

## UNUSUAL SHELTERS OCCUPIED BY BRAZILIAN HERMIT CRABS (CRUSTACEA: DECAPODA: DIOGENIDAE)

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(With 1 figure)

Hermit crabs are commonly found occupying gastropod shells. However, some hermits are known to utilize a variety of alternative shelters such as tusk shells, serpulid tubes, cavities of stones, sponges, dead corals, pieces of bamboo, bivalve shells (see Imafuku & Ando, 1999), and/or a variety of gastropod shells with the exterior surface colonized by organisms that affect shell selection (see Brooks & Mariscal, 1985). Despite the 47 hermit crab species recorded in Brazilian waters (Melo, 1999; Mantelatto *et al.*, 2001; Nucci & Melo, 2003), there have been no reports on type of shelters other than gastropod shells occupied by hermit crabs on the Brazilian coast.

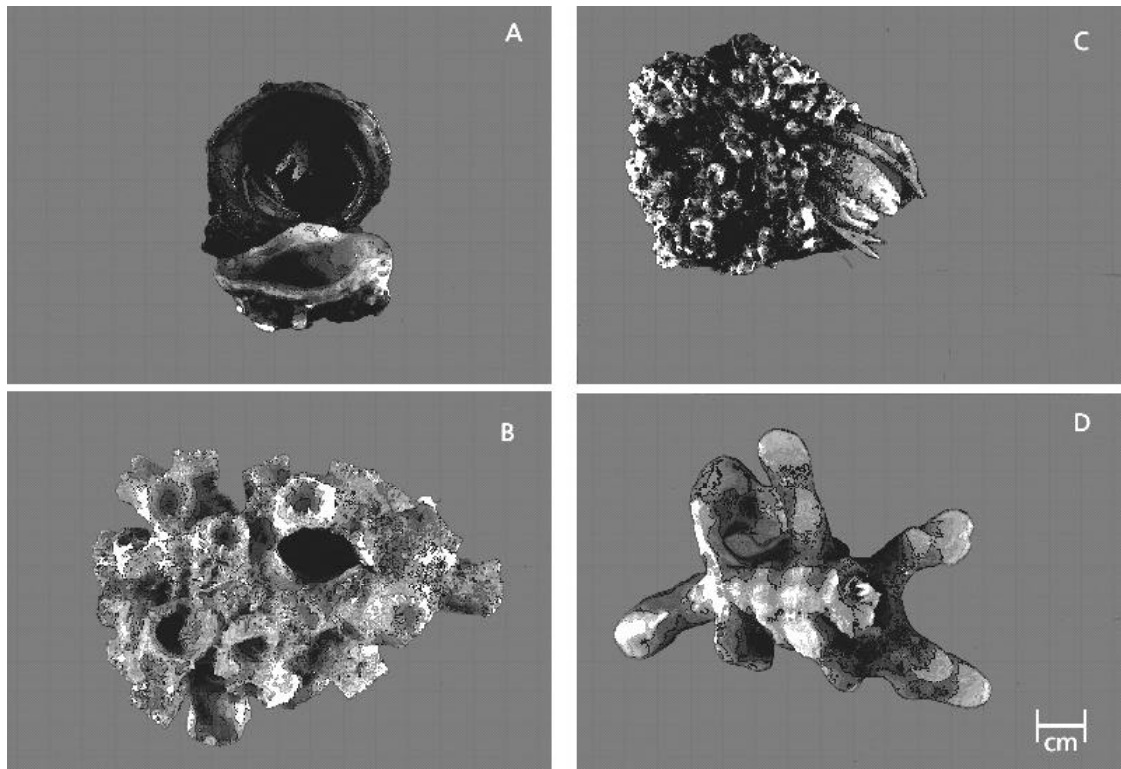
In December 2000, a male of *Dardanus venosus* (H. Milne Edwards, 1848), and a female of *Paguristes erythropus* Holthuis, 1959 (3.2 and 3.9 mm in shield length, SL, respectively), were caught by SCUBA methods on the rocky surface of the infralittoral area (9 m depth) of Anchieta Island (23°33'S, 45°05'W), Ubatuba region, São Paulo State. The male *D. venosus* inhabited a bivalve shell (shell aperture width, SAW = 10.0 mm; shell aperture length, SAL = 9.4 mm) of *Chama congregata* Conrad, 1833 (Fig. 1A), and the female *P. erythropus* a gastropod shell (SAW = 3.8 mm and SAL = 6.7 mm) of *Favartia cellulosa* (Conrad, 1846) totally covered by live corals of *Astrangia rathbuni* (Vaughan, 1906) (Fig. 1B).

On February 2001, one male and one female (6.9 and 3.0 mm of SL, respectively) of *Dardanus insignis* (Saussure, 1858) were collected on soft bottom substrate (35 to 45 m depth) with a double-rig trawl net in Caraguatatuba Bay (23° 57'S, 45° 28'W), and São Sebastião Island region (23°44'S, 45°02'W), northern

coast of São Paulo State. The male inhabited a barnacle shell (SAW = 14.4 mm and SAL = 12.3 mm) of *Balanus venustus* (Darwin, 1854) covered by small cirriped shells of the same species (Fig. 1C); and the female inhabited a gastropod shell (SAW = 5.0 mm and SAL = 10.0 mm) of *Fusinus brasiliensis* (Grabau, 1904) covered by a colony of unknown bryozoan (Fig. 1D). Voucher specimens collected are deposited in the Crustacean Collection of the Biology Department of FFCLRP, University of São Paulo, Brazil (DB/FFCLRP/USP 1087 to 1090).

As far as we known, the present communication is the first report of uncommon shelters used by hermit crabs in shallow waters of the Brazilian coast. It is important to note that the majority of specimens in all species reported here were found occupying gastropod shells in the natural populations (99.8% of the total) studied in the same region (Mantelatto *et al.*, 2001; Mantelatto & Garcia, 2002).

No deformities in pleopod, abdomen or pereopod morphology were observed in these hermit crabs. However, the length of the exopod of the uropods were measured, and the asymmetry index (AI) was calculated following Van Valen (1962);  $AI = (L - R)/(L + R)$ , with L and R being left and right measurements, respectively. The index varies from +1 (left longer) to -1 (right longer), with 0 indicating perfect symmetry. The female *D. insignis* had almost symmetrical uropods (0.15), while the others presented markedly left-biased asymmetrical uropods (0.24 for *D. venosus*; 0.21 for male of *D. insignis*; and 0.24 for *P. erythropus*). The present study reports isolated cases of uncommon hermit crab shelters in the São Paulo coast.



**Fig. 1** — Uncommon shelters occupied by hermit crabs in Ubatuba region. A) A male of *Dardanus venosus* inhabiting a bivalve shell of *Chama congregata*; B) a female of *Paguristes erythroptus* inhabiting a gastropod shell of *Favartia cellulosa* totally covered by live corals of *Astrangia rathbuni*; C) a male of *Dardanus insignis* inhabiting a barnacle shell of *Balanus venustus* totally covered by small shells of the same species; D) a female of *Dardanus insignis* inhabiting a gastropod shell of *Fusinus brasiliensis* covered by a colony of unknown bryozoan.

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