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ANALYSIS ON FISH CLIMBING PERCH (*ANABAS TESTUDINEUS,* BLOCH) IN DARBHANGA, BIHAR

Bimlesh Kumar
Research Scholar , L.N.M.U. Darbhanga.

ABSTRACT

The perch (Anabas testudineus) is one of Malaysia's most costly indigenous freshwater fish. The fecundity of this genus has been examined. From October 2017 to May 2018, Sthan Chauraha, Darbhanga, Bihar collected 70 gravid women from the waterbodies. Regarding fish with a total length (TL) of 12.4 – 19.2 cm and average SD of 16.13±0.249 cm, 33.22 – 137.19 g and medium body weight 1181.85± 356.12 g, the reported fertility (F) ranged from 3120 to 84.690, average deviations of 36.804 + 2.289 were identified. Fecundity and Total Body Weight, Fecundity and Ovarian (OW), Fecundity and Gonadosomatic Index (GSI), respectively, co-efficient 0.524, 0.473, 0.977, and 0.808. Relationships were also formed between ova diameter (OD) and total body weight (BW). When they were plotted against fecundity, the TL, BW, OW and GSI regression line of sample fish was found to be linear. There were strongly significant variables all observed (P < 0.05).

KEYWORDS: *Climbing perch, Anabastestudineus, bloch.*

INTRODUCTION

In fresh water fish the air respiratory structures were recorded to have been formed as an adaptation to hypoxic water conditions due to severe recurrent droughts during the Late Silurian or Early Devonian era(Smith, 1931;Johansen,1970)[14]. Recent studies of air respiring fish have shown that various types of morphological and physiological adaptations enabled fish to be used These fish are engineered in a manner that helps them to optimise their habitat. Morphological and physiological adaptations. The physical-chemical characteristics of the habit, the existence of biota, food chain and finally the morpho-physiological adaptation of animals have an intimate relationship.

Air structures are adjusted for a number of conditions for fish. In the case of low O2 and high CO2 inhabitants (Carter, 1957) [7], the adaptive features have been identified and structural modifications have been included that make it possible for their owners to blow air. The three genera of living dipnoans are of particular interest in this relation because they are nearest to what is considered to be the line of evolution of the tetrapod. Comprehensive air respiration fish experiments using sophisticated methods, These genres have been recently developed[9], but now the emphasis is based more on the adaptations of the air breathing televos (Jesse, Shub & Fishman,1967, Johansen & Lenfant, 1967,1968; Lenfant, Johansen & Grigg, 1966; Lenfant, & Johansen, 1968; McMahon, 1969),[8,9] Although not so important from the evolutionary perspective, studies of these types nevertheless prove invaluable by suggesting potential solutions to the fundamental physiological problems occurring during the water to land transition (Hughes 1966).Many of these studies have shown a reduction in total oxygen consumption when a fish breathes air by itself, and the absorption of oxygen through the skin, as in an angel, but the role of gills on oxygen intake has shown itself to be significant in land use in this fish as in mudskipper. The South African mudship skipers studied by Gordon etal. (2013)[11] were nevertheless not behaving as such, with their low oxygen usage constantly withdrawn from the water, but they were exhibiting bradicardia. If most fish were seen out of water, the Australian mudskipper (Garey, 1962) did not find the opposite. The South American teleost, the Samaranch one, also uses its air-breathing gills (Johansen, 1966); CO2 removal to water, in the case where both media are available, is more necessary than in air.

Anabas, a further popular air-breathing fish that represents an entire community of so called labyrinthine fish coming to the surface to get air and placed into a superbranchial cavity that has its own labyrinthine organs. This gaseous exchange between the blood and the air that circulates in the labyrinthine flat and the superbbranchial cavity is carried out by very fine sets of capillaries. While labyrinth plates were known to be modified gills, electron microscopy studies were found (Hughes & Munshi, 1968, 1970) [10], since they are not previously thought to be the typical pillar cells. The distances between the water and the blood of those fish are very great above most of the secondary lamellae (15-29 / s), but in the marginal area, they are considerably shorter than (5-8 fans) (Hughes & Munshi 1970). These distances contrast with the very short diffusion distance that can be less than 0-3 /im in the air respiratory organ. The area of the secondary lamellae in Anabas is very small (Saxena, 1962), and the labyrinthine plate and internal surface of the suprabranchial cavities is around J-J (Hughes, 1970).

