

## A review of Ripiphoridae in the Arabian Peninsula (Coleoptera: Tenebrionoidea)

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**Abstract.** Distribution of the Ripiphoridae (Coleoptera: Tenebrionoidea) in the Arabian Peninsula is evaluated. Six species belonging to the genera *Macrosiagon* Hentz, 1830 and *Ripiphorus* Bosc, 1791 are figured and keyed, and the distribution of each species is mapped. Including new and previously published records, the Ripiphoridae are now reported from 19 localities of the Arabian Peninsula and offshore islands. Coordinates for each exact locality are given.

**Key words.** Coleoptera, Tenebrionoidea, Ripiphoridae, Ripiphorinae, *Macrosiagon*, *Ripiphorus*, faunistics, Arabian Peninsula, Palaearctic Region

### Introduction

The Ripiphoridae (Coleoptera: Tenebrionoidea) are a cosmopolitan group of parasitoids, whose biogeography is only poorly understood. Only scarce distributional data are usually available because of their cryptic way of life in larval stages and short-lived adults. The Arabian Peninsula plays an important role in the understanding of their distribution in the Old World, as it is a transitional zone among three main zoogeographical realms: Afrotropical, Oriental and Palaearctic.

The aim of this paper is to provide basis for further studies of the Ripiphoridae in this part of Asia and to make further research easier for those students who are not familiar with these rarely collected beetles. Each species is keyed and figured based on specimens collected in the Arabian Peninsula, with emphasis on colour variability and also on sexual dimorphism where appropriate. Distribution of each species in the Arabian Peninsula is mapped and the coordinates of all traceable localities are provided.

### Material and methods

Photographs of specimens were taken using an Olympus Camedia C-5060 digital camera attached to an Olympus SZX9 binocular microscope. Partially focused images of each specimen were combined using Helicon Focus 3.20.2.Pro software.

Geographical coordinates of localities are added according to ENCARTA (2000) wherever possible. The map of the Arabian Peninsula was downloaded from the On-line Map crea-

Table 1. List of known localities (in alphabetical order) with coordinates and altitude.

|    | Locality                   | Coordinates           | Altitude    |
|----|----------------------------|-----------------------|-------------|
| 1  | Abu Arish (Saudi Arabia)   | circa 16°58'N 42°49'E | –           |
| 2  | Abyan (Yemen)              | circa 13°23'N 46°05'E | 50 m        |
| 3  | Aden (Yemen)               | circa 12°48'N 45°01'E | –           |
| 4  | Bahra (Saudi Arabia)       | circa 21°24'N 39°28'E | –           |
| 5  | Bárim Island (Yemen)       | circa 12°40'N 43°25'E | –           |
| 6  | Dhawran (Yemen)            | 14°40'N 44°13'E       | 1800 m      |
| 7  | Jebel al Fatk (Yemen)      | 16°35'N 52°49'E       | 34 m        |
| 8  | Jebel Jibir (U.A.E.)       | 25°39'N 56°07'E       | 1380 m      |
| 9  | Jebel Jihaf (Yemen)        | circa 13°45'N 44°41'E | 2133 m      |
| 10 | Jebel Qara (Oman)          | circa 17°19'N 54°04'E | 670 m       |
| 11 | Jidda (Saudi Arabia)       | circa 21°32'N 39°10'E | –           |
| 12 | Lahij (Yemen)              | circa 13°03'N 44°52'E | circa 100 m |
| 13 | Marbath – Sadh Road (Oman) | 17°04'N 54°52'E       | 110 m       |
| 14 | New Camp (Bahrain)         | not localized         | [0–135 m]   |
| 15 | Salalah (Oman)             | circa 17°00'N 54°05'E | –           |
| 16 | Wadi Anis (Yemen)          | 15°00'N 44°09'E       | 1522 m      |
| 17 | Wadi Ashawq (Oman)         | 16°53'N 53°46'E       | 30–40 m     |
| 18 | Wadi Safad (U.A.E.)        | 25°13'N 56°18'E       | 125–170 m   |
| 19 | Wadi Wurayah (U.A.E.)      | 25°23'N 56°16'E       | 210 m       |

tion application at <http://www.aquarius.geomar.de/omc>. Enlarged pictogram(s) in the maps represent country records without precise data. Only references containing records from the Arabian Peninsula are given for each species.

