ANOTHER VIEW ON THE *BLASICRURA TERES* COMPLEX LIVING IN HAWAIIAN WATERS

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Absrtact: A review of the *Blasicrura teres* complex living in Hawaiian waters has resulted in a quite different interpretation of this complex. The review is based on the unique visual database (VDB) of *Blasicrura teres* shells published by the late R.C. Dayle (2004). A single subspecies of *Blasicrura teres* is recognized, which differs from representatives of this complex elsewhere by smaller and mostly wider shells of an elliptical shape. This subspecies is here named *Blasicrura teres rashleighana* (Melvill, 1888). The full details of this conchological study based on data of 987 specimens and 5280 pictures of the majority of these specimens given by Dayle are published separately in Supplement 3 to this issue of Triton.
Key words: Mollsuca, Gastropoda, Cypraeidae, *Blasicrura teres*, intraspecific variation, taxonomy, Hawaiian Islands.

Introduction

Blasicrura teres (Gmelin, 1791) inhabits the Indo-Pacific region. In the Hawaiian waters *teres*-like forms are known for years. They are uncommon, and are found mainly by divers. During the last fifty years students of Cypraeidae have treated these forms usually as *Blasicrura teres* (Gmelin, 1791), *Blasicrura rashleighana* (Melvill, 1888), *Cypraea burgesi*, Kay, 1981, and *Cypraea alisonae* Burgess, 1983.

More conchological information on the taxonomic status of this *Blasicrura* population became available when the late R.C. Dayle, an American researcher and diver, published in 2004 "The Visual Database of *Cypraea teres*-related shells from Oahu, Hawai'i". By using that work Heiman (2005) has shown that the *teres*-like Hawaiian representatives are in fact varieties of a single species *Blasicrura teres,* because all the different taxa mentioned above pass gradually into each other without showing any conchological gap. Comparing the *teres*-like population from the Hawaiian Islands with other populations of this species throughout the Indo-Pacific was the next step of this review. This comparison is carried out in Heiman (2012). The work by Dayle (2004) was used in order to establish the diagnostic shell characteristics of the Hawaiian population and to compare them with such characteristics of populations of *B. teres* in other areas.

It turned out that the characteristics of the Hawaiian *teres*-like population differ substantially from those of *B. teres* from other areas and the Hawaiian populations can be separated from them at the subspecific level. A description of this subspecies is given below.

Material and diagnostic shell characteristics

The diagnostic shell characteristics of the subspecies from Hawaiian Islands were obtained from the unique visual database (VDB) of 987 shells of *B. teres* published as a CD (electronic book) in Dayle (2004). A copy of this work was obtained from R.C. Dayle in 2004.

This study is based on 987 specimens, 880 were personally collected by Dayle in the Hawaiian waters. Of each shell 6 pictures were taken from six different angles of view, resulting in 5280 pictures in the VDB. It contains also morphometric and other data of each of these shells and information concerning 99 shells of this taxon from the Hawaiian Islands studied by Dayle in other collections. In addition the visual database contains also statistical shell characteristics based on this conchological material and other useful information.

The morphometric shell characters of all the shells given in the VDB were used for calculation of morphometric characteristics: the average shell length and the average width to length ratio, and their standard deviations. In addition, the presence of qualitative shell characters—the shell shape and the dorsal blotch—was counted in all the studied shells. The details and the results of the conchological study based on the VDB are published separately in Heiman (2012).

An additional batch of 24 Hawaiian shells of this taxon from the collection of the senior author is also studied. Conchological diagnostic characteristics of other populations of the species used for comparison are cited from Heiman (2005).

Description and nomenclature of the Hawaiian population

The shells from the Hawaiian Islands—see pictures Figs. 1-16—may be characterized as follows:

Dimensions

The average shell length 21 mm; the standard deviation 4.8 mm

The average width to length ratio 0.58, the standard deviation 1.5 mm.

Due to unusual conditions in the Hawaiian waters the shell dimensions vary substantially.

Diagnosis

Shells of Hawaiian *B. teres* share the main diagnostic characters of the species: the shell is elongate with a depressed spire; the shell is subcylindrical to elliptical in shape; the shell profile is usually low to slightly convex; the right margin is angled, equally narrow, and usually spotted. There may be three bands on the dorsum and sometimes a blotch; the fossula and the peristome are broad and regularly ribbed.

