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A FOOD STUDY OF TWO CHAMCOOK LAKE MINNOWS: NOTROPIS CORNUTUS (MITCHILL) AND SEMOTILUS PUMBEUS (AGASSIZ).

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A FOOD STUDY OF TWO CHAMCOOK LAKE MINNOWS:

NOTROPIS CORNUTUS (MITCHILL) AND COUESIUS PLUMBEUS (AGASSIZ)

by

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These two common Chamcook lakes minnows are known to local fishermen under the names of "golden shiner" and "lake chub" and are used as bait for landlocked salmon and togue. The fishermen prefer for this purpose the second one, namely chub (Couesius plumbeus). Both of them inhabit practically all shallow waters near shore as well as certain tributaries of Chamcook lakes where they are associated with Fundulus diaphanus, Gasterosteus aculaetus and young Catostomus commersonnii. The exact geographical distribution of Couesius plumbeus in Canada is not as yet well known. This minnow being rather a northern species occurs as far as we know only in Eastern Canada from the Maritime provinces to Lake Superior. It was recorded, however, by Preble in 1904 from the Athabaska-Mackenzie region, but it is possible that it was confused with related species or probably the genus Agosia. Until a new revision of this american "Phoxinus" group of minnows is done throughout Canada nothing definite can be said with regard to the systematic and geographical distribution of this group. Notropis cornutus, on the other hadd, represents more southern fish and is distributed in Canada as far west as Manitoba. This is a very variable species.

Both of these minnows spawn in the Chamcook lakes from June to July at the age of two years. Very few individuals of these species seem to attain an age greater than two years, and a size of 120 mm. The study of the feeding habits of these two minnows was included into the general program of a Chamcook lakes survey, carried out under the auspices of the Biological Board of Canada.

The careful analyses of sixty stomachs of Notropis cornutus and sixty stomachs of Couesius plumbeus, taken mostly from the same catches, in different localities from First and Second Chamcook lakes during the open season of 1935, show that the main items of food are very similar for both of them. They feed on larval and adult stages of several aquatic insects, planktonic crustaceans and algae.

The vegetable food both in quantity and quality is more common for Notropis than for Couesius. Both species are perfectly selective in their feeding and entirely avoid certain animal and plant organisms which occur in abundance in their habitats. So, for example, although such species as Diaptomus minutus and other copepods are extremely abundant everywhere in Chamcook lakes they were not observed in the stomachs of Notropis and Couesius. It might be mentioned here that Diaptomus minutus is the chief food for Fundulus diaphanus which as it has been already pointed out is always associated with Notropis cornutus here. Rhynchotalona falcata, several species of Alona, Acropterus and Ostracods which represent the main food of young Catostomus commersonnii in Chamcook lakes were scarcely observed in the stomachs of these two minnows. Also two large groups of Protozoa and Rotatoria on which young suckers feed practically do not occur in stomachs of the shiner and chub from Chamcook lakes. In comparison with about 120 species of algae recorded in the stomachs of young Catostomus from these lakes only about 40 and 14 are recorded in the alimentary tract of Notropis and Couesius respectively. The larvae of Chironomidae are not a common food for them either, but the adult stages of Diptera and other small insects play a very important role in their diet.

In general, food of Notropis does not present such a diversity as in Catostomus and in connection with length of the alimentary canal (which in Notropis somewhat shorter than length of body, but in Catostomus it exceeds this length several times) the digestion should be more rapid. While in Catostomus undigested and well preserved cells of algae and small crustacea can be observed always, in Notropis such x phenomena have never been observed. Nevertheless, chitinous parts of all and well protected eggs of some insects do not seem to be digested at all. It seems possible on certain occasions that fertilized eggs of certain insects after passing through the alimentary canal of some fishes may still develop as some seeds develop after passing through the digestive tract of birds.

The following are summarized results of the food analyses of sixty specimens of Notropis cornutus and sixty specimens of Couesius plumbeus from Chamcook lakes.

Notropis cornutus (50mm. - 102mm.)	Couesius plumbeus (21mm.-95mm
I N S E C T A	
Chironomidae (larvae)..... 40	55
Corethra sp. (larvae)..... 1	
Simulium sp. (imago) 5	
Culicidae (imago)..... 2	
other Diptera (imago).....110	97
Hexagenia sp. (nymph)..... 8	20
other Ephemeridae (nymph)..... 45	25
Epemeridae (image)..... 7	

	Notropis cornutus (50mm.- 102mm)	Couesius plumbeus (21mm.- 95 mm)
I N S E C T A		
Trichoptera (imago)	53	1
Terrestrial coleoptera (imago)	1	
Hymenoptera		1
C R U S T A C E A		
Bosmina longirostris	190	650
Leptodora kindtii	72	2
Rhynchotalona falcata	10	60
Alona sp.	6	
Holopedium gibb erum		237
Diaphanosoma brachyurum	2	
Nauplii		few
Daphnia longispina		1
Cyclops sp.		1
Ostracods	2	15
P H Y T O P L A N K T O N		
Fragilaria sp.	few	few
Tabellaria fenestrata	few	
Tabellaria floculosa	few	
Epithemia turgida	few	
Diatoma elongatum	few	
Gomphonama acuminatum	few	
Navicula spp.	common	
Amphora sp.	few	
Synedra sp.	rare	
Stauroneis sp.	few	
Surirella sp.	few	

Cymbella sp. .....few

Stephanodiscus niagaroe.....rare

Cyclotella compta .....rare

Pleurosigma sp. .....few

Pinnularia viridis .....few .....few

Pinnularia sp. .....few

Gyrosigma sp. .....few

Rhopalodia gibba .....few

Melosira varians .....rare

Melosira granulata .....few

Mougeotia sp. .....few .....few

Zygnema sp. .....common .....few

Spirogyra sp. .....few .....few

Staurastrum minnesotense ....few .....few

Staurastrum paradoxum.....rare

Staurastrum pseudopachyrhynchum...rare

Staurastrum setigerum.....rare

Euastrum sp. .....rare

Cosmarium punctulatum.....few .....few

Netrium digitus..... .....few

Cosmarium botrytis.....rare

Pleurotaenium trabecula.....few

Spondylosium pulchrum.....few

spondylosium planum.....few

Gymnozyga moniliformis.....few

Onychonema filiforme.....rare

Pediastrum boryanum.....few

Pediastrum tetras.....rare

Scenedesmus quadricauda	few		
Ulothrix zonata	few		few
Palmella stage of some Volvocales	Few		
Botryococcus braunii	few		fairly common
Peridinium sp.	few		
Anabaena sp.	rare		
Microcystis aeruginosa	rare		rare
Coelosphaerium kuetzingianum	1		few
Bulbochaete sp.			rare

M I S C E L L A N E O U S

Cathyphna luna	1		1
Rattulus cylindricus			95
Rattulus latus			3
Rattulus sp.			2
Anuraea cochlearis			2
Difflugia spl .1	rare		
Pollen of trees	common		
Molluscs eggs	common		
Insect eggs	fairly common		
Parasitic nematods	7		15