

A MAGELLANIC MYSTERY

MODIOLA CUPREA JEFFREYS 1859 A PROBABLE JUNIOR SYNONYM OF
LISSARCA MILIARIS (PHILIPPI 1845) (BIVALVIA: PHILOBRYIDAE)

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Abstract The taxon *Modiola cuprea* Jeffreys 1859 is shown not to be the fry of *Crenella faba* (Müller 1776) and not to belong to the Mytiloidea. Rather it belongs to the Philobryidae and is proposed as a probable junior synonym of *Lissarca miliaris* (Philippi 1845). *Lissarca miliaris* and all *Lissarca* species are confined to the Antarctic and southern oceans in the magellanic and austral provinces. The supposed attribution of the type series of *M. cuprea* as coming from the crop of a bird, shot in Yorkshire, England must be discounted. Ranges, migration routes and flight times of both birds implicated, the Sanderling (*Calidris alba*) and the Brent Goose (*Branta bernicla*) do not support such an occurrence. The shell collection of William Bean is extensive and includes much material from around the world and it is proposed that Bean inadvertently gave a local origin to these shells before sending them to Jeffreys. *Modiola cuprea* can now be removed from the European checklist.

Key words *Modiola cuprea*, nomenclature, *Lissarca*, *Philobryidae*

INTRODUCTION

In the current European checklist (CLEMAM, 2011) *Modiola cuprea* Jeffreys 1859 is listed as “a chreson of uncertain status”. In 2011 I discovered three shells labelled “*Modiola cuprea* Bean Scarborough” in the Doncaster Museum & Art Gallery, Yorkshire. The labels were in the handwriting of William Bean (Fig. 1E) and I wondered if these were part of the original series from which Jeffreys described the species. Of immediate note was the attribution of the species name to Bean and not to Jeffreys; these shells also offered the opportunity to resolve the status and identity of *M. cuprea*.

Historic context The original description (Jeffreys, 1859a) is incomplete and refers only to external characters; there are no figures. Here Jeffreys likens the shells to those of the fry of *Crenella nigra* (= *Musculus nigra* Gray 1824). William Bean is recorded as having taken them from the stomach of a Sanderling (*Calidris alba* Pallas 1764) shot at Scarborough, Yorkshire, England.

In a subsequent paper Jeffreys (1859b) reports that the bird may not have been a Sanderling but rather the shells were taken from the crop of a Brent Goose (*Branta bernicla* Linnaeus 1758) by the taxidermist Alfred Roberts. The goose was shot during the severe winter of 1855.

The shell is figured in 1859 by Sowerby in his Illustrated Index of British Shells. The illustration of the external only and at life size; consequently there is little detail.

In 1864, Jeffreys in his *British Conchology*, completes the description by opening the specimen in his possession. He notes that the hinge teeth resemble those of the protobranchs *Nucula* and *Leda* but does not alter his opinion that the shell is of a mytilid akin to *Crenella*. He clearly believes that the shells are of a northern origin, Iceland, North Greenland or Spitzbergen as befits the range of the Brent Goose.

Under the previous entry Jeffreys notes the discovery of the eastern Atlantic boreal and arctic species *Crenella faba* (Müller 1776) taken from the stomach of a wild duck by Professor King shot near Newcastle, Northumberland, England.

In 1869 in the supplement to *British Conchology* Jeffreys states without comment that *M. cuprea* is the fry of *Crenella faba*. J.H. Nelson (1907) in his *Birds of Yorkshire* quotes a Mr J.E. Harting recounting that Jeffreys told him of the discovery of shells of “*Crenella faber*” (sic) in the stomach of a Brent Goose shot in Yorkshire. It should be noted that Bean in his own checklists of Scarborough shells never mentions either *Modiola cuprea* or *Crenella faba* (Bean in Theakston, 1861).

The next reference is that of Warén (1980) noting the presence of the holotype in the Jeffreys collection, in the Smithsonian, but no comment on the identity of *M. cuprea* was made.

RESULTS

Identity

Material Examined

Syntype. United States National Museum, Jeffreys Coll. From photographs only.

