

## Taxonomic changes in Eastern Mediterranean *Malachius* (Coleoptera: Malachiidae)

Vladimír ŠVIHLA & Jiří HÁJEK

Department of Entomology, National Museum, Kunratice 1, CZ-148 00 Praha 4, Czech Republic;  
e-mail: vladimir\_svihla@nm.cz; jiri\_hajek@nm.cz

**Abstract.** *Clanoptilus* (*Hypoptilus*) *erythropterus* (Erichson, 1840) comb. nov. is transferred from the genus *Malachius* Fabricius, 1775. *Malachius carnifex* Erichson, 1840 syn. nov. is regarded as a junior subjective synonym of *M. rubidus* Erichson, 1840. *Malachius stolatus* stat. restit. is established as a valid name for *M. carnifex* auctorum, nec ERICHSON (1840), and *M. bilyi* Švihla, 1987 syn. nov. is regarded as its junior subjective synonym. *Malachius suturalis* Motschulsky, 1854 stat. restit. is removed from synonymy of *M. carnifex* and regarded as a valid species. Lectotypes are designated for *M. carnifex*, *M. erythropterus* and *M. rubidus*. New distributional data are presented for *C. erythropterus* (Iran, Turkey), *M. rubidus* (Montenegro, Serbia) and *M. stolatus* (Libya).

**Key words.** Coleoptera, Malachiidae, *Clanoptilus*, *Malachius*, taxonomy, new synonyms, new combination, Palaearctic Region

### Introduction

The Malachiidae represent a large group in the superfamily Cleroidea. The family numbers over 1,400 taxa of species rank in the Palaearctic Region (cf. MAYOR 2007). The first large study on the family Malachiidae was published by ERICHSON (1840). The following revisions by PEYRON (1877) and ABEILLE DE PERRIN (1891) summarized the knowledge published at that time, increased the number of known species and added data on their distribution. However, all three authors retained the original wide concept of the genus *Malachius* Fabricius, 1775. This state, inconsistent with modern taxonomy, remained valid until EVERS (1985) revalidated some already described genera, created some new genus-group taxa, established new species synonymies, and published keys to the species for genera originally classified in *Malachius* sensu lato. Unfortunately, his concepts of the generic classification are doubtful as some genus-group taxa were based on characters that are transitional or occur in multiple genera (e.g. *Cordylepherus* Evers, 1985, *Hypoptilus* Mulsant & Rey, 1867 and *Haplomalachius* Evers, 1985).

In addition, the species concepts by EVERS (1985) are mostly not based on the examination of the types or on original descriptions. Therefore, most genera of former *Malachius* sensu lato badly need a revision as shown also in this paper.

The aim of this paper is to correct wrong classification of selected Eastern Mediterranean Malachiidae. The generic rearrangement of *M. erythropterus* is supplemented with new synonyms in the genus *Malachius*, based mostly on our study of relevant type material. The present work originated as a result of cataloguing the type material of Coleoptera deposited in the collections of the National Museum in Prague. The impulse for the writing was the finding of two syntypes of *Malachius erythropterus* Erichson, 1840 in the collection of Otakar Nickerl senior (1838–1920), an important Czech entomologist. The specimens were collected by another Czech entomologist, physician Jan Vilém Helfer (1810–1840) during his boat travel on the river Euphrates in the spring of 1836.

## Material and methods

The photographs of all specimens were taken by an Olympus Camedia C-5050 ZOOM digital camera attached to an Olympus SZX12 binocular microscope using AnalySIS docu software for image integration. Exact label data are cited for the type material. A forward slash (/) separates different lines and a double slash (//) different labels of data. Additional remarks are found in square brackets.

The specimens included in this study are deposited in the following institutional collections:

- NMPC Národní muzeum, Praha, Czech Republic (Vladimír Švihla);  
 ZMHB Museum für Naturkunde, Humboldt-Universität, Berlin, Germany (Manfred Uhlig);  
 ZMUM Zoological Museum, Moscow Lomonosov State University, Moscow, Russia (Nicolai B. Nikitsky).

