The egg capsule of the coral cat shark, *Atelomycterus marmoratus* (Bennett, 1830) (Chondrichthyes: Scyliorhinidae)*

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Key words: Scyliorhinidae; *Atelomycterus marmoratus*; coral cat shark; egg capsule.
The egg capsule of the coral cat shark (*Atelomycterus marmoratus* (Bennett, 1830)) is described and illustrated.

Introduction

The genus *Atelomycterus* Garman, 1913, consists of three recent species, *A. fasciatus* Compagno & Stevens, 1993, *A. macleayi* Whitley, 1939, and *A. marmoratus* (Bennett, 1830) (Compagno, 1999). Until recently the only information on the egg capsules of *Atelomycterus* species was taken from eggs removed from the uteri of specimens of the first two species. In 1998 and 2000 eggs released by captive specimens of *A. marmoratus* from respectively the aquarium of the University of Liège in Belgium and the

Fig. 1. Captive female of *A. marmoratus* (Bennett, 1830), TL 60-65 cm, from the Aquarium of the University of Liège, Belgium.

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* Note of the managing editor. This paper is re-issued because, by accident, the uncorrected version was used for publication in the first part of this volume.

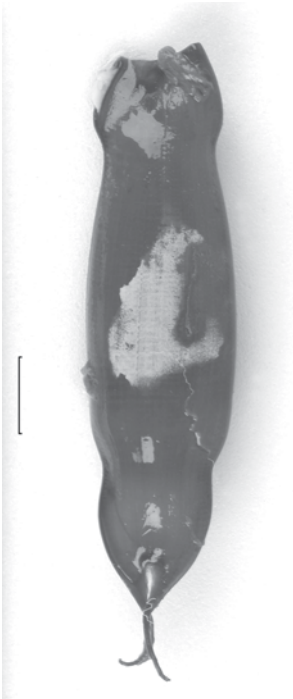

Fig. 2. Egg capsule of *A. marmoratus* (Bennett, 1830), RMNH 34857. Scale equals 10 mm.

aquarium of Núcleo de Estudo e Pesquisa em Chondrichthyes (NUPEC) in São Paulo, Brasil, became available. Since the few existing data on the egg capsules of *Atelomycterus* species are confusing, the egg capsule of *A. marmoratus* is described, depicted and compared to those of the other two *Atelomycterus* species.

Material and methods

A total of 23 egg capsules (5 full and 18 empty) were available for study. Of these egg capsules 4 were laid by a captive female (fig. 1) in the aquarium of the University of Liège, Belgium, and 19 by a captive female in the aquarium of NUPEC, São Paulo, Brasil. Only 20 of these egg capsules were preserved in alcohol and measured. Four dried specimens from NUPEC were not measured. The length of an egg capsule is measured from the vestibular end to the base of the horns. The width is maximum width of the egg capsule (Compagno & Stevens, 1993).

Material.— NUPEC 1789, 3 empty egg capsules, Santos, São Paulo, Brazil, iii.2002 in NUPEC captivity; NUPEC 1790, 3 empty egg capsules, Santos, São Paulo, Brazil, v.2002 in NUPEC captivity; NUPEC; 1791, 3 full egg capsules, Santos, São Paulo, Brazil, ix.2002 in NUPEC captivity; NUPEC 1792, 1 empty and 2 full egg capsules, Santos, São Paulo, Brazil, x.2002, in NUPEC captivity; RMNH 34857, 4 empty egg capsules, Santos, São Paulo, Brazil, 15-17.v.2001, 15.vi.2001, 22.vi.2001 in NUPEC captivity; RMNH 34856, 2 empty egg capsules from the aquarium of the university of Liège, 1998. Private collection P.H.F. Bor: 2 empty egg capsules from the aquarium of the university of Liège, 1998; 3 empty egg capsules, Santos, São Paulo, Brazil, 15.xii.2000 in NUPEC captivity.

Description
(figs 2, 3)

Shape.— Egg capsule elongated. Length: width ratio 2.6-3.5. Vestibular end truncate, without tendrils. Posterior end notched, with horns bearing short tendrils (up to about 20 mm long). Body of egg capsule with two constricted waists. Body surface smooth. Colour dark brown; when dried sometimes with alternating light and dark brown bands.

