

MESOGONISTIUS CHAETODON: An Account of Its Breeding and Other Habits by W.P. Seal

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Blackbanded Sunfish, called "Chaetodons," as they still are by some traditionalists, were one of the favorite aquarium fish in the Middle Atlantic states early in this century. At that time, no Americans had succeeded in breeding the species in an aquarium. The Aquarium Society of Phila. sent letters to prominent ichthyologists and naturalists around the U.S. in search of information. No one knew anything. The society president, H.R. Lippincott, then offered a cup--the Lippincott Cup--to the first member of the society "who succeeded in raising and exhibiting Mesogonistius Chaetodons [sic]." W.P. Seal wrote up the account of the winner, George W. Price, and forwarded it to the Smithsonian. Seal had been Aquarist for the U.S. Fish Commission, predecessor of one half of the U.S. Fish & Wildlife Service. Seal also authored the article on darter breeding reprinted in the Oct '85 AC.

Unearthing this material was Jare Sausaman, a NANFA member who is an historian of aquarium societies.

The article needs little in the way of comment, save that the genus name Mesogonistius has been changed to Enneacanthus, genus containing the Bluespotted (E. gloriosus) and Banded (E. obesus) Sunfish.

The last five paragraphs of the article, not dealing with this species but with native-fish aquaristics as a whole, are a C-Major conclusion.

This species, the only one of the genus, is one of the smallest as well as being one of the most beautiful and mild-mannered of the Centrarchidae or sunfish family. The name Chaetodon popularly given to it properly belongs to it as its specific name, being so-called because of its general outward resemblance to the family Chaetodontidae; these, however, being tropical sea fishes [i.e., Butterflyfishes]. It deserves the distinction because of its beauty and gentle character. The name black-banded sunfish is long and commonplace. The objection that the name Chaetodon is borne by a family of sea fishes has as little force as would an objection to the name sunfish, because there are sunfish in the sea.

While the species has been known at least sixty years, until recently very little had been learned regarding its habits. Its known range, which was for many years limited to the state of New Jersey, was later extended to Maryland, and still later to North Carolina. It is rarely found outside of red or black water--what is known as cedar swamp or cypress swamp water--though these conditions are, no doubt, merely an accident and not a necessity of its existence.

There is hardly room for doubt that they can be found in waters of this character at least as far south as Florida, and probably also in the bayous of the Gulf Coast.¹ I have only found it in one place in Pennsylvania, and that a tributary of the Delaware River, where, at one time, it was abundant.

Its habits of life are such that even where it is very abundant it might not be found at all by one not properly provided with the means of taking it and knowing where to look for it. Though the various species of the family in general are noted for their pugnacious dispositions, the Chaetodon is so mild-mannered as to appear timid by contrast--not at all like a carnivorous species. The contrast in this respect to the two somewhat smaller species of Enneacanthus, obesus and gloriosus, with one or both of which it is always found associated, is very great. In the aquarium, therefore, the Chaetodon is quite harmless to goldfish or other soft-rayed fishes, except to some extent when under the influence of sexual excitement, and then, possibly, only with the older and larger individuals. I was once told of a case where one had torn the eye out of a goldfish, a story which at the time I disbelieved, but later having witnessed a savage attack by one under similar stress, I was compelled to reverse my opinion. Pugnacity in the breeding season is, however, an universal characteristic.

The natural food of this species is probably almost wholly the worm-like larvae of dipterous insects, as these are more abundant than any other low forms of life in masses of plants in stagnant water. Of course, there are some young of other forms, such as beetles and dragon flies, and crustaceans, such as gammarus and asselus /sic/, and possibly some copepods, such as cyclops and daphnia, though these latter are scarce where fishes abound. In the aquarium they will eat most living things that they can swallow easily. They are very suspicious and will approach an object and examine it carefully before attempting to eat it, even when very hungry. Small water beetles they will not touch. They eat mosquito larvae with avidity, but do not care much for the pupae. Being timid, possibly the grotesque mask frightens them. Most, and perhaps all of the other sunfishes will gorge themselves with food until there is a very perceptible distension of the abdomen, but, whether taken from nature or in the aquarium, except the females when gravid, they never look as though they were well fed. Dead food, such as minced oyster, mussel or earth worm, or any of the prepared foods of

¹The speculations as to range were correct.--Ed.

animal nature, they will come by degrees to eat sparingly, but on such foods they will never breed. They will simply eat enough to preserve life for a time.

It is well known to all fish breeders that an abundance of acceptable food is the fundamental requirement in bringing about the spawning of fishes; not simply the quantity necessary to keep them alive and in health, but also that necessary in addition to stimulate the generative instinct and processes.

Though the Chaetodon has been a familiar aquarium fish for half a century and was exported to Germany many years ago, it is only in the present year that any record of their breeding habits has been made, so far as I am aware. An article by Mr. F. Schubert, appearing in the German magazine "Blaetter" of March 3d, 1914 and reproduced in Aquarium Notes and News for April, 1914, gives an interesting account of the breeding habits of this species.

Regarding Mr. Schubert's description of sexual coloration, I can only say that I have never been able to satisfy myself as to their sex, except by the distension of the female when gravid. I have never been able to discern any difference in shape or color, and I have caught them in their breeding season, some females being very dark and others very light and tinged with yellow. Some of those that were evidently males were likewise black and some quite light, with the yellowish tinge. Judging by analogy, it would be expected that the male would be the one more distinctly marked with bands or heightened color at this season, but, as Dr. Theodore Gill has pointed out ("A Plea for the Observation of the Habits of Fishes, and Against Undue Generalization," "Pro. of 4th Int. Fishing Congress"), we cannot safely generalize concerning such matters.