## Taxonomy

### *Clanoptilus (Hypoptilus) erythropterus* (Erichson, 1840) comb. nov.

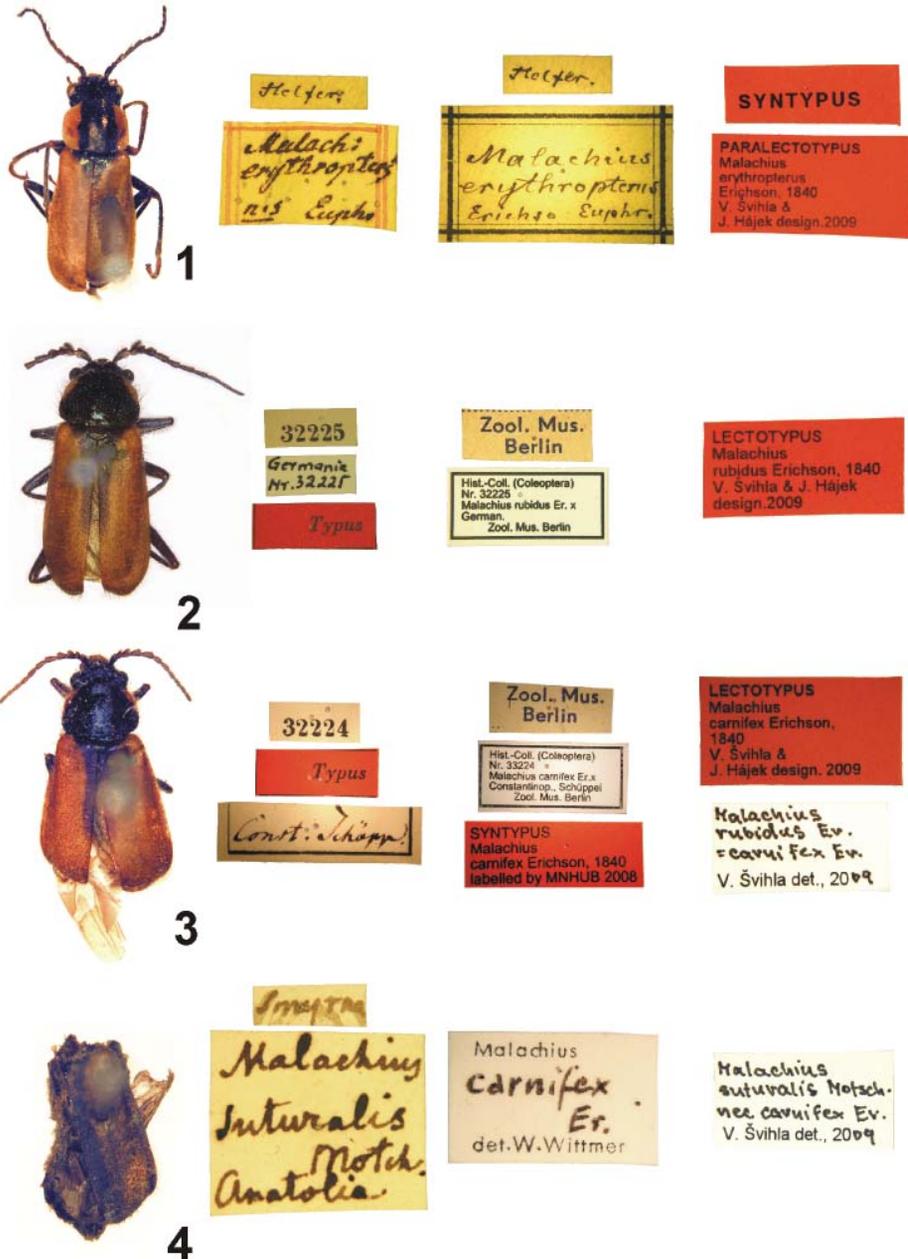
*Malachius erythropterus* Erichson, 1840: 68.

