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## Fecundity, spawning and ova diameter of the *Wallago attu* from Bhadar reservoir of Gujarat, India

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### Abstract

The present study is conducted at Bhadar reservoir landed of Rajkot in Gujarat, India. Duration of work was 8 months and total number of sample was 225. The spawning percentage was higher during the month of August (82.56%) and lower in December (53.34%). The averaged total spawning percentage was 60.02%. The absolute fecundity of *W. attu* ranged from 16565 – 29883. Monthly average fecundity of *W. attu* was 22171. The annual average fecundity per gram body weight was 10. The average fecundity determined for the study period of one year was 22717. The annual average ova diameter was 1.38 cm (range 1.1 – 1.9 cm).

**Keywords:** *Wallago attu*, spawning, fecundity, ova diameter

### Introduction

Fecundity is one of the most important biological aspects of fish. This must be known to assess the productive potential and to evaluate the commercial potentialities of a fish stock. For efficient fish culture and effective management practices it is prime importance to know the fecundity of fish. Moreover, the study is also essential to determine the index of density dependent factor affecting population size (Kabir *et al.*, 1998) [1]. Information on the reproductive biology of fish is considered as paramount importance for sustainable management of exploited stock. It includes knowledge of fecundity, diet composition and sex ratio which are essential for evaluating the commercial potential of stock, life history, practical culture and actual management of the fishery (Kareem *et al.*, 2015) [2]. The most suitable method of determining the reproductive cycle of fishes is to observe seasonal developmental changes in gonads. This maturation cycle has been described as morphological changes that gonads undergo to attain full growth and ripeness. The term fecundity can be expressed as the number of eggs laid in one season by the species. The egg production varies not only among different species but also within the same species depending upon the length and weight of gonad and influenced by the environment (Nandikeswari, 2016) [3]. The reproductive biology of fish is an essential factor that enables the determination of the appropriate management practice to conserve species of fish in their habitat. Fecundity is the number of ripening eggs in a female prior to the next spawning season. Ripe ovaries are appropriate for fecundity estimation. The present study was to estimate fecundity, spawning and ova diameter of *W. attu* because the bhadar reservoir was very highly productive for this species and it was very rare study about the biology of *W. attu* so that I was selected for research study of this fish species at Bhadar reservoir in Gujarat.

### Materials and Methods

The present study was conducted at Bhadar reservoir landed of Rajkot district (Saurashtra region (22°30'N 70°78'33"E) in Gujarat, India. Bhadar reservoir (site) is located at 21°76'28"N 70°42'37" E near Bhukhi village Dhoraji, Taluka of Rajkot district during July 2018 to February 2019. Data collected from the sites at every 1 month interval. *Wallago attu* fishes were collected from selected site of reservoir. The fishermen were mainly using gill net for fishing. Fish samples were brought to college of Fisheries, Veraval and used 5% formalin solution in specimen jar according to the size of species.

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## Biological Parameters

### Fecundity

Ovaries of female fishes have been collected and were preserved in 5% formalin. The weight (g) and the status (stage III and above) of the gonads was recorded. Moreover, three pieces of ovary weighing 1 g each from the anterior, middle and posterior portions of the ovary were taken and examined for the number of ova present in them to determine the fecundity. The ova diameter (mm) in each sub sample of the ovary was studied under a trinocular microscope using calibrated ocular micrometer (Narasimham, 1994) [4].