The aim of this analysis is to examine the relative functions of the gills and accessory organs in this fish's respiration, when the air and/or water pressures of the respiratory gases and under various conditions of access are changed. Experiments have been limited to those that do not conflict with fish. The classical studies of Willmer (1934)[16] on Erythrinus suggested that not only the content of Oa but the CO2 content of the air and water was a leading factor in use of aerial or aquatic respiration, which led him to plot the first diagram of O2 / CO2In terms of functionality and the physical characteristics of the media (Hughes, 1966), it was proposed that Anabas may be involved more in COA disposal than in accessory organs and that these might be more important from the point of view of the use of oxygen. In addition to this function, gills have been shown to be especially critical in the lease of carbon dioxide at least when the fish is in water. The breathability organs can be highly successful in meeting the oxygen needs of the animals.

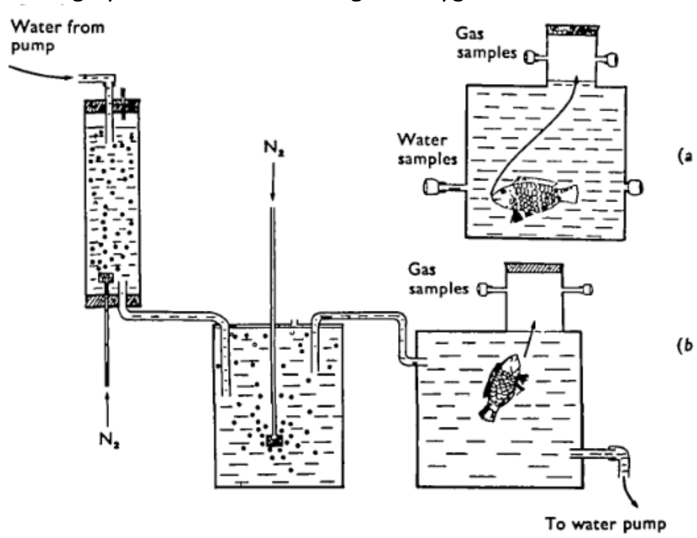


Figure. 1. Apparatus diagram used in calculating Po, water and air shift during Anabat breathing. (a) Air and water samples are taken as indicated from the therubber connectors. (6) Respirometer flow-through used in the study of indomogenous water respiration.

METHODOLOGY:

From October 2017 to May 2018, a total of 70 female fish were collected for determining fertility and ovary weight from Kusheshwar Sthan Chauraha, Darbhanga, Bihar. To differentiate the matured females, external morphological properties were used. The bulky abdomen of female fish was easily recognised as ripened. The selected fish were washed clearly with tap water in the laboratory. The total length (TL, cm) for each fish has been determined by an electronic balance with the scale to the nearest mm and the body weight (BW, g). Before pesing the fish excess water was separated from fishes by blotting paper.

The dissection and weighting of the gonads is as close as 0,01 g. As a gonad weight divided by a total weight multiplied by a hundred, gonadosomatic indice(GSI percent) was measured. After weight, the ovary was set to a list of fertility at 4% formalin. Gravimetric approaches were pursued to estimate fertility (Hunter et al , 1989). The anterior, middle and posterior parts of the two lobes of each ova were taken from three cross-sectional samples. Eggs were counted and the mean number of eggs was then determined in each of the three parts (Lagler, 1956; Doha and Hye, 1970; Das, 1977; Hossain et al, 1992). The overall number of eggs was calculated on the mean sample and total weight of the ovaries for each woman.The size of the ova was measured by 20 randomly selected eggs per female fish in diameter. A LEICA phase contrast microscope was used to measure egg diameter. The relations of fecundity (F) and TOL (TL) were determined by measuring the regression coefficients of body weight (BW) and ovary weight (OW). There was also a relationship between total (TL) and ova diameter (OD), body weight (BW). The interception point and correlation coefficients (r) are determined according to the lowest square method (Jhingran, 1961; Swarup, 1961).

