



THE VELIGER
CMS, Inc., 1999

The Veliger 42(4):306-337 (October 1, 1999)

A Systematic Review of the Hydrobiid Snails (Gastropoda: Rissooidea) of the Great Basin, Western United States. Part II. Genera *Colligyus*, *Eremopyrgus*, *Fluminicola*, *Pristinicola*, and *Tryonia*

ROBERT HERSHLER

Department of Invertebrate Zoology (Mollusks), NHB STOP 118, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560, USA

Abstract. This second and final part of a taxonomic treatment of hydrobiid snails of the Great Basin region in the western United States (based principally on material collected during a recently completed field survey) focuses on fauna other than the genus *Pyrgulopsis*. A new genus of small amnicoline snails, *Colligyus*, is proposed for *Hydrobia greggi* Pilsbry, 1935, together with a new species from the Harney Lake basin of Oregon. This group is strongly differentiated from other amnicolines by a unique female genitalic groundplan. New records are provided for three species of *Fluminicola*, and two new congeners are described from the northwest Great Basin, both of which had previously been confused with *F. turbiniformis* (Tryon, 1865). A new genus of cochliopine snails, *Eremopyrgus*, is erected for a new species from Steptoe Valley, Nevada. *Eremopyrgus* is distinguished from other cochliopines by unique aspects of its glandular penial lobes and other genitalic features. New records are provided for two species of *Tryonia*, and a new congener is described from thermal springs in central Nevada. Several new records of *Pristinicola hemphilli* (Pilsbry, 1890) from the extreme northwest Great Basin are provided.

INTRODUCTION

In the first part of a systematic review of hydrobiid snails of the Great Basin in the western United States (based principally on material collected during a recently completed field survey), 58 new species belonging to the widespread genus *Pyrgulopsis* were described, and new records were provided for 10 previously described congeners (Hershler, 1998). In this second and final part of this review, other hydrobiid groups, which are much more modestly represented in the region, are similarly treated. Novelties described herein include two small species of *Fluminicola* from the northwest Great Basin previously confused with *F. turbiniformis* (Tryon, 1865), a species of *Tryonia* from central Nevada, a new genus of cochliopine snails from eastern Nevada, and a new genus of small amnicoline snails from northern segments of the Great Basin.

The reader is referred to Hershler (1998) for study rationale and methodology. Institutional repositories of examined specimens are indicated by the following abbreviations: ANSP, Academy of Natural Sciences, Philadelphia; CAS, California Academy of Sciences, San Francisco; FMNH, Field Museum of Natural History, Chicago; USNM, former United States National Museum, collections now in National Museum of Natural History, Smithsonian Institution, Washington, D.C. Shell parameters for new species are summarized in Table 1.

SYSTEMATICS

Family HYDROBIIDAE Troscchel, 1857

Colligyus, Hershler, gen. nov.

Type species: *Hydrobia greggi* Pilsbry, 1935. Also included is *Colligyus depressus*, sp. nov. (described below).

Etymology: From New Latin, *collis*, hill or high ground; and *gyrus*, circle or round. Referring to the upland habitat and coiled shell of these snails. Gender masculine.

Diagnosis: A northwestern American amnicoline group having a small, globose to conical shell and paucispiral operculum. Female coiled oviduct simple; glandular oviduct large, ventrally closed; bursa copulatrix large, posteriorly positioned; seminal receptacles, 2.

Description: Shell small (up to 3.3 mm in length), thin, globose to conical, umbilicate. Whorls, 3.5-4.5, convex, narrowly shouldered, sutures impressed. Shell clear to white, periostracum thin. Shell apex nearly flat; protoconch of about 1.5 whorls, sculptured with weak spiral lineations. Teleoconch smooth except for faint growth lines. Aperture medium-sized, ovate or circular; outer lip thin; parietal lip complete across body whorl, thin; columellar lip sometimes slightly thickened. Umbilicus narrow to perforate. Operculum flat, thin, ovate, paucispiral. Outer margin of operculum without rim; attachment scar and callus weakly developed. Body pigmentation well de-

