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Gonodo-Somatic Index (GSI) in Thread Bream *Nemipterus japonicus* (Bloch,1791) from Karachi Coast Pakistan

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ABSTRACT

Gonado-somatic index (GSI) of *Nemipterus japonicus* was studied during the period August 2003 – January 2004. Size wise gonadal maturation was determined quantitatively by gonodo-somatic index in both sexes. A positive relationship between GSI values and stages of development of gonad was found. High GSI values at 230-260 mm TL in males and at 210 mm, 220 mm, 230-250 mm and 270 mm TL in females indicate the cent percentage maturation.

Keywords: Food fishes, Gonads, Gonosomatic index (GSI), Karachi, *Nemipterus japonicus*.

INTRODUCTION

Nemipterus japonicus is very important economically, good eating and are excellent food fishes. *N. japonicus* form large schools and caught mainly with bottom trawls. Nemipterus species are however an important part of the catch of joint venture trawl fishery. The thread bream *N. japonicus*, (family : Nemipteridae) is distributed throughout the Indian ocean and west Pacific (Russel, 1990). Some work have been done in the past on the biology, population dynamics, exploitation, maturation and spawning of *N. japonicus* by Vivekanandas and James (1968), Krishnamoorthi (1970), Weber and Jothy (1971), Eggleston (1972), Lee (1974, 1975), Dan (1977), Murty (1984), Samuel (1986), Iqbal (1991) and Bakhsh (1994). Taxonomical studies of *N. japonicus* were carried out by Day (1878), Munro (1967), Fisher and Bianchi (1984) and Hoda (1988).

MATERIALS AND METHODS

A total of 169 specimens of *N. japonicus* were collected from commercial landing at Karachi fish Harbor and Moosa colony fish market during August 2003 – January 2004. The fishes were deep freezed in the laboratory.

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The length and weight of each in the sample were taken to the nearest mm from the tip of the snout to the end of caudal fin by using measuring scale and weighed by using "Bonso Digital Scale" which measures upto 1 gm.

After measurement the fishes were dissected and gonads were taken and studies for its color, size weight and their extent in the body cavity. Gonads were preserved in 10 % formaline and then observed under a binocular for differentiation of sexual dimorphism (ovary and testes of small sizes stages).

The gonad weight depends on the size and stage of gonadal development. Gonad weight was expressed as a percentage of body weight (Nikolsky, 1963)

$$GSI = \frac{\text{Weight of gonad}}{\text{Weight of fish}} \times 100$$

Where,

GSI = Gonado – somatic index OR Gonosomatic Index

RESULTS AND DISCUSSION

Maturity stages of gonads of *N. japonicus* were demarcated into seven maturity stages. 31 immature 1-11 stages and 32 matured 111-V11 stages was found in male at different size groups. 53 immature

Table I: Mean GSI value of male in different size groups of *N. japonicus*

Size Group (Min-Max)	N	X	S.D	S.E	C.L
210-219	1	0.26	-	-	-
220-229	3	0.35	0.46	0.27	-0.18-0.88
230-239	7	1.18	0.41	0.15	0.89-1.47
240-249	11	1.05	0.35	0.10	0.83-1.24
250-259	13	1.12	0.45	0.12	0.88-1.36
260-269	16	1.00	0.45	0.11	0.78-1.22
270-279	10	0.92	0.28	0.08	0.75-1.08
280-289	2	0.92	0.08	0.06	0.80-1.04
210-289	63	0.85	-	-	-

Table II: Mean GSI value of female in different size groups of *N. japonicus*

Size Group (Min-Max)	N	X	S.D	S.E	C.L
210-219	2	1.26	0.03	0.02	1.22-1.30
220-229	6	2.14	1.08	0.44	1.38-3.00
230-239	10	1.81	1.07	0.33	1.16-2.46
240-249	8	1.77	0.70	0.24	1.30-2.24
250-259	27	1.81	1.17	0.23	1.36-2.26
260-269	26	0.93	0.75	0.14	0.66-1.20
270-279	17	1.25	2.02	0.48	0.31-2.19
280-289	7	0.61	0.22	0.08	0.45-0.77
290-299	3	0.87	0.47	9.27	0.85-1.40
210-289	106	1.38	-	-	-

