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**SOMATOGYRUS ALCOVIENSIS, NEW GASTROPOD SPECIES
FROM GEORGIA (HYDROBIIDAE)**

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Much of the interior of Georgia has never been fully explored by invertebrate zoologists, and until recently the Mollusca have been particularly neglected. Family Hydrobiidae, which includes those prosobranch gastropods with basocones on the central tooth of the radula (Thompson, 1968), is represented by many genera throughout the Southeastern States. *Somatogyrus*, itself widely distributed, belongs to subfamily Hydrobiinae, in which a single functional duct, the vas deferens, discharges at the tip of the penis (Morrison, 1949; Thompson, 1968). The present paper extends the known range of *Somatogyrus* into the headwaters of the Altamaha River system of Georgia.

Materials and Methods: Specimens were collected by hand or sieve in shallow water on 5 September 1968, April and May 1970, and 4 January 1971. The soft anatomy was described from living specimens. Permanent radular mounts were prepared after dissection and mercurochrome staining. The verge was sketched from animals preserved in sixty per cent ethyl alcohol.

***Somatogyrus alcoviensis*, new species** (Figs. 1-4)

Description: The shell is small, thin, and globose, reaching 5.1 mm. in length and 4.6 mm. in greatest diameter (Fig. 1). The three whorls are strongly convex, smooth, and unsculptured with numerous fine transverse striations. The apex is often eroded. The sutures are shallow. The aperture is large and widely ovate but acutely angular posteriorly, presenting a white interior. The outer lip is thin, not reflected; the inner lip is discontinuous, becoming a thin callus along a wide attachment to the body whorl. The umbilicus is reduced to a very narrow chink or is imperforate. Although the

shell may be coated with a black deposit, the shell itself is yellow-green.

Paratypes of *Clappia umbilicatus* and *C. cahabensis* revealed a mean obesity index (width/height) of 1.01 (0.92-1.04) and 0.95 (0.87-1.00), respectively. Fifty specimens of *Somatogyrus alcoviensis* each from the Yellow River and Alcovy River populations revealed respective mean obesity indices of 0.94 (0.86-1.06) and 0.95 (0.85-1.04).

The operculum (Fig. 2) is chitinous, ovate, and spiral with about 2.2 whorls. Externally, several strong growth lines and many finer striations radiate from a prominent nucleus, which is situated about one third the distance between the base and the apex and between the anterior and posterior margins. The inner opercular surface is featureless and smooth, but occasionally reflects the major external features.

The head is black; the rest of the animal is gray, the ventral foot and the verge being lighter. Tentacles are slender. Arising beneath the mantle collar behind the right tentacle, the verge is simple, compressed dorsoventrally, gradually tapers distally to a point, and lacks any secondary features such as papillae or glands. When relaxed the verge extends anteriorly then recurves posteriorly to the left over the neck; the penis is indistinguishable from the verge (Fig. 3)

The radula (Fig. 4) possesses the standard hydrobiid formula 2.1.1.1.2. There are about 65 rows of teeth. The central tooth arises from a broad base with four ectocones on each side of a larger mesocone, and with four basocones on each side of the anterior face. A rather rectangular projection extends slightly anteriorly from the lower face. The lateral teeth possess an extended, narrow shaft which bends outward about halfway along its length; the reflection contains four to six sharply pointed ectocones, four similarly pointed entocones, and a larger, blunt mesocone. A very large, bluntly pointed cusp projects infero-anteriorly from the lower face of the tooth. The marginal teeth curve gradually inward from the base, culminating in thirty to forty small, pointed cusps; the shaft of the inner marginal is slightly flanged.

The eggs are laid singly or in small, irregular clusters. The embryo is visible through a clear matrix, which occasionally is partially coated with the black deposit.

Dimensions: Holotype: 3.0 mm. in length, 2.9 mm. in greatest diameter; largest paratype (Yellow River): length 5.1 mm., diameter 4.6 mm.; smallest paratype (Alcovy River): length 1.5 mm., diameter 1.6 mm.

Type Localities: Holotype and paratypes are from Cedar Shoals in Yellow River about 1.0 km. S. of Porterdale, Newton County, Georgia. Additional paratypes are from Newton Factory Shoals in Alcovy River immediately above Jackson Lake in Newton County, Georgia. The species was named after its geographical location.

