On the Identity of *Crioceris aulica* Fabricius, 1781, a Member of Malachiidae Misplaced in Chrysomelidae (Coleoptera) and Consequent Taxonomical Changes in Atelechira Lacordaire, 1848

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ON THE IDENTITY OF *CRIOCERIS AULICA* FABRICIUS, 1781, A MEMBER OF MALACHIIDAE MISPLACED IN CHRYSOMELIDAE (COLEOPTERA) AND CONSEQUENT TAXONOMICAL CHANGES IN *ATELECHIRA* LACORDAIRE, 1848

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ABSTRACT

The type of *Crioceris aulica* Fabricius, 1781 in the collection of Sir Joseph Banks at the Natural History Museum, London was examined. It turned out that this species is in fact not a member of *Atelechira* Lacordaire (Chrysomelidae: Clytrini), but rather a member of *Hadrocnemus* (Malachiidae) as *Hadrocnemus aulicus* (Fabricius, 1781), **new combination**. *Hadrocnemus hilarus* (Evers, 1987) may be synonymous with *H. aulicus*, but it is here provisionally maintained as a valid taxon pending availability of further material. *Atelechira elegans* (Thunberg, 1821) is restored as the valid name for the species previously referred to as *A. aulica* (auct., not Fabricius). A lectotype is designated for *C. aulica*. All examined types are illustrated, and comments on their distinguishing characters and distribution are added.

Key Words: taxonomy, nomenclature, Chrysomeloidea, Cleroidea, Melyridae, Afrotropical Region

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Crioceris aulica is a species described by Fabricius (1781) from “Cap. bon. sp.” (= Caput Bona Spei, the historic name for the Cape region of South Africa) based on material in the collection of his contemporary Sir Joseph Banks, which is now housed as part of the historic collections at the Natural History Museum in London. Fabricius (1781) did not indicate how many specimens of *C. aulica* he had at his disposal when writing the description, so the number of potential syntypes is unknown. Later on, Zimsen (1964) did a survey of all the known and still existing type material of J. C. Fabricius and found only one potential syntype specimen, which is the one in Banks’ collection. This specimen was already marked as “type” by C. O. Waterhouse, who re-curated the Banks collection at the time it arrived at the British Museum in London.

A few decades after Fabricius’ original description, A. G. Olivier had the chance to re-examine some of the specimens in Banks’ collection. He included them in his books and illustrated them on color plates (Olivier 1792, 1808). Even though *C. aulica* was described in a chrysomelid genus, Olivier interpreted it as a species of *Melyris* Fabricius, suggesting that it belonged to an entirely different group of beetles (Melyridae). This

interpretation was not followed by subsequent authors. Schoenherr (1808) listed it again as a member of the genus *Crioceris* Geoffroy, even though he also mentions Olivier’s previous placement in *Melyris*. Lacordaire (1848), when publishing his monograph on the “Phytophages” (Chrysomelidae), placed *C. aulica* in *Clythra* Fabricius as a member of his newly established subgenus *Atelechira* Lacordaire. It is not clear what Lacordaire’s interpretation of Fabricius’ species was based on, but it may have been the very characteristic color pattern, metallic blue with yellow legs and elytra and two large, metallic blue patches on each elytron. In the Cape Region of South Africa, there is indeed an easily recognizable species of Chrysomelidae (Clytrini) that matches the color pattern of Fabricius’ *C. aulica*. Lacordaire’s subgenera of *Clythra* have since all been elevated to full generic rank within the Clytrini (Weise 1908; Medvedev 1969, 1993; Erber and Medvedev 2004), so the current combination of Fabricius’ name is *Atelechira aulica* (Fabricius, 1781).

It was rather surprising when the second author, during his SYNTHESYS visit to London in June 2017, discovered that the single type of *C. aulica* is in fact not a chrysomelid at all! Despite its superficial

resemblance with the common South African *Atelechira*, it turned out to be neither a species of *Atelechira* nor South African. In reality, Fabricius' type belongs to the family Malachiidae (*sensu* Bocakova *et al.* 2012), often treated as a subfamily of Melyridae (*e.g.*, Bouchard *et al.* 2011). Upon closer study by the first author, it was possible to place it in the genus *Hadrocnemus* Kraatz, 1895, where it turned out to be very close or possibly identical to a species from Senegal. The chrysomelid species so far interpreted as *Atelechira aulica* needs a change of name.