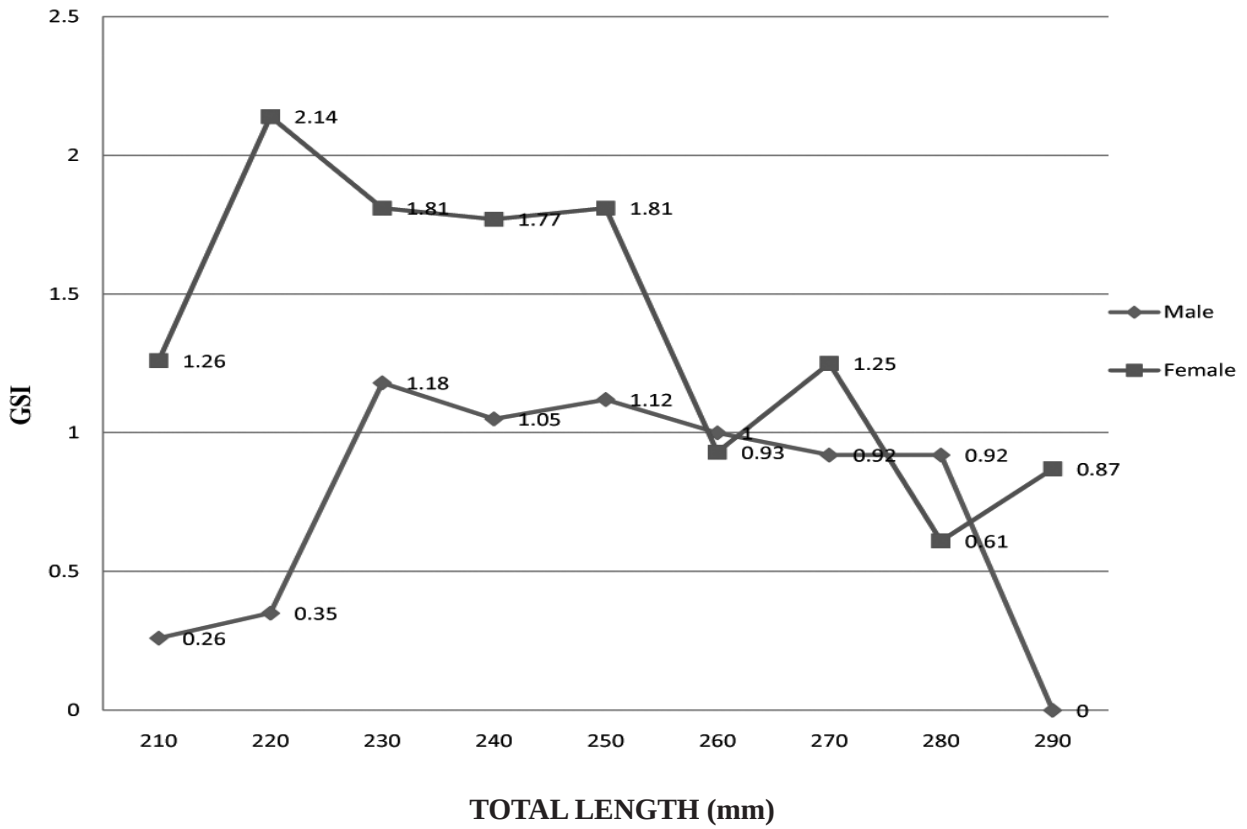

Figure 1: Mean GSI value of males & females in different size groups of *N.japonicus*