Type Depositories: From Yellow River: Holotype, Museum of Comparative Zoology, Harvard University No. 277838; twelve paratypes in each of the following: Harvard University No. 277839; U.S. National Museum, No. 701914; Florida State Museum, University of Florida, Gainesville, UF No. 21453; Delaware Mus. Nat. Hist. No. 41741. Additional paratypes from Alcovy River: Museum of Comparative Zoology, No. 277840; USNM No. 701915; UF No. 21454; Delaware Mus. Nat. Hist. No. 41742. All specimens were collected alive by the author.

Discussion: *Somatogyrus alcoviensis* possesses the prominent cusp projecting infero-anteriorly from the face of the lateral tooth upon which Walker (1909) primarily erected the genus *Clappia*. However, in few other respects does the present species resemble *Clappia*. Comparison with paratypes of *C. clappi* Walker 1909 (= *S. umbilicatus* Walker 1904; see Goodrich, 1944) and *C. cahabensis* Clench 1965 revealed that, while *S. alcoviensis* possesses an extremely reduced or entirely imperforate umbilicus, the umbilicus of *C. umbilicatus* and *C. cahabensis* is much larger and deep. In addition, *S. alcoviensis* presents a discontinuous columellar lip which is succeeded by a thin callus, although in *C. umbilicatus* and *C. cahabensis* the columellar lip is continuous and is attached to the body whorl only at its upper margin. Thus, the characteristics of the umbilicus and columellar lip preclude placing the present species within genus *Clappia*, because "In shell characters, *Clappia* differs from *Somatogyrus* in the conspicuous deep umbilicus, the straight, thin inner lip without any callus thickening, which is entirely separate from the body whorl, except for a very short distance at the upper extremity" (Walker, 1909).

The present species is assigned to genus *Somatogyrus* because it possesses shallow sutures, a white callus across the columellar mar-

gin of the aperture, and four basocones on each side of the central tooth of the radula (Thompson, 1968).

Somatogyrus alcoviensis is very similar to *S. (Walkerilla) tenax* recently described from Broad River, Elbert County, Georgia (Thompson, 1969), differing only in a more globose shell, more slender tentacles, somewhat lighter pigmentation, and a different number and arrangement of cusps on the teeth. The entire animal of *S. alcoviensis* is generally lighter in color than *S. tenax*; the mantle collar of *S. alcoviensis* remains light gray, although that of *S. tenax* is light grayish-orange. The central tooth of *S. alcoviensis* possesses four basocones and only four ectocones on each side, not three basocones or up to six ectocones on each side as in *S. tenax*. The lateral tooth bears four to six ectocones but only four entococones in *S. alcoviensis*, while in *S. tenax* there are either five or six ectocones and only three entococones. The marginal teeth possess about twice as many cusps as in *S. tenax*.

Ecology: *Somatogyrus alcoviensis* is restricted to shoals, where it crawls on boulders, gravel, and vegetation, being absent from silt and bottom sediments. Locally it may number in the thousands per square meter, particularly in the dense mats of *Podostemum ceratophyllum* (riverweed) which cover submerged rocks in rapid water. By its habits and radular form, *S. alcoviensis* probably is an *aufwuchs* and detritus feeder. It serves as food for the sunfish, *Lepomis* sp., and is closely associated with several other mollusks, including *Pisidium* sp., *Sphaerium fabalis*, *Elliptio hopetonensis*, *E. productus*, and *Oxytrema suturalis* (Krieger, 1969). The eggs are deposited on *Podostemum* stems and on the shells of living *Oxytrema* and *Somatogyrus*.

April and May 1970 collections of *S. alcoviensis* from Yellow River yielded specimens considerably larger (up to 5.1 mm. long, 4.6 mm. wide) than specimens collected concurrently from Alcovy River (up to 4.1 mm. long, 3.9 mm. wide), and larger than specimens collected at any other time from Yellow River (September 1968, January 1971). It was at this time, also, that eggs were obtained from the Yellow River population. Apparently *S. alcoviensis* is confined to a life cycle of only one year, rapidly attaining its greatest size in early spring and dying a few weeks after deposition of the eggs. Failure to obtain eggs or specimens of a similar size from Alcovy River may indicate a later chronology of the life

cycle due to different stream conditions, such as cooler temperatures, in Alcovy River. The pH and oxygen content of both localities, however, are extremely similar (Krieger, 1969). It is, of course, entirely possible that the *Somatogyrus* in Alcovy River reach maturity without attaining a comparable size due to genetic or environmental factors. In all other characteristics observed, both populations appear to be identical.

