ovigerous female collected on Seven and One-Half Fathom Reef are: length 6.9 mm and width 12.4 mm. The measurements of the two individuals collected from Port Aransas are: ovigerous female carapace length 7.3 mm and width 11 mm; male carapace length 5.7 mm and width 7.2 mm. These measurements are considerably smaller than those listed by Williams (1965).

Williams (1965) gave the color of *P. gibbesi* as "grayish white, sometimes stained with brown." A distinct color variation is present in these individuals. The carapace and chelipeds of the male from Mansfield Channel are yellowish orange while the female is light brownish gray. The carapace and chelipeds of the male from Port Aransas are moderate brown to yellowish brown. The carapace of the female is light brownish gray with moderate yellowish brown chelipeds. The carapace and chelipeds of the female from Seven and One-Half Fathom Reef are yellowish gray.

These five specimens were collected in water depths between one and eight fathoms which concurs with the depths given by Williams (1965) and Haig (1956).

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OXYGEN CONSUMPTION AS A FUNCTION OF BODY SIZE IN A TERRESTRIAL HERMIT CRAB, *COENOBITA* (DECAPODA, PAGURIDEA)

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The oxygen consumption of Crustacea increases markedly as their habitat becomes progressively more terrestrial (Pearse, 1929; Ayers, 1938; Vernberg, 1956; Lockwood, 1967). In fact, Vernberg (1956) reported that the oxygen consumption of terrestrial Decapoda tended to be 2 to 5 times greater than that of similar sized sub-tidal decapod Crustacea. Oxygen consumption has not previously been

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reported for the Coenobitidae, a family of hermit crabs considered to be among the most terrestrial of all Decapoda. The present study quantifies oxygen consumption as a function of body size in *Coenobita brevimanus* Dana, 1852.

Eight *Coenobita* were obtained from commercial sources and were reared at 24° C for 4 months before experimentation. The crabs were fed on vegetable matter and had free access to both fresh and sea water. Only animals in the intermolt stage and which had been starved for 48 hours were used for experimentation.

To determine oxygen consumption, a *Coenobita* was placed in a 500 ml glass vessel fitted with an air-tight lid. This lid was perforated with a short length of cannula connected to a liquid filled manometer and by a 3-way tap connected to a 1 ml glass syringe. Inside the chamber, but completely inaccessible to the animal, was a small vial containing a CO_2 absorbant. The apparatus was operated in a room with a constant temperature of 24° C $\pm$ ½° C and movements of the investigator were screened from the hermit crab in the chamber. A small volume (usually 1 ml) of O_2 was withdrawn from a gas cylinder into the syringe via the 3-way tap and then injected into the chamber. The time required for the pressure differential between the atmosphere and the respirometer chamber to equalize as monitored by the manometer was recorded. After the hermit crab was removed from the respirometer, the animal was induced to leave its shell, body weight was measured and the oxygen consumption for that animal calculated.

The relationship between oxygen consumption and body weight is presented as a log-log relationship in fig. 1. Oxygen consumption increased significantly with decreasing body weight with the largest animal (16.02 g) having a mean oxygen

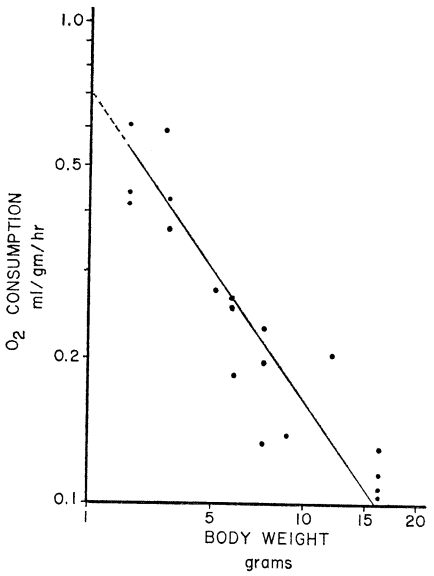

Fig. 1. Relationship of oxygen consumption at 24° C to body weight in *Coenobita*. Points plotted are single determinations. The line representing the relationship was fitted by eye.

consumption of only 0.12 ml O_2/g/hr. compared to the smallest animal (1.84 g) which had a mean oxygen consumption of 0.49 ml O_2/g/hr. The unit rate of metabolism, the theoretical metabolic rate when body weight is 1 g, for *Coenobita* is 0.70 ml O_2/g/hr. at 24° C. This is relatively large when compared to a fully aquatic crustacean such as *Procambarus alleni* which has a unit metabolic rate of only 0.115 ml O_2/g/hr. at 25° C. *Uca*, a littoral crab, has a higher unit oxygen consumption of 0.019-0.217 ml O_2/g/hr. at 24° C, while *Talitrus*, a littoral amphipod, has a unit oxygen consumption of 0.533 ml O_2/g/hr. at 25° C (Wolvekamp & Waterman, 1961). The data acquired in the present study for *Coenobita*, one of the most terrestrial species of Decapoda, support observations by previous workers that terrestrial Crustacea exhibit higher unit oxygen consumption than more aquatic species. Edney (1961) suggests that the ready availability of oxygen and the low density of air permit rapid and prolonged locomotion and subsequent elevated oxygen consumption in terrestrial species. However, higher rates of oxygen consumption in terrestrial species may also be a reflection of the increased energy required to cary the mass of the animal in a less buoyant medium.

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PATTERN POLYMORPHISM AND PREDATION IN THE SHORE CRAB, *CARCINUS MAENAS* (L.)

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Juvenile Shore Crabs, *Carcinus maenas* (L.), are highly polymorphic with respect to carapace colour pattern (fig. 1). Many juveniles show patterns which are striking, typically consisting of a dark background with highly contrasting bright white patches in the hepatic and facial regions of the carapace. Adult crabs