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A COMPARATIVE STUDY OF THE GROSS ANATOMY OF THE DIGESTIVE SYSTEM OF SOME NORTH AMERICAN SALAMANDERS by Dan Wonderly



relatively smooth surface externally, but internally the mucosa is normally thrown into longitudinal folds. In *Siren lacertina*, *Notophthalmus v. viridescens*, *Desmognathus o. ochrophaeus*, *Plethodon g. glutinosus*, *P. c. cinereus*, *P. r. richmondi*, and *Gyrinophilus p. porphyriticus*, there is a definite, external point of demarcation between the esophagus and stomach, as shown in Figures 6 and 10; but this is

TABLE I. Species of the order Caudata used in the study*

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|---|---|
| Suborder I Cryptobranchoidea | Suborder V Salamandroidea |
| Family Cryptobranchidae | Family Salamandridae |
| *Cryptobranchus a. alleganiensis* Daud. | *Notophthalmus v. viridescens* Raf. |
| | Family Amphiumidae |
| Suborder II Proteida | *Amphiuma tridactylum* Cuvier |
| Family Proteidae | Plethodontidae |
| *Necturus maculosus* Rafinesque | *Desmognathus f. fuscus* Raf. |
| | *D. o. ochrophaeus* Cope |
| Suborder III Meantes | *D. o. carolinensis* Dunn |
| Family Sirenidae | *D. quadramaculatus* Holbrook |
| *Siren lacertina* Linnaeus | *Plethodon g. glutinosus* Green |
| | *P. c. cinereus* Green |
| Suborder IV Ambystomatoidea | *P. r. richmondi* Netting & Mittleman |
| Family Ambystomatidae | *Gyrinophilus p. porphyriticus* Green |
| *Ambystoma maculatum* Shaw | *Eurycea l. longicauda* Green |
| *A. jeffersonianum* Green | *E. bislineata rivicola* Mittleman |
| *A. opacum* Gravenhorst | |

*The families in this table are arranged in the sequence used by Schmidt (1953).

absent in *Cryptobranchus a. alleganiensis*, *Necturus maculosus*, *Amphiuma tridactylum*, *Desmognathus quadramaculatus*, and in the genus *Ambystoma* (except for a moderately definite constriction in one specimen of *A. jeffersonianum*). Although most specimens of *D. f. fuscus* have no definite point of demarcation, a few do. In *D. ochrophaeus carolinensis* two of the six, and in *Eurycea l. longicauda* three of the six, specimens show a fairly definite point, and two of the six *E. bislineata rivicola* specimens likewise show the same feature. Apparently the presence or absence of such a point of distinction is not dependent upon the amount of food present, for Notophthalmus v. viridescens, *P. g. glutinosus*, and *P. c. cinereus* show it in specimens having both full and empty stomachs.

In salamanders, the stomach is a straight, expanded tube, lying slightly to the left side of the body cavity, and terminating at the pylorus (Figures 4, 6, and 8-11). A definite and readily observable pyloric sphincter occurs consistently in *C. alleganiensis*, *N. maculosus*, *S. lacertina*, and *A. tridactylum*, but in the remaining species studied, very little pyloric constriction is evident, and no appreciable thickening of the wall of the digestive tube at the junction of the stomach and duodenum can be observed. From the region of the pylorus, the small intestine usually makes an immediate sharp bend to the right, and extends somewhat anteriorly to where it receives the bile duct, which is embedded in the hepatoduodenal ligament (Figures 4, 6, and 8-11). The portion of the small intestine between the pylorus and the entrance of the bile duct comprises the duodenum. Soon after receiving the bile duct, the small intestine bends posteriorly to form a series of loops in the posterior part of the body cavity. The number of loops is much less than that found in mammals, sometimes being as few as three or four. In most salamanders there is a short, expanded, large intestine, sometimes called the "rectum," which is readily distinguishable from the small intestine (Figures 4, 6, and 8-11). All species studied, except *N. maculosus*, show this definite distinction.