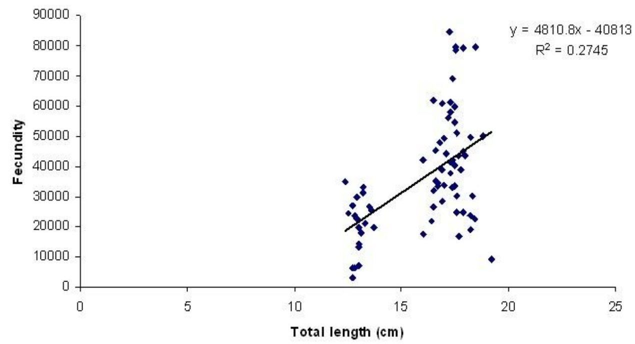
RESULTS AND DISCUSSION

The A's ovarie. Testudineus is an organ which lies only in a ventral location in the air bladder and which has a thin membrane mesovarium attached to the corpus. The ovary formed like a spindle on the left is slightly longer than the ovary on the right and remain separated for all its length. At approximately two thirds of their length, the two ovaries fuse together into a thin walled ovum opening out through the genital pores. Behind the oviduct, the last one third of the ovary remains a later extended sack. The ripened ovary has a distinct granular aspect, orange-yellow colour. Ova can be seen in naked eyes by the ovary wall [1].

The study found that 70 women's fecundity fish were found to differ from 3120 to 84,690, mean by 36,804 + 2289 for fish with a total length of 12.4 – 19.2 cm and mean by mean by variance of (16.13±0.249 cm), and that their body weights were range from 33.22 – 137.19 g with a mean and variance of (7.13±0.249 cm) and mean.

The relation between the total fecundity and the length of the body is expressed by a Y = a+bx equation whereby Y = fertility(TF), X = total intercept length(TL), coefficient of regression(b) and coefficient of correlation(r) are presented in figure 2. Regression Equation TF= -40813 + 4810.8TL has been determined. There was a linear relation between fertility and total fish body length. The correlation coefficient is positive since 'r' value is 0.524. The egg count is 3120 if the length of the body exceeds 12,7 cm (Table.1). With the body length of 17.24 cm, the maximum volume of eggs is 84,690 in the ovary

Figure 2: Relation between fertility and climbing perch total length (Anabas testudineus)



The fecundity (TF)-total fish body weight (BW) relationship was measured and expressed in the F=10844 + 330.31BW equation. There was also a positive linear association and r was = 0.473 (Table 1 and Fig 3). Table 1. For the corresponding bodily fish weigh 35.54 and 94.70 respectively, the minimum and maximum number of eggs shall be determined as 3120 and 84690[4].

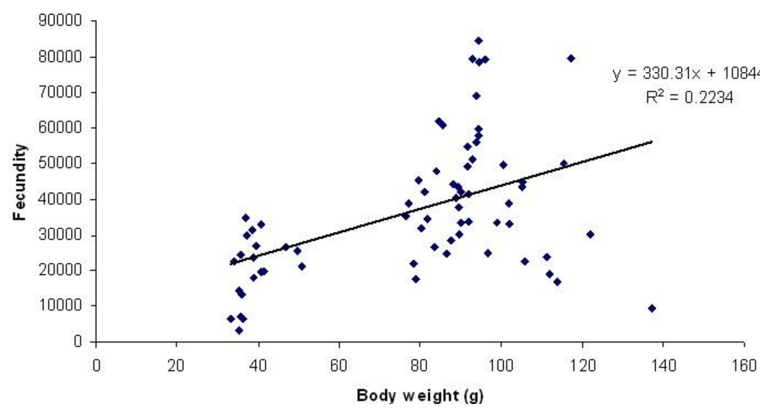


Figure 3: Fecundity / weight link Climbing perch (Anabas testudineus) Relationship

Figure 4 shows the ratio of fecundity (TF) to ovary weight (OW), with a mean ovarian weight value of 7.978± 0.51 g. The ratio of ovaries to ovaries is constant, expressed in formula F = 2109.6 + 4348.4OW .. For 0.60 g of ovary, the minimum number of ovary and for 16,70 g of ovarian weight is measured as 3120 and the maximum number is 84690. This is an exceptionally optimistic and substantial association since its 'r' value is 0.977.

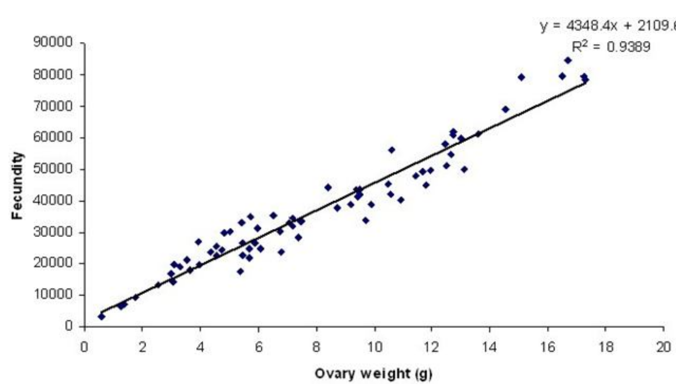


Figure 4: Relation between Climbing perch (Anabas testudineus) fecundity and ovarian weight.

