SEASONAL VARIATION IN THE FOOD HABITS OF THE CRAYFISH
*ORTONECTES PROPINQUUS* (GIRARD) IN TROUT LAKE, VILAS
COUNTY, WISCONSIN, U.S.A. (DECAPODA, ASTACIDEA,
CAMBARIDAE)

BY

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INTRODUCTION

Crayfish, because of their ability to utilize biomass from many different trophic
levels, have a great potential for influencing the structure of aquatic communities
when their numbers are large. Although crayfish are usually considered to be
opportunistic scavengers, evidence exists that some species show distinct food
preferences that vary with age (Creaser, 1934; Abrahamsson, 1966; Miller &
Van Hynig, 1970; Mason, 1975). Grazing by crayfish on benthic algae may
significantly affect rates of primary production (Flint & Goldman, 1975), and
both the herbivorous and carnivorous habits of crayfish may be important to other
aspects of community structure and energy flow (Langlois, 1935; Abrahamsson,
1966; Dean, 1969; Taub, 1972; Rickett, 1974; Capelli, 1975; Magnuson et al.,
1975). However, information on crayfish food habits is available for only a very
small percentage of the several-hundred known species.

I describe here the food habits of *Orconectes propinquus* (Girard) in Trout
Lake, Vilas County, Wisconsin.

MATERIALS AND METHODS

Trout Lake, a 1570 ha mesotrophic lake, is located in the west-central part of
Vilas County, within the extensive lake district of northern Wisconsin. *O. propin-
quus* is abundant (approximately 14 individuals/m² exclusive of young-of-year)
to a depth of about 10 m along the east shore of the south part of the lake
(Capelli, 1975). Crayfish were collected manually by SCUBA divers along a
transect in this part of the lake at depths of 1 m, 3 m, 5 m, and 8 m during late
June, early August, late September, and mid-November of 1972 and 1973. At
all sampling sites substrate consisted of rocks and gravel overlying sand; no
macrophytic vegetation was present, but some allochthonous plant detritus was
available.

Collections consisted of about 40 individuals from each sampling site on each
date, and included only adults and larger juveniles (≥17 mm carapace length).
Sex ratios were approximately equal during August, September, and November.
During late June, most females in shallower water were carrying eggs or newly-hatched young, and were in seclusion. Such females were very time-consuming to locate, and as a result June data are based on collections containing about 90% males. Although a substantially smaller percentage of females bore eggs and young in deeper water (Capelli & Magnuson, 1975), about the same proportion of males was analyzed from the deeper stations during June for the sake of consistency. Crayfish were preserved immediately after collection in 80% ethyl alcohol.

In the laboratory, stomachs were excised and the contents analyzed qualitatively for all identifiable food items, using light microscope magnification up to 100 X as necessary. Results were calculated as the percentage of crayfish containing a given food item (percent occurrence).

RESULTS

Crayfish stomachs contained a wide variety of food items, including primarily diatoms and other associated algae (mostly Cladophora), midge larvae (Diptera, Chironomidae), mayfly nymphs (Ephemeroptera, Heptageniidae) of the genus Stenonema, and other crayfish (fig. 1). Other items such as allochthonous plant detritus, fish remains, and various Rotifera, Copepoda, Cladocera, and Amphipoda were occasionally recognizable but never exceeded a frequency of 5% at any sampling point. Annelid worms and leeches, although common in the sampling areas, never exceeded a frequency of 2%. Major food habit trends were similar both years and there were no significant differences between sexes so data have been combined to increase sample sizes for each data point in fig. 1.

**Fig. 1.** Frequency of major food items found in crayfish stomachs, at various depths and times of the year. Sample size = 75-85 for each data point.