Stomach Contents of Natrix r. rhombifera (Reptilia: Serpentes) From an Oklahoma Lake[1]

MORGAN E. SISK, Oklahoma State University and

CLARENCE J. McCOY, University of Colorado Museum

During the springs and summers of 1960, 1961 and 1962, a series of 64 Diamond-backed Water Snakes, *Natrix r. rhombifera* (Hallowell), was collected from Boomer Lake, Stillwater, Oklahoma. The snakes were measured and the digestive tracts removed and preserved in ten percent formalin for examination of contents. Total lengths ranged from 59.3 cm to 117.8 cm, the mean being 90.5 cm.

Several authors (Carpenter, 1958; Diener, 1957; Guidry, 1953; Smith. 1950; Strecker, 1927) have mentioned some foods of *N. rhombifera* but no detailed study has come to our attention concerning this species.

Forty-nine of the stomachs examined contained food items. Of these, 26 were collected during daylight hours and the remainder between 7:00 p.m. and midnight. Stomachs from specimens collected during daytime yielded 191.8 ml of food material out of a total of 411.4 ml, possibly indicating that the Diamond-backed Water Snake does not restrict itself to nocturnal foraging but is rather an opportunist, feeding whenever food presents itself. This was confirmed on one occasion at midday when an adult snake was observed actively pursuing an injured fish of unknown species which it eventually captured and consumed. Diener (1957) intimated similar diurnal foraging habits in *Natrix erythrogaster*.

The stomach contents were sorted and identified to species when possible. Osteological characters were most helpful in identifying fish material. The Weberian apparatus and pharyngeal teeth were used to identify the catostomids and cyprinids, and the catfishes were easily separated by the shape of the dermethmoid bone. The *Sigmodon* remains consisted of two lower jaws which were identified by the conspicuous sigmoid lophs of the molars. Each food item was quantitatively measured by volumetric displacement and compared with the total volume of food to obtain the percentage of the total represented by each item. The results are presented in Table I.

It is obvious from Table I that *N. rhombifera* relies heavily on fishes (85.63 percent by volume) as its staple food in Boomer Lake, with the ictalurids being the most important single constituent, both in occurrence and percent of total volume. Frogs, though very abundant in the lake, appeared in only six stomachs and provided but 7.66 percent of the total food volume, indicating, perhaps, the Diamond-backed Water Snake's preference for fish. The items classified as miscellaneous should not be

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TABLE I. STOMACH CONTENTS OF *Natrix rhombifera* FROM BOOMER LAKE

Item	No. of stomachs in which item was found	% of stomachs in which item was found	volume in ml	% of total volume of food
Crustacea (Crayfish)	3	6.1	2.6	0.63
Insecta	3	6.1	1.0	0.24
Odonata	1	2.0	0.5	0.12
Orthoptera	1	2.0	0.5	0.12
Insect remains	1	2.0	trace	—
Teleostomi	46	93.9	352.3	85.63
Catostomidae	2	4.1	8.1	1.97
Carpiodes carpio	2	4.1	8.1	1.97
Cyprinidae	9	18.4	54.3	13.2
Cyprinus carpio	1	2.0	13.6	3.31
Notemigonus crysoleucas	2	4.1	10.2	2.48
Notropis sp.	6	12.2	30.5	7.41
Ictaluridae	13	26.5	119.7	29.1
Pylodictis olivaris	1	2.0	16.0	3.89
Ictalurus punctatus	2	4.1	14.1	3.43
I. melas	8	16.3	81.3	19.76
I. natalis	1	2.0	8.3	2.02

TABLE I (Cont.)

Item	No. of stomachs in which item was found	% of stomachs in which item was found	volume in ml	% of total volume of food
Centrarchidae	11	22.4	78.8	19.15
Micropterus salmoides	1	2.0	8.6	2.09
Lepomis sp.	10	20.4	70.2	17.06
Fish remains	11	22.4	91.4	22.22
Amphibia	6	12.2	31.5	7.66
Rana pipiens	1	2.0	6.3	1.53
R. catesbeiana	1	2.0	10.2	2.48
Tadpoles	1	2.0	1.1	0.27
Frog remains	3	6.1	13.9	3.40
Reptilia	1	2.0	1.4	0.34
Snake remains	1	2.0	1.4	0.34
Aves	1	2.0	0.5	0.12
Egg shells and feathers	1	2.0	0.5	0.12
Mammalia	2	4.1	5.4	1.31
Sigmodon hispidus	2	4.1	5.4	1.31
Miscellaneous	6	12.2	2.4	0.58
Aquatic plant material	2	4.1	0.6	0.15
Wood fragments	1	2.0	0.4	0.10
Stones	3	6.1	1.4	0.34
Unidentifiable	19	38.8	14.3	3.48

considered food items. The occurrence of wood and stones in the stomach and intestines of snakes is probably not rare, since these items could easily be taken into the mouth and swallowed while pursuing and capturing prey. The literature contains a few records of such material in the digestive tracts of snakes (Glaser, 1955; Goodman, 1958; Klauber, 1956) but none have been reported from the genus *Natrix*.

It was noted that of the total stomachs examined, a rather high percentage (76.6%) contained some food material. The only explanation we can offer is that most of the specimens were captured in April, May and early June and, that having only recently emerged from hibernation, the snakes were still voraciously feeding as a result of total abstinence throughout the winter.

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