

## A GENERALIZED STRUCTURE OF THE SCALE OF SPOTTED SCAT, *SCATOPHAGUS ARGUS* (LINNAEUS, 1766) USING LIGHT MICROSCOPE

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### ABSTRACT

This study provides basic information about the structure of scales of Spotted Scat, *Scatophagus argus*. Three regions of fish body were selected to study the variations in scale structure of *S. argus*. The result of light-microscopy shows that *S. argus* has spinoid type of ctenoid scales. Focus was absent in the scale and no or very few numbers of radii were observed only at the anterior margin of the scale and rarely in lateral fields of the scale.

**Key-words:** Spinoid scale, Ctenii, Radii, Circuli, lateral field, *Scatophagus argus*.

### INTRODUCTION

*Scatophagus argus* L. is commonly known as Spotted scat and locally known as Dateera and Korgi in Pakistan. They belong to order Perciformes and family Scatophagidae (Bianchi, 1985). Dorsal fin having X-XI spines and 16-18 soft rays. Anal fin with IV spines, the third spine is larger and stronger than others, and 13-15 soft rays. Body is quadrangular in shape and strongly compressed. They are Indo-Pacific fishes and reported from Fiji, Japan, New Caledonia, Samoa, Tonga and the Society Islands (Froese and Pauly, 2016).

Coburn and Gaglione (1992) studied the significance of scale characters in correct identification of fishes. Patterson *et al.* (2002) also used fish scales for their identification. Ferrito *et al.* (2003) studied microstructures on scale surface. Kaur and Dua (2004) and Jawad (2005) also signifies the role of scale characters in fish identification. Esmaili and Gholami, (2009) suggests the usage of different scale characters such as, shape of focus and its position, circuli, lepidonts and lateral line canal in correct identification of fishes. Matondo *et al.* (2010) described the significance of scale characters in discrimination of male and female sexes. Bendoy *et al.* (2011) found importance of scale variations in correct stock identification and conservation of species. Dapar *et al.* (2012) investigated the scale shape variations as noteworthy character in judgement of male and female sexes.

Due to the importance of fish scales in their identification and taxonomy, present investigation was made to describe the general structure of scale of *S. argus*. This study will be helpful in correct identification of this species.

### MATERIALS AND METHODS

A total of 54 specimens of *Scatophagus argus* were collected from the commercial landings at fish harbours of West wharf and Korangi creek, Pakistan. Samples were transferred to the laboratory. The three selected regions of fish body in order to study the variations in scale's structure are as follows;

Region A= scales from the head of the fish

Region B= scales from the abdomen of the fish

Region C= scales from the caudal peduncle of the fish

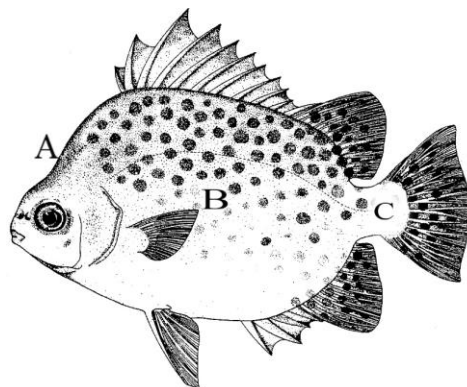


Fig. 1. Showing three selected body regions of *Scatophagus argus* (Modified from Bianchi, 1985).

Scales of *S. argus* were removed from the fresh specimens and kept into the paper envelopes with proper labeling. Slides of scales for the microscopic study were prepared following the method of Esmaili *et al.* (2007). Scales of each selected body regions were cleaned with 10% NaOH and then dehydrated with 30, 50 and 70% Alcohol. Scales were dried with filter paper and then placed on a clean glass slide. The slide containing the scales were covered with another glass slide to protect the scales from curling and damaging. Slides were studied under the light microscope. Photographs of scales were taken by a digital camera, attached to the microscope.

## RESULTS AND DISCUSSION

The different parts of scales of *Scatophagus argus* are shown in Fig. 2(A-D). The general structure of scales of *S. argus* studied under light microscope, shows the spinoid type of ctenoid scales in *S. argus*. The scales do not have the focus region. Scales have several circular lines in lateral and anterior region. These circular lines were sectioned with straight grooves called radii. The radii were in very few numbers on scales and sometimes these radii were found totally absent from the scale surface.

