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# 89. ON THE EXPLOITATION AND MARKETING OF EDIBLE OYSTERS IN GUJARAT

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## ABSTRACT

Edibe oyster survey was carried out between Sikka to Veraval, Gujarat, from April-August 1986. Stray population was observed at Sikka. Gagawa creek, Singach creek, Salaya (Beat kada), Salaya (Khanara creek,), Beh Laku point (Peshetra), Arambhada, Gomati creek (Dwarka) etc. and dense population was observed at Harsad (Medha creek) and Navibundar.

Edible oysters are being exploited from Harsad on small scale and are being marketed at Porbundar.

## INTRODUCTION

Systematics of edible oysters have been discussed (Awati and Rai 1931). Mention is also made that some species of edible oysters are available at Cutch, Okha, Gulf of Kutch, Dwarka and Peshetra along Gujarat coast (Rao (1974). Correct identity of edible oyster is discussed north of Bombay (Durve 1973).

Few workers from the area have worked on edible oysters on different aspects such as biological, neuresecretory and biochemical (Nimavat, 1978), bionomical (Patel 1979), culture and pollution studies (Dave 1979) and edible oyster resources (Jetani et al 1981), but survey of edible oyster has not been given sufficient importance from the area between Sikka to Veraval except Gagawa, Dwarka (Gomati) and Arambhada. So, as a part of research programme on edible oyster, survey of these are included and discussed below. Gagwa, Arambhad and Dwarka (Gomati Ghat) were resurveyed.

## MATERIAL AND METHODS

During low tides of spring tides, surveys were undertaken between Sikka to Veraval by covering the places Sikka, Gagwa, Singach creek, Salaya (Beat kada) Salaya (Khanara creek), Beh, Pindhara, Vasti point - Peshetra, Beyt Dwarka, Arambhada creek, Dwarka (Gomati Ghat), Harshad creek, Navi-bundar Time-Mangrol bara and Meghal.

Length and breadth of edible oyster grounds were measured through 50 m long monofilament thread of 5 mm size. Random samplings were carried out in each area where edible oysters occur by plotting 1 x 1 m wooden quadrate. Then, from the data, probable population of the whole area was estimated.

Besides, eye estimation was made in each site to get approximate population of oysters. Fishermen of the areas were also contacted to get information about availabilit of edible oysters from each area wherever possible.

Samples of oysters from each areas were taken out through hammer and chisel and were brought to laboratory for systematics.

## RESULTS AND DISCUSSIONS

*Species recorded during survey*

(1) *Crassestrea gryphoides* (Schotheim)

Shell oblong, narrow in the anterier margin and borader in the posterior margin. Lower valve laminated, very thick particularly in anterior region below the ligament area. Shell generally curves to the left and in some to the right; upper shell is thin, Inner side of shell is white and glossy. He dentiles on inner shell margin; muscle scar more or less bean-shaped and yellowish white in colour.

(2). *Crassestrea discoidea* (Gould)

Shell large, rounded, ligament area small, upper valve of the same size and shape as to lower valve. Inner surface of valves clear,

white and glossy, no denticles, muscle sear bean-shaped and similar to *gryphoides* in colour.

(3). *Saccostrea cucullata* (Born)

Shell more or less trigonal, generally small, lower valve thick, overlapping at margin, greater portion of the margins of both upper and lower valves denticulated; muscle scar oblong and purple in colour.

*Description of grounds and survey details*

1. *Sikka:* At Sikka there is no creek and river meeting to the sea. Stray specimens were noticed in G. E. B. pools in which *Crassostrea gryphoides* and *Saccostrea cucullata* were met with. The later species was also found on scattered boulders near G. E. B. pools on intertidal reef flat.

2. *Gagva:* Seasonal river Padanio opens to the sea near Gagva village which results into a creek, known as Gagva creek. On one of the banks, there are salt pans. Also on both the banks there is lush growth of dwarf mangrove s It is a zig-zag creak in which at the turning points or at the junctions of creeklets there are formations of hard rocks on which growth of *Crassostrea gryphoides* was observed. *Crassostrea discoidea* and *Saccostrea cucullata* were also noted in few numbers, the creek was subjected to heavy siltation. Altogether, there were three grounds of edible oysters of small sizes. Population decreased from 2149 to 100.

