ABSTRACT

Histological analysis confirmed the resemblance of the ovarian structure and development of *Panulirus longipes longipes* to those of other palinurid species. The low incidence of inactive ovaries and the presence of developing ovaries at any time of the year indicate that this species breeds year round in Calatagan, Batangas, Philippines. Continuous breeding of the population is further ascertained by the incidence of egg-bearing females in the landed catch during practically all months from July 1982 to June 1984. Furthermore, the incidence of developing and redeveloping ovaries in egg-bearing females (44.0-81.2 mm CL) suggests that individuals can produce at least 2 broods in rapid succession particularly during the warmer months of March to May. The smallest females with eggs and mature ovaries were 41.8 and 41.4 mm CL size, respectively. The disproportionate increase in the growth of the third walking leg of the males relative to the females indicate that males reach first functional sexual maturity between 55.0-60.0 mm CL. The relationship between the total number of eggs (E) carried and the size of the female (CL) is expressed by the relationship: \( E = -291063 + 7387 \times CL \) over the size range 43.0-85.4 mm CL. Over this size range, the reproductive potential of *P. longipes longipes* is higher than that of closely related species belonging to the *P. japonicus* group.

RÉSUMÉ

L'analyse histologique a confirmé la ressemblance de la structure de l'ovaire et du développement de *Panulirus longipes longipes* avec ceux des autres espèces de palinurides. La faible fréquence d'ovaires inactifs et la présence d'ovaires en cours de développement à tout moment de l'année indiquent que cette espèce se reproduit toute l'année à Calatagan, Batangas, Philippines. La reproduction en continu de la population est confirmée par la fréquence de femelles ovigères dans les prises débarquées pendant pratiquement tous les mois de juillet 1982 à juin 1984. De plus, la fréquence des ovaires en développement ou redéveloppement chez les femelles ovigères (44,0 à 81,2 mm CL) suggère que les individus peuvent produire au moins 2 pontes en succession rapide en particulier au cours des mois les plus chauds de mars à mai. Les plus petites femelles avec œufs et ovaires à maturité mesuraient 41,8 et 41,4 mm CL, respectivement. La croissance disproportionnée de la troisième patte ambulatoire des mâles comparée à celle des femelles indique que les mâles atteignent les premiers la maturité sexuelle fonctionnelle entre 55,0 et 60,0 mm CL. La relation entre le nombre d'œufs (E) et la taille de la femelle (CL) est exprimée par: \( E = -291063 + 7387 \times CL \) pour la classe de taille 43,0-85,4 mm CL. Dans cette classe de taille, le potentiel reproductif de *P. longipes longipes* est supérieur à celui d'espèces proches appartenant au groupe *P. japonicus*. 
INTRODUCTION

Panulirus longipes (A. Milne-Edwards, 1868) is a common tropical spiny lobster in the Indo-West Pacific region and its distribution ranges from East Africa to Polynesia. Unlike Panulirus penicillatus (Olivier, 1791) which has been noted by Briggs (1974) as the only transpacific spiny lobster, P. longipes has never crossed the Pacific barrier and its dispersal is limited by distances greater than 1,600 km (George, 1968). Two subspecies, P. longipes longipes (spotted legs) and P. longipes femoristriga Von Martens, 1872 (striped legs) are found in various localities in the Philippines (Gomez & Juinio, 1985). Both subspecies thrive in coral reef areas and calmer waters compared to other local species. Sympatric occurrence of these subspecies has been reported along the Philippine Pacific coast. The presence of intermediate morphs and electrophoretic evidence suggest interbreeding between subspecies at these localities (Juinio et al., 1991).

Panulirus longipes longipes occupies the western portion of this species' distribution extending from the coast of East Africa to the Philippines (George & Holthuis, 1965). It is the only P. longipes subspecies found in Calatagan, Batangas, Philippines (13°48' N 120°37' E), comprising about 66% of the total landed lobster catch of artisanal spearfishermen (Gomez & Juinio, 1985). In this paper, we determined the breeding period of this form at Calatagan, Batangas, from the relative frequencies of the different stages of ovarian development and the incidence of egg-bearing females in the landed catch and estimated the reproductive potential of this population.

METHODS

Daily landings of lobsters were monitored during the period July 1982 to June 1984. Individual total weight of almost all landed lobsters was determined to the nearest 5.0 g using a 10 kg commercial weighing scale. Carapace length (CL) was measured with a vernier caliper along the mid-dorsal line from the transverse ridge between the post-orbital spines to the posterior edge of the carapace to the nearest 0.1 mm. The third walking leg of 165 males (44.0-83.3 mm CL) and 80 females (41.0-90.4 mm CL) was measured to the nearest millimeter along the ventral surface from the tip of the dactyl to the proximal margin of the ischium to estimate the size at first functional sexual maturity of males. The sizes of egg-bearing females in the landed catch were used to infer the size at first sexual maturity in this sex.

From February 1983 to May 1984 (except July), the gonads of a total of 252 females were collected. The color and condition of the fresh ovaries were noted. The ovaries were preserved in 10% formalin and wet weight was determined to the nearest 0.1 g with an electronic balance after being blotted dry prior to standard histological processing. The middle sections of one of the posterior lobes of the ovaries were dehydrated in ethanol, cleared in xylene, embedded in paraffin, sectioned at 7 μm, and stained in Delafield's hematoxylin-eosin Y. All