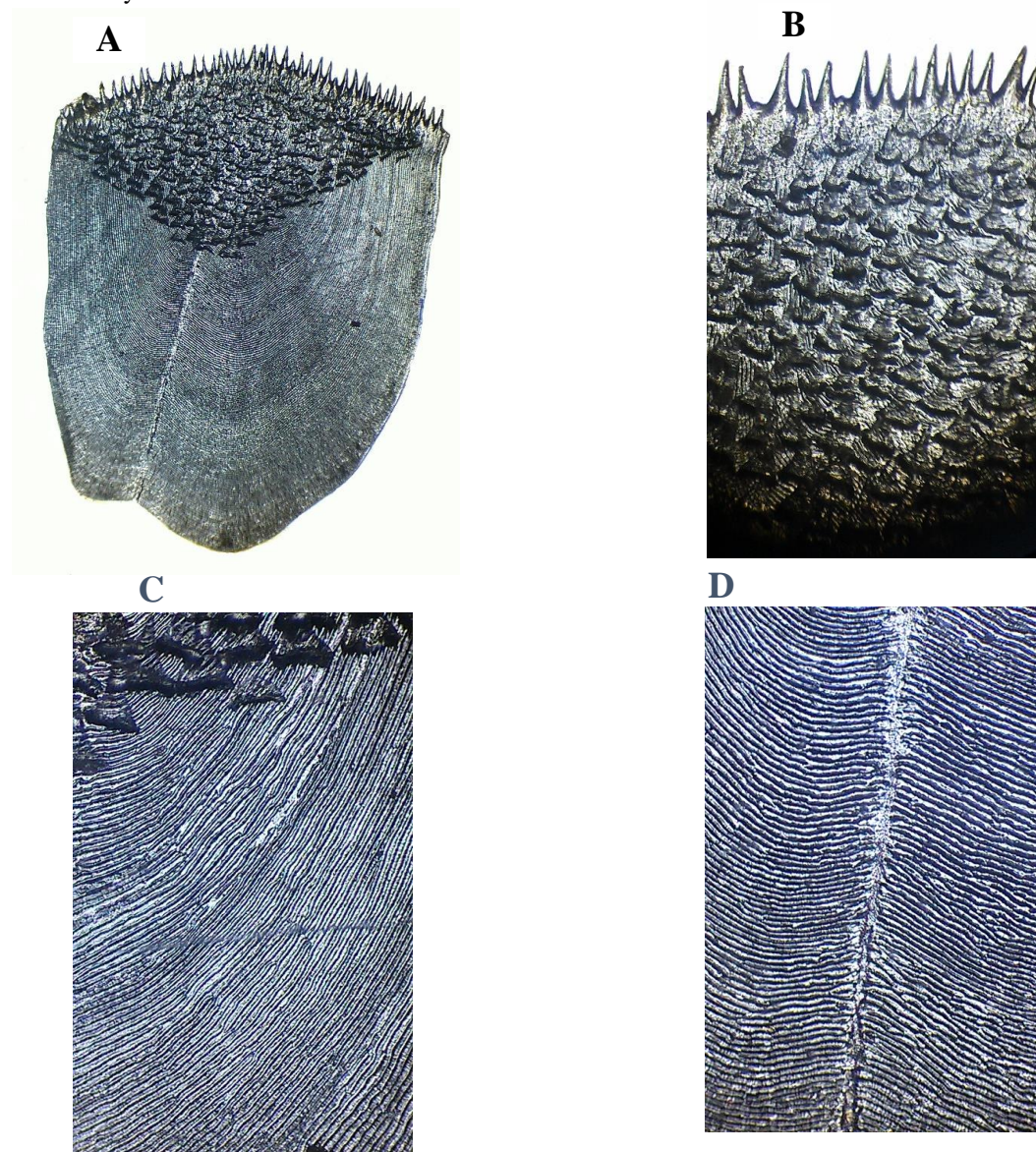


Fig. 2. Showing different regions of scales of *Scatophagus argus*.

A- Scale of *S. argus*, B- Teeth like structures or Ctenii, C- Lateral field of scale showing circular lines or circuli, D- Straight groove or radii.

Roberts (1993) have classified ctenoid scales into three types; 1) crenate scales, 2) spinoid scales and 3) whole ctenoid scales. Crenate scales have simple indentations on their posterior margin while, spinoid scales have complete ctenii directly attached to the main body of the scale. The whole ctenoid scales having ctenii separate from the main body of the scale. During this research, spinoid type of ctenoid scales were investigated from the three body regions of *S. argus* (i.e., head, body and caudal) which is also in agreement with the findings of Roberts (1993).

Focus is the center part of a scale and divides a scale into anterior, posterior and lateral fields (Esmaili *et al.*, 2007). Despite this, during present study, it is observed that scales of *S. argus* lack the focus.

The radii can be classified into three types: 1. Primary radii originate from the focus of the scale and reached up to the margin of the scale, 2. Secondary radii originate from midway between the focus and the margin of the scale and 3. Tertiary radii originate between midway and the margin of the scale (Esmaili and Gholami, 2011). According to Esmaili *et al.* (2009) radii provides the flexibility to the scale and the higher number of radii represents the good nutritive condition of fish. While, during this study, very few radii were found in the form of straight grooves at the anterior part of the scale of *S. argus* and very rarely in lateral fields of the scale.

## CONCLUSIONS

From the results of present investigations, it can be concluded that the spinoid type of ctenoid scales, absence of focus and very few numbers of radii are some of the important scale characters which can helps to identify *Scatophagus argus*.

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