

A possible new candidate for grouper aquaculture

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Grouper culture in the western Pacific can serve to: 1. reduce fishing pressure on wild groupers that are heavily overfished in Southeast Asia, 2. provide an alternative source to cyanide-caught fish in the live reef food fish trade, and 3. offer a means of reducing the risk of ciguatera food poisoning, which has caused serious problems in Hong Kong twice in two years. (Whether it can operate sustainably, however, is an important question to which we do not have satisfactory answers yet.)

Because estuarine waters typically vary greatly in temperature, salinity and particulate and organic loads, groupers that live in estuaries would appear to have natural advantages in withstanding the environmental insults typically associated with tropical finfish aquaculture. It may therefore be no coincidence that the two species of grouper that have proven easiest to culture, *Epinephelus coioides* and *E. malabaricus*, both spend significant portions of their lives in mangrove estuaries (e.g. Sheaves 1996). In addition, a third species, *E. lanceolatus* that also lives, in part, in estuaries has also proven recently to be a very suitable species for aquaculture (see Chan this issue, p. 32).

The literature on fish assemblages in tropical Indo-Pacific estuaries suggests that these three species are the only groupers that are commonly found in mangrove areas in the western Pacific (e.g. Heemstra and Randall, 1993). In parts of this region a fourth species, *E. polystigma*, is reported from estuaries, but, according to Heemstra and Randall (1993) “seems to be a rare species; consequently it is of little interest to fisheries.” Here I provide evidence that it is probably not rare in at least one part of its range, and why it may be of interest, not for fisheries, but for aquaculture.

During interviews with Solomon Islands fishermen concerning spawning aggregations of other species of groupers (see Johannes and Kile, this issue, p. 5), the fishermen described some unusual features of the behaviour of *E. polystigma*. These features suggest why it is thought by ichthyologists to be rare, although it is apparently common in Solomon Islands, and why it has received so little attention from researchers. The following description is based on highly consistent informa-

tion provided independently by fishermen at four different localities in Ysabel Province.

The fish is known as *kobiri* or *kobili* in a number of different Solomon Island languages (G. Bennet, R. Hamilton, N. Kile, E. Hviding, all personal communications) and was described by fishermen as reaching weights of between 4 and 6 kg. It is said to inhabit shallow estuarine waters, often aggregating in water so shallow that the backs of the fish protrude from the water as they rest on the bottom. The fish was described as being very ‘lazy’ and exceptionally easy to approach and spear. For this reason it is said to have disappeared completely from some estuaries in Roviana lagoon, Solomon Islands as far back as the 1970s (R. Hamilton pers. comm.) The species is also said by fishermen to be tolerant of domestic and latrine pollution and capable of living out of water for many hours if kept in the shade. Nothing seems to be known, either by researchers or the Ysabel fishermen we interviewed, about its reproductive habits.

In the last village we visited during our interviews we were told that there were still some *kobiri* living in a small nearby estuary because it was polluted by village waste and people did not want to eat fish from such a source. I expressed interest in seeing a specimen but was not taken up immediately on this request. However, I was awakened that night when a fisherman appeared outside my door and shook a still-living *kobiri* off his spear. He had just speared it by torchlight only 200 m away in the estuary near the edge of the village.

It was only then that I was able to identify the species as *E. polystigma*. Its stomach contained four undigested crabs. I made the mistake of leaving it outside until I could examine it further in the morning. By morning, however, it had disappeared, probably having been appropriated by one of the village cats. That same morning we had to leave and there was no opportunity to make further observations.

Ysabel fishermen at four locations all told us that the fish was abundant and easily caught in the estuaries of rivers and streams that are not close to human habitation. There are many such streams on Ysabel because rainfall is very high and human set-

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lements are few; the human population of this 100-mile-long island is only about 18,000, 75% of which are concentrated in one small area.

Some fishermen said that they had never seen *kobiri* other than in estuaries. Several others asserted, however, that they had seen it in coastal waters where, in contrast to its coloration in estuaries, it possessed small white blotches.

In addition to *E. polystigma*'s ability to live in estuarine conditions, other characteristics make it appear worth investigating for aquaculture. It is said by fishermen to taste as good as other groupers. It is attractively coloured; the body is a uniform chocolate brown, without the pale abdomen of many species. Small circular yellow spots densely cover the body and all fins except the ventrals. The fact that it can apparently live out of water for a long time suggests that it would withstand air-shipment well. In addition, the species is apparently rare in Southeast Asia, and rarity is seen as a gastronomic virtue among Cantonese consumers. How appealing it would be to satisfy this demand for rarity with a species that is apparently common in at least one part of its range.

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References

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Taiwan grouper hatchery production in 2000

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Two million giant grouper (*Epinephelus lanceolatus*) fry were produced in Taiwan hatcheries and sold in 2000. The price dropped from HK\$ 25 per 3-cm-long fish at the beginning of the season to HK\$ 2.5/fish at the end of the season². A large quantity of fry was sold to Hainan and some to Hong Kong, Sabah, Malaysia and Vietnam, but the survival rate was reported to be unsatisfactory. Overseas markets could not be found to absorb all the fry produced and large quantities are now being reared by Taiwanese culture fishermen.

The current price of the (eating-sized) giant grouper in Hong Kong is around HK\$ 90/catty and we believe the price will drop to HK\$ 60/catty when the fish start going into the Hong Kong market in August and September in 2001³. This will also badly affect the price of *Epinephelus coioides*, which could be replaced by giant grouper. It is believed that the harvest of fry in Taiwan will continue to be good in 2001.

Since the price of fish is low, green groups may want to consider raising funds to buy the fry for release in order to improve the population of this type of fish in the wild.

A hatchery in Penang is working hard to produce giant grouper but no news of success has been heard.

About 300,000 tiger grouper (*Epinephelus fuscoguttatus*) fry were produced by Taiwanese hatcheries. The majority of the fish were sold to the local culture fishermen. The survival rate of the fish has been very good and they grow very fast. Hatcheries from Bali, Indonesia, and Penang, Malaysia, also produced some fry of this species, but information on the quantities is unavailable. Tiger grouper fry are being reared in Thailand, Vietnam, Sabah, West Malaysia, Hainan and Hong Kong.

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2. HK\$ 1.00 = US\$ 0.128 (Feb. 2001)

3. 1 catty = 600 g