THE RELATION BETWEEN BODY SIZE AND NUMBER OF EGGS IN THE FRESHWATER PRAWN, MACROBRACHIUM LAMARREI (H. MILNE EDWARDS) (DECAPODA, CARIDEA)

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INTRODUCTION

To ensure a greater number of surviving juveniles, a species may produce large numbers of eggs as in the cod, Gadus morrhua L., or fewer, larger sized eggs, as in the freshwater fishes (Blaxter, 1969) and some crustaceans (Allee & Schmidt, 1957), from which more viable individuals may be hatched. Among oviparous forms, the success of crustaceans can be attributed to the fact that most of them carry their developing eggs until hatching; this 'parental care' results in a greater survival of the eggs. Among many factors that regulate the number of eggs carried by a female, the size of the mother animal appears to be an important one (e.g. in fishes, Blaxter, 1969). In several marine crustaceans, the number of eggs carried has been found to be linear to the length of the female (e.g. Palaemon elegans Rathke (as Leander squilla) and Palaemon serratus (Pennant), cf. Forster, 1951; several marine Malacostraca, Jensen, 1958; Sphaeroma hookeri Leach and Gammarus zaddachi Sexton, cf. Kinne, 1954, 1961; Crangon septemspinosus Say, cf. Price, 1962; Pandalopsis dispar, Collin et al., 1972; and Panulirus longipes, Morgan, 1972). Jensen (1958) working on several marine Malacostraca concluded that the "absolute number" of eggs (the total number of eggs carried in all the broods of an individual) was determined by environmental factors; however, the "relative number" of eggs (total number of eggs carried in a single brood at any one time) exhibits a linear relationship to the volume of the mother and hence is dependent upon the mother itself. It is not clear whether the relationship between the egg number and mother's volume as observed by Jensen for marine malacostracans would also hold true for freshwater crustaceans. As most decapods carry the eggs attached to the plumose hairs of their abdominal appendages, it remains to be seen whether the restricted space thus available for the attachment of these eggs on the appendages, imposes certain restrictions on the egg size and/or number of eggs carried by the female in a single brood. The present paper reports the observations on the egg size/number in relation to the mother animal in the freshwater prawn Macrobrachium lamarrei (H. Milne Edwards, 1837).
Figs. 1-3. *Macrobrachium lamarrei* (H. Milne Edwards). 1, regression showing the direct linear relationship between total egg number per brood and the volume (length$^3$) of the mother animal $Y = 85.48 + 0.4858 (X - 105.79)$.

2, regression showing the inverse linear relationship between the total biomass of eggs per brood (expressed in mg/g dry weight of mother animal) and the biomass of the female $Y = 220.54 - 0.158 (X - 251.60)$.

3, regression showing the inverse linear relationship between the individual egg weight as function of the total number of eggs per brood of mother animal (4.6 cm body length) $Y = 0.51 - 0.000454 (X - 91.35)$.