Size.— The Liège egg capsules, laid by a female of 60-65 cm TL, measure: 79×23 mm, 79×23 mm, 78×23 mm and 71×23 mm. The NUPEC egg capsules, laid by a female of 47 cm TL, measure: 62×20 mm, 63×20 mm, 52×18 mm, 64×20 mm 57×19 mm, 50×19 mm, 70×21 mm, 65×20 mm, 65×20 mm, 64×19 mm, 64×20 mm,

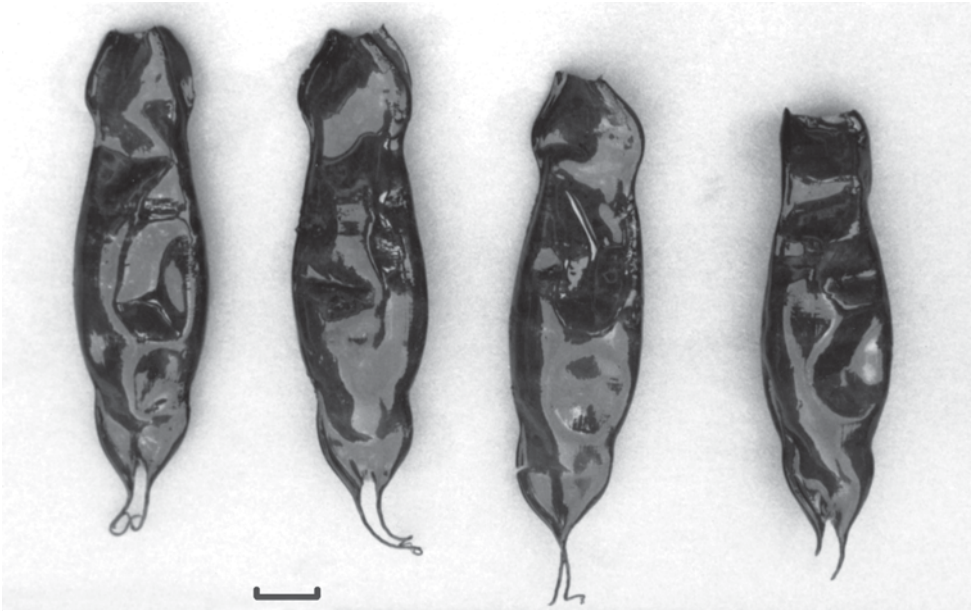

Fig. 3. Egg capsules of *A. marmoratus* (Bennett, 1830), RMNH 34856 & private coll. P.H.F. Bor. Scale equals 10 mm.

63×21 mm, 63×20 mm, 64×21 mm, 67×20 mm and 67×20 mm.

Discussion

Smedley (1927: 356, fig. 1) described and figured the egg capsule of *Scyllium marmoratum* Bennett, 1830, with long tendrils on each corner. However, the identification of the species was based on an embryo inside one of the egg capsules. These egg capsules had been collected in the China Sea at a depth of 115 fathoms. Whitley (1938: 378, fig. 13) used the figure and description of Smedley (1927) for his description of the "Marbled Catshark (*Atelomycterus marmoratus*)". In a postscript to this article he described an egg capsule taken from a female Marbled Catshark caught near Melville Island, Northern territory, with a body size of 2.75×1 inch (= ca. 70×25 mm), and only one pair of short tendrils. The posterior end of the egg capsule is described as being preceded by a constricted

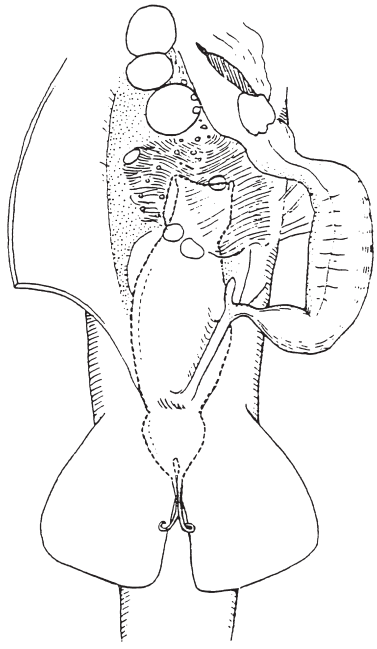

Fig. 4. Egg capsule of *A. macleayi* Whitley, 1939, in the uterus. From Whitley (1939, fig. 3).

Fig. 5. Egg capsules of *A. fasciatus*. Compagno & Stevens, 1993. From Compagno & Stevens (1993, fig. 10). Scale equals 10 mm.

waist. Thus in this article Whitley described two different shaped egg capsules for one species.