1 complete shell USNM 197629: labels (Fig. 1A–C) read <*Crenella faba* Fabr. from stomach or craw of a Brent Goose shot at Scarborough, Eng, Bean, *Modiola cuprea* old label>. A second label reads <*Crenella polienda* Scarbro ("*Modiola cuprea*" as a pencil annotation)>

1 complete shell, USNM 197645: label (Fig. 1D) reads <"*Modiola cuprea*" *Crenella faba* Fabr. Aug 9 1864, W Bean ("Type" as a pencil annotation)>. Although this is the specimen identified by Warén (1980) as the holotype, the date on the label suggests that Jeffreys acquired it some five years after the original description was published. Given this uncertainty the USNM chooses to assign type status to USNM197629 only (Ellen Strong, pers. comm.)

2 shells and 1 valve, Doncaster Museum & Art Gallery, ex coll. William Bean

Description (Fig. 2A–F) Shell very small to 3.5 mm in length. Robust for its size. Tumid. Equivalve. Inequilateral, beaks distinctly to the anterior. Outline obliquely oval, dorsal margins narrow, anterior much narrower than posterior. Sculpture of regularly and closely spaced co-marginal lines. Hinge taxodont, five chevron shaped posterior teeth somewhat obliquely oriented, five chevron shaped anterior teeth more

vertically aligned. Ligament alivincular in a shallow posteriorly directed resilifer. Anterior and posterior margins prominently crenulated. Posterior adductor scar large, anterior adductor scar absent. Shell colour, pale fulvous, brown.

Remarks The taxodont hinge and alivincular ligament are characteristic of the Limopsoidea in general and the oblique outline and narrow oblique resilifer are typical of the genus *Lissarca* in the family Philobryidae (Tevesz, 1977).

Lissarca species are confined to the Antarctic, Magellanic and Southern Austral provinces. The most common of these is *L. miliaris* Philippi 1845 described from the Magellanic region but widespread in subantarctic and antarctic waters where it was formerly known under the name *L. rubrofusca* Smith 1877 (Dell, 1964, 1990). Four species are recognised from Australia (Lamprell & Healey, 1998) and nine species from New Zealand or its subantarctic islands (Powell, 1979). *Lissarcula australis* Thiele 1923 from the Torres Straits is considered to be a *Lissarca* (Tevesz, 1977), but unlike all *Lissarca* species, has a tropical range in the Torres Straits.

In outline, robustness and strength of hinge *L. cuprea* is most similar to *L. miliaris* from Tierra del Fuego as figured by Dell (1990) (Fig. 2G–H) and that collected by D.G. Zelaya (pers. comm.) from the Straits of Magellan. It is unlike the *rubrofusca* form in which the posterior margin is more elongate and interrupts the hinge teeth. Of the austral species, those from the subantarctic islands of New Zealand (*L. aucklandica* EA Smith 1902, *L. exilis* Suter 1913 and *L. stewartiana* Powell

