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SEX RATIO AND SEXUAL DIMORPHISM IN LATE INSTAR LARVAE OF *ISCHNURA POSITA* (HAGEN) (ZYGOPTERA: COENAGRIONIDAE)

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Abstract The evidence presented indicates that *I. posita* larvae do not exhibit the skewed sex ratios as reported for Anisoptera. Mean head widths in the Texas population studied are substantially lower than the range reported by E.M. WALKER (1933, *The Odonata of Canada and Alaska,* vol. 1, Univ. Toronto Press). For the first time sexual dimorphism is suggested in the larval stage of this sp.

Introduction

CORBET (1962) found an imbalance in the sex ratios of larval anisopteran populations with a trend toward an excess of females. Working with a smaller data set, LAWTON (1972) was unable to establish such a pattern among larval zygopterans. Since it is of theoretical interest to know if zygopterans and anisopterans qualitatively differ from each other we provide sex ratio data on *Ischnura posita* to supplement Lawton's review.

I. posita is a common coenagrionid damselfly found in the lentic environments of Tarrant County, Texas. Individuals remain at the aquatic site for much of their adult life and often roost on emergent vegetation (ROBINSON et al., 1985). As adults, males and females commonly co-occur (ROBINSON, 1983) yet reproduction is rarely observed (BICK, 1957).

Methods and results

A random sample of *I. posita* larvae was collected from Veteran's Park pond in Arlington, Texas during May, 1988. The sex of each ultimate and penultimate individual was determined and head width measurements were taken using an ocular micrometer. 386 larvae were sexed and measured. Of the larvae collected 239 were in the ultimate instar and 147 in the penultimate stage. There were 193 males (exactly 50%) in the combined group of both instars. When the instar groups were considered separately there was a slight excess of males in the ultimate instar (53.9%) and a somewhat larger excess of females in the penultimate instar (56.5%). These frequencies did not differ significantly from those expected from a 1:1 ratio of males to females.

The head widths of male and female larvae were compared. The mean head width for ultimate instar males was 2.74 mm and for females of the same instar 2.82 mm. These values are considerably smaller than those reported by WALKER (1953). In the penultimate instar the mean head width for males was 2.17 mm and for females 2.22 mm. This difference in head widths was found to be significant using analysis of variance techniques ($p < .001$). Both sexes increased in size at the same rate, 26%, between these instars.

Discussion

Our data are consistent with those of LAWTON (1972) in that zygopteran larvae do not exhibit the skewed sex ratios reported by CORBET (1962) for anisopteran larvae. These larval data also support the conclusion by ROBINSON (1983) that the ratio of males to females is not different from 1:1 in adult *I. posita.*

Mean head widths reported here for final instar *I. posita* are both substantially lower than the range reported by WALKER (1953). ROBINSON (1983) has noted that adult female *I. posita* in Tarrant Co., Texas are blue before pruinescence while WALKER (1953) states that females collected in Canada are green. It is possible, therefore, that we are observing regional differences in populations of this species.

While sexual dimorphism has been described in adult *I. posita* (GARMAN, 1917; WALKER, 1953) our results are the first to suggest sexually dimorphic larvae. Frequency distribution histograms of head widths are often used to assign larvae to instar groups. Sexual dimorphisms, while probably not great enough to obscure distinctions between instars, can cloud the frequency distribution and sometimes lead to bimodality in the distributions of later instar head widths. Therefore care should be taken to sex larvae when measuring head widths especially in species whose adults are known to be sexually dimorphic.

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