SUMMARY

9.1. CHELIPED ALLOMETRY

The smallest male and female *Macrobrachium nobilii* recorded has a minimum body weight of 1.449 and 0.336 g and a maximum body weight of 12.676 and 7.178 g respectively.

Length and weight relationship had higher (P<0.05) growth constant (b=4.28) for males than for females (3.02).

In male and female *Macrobrachium nobilii* the chelae weight contributes to 4.83-27.04% and 2.98-7.38% of the total body weight in male and female respectively.

Among males there is a remarkable difference (P<0.05) in the growth pattern of length between major and minor chelae (P<0.05). However between weights no such difference prevailed. Among females length and weight of the two chelae do not vary (P>0.05).

In males, total body weight, chelae length and weight showed positive allometric growth. Other parameters such as total length (TL), cephalothorax length (CTL) and carapace width (CW) showed negative allometry.

In females the growth in length and weight of chelae is isometric.

In males growth of both major and minor chela segments like ischium, merus, carpus, propodus and dactylus showed positive allometric growth.

In females, growth of carpus and propdous of major cheliped alone indicate positive allometry. Ischium and dactylus of major and minor chelae showed negative
isometry while merus of major cheliped and merus, carpus and propodus of minor cheliped registered isometric growth.

In both sexes, the growth gradient or the growth center of both chelae is in carpus.

In *Macrobrachium nobilii*, chelipeds indicate sexual dimorphism (Plate 3.1).

The second pair of chelipeds can be distinguished as crusher and cutter based on their morphology.

In field population, males have the major chela prevalently (P<0.05) on right side but in females it is evenly distributed.

9.2. LIMB LOSS IN FIELD POPULATION

Of the 1237 prawns collected bimonthly from November 1994 to January 1995, 203 (16.41%) were found to have lost 709 right and/or left pereiopods which comprised of 15.37% first, 28.91% second, 28.77% third, 17.91% fourth and 9.02% of the fifth pereiopods.

Monthly variations in limb loss (%) among juveniles, males and females ranged from 9.79 to 11.96, 14.75 to 15.70 and 20.61 to 24.15.

The total limb loss for the three groups (juvenile, male and female) of *Macrobrachium nobilii*, i.e. 10.89%, 15.20% and 22.27% did not vary significantly (P>0.05) between months and sites of collection. However a significant difference (P<0.05) exists in the percentage of limb loss between juvenile, male and female *Macrobrachium nobilii*.

The probability of limb loss between any corresponding right or left pereiopod is identical (P>0.05) among all three groups. However there apparently exists a differential susceptibility for limb loss between the pairs of appendages: the most vulnerable pairs for injury are the 2\textsuperscript{nd} and 3\textsuperscript{rd}, and the least vulnerable is 5\textsuperscript{th} and 1\textsuperscript{st} pair (P<0.01).
Among females, berried prawns suffer a greater frequency of limb loss (3.65 pereiopods/prawn) than (P<0.05) non-berried females (2.93).

**9.3. LABORATORY STUDIES**

Juveniles of *Macrobrachium nobilii* stocked in three chosen densities (22, 38 and $77 \text{m}^2$) indicate that increased stocking density adversely affects survival, growth and limb loss.

A higher incidence of limb autotomy is recorded in $77 \text{m}^2$. Provision of shelters reduced the incidence of limb loss; thus increased the survival and growth.

The maximum rearing density of $77 \text{m}^2$ resulted in the high incidence of limb loss, and minimum growth and survival.

When reared individually 26% of the males autotomize their major chela during exuviation. Partial exuviation leading to limb autotomy along with the exuvium is reported for the first time.

Juvenile *Macrobrachium nobilii* recover complete length of autotomized limb in two subsequent post autotomy mouls while in males and females more than two mouls are needed.

Biochemical studies indicate that among the three groups (juvenile, male and female) the chelipeds of males are heavily mineralized for use as a weapon for giving them advantage in establishing dominance.
9.4. CHELIPED AND BEHAVIOUR

Presence of chela plays a major role in acquisition of shelters.

The animal lacking chelae behaves submissively when compared with a prawn of similar size but with chelae and readily co-inhabits a shelter with it.

Prior residence exerts a significant (P<0.05) advantage in retaining a shelter.

The selection of shelter size (diameter) is related to the size (Carpace Length) of the prawn.

Both juveniles and adults seek dark shelters than the opaque shelters and open area but never enter into a transparent shelter.