**Type locality.** ‘Mesopotamien’ [= probably recent Iraq].

**Type material.** LECTOTYPE: ♀ (ZMHB) by present designation, labelled: ‘32221 [white label, handwritten] // Paratypus [sic!, red label, printed] // Hist.-Coll. (Coleoptera) / Nr. 33221 / Malachius erythropterus / Er.x / Mesopotam., Helfer / Zool. Mus. Berlin [white, black-bordered label, printed] // SYNTYPUS / Malachius erythropterus / Erichson, 1840 / labelled by MNHUB 2008’. PARALECTOTYPES: 3 ♀♀, same label data as lectotype (ZMHB); 1 ♀, ‘Helfer. [yellow label, handwritten] // Malachius / erythropterus / Erichs. Euphr. [yellow, black-bordered label, handwritten] // SYNTYPUS [red label, printed]’ (NMPC, ex coll. Nickerl); 1 ♀, ‘Helfer. [yellow label, handwritten] // Malach: / erythropterus / n\_s Euphr [yellow, red-bordered label, Nickerl’s handwriting] // SYNTYPUS [red label, printed]’ (NMPC, coll. Nickerl).

**Specimens excluded from the type material.** 3 ♂♂, same label data as lectotype. One specimen with additional label ‘erythropterus Er., Mesopot. Helf. [grey label, not Erichson’s handwriting]’ (all ZMHB).

**Additional material examined.** IRAN: KHUZESTAN: Shūstār, loc. no. 287, 13.iv.1977, 1 spec.; Ahwāz, loc. no. 289, 14.–15.iv.1977, 12 spec.; 40 km N Ahwāz, loc. no. 191, 15.–16.iv.1977, 4 spec.; 34 km SE Omīdīyeh, loc. no. 292, 16.–17.iv.1977, 1 spec., all Exped. Nat. Mus. Praha. IRAQ: Baghdād, Káalová lgt., 91 spec. TURKEY: ADYAMAN: Nemrut Dağı, 8.vi.1992, Kondler lgt., 1 spec. ŞANLIURFA: Halfeti, 21.v.1993, V. Švihla lgt., 2 spec. (all NMPC).



Figs. 1–4. Type specimens of *Malachius*, their locality and identification labels. 1 – *Malachius erythropterus* Erichson, 1840; 2 – *M. rubidus* Erichson, 1840; 3 – *M. carnifex* Erichson, 1840; 4 – *M. suturalis* Motschulsky, 1854. Not to scale.

**Notes on the type material.** The original description of *Malachius erythropterus* is based only on a female, although Erichson himself mentioned also one male with missing antennae that could also belong to the same species. The number of syntypes was not given in the original description. The original series from ZMHB was labelled subsequently and consists of three males and three females (two males are comparatively well preserved including almost complete antennae but the third one is strongly damaged with the head, prothorax and four legs missing). Two additional females are deposited in NMPC. Although the males mentioned above most probably came from the same lot of Helfer's specimens, we remove them from the type material in accordance with the original description. Because of the relevant taxonomic works do not allow for an unambiguous identification of specimens, we designate a lectotype to fix the identity of this species.

**Comments on classification.** The erroneous concept of *Malachius erythropterus* originated from PEYRON (1877) and was followed by ABEILLE DE PERRIN (1891) and EVERS (1985), although the former two authors expressed some doubts. The examination of the type material and other specimens belonging to the original series revealed that this species possesses an apical elytral depression and lacks any frontal secretoric structures in male, and therefore belongs to the genus *Clanoptilus* Motschulsky, 1854, subgenus *Hypoptilus* (sensu EVERS 1985), and is related to *Clanoptilus dlabolai* (Wittmer, 1979) (Iran) and *Clanoptilus assimilis* (Baudi di Selve, 1871) (Eastern Mediterranean) characterized by a shallow apical elytral depression without any thorn-shaped structure. It is possible that *Clanoptilus hajazensis* (Pic, 1929) (Saudi Arabia) is identical with *C. erythropterus*, but the type material of *C. hajazensis* was not at the disposal for an examination.

*Malachius erythropterus*, sensu PEYRON (1877) and following authors, in fact most probably represents a formally undescribed species of *Malachius*.

**Distribution.** South-western Iran, Iraq, north-eastern Turkey. Occurrence in Syria (BAUDI DI SELVE 1871) needs to be verified. **New species for Iran and Turkey.**

### *Malachius rubidus* Erichson, 1840

*Malachius rubidus* Erichson, 1840: 70. Type localities: Berlin, Oesterreich [= Austria], Ungarn [= Hungary].

