LENGTH-WEIGHT RELATIONSHIP OF *SCOLIODON LATICAUDUS* MULLER AND HENLE AND *CARCHARHINUS LIMBATUS* (MULLER AND HENLE), FROM DAKSHINA KANNADA COAST

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**ABSTRACT**

Length-weight relationships of two shark species were derived based on random samples from commercial catches of Mangalore, Malpe and Gangolli landing centres. The relationships were compared between sexes separately for each species and it was found that the relationships did not differ significantly. Both the species were found to exhibit isometric growth pattern.

The length-weight relationships of elasmobranchs are not well known as compared to their teleost counterparts. A few reports on shark length-weight relationships, however, are those of Ripley (1946), Olsen (1954), Stevens (1975) and Jones and Geen (1977). As the reports on the sharks of Indian seas are scanty, the present study was undertaken.

Length-weight relationships in this study, are based on random samples of 458 specimens of *Scoliodon laticaudus* (size range 16-46 cm SL) collected from trawl catches at Mangalore and 691 specimens of *Carcharhinus limbatus* (size range 36-76 cm SL) collected from gill net catches at Malpe and Gangolli landing centres during the period March, 1980 to February, 1981. The specimens of the two shark species were measured, fortnightly at each centre, for standard length nearest to millimeters (i.e. distance from tip of the snout to base of upper caudal), using a measuring board and individual weight was recorded nearest to grammes, using a pan balance for either sex. The non-linear relationship of the form \( w = a l^b \), as used by Olsen (1954), was employed to study the length-weight relationship. Analysis of covariance technique (Snedecor and Cochran, 1967) was adopted to test the statistical equality of the regressions between the sexes for each species. The growth pattern of each species was tested employing t-test.

The following length-weight relationships were obtained for two species, sexwise.

**S. laticaudus:**
- **Females:** \( \log w = -3.63519 + 2.9632 \log l \)
  - or \( w = 0.0002316 l^{2.9632} \)
- **Males:** \( \log w = -3.91366 + 3.20381 \log l \)
  - or \( w = 0.0001219 l^{3.20381} \)

**C. limbatus:**
- **Females:** \( \log w = -4.79959 + 2.98729 \log l \)
  - or \( w = 0.0001586 l^{2.98729} \)
- **Males:** \( \log w = -4.78874 + 2.98405 \log l \)
  - or \( w = 0.0001626 l^{2.98405} \)

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Analysis of covariance technique indicated no significant difference (at 5% level) on the relationships between the sexes of both the species and hence a common relationship for each species was obtained as follows:

**S. laticaudus**:

\[
\log w = -3.72466 + 3.07489 \log l \\
\text{or } w = 0.0001885 \times 10^{3.07489}
\]

**C. limbatus**:

\[
\log w = -4.92031 + 2.98628 \log l \\
\text{or } w = 0.000012014 \times 10^{2.98628}
\]

Further, under the hypothesis of no departure in the isometric growth of two species, the calculated values of \(t\)-statistic were found to be 0.33 and 0.26 for **S. laticaudus** and **C. limbatus** respectively, thereby indicating no significant departure from the isometric growth pattern of each of the two species. This means that both the species confirm the cubic law of growth indicating proportionate increase in weight for increase in length.

The existing reports on the length-weight relationships of other shark species show varying values of the regression coefficient (\(b\)). Olsen (1954) found that Australian school shark **Galeorhinus australis** had more or less similar \(b\) values for the males (3.17) and females (3.18). But Stevens (1975) recorded a slightly larger difference between \(b\) values of **Prionace glauca** with respect to sex (i.e. 3.41 for males and 3.2 for females). Ripley (1946) found that in larger males of **Galeorhinus zyopterus** weight increase by 3.2 power of length (i.e. \(w = a l^{3.2}\)) but in females there was a marked change in \(b\) values after sexual maturity. The variations in \(b\) values with respect to sexual maturity have also been reported by John and Geen (1977) for **Squalus acanthias**.

The \(b\) values reported in the present study (3.07489 for **S. laticaudus** and 2.98628 for **C. limbatus**) are lower than those reported for other species elsewhere. While the samples of **S. laticaudus** represented different maturity stages, in case of **C. limbatus** it is worthwhile to note that only immature specimens were present in the commercial landings. In general, \(b\) values in the length-weight relationship of sharks could be influenced by sex and state of maturity, geographical locality and other environmental factors.

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**REFERENCES**