

LAMPREYS IN THE DIET OF HELLBENDER *Cryptobranchus alleganiensis* (DAUDIN), AND THE NEUSE RIVER WATERDOG *Necturus* *lewisii* (BRIMLEY)

In 1972 William E. Brode (pers. comm.) stated that lampreys occur in the diet of Tennessee River *Cryptobranchus*, but there is nothing in the literature concerning this phenomenon. Crayfish are the major dietary item of hellbenders throughout their geographic range (Nickerson & Mays, 1973). However, some specimens in Missouri populations of *C. alleganiensis* have contained large numbers of lampreys. One series that contained lampreys was collected in early April 1974 from the Niangua River, Dallas County (Osage River drainage) by James Caliendo (Robert Wilkinson, pers. comm.). Nickerson collected another series on 21 April 1977 in the Big Piney River, Texas County (Gasconade River drainage) from which was preserved a sample of regurgitated lamprey.

The Texas County sites are within the range of three lamprey species, but only the Northern brook lamprey, *Ichthyomyzon fossor*, is recorded from either river (Pflieger, 1971). Although the Big Piney River lampreys were partially digested, William L. Pflieger (pers. comm.) identified one as an adult *I. fossor*. April is the breeding season for *I. fossor* at this latitude (Pflieger, 1975), and presumably *Cryptobranchus* are harvesting the lampreys in their breeding pits.

No food studies have been published on the Neuse River waterdog, *Necturus lewisii*, but studies now being made of this species at the North Carolina State Museum of Natural History show that small aquatic invertebrates, some terrestrial invertebrates, and some fish and salamanders are included in the diet. Unlike *N. maculosus*, *N. lewisii* only occasionally feeds on crayfish.

Predatory behavior of the waterdog on fish and other vertebrates in the laboratory is also being studied. Specimens of the Least Brook Lamprey, *Lampetra aepyptera*, were collected in shallow breeding waters of a small tributary of the Neuse River in April 1979 by David S. Lee and David Carroll. Three adults of this small species were introduced into a 165 gallon aquarium containing three adult *N. lewisii* (two females and a male). The lampreys took refuge beneath large pebbles and rocks, and on the same evening they were observed depositing eggs. One of the *N. lewisii* converged on the area. Upon approach of the apparently foraging waterdog the lampreys withdrew under the stones, but the waterdog wedged its head under the stones and sucked a lamprey into its mouth. The *Necturus* then forcefully pulled the lamprey from the stones and consumed it from the head end, swallowing it alive and whole. No lampreys could be located in the tank twenty-four hours after their introduction.

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A MELANISTIC *Elaphe vulpina* FROM OHIO

Certain taxa of snakes, such as *Elaphe o. obsoleta* and *Coluber c. constrictor*, are known to normally undergo a post-embryonic ontogenetic increase in melanism. Other species such as *Sistrurus c. catenatus* and *Crotalus horridus* (Klauber, 1972) have local populations which do the same. Yet other species, such as *Thamnophis sirtalis*, have populations with a high proportion of individuals which have melanism present from birth (Blanchard and Blanchard, 1941). However, for most aberrantly melanistic snakes mentioned to date (for example: *Storeria d. dekayi*, Heckman, 1960; *Nerodia f. fasciata* and *Lampropeltis c. calligaster*, Mount, 1975; *Agkistrodon c. contortrix*, Fitch, 1959; *Crotalus v. viridis* and *C. v. oreganus*, Klauber, 1972; *C. intermedius omiltemanus*, Armstrong and Murphy, 1979; *Micrurus fulvius tener*, Gloyd, 1938) it has not been determined whether the abnormal amounts of black pigment are present at birth or are post-embryonically ontogenetically acquired. Catling and Freedman (1977) report, however, that aberrant melanism in *Thamnophis butleri* is present from birth. In this paper we report an ontogenetic increase in black pigmentation for an aberrantly melanistic *Elaphe vulpina gloydi*.

On 26 May 1977, the senior author collected a female *E. v. gloydi* at a locality within the Toledo City Limits, Lucas Co., Ohio. Upon its capture the specimen was observed to possess several unusual characteristics. These were the presence of a nodular spinal deformity ca. one-third of the way down the dorsum, the unusual shape and appearance of the head, and the uncharacteristically dark coloration of the skin. The specimen at this time was ca. 35 cm long (total) and the dorsal coloration was a dusky chestnut, slightly lighter than the rows of dark brown dorsal blotches. This is in contrast to the normal

color pattern at this size of dark brown blotches on a straw-colored ground. After examination, the specimen was released where captured.

On 4 June 1978, the specimen was recaptured at the same site. The presence of the same combination of aforementioned aberrant characters in this specimen precluded the possibility of two snakes being involved. It was now ca. 80 cm long (total) and was nearly uniformly flat dark brown along the dorsum; the blotches were most evident anteriorly. The ventral pattern consisted of a yellow ground and a concentration of dark brown squares along the sides of the ventrum. This pattern of ventral blotch distribution is also uncharacteristic of the species. The amount of melanin in this specimen was evidently increased between the two capture dates. The scale and blotch counts of the specimen are normal for the subspecies.

A shed epidermis from this snake was saved and shows the same preponderance of dark coloration as does the specimen itself. The presence of the abnormal amount of melanin in the epidermal cells is expected for such cases of morphological melanism as reported herein (Bagnara and Hadley, 1973, p. 31).

This specimen was found in a heavily disturbed industrial area where *E. vulpina* is fairly common. The amount of chemical contamination of the environment probably is moderate to heavy. In this locality other oddly colored *gloydi* have been found which have had unusually pinkish or orange ground colors, though these are not so striking as the melanistic specimen. Also, *Thamnophis butleri* from this locality sometimes exhibit unusually reddish lateral coloration. It should be noted that the authors have never seen unusually colored *E. v. gloydi* or *T. butleri* from any of numerous other localities within northwestern Ohio. It is possible that these color aberrations are due to chemical contamination of the environment, although it remains unproven.

Besides indicating that melanin content in aberrantly melanistic snakes may be post-embryonically ontogenetically increased, this specimen also appears to represent the first reported aberrantly melanistic specimen of the genus *Elaphe*.

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