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SELECTIVE FEEDING OF THE SCULPIN, *COTTUS BAIRDI* GIRARD, IN ILLINOIS

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ABSTRACT

The major food item of *Cottus bairdi* in Rob Roy Creek, Kendall Co., Ill. is *Asellus militaris*. This indicates some selectivity of food since *A. militaris* has a low relative density in the habitat. The sculpin tended to be associated with large clumps of algae where its food was found.

INTRODUCTION

Cottus bairdi is typically considered a northern fish associated with relatively clean, clear, cold water streams. In Illinois *C. bairdi* has been reported only sporatically from colder spring fed streams in the northeast (Smith, 1965). The selective feeding behavior of a small population of the sculpin is investigated.

METHODS AND MATERIALS

The population studied was from Rob Roy Creek, located at the northcentral edge of Kendall County. The area collected was a section of the creek 4.8 miles south of Sugar Grove, Ill., which parallels Illinois Route 47. *C. bairdi* were taken by a 6 foot minnow seine, in riffle-rapid areas having rock, gravel bottoms and around mid channel clumps of algae predominantly consisting of *Chara*, with some *Cladophora* present. *Batrachospermum* was also present at the base of the clumps. 38 sculpin were collected on Nov. 22, 1974 from 5:30-6:30 a.m., which appeared to be their previously determined peak feeding time. Stomachs were injected and the fish preserved in 10% formalin. Surber net samples of the benthic macroinvertebrates from the habitat were collected and identified, counted, and the volumes of each taxa determined using the water replacement method (Hunt, 1960). Sculpin stomach contents were separated, identified, counted and the volumes determined for each taxa using the volume of that taxa found in the habitat.

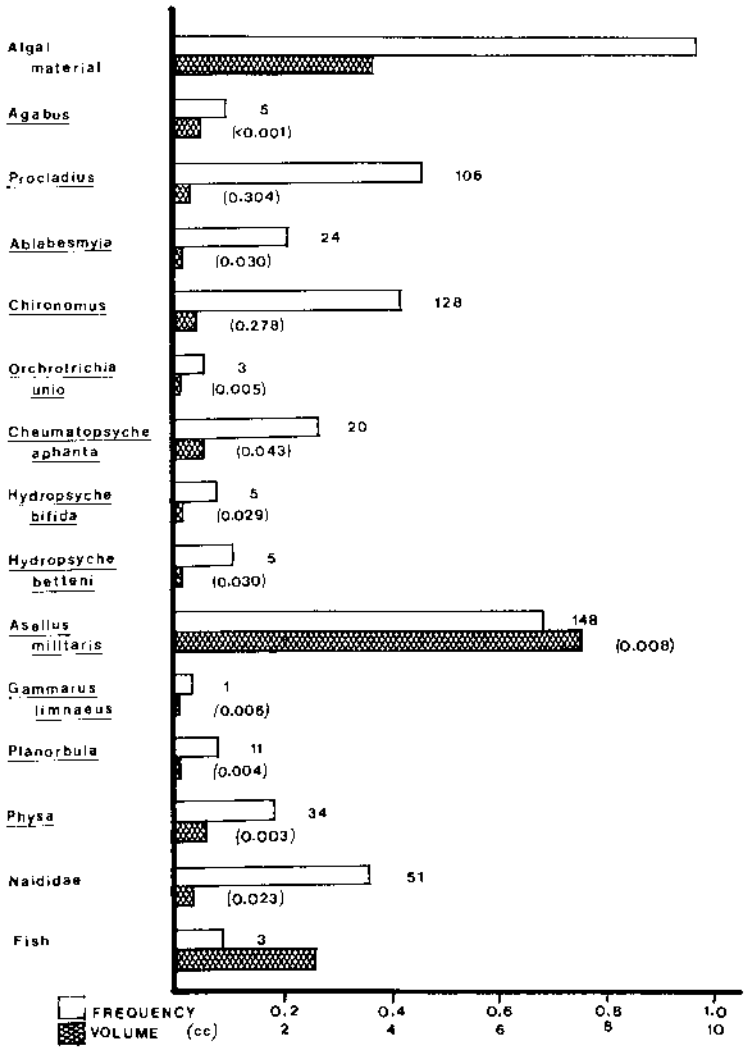

Figure 1. Relationship of number (number following frequency bar), frequency of occurrence in stomachs, and volume of invertebrates found in the stomachs of 38 sculpin from Rob Roy Creek. Number in parenthesis is the relative density of that taxa in the habitat.

RESULTS

The dominant food item found in the stomachs of C. bairdi (Figure 1) was the aquatic sowbug, Asellus militaris. This isopod was dominant both numerically and by volume which is noteworthy since the isopod is not the most abundant invertebrate found at the sampling site, its relative density was only 0.008. The most abundant potential food items were Dipteran larvae of the family Chironomidae. Three genera were collected, Procladius, Ablabesmyia, and Chironomus, together they have a relative density of 0.638. Although they occur frequently in the stomachs and are numerically abundant, by volume they compose less than 2.5% of all food items. Similarly, Trichoptera the second most abundant group in the habitat, relative density of 0.075, composed a very small percentage of the food items both by volume and numerically. A considerable amount of algal material was found in the stomachs.

DISCUSSION

If the selective preference for A. militaris is examined in view of the microhabitat of the food species some possible relationships can be determined. The isopod preforms the mechanical function of braking up dead and decaying vegetable matter and as such is commonly found in or very near the substrate surface. The isopods in this creek were found around the base of algae clumps as were sculpin. Most of the algal material in the sculpin stomachs was Batrachospermum which was the form that was found at the base of the algal clumps. When the sculpin consumes its food it takes in a considerable amount of this soft filamentous algae. When the contents of the short intestine of the sculpin was examined a large amount of algal material and a few sclerotized shields from invertebrate segments or heads were found but no whole invertebrates. The algal material was not being digested. It is possible that the Chironomids were also selectively fed upon since whenever they were numerically abundant in a stomach few or none of the Asellus were found. Both Chironomids and Trichopterans, when abundant, were usually in smaller sculpin. This selectivity is not generally reported by other investigators (Koster, 1937; Bailey, 1952; Dineen, 1951; and Zarbock, 1951), neither do they indicate the presence of significant amounts of algal material in the stomachs. Thus, this may be an adaptive characteristic of this population for this particular environment.

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