

JOURNAL
OF THE
Tennessee Academy of Science

VOL. XXXVIII

JANUARY, 1963

No. 1

REPORT OF THE DIRECTOR OF THE REELFOOT LAKE BIOLOGICAL STATION

C. L. BAKER

Southwestern College, Memphis, Tennessee

The thirty-first session of this research Station, directed by the Tennessee Academy of Science and supported by a grant from the State of Tennessee, was characterized by intensive activities of three research investigators, visits from summer school students and many visitors from the surrounding region.

Dr. Robert J. Schoffman of the Spalding Institute, Peoria, Illinois, spent his twenty-fourth consecutive summer of investigation on the study of age and growth rate of the fishes of the lake.

Dick L. Deonier, graduate student at Iowa State University, Ames, Iowa, used our facilities for his work on the Taxonomy and Ecology of the genus *Hydrellia*, which is quite abundant on the vegetation of the lake.

A bridge was built across the ditch that has prevented access to the Station for several years by the United States Fish and Wildlife Service, and it is hoped that our facilities may be of greater use and benefit to research workers in the future.

SPERMATOOZA AND SPERMATELEOSIS IN CRYPTOBRANCHUS AND NECTURUS¹

C. L. BAKER

*Department of Biology, Southwestern College
Memphis, Tennessee*

INTRODUCTION

The diversity that exists between the seven families of urodeles on the basis of external features is equalled by the differences found in the structure of the spermatozoa from these various groups. It is also expected that phylogenetic relationships can be determined by sperm structure. Although the sperm of all urodeles have some uniformity in general structure such as a prominent flagellum marginal to a conspicuous axial filament, no particular sperm can be said to be "typical."

The sperm from one or more genera of each family of urodeles have been observed and the basic features noted and that of *Amphiuma* has been reported (Baker, 1962). This is the second of a series dealing with spermateleosis, sperm morphology and motility of urodelean sperm.

Cryptobranchus alleganiensis bishopi, or Ozark Hellbender, has a distinctive sperm in that the neck piece is much reduced, the ring does not elongate down the axial filament, there is no evidence of the cytoplasm and cell membrane passing down the axial filament of the tail, no mitochondria are evident on the tail and the middle piece cannot be distinguished from the principal piece. Mito-

chondria are present about the head in conspicuous protoplasmic beads. The flagellum is quite prominent and has a modified planar motility that is three dimensional. Its wave length and sine amplitude are constant for the species.

The sperm of *Necturus maculosus maculosus*, the Mud-Puppy, by contrast, has an elongate neck piece, the cytoplasm and cell membrane passes down almost the entire length of the tail but there is no evidence of an elongating ring, the mitochondria are present along the entire axial filament and the flagellum is wound about this filament for its entire length. This sperm is longer and of less diameter than any other urodele sperm.

In spermateleosis in both of these urodeles the axial filament and flagellum have an early origin from a prominent granule in the spermatid as a single filament that later separates with the flagellum being considerably longer. Motility is evident quite early and continues throughout spermateleosis. As the sperm matures the parallel flagellum forms into waves alongside or around the axial filament and extends only slightly beyond as a free end piece. Additional observations on *Amphiuma* indicate clearly a similar origin of flagellum and axial filament which was overlooked in the previous study.

Motility in both urodeles is definitely helical and clockwise.

1. This investigation was supported by a PHS research grant No. 7209 (C1) from the division of Medical Sciences, Public Health Service.