Whitley (1939: 230) described the new species *A. macleayi.* The female shark caught near Melville Island was re-identified and found to belong to this new species. For a habitus figure of the new species Whitley (1939) referred to his figure of *A. marmoratus* in Whitley (1932) but the description was accompanied by a figure of an egg capsule in the uterus (see fig 4). The figure clearly shows two constrictions instead of one. In the Fishes of Australia (Whitley, 1940) both the habitus figure and the figure of the "egg case in utero" were given. Whitley (1940: 93) stated that *A. macleayi* differs from *A. marmoratus* in coloration and its egg. Presumably Whitley compared the egg capsule of his *A. macleayi* with the one Smedley (1927) originally ascribed to *A. marmoratus*. As we have shown above, the egg capsule of *A. marmoratus* has only one pair of tendrils. Therefore, the egg capsule Smedley (1927) described is not of *A. marmoratus*, but must belong to another Scyliorhinid species.

Compagno & Stevens (1993) described the new species *A. fasciatus* and also described and figured the egg capsule of this species, measuring 67 × 20 mm (see fig. 5). These egg capsules were removed from the uterus of three adult females. The egg capsule of *A. fasciatus* strongly resembles that of *A. macleayi*, as figured by Whitley (1939, 1940).

Till now nothing was known about the egg capsules from *A. marmoratus*. The eggs of *A. marmoratus* from the captive females are the first of an *Atelomycterus* species that have left the oviduct in a natural way. These egg capsules show no signs of vestibular horns. Therefore, the suggestion of Compagno & Stevens (1993: 158), that these horns might be formed when the egg capsule leaves the oviduct at least does not hold in *A. marmoratus*.

There is a difference in measurements between the egg capsules of Liège and NUPEC. Mean measurements of the Liège egg capsules are 76.8×23 mm, while the NUPEC egg capsules are on average smaller, 62.5×19.8 mm. However, it is known in other cat sharks that the egg capsules lengthen and widen with body growth (Iglesias et al., 2002: 62). The Liège female was estimated (the shark has died in 1999) being of larger size (TL = 60-65 cm; C. J. Michel pers. comm.) than the NUPEC female (TL = 47 cm). Judging from Compagno (1984: 294) the Liège female has reached the maximum length of the species, so this might also be the case for her egg capsules.

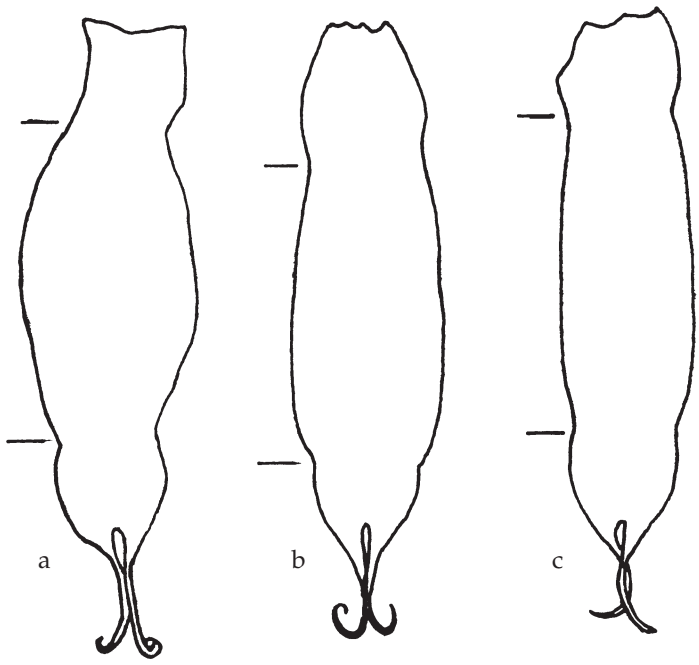

Fig. 6. Outlines of egg capsules of the *Atelomycterus* species, drawn to equal length. a, *A. macleayi* Whitley, 1939; b, *A. fasciatus* Compagno & Stevens, 1993; c, *A. marmoratus* (Bennett, 1830).

When the outlines of the egg capsules of the three *Atelomycterus* species are compared (Fig. 6), it is clear that they are very similar. There seems to be a difference in relative width, but the eggs of *A. macleayi* and *A. fasciatus* fall in the range of *A. marmoratus* (ratios respectively 2.75, 3.35, and 2.6-3.5). The eggs of *A. fasciatus* seem to differ from the other species in the position of the constrictions, but more eggs are needed to confirm this. Although similar cat shark egg capsules are known (e.g. Waite, 1906), this type of egg capsule with two constrictions and short tendrils seems to be unique for *Atelomycterus*.

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