

## Beche-de-mer production from three Papua New Guinean atolls between 1982 and 1983.

Annual harvests of sea cucumber or beche-de-mer in Papua New Guinea (PNG) for export are low and amount on average to about 5.5t/ yr dry weight or about 55t/ yr wet weight (Dalzell & Wright 1986). By comparison exports of beche-de-mer in Fiji rose in the late 1980s to about 1,000 t/ yr or an equivalent of 10,000 t/ yr in wet weight production. Research on beche-de-mer in PNG has been limited to several species found in coastal lagoons along the South Papuan coast (Shelley 1981). No other accounts of beche-de-mer fisheries occur in the literature on PNG fisheries other than a few unpublished reports listed in the PNG fisheries bibliography (Lock & Waites 1985). This short note summarises the brief history of a beche-de-mer fishery in the Nuguria, Carteret and Mortlock and Islands of north eastern Papua New Guinea.

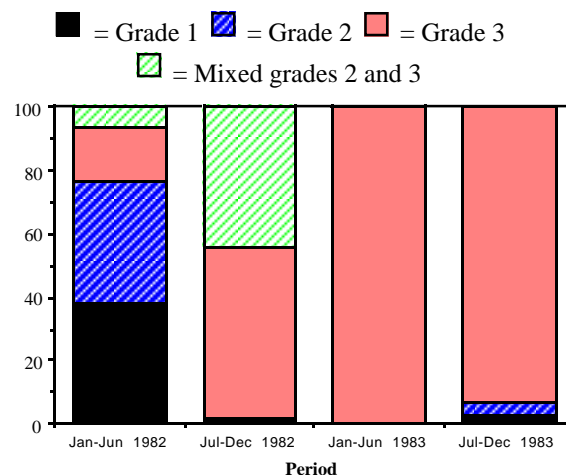
The three island groups are coral atolls to the north and east of the large island of Bougainville (North Solomons Province). The traditional fisheries of these islands has been described by Wankowski (1979) who mentions that beche-de-mer had previously been harvested on these islands in the past. Due to the efforts of the fisheries extension staff beche-de-mer harvesting commenced again in these islands in 1982 and lasted until the end of 1983. Beche-de-mer were collected and processed by villagers on the islands and collected periodically by dealers based in the provincial capital of the North Solomon Province, Kieta. The fishery targetted mainly on the black and white teat fish *Holothuria nobilis*. A total of 18.4t dry weight of beche-de-mer were produced by these three island groups over this two year period, 66% of which came from the Carteret Islands (Table 1).

**Table 1. Production of beche-de-mer from three northern Papua New Guinea atolls for each six month period in 1982 and 1983.**

Period	Beche-de-mer production (kg)			
	Carteret Is	Nuguria Is	Mortlock Is	Total
Jan-Jun 1982	4575	497	2316	7388
Jul-Dec 1982	4750	1201	770	6721
Jan-Jun 1983	1618	365	268	2251
Jul-Dec 1983	1136	536	339	2011
<b>Total</b>	<b>12079</b>	<b>2599</b>	<b>3693</b>	<b>18371</b>

The dried beche-de-mer were graded into three classes based on size; grade 1  $\geq$  20cm, grade 2 = 17-20cm and grade 3 = 15-17cm. The production by size grades were recorded by the beche-de-mer dealers in Kieta. Summaries of these records for each six month period are given by Ito (1984). At both Nuguria and Mortlock Islands catches consisted mainly of grade 1 and grade 2 beche-de-mer throughout the history of the fishery. At the Carteret islands, however, grade 1 and 2 beche-de-mer were virtually eliminated from the fishery in the first six months of collecting by the villagers (Fig 1). Grade 1 specimens which accounted for 38.0% of

the harvest in the first half of 1982 comprised only 1.4% of collections in the subsequent six months of the same year.



**Figure 1. Grade (size) proportions of beche-de-mer harvests from the Carteret Islands, 1982-1983**

Harvests at the Carteret Islands during 1983 were comprised almost entirely of small grade 3 specimens although in the latter half of the year a few grade 1 and grade 2 specimens were collected. Ito (1984) suggested that the virtual absence of larger beche-de-mer in the Carteret Island production after the first half of 1982 was a probable consequence of over fishing. The more modest harvests from the other two atolls was not accompanied by an elimination of the larger beche-de-mer specimens. According to Ito & Selemet (1985) buyers in Kieta ceased operations after 1983 since most of the production was based on the Carteret Islands and the quantity and quality of the beche-de-mer from this location had declined appreciably as detailed above.

