Color Change in the Olympic Mudminnow

by Tom Baugh

During the spring, summer, and fall of 1978 I collected small members of the Olympic mudminnow (*Novumbra hubbsi*, Schultz) from three streams in the Chehalis River watershed of Washington State. The streams are Scatter Creek, Salmon Creek, and Beaver Creek (fig. 1) (*N. hubbsi* had previously been reported from the first two streams but not from Beaver Creek although Beaver Creek is well within the established range of this species). At the time the specimens were collected the waters of Scatter Creek were clear, those of Salmon Creek were muddy and stained, and those of Beaver Creek were stained but were essentially clear of suspended sediment.

The fish from these three streams are classified in this report as either beige or black. The fish from Scatter Creek were beige as were those from Salmon Creek. The fish from Beaver Creek, however, were quite dark and classified as black.

In his 1968 study of the zoogeography of *N. hubbsi* Meldrim noted the possibility of color morphs of this species. He also stated that he had observed that fish from darker waters tended to be darker than those from lighter waters. My field observations do not necessarily confirm this statement. If Meldrim is correct, and if his observation holds throughout the restricted range of this species, we would expect to find that the fish from muddy, darkly stained Salmon Creek would be among the darkest collected from the three streams mentioned in this report. This, however, is not the case. In fact, the fish taken from Salmon Creek are, in general, as light as those taken from the relatively clear waters of Scatter Creek.

It is possible, as Meldrim claims, that water color has some relationship to fish color. I suspect, however, that at least one other factor, substrate color, is a significant contributor to the colors of *N. hubbsi*.

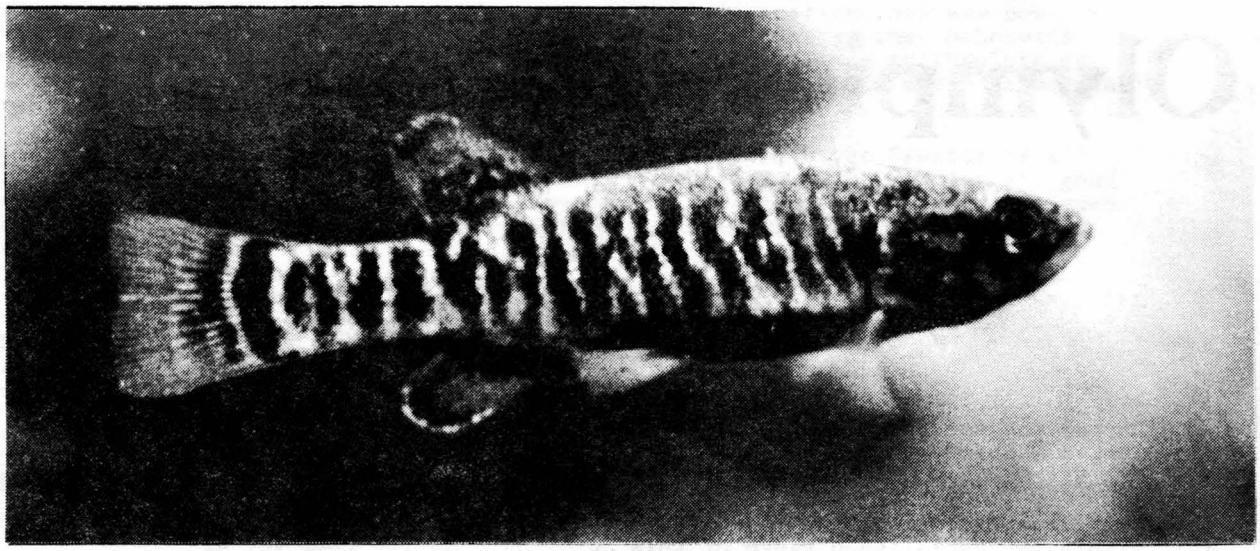
I was well into my observations of the behavior of *N. hubbsi* before I became aware of the possible relationship between the lightness or darkness of bottom substrate and fish color. I had placed some dark *N. hubbsi* (fig. 2) in an aquarium where the bottom was covered with commercial black aquarium gravel. After several weeks I moved one of the black fish into an aquarium with beige colored specimens (fig. 3) and a light sandy substrate. Within two days the black fish had lightened considerably and by the end of the week it closely matched the lightness of the beige specimens. I then took some beige colored fish from a third aquarium and placed them into the aquarium with black fish and black gravel. The results were exactly the same only in reverse. The beige fish began to darken until they were quite dark.

In summary, casual observation of *N. hubbsi* indicates that members of this species can lighten or darken in response to the lightness or darkness of the gravel substrate in aquaria. This observation does not necessarily disprove Meldrim's contention that fish color and water color are related nor does it disprove the existence of color morphs of this species. My observation, however, introduces yet another factor as a possible explanation for the lightness or darkness of various specimens of *N. hubbsi*.

