

# O'Keefe's Lake sticklebacks

BY LARRY MacPHEE

The ninespine stickleback Pungitius pungitius is a widely distributed marine and freshwater fish of the northern hemisphere. Morphologically, sticklebacks differ from typical fish in several ways. Anterior to the dorsal fin, sticklebacks have a number of bony dorsal spines. Instead of pelvic fins, sticklebacks possess a pair of bony pelvic spines. Anterior to the anal fin, sticklebacks possess a single anal spine. Each spine articulates in a joint at its base and can either be retracted flat against the body or extended and locked rigidly in place. It is believed that these spines have evolved from the dorsal, pelvic and anal fin rays. Mean spine length is quite variable between populations, and even the number of dorsal spines is variable.

Sticklebacks use their spines in defence against bird and fish predators. When attacked at close range, a stickleback generally "freezes" in the water and locks all of its spines erect. This makes handling and swallowing them very difficult. It has been experimentally shown that when given a choice, fish predators will select "unarmored" prey before attempting to eat sticklebacks.

I have been studying the lakes and ponds of eastern Prince Edward Island because the sticklebacks in this region are extremely variable. In O'Keefe's Lake and a few nearby sites, a very rare phenomenon has occurred. Most individuals lack pelvic spines and some lack the entire pelvic support skeleton. Genetic crosses performed by Dr. Max Blouw at St. Francis Xavier University suggest that this pelvic spine loss is heritable. Since these structures are extremely important to the survival of the fish, it seems odd that at a few localized sites, most of the fish lack pelvic spines. If spine loss is detrimental, why is spine loss so common year after year? The best explanation is that pelvic spine loss may be advantageous for other reasons. Perhaps the advantages of spine loss outweigh the disadvantages at these sites. I am testing several possibilities in the laboratory as well as continuing to monitor the lakes for any peculiarities which might be associated with spine loss. One important observation is that spine loss only occurs under a unique set of conditions. All lakes with armor-reduced sticklebacks have a low pH, low calcium ion concentration, and a lack of inflows and outflows. The pieces of the puzzle are beginning to fall into place and I will gladly send an update when my research is completed.

I would like to make one request to the readers of this article: if anyone has a collection of preserved sticklebacks from O'Keefe's Lake dating before 1984, I would be very interested in examining them. If anyone knows of such a collection, I would be grateful for the information. My present address is Box M-71, Mount Allison University, Sackville, N.B., E0A 3C0.



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It is not surprising to hear that concern is being raised over the coyotes that have taken up residence on Prince Edward Island. The Eastern Graphic's June 10 front page carried a story on the increasing number (and two weeks earlier had a picture of a man who had shot one). The most vocal group are sheep farmers, some of whom have lost sheep to coyotes. Seeing sheep wandering on a road is not uncommon here, but without proper fencing sheep can easily become food for dogs and coyotes. It will be interesting to keep an eye on the situation and to see if any kind of solution can be worked out.