



Food Habits of *Triturus Granulosus* in Western Oregon

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FOOD HABITS OF TRITURUS GRANULOSUS IN WESTERN OREGON.— Collections of *Triturus granulosus granulosus* (Skilton) were made during the months of April, May, and June, 1947, at five localities in western Oregon. Collections were taken only from trout waters. These localities were:

A tributary to Boulder Creek, which is a tributary of the lower Rogue River, south of Iron Mountain, Curry County. It is a slow, clear stream flowing through a meadow at 3500' elevation. Twenty-two specimens were collected at 5 P.M. on April 26, 1947.

Strawberry Flats, on the west side of the Rogue River, 3 miles above Agness, Curry County. Eleven specimens were taken from small and large pools and eddies of the main river, at 8:30 A.M. on April 27, 1947.

Arboretum Lake, situated in McDonald Forest in the Willamette Valley, 10 miles north of Corvallis, Benton County. This is an artificial lake in which trout production studies have been carried on for several years. Eight specimens were collected at 3:30 P.M. on May 20, 1947.

South Santiam River at Foster Bridge, Linn County. Thirty-five specimens were collected at 7:30 A.M. on May 24, 1947, in eddies and pools through which river currents were flowing.

Nash Lake, on the headwaters of the Yaquina River, 3 miles north of Nashville in Lincoln County. It was created by a landslide, and is also fed by a spring. Twenty-eight specimens were collected at 2 P.M., June 3, 1947.

A summary of food materials found in individual stomachs follows. The data are based on the number of individual organisms present in each specimen, because it was difficult to get accurate relative proportions of the various food items present, either by weight or by volume.

TABLE I
FOOD SPECIES OCCURRENCE IN ANIMALS TAKEN AT EACH LOCALITY

Locality	No. of Stomachs examined	No. of diff. food species	No. Species taken/individual	No. Items/individual
Boulder Creek	22	19	1-3	1-10
Strawberry Flats	11	17	1-5	2-58
Arboretum Lake	8	11	0-4	0-14
South Santiam	35	25	0-8	0-19
Nash Lake	28	13	0-5	0-72
Total in all localities:	104	50		

TABLE II

FOOD SELECTIONS BY LOCALITIES

Item Abundance is based upon the number of occurrences in specimens of each locality. *Frequency %* is based on ratio of occurrence in individuals to the total number of individuals taken at any one locality. There may be more than one item with the same frequency per cent. "Plant matter" is all unidentified.

Rating	Boulder Creek	Strawberry Flats	Arboretum Lake	South Santiam	Nash Lake
Item Abundance					
First	Baetidae	Baetidae	Corixidae	<i>Goniobasis</i> (snail)	Chaoboridae
Second	<i>Triturus</i> eggs	Hydropsychidae	Coenagrionidae	<i>Rana boylei</i> eggs	Cladocera
Third	Plant matter	Heptageniidae	Baetidae	<i>Physa</i> (snail)	Chironomidae
Fourth	Diptera	<i>Hyla</i> eggs	{ Cladocera Chironomidae Limnophilidae }	<i>Triturus</i> eggs	Baetidae
Fifth	Algae	Chironomidae Plant matter		Heptageniidae	Algae
Frequency %					
First	Baetidae	Baetidae	Coenagrionidae	<i>Goniobasis</i> <i>Rana boylei</i> eggs	Chaoboridae
%	<i>Triturus</i> eggs 36.0	91.0	50.0	37.1	85.7
Second	Plant matter	Hydropsychidae	Corixidae	<i>Physa</i> (snail)	Chironomidae
%	27.0	45.0	37.5	31.4	39.3
Third	Algae	Heptageniidae	Baetidae	Heptageniidae	Baetidae
%	18.0	27.0	25.0	22.6	35.5

SUMMARY.—One hundred and four specimens from five localities produced a total of 50 different food items. Specimens from the S. Santiam River contained the largest variety of food items—25 different foods, possibly because the most individuals were collected there. The number of food items found in any one stomach varied from 0 to 72. The average for the 104 specimens was 9.42. The number of different items found in any one stomach varied from 0 to 8. The average number of different items taken per individual in all localities was 10.3. Animal food was taken about 88 per cent of the time, Insecta being the predominant class. Mayflies are the most important food item.

There is definitely a strong competition with trout for the trout's preferred foods, since Baetidae have frequencies of 91.0, 36.0, 35.5, and 25.0 per cent, Chaoboridae 85.7 per cent, and Coenagrionidae 50 per cent. Hydropsychidae have a frequency of 45.0 per cent in the present study. All of these insect families rank high on the food preference list of trout, for according to food habit studies of rainbow trout by Needham (1940, Trout Streams, Comstock: 122) mayflies, caddisflies, and Diptera are the predominant foods eaten.

Findings on *Triturus* food habits are in general agreement with those of Asa Chandler (1918, Oregon Agric. Coll. Exper. Sta. Bull., 152: 1-24) and Donald S. Farner (COPEIA, 1947: 259-261).—FRED G. EVENDEN, JR., Oregon State College, Corvallis, Oregon.

MUHLENBERG'S TURTLE IN SOUTHERN NEW YORK.—Returning from a field trip in the Montrose District of the Town of Cortlandt, Westchester County, New York, during the late afternoon, June 21, 1947, my associate, Thomas M. Heaphy, discovered the mutilated remains of a female Muhlenberg's turtle, *Clemmys muhlenbergii* (Schoepff), in the middle of the road.

On June 28, on return to the site, I found a small flooded meadow on the north side of the road; at the rear of the meadow, in a section of woods, was a small pond approximately a foot in depth. Sphagnum moss was fairly abundant at the pond and in the swampy meadow.

The second specimen of *C. muhlenbergii* found was an adult male taken in the meadow. Its carapace was only partly covered by water. Less than 4 yards away I found an adult female. The two temporal blotches on the head of the female were decidedly yellowish while those of the male were orange. The carapace of the male measured 85 mm. (3.34 inches), and that of the female 87.3 mm. (3.44 inches).

On July 5, 1947, I collected another female specimen of *muhlenbergii* (89 mm.) in the meadow, and a considerably younger individual, measuring only 75 mm., was collected on July 26.

Spotted turtles, *Clemmys guttata* (Schneider), were encountered on every field trip to this area.

Regarding the more southerly range of *C. muhlenbergii* in New York state, Miss Adeline Thurston, science teacher at the Nathaniel Hawthorne School, Yonkers, informs me that a former pupil caught a specimen several years ago at White's Pond in north Yonkers, lower Westchester County.—HAROLD R. ASHLEY, 50 Saratoga Ave., Yonkers 5, New York.