The Hawaiian population differs from other populations of the species in the Indo-Pacific region by the following statistical shell characteristics:

⇨ The shells are usually smaller than in other populations, the average shell length is 21 mm.

⇨ The shells are usually wider and have an elliptical shape, the average width to length ration 0.58.

⇨ About a half of the shells may have the brown dorsal blotch of different size and shape.

Distribution

This subspecies is expected to be found in all the waters of the Hawaiian Islands.

The nomenclature of the Hawaiian subspecies

The nomenclature of this Hawaiian subspecies is rather complicated because due to its variability several names have been given to shells with the Sandwich or Hawaiian Islands as type locality:

Cypraea tabescens var. *pellucens* Melvill, 1888
Cypraea teres var. *eunota* Taylor, 1916
Cypraea teres ver. *transpiciens* Taylor, 1916
Cypraea burgessi Kay, 1981
Cypraea alisonae Burgess, 1983

While other taxa described from unknown localities have been associated already for a long time with Hawaiian shells of which the most important is *Cypraea rashleighana* (Melvill, 1888). The latter was described by Melvill (1888a) from a single specimen and unknown locality, which description was published in a strange way. The drawings of the holotype were published already on 27 November 1887 on plate 2 in the Journal of Conchology, 5 (8), the first page of the description on 28 January 1888 and the second page of the description on 12 April 1888. This is a classic example of an interrupted description and the date of publication should read 12 April 1888. It was figured once again by a rather poor photograph by Melvill (1888b) and by much better photographs by Melvill & Standen (1895: plt. 2, figs. 7-8). Although Schilder (1965) considered the Loyalty Islands as the type locality, we agree with Lorenz & Hubert (2000) that *rashleighana* was probably based on material from the Hawaiian Islands.

Cypraea tabescens var. *pellucens* was described by Melvill (1888b) in the same year as *rashleighana*, however in a different article which was submitted only on 17 April 1888. Subsequently according to the rules of priority stipulated in Article 23 of the ICZN (1999) *rashleighana* has to be considered the oldest name. Therefore we have to use that name for our Hawaiian subspecies. The original description and the figured holotype, which is present in the Museum of Wales (NMW 1955.158.55) according to Trew (1987), fits a broad form of the *Blasicrura teres* population occurring in Hawaiian waters. The correct name for that population reads therefore *Blasicrura teres rashleighana* (Melvill, 1888).

For identifying this subspecies one is urged to use the new diagnostic shell characters given above.

1-6. *B. teres rashleighana*, 20.8 mm. Shell from Oahu Island illustrating typical for this subspecies characters: the shell length close to the average meaning, the elliptical shape, the convex profile, the three dorsal bands, and the dorsal blotch.

7-9. *B. teres rashleighana*, 22.9 mm. The labral spots characteristic to *B. teres* are clearly visible.

10-12. *B. teres rashleighana*, 24.8 mm. From this picture (and in Figs. 1, 3, 6, 7-8) an impression can be formed that the dorsal blotch covers the dorsal band; perhaps it is formed after the band.

13-15. *B. teres rashleighana*, form dilated. After Dayle (2004), the VDB # 911.

16-18. *B. teres rashleighana*, form hyper-dilated. After Dayle (2004), the VDB #536.

Discussion

B. teres is a variable species and shells with a certain character, such as an elliptical shape or the dorsal blotch, for example, can be found from time to time in populations throughout its range of distribution. This is a normal manifestation of intraspecific variation. Odd conchological information regarding *B. teres* in the Hawaiian waters was available from 60th of the 20th Century but it was not used effectively due to different circumstances.

Shells of *B. teres* are uncommon and variable and it is difficult to get an idea of shell characteristics of the Hawaiian population as a whole due to a high degree of intraspecific variation. The late R.C. Dayle collected shells of the species during several years and documented carefully the shell data. The results exceeded all expectations: one can obtain from the VDB a lot of conchological information including statistical diagnostic morphometric characteristics and statistical diagnostic characteristics of counted shell characters. It was exactly what was needed when the subspecific level of the Hawaiian population of *Blasicrura teres* was revised.

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