Label data are cited as follows: different lines on one label are separated by a single slash (/), different labels are separated by a double slash (//) and comments appear in square brackets.

The following codens identify the collections housing the specimens:

JBCP Jan Batelka collection, Praha, Czech Republic;

BMNH The Natural History Museum, London, United Kingdom (Maxwell V. L. Barclay);

MSNTC Museo di Storia Naturale e del Territorio, Calci, Italy (Marco Dellacasa).

## Results

### Tribe Macrosiagonini

### Genus *Macrosiagon* Hentz, 1830

#### *Macrosiagon bipunctata* (Fabricius, 1801)

(Figs. 10, 18)

**Published record.** BATELKA (2007: 241): ‘Yemen, Dhawran, 1 ♀, 29.x.2005’.

**New records. YEMEN:** 1 ♀ (BMNH), ‘W. Aden Prot. / Jebel Jihaf / ca. 7.000 ft. / 7–12.x.1937. // B.M. Exp. to / S. W. Arabia / H. Scott & / E. B. Britton. / B.M. 1938-246. [p]’; 1 ♀ (BMNH), ‘Lakej / 95 – 69 [p]’; 1 ♂, 3 ♀♀ (BMNH), ‘Millin / gen // Arabia / Yemen [p] // Frey Coll. / 1905. 100 [p]’.

**Distribution.** Afrotropical Region, Indian subcontinent, **Yemen**.

***Macrosiagon elegans* (Marseul, 1876)**

(Figs. 1–9, 18)

**Published records.** MARSEUL (1876: 27) (as *Rhipiphorus elegans*): ‘Arabie, Djeddah, TYPE’. BATELKA (2007: 242): ‘S. Arabia, Jidda, 1 ♀, LECTOTYPE’.

**New records.** ‘ARABIA’: 1 ♀ (BMNH), ‘Arabia [hw] // F. Bates / 81 – 19 [p, form A, det. K.G. Blair]’. SAUDI ARABIA: 1 ♂ 1 ♀ (BMNH), ‘Arabia: / Hejaz, / Jidda. [p] / 4.xii. [hw] 1926. / H. St. J. B. Philby. [p] // Brit. Mus. / 1927 – 30. [p, form B + C, det. K.G. Blair]’. YEMEN: 1 ♀ (BMNH), ‘4049 // Millin / gen // Arabia / Yemen [hw] // Fry Coll. / 1905. 100 [p] // Rhipiphorus / elegans Mars [hw] / det. K.G.B. [p, form A, det. K.G. Blair]’; 1 ♀ (BMNH), ‘4048 // Millin / gen // Arabia / Yemen [hw] // Fry Coll. / 1905. 100 [p] // form / B [hw, det. K.G. Blair]’.

**Variability.** Two female forms could be distinguished in the available specimens. Form A (Figs. 5–8) sensu K. G. Blair (see New records) is represented by typically coloured females with a completely orange body except of the black metepimeron and two black spots on each elytron, one isolated in the middle and one small at the apex. Female form B (Figs. 1–4) is light red with black middle and hind legs and a black mesepisternum, metepimeron, mesepimeron, metepisternum and metaventrite. The elytra are orange with a black basal band, isolated central spot and black apical spot. The length of metatarsomeres is also different: form A has the 2<sup>nd</sup> metatarsomere short and robust (but not flattened from above as in *M. bipunctata*) and shorter than the 3<sup>rd</sup> (Figs. 6–7). Form B has the 2<sup>nd</sup> metatarsomere long and slender and almost as long as the 3<sup>rd</sup> (Figs. 2–3). Moreover, the species is quite variable in the shape of the elevated process at the apex of pronotum: in form A it is quite distinct and long (Fig. 8), while in form B it is reduced with a small cavity (Fig. 4). Both forms are 6–10 mm long and overlap in their range of distribution. I assume that the morphological and colour differences between both forms are related to their development (possibly different hosts?) and have no taxonomic value. Form C (Fig. 9) is a 4 mm long male, which is completely black with light yellow, basally and apically black elytra (sexual dichroism) and fuscous antennae and tarsal segments; the elevated process at the apex of pronotum is reduced with a small cavity.