Fecundity-gonadosomatic index relationships (percentage) are also linear and expressed in equation TF=-2427.3 + 3878.3GSI (Fig . 5). The correlation coefficient between the egg number and GSI (percent) is positive because 'r' is 0.808. All the relations drawn in this analysis for the various variables based on the correlation co-efficient (r) values show that this relationship is linear and positive.

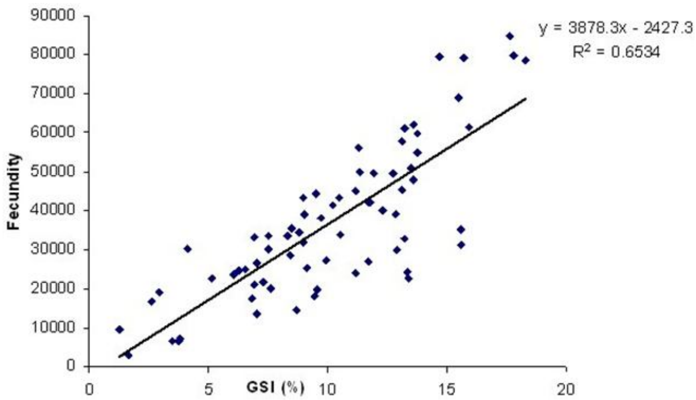


Figure 5: Relation from fecundity (Anabas testudineus) to GSI (percentage) of climbing perch

Diameter of eggs between 0,54 and 0,80 mm was observed. There is also a linear relationship between the entire length and the ovum diameter which is expressed by OD = 0.4744 + 0.0126Tl (Fig . 6).

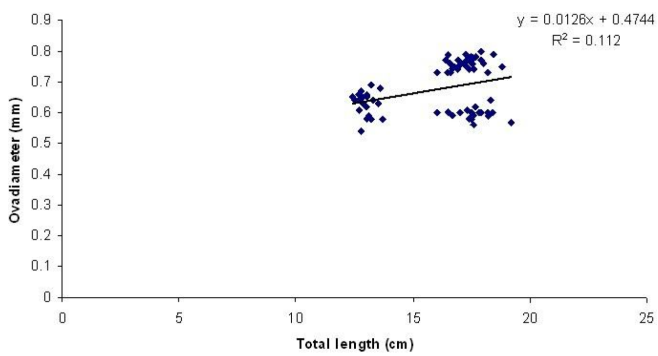


Figure 6: Relationship between total length and ova diameter of Climbing perch (*Anabas testudineus*)

The correlation coefficient between the total fish length and the ova diameter is positive, since 'r' is 0.334. Figure shows the relation of ova diameter to fish body weight. Equation = 0.6154 + 0008BW and expressed by 7. In the current analysis, there was a positive correlation with a r value of 0.278. The smallest graved fish, with a full length of 12.4 cm and weight of 36.84 g were found in the current study, with eggs of 0.65 mm medium diametre, while the biggest fish had an egg diameter of 0.57 mm in total with a total length of = 19.2 and a body weight of = 137.19 g. In fish of the intermediate size of the total length = 17.90 cm and weight 105.26 g, the eggs with the maximum mean diameter of 0.80 mm were discovered [6].

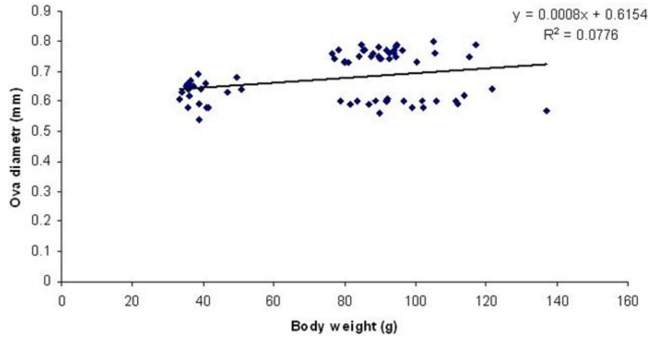


Figure 7: Body weight association with the diameter of ova (Anabas testudineus) Climbing perch

