

GONAD DEVELOPMENT IN THE THREE-RIDGE NAIAD,
AMBLEMA PLICATA (SAY, 1817)

CAROL B. STEIN

The Ohio State Museum and The Ohio State University

Permanent histological sections of the gonad region of the visceral mass have been prepared and studied to determine the age at maturity, rate of gonad development, and incidence of hermaphroditism in the naiad *Amblyma plicata* (Say, 1817).

The youngest specimens studied were three years old, as determined by the annular rings on the shells. None of the nine three-year-old specimens was sexually mature. Most of them possessed undifferentiated primary gonads; a few could be tentatively distinguished as males or females, but none possessed mature gametes.

The youngest female with clearly differentiated ovaries was a four-year-old, 52 mm long, in which primary gonidia were differentiating into young oocytes and were bulging into the lumina of the ovarian follicles. Ripe oocytes were found in five-year-old and older females. In mid-June and early July many ripe oocytes break off from the follicle walls and pass through the ciliated oviducts to the gonopores. There does not seem to be any resting period between ovulation and the beginning of oogenesis for the next year's egg crop. Specimens with blastula-stage embryos in the gills already contain enlarged oocytes in the lumina of the ovarian follicles.

The youngest recognizable male specimen was three years old, 34 mm long. It possessed some spermatocytes in the testicular follicles, but no mature spermatozoa were present. No four-year-old male specimens have been examined. Mature sperm are present in the testicular follicles of five-year-old males. It seems probable that sexual maturity is attained during the fourth year in males, as well as in females.

Of 148 *A. plicata* examined from western Lake Erie, four were found to contain both ovarian and testicular follicles in the gonads. Two of these specimens appeared to be producing both normal spermatozoa and normal eggs at the time of collection. The other two appeared to be functioning as males, with undeveloped or immature ovarian follicles also present. In all four hermaphroditic specimens the testicular follicles were distinctly separate from the ovarian follicles, and no mixed follicles were seen. Several hundred specimens from the Walhonding, Muskingum, and Ohio Rivers have been examined, and no hermaphroditic individuals have been found in the populations from these rivers.