**Biogeography.** *Macrosiagon elegans* belongs to the rather speciose *M. ‘bifasciata’* species group (BATELKA 2008b), to which also belongs *M. fortieri* (Chobaut, 1893) described from Egypt. *Macrosiagon elegans* seems to be more closely related to *M. bifasciata* (an Eastern Palearctic and Oriental species) or to *M. meridionalis* (Costa, 1859) (a Mediterranean species) than to *M. bipunctata* (with which it occurs sympatrically in Yemen) or to *M. fortieri*. However, these affinities cannot be proved without a comparison of molecular data of all related species.

**Distribution.** Eritrea, Saudi Arabia, Yemen (new country record).

***Macrosiagon ferruginea* (Fabricius, 1775)**

(Figs. 11, 18)

**Published record.** BATELKA (2008a: 254): ‘U.A.E., Rus al-Jibal Mts., Jebel Jibir, 1 ♀, 27.iii.2007’.

**New records.** OMAN: 1 ♀ (JBCP), ‘Wadi Ashawq / 16°53’83N 53°46’31E / m 40 – 23.09.2001 / su Aerva javanica // Oman / Dhofar region / Dellacasa leg. // Museo di Storia / Naturale e del / Territorio / Università di Pisa / Calci (Pisa) – Italy [p]; 2 ♀♀ (MSNTC), ‘Oman 2002 – Dhofar / Wadi Ashawq / 16°53’9N–53°46’3E / 12. IX. mt 30 / leg. F. Strumia // Museo di Storia / Naturale e del / Territorio / Università di Pisa / Calci (Pisa) – Italy [p]; 1 ♀ (MSNTC), ‘Al Mughsayl dint. / 16°53’83N / 53°46’31E [according to given coordinates it is identical with the previous locality] / 40 m / 06.09.2002 // Oman / Dhofar region / Leg. Dellacasa M. // Museo di Storia / Naturale e del / Territorio / Università di Pisa / Calci (Pisa) – Italy [p] // *Macrosiagon* / cf. *ferrugineum* (F.) [hw] / det. R. Poggi [p], 2002 [hw]. YEMEN: 3 ♀♀ (BMNH), ‘Lakej / 95 – 69 [p]’; 1 ♀ (BMNH), ‘Aden [hw] / 86.24 [p]’;

1 specimen (BMNH), 'Aden / 84.29 [hw] // Mordella / ferruginea / Fab [hw] // Macrosiagon [p] / signaticolle / Pic [hw] / det. ZHFalin '96 [p]'.

**Note.** BEDEL (1895: 191, footnote) reported two specimens of this species allegedly collected in April 1895 by Dr. Ch. Martin in 'El-Hadj (Arabie)'. However, I failed to find any place with such a name in the Arabian Peninsula. The locality might belong to some country in the North Africa, where several places of the same name exist (ENCARTA 2000). This record was probably repeated by CSIKI (1913) as 'Arabia' and I have therefore decided to exclude both references from the list of known localities.

**Distribution.** South Europe, Africa, Asia, **Oman** (new country record), **United Arab Emirates**, **Yemen** (new country record).

### *Macrosiagon oberthurii* (Fairmaire, 1879)

(Figs. 12, 18)

**Published records.** FAIRMAIRE (1887: 303) (as *Rhipiphorus melanurus* Fairmaire, 1887): 'Arabia, HOLOTYPE, sex unknown'. BATELKA (2007: 243): 'Arabia'.

**New record. BAHRAIN:** 1 ♀ (BMNH), 'Persian Gulf: / Bahrain Island / New Camp [p] / 31.vi.1936 [hw] / J. Fernandez. / B.M. 1936-378 [p] // [?illegible] New Camp / 31.3.36 / Island / Bahrain [hw, original locality label; i.e., the correct date of collection is probably March, not June] // Macrosiagon [p] / tricuspidatum (Lep.) [hw] / det. ZHFalin '96 [p]'.