MATERIAL AND METHODS

This study is based on the examination of dry-mounted type material deposited at the following institutions:

BMNH	Natural History Museum, London, UK
MFNB	Museum für Naturkunde, Berlin, Germany
UUZM	Museum of Evolution, Uppsala University, Sweden

Photographs of the type specimens of *C. aulica* and *Clythra elegans* Thunberg, 1821 were taken with a Canon EOS 550D digital camera with a Canon MP-E 65 mm objective by Jan Bezděk. Images of the same specimen at different focal planes were combined using Helicon Focus 5.1.19 software. The type of *Apalochrus hilarus* Evers, 1987 was photographed with a Canon EOS 550D digital camera mounted on a Leica MZ 12 microscope by Michael Geiser, and the different focal planes were combined using Helicon Focus 5.3. All photographs were edited in Adobe Photoshop.

RESULTS AND DISCUSSION

Family Malachiidae Fleming, 1821

Hadrocnemus aulicus (Fabricius, 1781), new combination

Crioceris aulica Fabricius 1781: 154.

Crioceris aulica: Fabricius 1787: 89, 1792: 9, 1801: 458; Schoenherr 1808: 274.

Cryptocephalus (*Crioceris*) *nitidus* Gmelin 1790: 1722 (unnecessary replacement name for *Crioceris aulicus* Fabricius, 1787).

Melyris aulicus: Olivier 1792: 655, 1808: no. 21: 4.
? = *Apalochrus hilarus* Evers 1987: 28–29, pl. V, fig. 1.

? = *Hadrocnemus hilarus* (Evers, 1987): Mayor 2004: 92.

Type Material Examined. The lectotype of *C. aulica* (BMNH, here designated) bears a handwritten label (presumably not written by Fabricius

or Banks himself): “Cr. Aulica / Fabr. Sp. Ins. n. 29” (Figs. 1–5). This type is missing part of its abdomen and its left antennomeres 6–11 and has a small hole in the pronotum. Also, part of the underside is obscured by a large drop of brownish glue, and its left hind wing is sticking out and slightly damaged. This specimen is here designated as lectotype in accordance with International Commission on Zoological Nomenclature (1999), Art. 74, to clarify the identity of this species and avoid potential confusion in case additional syntypes are discovered. No additional specimens were listed by Zimsen (1964); however, there are cases in other groups of Coleoptera where Zimsen's survey of Fabricius types turned out to be incomplete (*e.g.*, Sekerka and Barclay 2014).

The holotype of *A. hilarus* (MFNB) has the printed labels “Casa- / mance”, “HOLOTYPUS ♂”, [handwritten] “IFAN-1948 / EX COLL. / E. FLEUTIAUX”, and [partially handwritten in A. Evers' handwriting] “Apalochrus / hilaris Evers / A. Evers det. 1985” (Figs. 6–7). The specimen is in good condition.

A detailed description of *A. hilarus* was provided by Evers (1987), who also included it in his key to the African species of *Apalochrus* Erichson, 1840 (now *Hadrocnemus* Kraatz, 1895) and added a schematic drawing of the mesotibia. Because of an earlier type species designation, previously overlooked by Evers and other malachiid workers, the genus name *Apalochrus* now has to be applied to a rather small group of Palearctic species, while the much larger, primarily Afrotropical genus “*Apalochrus*” *sensu* Evers is now called *Hadrocnemus* (Mayor 2004). A thorough revision of the African species of *Hadrocnemus* is currently needed. Given the results of some recent revisions of some Asian taxa within this tribe (Tshernyshev 2015, 2016), it seems likely that the generic definitions established by Evers (1987) cannot be maintained. As a result, this species might need to be re-classified in the future.

