

PHYSIOLOGICAL FUNCTIONS OF THE EPIBRANCHIAL ORGAN
OF MILKFISH FROM THE POINT OF ITS ONTOGENY

by

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Abstract

The epibranchial organ of milkfish was believed for long to be a respiratory organ similar to that in Anabantoids. Later on, the structure was considered to be an accessory to the digestive system. The observations made by the authors on the physiological functions of the organ supports the latter views. This finding, probably would provide a new field of research on milkfish.

Introduction

Hyrtil (1863) was the first author to describe and draw a diagram of the pharyngeal organ of Lutodeira chanos (Chanos chanos) as a respiratory organ, called "die accessorishchen kiemen organe".

Since then many scientists have studied the structure of the organ mostly in lower teleosteam herbivorous fishes such as the elopiform and clupeiform fishes. They believed that the organ had a respiratory function similar to that in anabantoids. Heim (1935), however, corrected this concept by studying the structure of the organ concluding the organ to be an accessory to the digestive system.

Recently, Bertnar, et. al. (1969) summarized the studies along this line, and moreover, expanded our knowledge of the Clupeiformes (Clupeidae and Engraulidae), Gonorhynchiformes (Chanidae, Gonorhynchidae, Kneriidae, and Phractolaemidae), Osteoglossiformes, Salmoniformes (Salmonidae), and Cypriniformes (Characidae, Distichodontidae, Citharinidae, Curimatidae, Hemiodontidae, Prochilodontidae). They classified the structures into seven types.

Besides the contribution of Hyrtl, (1863) there are only a few papers dealing with the epibranchial organ of milkfish such as (Monod, 1949, 1961, 1963; Kapoor 1954; and Takashi, 1957). Among them, Kapoor attempted detailed studies on the anatomy

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and histology, and came to the same conclusion that the epibranchial organ of milkfish functioning principally as accessories to feeding and digestion. This was based on the finding that the inner surface of the pocket is lined with striated, squamous epithelium carrying a number of mucous cells.

Observations

We have observed a speck of food wrapped in mucous in both the organs. We also studied the structures which allow the passage of the food before and after coming to the organ. From these studies we gather the following:

The food accumulated between two rows of gill rakers on each gill arch are sucked into the organ under an automatic movement. The water sucked along with the food into the organ is ejected through the marginal canal which runs from the inner wall of the blind sac to the outer part of the gill rakers in buccal cavity. Then, the accumulated food is conveyed to the oesophagus. Enzyme which might exist in the organ are not yet elucidated. Thus, it appears that the organ is a part of the digestive system.

Surprisingly, the rudimentary epibranchial organ appears before any other parts of the digestive system and is observed in as early stage as 14 mm fry. The relationship between the development of the epibranchial organ and the number of gill rakers was found as follows:

Total length	Weight	Number of gill rakers	Epibranchial organ	Length of intestine
14mm	--	14	rudimentary	about 7mm(straight)
19mm	--	177	complete	19mm
62mm	--	250	-do-	(not examined)
	300g	430	-do-	(not examined)

Remarks

From the findings as mentioned above, we may attribute, reasons for, higher production in different milkfish culture systems especially because of the existence of this specialized organ and its function. The other words, we consider that the functional study of the epibranchial organ from the point of biochemical and habitual aspects provide a new field on milkfish problems for searching rational culture techniques from fry to adults.

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