*Malachius carnifex* Erichson, 1840: 69, **syn. nov.** Type locality: 'Umgegend von Constantinopel' [= environs of Istanbul].

*Malachius fallax* Strübing, 1854: 198 (synonymised by ABEILLE DE PERRIN 1891). Type locality: Posen [= Germany, Thüringen, Posen].

*Malachius rubidus* var. *mazarakii* Baeckman, 1903: 92 (synonymised by MAYOR 2007). Type locality: 'St. Petersburger Gouvernement' [= Russia, Sankt Petersburg region].

*Malachius rubidus* var. *sublateralis* Pic, 1912: 89 (synonymised by MAYOR 2007). Type locality: 'Autriche, environs de Wien' [= Austria, environs of Wien].

*Malachius rubidus* var. *valesiacus* Pic, 1929: 1 (synonymised by MAYOR 2007). Type locality: 'Sierre, dans le Valais' [= Switzerland, Valais, Sierre].

**Type material.** *Malachius rubidus*: LECTOTYPE: ♂ (ZMHB) by present designation, labelled: '32225 [white label, printed] // Typus [red label, printed] // Germania / Nr. 32225 [white label, handwritten] // Zool. Mus. / Berlin [white label, printed] // Hist.-Coll. (Coleoptera) / Nr. 32225 / Malachius rubidus Er. x / German. / Zool. Mus. Berlin [white, black-bordered label, printed]'. PARALECTOTYPES: 6 ♀♀, '32225 [white label, printed] // Typus [red label, printed] // Germania / Nr. 32225 [white label, handwritten] // Zool. Mus. / Berlin [white label, printed] // Hist.-Coll. (Coleoptera) / Nr. 32224 / Malachius rubidus Er. x / German. / Zool. Mus. Berlin [white, black-bordered label, printed]' (ZMHB).

*Malachius carnifex*: LECTOTYPE: ♀ (ZMHB) by present designation, labelled: '32224 [white label, printed] // Typus [red label, printed] // Const.[antinopol] Schüpp.[el] [white label, handwritten] // Zool. Mus. / Berlin [white label, printed] // Hist.-Coll. (Coleoptera) / Nr. 33224 / Malachius carnifex Er. x / Constantinop., Schüppel / Zool. Mus. Berlin [white, black-bordered label, printed] // SYNTYPUS / Malachius / carnifex Erichson, 1840 / labelled by MNHUB 2008 [red label, printed]'. PARALECTOTYPE: 1 ♀, 'Constantinopol / Schüpp.[el] / Nr. 32224 [white label, handwritten] // Typus [red label, printed] // Hist.-Coll. (Coleoptera) / Nr. 33224 / Malachius carnifex Er.x, Constantinop., Schüppel / Zool. Mus. Berlin [white, black-bordered label, printed] // SYNTYPUS / Malachius / carnifex Erichson, 1840 / labelled by MNHUB 2008 [red label, printed]' (ZMHB). The number of syntypes is unknown. As available taxonomic works misinterpreted *M. rubidus* and *M. carnifex* and do not allow their unambiguous identification, we designate lectotypes of both species to fix their identity.

**Additional material examined.** SERBIA: Tara National Park, 17.-23.v.2006, L. Purchart lgt., 1 ♂; 6.vii.1958, J. Mařan & L. Hoberlandt lgt., 1 ♀. MONTENEGRO: Źabljak – Podgorica, 1300 m a.s.l., 30.vi.1958, J. Mařan & L. Hoberlandt lgt., 2 ♀♀. Further specimens from France, Germany, Czech Republic, Austria, Macedonia and Greece (all NMPC).

**Comments on classification.** *Malachius rubidus* is a widespread species occurring in central and southern Europe. Type specimens of *M. carnifex* do not differ from female type specimens of *M. rubidus*, as well as from other specimens at our disposal, in any essential characters (e.g. dark brown epimera of mesothorax and dark frons and labrum) and there is no doubt about their synonymy. For the sake of stability of nomenclature, we prefer to preserve the name *M. rubidus*, many times used in the literature on Central European fauna, instead of *M. carnifex*. Moreover, the concept of *M. carnifex* of later authors is different and would be misleading (see below).