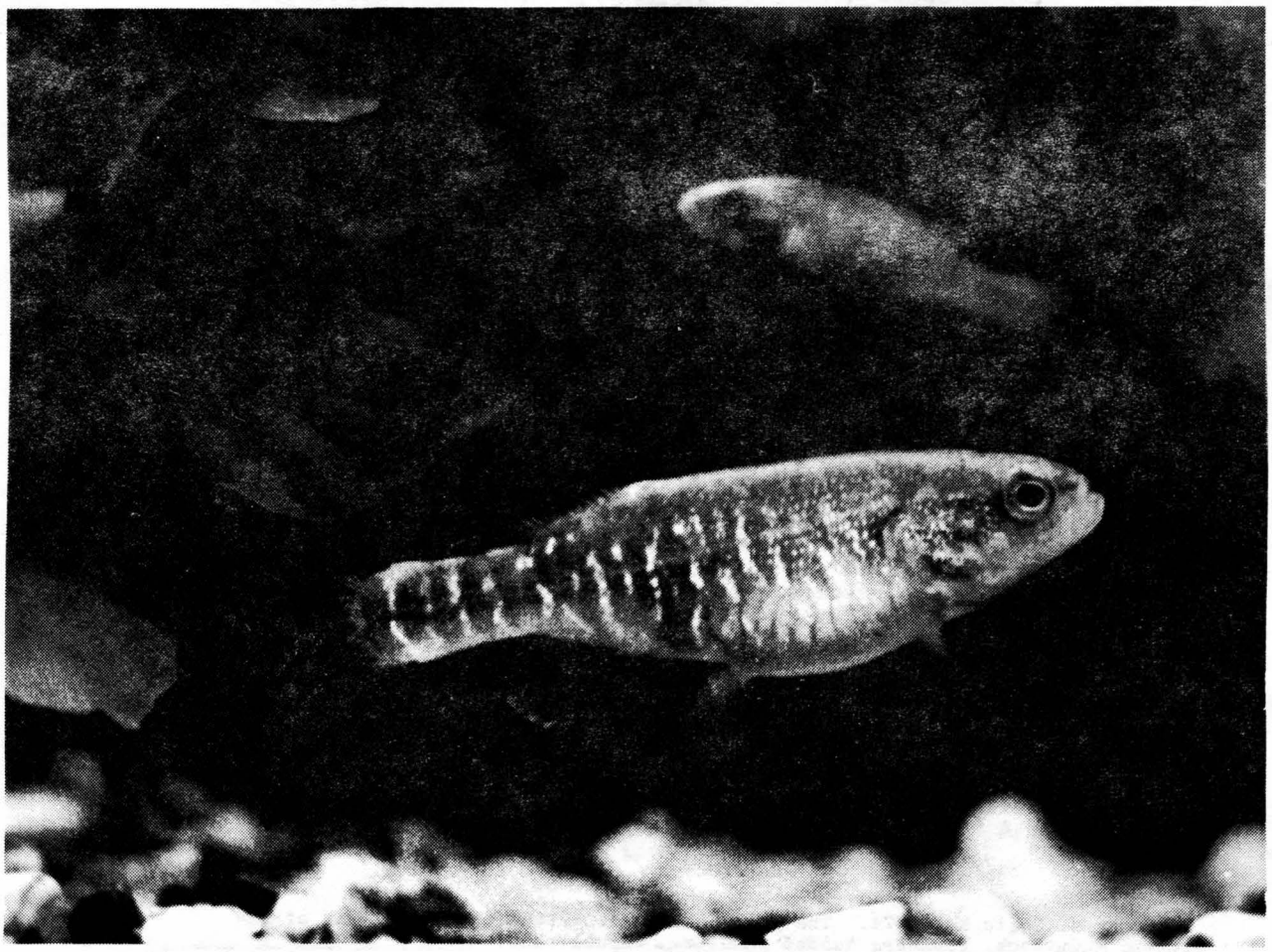
References

Harris, Colin K. 1974. The geographical distribution and habitat of the Olympic mudminnow, *Novumbra hubbsi* Schultz. Unpublished.

Meldrim, John W. 1968. The ecological zoogeography of the Olympic mudminnow. Ph.D. Thesis. University of Washington, Seattle.



2 A dark colored Olympic mudminnow (*Novumbra hubbsi*).
3 A light colored Olympic mudminnow (*Novumbra hubbsi*).



The Olympic mudminnow (*Novumbra hubbsi* Schultz). A male appears in the foreground with a female in the middle distance.

Photographs by Tom Baugh