



## Two new, possibly threatened species of *Pyrgulopsis* (Gastropoda: Hydrobiidae) from southwestern California

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### Abstract

Here we describe (for conservation purposes) two new species of *Pyrgulopsis* from southwestern California based on morphologic and molecular (mtCOI) evidence. *Pyrgulopsis castaicensis* n. sp. is endemic to a single spring in the upper portion of the Santa Clara River basin and may be threatened by the proposed development of a master-planned community (Newhall Ranch) near Santa Clarita Valley. This snail differs from two morphologically similar regional congeners (*P. micrococcus* [Pilsbry in Stearns, 1893], *P. stearnsiana* [Pilsbry, 1899]) by its larger terminal gland, simple oviduct coil and mtCOI sequences (6.1–9.3% for *P. micrococcus*, 3.5–8.2% for *P. stearnsiana*). *Pyrgulopsis milleri* n. sp. is distributed in spring-fed waters along a short reach of upper Tule River drainage and threatened by surface water diversion and its close proximity to a major road (CA 190). *Pyrgulopsis milleri* differs from closely similar and geographically proximal *P. stearnsiana* in its broader central cusps on the central radular teeth, shorter pallial section of the albumen gland, greater overlap of the bursa copulatrix by the albumen gland, simple anterior vas deferens, usual absence of a terminal gland and mtCOI sequences (2.8–8.4%).

**Key words:** Santa Clara River, Tule River, springsnails, mitochondrial DNA, conservation

### Introduction

*Pyrgulopsis* Call & Pilsbry, 1886 (Gastropoda: Hydrobiidae) is the largest genus of aquatic mollusks in North America, with 129 currently recognized species (Hershler & Liu 2009). This genus is composed of small (ca. 2–8 mm shell height) species whose rather uniform shells mask a striking anatomical (e.g., penial morphology) radiation (Taylor 1987; Hershler 1994; Hershler 1998). *Pyrgulopsis* typically lives in small, spring-fed habitats (e.g., Hershler 1998) and is distributed within much of the continent west of longitude 97°W (Hershler *et al.* 2008, fig. 1).

Although *Pyrgulopsis* has been intensively studied since 1994 (see Hershler & Liu 2009 and references cited therein), its species diversity is still poorly known because the genus has not been surveyed and taxonomically investigated in detail across much of its broad geographic range (Hershler & Liu 2009). One of the least studied geographic subunits of *Pyrgulopsis* is that of southwestern California, here treated as the San Joaquin-Tulare basin and coastal drainage from San Francisco Bay southward. Only seven currently recognized species and few records have been reported from this large region, which encompasses five major drainages having a total watershed area of >150,000 km<sup>2</sup> (Seaber *et al.* 1994). Five of these species — *P. diablensis* Hershler, 1995; *P. giulianii* Hershler & Pratt, 1990; *P. greggi* Hershler, 1995; *P. micrococcus* (Pilsbry in Stearns, 1893); *P. taylori* Hershler, 1995 — have narrowly localized distributions within the region (Hershler & Pratt 1990; Hershler 1995) while the other two — *P. californiensis* (Gregg & Taylor, 1965), *P. stearnsiana* (Pilsbry, 1899) — range widely (Gregg & Taylor 1965; Taylor 1981; Hershler 1994).