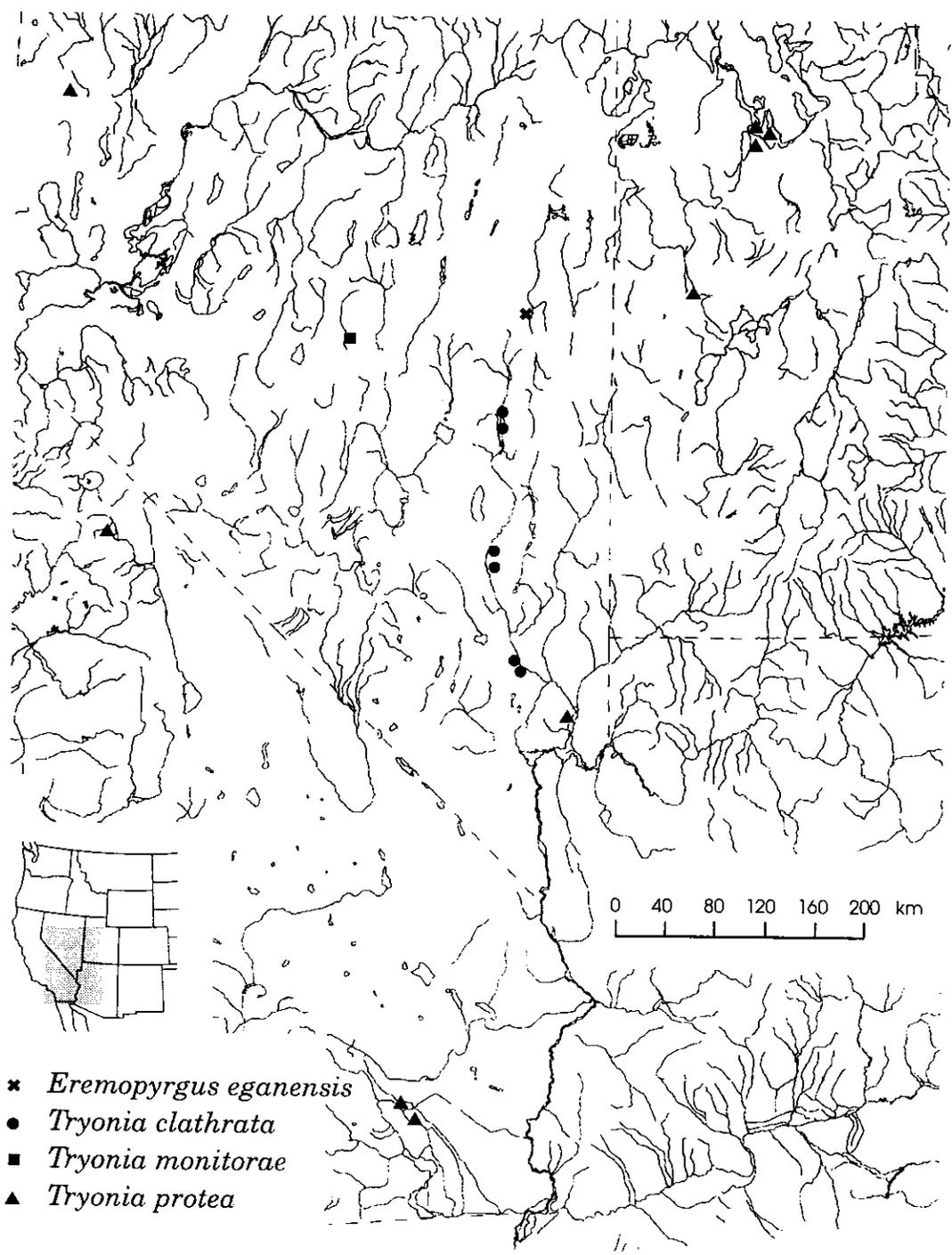


Figure 14

Map of the Great Basin (excluding northernmost portion) and adjacent regions showing the distribution of *Eremopyrgus* Hershler, gen. nov., and *Tryonia* species. The Mexican locality for *T. protea* is not shown.

form shell. Penis ornamented with one or more glandular papillae. Distal portion of penis having blunt, pigmented tip, a sub-terminal swelling along inner edge, and terminal papilla through which penial duct opens. Females ovoviviparous; capsule gland thin-walled, functioning as brood pouch; albumen gland highly reduced; bursa copulatrix and seminal receptacle small; fertilization duct coiled, opening to sperm tube.