**Distribution.** Central and south-eastern Europe: Albania, Bosnia-Herzegovina, Bulgaria, Czech Republic, France, Germany, Greece, Hungary, Italy, Lithuania, Macedonia, Poland, Slovakia, Switzerland. MAYOR (2007) reports it also from the Asian part of Turkey and Syria, but we are not aware of any specimens from either country. **New species for Serbia and Montenegro.**

### *Malachius stolatus* Mulsant & Godart, 1855 stat. restit.

*Malachius stolatus* Mulsant & Godart, 1855: 168. Type locality: Crimea [Ukraine].

*Malachius suturellus* Kiesenwetter, 1859: 31 (synonymised by PEYRON 1877). Type locality: Crete [Greece].

*Malachius fallaciosus* Baudi di Selve, 1871: 64 (synonymised by MAYOR 2007). Type locality: Cyprus.

*Malachius carnifex* var. *latenotatus* Pic, 1914: 33 (synonymised by MAYOR 2007). Type locality: 'Turquie d'Asie' [= Asian part of Turkey].

*Malachius carnifex* var. *naxosensis* Pic, 1923: 2 (synonymised by MAYOR 2007). Type locality: Naxos [Greece].

*Malachius bilyi* Švihla, 1987: 282, **syn. nov.** Type locality: Greece, Crete, Lefka Ori Mts., Omalos.

**Type material examined.** *Malachius bilyi*: HOLOTYPE: ♂, labelled: 'Crete, Lefka Ora, Omalos, 26.v.–1.vi.[19]80, Bílý, Brodský leg. [white label, printed] // HOLOTYPUS, Malachius bilyi sp. n., VI. Švihla det. 1987 [red label, printed and handwritten]'. PARATYPES: 2 ♂♂, same locality data as holotype, 'PARATYPUS, Malachius bilyi sp. n., VI. Švihla det. 1987 [red label, printed and handwritten]'; 1 ♂, 'Crete, Lefka Ori Mts., Omalos, 3.vi.1981, Bílý leg. [white label, printed] // PARATYPUS, Malachius bilyi sp. n., VI. Švihla det. 1987 [red label, printed and handwritten]' (all NMPC).

**Additional material examined.** ITALY: BASILICATA: Valsinni, Sinni riv., 18.iv.1990, I. Kováf lgt., 1 ♂. LIBYA: Al Jabal al Akhdar, Shabat, steppe, 25.iv.1990, K. Hürka lgt., 1 ♂. GREECE: CENTRAL MACEDONIA: Mt. Athos, 1 ♂; ATTICA: 1 ♂; CRETE: Lefka Ori Mts., Omalos, vi. 1926, 1 ♀; same data, but 27.v.–1.vi.1980, S. Bílý & O. Brodský lgt., 3 ♀♀; same data, but v.1981, J. Kratochvíl lgt., 3 ♀♀; same data, but 3.vi.1981, S. Bílý lgt., 8 ♀♀; same data, but 22.–30.v.1990, I. Jeniš lgt., 1 ♂ 1 ♀; same data, but 17.–19.v.2003, E. Jendek lgt., 13 ♂♂ 13 ♀♀; Mirtos, iv.1994, I. Jeniš lgt., 1 ♂. TURKEY: İSTANBUL: İstanbul env., 1 ♀; Kadıköy, 2 ♂♂ 1 ♀. BURSA: Bursa, A. Hoffer

lgt., 4 ♂♂ 3 ♀♀. **HATAY:** Samandaği, Asi Nehri riv. valley, 24.iv.1992, Z. Malinka lgt., 1 ♂. **CYPRUS:** Athienou env., 22.iii.1994, Preiss lgt., 1 ♂ 1 ♀ (all NMPC).

**Comments on classification.** The synonymy of *Malachius carnifex* established above leads to a rather complicated nomenclatorial case (see also MAYOR 2007):

After placing the 'true' *M. carnifex* in a synonymy with *M. rubidus*, the oldest available name for *M. carnifex* sensu PEYRON (1877), ABEILLE DE PERRIN (1891), KRAUSS (1902) and EVERS (1985) is *Malachius suturalis* Motschulsky, 1854. However, we studied one syntype of the latter species and it does not agree with the subsequent interpretation of *M. carnifex* of the four authors mentioned above. Therefore we remove *M. suturalis* from the synonymy (see below).