3. *Singach*: Site of Singach edible oyster ground is located near Pump House No. 1 of Singach Salt Works where river Phulser 2 and Zakhar meet. The edible oyster ground was small with large boulders and burrows under them. It was also subjected to silting. Edible oysters of species *gryphoides* and *cucullata* were spotted here. Down side of creek from the ground is provided with mangroves on both banks. 140 numbers of *glyphoides* were noticed during survey line.

4, *Salaya (Beat Kada)*: It is located in between Goinjvel and Sunosada village on the shore. Edible oyster ground was 150 m in length and 100 m in breadth. *Saccostrea cucullata* was dominant on rockey grounds, made up of large boulders. Mud and sand accumulated on ground bottom. *Crassostrea gryphoides* was also available there, but in fewer numbers.

5. *Salaya (Khanara creek* : It is situated nearby Salaya. The length and breadth of edible oyster ground was 210 m and 60 m respctively. Bottom was rocky as well as sandy. *C. gryphoides* of numbers was observed during survey.

6. *Beh*: Located near Beh village where ground length was 200 m and breadth was 125 m. It was rocky and sandy in nature. 250 numbers of *C. gryphoides* was noticed during survey time. Dead molluscan shells of other species were also noticed.

7. *Pindhara*: In the horse-shoe-shaped area where dwarf mangroves protect the shore line of the area where thick growth of *Saccostrea cucullata* was observed on the dead stumps of mangroves as well on the vital stems of plants. At first instant it was felt that it was *Crassostrea rizophorae*, but after close inspection it was found that they were *Saccostrea cucullata*. Such instance was recorded in East African waters where species has invaded the mangroves habitat and it has been reported to occur in two distinct forms which Stenzel (1971) considers as ecomorphs (Ahmed 1975).

8. *Vasti Point, Poshetra*: Only *Saccostrea cucullata* was dominant. A few specimens of *Crassostrea gryphiodes* were also noted.

9. *Laku Point Poshetra*: In a small area of 400 m x 100 m, 80 numbers of disc oysters, *Crassostrea disceidea* were observed. It was dominant, Point remains submerged and exposed during minus tide.

10. *Beyt Dwarka*: In Beyt Balapur, there is a breakewall near Hanuman dandi. In the vicinity of it, *Saccostrea cucullata* was noticed in live conditions on rocky boulders which were exposed during low tide.

11. *Arambhada creek*: Arambhada creek is located between Arambhada village and Pump House of M/s. Tata Chemicals Ltd., Mithapur. It is transected by an over bridge. In the seaward side or downstream, few specimens of *Crassostrea gryphoides*were seen in 100 m x 50 m. Hornell (1905-1909) visited this place. Population of *gryphoides* depleted from 384 to 100 numbers.

12. *Dwarka (Gomati Ghat)*: In Gomati estuary there is water logging area where on single rocky line substratum, *Crassostrea gryphiodes* were available in 65 m x 60 m. *Crassostrea crystagalli*, cocks comb oyster was also noticed by earlier workers from there. Jetari et al (1981) observed 860 numbers of *gryphoides*, but now it dwindled to 110.

13. *Harshad*: Medha creek is crossed by a bridge-Harshad overbridge, On one side of bridge, Harshad Village is located and on the other side Miyani Village is situated. *C. griphoides* were seen in good numbers on scattered large boulders under bridge side. Area was 831 m x 500 m. From the area, small scale exploitation of edible oysters is being done. The estimated population was 41550.

14. *Navibundar*: Near Navibundar village River Ozat and Bhadar meet together and open to the Arabian sea. Oyster ground is at the meeting of both rivers and measured 1500 m x 200 m. It was rocky and shallow at places. *Crassostrea gryphoides*, as at Harshad was dominant. During winter, fishermen used to exploit about 40,000 oysters from the ground and dispese off their meat at Porbundar market. No exact details of exploitation were available. During survey, good numbers of shells were spotted there.

