

Gills Scanning Images of the Seawater Fish *Eugerres brasilianus* (Gerreidae)

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ABSTRACT

The gills of the adult fish, *Eugerres brasilianus* (Gerreidae) were analyzed in a scanning electron microscope. The stratified epithelium was uniform on all parts of the branchial arch. Concentric microridges were present on cells that form this epithelium and were mainly observed in the primary lamellae and pharyngeal region where mucous cells were also abundant. The ultrastructural features of *E. brasilianus* gills indicated that this was not a filtering species, and that the feeding habit included mainly the intake of small organisms. The results presently obtained agreed with other literature data which determined the feeding habit of this species by means of stomach content analysis and other aspects..

Key words: Gill, morphology, scanning, *Eugerres brasilianus*

INTRODUCTION

The species *Eugerres brasilianus* (Cuvier, 1830) is found along all Brazilian coast, specially during the summer. Several aspects of its biology have been studied (Eiras & Stofella, 1986; Eiras-Stofella & Fanta, 1991; Pérez-Hernández & Zavala-Hurtado, 1993). The branchial ultrastructural features of fishes has helped in the understanding of several physiological and behavioral aspects of different species (Eiras-Stofella, 1994; Vandenberg *et al*, 1994; Minbattiwalla & Gazdar, 1996; Dunel-Erb *et al*, 1997; Eiras-Stofella & Charvet-Almeida, 1997, 1998; Fernandes *et al*, 1998; Galvez *et al*, 1998). The present study reveals the images obtained of the branchial surface of *Eugerres brasilianus* and they indicate some functional aspects.

MATERIALS AND METHODS

Eleven adult fishes (12.5-18.0cm) of *Eugerres brasilianus* were obtained from trawl nets in the beach of Pontal do Paraná, south coast of Brazil.

The fishes were identified according to Menezes & Figueiredo (1980). The gills or branchial arches were submitted to the routine chemical, dehydration and gold coating treatment described in previous studies (Eiras-Stofella & Charvet-Almeida, 1997, 1998). The electronmicrographs were obtained in a Philips SEM-505 scanning electron microscope. The ultrastructural description of the gills was done through the analysis of the second gill arches of the fishes (Hughes, 1984).

RESULTS

The gills presented a strong curvature angle on the superior third portion of the arch. The branchial filaments were slightly shorter on the extremities of the arch and in the region of the curvature angle. Both sides of the arch presented similar morphological characteristics in relation to the filaments and to the rakers observed in the pharyngeal region (Fig. 1). The branchial filaments include wide primary lamellae which became thinner towards the tip of the filament. The secondary lamellae presented a discrete

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development (Fig. 2). The pharyngeal region showed pairs of rakers (Fig. 3). The rakers are short and formed by several saliences that contain many taste buds (Fig. 4 and 5). On the lateral sides of the arches there were groups of spines on the base of each raker and between the rakers a great quantity of taste buds was observed. The stratified epithelium of all gill was formed by cells with concentric microridges on their surface. The microridges were less abundant in the secondary or respiratory lamellae. Mucous cells were extremely common in the primary lamellae and in the gill pharyngeal region.

DISCUSSION

Comparison of the gill morphology of *E. brasiliianus* with other tropical teleosts (Eiras-Stofella, 1994) did not show any particular structural aspects. The abundance of mucous cells in the primary lamellae and in the pharyngeal region suggested that the production of this secretion provided greater protection to the small respiratory lamellae. Rakers which were not very prominent and the presence of several taste buds indicated that the food selection in this species was done through chemical receptors and not by the mechanical action of the branchial structures (Eiras-Stofella, 1994; Vanderberg *et al*, 1994; Eiras-Stofella & Charvet-Almeida, 1997,1998). *E. brasiliianus* is characterized by a highly protractile mouth (Pérez-Hernandez & Zavala-Furtado, 1993) but it has an omnivorous feeding habit, ingesting mainly on small organisms (Vasconcelos Filho *et al*, 1981; Eiras-Stofella, 1994). The structures of the gill arches of this species are particularly specialized and suited for this feeding habit. The presence of sturdy but not very well developed rakers, groups of spines and the lack of other ultrastructural features capable of developing a plankton feeding habit reinforces that food selectivity.

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RESUMO

Peixes adultos da espécie *Eugerres brasiliianus* (Gerreidae) tiveram suas brânquias analisadas em microscópio eletrônico de varredura. O epitélio de revestimento é uniforme em todas as porções dos arcos. É formado por células com micropregas concêntricas principalmente nas lamelas primárias e na região faríngea, locais onde são abundantes as células que secretam muco. A caracterização ultra-estrutural das brânquias de *E. brasiliianus* indica que a espécie não é filtradora e que em sua alimentação deve predominar a ingestão de pequenos organismos. Esses resultados estão de acordo com os dados da literatura que determinam o hábito alimentar da espécie através de análises de conteúdo estomacal e outros aspectos.

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