Remarks: The scope and content of this genus remains poorly known as *Tryonia* has neither been subject to a modern revision nor been shown to be monophyletic. Many of the Recent species now allocated to the genus have not been well studied in terms of their anatomy. Taylor (1966b:196–198) placed numerous Recent-Tertiary high-spired species from North, Central, and South America into the genus, whereas Nuttall (1990:184–185) later questioned allocation of South American fossils to this group. Hershler & Thompson (1992) restricted the group to Pliocene-Recent species of North America.

Full descriptions of previously reported Great Basin species will be provided in a forthcoming review of this genus.

Tryonia clathrata (Stimpson, 1865a)

(Figure 14)

Tryonia clathrata Stimpson, 1865a:54, pl. 8, fig. 1.—Stimpson, 1865b:48–49, fig. 29.—Tryon, 1870:67.—Stearns, 1893:281.—Pilsbry, 1899:122.—Stearns, 1901:282.—Walker, 1918:139.—Gregg, 1941:118.—Baker, 1964:172.—Taylor, 1966b:197.—Taylor, 1975:58 (literature compilation).—Pratt, 1977:7.—Burch & Totrenham, 1980:100, fig. 134.—Williams et al., 1985:36, 45, 48.—Hershler & Thompson, 1987:figs. 1, 11, 12, 13–15, 19, 21–23.—Turgeon et al., 1988:63.—Hershler & Thompson, 1992:110, figs. 71a,c–e, 72.

Diagnosis: A medium to large species with turritiform shell; teleoconch sculpture of numerous, regularly spaced, collabral lamellae. Inner edge of penis ornamented with a single basal and four distal papillae.

Type locality: Given as “basin of the Colorado Desert,” but probably in error; subfossil. Lectotype, ANSP 27969. Stimpson (1865b:48) indicated that the type material was collected by Blake during his service on one of the Pacific Railroad Surveys. Stearns (1893) disputed the type locality as this species has not been found in numerous other samples from the Colorado Desert, whereas Merriam collected living specimens from Pahranaagat Valley (Nevada) well to the east. (Note that Pacific Railroad Survey expedition led by Lt. R. S. Williamson, with Blake serving as geologist, explored the Colorado Desert, but did not venture near southern Nevada [Blake, 1857].) Stearns (1901) later suggested that older Colorado Desert collections probably came from near Merriam’s locality. Morrison (1940) reiterated this point and suggested that early usage of the term “Colorado Desert” probably re-

ferred more generally to the Great Basin. Taylor (1966b) suggested that the type material probably came from the Muddy River (Moapa Valley, Nevada).

Baker (1964) designated ANSP 27969a as the lectotype. Although the original label associated with this lot merely identifies it as from Stimpson’s collection, with the locality, “Colorado Desert,” additional material from this lot, ANSP 30778, has a label identifying Blake as the collector, with the locality given as in Stimpson’s description.

Remarks: This species lives in warm springs in the White River trough (Moapa, Pahranaagat, White River Valleys) in southeastern Nevada (Figure 14). Extant populations conform to “Colorado Desert” material, with shells varying from about 2.9–7.0 mm. and having 5.75–8.75 whorls. Shell sculptural development varies from low, riblike ornament (rare) to well-developed, almost spinose lamellae. Whether or not *Tryonia clathrata spiraliistriata* Wesselingh, 1996, from the Pliocene of Guatemala, is closely related to extant *Tryonia clathrata* is conjectural. As noted by Wesselingh (1996), these fossils, although similar to *T. clathrata* in size, shape and collabral shell sculpture, differ in having numerous well-developed spiral lirae on the teleoconch.