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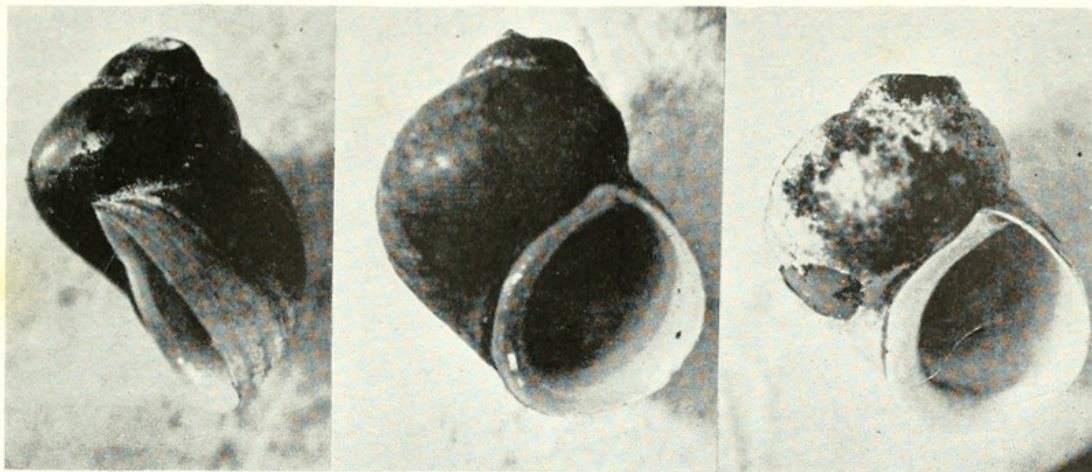
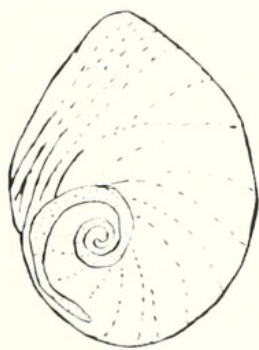
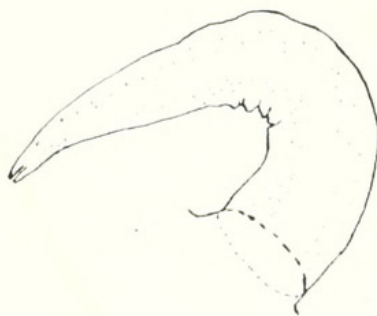


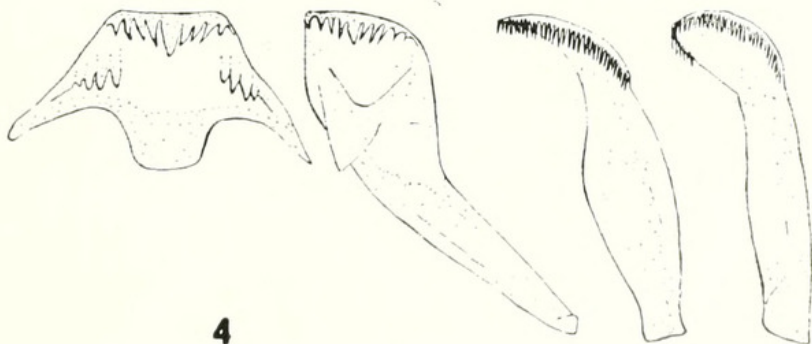
Fig. 1. Views of two paratypes of *Somatogyrus alcoviensis* Krieger *new species*. Length 3.0 mm., greatest diameter 2.9 mm. (Delaware Museum Natural History, no. 41741).



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Figs. 2-4. *Somatogyrus alcoviensis* Krieger, *new species*. Fig. 2. Outer surface of operculum. Fig. 3. Verge in relaxed position; broken line near base indicates the degree of dorsoventral compression. Fig. 4. Radula, frontal view: (l-r) central tooth, lateral tooth, inner and outer marginal teeth.



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