Table 1: Complete length (TL), body weight (BW), ovarian weight (OW), GSI percent, 70 gravid of Complete Fecundity (TF)

females of climbing perch *(Anabastestudineus)*

SL NO	Total length of the fish (cm)	Total weight of the fish (g)	Total weightof the ovaries(g)	Gonadosomatic index (GSI%)	Fecundity	M ean oocyte diameter (mm)
1	13.2	38.46	5.99	15.57	31148	0.69
2	12.5	35.71	4.77	13.36	24327	0.64
3	13.2	40.9	5.41	13.23	33001	0.58
4	12.4	36.84	5.74	15.58	35014	0.65
5	13	40.73	3.11	7.64	19904	0.66
6	12.8	38.9	4.35	11.18	23925	0.54
7	12.7	39.5	3.93	9.95	27117	0.64
8	13.6	49.56	4.54	9.16	25424	0.68
8	13.3	50.8	3.52	6.93	21120	0.64
10	12.9	37.37	4.83	12.92	29946	0.65
11	13.1	38.89	3.67	9.44	17983	0.59
12	12.9	34.03	4.56	13.4	22800	0.63
13	13	35.27	3.07	8.7	14429	0.65
14	13.7	41.55	3.97	9.55	19850	0.58
15	12.8	36.38	1.27	3.49	6477	0.67
16	13	36.1	2.54	7.04	13462	0.62
17	12.7	33.22	1.26	3.79	6426	0.61
18	13.5	46.67	5.47	11.72	26803	0.63
19	13	35.65	1.36	3.81	7208	0.58
20	12.7	35.54	0.6	1.69	3120	0.66
21	18.3	121.91	5.02	4.12	30120	0.64
22	18.2	111.93	3.29	2.94	19082	0.59
23	19.2	137.19	1.76	1.28	9504	0.57
24	17.7	113.71	3	2.64	16800	0.62
25	17.30	92.08	9.42	10.23	41460	0.61
26	17.60	89.83	6.74	7.50	30116	0.56

Table 1: Continue

27	17.50	99.10	7.45	7.52	33404	0.58
28	16.70	81.80	7.20	8.80	34432	0.59
29	17.60	86.74	5.68	6.55	24998	0.59
30	16.50	83.60	5.89	7.05	26600	0.60
31	18.20	111.39	6.80	6.10	23728	0.60
32	17.90	96.61	6.10	6.31	24674	0.60
33	17.00	92.10	9.72	10.55	33708	0.60
34	17.00	91.67	11.66	12.72	49478	0.60
35	17.80	101.80	9.21	9.05	38998	0.60
36	17.40	102.04	7.07	6.93	33058	0.58
37	17.50	88.80	10.91	12.29	40214	0.60
38	18.40	105.99	5.48	5.17	22692	0.60
39	16.00	79.06	5.40	6.83	17556	0.60
40	17.30	89.53	8.72	9.74	37980	0.75
41	16.70	90.21	7.51	8.33	33352	0.74
42	18.00	105.45	9.50	9.00	43472	0.76
43	16.50	80.30	7.20	8.97	31976	0.73
44	16.60	79.74	10.48	13.14	45200	0.73
45	16.80	84.07	11.44	13.61	47994	0.75
46	17.60	92.84	12.51	13.47	51060	0.74
47	18.20	100.44	11.96	11.91	49718	0.73
48	18.80	115.38	13.11	11.36	50030	0.75
49	16.90	87.55	7.37	8.42	28582	0.75
50	16.00	81.20	9.50	11.70	42014	0.73
51	16.40	78.30	5.71	7.29	21802	0.77
52	16.90	77.12	9.90	12.84	38928	0.74
53	17.90	105.26	11.79	11.20	45144	0.80
54	17.40	90.08	10.58	11.75	42128	0.74
55	18.45	117.27	17.24	14.68	79614	0.79
56	17.31	94.53	12.44	13.12	57912	0.75
57	17.07	88.20	8.40	9.52	44248	0.76
58	17.21	94.00	10.61	11.28	56276	0.76
59	17.90	96.28	15.10	15.70	79266	0.77
60	16.90	85.79	12.74	13.20	61020	0.77
61	17.55	92.84	16.50	17.78	79674	0.76
62	17.69	89.64	9.41	10.49	43418	0.78
63	17.52	94.60	17.30	18.29	78386	0.78
64	17.47	91.77	12.65	13.74	54878	0.77
65	17.50	94.50	13.00	13.76	59700	0.78
66	17.38	93.81	14.53	15.46	69050	0.77
67	17.30	85.50	13.60	15.90	61350	0.77
68	16.60	76.63	6.51	8.49	35340	0.76
69	17.24	94.70	16.70	17.63	84690	0.79
70	16.50	84.79	12.74	13.60	62015	0.79
M ean	16.134	78.596	7.978	10.115	36804	0.678
SD	0.249	3.275	0.510	0.477	2289	0.009