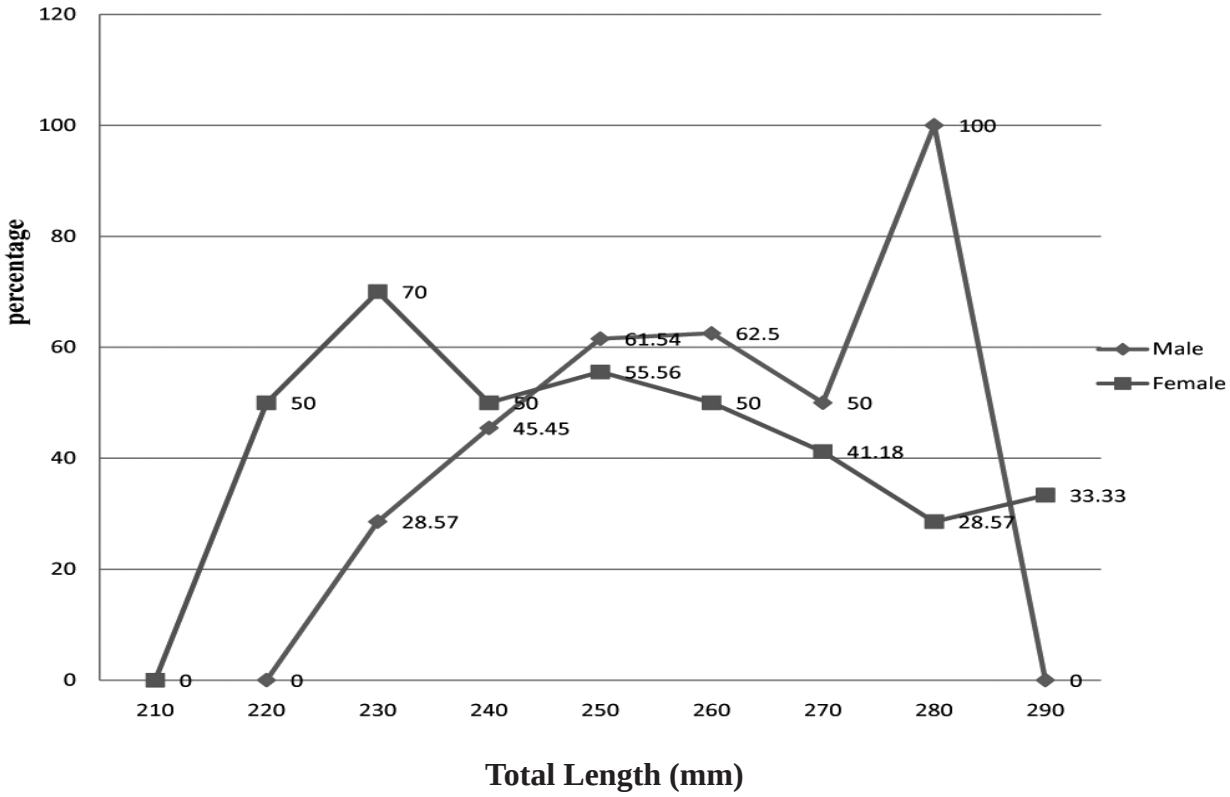

Figure 2: Sexual maturity in *N.japonicus*

1-11 stages and 52 matured 111-V11 stages was found in female at different size groups. A positive relationship between GSI value and stages of development of gonads is found. The increase in

GSI value may be due to the active maturation of the spermatocytes and oocytes taking places in gonads.

Maturation showing the percentage of mature male and females in each length group indicate size group at 230 mm TL in male and 220 mm TL in females.

High GSI values at 230 – 260 mm TL in males and at 210 mm, 220 mm, 230 – 250 mm and 270 mm TL in females indicate the cent percentage maturation. These observation were similar by Eggleston (1972), Weber and Jothy (1977), Dan (1977) and Murty (1984). This eight months data (Aug. 2003 – Jan 2004) does not show spawning season because V, V1, and V11 stages are not found in large number.

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