**Distribution.** Algeria, Tunisia, 'Arabia', **Bahrain** (new country record).

### *Macrosiagon terminata* (Laporte, 1840)

(Figs. 13–14, 17–18)

**Published records.** BATELKA (2007: 246): 'Yemen, Lahij, 3 ♀♀'; 'Yemen, Bárím Island, 2 ♀♀'; 'Yemen, Abyan, 3 ♀♀, 20.v.1967'; 'Yemen, Aden, 2 ♀♀'. BATELKA (2008a: 254): 'U.A.E., Wadi Safad, 1 ex., 28.iii.2007'; 'U.A.E., Wadi Wurayah, 4 ♂♂ 4 ♀♀, 25.iii.2007'.

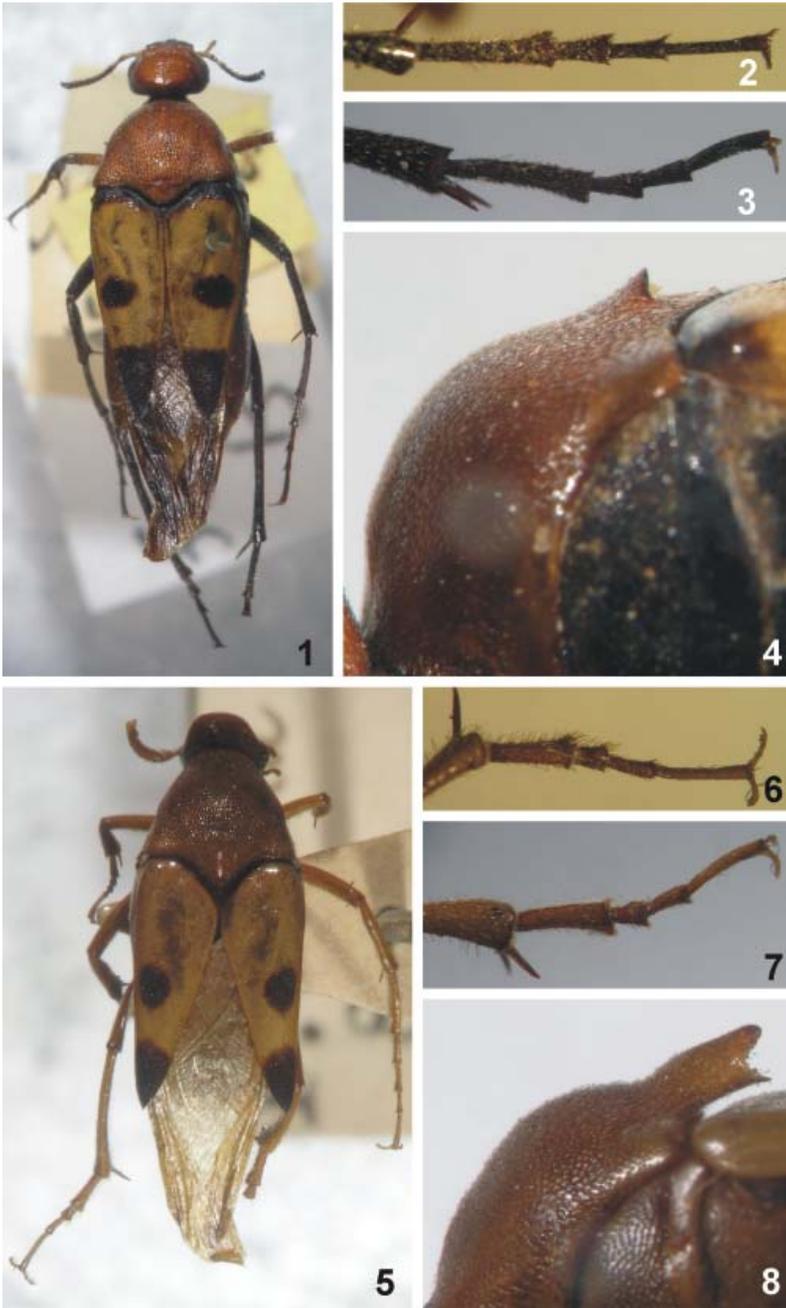
**Note.** The record from Saudi Arabia (BATELKA 2007) in fact refers to Yemen. The specimens labelled 'S. Arabia / Abyan. / 50 m. / 20.v.1967' by K. M. Guichard (BMNH) were collected in the Abyan Governorate of South Yemen, most probably on the shore of the Gulf of Aden. Some hymenopteran records (Aculeata) have been published by various authors (e.g., PATINY 2002: 43, DALY 1983: 504) based on the material from the same expedition (May 1967) and collected by the same collector in Lodar (Lawdar 13°53'N, 45°53'E), which is situated in the Abyan Governorate. However, because of the confusing labels by Guichard, locality data from this expedition have been misinterpreted elsewhere (e.g., BOLOGNA & TURCO 2007: 25). *Macrosiagon terminata* has not been collected in Saudi Arabia yet.

