

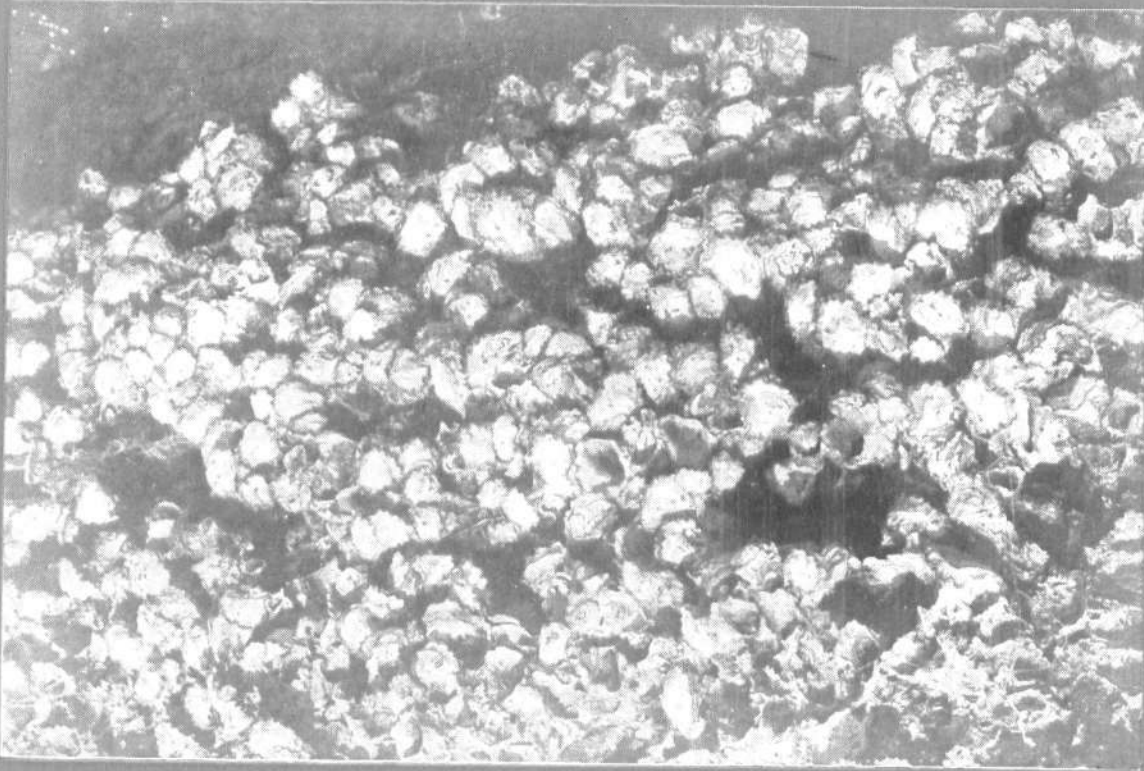


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## SIZE AND WEIGHT REDUCTION IN *HOLOTHURIA SCABRA* PROCESSED AS *BECHE-DE-MER*

### *BECHE-DE-MER\**

Along the Tamil Nadu coast *Holothuria scabra* is fished for *beche-de-mer* preparations. The fishing for this species extends from Rameswaram to Kottapattinam in the Palk Bay and from Pamban to Tuticorin in the

Gulf of Mannar in shallow waters. Fishing for holothurian is highly seasonal being restricted to March to October in the Palk Bay and October to March in the Gulf of Mannar. Nearly 1,000 divers are seasonally engaged in this fishing activity. Throughout the area both adult and juvenile specimens are collected by the divers.

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Growing demand for *beche-de-mer* in the marine export market has naturally led to considerable debate among fishery biologists in our country on the problem of irrational exploitation of the natural stock. One important aspect currently discussed is about the minimum size of the live animal that may be safely exploited. The process in the preparation of *beche-de-mer* results in considerable shrinkage from the initial size of the animal and the export control standard prescribed in the country stipulates that *beche-de-mer* below 75 mm (3") should not be exported. The exporters feel that this decision needs revision and that they should be allowed to export *beche-de-mer* above 50 mm size since good percentage of material is below 75 mm and also material of this size has some demand in foreign markets.

The Central Marine Fisheries Research Institute as the nodal institute to give expert opinion on such matters affecting the exploitation of the natural stock, had an indepth discussion on various aspects connected with the *beche-de-mer* industry during the recent National Workshop on *Beche-de-mer* (1989) held at Mandapam and explained the rationale behind the export size stipulation. At the end it was agreed, amongst other things, that the Institute should undertake investigations to throw more light on:

- i) The extent of shrinkage or size reduction of *H. scabra* from the fresh to the dried product.

- ii) The weight loss of fresh animal to the dried condition and
- iii) The size ranges of *H. scabra* entering the commercial catches.

The details presented in this report are the results of the follow-up studies made on the above lines during April-May, 1989.

For the study purpose fresh material was collected from Rameswaram, Devipattinam and Tirupalakudi and processed. The results emerged from the study are presented in Tables 1-3. It has been found that:

- i) The size groups of *H. scabra* fall within a range of 130-340 mm. 61.81% of the specimens are in the size range of below 230 mm. This shows that in the commercial catches there is a preponderance of individuals which are maturing (16.37%, 130-170 mm, 24.35%, 171-200 mm) and those about to spawn (21.09%, 201-230 mm). Studies on the size at first maturity of *H. scabra* undertaken by the authors, reported elsewhere, have indicated that the spawning size is 201-230 mm (average 220 mm).
- ii) *H. scabra* in the size group 201-230 mm after processing attains a reduced size of 73-80 mm (average shrinkage 76 mm).