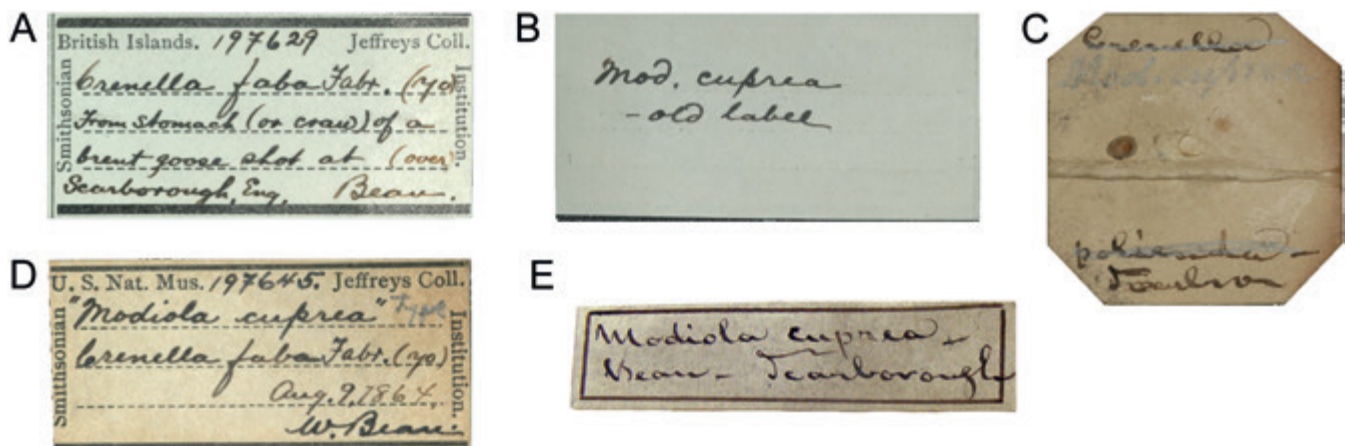


Figure 1 Labels associated with specimens of *Modiola cuprea*. A–B, Smithsonian label for USNM 197629; C, Label of William Bean for *Crenella polienda* found with USNM 197629; D, Smithsonian label for USNM 197645; E, Label of William Bean found with the shells of *Modiola cuprea* in the Doncaster Museum.

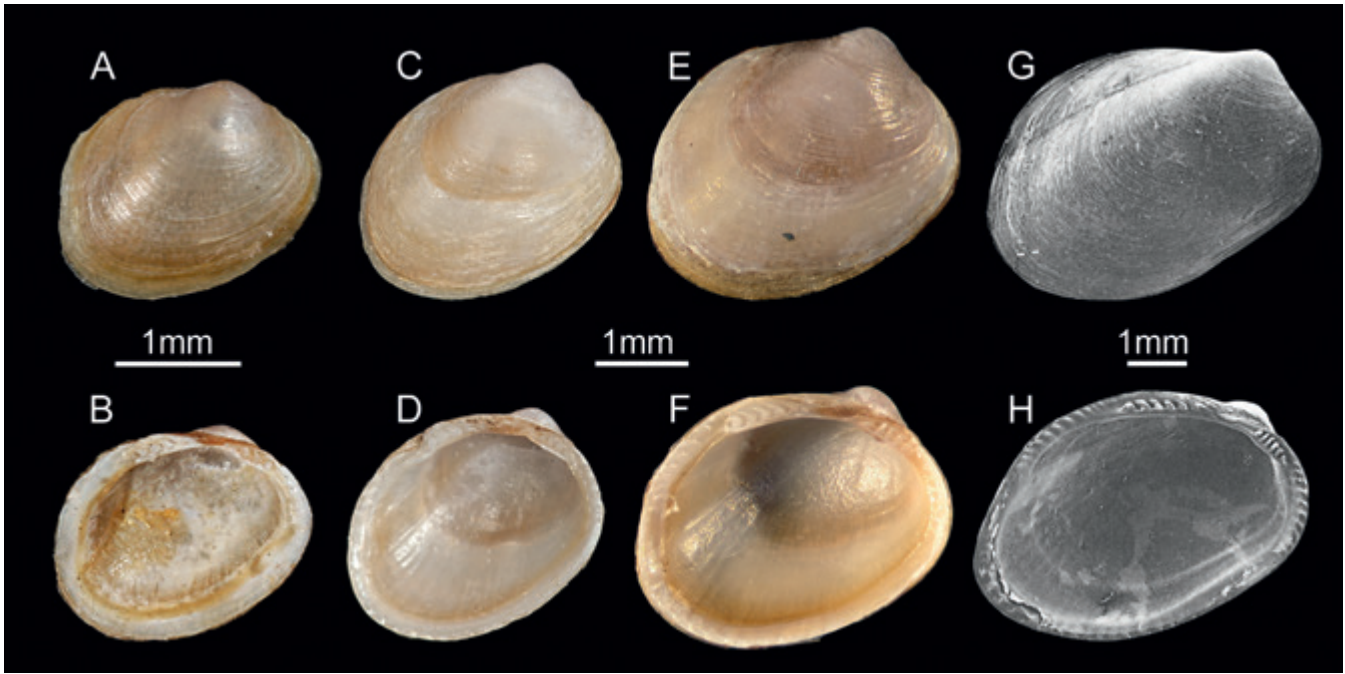


Figure 2 A–B, *Modiola cuprea*, syntype, USNM 197629. C–D, *Modiola cuprea*, Jeffreys coll. USNM 197645. E–F, *Modiola cuprea*, Doncaster City Museum. G–H, Scanning electron micrographs of *Lissarca miliaris*, Isla de los Estados, Tierra del Fuego from Dell, 1990 (© Royal Society of New Zealand).