**Distribution.** Africa, Indian subcontinent, **United Arab Emirates**, **Yemen**.

Tribe Ripiphorini

### Genus *Ripiphorus* Bosc, 1791

This genus is represented in the Arabian Peninsula by three (as far as known endemic) species: *R. arabiaefelix* Batelka, 2009 and two undescribed species recorded from Yemen (Aden; Lahij) and Saudi Arabia (Abu Arish; Bahra), respectively (BATELKA 2009). The number of



Figs. 1–8. *Macrosiagon elegans* (Marseul, 1876). 1–4 – female form ‘B’ from Yemen; 5–8 – female form ‘A’ from ‘Arabia’. Not to scale.



Figs. 9–14. Arabian *Macrosgiagon*. 9 – *M. elegans* (Marseul, 1876), male; 10 – *M. bipunctata* (Fabricius, 1801), female from Dhawran; 11 – *M. ferruginea* (Fabricius, 1775), female from Jebel Jibir; 12 – *M. oberthurii* (Fairmaire, 1879), female from Bahrain; 13–14 – *M. terminata* (Laporte, 1840), females, two colour forms from Wadi Wurayah. Not to scale.



Figs. 15–16. *Rhipiphorus arabiaefelix* Batelka, 2009; paratypes from Lahij. 15 – male; 16 – female. Not to scale.

available specimens of the latter two species does not allow me to understand their range of variability, and they should remain undescribed until more specimens will be available. Both undescribed taxa have been therefore excluded from the present study.

### *Rhipiphorus arabiaefelix* Batelka, 2009

(Figs. 15–16, 18)

**Published records.** BATELKA (2009: 156): ‘Yemen, Aden, 1 ♂, HOLOTYPE’; ‘Yemen, Lahij, 2 ♂♂ 5 ♀♀’; ‘Yemen, Lahij, 1 ♂ 1 ♀, iv.1999’; ‘Yemen, Wadi Anis, 3 ♀♀, 7.x.2005’; ‘Yemen, Jabal al Fatk, 1 ♀, 16.x.2005’; ‘Oman, Dhofar, Salalah, 1 ♂ 2 ♀♀, 21.ix.1977’; ‘Oman, Dhofar, Qara Hills, 1 ♀, 22.ix.1977’; all PARATYPES.

**New record. OMAN:** 1 ♀ (MSNTC), ‘OMAN 2002 – Dhofar / Road Marbat - Sadh / 17°04’.02N 54°52’.49E / 10.IX – mt. 110 / leg. F. Strumia // Museo di Storia / Naturale e del / Territorio / Universita di Pisa / Calci (Pisa) – Italy [printed]’.

**Distribution.** Oman, Yemen.

### Key to Rhipiphoridae in the Arabian Peninsula

1. Elytra extremely abbreviated, much shorter than abdomen, scale-like, rounded at apex. .... *Rhipiphorus arabiaefelix* Batelka, 2009\*
- Elytra at least as long as abdomen, triangular, acute at apex. Genus *Macrosiagon* Hentz, 1830 ..... 2
2. Median lobe of pronotum without a short elevated process at apex, elytra unicolour without black markings or spots. .... *M. ferruginea* (Fabricius, 1775)

\* Only one described species of the genus occurs in the Arabian Peninsula; see comments under *Rhipiphorus* concerning other two undescribed species.