There is little that can be added to the documentation of this short lived fishery. No information is available on the size of the harvesting grounds at each atoll or the relative amounts of effort used to generate production. However, these limited data lend support to the general concept of beche-de-mer fisheries being governed by boom or bust cycles. Further, declining harvests and reduction in mean size of harvested animals are symptomatic of overexploited fisheries. Members of the beche-de-mer SIG are encouraged to send in similar short accounts of fishery case histories for comparison, particularly where the information concerned is presently in a form that will receive limited circulation in the region.

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### References

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**Beche-de-mer recovery rates**

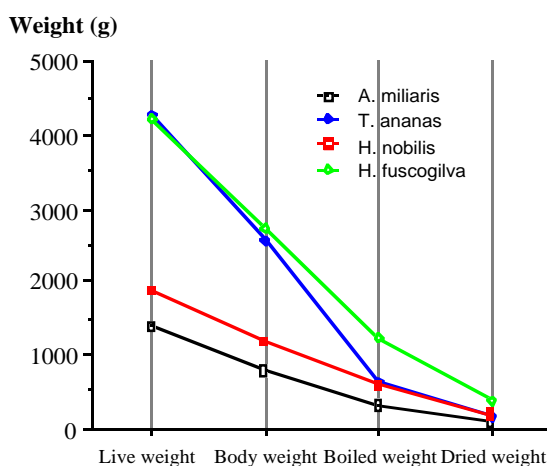
Recovery rates (ie the percentage of dried product obtained from a given amount of fresh material) for beche-de-mer have been estimated by several researchers over the last few years. Some recent drying experiments were carried out by Veikila Vuki and Filipe Viala, both formerly of the Fiji Fisheries Division

in Suva. A report on these trials will be presented in a forthcoming SPC publication. Below is a summary of results from this and previous studies by other workers, expressed as weight and length retained by specimens after processing.

Species	English name	% weight retained	% length retained	Reference (see below)
<i>Actinopyga mauritiana</i>	Surf red fish	6.7	44	1
<i>Actinopyga mauritiana</i>	Surf red fish	4.9	46	5
<i>Actinopyga miliaris</i>	Black fish	5.6*	--	2
<i>Actinopyga miliaris</i>	Black fish	9.7	52	5
<i>Actinopyga echinites</i>	Deepwater red fish	3.0	--	3
<i>Actinopyga echinites</i>	Deepwater red fish	11.2	47	4
<i>Holothuria atra</i>	Lolly fish	2.6	--	2
<i>Holothuria atra</i>	Lolly fish	7.7	48	5
<i>Holothuria fuscogilva</i>	White teat fish	7.6	51	4
<i>Holothuria fuscogilva</i>	White teat fish	9.8	53	5
<i>Holothuria fuscopunctata</i>	Elephants trunk fish	9.3	50	5
<i>Holothuria nobilis</i>	Black teatfish	8.7	--	2
<i>Holothuria nobilis</i>	Black teatfish	9.8	44	4
<i>Holothuria nobilis</i>	Black teatfish	8.1	55	5
<i>Holothuria scabra</i>	Sandfish	5.0	--	3
<i>Thelenota ananas</i>	Prickly red fish	3.0	--	2
<i>Thelenota ananas</i>	Prickly red fish	4.6	38	4
<i>Thelenota ananas</i>	Prickly red fish	5.6	36	5
<i>Stichopus chloronotus</i>	Green fish	2.7	32	5
<i>Stichopus variegatus</i>	Curry fish	3.9	34	5

\* Recalculated from original data

(Sources [see bibliographic listing this issue]: [1] Zoutendyk, 1989b and c: [2] Harriott, 1984: [3] Conand, 1979: [4] Shelley, 1981, cited in (2): [5] Vuki and Viala [in press])



**Weight loss during processing of four beche-de-mer species.** Based on Harriott (1984) and Conand (1979)

There is a fair degree of consistency among the results, especially considering the variations in experimental methodology used by the different researchers. Few, if any, species will yield more than 10% of their original weight as dried product, and some, such as *Stichopus chloronotus*, may yield as little as 3%. Some of the largest species, such as *Thelenota ananas* (prickly red fish) undergo the greatest weight loss. For most beche-de-mer species, shrinkage is relatively consistent, with the length of the dried product being between 30 and 50% of the live length. Dried length of the finished product is probably consistent enough in relation to live animal size to serve as a basis for size limits in cases where this form of management is considered desirable.

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