Members of *Hadrocnemus* and related genera are characterised by a combination of secondary sexual characters of the males. The genus is defined by the presence of complex modifications (“Excitatorenn”) on the mesotibiae, serrate or filiform (not pectinate) antennae, and a comb-like appendage on the second protarsomere. Fortunately, the syntype of *C. aulica* is a male, so its placement in *Hadrocnemus* (*sensu* Mayor 2004) is unambiguous. Within the genus, *H. aulicus* is characterized by the complex shape of the male mesotibia (Fig. 4), along with the presence of an elevated, bright yellow bulge above each antennal insertion on the frons (Fig. 3). These characters were found to be identical in both the type of *C. aulica* and that of *A. hilarus*. However, the dorsal color pattern, also rather characteristic for this species, seems to show some differences between *A. aulicus* and *A. hilarus*. In the type of *A. hilarus*, the

Figs. 1–7. *Crioceris aulica*, male syntype: 1) Dorsal habitus; 2) Lateral habitus; 3) Head, frontal view; 4) Right mesotibia; 5) Original label. *Apalochrus hilarus*, male holotype: 6) Dorsal habitus; 7) Original labels.

bluish metallic humeral macula of each elytron is rather extensive and conjoined with the postmedian macula in one point (Fig. 6), while the humeral macula in the type of *C. aulica* is much smaller and widely separated from the postmedian macula. Also, the metallic color in the type of *C. aulica* is green rather than blue as in *A. hilarus*. These differences might be interpreted as infraspecific variability, but as long as no other specimens are known, *A. hilarus* is here provisionally maintained as a valid but closely related species, pending further revision.

In light of this discovery, it appears unlikely that the type of *C. aulicus* actually originated from “Caput Bona Spei”. *Hadrocnemus* is very poorly represented in South Africa and presumably absent from the Cape Region (Evers 1987). Species of *Hadrocnemus* are, however, well represented in West Africa, and several relatives of the above species are also found in the area. There is no reason to question the correctness of the type locality of

A. hilarus, the Casamance region of Senegal. Fabricius (1781) indicated “Dr. Forster” as the collector of the *C. aulica* specimen. This suggests that it was collected by Johann Reinhold Forster or his son Georg on Capt. James Cook’s second voyage around the world. Interestingly, it appears their ship only stopped twice along the African coast: once on the Cape Verde Islands and then again at the Cape of Good Hope (Forster 1778). No *Hadrocnemus* species is currently recorded from Cape Verde, so the full distribution of the species remains a mystery until more material is found.

Family Chrysomelidae Latreille, 1802

Atelechira elegans (Thunberg, 1821), restored as valid species

Clythra elegans Thunberg 1821: 184. Forsberg 1821: 263, 279.

Figs. 8–12. *Clythra elegans*, male holotype. **8)** Dorsal habitus; **9)** Lateral habitus; **10)** Head and pronotum; **11–12)** Original labels.

Clythra (Atelechira) aulica: Lacordaire 1848: 85–87 (misidentification).
Miopristis aulica: Gemminger and Harold 1874: 3279 (misidentification).
Miopristis (Atelechira) aulica: Jacoby and Clavareau 1906: 13 (misidentification); Clavareau 1913: 29 (misidentification).
Atelechira aulica: Weise 1908: 144 (misidentification); Medvedev 1993: 381–382 (misidentification); Erber and Medvedev 2004: 80 (misidentification).

Type Material Examined. The holotype of *C. elegans* in the UUZM), bears a printed red label with “Uppsala Univ. Zool. Mus. / Thunbergsaml. nr. 8211 / *Clythra elegans* / Cap. TYP” and a white handwritten box label with “*elegans*. / Cap. 22” (Figs. 8–12). Because there is no indication that Thunberg used for his description the material from other collections, we treat this single specimen of *C. elegans* as the holotype (see also Bezděk 2016).

Due to the aforementioned misinterpretation of the type of *C. aulica*, the name of the species currently known as *A. aulica* needs to be changed. Thus, the only known synonym, *Clythra elegans* Thunberg, 1821, is restored as a valid species.

Lacordaire (1848) proposed the subgeneric name *Atelechira* with two included species, *C. (A.) aulica* and *Clythra (Atelechira) baculus* Lacordaire, 1848, but he did not choose the type species of the subgenus. Medvedev (1970) designated *C. baculus* as the type species of the *Protoclythra* Weise subgenus *Hirtolenes* Medvedev, 1970. The type species of *Atelechira* was not designated until Medvedev (1993) designated *A. aulica*. Because Medvedev’s (1993) designation was based on misapplication of a previously established nominal species, the type species of *Atelechira* is *Atelechira elegans* (Thunberg, 1821) (see ICZN, Art. 69.2.4).

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