**Table 1.** Changes in length and weight during processing of the sand fish *Holothuria scabra* at Rameswaram (sample size: 128)

Size group (mm)	Nos.	Initial state		I Boiling		II Boiling		Drying (72 hrs)	
		Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)
130-170	12	160	218	130	75	90	35	60	6.3
171-200	8	185	255	140	90	98	44	63	8.0
201-230	8	220	320	140	80	130	60	80	18.0
231-260	16	253	440	190	217	178	134	132	51.5
261-300	56	278	487	184	200	172	134	131	52.5
301-340	28	323	548	194	214	186	140	146	60.0
<b>Total</b>	<b>128</b>	<b>1,419</b>	<b>2,268</b>	<b>978</b>	<b>876</b>	<b>854</b>	<b>547</b>	<b>612</b>	<b>196.3</b>
<b>Mean</b>		<b>236.5</b>	<b>378</b>	<b>163</b>	<b>146</b>	<b>142.3</b>	<b>91.16</b>	<b>102</b>	<b>32.72</b>
<b>% of shrinkage</b>		<b>100.0</b>		<b>68.9</b>		<b>60.18</b>		<b>43.13</b>	
<b>% of weight</b>			<b>100</b>		<b>38.6</b>		<b>24.12</b>		<b>8.66</b>
<b>% of weight loss</b>			<b>100</b>		<b>61.4</b>		<b>75.88</b>		<b>91.34</b>

iii) The weight loss is considerable amounting to 91.34-91.79%.

iv) A perusal of Tables-1-3, indicates that the final reduction in length of the dried product constitutes 43.13% at Rameswaram, 42.65% at Devipattinam and 42.9% at Tirupalakudi. So far

as the weight loss is concerned, it was 91.34% at Rameswaram, 91.79% at Devipattinam and 91.73% at Tirupalakudi. Thus it is evident that specimens collected from different places show only negligible variation in size reduction on conversion to *beche-de-mer*.

**Table 2.** Changes in length and weight during processing of the sand fish *Holothuria scabra* at Devipattinam (sample size: 56)

Size group (mm)	Nos.	Initial state		I Boiling		II Boiling		Drying (72 hrs)	
		Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)
130-170	12	162	233	121	85	84	26	65	14
171-200	15	192	294	125	91	85	28	65	14
201-230	17	215	346	140	108	96	35	73	18
231-260	8	247	454	192	221	169	134	132	52
261-300	4	272	487	184	197	167	134	129	51
301-340	—	—	—	—	—	—	—	—	—
<b>Total</b>	<b>56</b>	<b>1,088</b>	<b>1,814</b>	<b>762</b>	<b>702</b>	<b>601</b>	<b>357</b>	<b>464</b>	<b>149</b>
Mean		217.6	362.8	152.4	140.4	120.2	71.4	92.8	29.8
% of shrinkage		100		70.04		55.24		42.65	
% of weight			100		38.7		19.68		8.21
% of weight loss			100		61.3		80.32		91.79

**Table 3.** Changes in length and weight during processing of the sand fish, *Holothuria scabra* at Tirupalakudi (sample size: 120)

Size group (mm)	Nos.	Initial state		I Boiling		II Boiling		Drying (72 hrs)	
		Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)
130-170	22	162	236	121	86	85	27	66	14
171-200	48	191	294	126	92	85	28	66	15
201-230	32	217	354	141	109	97	37	74	18
231-260	10	247	455	192	222	170	134	132	52
261-300	8	274	487	184	198	168	134	130	52
301-340	—	—	—	—	—	—	—	—	—
<b>Total</b>	<b>120</b>	<b>1,091</b>	<b>1,826</b>	<b>764</b>	<b>707</b>	<b>605</b>	<b>360</b>	<b>468</b>	<b>151</b>
Mean		218.2	365.2	152.8	141.4	121	72	93.6	30.2
% of shrinkage		100		70.03		55.45		42.9	
% of weight			100		38.72		19.72		8.27
% of weight loss			100		61.28		80.28		91.73

From the foregoing account there appears to be no need to reconsider the earlier decision banning export of *beche-de-mer* less than 75 mm (3" size) individually since such a step would mean allowing animals of range below 201-230 mm to be fished and processed. As is evident from the data collected now juveniles are indiscriminately removed along with adults since divers maintain that it is not possible to differentiate the size under water. A practical way of overcoming this problem is to adopt the principle of 'closed season' each year. Thus revival of the natural stock can take place and this would help in encountering specimens beyond the size of 75 mm in length. The fishermen need to be educated on these points so that indiscriminate exploitation can be brought under control. However, more studies are required on the biology of holothurians to determine precisely the period of maturity and spawning in different species in a year.

**Summary:**

- i) The fishing of holothurian *Holothuria scabra* extends from Rameswaram to Kottai-pattinam

in the Palk Bay and from Pamban to Tuticorin in the Gulf of Mannar in shallow waters.

- ii) In commercial catches the size groups of *H. scabra* from different places fall within a range of 130-340 mm and maximum percentage (61.81%) fall below 230 mm.
- iii) Studies on the size at first maturity undertaken by the authors indicated that the spawning size is 201-230 mm (average 220 mm) and this size group after processing attains a reduced size of 73-80 mm (average shrinkage 76 mm).
- iv) The size and weight reduction of *H. scabra* from fresh to *beche-de-mer* from different places show only negligible variation (size: 42.65-43.13%; weight: 91.34-91.79%).
- v) There is no justification to reconsider the earlier decision banning export of *beche-de-mer* less than 75 mm (3" size) individually. Also it is advisable to observe a 'closed season' each year to conserve the holothurian resources.

