

#### XIV.—THE NESTING HABITS OF THE GOURAMI (*OSPHRONEMUS GORAMY*).

In vol. xl. No. 4, May, 1939, p. 766 of your Journal Mr. Jones 'On the nesting habits of the Gourami (*Osphronemus goramy*)' mentions the various authors who have contributed on this subject but evidently is not aware of an article by Hilario A. Roxas and Agustin F. Umali on 'Fresh-water Fish Farming in the Philippines' (Philip. Jour. Sc. vol. 63, 1937, p. 443). In this paper the authors deal with the bionomics of Goramy and the following extract is illuminating on the question of the nesting habit of *Osphronemus goramy*:—

'In the Philippines, and under the conditions obtaining in the artificial concrete ponds of the Bureau of Science, where the bottom is muddy, the water stagnant, the temperature at the surface ranging from 27° C. to 32° C., and where there is no vegetation except patches of water hyacinths, *Eichornia crassipes* (Martius), confined along the sides by means of a wire stretched taut, the giant goramy breeds the year round, although the peak of the breeding season occurs during the warm months, from March to May.

'On spawning, the goramy pair off, and each pair selects a suitable place along the sides of the tank just beneath and along the edges of the patches of water plants. The vegetation preferred is an aquatic plant that grows on the surface of the water and whose floating roots, which rise and fall with the surface of the water, form natural galleries under which the fish can conceal themselves from public gaze and disturbance.

'In the pond, among the water hyacinths and a little below the surface of the water, the goramy attaches its nest. The nest is composed of plants, mud, and other available floating or submerged materials. Its shape varies from somewhat spherical to oval, and in form it resembles those of some birds. Table 4 summarizes the features of nests A, B and C, all of which were actually recovered from goramy ponds in the Philippines.

'The size of the nest varies with that of the fishes, while the materials of which it is built depend upon whatever is procurable in the feeding or spawning ponds. It takes about a week for the goramy to build its nest.

'When the nest is completed, the female deposits her eggs in the centre of it. The eggs are round, shading from orange to yellow, and about 1 millimetre in diameter. After the eggs have been deposited and fertilized, the parents remain near, patiently aerating them by the constant fanning movements of the pectoral fins and zealously guarding them from predators and enemies.

'The eggs hatch in about 10 days. Plate 2, figs. 1 to 4, shows various stages in the development and metamorphosis of the fry, from the time the individual is newly hatched until it reaches the age of 1 month and 12 days, when the appearance and shape of the adult become evident, and when the first ray of



the ventral fin is distinctly beginning to prolong. The young find refuge in the nest during the first days of their life, under the protection of their parents; they do not soon disperse, but keep together in schools under the guidance of the parent fish.

Table 4. Summarized features of goramy nests recovered from ponds in the Philippines.

Nest	Date recovered	Locality	MEASURE- MENTS			Contents	Composition
			Cm. Length.	Cm. Width.	Cm. Depth.		
A.	Nov. 10, 1932	Manila Propagation Ponds.	30	18	9	Remnants unfertilized eggs that have become decayed, soft and mossy.	Roots, stalks, and leaves of water hyacinths; rattan; vines for tying kangkong, the feed of the fish; stalks of <i>Hydrilla verticillata</i> ; mud.
B.	Aug. 16, 1935	Do.	28	20	10	Newly hatched fry, with yolk sacs and some decayed unfertilized eggs.	Mostly roots, stalks and leaves of water hyacinths with scatterings of mud.
C.	Oct. 19, 1935	Mexico, Pam-panga.	28	26	10	Unrecorded.	Grasses and twigs made compact and somewhat woven with roots of grasses and some wire, and pasted with mud.

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## XV.—TROUT FISHING IN KASHMIR.

(With a plate).

I have been fishing in Kashmir on and off for the last eighteen years or so. Last year I managed to put in nearly three months, and, as I fished most of the beats now open to the public, it is rather interesting to look back and consider how the original experiment of stocking these streams has fared.

Brown trout were, I think, first introduced into some of the streams about 1901, and, after a few initial difficulties, thrived and



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