

**STATE OF OUR KNOWLEDGE ON THE DIVERSITY  
AND FEEDING ECOLOGY  
OF THE SUCKERMOUTH ARMORED CATFISHES (LORICARIIDAE)**

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**EXTENDED ABSTRACT - ONLY DO NOT CITE**

With currently about 640 species recognized as valid, the Loricariidae (suckermouth armored catfishes) of South America represents the largest catfish family, and perhaps the largest algivorous family of fishes. With such a tremendous assemblage of species, it is clear that loricariid catfishes have a great impact on stream ecosystems; however, it is currently unknown how so many loricariid catfishes can exist and how so many can occur at the same location at the same time. I will discuss what is known about feeding in loricariids and current hypotheses on their evolution and the reasons why they are so diverse.

Loricariid catfishes are recognized by a ventral, suctorial mouth and jaws that are designed for rasping along submerged surfaces (Schaefer, 1987, 1988). Loricariids typically feed on algae and the organic biofilm that covers submerged surfaces (Power, 1984). Loricariids typically possess a very long gut where the food is processed.

To date, there has been no satisfactory hypothesis to explain the diversity of loricariid catfishes. Schaefer and Lauder (1986, 1996) suggest that the diversity of morphology in loricariids is a result of the loss of a biomechanical couple linking the opercle and the lower jaw. Loss of this couple has allowed loricariid to radiate into a wide variety of niches involving algivory/detritivory.

The decoupling hypothesis has also been used to explain the large number of cichlids in Africa vs. South America (Liem, 1973). However, the decoupling hypothesis is a circular argument – find a group that is diverse, find a mechanical couple that has been lost, and then use the lost couple to explain the diversity. The decoupling hypothesis does not take into account the ecology of the organisms and fails for many reasons with loricariid catfishes. Phylogenetic analysis suggests that primitive loricariids retain the couple suggested by Schaefer and Lauder (1986, 1996) to be important in the evolution of loricariids, and many loricariid groups have re-evolved a similar couple. Given that decoupling is unlikely to be a major influence on the evolution of loricariids, what can explain the diversity of loricariids?

I have examined the diversity of loricariids from an ecological and biogeographical stand-point. I have attempted to determine the feeding-modes followed by loricariid catfishes. Although most are algivorous/detritivorous, many are insectivorous, granivorous, moluscivorous, or scavengers. In addition, exploitation of the algivorous/detritivorous niche is complex. By examining jaw and tooth morphology, it is clear that not all loricariids are exploiting algae and detritus in the same way.

I hypothesize that a particular substrate can be fed upon by several different groups of loricariids. Long, straight-jawed species feed on filamentous algae. Short, slightly-angled-jawed species feed on tougher material closer to the surface. And, on logs, short, highly-angled-jawed species feed on either wood or material growing in the wood. In addition, observations in the field suggest that loricariids are found on particular substrates such as plants, rocks, sand, or logs in a particular flow regime (riffle, run, pool). By conservatively factoring in the number of permutations of feeding areas available at a particular location, it can be determined that many potential feeding areas can be available at a given location. The value would be decreased somewhat by species that are attracted to a particular habitat regardless of flow or if a particular habitat is not available at a location. A particular niche may be further subdivided by species using the feeding area at different times during the day or season or in slightly different ways. This method will be used to explore the loricariid assemblages at certain well-studied localities.

## References

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