

SUMMARY

- ➔ During January 2011 to December 2013, a total of 633 numbers of *P. monodon* were examined of which 391 were females and 242 were males.
- ➔ Maximum carapace length was recorded 9.50 ± 0.05 cm and minimum carapace length was recorded 3.50 ± 0.05 cm, maximum total length was recorded 27.70 ± 0.09 cm and minimum total length was recorded 12.50 ± 0.09 cm and maximum weight was recorded 261 ± 1.48 g and minimum weight was recorded 47 ± 1.48 g during the investigation period.
- ➔ The length – weight relationship of *P.monodon* males, females and combined were $W=0.076636L^{2.40936}$, $W=0.026828L^{2.38872}$ and $W=0.018629L^{2.60916}$. Length-weight relationship revealed the exponent ranging from 2.245 to 2.572 for males, 2.287 to 2.489 for females and 2.525 to 2.692 for pooled sexes, respectively. Growth exhibited negative allometry.
- ➔ Highest average condition factor was observed 1.5 ± 0.54 in June of males and 1.65 ± 0.05 in January of females and lowest 1.2 ± 0.49 in March of males and 1.4 ± 0.55 in Feb, March, Aug and Sept of females.
- ➔ The overall annual sex ratio (males: females) was 1:1.6.
- ➔ January-February and extending up to June was the peak spawning season of *P. monodon*.
- ➔ The Gonado Somatic Index (GSI) was highest 10.13 ± 0.45 in January and 10.36 ± 1.27 in June.
- ➔ The length at first maturity was at 163.5 mm TL.
- ➔ Fecundity varied from 120155 to 961240.

- ➡ The gastro somatic index was highest in July and lowest in January for combined sexes and females, but in the case of males, the highest was observed in March and lowest in January.
- ➡ Active feeding was high 23.2 % in February and low 2.9% in March and poor feeding was high 76.8 % in June and low 36.2% in February.
- ➡ January and June is the breeding season according to the present study and so poor feeding in June and active feeding in February is because they consumed more feed after the breeding period.
- ➡ The average annual catch of *P. monodon* during 2011 - 2013 was 281.29 ± 9.67 ton, which contributed 0.41 % to the total trawl net catches at Digha coast.
- ➡ The average catch rate was 43.41 kg/h.
- ➡ The percentage of *P. monodon* to total shrimp catch was 1.91% in trawl landings at Digha coast.
- ➡ Monthly mean landings were 28.13 ± 0.97 t from the trawl nets.
- ➡ Peak landings were observed from June to November with a maximum of 56.46 ± 1.97 t in September and lean landings were observed from December to March with a minimum of 6.12 ± 0.21 t.
- ➡ The growth parameters, L_{∞} and k estimated for males and females were 24.89 cm and 29.3 cm and 1.24 year^{-1} and 0.94 year^{-1} respectively.
- ➡ The asymptotic weight was 170.48 g for males and 294.85 g for females and size at first capture (L_c) was 16.86 cm at an age (t_c) of 0.72 year for males and 19.36 cm at an age 1.05 year for females.
- ➡ The growth performance index (ϕ) was 2.94 and 2.91 for males and females and t_0 was -0.097 years for both sexes.

- ➡ The von Bertalanffy growth equation was $L_t = 24.89 [1 - e^{-1.4(t + 0.097)}]$ for males and $L_t = 29.3 [1 - e^{-0.94(t + 0.097)}]$ for females.
- ➡ The longevity was 2.05 years for males and 3.09 years for females.
- ➡ The length at first capture was 16.86 cm for males and 19.36 cm for females.
- ➡ The mortality rates M, F and Z computed were 2.35 yr⁻¹, 3.94 yr⁻¹ and 6.28 yr⁻¹ for males and 1.73 yr⁻¹, 3.12 yr⁻¹ and 4.85 yr⁻¹ for females respectively.
- ➡ The exploitation rate (U) was 0.46 and exploitation ratio (E) was 0.63 for males and 0.42 and 0.64 for females.
- ➡ VPA indicated that the main loss in the stock up to 15.9 cm and 17.1 cm size was due to natural causes for males and females.
- ➡ Fishing mortality exceeded natural mortality from 17.7 cm for male and 20.7 cm for female.
- ➡ The maximum fishing mortality for male of 6.004 was at size of 18.3 cm and for female of 4.58 was at size of 21.3 cm.
- ➡ The annual standing stock (P), biomass (B) and MSY were estimated at 639 t, 81 t and 221 t.
- ➡ The maximum sustainable yield was 112 t for male and 109 t for females, which was close to the average annual catch (140.65 t) indicating optimal exploitation of the species.
- ➡ The recruitment pattern revealed that recruitment of young ones into the fishery occurred almost throughout the year.
- ➡ Major peak in recruitment was during April – August for males and this pulse produced 75.06% of the recruits and for females, the major peak in recruitment was from May - August and this pulse produce 68.54% of the recruits.
- ➡ The smallest length of recruitment was 12.25 cm for male and 15.25 cm for female.

- ➡ Annually 10.78 million were recruited into the fishery.
- ➡ The present yield and yield per recruit in male was 140.63 t and 20.078 g. In the case of female, the present yield and yield per recruit was 140.65 t and 37.283 g. Maximum increase in relative yield by increasing the effort would be 16.7% for males and 15.05% for females.