REPRODUCTIVE BIOLOGY OF *Acanthopagrus datnia* COLLECTED FROM THE BAY OF BENGAL, BANGLADESH

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Session: 2023-2024

A thesis submitted in the partial fulfillment of the requirements for the degree of Master of Science in Fish Biology and Biotechnology

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Khulshi, Chattogram-4225, Bangladesh

December, 2024

Authorization

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Author

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This is to certify that we have examined the above Master's thesis and have found that is complete and satisfactory in all respects, and all revisions required by the thesis examination committee have been made

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LIST OF ABBREVIATIONS

ABBREVIATION	FULL FORM
gm	Gram
cm	Centimeter
µm	Micrometer
ml	Milliliter
°C	Degree Celcius
FY	Fiscal Year
MT	Metric tons
LWR	Length-weight relationship
L_m	Length at first maturity
OD	Oocyte diameter
GSI	Gonadosomatic index
HSI	Hepatosomatic index
CN	Chromatin nucleous
PO	Perinuclear oocyte
Sz	Spermatozoa
GE	Germinal epithelium
Oo	Oogonia
OL	Ovarian lamellae
EPO	Early perinuclear oocyte
LPO	Late perinuclear oocyte
YV	Yolk vesicle
YG	Yolk granule
ZR	Zona radiata
At	Atresia
TL	Testicular lumen
Sg	Spermatogonia
Sc	Spermatocyte
St	Spermatid
RS	Residual sperm
TC	Testicular cavity

ABSTRACT

Studying the life-history traits and reproductive biology of commercially important species are important for successful conservation and management of fishery resources. Bengal yellowfin seabream, *Acanthopagrus datnia*, is a commercially important species from the Bay of Bengal, Bangladesh with scanty information on the reproductive biology and life history. A total of 169 samples, both male and female, were collected from January 2023 to July 2024. Biological parameters such as length-weight relationship (LWR), condition factor (K), gonadosomatic index (GSI), hepatosomatic index (HSI), length at first maturity (L_m), fecundity, oocyte diameter and gonadal histology were investigated to find out the overall life-history of the fish. Histological analysis revealed that this species is protandric hermaphrodite. The coefficient of regression 'b' was 2.88, 3.01 and 2.34 for all fishes (combined), males and females respectively showing the negative allometric growth pattern for the pooled and females, however isometric for males. Mean K value was always higher than 1 indicating the good condition of the fishes. Length at first maturity (L_m) was estimated 15.9−18.4 cm for males and 16.8−17.4 cm for females. Oocyte diameter ranged from 23.9−232.6 µm, lowest in August and highest in February having a moderate alignment with the GSI that peaked in February. Histological examination shows that the highest number of yolk granule stage in females and spermatozoa in males in February which indicates the spawning season in this month. Fecundity ranged from 33,005−1,38,330 eggs/females. This study is the first record of life-history characteristics of this hermaphrodite fish from the Bay of Bengal. Information gathered in this research work will be helpful for successful conservation and management in the Bay of Bengal.

Keywords: *Acanthopagrus datnia*, reproductive biology, length-weight relationship, condition factor, histology, GSI, oocyte diameter