TRANSPORT OF *PACHYGRAPSUS GRACILIS* (DE SAUSSURE, 1858)
MEGALOPAE FROM A LAGOON SYSTEM INLET IN THE
SOUTHWESTERN GULF OF MEXICO

BY

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ABSTRACT

Megalopae of the wharf crab, *Pachygrapsus gracilis* were collected in the two inlets of the Alvarado Lagoon System, i.e., Alvarado Lagoon Inlet (ALI) and Camaronera Lagoon Inlet (CLI). The sampling period included January to October 2005. Collections were taken over a 13 h period with a conical plankton net of 243 \(\mu\)m mesh that filtered during 15 min. every hour. Simultaneously, we recorded water temperature, salinity, current velocity, and flow direction. Megalopa density was standardized as number/1000 m\(^3\) and data were \(\log_{10}\) normalized. Multiple correlations of density vs. water temperature, salinity, current velocity, and flow direction were tested. The density between the two sampling inlets was compared with analysis of variance (ANOVA). A total of 15,454 megalopae was collected in the two inlets, 1,413 from ALI and 14,044 from CLI. The highest density was in July with 2,788 megalopae/1000 m\(^3\). The average temperature in ALI was 27.49 ± 3.36°C, in CLI 27.49 ± 3.84°C; salinity in ALI was 7.06 ± 4.49 psu, in CLI 14.86 ± 8.96 psu; and current velocity in ALI was 1.22 ± 0.64 m s\(^{-1}\), in CLI 0.72 ± 0.44 m s\(^{-1}\). During this study, the existence of recruitment peaks between 19:00 h and 03:00 h was determined. Significant multiple correlations were found \((P < 0.05)\) between the densities of the megalopae and environmental factors. The ANOVA showed significant differences between the densities at the two inlets in September, October, and January, whereas March, June, and July did not show significant differences. This indicates that recruitment is related to a continuous global process, i.e., seasonal and temporal reproductive pulses, as well as to the shape of the inlet.

RESUMEN

Se colectaron megalopas del cangrejo de muelle, *Pachygrapsus gracilis* en dos bocas de comunicación del Sistema de Lagunar de Alvarado: boca de la Laguna de Alvarado (ALI) y boca de
The geographic range of the wharf crab, Pachygrapsus gracilis (De Saussure, 1858), extends from Florida to Paraná (Brazil), with additional records from Senegal and Angola (Williams, 1984). According to the life cycle of the genus Pachygrapsus, females with eggs are present from April to November; the number of eggs varies between 8,000 and 10,000 (Crichton, 1960; Williams, 1984). The number of zoeal stages is variable: in P. crassipes J. W. Randall, 1840 and P. marmoratus (Fabricius, 1787) five stages have been observed, whereas P. gracilis has 13 zoeal stages (Brossi-García & Domingues, 1993). The megalopa of P. gracilis has recently been described (Cházaro-Olvera et al., 2006).

Two migratory events occur during the life cycle of some crabs. During the first event, the adults emigrate to the inlet of the estuary, and the second event comprises the return of the megalopae to the adult habitat. Thus, the stock size of adult wharf crabs is determined by the successful recruitment of planktonic postlarvae (Wenner et al., 2005).

The recruitment of brachyuran megalopae is highly episodic (Jamieson & Philips, 1988; Queiroga et al., 1994; Queiroga, 1996; Abello & Guerao, 1999). The success of recruitment in estuarine habitats depends on numerous behavioural and environmental factors (Dittel & Epifanio, 1982; Olmi et al., 1993; Miller & Emlet, 1997): the suitability of the estuary is often associated with tidal range, wind direction, and variations in salinity and/or temperature (Little & Epifanio, 1991; Jones & Epifanio, 1995; Mense et al., 1995; Van Montfrans et al., 1995; Perry et al., 1995; Rabalais et al., 1995; Wrona et al., 1995). During efflux, some