# BREEDING PERIOD OF THE CRAB GONIOPSIS CRUENTATA (LATREILLE 1803) (CRUSTACEA: BRACHYURA: GRAPSIDAE) IN NA ESTUARINE AREA, MACEIÓ, ALAGOAS, BRAZIL.

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## INTRODUCTION

Reproduction is certainly the main mechanism by which to guarantee species continuity, being a result of adaptative processes determined by evolutionary pressures to improve offspring survival (Hartnoll & Gould 1988).

Breeding period is defined as the time interval in which ovigerous females may be found. According to Sastry (1983), it is the result of the complex interactions of endogenous and exogenous factors. The endogenous factors regard the hormone control of molting and gonadal cycle. The exogenous factors are the environmental factors, specially temperature, photoperiod, pluviosity and food availability (Cobo & Fransozo 2003; Díaz & Conde 1989; Sastry 1983). Factors like salinity and parasitism (Sastry 1983), and lunar cycle (Adiyodi 1988) are also commonly mentioned.

The red mangrove crab Goniopsis cruentata is commonly found in mangrove areas, on the upper beach, in burrows or between mangrove roots, occupying most of the microhabitats in the mangrove ecosystem (Cobo & Fransozo 2003).

## OBJECTIVES

The aim of the present investigation is to provide knowledge about the breeding period of G. cruentata in the study area, providing information to support the sustainable exploration of this natural resource.

## MATERIAL AND METHODS

The crabs were collected monthly during the diurnal low tides in the Mundaú - Manguaba Estuarine Lagoon Complex (CELMM) (9º35'00"-9º45'00"S and 35º42'30"-35º57'30"W) from August/2007 to July/2008, except for April. The crabs were captured by hand and placed into containers containing alcohol 70%. In the laboratory, they were sexed according to abdomen morphology and had their carapace width measured. The ovigerous females and the overall population of females had their mean size ± SD obtained. The breeding period was obtained based on the relative frequency of ovigerous females. The atmospheric and water temperatures were obtained with a toluene thermometer and water samples were collected for salinity determination.

## RESULTS AND DISCUSSION

A total of 1123 crabs were captured (571 males and 552 females, of which 71 were ovigerous). The mean size ± SD was 28.66 ± 5.39 to males, 27.72 ± 4.84 to females and 31.85 ± 7.22 to brooding females. The mean salinity, and water and air temperatures were 17.97 ± 6.5, $26.5^0$C ± 1.82 and $26.7^0$C ± 2.01, respectively. The overall sex ratio was statistically around the proportion 1:1(ratio=096; x $^2$=0.32, d.f=1, p <0.05) and so the population is assumed to be at equilibrium.Females carrying eggs were not observed in August/2007, October/2007 and May/2008, being most representative in the summer (November/2007 to March/2008), but also occurring in September/2007, June/2008 and July/2008. The low frequency of ovigerous females in the May-October period may be a high influence of the intensified criptic habit of this species, likely to protect brooding females in the "raining"months (Cobo & Fransozo 2000). Frequency of ovigerous females showed to be moderately correlated to salinity (r = 0.67) and weakly to water (r = 0.46)and air (r = 0.37) temperatures.

The frequency for brooding females clearly suggests a seasonal - continuous pattern of reproduction in Goniopsis cruentata, similarly to the results obtained by Cobo & Fransozo (2003), Silva & Oshiro (2002) and Cobo & Fransozo (2000) to the same species in the southeast region of Brazil. Thus, this species may follow this pattern on a wide range of latitude. However, according to SASTRY (1983), populations of the same species inhabiting different latitudes, for the

particular conditions of the environment, may vary in reproductive pattern. In this way, Hartnoll & Gould (1988) pointed out that periodic reproductive patterns seems to be proximally correlated with latitude, and Adiyodi (1988) stated that species confined to the tropics and having perennial sources of water may have prolonged breeding seasons extending for several months. The southeast region of Brazil shows a great variation in temperature, maybe like other environmental factors, such as pluviosity, photoperiod and food availability. The population in this area suffers more from stress to follow the general order of maximizing the reproductive output.

In the present study, only the salinity showed to be correlated with breeding season ($r = 0.67$); air and water temperature were not correlated, which can be caused by methodological applications, since temperature plays a pronounced influence on the reproductive period (Cobo & Fransozo 2003).

Environmental conditions may be favorable to larval survivorship and recruitment, and also to availability of food and mild environmental conditions for adult populations, favoring the occurrence of periodic reproductive strategies (Díaz & Conde 1989). The abiotic factors have a great importance in this way, as was observed by Cobo & Fransozo (2003). Despite this fact, Sastry (1983) considered that some biotic factors, such as competition for resources, avoidance of predators and behaviors for locating food and mates, may become more important to the life history and reproductive strategies of species.

Since growth competes with reproduction for energy resources (Hartnoll & Gould 1988), it has a great influence on reproduction. Growth and reproduction occur as antagonistic processes, mutually exclusive processes. Species may develop strategies to growth more intensively in phases not so favorable to reproduction.

Reproduction is probably the result of the narrowest environmental changes, combined to a wide tolerance for alterations of key external factors (Cobo 2002).

## CONCLUSION

The breeding period of Goniopsis cruentata is sazonal - continuous, being concentrated in the warmest months. Salinity was the main factor influencing breeding, not excluding the influence of other abiotic and biotic factors. Tropical species are adapted to reproduce continuously.

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