.

Very wide-spread in Africa, reaching India in the east. In Cabo Verde known from Boa Vista, Fogo and Santiago.

### *Hydrophilus senegalensis*

**Boa Vista:** Ribeira do Rabil, Rio Grande, 6.I.2001, in muddy sediment of pool – see Fig. 4, a dead specimen without head, pronotum and abdomen (NMW); a live specimen was observed on the same day in a larger temporary pool nearby (in early January 2007 there was no water in this pool, the bottom was covered with grass).

Very wide-spread in Africa, reaching India in the east. In Cabo Verde known only from Boa Vista. First record for Cabo Verde.



Fig. 2: Boa Vista, Ribeira da Bofareira. Eutrophicated ephemeral pool. Habitat of *Dineutes aereus* (photograph by E. Aistleitner, XI.2013).

Fig. 3: Boa Vista, Ribeira da Bofareira. Springfed pool under rock. Habitat of *Dineutes aereus* (photograph by E. Aistleitner, XI.2013).



Fig. 4: Boa Vista, Ribeira do Rabil, Rio Grande. Habitats of *Cybister tripunctatus africanus*, *Eretes sticticus* (Dytiscidae), *Hydrophilus senegalensis*, and *Sternolophus solieri* (Hydrophilidae) (photograph by E. Aistleitner, I.2001).

Fig. 5: Santo Antão, Ribeira da Torre, near Xoxo, perennial stream with residual pools. *Dineutes aereus* may occur in very large numbers (photograph by E. Aistleitner, I.1999).

### *Sternolophus solieri*

**Boa Vista:** Ribeira do Rabil, Rio Grande, 6.I.2001, several exs. (EFMEA, NMW) – see Fig. 4; Sal Rei south, dunes, 22.–24.XI.2009, at light, several exs. (EFMEA).

**Santo Antão:** Ribeira Grande, 2 km west, 2.XII.2000, 1 ex. (EFMEA).

**Brava:** Ribeira d’Fajã Agua, 50 m, 9.XII.2002, 3 ex. (EFMEA, NMW).

Very wide-spread in Africa, reaching India in the east (H. Nasserzadeh, pers. comm.). In Cabo Verde known from six islands (Boa Vista, Brava, Santiago, Santo Antão, São Nicolau, and São Vicente). First record for Brava.

### Conclusions

The water beetle fauna of Cabo Verde is comparatively poor in species. At present, two species of Gyrinidae, seven species of Dytiscidae and 12 species of aquatic Hydrophilidae are known from Cabo Verde. Four hydrophilid species are regarded as terrestrial. Including the four species of Hydraenidae known from Cabo Verde, this archipelago is home to 25 species of water beetles, most of which are very wide-spread, at least on the African continent.

Two taxa of aquatic Hydrophilidae (*Enochrus wollastoni* and *Laccobius subpictus subpictus*) and two species of aquatic Hydraenidae (*Ochthebius balfourbrownnei* JACH, 1989, and *O. hesperides* BALFOUR-BROWNE, 1976) are regarded as endemic to Cabo Verde. Both of these two hydrophilid taxa were regarded as extinct by OROMÍ et al. (2005). They are thus among the few water beetle taxa world-wide, which are considered globally extinct. However, the aquatic habitats of Cabo Verde are still inadequately explored and therefore it is premature to draw final conclusions. For instance, two species, *Dineutes subspinosus* and *Cybister tripunctatus*, both of which were regarded as extinct in Cabo Verde by OROMÍ et al. (2005), were in fact collected by the senior author in 2001.

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### Book Review

**TELNOV, D. (ed.) 2014: Biodiversity, biogeography and nature conservation in Wallacea and New Guinea. Vol. II.** – Riga: Entomological Society of Latvia, 458 pp., 126 pls.

The book is the second contribution to a series on “Biodiversity, biogeography and nature conservation in Wallacea and New Guinea” which started in 2011. Similar to the first volume, it is a collection of scientific articles that are grouped into sections, but the articles (24) and sections (seven) are more numerous and cover more fields of original research than in the first volume.

Starting with a foreword by M. Barclay and a rather emotional editorial by D. Telnov, the book comprises seven sections. The first one, “Dedication to A.R. Wallace”, includes an article by A. Reeuwijk, which focuses on the life and achievements of Wallace and aims at pulling him out of Darwin’s shadow as well as at showing his importance in developing new ideas about biogeography. It is animatedly written, with citations of the scientist’s speeches and articles, and of Wallace’s and Darwin’s letters. It is provided with nice illustrations and, in my opinion, is appealing to a broad auditorium.

More specific data are presented in the following sections. The second section “Biogeography” includes two articles on the biogeography of Southeast Asia (and Wallacea) scorpions and the general biogeography of Luzon Island (Philippines). The third, fourth, fifth, and seventh sections, with one article each, are devoted to bibliography (non-marine molluscs of the Papua Subregion), botany and biogeography (southern Thailand bryophytes), vertebrate zoology and biogeography (*Platymantis* GÜNTHER, 1858, Anura, Amphibia), and faunistics (Geckonidae, Reptilia) respectively.

The sixth section is the largest one: “Invertebrate zoology and biogeography”. It includes 17 articles on Mollusca, Diplopoda, Phasmida, Odonata, Orthoptera, Lepidoptera, and Coleoptera. Within the order Coleoptera, the following five families are treated in seven articles with descriptions of new genera, subgenera, and species, nomenclatural changes, distribution, and biology: Staphylinidae, Dermestidae, Buprestidae, Chrysomelidae, Cerambycidae, and Anthicidae. Almost each of these articles provides keys to species identification. Special attention should be given to a large (90 pages) revision of the genus *Sapintus* CASEY, 1895 (Anthicidae) from the region by D. Telnov. This article involves 31 species (ten of them new) and proposes 13 new combinations, 12 new synonymies, seven lectotype designations, a key to species, data on biology and ecology, and a discussion on the biogeography of the genus.

The book is concluded with an index to scientific names and 126 plates of color photos for 18 articles. Especially rich in color illustrations are the articles on Mollusca, Lepidoptera, Orthoptera, Buprestidae, Cerambycidae, and Anthicidae. Generally, the book is well illustrated, almost every article contains black-and-white drawings, photos, and maps. The book is written in English, with the exception of the article on Cerambycidae by A. Skale & A. Weigel, which is in German.

Talking about shortcomings, it is difficult to find any. However, structure of the sixth section is slightly confusing (one would wish a systematic order of the articles). Furthermore, the description of the Entomological Society of Latvia (p. 60) and an advertisement for a website that provides travel information for Indonesia (p. 134) are not listed in the “Contents”.

I think that this book is nice and useful for all those who are interested in biological research in Wallacea and New Guinea.

H. SHAVERDO

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