

**Table 2. Concentration of chlorinated hydrocarbons in Gulf of Mexico and northern Caribbean plankton and fish (parts per billion wet weight).**

	Zooplankton	Small whole fish (6 inches or less) and fish muscle	Fish liver
Total DDT range	<0.2-34	1-159	13-1505
Mean total DDT	11	39	282
PCB range	<3-1055	1-527	18-1300
Mean PCB	94	49	290
Number samples analyzed	29	43	13

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dal faunas are considered to be the effect of ice action (Dayton *et al.*, 1969) and harsh environmental conditions (Knox, 1968). A habitat which provides protection from ice action of the abrasive kind, at least at Palmer Station, is the stable boulder and cobble rubble. Collections and observations made in this habitat at Palmer Station (64°46'S. 64°04'W.) revealed a relatively large number of intertidal species (table). The locations where this habitat was studied are noted in fig. 1.

The byssate bivalve *Kidderia* (*Kidderia*) *subquadratum* (fig. 2) is the dominant invertebrate of the assemblage of organisms found, often reaching densities in excess of 30 individuals per square centimeter. The upper intertidal limit of this species appears to be associated with dessication. Individuals living among the

## An intertidal assemblage at Palmer Station

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The antarctic intertidal zone has been described as either very poor (Knox, 1960; Price and Redfearn, 1968; Gruzov and Pushkin, 1970) or lifeless (Propp, 1970). Stout and Shabica (1970) recorded an intertidal association at Port Lockroy, Wiencke Island (64°48'S.-64°30'W.), dominated by *Kidderia* (*Kidderia*) *subquadratum* Pelseneer (recorded as *Lasaea consanguinea*). At Palmer Station, Hedgpeth (1969) reported a simple intertidal assemblage with *Patinigera polaris* as the only large intertidal animal.

The primary reasons for such simple antarctic interti-

### Intertidal species found at Palmer Station.

Phylum	Number of species
Porifera	4
Coelenterata	1
Platyhelminthes	1
Nemertinea	2
Ectoprocta	2
Annelida	5
Mollusca	6
Arthropoda	6
Pycnogonida	2
Echinodermata	3
Rhodophyta	(
Phaeophyta	(7
Chlorophyta	(

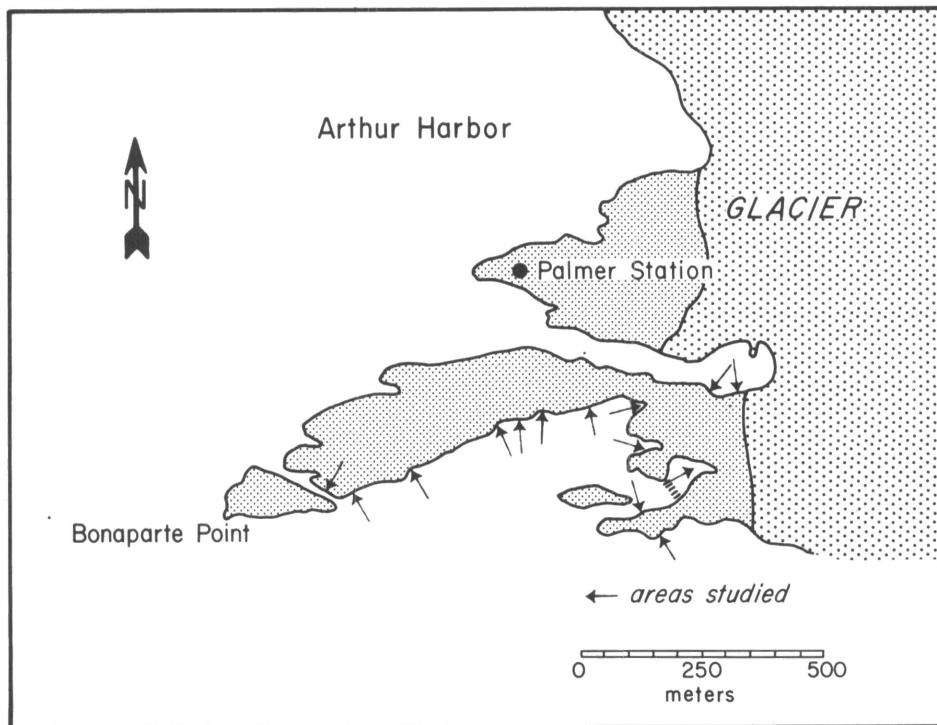


Figure 1. Locations of intertidal assemblages near Palmer Station, Anvers Island.



Figure 2. *Kidderia (Kidderia) subquadratum* Pelseneer, in a small intertidal crevice. The largest individuals are about 3 millimeters in length.

rubble range of up to +0.3 meters (mean lower low water, MLLW). When associated with, and hence protected by, the alga *Curidaea racovitzae*, however, they are able to live as high as +0.75 meters (MLLW). Tolerance of high temperatures is not a factor in the vertical distribution of this bivalve. The lower depth limit of *K. subquadratum* was not located in this study and probably is subtidal.