DISCUSSION:

In the present analysis, the range of fertility of A testudineus has differ in length and weight from 3120 to 84690 to 12.7 cm–17.24 cm and 35.54–94.70 g. The variations in the fertility rate were very normal and observed by Doha and Hye (1970) in the fish and rely on several factors such as sizes, age and environmental conditions the number of eggs produced by a female person. The availability of room and food (Mookeerjee and Mazumder, 1946) also affects the reproductive capacity of fish.

The largest individual fish with 19.2 cm long and 137.19 g body weight were found with 9504 eggs and 35.014 eggs were found to hold the smallest fish with a length of 12.4 cm and a total body weight of 36.84 g. But even for women of similar length and body weight, the difference of fertility was noticed. A fish with a total length of 17 cm, weight 92,10 g and ovary weight 9,72 g produced 33708 eggs during this research, while another fish with the same length produced 49478 eggs. Likewise, 57912 eggs and 61350 eggs respectively were produced in two other fish with a length of 17.30, and 17.31 cm (Table1). In addition, Marimuthu et al, (2006) in Hilsa ilisha and Musa and Bhuiyan (2007) in Mystus bleekeri were reported on the same form of variation.The disparity in the fertility of the fish is thought to be due not only to the length and weight of the fish but also to diet, flowing water and vitamin factors (Dube, 1993). In addition, the climate and the availability of food and supply in water bodies can have an effect on fish fertility (Bagenal, 1957). The variance in the fruitfulness of the A is probable. The environmental conditions of the river and water bodies can result in testudineus. The statistical analysis showed that in candidate organisms the linear relationship between the fertility- fish length and the fertility-body weight was observed. The study showed that fertility increases linearly by increasing the total length, weight and gonadal weight (Table.1). The connexions found in this analysis agree well with previous studies of this species (Khan and Mukhopadhyay 1972).

Fecundity-to-other parameters correlation values illustrate that difference in fertility can be clarified very easily with respect to a fish's body weight. A linear fecundity-weight relation in various TV species such as Mystus gulio (Rao, 1981) has been reported; Mystus cavasius (Sharma, 1987); Etroplus suratensis (Jeyaprakas et al, 1990); Channa. Gachua (Mishra, 1991); Labeo boggut (Patil and Kulkarni, 1995); Channa ponctatus (Marimuthu et al., 2006); Hilsa ilisha (Akter et al, 2007) and M ystus bleekeri (Musa & Bhuiyan, 2007) and Heteropneustes fossilis Footnote 2 (Mishra & Rao, 1992). Even in people of the same length and body weight, differences in the egg size were also noticed. Ezenwa et al, (1986) reported similar comments. Similar comments. The differences are possibly due to differences in each ovulation cycle and in the development stage of eggs, Ezenwa (1981). In the current fecundity analysis this was shown by A. Compared with carps, other species of catfish and other breathing air fish, testudineus is low fecund. Similar remarks were made by Khan and Mukhopadhyay (1972). The lower number of eggs can also be associated with shorter development time and decreased frieze and fingering mortality, which means higher survival during the youthful age. Further tests, including histological testing, embryo and larval growth, age and first ripeness, and so on, are important in determining the annual reproductive biology.

CONCLUSION:

The air-breathers are not only common in India as warm water tropical fish but the Indian biologists have made important contributions in understanding their functional morphology. Gross morphology and the behavioural dimensions of air respiration fish have been studied in greater detail than the physiological and morphologic dimensions applied to the impacts of contaminants. The use of more chemicals in our food and the contamination of the atmosphere is likely to change the functional morphology of air-breathing fishes. Therefore, studies of this aspect would have fresh and far-reaching opportunities.

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