1935) are most similar, but all may be part of a circum-subantarctic complex that would include *L. miliaris* (D.G. Zelaya, pers. comm.; Adam Reed, pers. comm.). Given this uncertainty in the number of species it is not possible to reach a definitive conclusion on the identity of *M. cuprea* and this must await a full revision of the genus.

It is surprising that Jeffreys (1864) did not realise that *M. cuprea* was not a mytilid as he noted the taxodont hinge being like that of *Nucula* or *Leda*. Given the supposed source of the specimens, from a goose with an arctic-north temperate range, I suppose he was drawn into considering a shallow water arctic origin. He had already noted the discovery of the arctic *Crenella faba* in the crop of duck shot in Northumberland and thus assumed a similar occurrence. This specimen is present in the Jeffreys collection and is illustrated here (Fig. 3B). Why he later actually stated that *M. cuprea* is the young of *C. faba* is a puzzle because the sculpture and hinge characters are quite different (Fig. 3).

Status

Without a complete review of all *Lissarca* species the exact identity of *M. cuprea* remains uncertain. However, from data currently available it

falls into the range of variation of *L. miliaris* and this paper proposes that *M. cuprea* Jeffreys, 1859 be considered a junior synonym of *Lissarca* (as *Pectunculus*) *miliaris* (Philippi 1845). At this time the name *cuprea* Jeffreys 1859 predates all other names applied to *Lissarca* except for that of *miliaris* Philippi 1845. Should future revisions suggest that these taxa are not synonymous it is proposed here that the name *cuprea* not be given priority over any existing name. This proposal is based on the lack of a type locality and the lapse in use of the name since 1864.

Given the conclusions of this paper it is further suggested that the taxon *Modiola cuprea* Jeffreys 1859 can be removed from the European and British checklists.

Although the authority on the labels in the Doncaster museum appears to be Bean there are no published versions of this; Bean never cited this species in his lists of Scarborough shells (Bean in Theakston, 1861). However, in this publication the name *Crenella polienda* does appear but without any description or figure and therefore not available for nomenclatural purposes. From the labels associated with the type material of *Modiola cuprea* we can now identify *Crenella polienda* and further understand how confusion can have arisen.



Figure 3 *Crenella faba*, **A**, Greenland, National Museum of Wales, Melvill-Tomlin Coll. NMW.1955.158; **B**, From stomach of a duck shot by Prof. King, near Newcastle, Northumberland, England, Jeffreys coll. USNM 197630.

Origin

The discovery of the Magellanic origin of *M. cuprea* leads one to dismiss the whole episode of the discovery of these shells in the crop of a bird, shot in England.

The Brent Goose breeds in the Arctic, over winters in England (BTO, 2011) and cannot be considered. Alfred Roberts, the taxidermist attributed to finding the shells, was well respected and his ornithological records were accepted by his peers (Jim Middleton, pers. comm.). It is therefore likely that he did find shells in a Brent Goose, but not these!

Sanderling comprise two subspecies, one breeding in arctic Canada and Alaska and wintering in the Americas; the other breeding in Greenland, Jan Mayen, Svalbard and Siberia and wintering in Africa (Reneerkens, 2009). The British birds are passage migrants from SW Africa using the E. Atlantic Flyway although it is possible but not recorded that a vagrant American bird may arrive in England (Reneerkens, pers comm). The flight time for the passage from Africa to England is many days with frequent stopping points to feed, thus a passage from the Magellan region would take longer, making it most unlikely that food would remain in the stomach during the entire passage (Reneerkens, pers comm).

The most likely explanation is one of confusion on the part of William Bean. His collection was large and he had numerous sources from around the world but he himself published little; rather he generously gave shells to others to describe (McMillan & Greenwood, 1972). It is noted in the description of *M. cuprea* that the bird was shot in the winter of 1855 but Jeffreys published his

description four years later in 1859; plenty time for the memory to slip!

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