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An Overview on Circular, cartilaginous, and bony fish

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Abstract

I Characteristics of the inner ear in bony and cartilaginous fish. With the exception of the division of Chondrichthyes into Holocephali and Elasmobranchii, which is denoted by an asterisk, the phylogeny was modified. The number of species researched with regard to inner ear morphology is shown in bracketed numbers. ASC stands for the anterior semicircular canal, and PSC stands for the posterior semicircular canal. Macula utriculi (utr.): S, standard pattern, consisting of opposing ciliary bundles in the striola region and radially orientated ciliary bundles on the cotillus; The horizontal groups in the anterior region of the macula sacculi (sac.) are caused by the orientation of the ciliary bundles, which follow the curvature of the macula. Numbers show the number of ciliary bundle orientation groups; O stands for opposed ciliary bundle groups, and V for vertical ciliary bundle orientation.

Keywords: Fisheries and aquaculture, Holocephali and Elasmobranchii,

Introduction

For hundreds of millions of people worldwide, fishing and aquaculture continue to be vital sources of food, nutrition, money, and livelihoods. The amount of fish consumed globally per person increased to a new high of 20 kg in 2014, largely due to aquaculture, which now produces half of all fish for human consumption, and a minor improvement in the condition of some fish populations as a result of better fisheries management. Additionally, fish remains one of the most traded food commodities globally, with poor nations accounting for more than half of the value of fish exports. The fisheries and aquaculture industries provide a living for a considerable portion of the global population. Fish has a high protein content, low cholesterol, and high proportion of polyunsaturated fatty acids, liposoluble vitamins, and vital minerals, particularly those containing omega fatty acids, which are reasons why it is popularly consumed throughout the world.

Fish output for human consumption worldwide has greatly expanded, rising from 67% in the 1960s to 87%, or an expected even higher number of tonnes in 2014. The other 21 million tonnes, which were meant for non-food items, were mostly used for a variety of reasons, such as raw materials for direct feeding in aquaculture, of which 76% in 2014 were concentrated into fishmeal and fish

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oil. International commerce contributes significantly to economic growth and development, food and nutrition security, employment creation, food supply, income generation, and all of these outcomes in the fisheries and aquaculture industry. With 78% of seafood goods estimated to be subject to international trade rivalry, fish and fishery products are the most traded segments of the global food sector. Many nations' economy depends on the export of fish and other fishery products. According to the National Policy on Marine Fisheries of 2017, India has an Exclusive Economic Zone (EEZ) of 2.02 million sq. km, a long coastline of 8,118 km, and two major groups of Islands, all of which are home to rich and diverse marine living resources. The annual harvestable potential of marine fisheries is estimated to be 4.412 million metric tonnes; an estimated 4.0 million people rely on the resources for their livelihoods; and marine fisheries also contribute to an economy

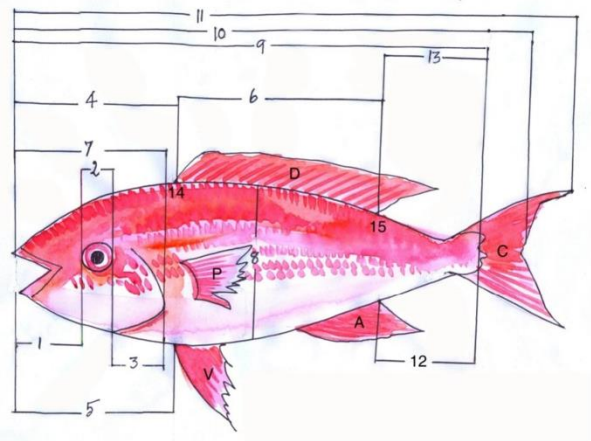

Figure 1: Borne fish

LITERATURE REVIEW

According to Venkataraman and Raghunathan (2015), India has a coastline of about 8000 km and an Exclusive Economic Zone (EEZ) covering 2.02 million km2, of which 0.86 million km2 are on the west coast, 0.56 million km2 are on the east coast, and 0.6 million km2 are located around the Andaman and Nicobar Islands. Indian ichthyology has a long and inspiring history. Day (1875-1878, 1889a, b), Whitehead and Talwar, and others have written succinct histories of early Indian

