NOTE ON BIOLOGICAL CHARACTERISTICS AND RESOURCES OF THE SCALLOP (*CHLAMYS NOBILIS*) IN THE COAST AL AREAS OF BINH THUAN PROVINCE

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ABSTRACT

This paper has emphasis on data from 1985-86. The data have historical value because the scallop resource in recent time has been overexploited with severe consequences for the natural stocks. Data demonstrate that a rich resource of scallop (*Chlamys nobilis*) used to be widely distributed in Binh Thuan coastal area. *C. nobilis* could be exploited annually from August to October when scallops were over one year old and had a shell length of 6.5-7.6 cm. Exploited production varied annually but the potential production should be approximately 15,000 tons. Main landings came from four places within an area of about 100 km^2. The paper summarises ecological information available on *C. nobilis*.

INTRODUCTION

We use the name *Chlamys nobilis* Reeve, 1852 for the present scallop but taxonomists still discuss whether the name *Chlamys (Mimachlamys) crassicostata* (Sowerby II, 1842) should be more appropriate for this species.

C. nobilis has a high economic value and is an essential export item from Binh Thuan province. However, the yield of *C. nobilis* varies much from year to year without clear reasons. It has been suggested that overfishing and poor management of the stocks are the main reasons, but variations due to fluctuating environmental factors, influencing the recruitment, may also play a role. The objectives of this study are to show the situation as it used to be when *C. nobilis* was a common but not fully exploited resource in the Binh Thuan coastal area. In addition to stock estimates we investigated selected ecological parameters.

MATERIALS AND METHODS

Following the "Norms of synthetic survey in inshore areas" QPVN-79, we carried out two survey trips on the FAO-91 ship and FAO-93 ship (the first time in December 1985 and the second in April 1986). We surveyed a total 45 places from Phan Rang to Ham Tan. A biological dredge (size of frame: 60 x 25 cm) was used to sample *C. nobilis* at selected survey stations, especially from Ca Na to Phan Thiet (Figure 1).

Weight of the ovary was compared to total weight of the soft body and the weight of the ovary calculated as a percentage.

RESULTS AND DISCUSSION

Size of C. nobilis*:*

Figure 2 shows that the average size of *C. nobilis* was 3.9 cm (January), 5.5 cm (April), 7.4 cm (September and October) in the first year and 8.5-9.4 cm at the beginning of next year. The analysis of length-size distributions indicated that the exploited age of *C. nobilis* was mainly scallops in the second year (1^+).

Reproduction

The weight of ovaries were rather constant (range 7.4-7.5 % of total body weight). We separated immature eggs from mature eggs under the microscope. Immature eggs were