Material examined: Colorado Desert. ANSP 27969, USNM 27893, USNM 30596, USNM 56403, USNM 121072, USNM 170786. **NEVADA. Clark County:** 9.6 km northwest of Moapa, Moapa Valley, USNM 791488.—Muddy Spring, Moapa Valley, T. 14 S, R. 65 E, NE ¼ section 16, USNM 873358, USNM 873359.—Muddy Spring, 100 m below source, Moapa Valley, T. 14 S, R. 65 E, NE ¼ section 16, USNM 874346, USNM 874790.—springs, west of Muddy Spring, Moapa Valley, T. 14 S, R. 65 E, NW ¼ section 16, USNM 874351.—spring, west of Muddy Spring, Moapa Valley, T. 14 S, R. 65 E, NW ¼ section 16, USNM 874007, USNM 874024.—spring, 0.6 km south of above, Moapa Valley, T. 14 S, R. 65 E, NW ¼ section 16, USNM 850291, USNM 873192.—“Cardy Lamb Spring,” Moapa Valley, T. 14 S, R. 65 E, SW ¼ section 16, USNM 874352, USNM 874355, USNM 874788.—“Apcar Springs,” Moapa Valley, T. 14 S, R. 65 E, SE ¼ section 16, USNM 874349.—“Oasis Spring,” Moapa Valley, T. 14 S, R. 65 E, NW ¼ section 16, USNM 874010.—Moapa Valley Water District Spring, T. 14 S, R. 65 E, SE ¼ section 16, USNM 874018, USNM 874023.—spring, Moapa Valley National Wildlife Refuge, T. 14 S, R. 65 E, NE ¼ section 21, USNM 873356, USNM 873417, USNM 874343, USNM 874506, USNM 874787.—spring, 14.8 km northwest of Moapa, Moapa Valley, T. 14 S, R. 65 E, NE ¼ section 21, USNM 874080. **Lincoln County:** Pahranaagat Valley, USNM 123621.—warm spring, Pahranaagat Valley, USNM 107735. Ash Springs, Pahranaagat Valley, T. 6 S, R. 60 E, NE ¼ section 1, USNM 874011, USNM 874095, USNM 874789.—Crystal Spring, Pahranaagat

Valley, T. 5 S, R. 60 E, NE ¼ section 10, USNM 873157. *Nye County*: Hot Creek (source), White River Valley, T. 6 N, R. 61 E, NE ¼ section 18, USNM 873196, USNM 874306, USNM 874690.—Moorman Spring, White River Valley, T. 8 N, R. 61 E, SE ¼ section 32, USNM 873178.

Tryonia monitorae Hershler, sp. nov.

Monitor tryonia

(Figures 3D, 13D–G, 14, 15)

Etymology: Refers to endemism of this snail in Monitor Valley.

Diagnosis: A medium to large species with turriiform shell often weakly sculptured with spiral threads. Penis ornamented with single basal papillae along inner and outer edges, and two distal papillae along inner edge.

Description: Shell (Figure 15A) turriiform: height, 3.5–4.6 mm; whorls, 6.25–7.5. Apex flattened, often tilted; protoconch (Figure 15B) of 1.75 whorls, diameter about 0.41 mm; smooth. No obvious zone representing growth during brood period evident. Teleoconch whorls weakly to moderately convex, evenly rounded, without shoulders. Microsculpture of weak growth lines, sometimes strengthened at short intervals. Spiral threads often obvious on shells retaining periostracum; threads less obvious on cleaned shells. Periostracum brown. Shell clear. Aperture small, ovate. Outer lip thin, orthocline, often sinuate, with abapical portion advanced. Parietal lip often complete across body whorl, thin, broadly adnate. Columellar swelling absent. Shell anomphalous.

