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PRÉSENCE DE LA CREVETTE PÉNÉIDE *PLESIOPENAEUS NITIDUS*
BARNARD, 1947, AUX ÎLES SAINT PAUL ET AMSTERDAM
ET AU LARGE DU DÉTROIT DE BASS (AUSTRALIE)

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Jusqu'à maintenant *Plesiopenaeus nitidus* Barnard, 1947, n'était connu que de la côte est de l'Afrique du Sud, de la région du Cap (BARNARD, 1950) jusqu'au nord de Durban (28°37,8'S 32°38,4'E, Kensley, 1977, 1981), ainsi que, dans le sud de l'Atlantique, sur le banc de la "Valdivia" (25°S 6°E, Burukovsky, 1975, sous le nom d'*Aristeus crosnieri*; Macpherson, 1984).

L'examen de récoltes non encore étudiées nous permet d'étendre l'aire de répartition de cette espèce au voisinage des îles St. Paul et Amsterdam (Muséum national d'Histoire naturelle, Paris: N.O. "Marion Dufresne", camp. MD 50: St. 2, CP 7, 37°47,20'S 77°38,98'E, chalutage, 1680-940 m: 1 ♂, MNHN-Na 9986 — St. 23, CP 113, 38°55,52'S 77°38,12'E, chalutage, 1065-1125 m, 1 ♂, 1 ♀, MNHN-Na 9985) et au sud-est de l'Australie (Museum of Victoria, Melbourne: Stn SLOPE 58, 34°43,95'S 151°14,74'E, New South Wales, 56 km E.N.E. of Nowra, chalutage, 1009 m, 1 ♂, J 15856. — N.O. "Margareth Phillipa", 1982, probablement Western Bass Strait, 7 ♀, J 15857).

Ces récoltes confirment que *P. nitidus* vit à de grandes profondeurs. Macpherson (1984: 47) écrit que cette espèce a été récoltée entre 126 et 460 m au

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Vacelet, 1959 at Marseilles (Ledoyer, 1968), and an orange sponge at Cap Rederis, Banyuls (Zibrowius, 1985).

Eighteen among the twenty three records of *B. gasti* were carried out by scuba divers. This fact shows that the rare occurrence of this shrimp is linked to the sampling techniques.

The nature of the association is still to be elucidated. Nothing is known about feeding, but it is possible to suppose a trophic relation on the base of the homochromy recorded in most specimens (Zibrowius, 1985). Noël (1985) remarked on the homochromy and homeomorphy of *B. gasti* with its hosts, as shown in a drawing of the shrimp on *G. savaglia* (as *G. lamarki*).

Zibrowius (1985) at Marseilles observed "in situ" the shrimps which "circulent librement entre les polyces" of *G. savaglia*. Ledoyer (1968) found it "cramponné" on *V. cavernicola*. The shrimps recorded from *E. cavolinii* and *C. rubrum* (collection from Bosa) clinged to the ramifications of the colonies. The behaviour of clinging is related to the particular conformation of the carapace, abdomen and pereopods. The homeomorphy may be the result of a convergent evolution and probably is linked to the habit of clinging to the host as shown by the shrimp.

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large de l'Afrique du Sud, mais il s'agit très certainement d'une erreur. D'après les données que nous possédons, on peut admettre que l'espèce se trouve entre 750 et 1200 m de profondeur environ. Il semble bien, d'autre part que cette espèce ne se trouve que dans le sud des océans; elle n'a, en effet, jamais été trouvée à moins de 25°S.

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USE OF GASTROLITH DEVELOPMENT IN MOULT STAGING THE FRESHWATER CRAYFISH *CHERAX CUSPIDATUS* RIEK, 1969

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INTRODUCTION

Gastroliths occur in freshwater crayfish of the families Astacidae and Parastacidae as paired, hard, thick, disc-shaped structures (Travis, 1960; Johnson, 1984), which are formed by patches of specialised cuticle (gastrolith discs) located in the anterio-lateral walls of the cardiac stomach (Greenaway, 1985). The gastroliths function as sites of calcium storage during ecdysis, calcification beginning during moult stage D₀, utilising calcium resorbed from the old exoskeleton. Gastroliths increase in size during subsequent D stages reaching a maximum size at stage D₄, immediately prior to ecdysis (Travis, 1960; Adegboye et al., 1974), at which stage calcification is also complete (Greenaway, 1985).

The fully formed gastroliths are shed into the cardiac stomach at the end of stage D, together with the cuticular lining of the stomach. Following ecdysis the gastroliths are subsequently broken down to release their contained calcium which is resorbed during the initial hardening of the new exoskeleton (Scott & Duncan, 1967). Calcium resorption is complete by the end of moult stage A (McWhinnie, 1962).

In the present study a method for accurately predicting ecdysis using changes in size, shape and position of the gastroliths during proecdysis was devised for the parastacid crayfish *Cherax cuspidatus* Riek, 1969.

MATERIALS AND METHODS

All crayfish used were laboratory bred young of year with carapace lengths of 7.15 to 27.60 mm. Each crayfish under observation was housed individually in a plastic container (11 cm diameter) filled with aged tap water at room temperature. Translucent, bluish-white rather than the natural brown-green coloured exoskeletons had been induced in the experimental animals by feeding them pelletised food deficient in beta carotenes. The translucent carapaces allowed direct observation of gastrolith development, but did not appear to affect the crayfish adversely in any way.

Changes in carapace hardness, setal morphology and behaviour were used to moult stage crayfish. The degree of hardness of the cheliped merus, postorbital ridge, cervical groove and branchial, areola and gastric regions of the carapace was recorded by applying finger nail pressure to each and determining whether it was 'hard', 'firm', 'brittle', 'leathery' or 'jellylike'. Examinations were conducted daily for crayfish in early proecdysis and late metecdysis, and hourly for those in late proecdysis and early metecdysis. Intermoult were inspected once per week. The ecdysial suture of crayfish in late proecdysis was examined hourly to assess the degree of opening.

The setal morphology analysis utilised the techniques of previous studies on parastacid crayfish (Mills & Lake, 1975; Burton & Mitchell, 1987). The pattern of feeding and response to handling of each crayfish was examined daily.

Temporal changes in the size, shape and position of the gastroliths, when viewed from dorsal and lateral surfaces were mapped at regular intervals, sequentially to observations on the other three characters. Observations were made two to three times per hour for animals within five hours of ecdysis, every 10 minutes for the first hour post-moult, and then every three to four hours, until the gastroliths were no longer visible.

RESULTS AND DISCUSSION

Table I provides a set of characteristics with which individual *C. cuspidatus* can be moult staged into one of eight stages, each stage being identified by a combination of carapace hardness, setal morphology and behavioural criteria. The changes in gastrolith development which occur during each stage are also summarised in the table. Changes in size, shape and position of the gastroliths are sufficient to allow identification of four of the five proecdysial stages.

The appearance of the gastroliths readily allows identification of stage D₀. No observable changes in gastrolith development take place during stage D₁,