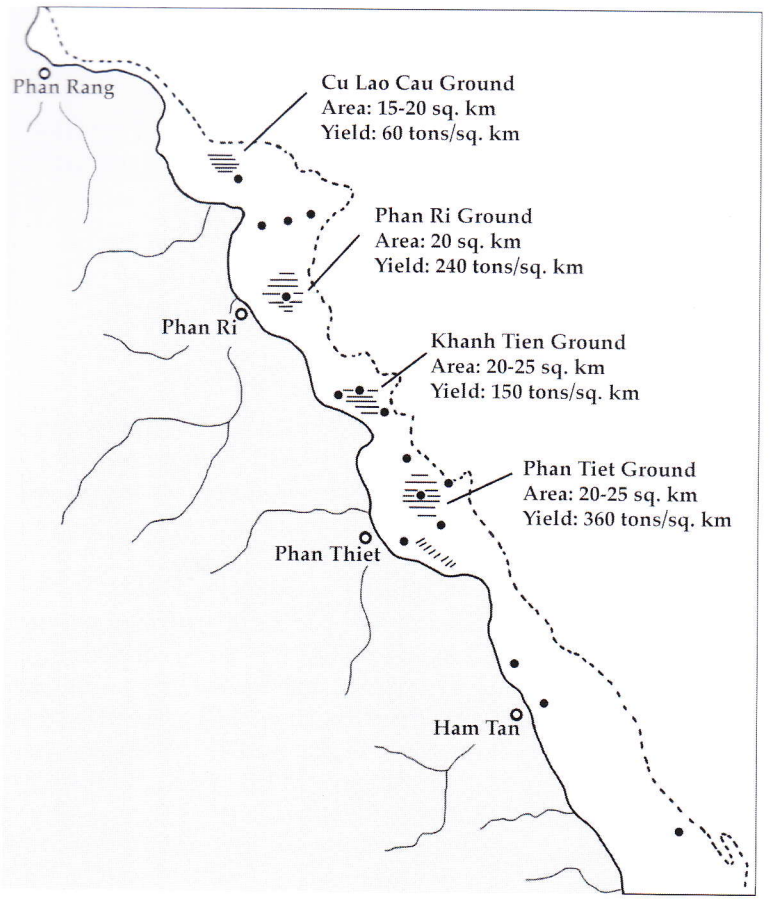

Figure 1. Distribution of *C. nobilis* in four major scallop grounds (total area inserted). Sampling sites for scallop are indicated by filled circles.

multiform and significantly different in size. This analysis demonstrated that scallops could breed several times in a breeding season but peaks were noted from May to August. *C. nobilis* matured at size of 40 mm. The fecundity of females was 277,000-509,000 eggs/ individual. Relative fecundity was 23,660-36,850 eggs/g total weight (shell included), or 290,650-459,790 eggs/g weight of soft body.

Environment of C. nobilis*:*

Sediment at most of *C. nobilis* grounds consisted of sand, gravel, and dead coral with a relatively high amount of mud and many mollusc shells. The bottom was relatively hard. The maximum speeds of currents at surface in Phan Ri and Phan Thiet stations were estimated at 56 and 54 cm/s respectively. The flow speed was reduced near the bottom but still strong. Water temperature of the first survey ranged from 24-26 °C and in the second survey from 26.0-29.5 °C; corresponding salinities were 31.8-33.0 and 33.3-34.4 ‰. Transparency (Secchi) was 2.3-4.9 m

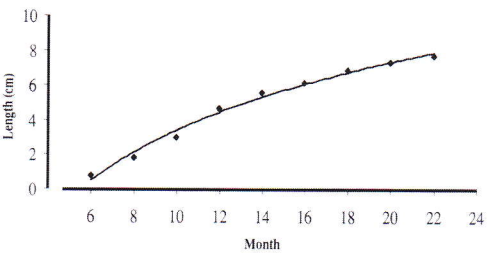

Figure 2. The growth curve of *C. nobilis*.

Table 1. Average values of *C. nobilis* shell and organs estimated for 4 size classes (December 1986)

Size class (mm shell length)	N (ind.)	Height (mm)	Length (mm)	Shell hard part (g)	Soft body, total (g)	Adductor muscle (g)	Gonad (g)
Phan Thiet 21-40 mm	26	34.2	29.2	5.07	2.94	0.96	no data
Phan Thiet 41-60 mm	29	48.3	42.2	11.22	6.56	2.26	no data
Phan Thiet 61-82 mm	34	79.2	75.3	36.44	27.94	9.73	1.97
Phan Ri 60-90 mm	62	78.0	72.9	59.50	27.55	7.11	2.27

RESOURCES OF *C. NOBILIS*

C. nobilis shells measured 55-94 mm in length, mainly 65-79 mm. The weight of shells, total soft parts, isolated weight of adductor muscle (main item for export) and weight of isolated gonads are shown in Table 1. The weight of adductor muscle of scallops with heavy fouling on the shells (415 individuals) and scallops without fouling (231 individuals) did not differ.

Table 2 shows data from Fishery Department on landings of *C. nobilis* (total weight, including shells)

We calculated potential production and yield that could be exploited in Binh Thuan coastal assuming 7 cm shell length and a weight of 30 g/ individual. Our estimate is 15,000 tons/yr. At the time of this study the exploited-available production made up 80% of the potential production. We discovered one more *C. nobilis* ground at Cu Lao Au and maybe another ground in Southern Ham Tan.

Table 2. Total landings of *C. nobilis* (tons wet weight)

Year	(tons)
1977	192
1978	3,740
1979	718
1980	306
1981	592
1982	140
1983	209
1984	475
1985	864