The oldest available name then becomes *Malachius stolatus* Mulsant & Godart, 1855. This species, synonymised with *M. carnifex* by PEYRON (1877), was described from a single male from Crimea. Unfortunately, we were neither able to trace the type nor have any other specimens from Crimea at our disposal (apparently the type material of Mulsant was passed to his son and then got destroyed). Nevertheless, we consider *M. stolatus* as a valid name for the former *M. carnifex* sensu auctorum although we are aware that the identity of *M. stolatus* based only on the original description is doubtful: one character agrees with the concept of *M. carnifex* (head before eyes yellow) and another one with *M. rubidus* (venter of body entirely metallic).

*Malachius suturellus* Kiesenwetter, 1859 was synonymised with *M. carnifex* by PEYRON (1877). Although the type material of *M. suturellus* was destroyed (M. BAEHR, pers. comm.), the original description agrees well with specimens from Crete at our disposal as well as the type material of *M. bilyi* Švihla, 1987 and no other species of *Malachius* are known from Crete. We therefore consider *M. bilyi* as a junior subjective synonym of *M. stolatus*.

Moreover, the concept of *M. carnifex* by PEYRON (1877), ABEILLE DE PERRIN (1891), KRAUSS (1902) and EVERS (1985) agrees with *M. stolatus* only for males. The female was described separately as *Malachius fallaciosus* Baudi di Selve, 1871 and synonymised subsequently with *Malachius graecus* Kraatz, 1862 by PEYRON (1877). PARDO ALCAIDE (1975) was the first to recognise the sexual dichroism of *M. carnifex*, removed *M. fallaciosus* from the synonymy with *M. graecus* and classified it as the female variety of *M. carnifex*. He also mentioned that he did not examine any females with the elytra coloured as in the male (only sutural portion metallic blue or green), which is in good accordance with female specimens collected together with males that are at our disposal.

MAYOR (2007) listed two additional synonyms: *M. carnifex* var. *latenotatus* Pic, 1914, described from a female from Asian Turkey, and *M. carnifex* var. *naxosensis* Pic, 1923, described from a male from the Naxos Island. We did not study the type material of either taxon and therefore cannot revise the synonymies. However, we would like to mention the urgent need of a critical revision of at least some of these taxa; based on the brief original descriptions, they might represent synonyms of other Eastern Mediterranean *Malachius*.

**Distribution.** Italy, Greece, Crete, Turkey, Cyprus. The occurrence in Greece: Naxos, Crimea, 'Caucasus' (MAYOR 2007) and Georgia (PEYRON 1877) needs to be verified by voucher specimens. **New species for Libya.**

***Malachius suturalis* Motschulsky, 1854 stat. restit.**

*Malachius suturalis* Motschulsky, 1854: 31.

**Type locality.** Asia Minor.

**Type material.** SYNTYPE (ZMUM), labelled: 'Smyrna [= Izmir] [handwritten] // Malachius / Suturalis / Motsch. / Anatolia [handwritten]'.

**Notes on the type material.** The number of syntypes is unknown. The only syntype at our disposal is badly damaged and only the right elytron and wing, mesothorax, metathorax and abdomen are preserved. Because the syntype does not provide any characters necessary for a reliable identification of the species, we do not designate it as a lectotype and hope that additional specimens in better condition will be found in ZMUM.

**Comments on classification.** *Malachius suturalis* Motschulsky, 1854 was described from a female from Asia Minor (= Turkey) and subsequently synonymised with *M. carnifex* by PEYRON (1877). However, the syntype at our disposal has dark brown, slightly metallic epimera of mesothorax and red elytra with a narrow metallic-blue sutural stripe. Based on these characters it cannot represent a senior synonym of *M. stolatus* (= *M. carnifex* sensu auctorum). Most probably it represents a junior synonym of *M. rubidus* or a senior synonym of *Malachius dama* Abeille de Perrin, 1888. As the bad condition of the syntype does not allow us to resolve its identity, we leave *M. suturalis* as a valid species until a detailed revision of whole group.

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