Description of the otolith of *Cheimerius nufar* Ehrenberg 1820 (Sparidae)

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Received 7 November 1979; accepted 13 March 1980

The shape of otoliths are species specific and the sagitta has been used for taxonomical studies (Hecht 1978; Hecht & Hecht 1978, 1979). Otoliths found in stomach contents of predators are used to identify the prey species (Hecht 1978). In addition, if the otolith-fish length relationships are known, the size of the prey species can be estimated.

Otoliths used in this study were collected from fish caught in Algoa Bay, Port Elizabeth (Coetzee 1978). A total of 446 sagittae were examined from fish of the size range 20 cm to 75 cm. Figure 1 illustrates the relationship between fish total length (tip of snout to tip of caudal fin), otolith length and otolith breadth. The otoliths of *C. nufar* showed more rapid growth in length (anterior posterior axis) than in breadth (Fig. 1), as is generally the case with most otoliths (Bagenal 1974).

The characteristic features and major changes in the shape of the growing sagitta were investigated. For this purpose the otoliths were divided into three arbitrary size groups, small (≤ 10 mm otolith length), medium (10–15 mm) and large (≥15 mm).

The morphological features and terminology used in the descriptions are based on that of Hecht (1978) and Hecht and Hecht (1978). All descriptions are of the medial surface of the left sagitta, unless otherwise stated.

Small sized sagittae (Fig. 2a): The medial and lateral surfaces are strongly convex and concave, respectively. Anterior and posterior margins are pointed, each forming a prominent tip. Dorsal and ventral margins are serrated, the latter more finely than the former. The rostrum is pronounced, the antirostrum small, but well defined and the excisura ostii is distinct. The posterior tip points ventrolaterally. The sulcus acusticus is slightly S-shaped, starting at the antirostrum and extending ventroposteriorly. The ostium flares towards the anterior margin and the length is approximately 35% of the total otolith length. The cauda dips ventrally, but does not open at the margin. The crista superior is well defined and more prominent than the crista inferior.

Medium sized sagittae (Fig. 2b): As the sagitta increases in size, the anterior margin becomes more pointed and the rostrum more strongly defined. The ventral margin is more finely serrated than the dorsoposterior and dorsal margins. On the lateral side, grooves radiate from the nucleus towards the dorsal margin (Fig. 2d). The crista inferior is absent whereas the crista superior is more prominent than in

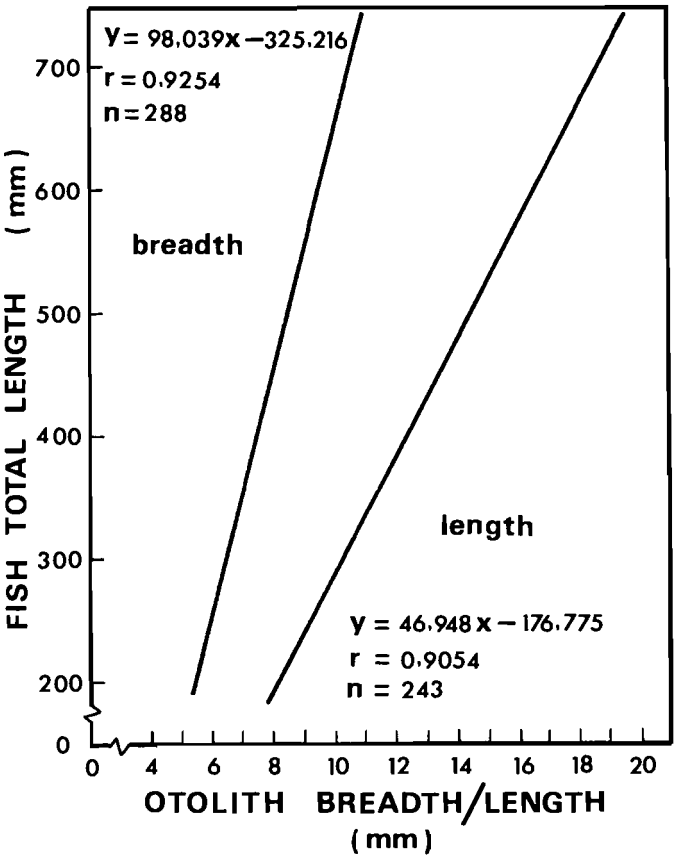

Fig. 1 Relationship between fish total length, otolith length and otolith breadth.

