

A PRELIMINARY ANATOMICAL STUDY OF MALE REPRODUCTIVE SYSTEM OF THE FRESHWATER CRAB *POTAMON MAGNUM MAGNUM* (PRETZMAN) (ARTHROPODA: CRUSTACEA: DECAPODA)

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ABSTRACT

The present study was conducted, as a preliminary study, on the male reproductive system of the freshwater crab *Potamon magnum magnum*, collected from the shores of river Tigris in Mosul City, Ninevah Province, Iraq, aiming at describing the male reproductive system which seems to have never been described before. Results of the present study showed that the male reproductive system consists of a pair of testes, a pair of vas deferens, ending into ejaculatory ducts and a pair of penises. Gonopods are also present which are known to serve as copulatory organs which transfer the spermatophores into female gonopores. The macroscopic anatomy of the testes showed a similar pattern to that described in other decapod species, e.g. in the paired testes, the H-like appearance and presence of gonopods.

INTRODUCTION

Potamon magnum magnum is a freshwater crab, distributed all over Iraq, from northern to southern parts, along the river Tigris. Due to their economical and medical importance, crabs, in general, have attracted the attention of many researchers, all over the world, to study their reproduction and to investigate their reproductive organs, in details (for references, see Al-Barwary, 2011). In Iraq, reviewing the internet and all the work conducted on the freshwater crabs show that, apart from the work accomplished by some authors on the neurosecretion and neurosecretory cells of the crab *Potamon magnum magnum* (Gorgees and Rshan, 1976; Rshan and Gorgees, 1977a, b, c; Rshan et al., 1978, Rshan et al., 1989; Al-Barwary, 2007; Gorgees and Al-Barwary, 2009), there seems to be no work conducted on this species. Therefore, the present work may well be considered the first trial in this respect, in Iraq, aiming at describing the reproductive system of this freshwater crab.

MATERIALS AND METHODS

Collection and Maintenance of Specimens

Freshwater crabs were collected from the shores of the river Tigris in Mosul City for the period October, 2009 till May, 2010. The crabs were previously classified as *Potamon magnum magnum* by the Natural History Museum in London (see Al-Barwary, 2007). The specimens (Fig.1) were kept in the laboratory in plastic containers, dechlorinated water was

replaced every other day and food was given every day. Males were chosen for the study. They were separated from the females by the fine cover in the carapace (Fig. 2). Size of the crabs was taken into consideration by the diameter of the carapace; it ranged between 5.5-7.5cm. The crabs were left in the containers until dissected. Only crabs with 7.5cm carapace diameter were considered for this study

Morphology and Gross Anatomy

Healthy male crabs were selected for dissection. Longitudinal slits were made, dorsally, starting at the posterior end towards the anterior end (Fig. 3). The hard cover and the tissues covering the reproductive system were removed.

RESULTS

The reproductive system of male freshwater crab *Potamon magnum magnum* consists of paired testes, of equal size, vas deferens, ejaculatory ducts and penises. It appeared as H-shape (Fig. 4). Anatomically, it is located in the cephalothorax region, dorsally. The system originates at the eyestalk and extends between the stomach and hepatopancreas, beneath the heart until it reaches the coxa of 5th walking leg. Testes are off white, elongated, lobulated and connected with each other, near their posterior end by a commissure, so appeared as U-shape. Each testis is attached, posteriorly, with a vas deferens of different degrees of convolution. Each vas deferens consists of three parts, the anterior, median and the posterior and finally ends up by the penis which opens in the coxa of the 5th walking leg. Androgenic gland (Fig. 5) was noticed, as a longitudinal



Figure 1: Photograph showing the freshwater crab *Potamon magnum magnum*



Figure 2: Photograph showing male *Potamon magnum magnum* and the fine cover of the carapace (Arrow)



Figure 3: Photograph showing cutting of carapace from posterior to- words anterior end

structure, attached to the posterior part of the distal end of vas deferens.

DISCUSSION

The present work is the first trial to study the anatomy of the male reproductive system of *Potamon magnum magnum* in Iraq. The general layout of the male reproductive system of the investigated species, i.e. the paired testes, the vasa deferentia and the rest of the system parts was similar to those found in other decapods (for references, see Sherkhane et al., 2010). The H- shape observed in *P. magnum magnum* seems to be a characteristic of many brachyuran crabs, formed due to joining of posterior ends of testes. This arrangement is found in many crabs and crayfishes (Krol et al., 1992; Cumberlidge, 1999; Lopez Greco et al., 2007; Castilho et al., 2008; Sherkhane et al., 2010). In *P. magnum magnum*, the testes were of equal size, differing from that of *B. cunicularis* where that of the right side was often slightly larger in size than that of the left side as mentioned by Sherkhane et al. (2010). In the present study, the vas deferens was observed to be formed of three parts, the anterior, middle and posterior, a similar observation has been presented by previous authors on other decapods (Lopez

Greco et al., 2007; Castilho et al., 2008) based on macroscopic and microscopic features. However, Sherkhane et al. (2010) were not ascertain of the same case in *B. cunicularis*. The only difference, mentioned by previous authors, may be the degrees of convolution. The presence of the androgenic gland, reported in the present study, has been made by previous workers in other crustaceans, although the only difference could be attributed to the position of this gland where it has been reported to be attached along the vas deferens, whereas it is noticed, in the present study, to be attached to the distal end of the posterior part of the vas deferens, which may reflect some difference in the physiology of this gland. Perhaps, further investigation, based on histological and histochemical studies may resolve this problem. The general conclusion which could be derived from the results of the present study is that, the male reproductive system of *P. magnum magnum* is similar, anatomically, to many species of other decapods.

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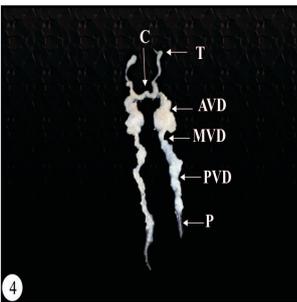


Figure 4: Photograph showing different parts of male reproductive system illustrating the H-shape. Arrows showing C (Commisure), T (Testes), AVD (Anterior Vas Deferens), MVD (Median Vas Deferens), PVD (Posterior Vas Deferens), P (Penis)

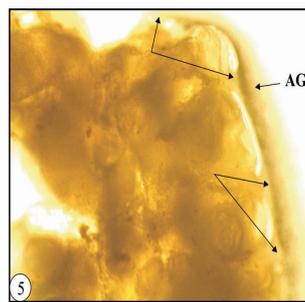


Figure 5: Microscopic photograph showing the longitudinal androgenic gland (AG) (arrows) attached to the distal part of the posterior vas deferens

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