A partial Review on the Variability during Developmental Stages in Scorpions (Scorpionidae)

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The variability in number of oocytes or diverticulae in the ovariuterus of scorpions, increases during development. It is low in the small, rudimentary oocytes or diverticulae, increasing in the embryonic ones, and is considerably higher in the post-partum diverticulae. Possibly, because there are generally more than one generation of the latter that can be traced in the ovariuterus. Variability in embryo and juvenile numbers as well as the latter’s mass vary within and among species as well as between different families. The lowest variability in number of embryos was 30%, and in litter size about 20%. The lowest variability in juvenile mass was 1.8% and the highest 12.1%. The significance of these findings for the reproductive ecology and survival of scorpions is discussed.

Keywords: Scorpion oocytes – Scorpion embryos – litter size – juvenile mass – reproductive ecology

1 Introduction

The variability in reproduction of isopods is a well documented phenomenon. Thus, Francke & Jones [1982] noted that scorpions mature at different instars and different sizes. Likewise, the litter size varies among cohorts [Bradley 1984, Formanowicz & Shaffer 1993], or within a family (Diplocentridae) [Francke 1981, Brown & Formanowicz 1995]. Neither litter size nor offspring mass showed any relationship to female size [Aguilar et al 2008].

More interesting perhaps is the variability in offspring mass within a single cohort [Brown & Formanowicz 1995] who summarizes the coefficient of variation (V) in Tab 2 there (see also Tab 1 in Brown [2004]).

The scorpion females show variability in number of oocytes, diverticulae or embryos, all vary among different females. What could be the cause creating such variability? There could be a number of reasons for the variability in reproductive system and in litter size among females. These could be caused by the female’s size (i.e. age). However, it is more difficult to explain intra-cohort (i.e brood) variability in mass. One possible explanation could be that the cohort is of multi-parenthood origin. It is well documented that some females may take in more than a single spermatophore [Peretti 2010]. These could be of different paternal source. Consequently, the variability in offspring mass could be due to sperm mixing with different juveniles being of different paternal origin. The best way to prove this contention is by using parthenogenetic species. In that case variability should be minimum since it is solely of maternal origin. Alternatively, use virgin females that were collected in the field and molted in the laboratory, to become mature females.