15. *Time Mangrol bara*: Creek started from Langan bridge and ended at Mangrol Bara. Area was 1200 m x 100 m. Ground was rocky and muddy. *Crassostrea gryphoides* was met with estimated population was 3600

16. *Meghal:* Meghal river meets the Arabian Sea between Chorvad to Holiday Camp. Ground was rocky and sandy covering 500 m x 100 m *Crassostrea gryphoides* was seen and the estimated population was 2000.

## A NOTE ON THE EXPLOITATION AND MARKETING

20-25 persons including women belonging to 7-8 Kharva families of Miyani Village go for fishing under Harshad bridge during low tides of high spring tides. Some get few oysters whereas others get more oysters. They remove oysters by hammers and chisels from 5'-6' deep water and bring them to the hard rocks where they shuck meat by breaking shells through hammers and chisels. They put meat in aluminium utensils with sea water (locally known as "Dabari" and through away shells.

Next day early morning 4-5 fishermen with 5-6 "Dabaries" in each 5-6 kg meat, go to Porbunder market by bus for disposal. Local Kharvas and Mohmedans and Harijans are their regular customers. Selling rate of meat is 10 pieces/5 Rs. (10 Rs/kg of meat.

Collection lasts for 3-4 months in winter. During summer small scale exploitation is closed down. However, 38-40 Kharva families when they wish to eat edible oysters exploit 500-700 g meat/family for their consumption.

It was learnt from the fishermen that two years earlier daily 70-80 kgs meat was sent to Porbundar market.

No details on exploitation were available from Navi bundar.

Occasional exploitation of edible oyster was noted from Gagva and Singach. The rate of meat was Rs 15/kg there.

Moreover, at Somnath, M/s. Akbarali Hadakawala of Bhavnagar exploits fossil shells of edible systers for poultry grit. He employes 10-15 labours for this. Every year nearly 2000-3000 t of shell grit are disposed off to Bombay market, interior parts of Gujarat, Madya Pradesh and Maharashtra. Selling rate is Rs. 300/t. No lime industrie is established in Gujarat, as in Andhra Pradesh and Tamil nadu.

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## REFERENCES


AHMED, M. 1975 Speciation in living oysters, *Adv. mar Biol.* 13 : 57-397.

AWATI, P. R. AND H. S. RAI, 1931. *Ostrea cucullata*, Methodist publishing House, Lucknow, 3 : 1-107.

DAVE, H. B. 1979. Some aspects of culture and pollution studies of eggs, larvae and spats of edible oysters. Ph. D. thesis submitted to the Saurashtra University, Rajkot (India).

DURVE, V. S. 1973. Malacological differences between the oysters *Crassostrea gryphoides* (Schlotheim) and *Crassostrea madrasensis* Preston, *Indian J. Fish.*, 20 (2) : 624-625.

JETANI, K. L , M. I. PATEL, AND M. A. VARGHESE, 1981. Edible oyster resources from the Gulf of Kutch. Submitted to 2nd All India Symposium on Experimental Zoology held at Dept. of Zoology, M. S University, Baroda-390 002 on 29th-31st January, 1981.

NIMAVAT, D. M. 1978. Biological and Biochemical studies of some edible oysters of Saurashtra coast Ph. D. thesis submitted to the Saurashtra University, Rajkot (India).

PATEL, B. V. 1979. Bionomical and some pollution studies on Oysters *Crassostrea* and *Ostrea* species. Ph. D. thesis submitted to the Saurashtra University, Rajkot (India).

RAO, K. S. 1974. Edible Bivalves : Mussels and oysters. *The Commercial Molluses of India*. Bull. Cent. Mar. Fish. Res. Inst., 25 : 4-39.

STENZEL, H. B. 1971. Oysters. *In : Treatise on Inverte-brate paleentology". 3* (3) : 953-1224.