

Note on Reproduction System in Seahorse

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Opinion Article

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DESCRIPTION

The lined seahorse, *Hippocampus erectus* was examined in Chesapeake Bay for its reproductive and feeding biology. Males incubate the eggs received from females in a closed brood pouch and females incubate the eggs received from males. After mating, females do not provide any parental care. Both the total sex ratio and the operational sex ratio were heavily skewed in favour of women. The quantity of eggs/embryos and hydrated oocytes in males and females was identical. The number of eggs/embryos detected in the male brood pouch ranged from 97 to 1,552 (fish ranging from 80 to 126 mm TL) while the number of hydrated oocytes found in the female brood pouch ranged from 90 to 1,313 (fish ranging from 80 to 126 mm TL) (fish from 60 to 123 mm TL). The number of eggs/embryos and hydrated oocytes were better linearly related to total weight.

Because of its short nose and mouth, the lined seahorse can only eat small animals. Amphipods, particularly *Ampithoe longimana*, *Gammarus mucronatus* and *Caprella penantis* were the most common food items detected in

the stomach. Although the lined seahorse is not abundant in Chesapeake Bay, it does have a reproductive population that is likely transported in by currents on drifting vegetation. Because of its limited quantity, muddy waters and sluggish behaviour finding a spouse may be challenging. The lined seahorse, *Hippocampus erectus* can be found from Nova Scotia to Uruguay and can survive a wide range of salinity and temperature. It is more frequent in deeper water where vegetation is abundant. The sex roles of male seahorses are reversed. The oocytes acquired from the female are fertilised and incubated in a sac-like brood pouch found behind the tail. Females are not involved in parental care after the oocytes have been transferred. Seahorse male brood pouches are the most advanced of any syngnathid species with simply an anteromesial pore.

Pregnancy has historically been described as the period after egg–sperm union during which growing embryos are incubated in the body. Despite the fact that viviparity in mammals and other vertebrate species is very comparable. Researchers have traditionally avoided using the term pregnancy for non-mammals because of the highly developed form of viviparity in eutherians. Syngnathid fishes (seahorses and pipefishes) have a unique reproductive system in which the male incubates growing embryos in a specialised brooding structure where they are aerated, osmoregulated, sheltered and possibly supplied.

Male incubation in these species is a highly specialised mode of reproduction analogous to other forms of viviparity. According to recent insights into physiological, morphological and genetic modifications linked with syngnathid reproduction. We examine these recent developments in this article, emphasising the parallels and contrasts between seahorse and mammalian pregnancy. Understanding the changes associated with the parallel evolution of male pregnancy in the two major syngnathid lineages will aid in identifying key innovations that aided in the development of this unique form of reproduction as well as allowing the identification of a common set of characteristics shared by all viviparous organisms through comparison with other forms of live bearing.

Sexual fidelity in apparently monogamous species is rare according to genetic research. Pairing is extremely rare in fish whether sexually faithful or not and has never been confirmed in fish from sea grass settings. Males and females of an Australian species (*Hippocampus whitei*) form pairs that mate regularly and exclusively according to the first underwater investigation of seahorse reproduction. Non-partner encounters are avoided. Partners greet each other on a daily basis. Seahorses are unique in that both sexes show clear visual evidence of mating (the male becomes impregnated as the female transfers hydrated eggs) giving the impression that these fish are sexually faithful to each other. Couples do not divorce and a pair bond only ends when one of the partners dies.

Intra-sexual competition does not appear to play a role in the maintenance of pair bonding. Seahorse mating begins with a complex wooing ritual that might take several hours in some species. Few seahorse species have been documented as having courtship however reports of mating relations in the Australian species *Hippocampus whitei* can give us an idea. When the male and female meet, the male and female brighten in colour and begin a dance, twirling their tails and swimming in circles. After a lengthy courtship dance, the female inserts her ovipositor into a pouch on the male's tail through a small aperture. She inserts unfertilized eggs into the male's pouch where sperm is released to fertilise the eggs.

It merely takes a few seconds to transfer the eggs. The female's investment in the kids is finished at this stage but the male is left with a pouch full of developing progeny. For several weeks, the male bears the developing brood in his pouch which becomes larger and larger until he gives birth. For pregnant men, the pouch looks to be a significant load and they appear to move around very little while pregnant. The life of a pregnant male seahorse is

not wholly lonely despite the fact that he is solely responsible for the care of the developing embryos. The female comes by every morning to greet the male despite the fact that she does not give parental care.