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Oligochaeta as a Winter Food Source for the Old Squaw

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OLIGOCHAETA AS A WINTER FOOD SOURCE FOR THE OLD SQUAW¹

Previous studies have shown that the old squaw (*Clangula hyemalis*), on its wintering grounds, feeds almost entirely on animal material. Crustaceans (Ellarson 1956, Kortright 1943), molluscs (Lagler and Weinert 1948), or fish (Hull 1914) were the major constituents of their diet. The old squaw is the most common wintering species of waterfowl in Milwaukee Embayment, Lake Michigan (Rofritz 1972). The most abundant benthic organisms in Milwaukee Harbor are the oligochaete worms, reaching a maximum of over 335,000 individuals per square meter (Rofritz 1972). The purpose of this investigation was to determine the importance of the Oligochaeta in the diet of old squaw in Milwaukee Harbor during January 1972.

To capture birds, gill nets (both 3 and 5 inch stretched mesh) were set horizontally on the bottom in areas known to be feeding grounds. The gill nets took only actively feeding birds. All waterfowl taken were labelled, placed in plastic bags and immediately frozen in the field. Gastro-intestinal tracts were later removed and preserved at once in 15 percent formalin. The contents of the esophagus, proventriculus and gizzard were combined and treated separately from those of the intestines.

Twenty-four old squaw were captured during the study. Oligochaeta made up the entire identifiable gut contents of these birds (Table 1). *Tubifex tubifex* and *Limnodrilus hoffmeisteri* were included. Unidentifiable material appeared to be partially digested oligochaete worms. Although Mollusca and Crustacea were present in the bottom fauna of the Milwaukee Harbor

¹ Contributed by the University of Michigan Biological Station.

Table 1. Old squaw food habits in the Milwaukee Harbor during January 1972.

	Average
Whole Body Weight (gm)	1046
Anterior Gut* Volume (ml)	19.8
Posterior Gut** Volume (ml)	16.3
Unidentifiable Organic Matter	
Volume (ml)	9.5
Oligochaete Volume (ml)	7.2
Grit Volume (ml)	3.1
Percent Unidentifiable Organic Matter	44.6
Percent Oligochaetes	31.0
Percent Grit	24.4

* Anterior gut—gullet, proventriculus, and gizzard.
** Posterior gut—intestine.

(Table 2), they were absent in the gastro-intestinal tracts of the old squaw. This indicates either that the Oligochaeta are preferentially selected or that the sample size was too small.

There have been no previous reports that the Oligochaeta are an important food source for waterfowl or vertebrates in general. The oligochaete worms may have been overlooked as a food source in many previous investigations on waterfowl food habits because they digest very rapidly. The combination of cold water and the use of gill nets to obtain specimens made it possible for this study to show the importance of Oligochaeta in the winter diet of the old squaw. The oligochaete “sludge” worms may be a source of food for diving ducks other than old squaw. Since Oligochaeta have a significantly higher number of calories per gram of body weight than any of the other benthic fauna present (Cummins and Wuycheck 1971), selection may play a role in the old squaw’s feeding habits.

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Table 2. Bottom Fauna of Milwaukee Harbor—species list and relative abundance.

Taxonomic groups	Percent (by number) of total bottom fauna
Class Gastropoda	6.1
<i>Bulimus</i> (= <i>Bythinia</i>) sp.	
<i>Helosoma</i> sp. ^a	
<i>Physa</i> sp. ^a	
<i>Valvata perdepressa</i>	
Class Pelecypoda	7.0
<i>Pisidium</i> sp.	
<i>Sphaerium corneum</i>	
<i>Sphaerium striatinum</i> forma <i>acuminatum</i>	
Class Oligochaeta	85.1
<i>Limnodrilus hoffmeisteri</i>	
<i>Tubifex tubifex</i>	
Class Hirudinea	0.3
Class Crustacea	1.2
Isopoda (<i>Asellus</i> sp.)	
Amphipoda (<i>Gammarus</i> sp.)	
Class Insecta	0.3
Chironomidae	

^a Only the shell present.

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