

A COMPARATIVE STUDY OF THE GROSS ANATOMY OF THE DIGESTIVE SYSTEM OF SOME NORTH AMERICAN SALAMANDERS¹Daniel E. Wonderly²

Anatomical and histological studies have been made on single species of the order Caudata, and considerable work has been done on the comparative anatomy of the skeletal and respiratory systems. However, little has been done toward making comparative studies of the digestive system of salamanders. There is a lack of information on the distinctive features of the digestive tube and major digestive glands of salamanders. There have been a few good histological studies of the digestive system of certain species of salamanders, but even these deal only with single species, not being of a comparative nature.

In the present study the principal works which were found to give an appreciable amount of helpful information on the gross and microscopic anatomy of the digestive system of salamanders are: Vaillant (1863) on *Siren*; Davison (1895) on *Amphiuma*; Kingsbury (1894) on *Necturus*; Bates (1904) on *Ambystoma*; Reese (1905) on *Cryptobranchus*; Noble (1931) on *Necturus*, *Siren*, and *Proteus*; Francis (1934) on *Salamandra*; Hyman (1942) on *Necturus*, and Baker (1945) on *Amphiuma*. Holmes (1924), Siwe (1937), Gershbein (1954), Elias (1955), and Lucas (1956) provide valuable information on the anatomy and structure of the vertebrate liver. Pigmentation of the liver is dealt with by Berg (1914), Jordan (1931), and Andrew (1959). Cope (1889) treats the skeletal system and phylogenetic relationships extensively, and illustrates the viscera of several genera.

In view of the ever-increasing problems in taxonomic relationships, it is necessary that a search be made for further means of distinguishing among taxonomic groups. Taxonomists have made good use of external morphology and of internal skeletal features, but other systems of the salamander body have apparently not been investigated with a view of using their structure to implement taxonomic determinations. The present study is an attempt to discover those gross anatomical distinctions which exist between the digestive systems of certain groups of salamanders, with the hope that these distinctive features will be an aid in confirming or questioning the taxonomic relationships within the order.

This study includes some North American members of the suborders Cryptobranchioidea, Meantes, Proteida, Ambystomatoidea, and Salamandroidea, with the main emphasis upon the families Ambystomatidae, Salamandridae, and Plethodontidae.

MATERIALS AND METHODS.

The study uses both anatomical literature and laboratory dissection of preserved specimens, especially the latter. One hundred and four fixed specimens, representing seventeen species and one additional subspecies, were systematically dissected.

Most of the material for dissection was obtained by field collecting in Athens, Hocking, and Vinton Counties, Ohio, and in Garrett County, Maryland, during the years 1959 and 1960. The specimens of *Desmognathus ochrophaeus carolinensis* were obtained from Rabun County, Georgia, and Sevier County, Tennessee, and those of *D. quadramaculatus* were collected in Sevier, Monroe, and Unicoi Counties, Tennessee. One of the *Plethodon g. glutinosus* specimens was taken in Habersham County, Georgia. The specimens of *Amphiuma* and *Siren* and two of the *Nec-*

¹Adapted from a thesis submitted in partial fulfillment of the requirements for the degree of Master of Science, at Ohio University, Athens.

²Present address: Department of Biology, Wingate College, Wingate, North Carolina.