The high intertidal (+1.2 meters to +1.8 meters MLLW) is marked by the presence of the green alga *Monostroma* sp., and associated with it is a small, unidentified annelid, probably an oligochaete. The alga was not found strictly in the rubble, more generally in open spaces. The filamentous green alga *Chaetomorpha* sp. was found, in many cases, immediately below the *Monostroma* zone (fig. 3), its position being controlled by wave exposure.

*Patinigera polaris*, the common antarctic limpet, also was a readily apparent member of this intertidal assemblage. Although apparently more numerous, subtidally, it occasionally reaches high densities, intertidally. In one case, associated with a crack system, an area of 0.025 square meters had 72 individuals. The upper limit of *P. polaris* at +0.60 meters (MLLW) may be exceeded on rare occasions but appears to be fairly constant in the areas studied.

The presence of this assemblage is important, considering its implications concerning the physiology of intertidal polar animals and the distribution of exploited intertidal space. This work was supported by National Science Foundation grant GV-31162. The identification

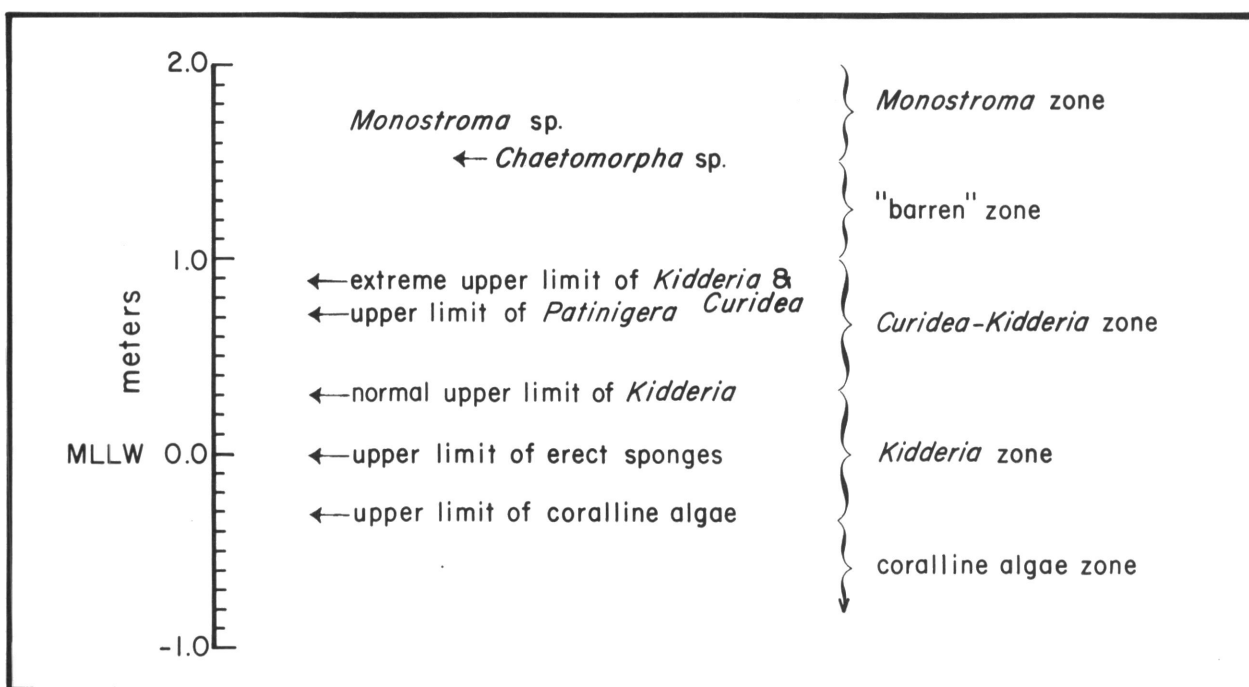


Figure 3. Preliminary zonation of the protected intertidal rubble zone near Palmer Station.

of *Kidderia* (*Kidderia*) *subquadratum* was made by Dr. Patrick Arnaud. Ms. Nancy Valentine did the drafting. To these people and to Dr. Jere H. Lipps, for his help in this project, I extend my thanks.

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## Ecology of antarctic marine diatoms

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Ecological studies on antarctic near-shore phytoplankton and benthic microalgae were carried out in Arthur Harbor, near Palmer Station, Antarctica, during December 1971 to January 1973. This work was supported by National Science Foundation grant GV-31162, to Jere H. Lipps. It is an essential part of a program designed to study shallow-water benthic foraminiferan ecology and population dynamics in waters off the Antarctic Peninsula (Lipps *et al.*, 1972).

The marine planktonic and benthic microalgae in Arthur Harbor consist almost entirely of diatoms. Thus my work became a study of antarctic marine diatom ecology. It involved quantitative and taxonomic studies of diatom seasonal fluctuations in Arthur Harbor, as well as measurements of important physico-chemical parameters of the seawater. Weekly water samples were secured at 10-foot intervals down to 100 feet and at 135 and 175 feet. A portion of the water was set aside for chemical analysis while the remainder was processed for diatoms. In conjunction with this, tows for zooplankton were