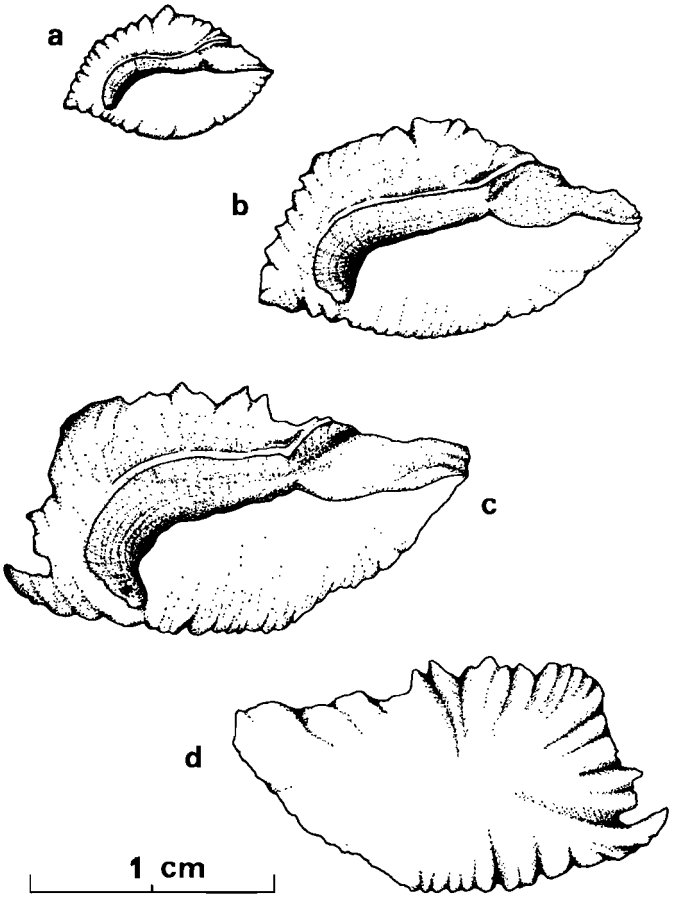

Fig. 2 The left sagitta of *Cheimerius nufar*. (a, b & c) Medial face of the small (≤10 mm otolith length), medium (10 – 15 mm) and large (≥15 mm) size ranges. (d) Lateral aspect of the large sagitta.

the smaller sagittae. An indistinct anterior colliculum is present.

Large sized sagittae (Fig. 2c, d): Posteriorly, the tip becomes very prominent and 'curls' dorsolaterally. From the lateral side the posterior protrusion is well defined, forming a ridge that runs to the nucleus (Fig. 2d). The dorsal, posterior and ventroposterior margins are coarsely serrated. Ventroanteriorly the margin is more finely serrated and less irregular. The ostium and cauda are clearly divided. Approximately 45% of the sulcus acusticus is occupied by the ostium; the latter flares towards the anterior margin. A prominent crista superior is present, which runs approximately 75% of the length of the sulcus acusticus (anterior to posterior); at the anterior margin it ends at the antirostrum. The ventral aspect of the sulcus acusticus is deeply grooved. The anterior colliculum is more prominent, but still not very distinct. Well defined grooves are present on the lateral side of the sagitta and they radiate from the nucleus to the dorsal and dorsoposterior margins (Fig. 2d).

Acknowledgements

I would like to thank Mr A Dye for commenting on the manuscript. Financial support from the University of Port Elizabeth and the Department of Environmental Planning and Energy are gratefully acknowledged.

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Distribution and tidal rhythmicity of a littoral amphipod

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Accepted February 1980

Amphipods of the genus *Hyale* are nestlers and numerically constitute a large portion of the littoral amphipod fauna of South Africa (Griffiths 1976). A study of the fauna associated with the littoral seaweed *Gelidium pristoides* (Turner) Kützing on St Croix Island in Algoa Bay (Beckley 1977) has shown *Hyale grandicornis* (Kröyer) to be the dominant amphipod in the epifauna.