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ichthyology (1976). Francis Day's (1875–1878) work The Fishes of India is the most significant of the publications written on Indian fish. We have learned a lot about India's fish resources thanks to the books Commercial Sea Fishes of India by Talwar and Kacker (1984) and Fishes of the Laccadive Archipelago by Jones and Kumaran (1980). According to Venkataraman and Raghunathan (2015), India has over 2546 species of marine fish, of which 154 are chondrichthyes (cartilaginous fish) and over 2275 are actinopterigii (bony fishes). The database of Indian fish has grown to 2629 species as a result of recent investigations (Ramakrishna et al., 2010).

Methods

Biological - Character The gonadosomatic index (GSI) was computed for both sexes, and the formula for calculating the percentage of gonad weight in relation to total body weight is as **follows:** In order to measure the percentage of gonad weight in relation to total body weight, the gonadosomatic index (GSI) was developed for both sexes.:

$$GSI = \frac{Weight\ of\ gonads}{Weight\ of\ body} * 100$$

Condition factor (Fulton factor): Using Fulton's condition factor, the health of each dominating species was investigated (Htun-Han, 1978). Calculating the Fulton condition factor (%) is as follows:

$$K = \frac{(TW)}{(FL)^3} * 100$$

Result and Discussion

The morphometric and meristic characteristics of threadfin bream taken from the coastal seas of Chennai and Kochi were examined using cluster variation. Table 1 is a list of the variables that were examined for this particular study. Indicate the number of variables in each cluster, the variance within the cluster, the total variance explained, and the percentage of the total variance accounted for by the variables within the cluster.

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Table 1: Variation in meristic and morphometric features for 3 clusters by oblique centroid component analysis

Oblique Centroid Component Cluster Analysis Cluster Summary for 3 Clusters					
Cluster	**Members**	**Cluster Variation**	**Variation Explained**	**Proportion Explained**	**Second Eigenvalue**
1	5	5	4.509411	0.9019	0.2738
2	8	8	7.277176	0.9096	0.4180
3	2	2	1.790684	0.8953	0.2093

Total variation explained = 13.57727 Final Proportion = 0.9052

The sum of the explained variance across all clusters is shown in the table's "Variation Explained" column. The final "Proportion" listed below Table 1 is the sum of the cluster variations divided by the overall explained variation. The three clusters may account for nearly 91% of the total variation in the data, according to this figure of 0.9052. The clustering of the variables is shown in Table 2 below.

Table 2: Cluster analysis of meristic and morphometric characters

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3 Clusters		R-squared with		1-R**2 Ratio
Cluster	Variable	OwnCluster	NextClosest	
Cluster 1	HL	0.9511	0.8738	0.3872
	TL	0.9127	0.8948	0.8295
	DFL^{min}	0.7854	0.5149	0.4423
	DLF^{max}	0.9281	0.7227	0.2592
	POL	0.9320	0.7451	0.2666
Cluster 2	SL	0.9281	0.7600	0.2997
	STL	0.9851	0.8120	0.0794
	FL	0.9747	0.8888	0.2275
	BD	0.9142	0.7445	0.3359
	ED	0.6223	0.4684	0.7106
	PDL	0.9332	0.8636	0.4902
	PPD	0.9577	0.7900	0.2013
	WDF	0.9620	0.7831	0.1753

Conclusion

It was extensively researched for a variety of topics, including maturity, spawning and fecundity, biology, population dynamics, and discrimination; nevertheless, there are little studies on the morphometric and meristic traits of this species. The study of these factors essentially advances our understanding of how various species—located in various regions—grow on an individual basis. The morphometric correlations between fish body components are important for taxonomic study, but they can also be used to evaluate an individual's health and spot potential differences between different unit populations of the same species. Additionally, an environmental explanation of morphometric differences would advance our knowledge of the various local populations' modes of existence and aid in the creation of a sound conservation strategy.

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