

# Exploitation of Seahorses and Pipefishes

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**A**ny perception of seahorses and pipefishes as cute but rather irrelevant fishes is about to change. These fishes are now the targets of a large international trade, the scale of which is probably unsustainable. They are also victims of wholesale destruction of their inshore habitats.

Seahorses and pipefishes (syngnathids) are sold primarily for use as Chinese medicines and aphrodisiacs but also as aquarium fishes, curios and foods. The recent economic boom in China has created an explosive demand for animal and plant products used in traditional medicine. Public attention has been on tigers, rhinoceroses and bears but seahorses are also highly valued.

Syngnathids are credited with curing ailments ranging from asthma and arteriosclerosis to impotence and incontinence. They also provide remedies for skin ailments, high cholesterol levels, excess throat phlegm, goiters and lymph node disorders. They are reputed to facilitate parturition, to act as a powerful general tonic, and to provide a potent aphrodisiac.

All seahorses and pipefishes apparently serve the same purposes in Chinese medicine, but they differ in their perceived efficacy and thus in their value. Prices in Hong Kong in May 1993 ranged from about US\$250 per kg for "inferior" small brown seahorses to about US\$850 per kg for large bleached seahorses. Traditionally, prescriptions are tailored to each patient's needs. The syngnathid is bought whole, sliced into chunks, ground to a powder and blended with other plant and animal products. Bleached seahorses are apparently becoming less popular because of worries about chemical residues and loss of nutrient value. A sign of the times in China is that prepackaged medicines are flourishing.

We currently have evidence of seahorse and/or pipefish exports from Australia, Belize, Brazil, Ecuador, India, Indonesia, Kuwait, Malaysia, Mexico, New Zealand, Pakistan, the Philippines, Spain, Sri Lanka, Tanzania, Thailand, United Arab Emirates, USA and Vietnam. Many of these countries also use seahorses domestically. China, Taiwan, Hong Kong,

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and Singapore are large importers that also re-export. The scale of Japanese and Korean involvement is uncertain.

The Philippines exports both live and dead seahorses. Most are hand-collected as a target catch although some are caught incidentally in trawl nets. Fishers may earn up to 80% of their annual income from selling seahorses to local buyers, who then sell to wholesale exporters. Live seahorses can suffer very bad treatment en route to hobby aquarists in Europe and North America. Large seahorses are worth more dried for the Chinese medicine trade than as live aquarium fishes, so they are killed. The live seahorse is hung in the sun by a string around its snout and its tail flails for a holdfast until it desiccates. Dried syngnathids are often traded by mer-

chants specializing in sea cucumbers (*bêche-de-mer*) since sources, handling requirements and markets are similar.

Globally, my best guess is that 20 million seahorses were traded last year. The total figure may be much higher, given the difficulty in obtaining data. A reliable source puts China's 1992 consumption at about 20 tonnes of dried seahorse (about 6 million seahorses), which would represent a ten-fold increase in ten years. Taiwan recorded imports of about 3 million animals last year but this figure ignores the high level of smuggling across the Taiwan Strait. Available evidence suggests that Singapore and Hong Kong used at least as many.

The pipefish trade, while smaller, is also substantial.

All indicators are that this level of seahorse exploitation is unsustainable. Sparse distributions, highly structured populations, mate fidelity, low fecundity, lengthy parental care and low natural adult mortality make seahorses very vulnerable to intense harvesting. Indeed fishers report declining numbers and sizes of animals. Some areas are now yielding only juveniles, indicating that the population is at risk. Worryingly, we were repeatedly told that seahorse supply does not meet demand.

## Biology

Management and conservation initiatives are going to be difficult because we know very little about syngnathid biology. There are something



Male (pregnant) *Hippocampus reidi*.

like 300 species in about 30 genera, of which seahorses comprise one genus of about 35 species, but the taxonomy is in chaos. They live in seagrass beds, mangroves and reefs in most shallow coastal waters of the temperate and tropical regions, but we do not know geographic distributions for most species. Adults are site faithful—they are poor swimmers and rely on their tail to anchor to a holdform—but juveniles probably disperse and seahorses may migrate seasonally.

A few recent studies have focused on their extraordinary reproductive ecology. In syngnathids, only the male becomes pregnant. The evolution of the male brood pouch can be traced across genera, from simple ventral gluing in some pipefishes to the completely sealed seahorse pouch. Females transfer eggs to the male's brood pouch, where they are fertilized, and then provide no further parental care. Males protect, aerate, osmoregulate and nourish the developing embryos for up to six weeks (depending on species and water temperature), before releasing them as independent young.

In terms of their reproductive ecology, the syngnathids studied thus far fall into two broad categories.

1. Some pipefishes mate promiscuously. Each female confers eggs on more than one male and males of some species accept partial clutches from more than one female. Neither males nor females hold home ranges and both sexes move large distances. Females compete more intensely than males for mates - and are commonly larger, more colorful and more conspicuous than males.

2. Seahorses and other pipefishes are rigidly monogamous. One male and one female mate repeatedly and exclusively



*Dried seahorses for sale in Hong Kong.*

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with each other and these pair bonds are reinforced with daily greetings, occurring shortly after dawn throughout the male's pregnancy. In the seahorse *Hippocampus whitei*, for example, the female moves to the male's small home range at the core of her larger home range, passing other males en route, and the pair perform a greeting dance lasting 6 to 10 minutes. In these species, males compete more to obtain mates - and males are larger, more colorful and more conspicuous than females (where there is any difference).

Syngnathids are voracious carnivores, preying upon crustaceans, larval fishes and plankton. The few studies on their feeding ecology suggest that they may play a substantial role in structuring at least some benthic faunal communities. Young seahorses, in their turn, are killed and eaten by fishes, crustaceans and anemones. Rates of predation on adult syngnathids are low, probably because they are highly cryptic and heavily armoured.

We need to know much more. During the next two-and-a-half years, I will be working with local biologists to study seahorse populations in the Philippines and Vietnam. We will document the basic biology of exploited species, assess the conservation threat posed by the seahorse trade, and explore options for managing and protecting seahorses and their habitats. Although habitat destruction may be more of a threat than any direct exploitation, seahorses could serve as very attractive flagship species for efforts to protect seagrasses and mangroves.

We would be most grateful for any information at all (however seemingly trivial, descriptive or anecdotal) about the harvest of and trade in seahorses and pipefishes. It would be helpful to receive examples of dried syngnathids being sold, especially if they are labelled with purchase location, price and as much other information as possible. The following questions give some idea of our interests:

- What species of seahorse and pipefish are being caught or sold?
- How are they used? Dried as medicines? Live as aquarium fishes?
- What are the buying and selling prices for seahorses and pipefishes? What are seahorses and pipefishes worth as a portion of annual income of the fisher or dealer?
- Who buys the seahorses and pipefishes? Where?
- Has the price per seahorse or pipefish changed recently? By how much?
- Where are the seahorses and pipefishes caught? Country? Habitat?
- When? Does the catch vary with the season or time of day?
- How? By hand or trawl or ...? As a target catch or a bycatch?
- How many are caught per unit time?
- Has the supply of seahorses and pipefishes changed? Over what time period? Why?
- Is there any attempt to culture seahorses or pipefishes?
- Has there been destruction or degradation of local seagrass, mangrove or reef habitats occupied by seahorses or pipefishes? How, when and where?

Please send any information and samples you can share to Amanda J. Vincent, Department of Zoology, South Parks Road, Oxford OX1 3PS. Tel:(0865)271217 Fax:44-865-310447 email:avincent@vax.oxford.ac.uk.



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