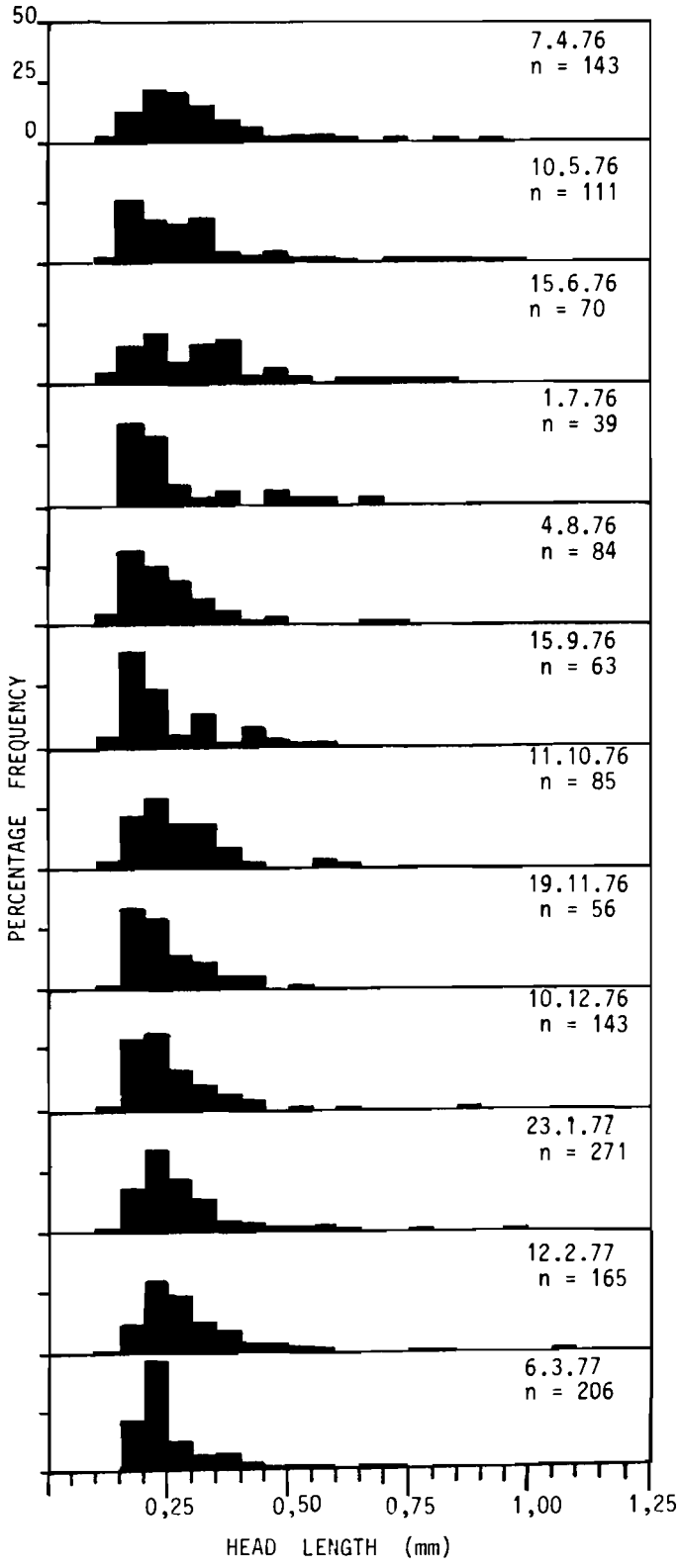

Fig. 1 Combined percentage size frequency histograms for *Hyale grandicornis* collected from *Gelidium pristoides* on St Croix Island.

A monthly sample of six *G. pristoides* tufts from each of three transect sites on St Croix (Beckley & McLachlan 1979) was obtained during the period April 1976 to March 1977. Twenty percent of the *Hyale grandicornis* specimens was subsampled and the head lengths measured along the dorsal midline using a dissecting microscope fitted with an ocular micrometer. The relationship between head length and total body length (head to telson) was determined from