The natural habitat of the Chaetodon is the sluggish or stagnant part of creeks or ponds where there are dense masses of plants, and among these they have their preferences, some of them probably affording better protection or more abundant food supplies. At all events, the seeker after them may search a long time before he finds their favorite haunts. In winter they will be more closely segregated and will, of course, be at or near the bottom, while in spring and summer they will be near the surface, where it is warmer.

Because of its habit of living in dense masses of plants, with a thick, soft, sedimentary deposit beneath, it has always appeared to me probable that they spawned on plants, but until the present summer there has been no certainty of this.

Mr. George W. Price, of the Philadelphia Aquarium Society, has been fortunate enough to have had several nests made in his

aquarium by Chaetodons, which, while in part seeming to confirm the observations of Mr. Schubert, have been found in the main to...spawn on plants, thus again emphasizing Dr. Gill's caution against "Undue Generalization." Mr. Price had one pair of fish to spawn five times, June 5th, 16th and 19th, and July 11th and 15th. The usual spawning season is the latter part of May and early part of June, but in this case it was retarded by the changed conditions. No fish resulted from the first, second and fourth spawnings. Of the third lot, some of the eggs were removed and placed in a jar, where they hatched on June 21st. Of the fifth spawning, July 15th, about half of the eggs were transferred to a jar, where they hatched on the 17th.

The nest is usually made in the denser part of a mass of plants, and is simply a hollow fashioned out by the male forcing itself around and around until a place large enough to hold the two fish is formed. On the plant on the lower part and sides of this hollow the eggs are deposited.

The act of spawning, Mr. Price describes as follows: After several attempts, the male succeeded in inducing the female to follow to the nest. Following the usual sidewise undulatory movements common to the other sunfishes, the fish came together somewhat in the shape of a butterfly when resting on a leaf with wings moving back and forth, thus forming an acute angle, varying probably from five to forty degrees. With this there was also the characteristic quivering motions common to fishes that are not in motion when spawning. When the spawning was completed the female was driven out, and thereafter kept away from the nest. The fish were hatched in two days, on June 21st, upon which they dropped to the bottom of the tank and stood on their tails in a cluster directly under the nest. They were then only about one-eighth of an inch long. By the 26th they had started to swim. From the 22d they were fed on dried lettuce leaf and fine daphnia, but as all young fishes of oviparous species are provided with a yolk sac, from which they derive sustenance while undergoing the earliest stages of development, it is probable that the dried lettuce did no more than provide food for the development of infusaria and for the daphnia, all of which later became available for the young Chaetodons. In a week's time the fish had increased to a length of about three-eighths of an inch. By July 20th the black and red markings on dorsal and ventral fins were plainly discernible. By July 25th, when five weeks old and half an inch long, they were perfect reproductions of adults.

The plants in which the nests were made were the roots of the water hyacinth and Myriophyllum. In addition to the nests in the plant masses, some hollows were fanned out in the sand and gravel, but it was found that this was done to uncover the fine fibrous roots of plants like Valisneria and Sagittaria, on which to deposit the eggs. It is quite possible that a closer examination would have shown this to be the fact in Mr. Schubert's case, as he refers to Valisneria as the

plant used and preferred for the purpose. On the other hand, it is quite possible that in the absence of the roots they might have spawned on small stones or whatever solid substance might have been present. I once had a species of Enneacanthus to spawn on the glass of an aquarium, the eggs being plastered in a single layer, just as they were deposited by the common sunfish, Fu.../illeg./ gibbosus.

It is also possible that the younger and smaller individuals of the larger species may...spawn on plants and that the "pot-nests" are only made by the older and larger ones. These, however, are only suggestions for future observation.

/illeg./ H.R. Lippincott was also fortunate enough to have a nest built in a wooden tank, but, unfortunately, where chances for observation were limited. He says, "They hollowed out a cup-shaped space in a mass of very fine Utricularia, arranging it just below the surface and making it about 2 $\frac{1}{2}$ inches in diameter, with an opening in the bottom through which they made their entrance and exit. After the eggs, which were much like goldfish eggs, except for their uniform crystal whiteness, were deposited, one of the fish seemed to be almost constantly with them, and when disturbed would dart quickly through the hole and into hiding." This was undoubtedly the male fish. Very unfortunately, at this time, Mr. Lippincott was obliged to be away from home, and so was unable to make further observations and is not sure whether or not any of the young are in hiding in the darker recesses of the tank.

In published papers I have quoted Dr. Theodore Gill as saying to me that "It is a shame that we know so little of our commonest fishes." I once delighted Dr. David Starr Jordan by showing him two species of darters spawning in aquaria, he being especially interested in that group of fishes.

I introduce these two incidents here as a text for a few remarks offered in the hope of inspiring greater efforts on the part of our fanciers in the investigation of the habits of our native fishes. We are far behind the Germans in this respect and are engaged principally in observing species whose habits they have already described, the Chaetodon being one of them.

To anyone who desires a pleasant pastime for their leisure hours, or for a mental stimulus, nothing can have a greater interest than a study of living things, and especially of the denizens of that more hidden and mysterious realm, the waters.

It is not too much to say that all the great aquaria of the world, costing large sums of money for erection and maintenance, and most of them being adjuncts to great biological laboratories, do not achieve any of the results common to the aquarium fanciers of the world.

They have not even acquired that fundamental knowledge necessary to the successful holding of fishes in captivity in healthful condition, to say nothing of inducing the exercise of the generative instinct. Menagerie methods prevail, and but for constant renewal at great expense, their tanks would be empty.

Blackbandeds have received frequent attention in NANFA publications, most recently in "Spawning the Blackbanded Sunfish" by James Sternburg, AC, Jan. '86, p. 6.

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