Operculum (Figure 15 C, D) thin, slightly convex, amber, ovate, paucispiral, whorls on outer surface weakly frilled; outer margin having weak rim. Attachment scar margin unthickened on inner surface. Callus absent.

Radula with about 47 rows of teeth; ribbon length, 400 μm , ribbon width, 75 μm ; central tooth width, 19 μm . Central teeth (Figure 15 E, F) with moderate dorsal indentation; lateral cusps, 5–7; median cusp narrowly pointed, slightly broader and considerably longer than laterals; basal cusps, 1–2, inner cusp larger; basal tongue broad V-shaped, about even with lateral margins; basal sockets medium indented; lateral margins slightly thickened, strongly flared, often with distinct bend along outer edge, inclined about 50° to vertical axis of teeth. Lateral teeth

(Figure 15G) with very slight dorsal indentation; lateral wings slightly longer (120%) than width of cutting edge; tooth face slightly taller than wide; central cusp narrowly pointed; lateral cusps 3–4 (inside), 4–6 (outside). Inner marginal teeth (Figure 15H) with 19–25 cusps; outer marginal teeth (Figure 15I) with 18–27 cusps. Cusps on inner marginals larger than those on outer marginals.

Snout, tentacles, foot, neck unpigmented to medium gray-brown. Opercular lobe black along inner edge and sides. Pallial roof light gray to near black, visceral coil pale except for black pigment on stomach, to almost entirely black on all dorsal surfaces.

Ctenidium abutting pericardium; filaments about 35, well developed, about as tall as wide, pleated. Osphradium small (ca. 14%), positioned centrally or slightly posterior to middle of ctenidial axis. Hypobranchial gland not evident in dissection. Renal organ with moderate (30%) pallial bulge; renal opening slightly thickened. Salivary glands small, tubular. Stomach as long as style sac; anterior stomach chamber larger than posterior chamber. Cephalopodal ganglia unpigmented; cerebral commissure moderate length (ca. 43%); pedal commissure very short.

Oviduct terminating as slightly thickened tube a little behind stomach. Distal female genitalia shown in Figure 13 D–F. Coiled oviduct of two small, darkly pigmented overlapping loops (initial loop anterior-oblique, second loop posterior-oblique). Seminal receptacle a very small pouch just anterior to the bursa copulatrix (sometimes slightly overlapping left-dorsal surface). Seminal receptacle duct about as long as body, opening to coiled oviduct at point where latter connects with albumen gland. Fertilization duct of two small, tightly appressed coils opening to sperm tube (a little behind pallial wall) dorsal to coiled oviduct. Bursa copulatrix small, ovate, positioned along left-ventral side of brood pouch, extending to (or slightly posterior to) posterior edge of brood pouch, with narrow duct emerging from anterior edge; duct (to point where joined by fertilization duct) narrow, slightly longer than bursa copulatrix; sperm tube opening to pallial cavity a short distance in front of pallial wall. Brood pouch large, posteriorly folded along right side of bursa copulatrix. Pouch containing about 12 variably sized embryos; largest embryos of about 2.0 shell whorls. Albumen gland short, narrow, coursing ventrally across right side of bursa copulatrix and extending onto left side of bursa. Genital aperture broad, slightly muscularized.

Figure 15

Scanning electron micrographs of shell, operculum, and radula of *Tryonia monitorae* Hershler, sp. nov. A. Shell, USNM 860760 (height 2.6 mm). B. Shell apex, USNM 860760. Bar = 133 μm . C. Operculum, outer surface, USNM 883939. Bar = 200 μm . D. Operculum, inner surface, USNM 883939. Bar = 214 μm . E. Central radular teeth, USNM 883939. Bar = 10 μm . F. Central radular teeth, USNM 883941. Bar = 8.5 μm . G. Lateral radular tooth, USNM 883939. Bar = 10 μm . H. Inner marginal tooth, USNM 883939. Bar = 11 μm . I. Outer marginal teeth, USNM 883939. Bar = 10 μm .