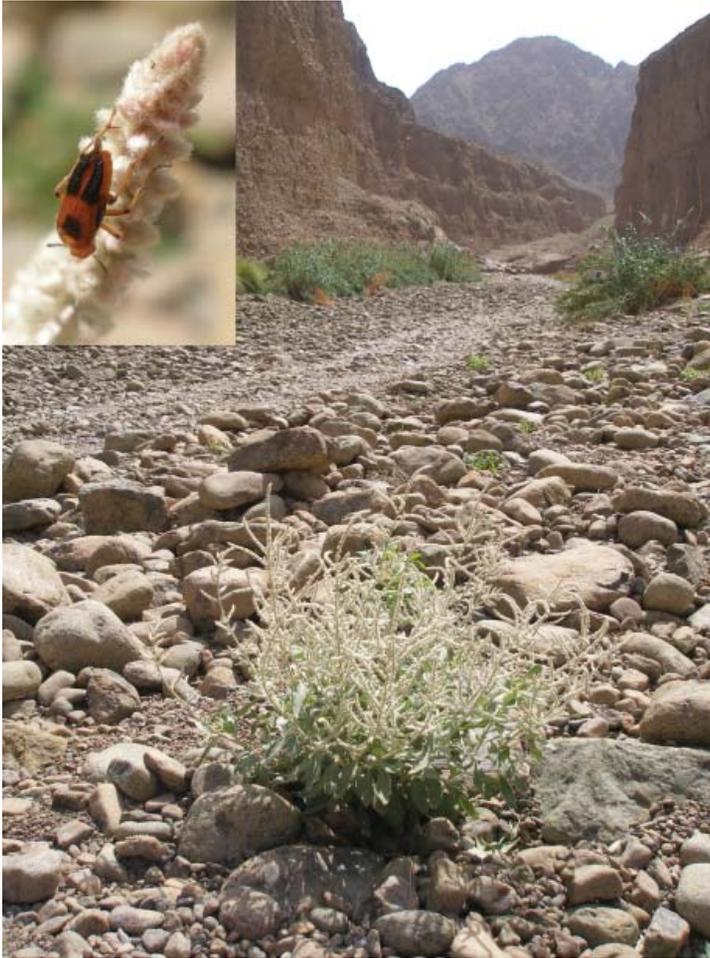


Fig. 17. Flowering bush *Aerva javanica* in Wadi Wurayah with *Macrosiagon terminata* (Laporte, 1840) (inset).

- Median lobe of pronotum with a short elevated process at apex, elytra yellow or orange with black markings or spots. .... 3
- 3. Elytra slightly convex, without longitudinal depression. .... 4
- Elytra flat, with weak longitudinal depression in the middle. .... 5
- 4. Elytra shortened, 1.6× as long as pronotum, almost rounded apically, wings hyaline, sometimes with smoked tips. .... *M. oberthurii* (Fairmaire, 1879)
- Elytra long, 1.8× as long as pronotum, acute apically, wings smoked. ....  
..... *M. terminata* (Laporte, 1840)
- 5. 2<sup>nd</sup> metatarsomere shorter than 3<sup>rd</sup>, flattened from above. ....  
..... *M. bipunctata* (Fabricius, 1801)
- 2<sup>nd</sup> metatarsomere similar in length to 3<sup>rd</sup>, cylindrical. .... *M. elegans* (Marseul, 1876)



Fig. 18. Distribution of the Ripiphoridae in the Arabian Peninsula.

## Conclusion

From the six known subfamilies, only the Ripiphorinae are represented in the area by the genera *Macrosiagon* and *Ripiphorus*. The first ripiphorid from the Arabian Peninsula was described by Marseul as early as in 1876 (*Macrosiagon elegans*, type locality ‘Djeddah’: MARSEUL (1876)), but this place has remained the only known exact locality in the Arabian Peninsula for the next 130 years. In the past few years I had opportunity to examine relevant types and some additional material from the region, resulting in 12 new country-records, 5 new species-records for the Arabian Peninsula (including two possibly undescribed species of *Ripiphorus*) and one species new to science (BATELKA 2007, 2008a, 2009, present study). Distributional affinities of the Arabian ripiphorids have been discussed in detail in BATELKA (2009). However, the ripiphorids in the Arabian Peninsula are still badly unexplored if we take into consideration how large is this area and how rich in different types of habitats it is.

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