## Results and Discussion

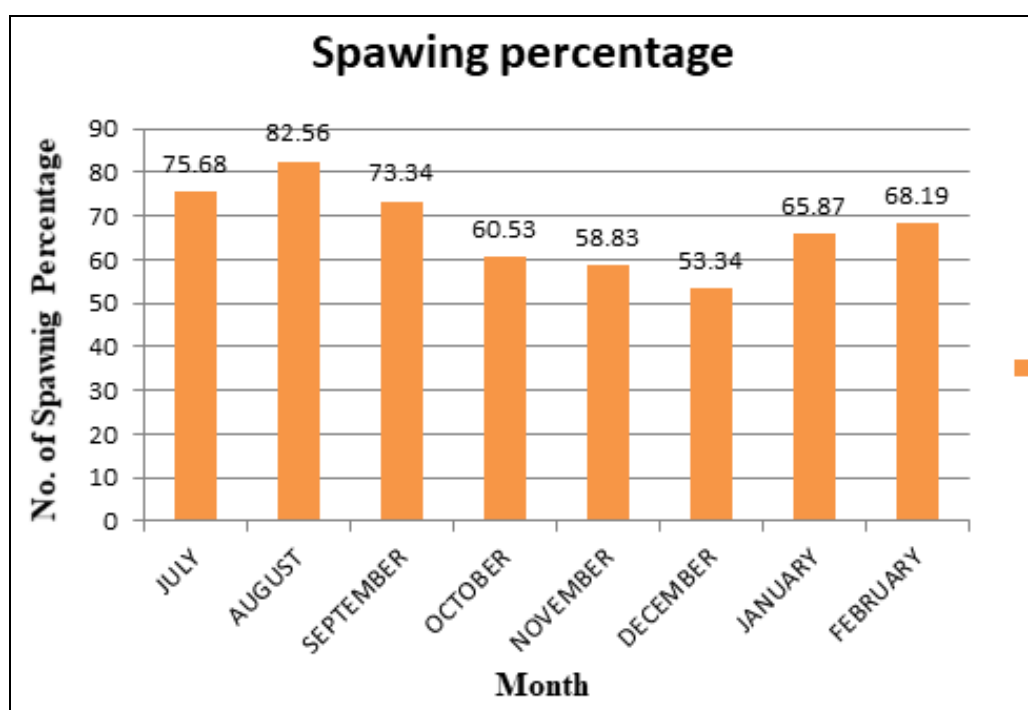
### Spawning

*W. attu* spawned throughout the year with the peak in July and August (Table 1 & Figure 1). The spawning was determined on the basis of occurrence of individual in mature, running

and spent stage of maturity in each month. The spawning percentage was higher during in month of August (82.56%) and low December (53.34%). The total average 60.02% of spawning.

**Table 1:** Monthly Variation in Maturity and Spawning of *W. attu*

Month	No. of Fishes		Spawning %
	Observed	Matured	
July	15	8	75.68
August	34	20	82.56
September	15	11	73.34
October	38	23	60.53
November	35	29	58.83
December	37	28	53.34
January	29	22	65.87
February	22	15	68.19
Total	225	156	Average 60.02%



**Fig 1:** Monthly variation Maturity and Spawning percentage of *W. attu*

### Fecundity

In present study absolute fecundity of *W. attu* ranged from 16565 - 29883 (Table 1). The fecundity per gram of body weight was the highest in July (10.95) and end of the in September (7.95). The average fecundity per gram body weight was 10. The average fecundity determined for the study period of one year was 22717. There were two peaks in the fecundity i.e., the first in October and the second in November (Table 2).

Similar study reported by Absalom, 2017 [5]. On fecundity and Egg Size of *Clarias gariepinus* in Pandam Lake, Quan-Pan LGA Plateau State, Nigeria, they were founded in Fish fecundity was 25,664 eggs per female. Arockraraj, *et al.*, (2004) [6] studied Fecundity of threatened catfish *Mystus montanus* which was estimated from a collection of gravid females, which ranged from 290 to 27,972 according to body length and weight from Tamilnadu India. Valçin *et al.*, (2001) [7] observed fecundity in the catfish (*Clarias gariepinus* Burchell, 1822) living in the River Asi, Turkey, and reported that Fecundity varied from 4,483 to 336,157 eggs per female.

**Table 2:** Fecundity per gram body weight of *W. attu*

Month	Fecundity/gm body weight	Fecundity
July – 2018	10.95	22316
August – 18	9.75	16565
September -18	7.95	9365
October -18	10.5	29536
November- 18	10.8	29883
December – 18	10	21155
January - 2019	10.2	26581
February -19	10.35	26340
Average	10	22717

### Ova Diameter

The size of the ova of *W. attu* ranged 1.1 – 1.9 cm (Table 3). The mean size of the ova was higher in August (1.9 cm) and the least in September (1.1 cm). The averaged mean size of the ova was 1.38 cm. Similar study reported by Absalom, 2017 [8], on Fecundity and Egg Size of *Clarias Gariepinus* in Pandam Lake, Quan-Pan LGA Plateau State, Nigeria. They found Fish ova diameter ranging from 1.13 mm to 1.16mm. Valcin *et al.*, (2001) [9] studied ova diameter in the catfish

(*Clarias gariepinus* Burchell, 1822) living in the River Asi, Turkey. They reported the average diameter of ripened eggs was 1.41 - 1.66 mm.

**Table 3:** Variations in ova diameter of *W. attu*

Sr. no	Month	Mean ova diameter (mm)
1.	July – 2018	1.7
2.	August – 18	1.9
3.	September -18	1.1
4.	October -18	1.2
5.	November- 18	1.2
6.	December – 18	1.3
7.	January – 2019	1.3
8.	February -19	1.4
Annual	July – 2018	1.38

### Conclusion

Present study was near Bhukhi village Dhoraji Taluka of Rajkot district of Gujarat at Bhadar reservoir were suitable environment condition for *W. attu* fish. The spawning percentage was higher during the month of August (82.56%) and lower in December (53.34%). The averaged total spawning percentage was 60.02%. The absolute fecundity of *W. attu* ranged from 16565 – 29883. Monthly average fecundity of *W. attu* was 22171. The annual average fecundity per gram body weight was 10. The average fecundity determined for the study period of one year was 22717. The annual average ova diameter was 1.38 cm (range 1.1 – 1.9 cm).

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