ESM Contents

- ESM Materials Text
  - Previous research involving Himasthla sp. B (HIMB).
  - HIMB life cycle.

- ESM Figures
  - Figure S1. Life cycle of Himasthla sp. B (HIMB).
  - Figure S2. Secondary morph (putative soldier) rediae are much smaller than primary morph (putative reproductive) rediae of Himasthla sp. B.
  - Figure S3. Absolute and relative pharynx sizes of individual secondary and primary morph rediae of Himasthla sp. B.
  - Figure S4. Himasthla sp. B (HIMB) secondary morphs (putative soldiers) attack heterospecifics and conspecifics from other colonies, but never themselves.

- ESM Tables
  - Table S1. Other trematode-snail systems for which we have observed a probable soldier caste.

- ESM References
ESM Materials and Methods Text.

**Previous research involving Himasthla sp. B (HIMB).** For over 65 years, researchers have included HIMB in studies of the California horn snail trematode guild. Hunter described HIMB in her 1942 thesis, as “Cercaria cerithidia 14” (Hunter 1942). Martin referred to HIMB as the ‘fin-tailed echinostome’ in his 1955 community study (Martin 1955), and included HIMB in his 1972 key (Martin 1972) as “Echinoparyphium sp.”. This was the name used until 2000 in research (Sousa 1983; Kuris 1990; Sousa 1993; Lafferty et al. 1994) that focused on the interspecific dominance relationships among the trematode species. Huspeni (2000) argued that Echinoparyphium sp. was a species of Himasthla and it has subsequently been referred to as Himasthla sp. B (HIMB) (Huspeni & Lafferty 2004; Lafferty et al. 2006; Hechinger et al. 2007; Whitney et al. 2007; Hechinger et al. 2008; Hechinger et al. 2009; Hechinger 2010). Morphological and molecular genetic work is currently in progress to resolve the taxonomy for this species.

**HIMB life cycle.** The physical caste polymorphism characterizing HIMB rediae occurs within the context of the serial polymorphism characterizing HIMB's complex life cycle. Like most trematodes (Kearn 1998; Galaktionov & Dobrovolskij 2003), HIMB obligatorily uses three hosts to complete its life cycle (Fig. S1). A single larva infects a horn snail as first intermediate host. Subsequent clonal reproduction forms the redia colonies that are the subject of this study. The rediae castrate their host and effectively steal its body for themselves (Hechinger et al. 2009; Hechinger 2010). During the height of the productive season, HIMB redia colonies take an average of 24% of the infected snail’s soft tissue mass (Hechinger et al. 2009). HIMB also grows the stolen snail body about twice as fast as uninfected snails (Hechinger 2010). Dispersive larvae (cercariae) leave infected snails to encyst within the pericardia of other snails (Huspeni and Hechinger, unpublished observations; Lafferty et al. 2006). The cysts transmit to final host birds, when the birds prey upon infected snails. Sexual stages live in the intestines of birds, and their eggs exit the bird with its feces. A single larva (miracidium) hatches from an egg and swims to find and infect a snail, founding a new HIMB redia colony.
ESM Figures.

Figure S1. Life cycle of *Himasthla* sp. B (HIMB). See ESM text for further details.
Figure S2. Secondary morph (putative soldier) rediae are much smaller than primary morph (putative reproductive) rediae of *Himasthla* sp. B. Data represent the individuals from each of the seven *Himasthla* sp. B colonies in terms of volume (top), length (middle), and width (bottom). Note the log-scaled size axes for the top and bottom panels.
Figure S3. Absolute and relative pharynx sizes of individual secondary and primary morph rediae of Himasthla sp. B. (top) The absolute pharynx sizes of individual secondary morphs (putative soldiers) overlapped with those of primary morphs (putative reproductives) in each of the seven colonies. (bottom) Secondary morphs had much larger pharynxes relative to their body sizes in each of the seven colonies.
Figure S4. *Himasthla* sp. B (HIMB) secondary morphs (putative soldiers) attack heterospecifics and conspecifics from other colonies, but never themselves. The number of HIMB secondary morph attacks observed two hours after placement with secondary morph rediae from the same colony, with conspecific secondary morphs, or with heterospecific parthenitae. This figure is a version of Fig. 3a that presents actual number of attacks, additional detail, and the results for the additional heterospecific treatments. Δ’s indicate the first two trials that used 20 individuals of each morph placed in 1.5 mL glass wells. The other nine trials used 15 of each redial type in 0.32 mL plastic wells. X’s indicate the two trials where secondary morphs did not attack one or both conspecifics. Three of the heterospecifics also have secondary morph rediae (putative soldiers) and we used their secondary morphs and primary morph rediae in separate treatments. Because heterospecific primary morphs are also much larger than secondary morphs, we used five instead of 20 rediae. Treatment codes: self = HIMB secondary morphs from same colony, consp1 = HIMB secondary morphs from a second colony, consp2 = HIMB secondary morphs from a third colony, PYGI = *Pygidiopsoides spindalis*, STIC = *Stictodora hancocki*, HIMA = *Himasthla rhigedana*, CLOA = *Cloacitrema michiganensis*, PARO = *Parorchis acanthus*, LGXI = Large Xiphidiocercaria. LGXI parthenitae are sporocysts whereas parthenitae for all other species are rediae (have mouthparts). HIMA, CLOA, and PARO also appear to produce a soldier caste and the “p” or “s” following their names indicate treatments using primary or secondary morph rediae, respectively.
### Table S1. Other trematode-snail systems for which we have observed a probable soldier caste.*

<table>
<thead>
<tr>
<th>trematode species</th>
<th>trematode family</th>
<th>snail host species</th>
<th>geographic location</th>
<th>observed by &amp; when</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloacitrema michiganensis</td>
<td>Philophthalmidae</td>
<td>Cerithidea californica</td>
<td>North America, Pacific Coast</td>
<td>RFH, repeatedly 2001-present; ACW, 2006-present</td>
</tr>
<tr>
<td>Parorchis acanthus</td>
<td>Philophthalmidae</td>
<td>Cerithidea californica</td>
<td>North America, Pacific Coast</td>
<td>RFH, repeatedly 2001-present; ACW, 2006-present</td>
</tr>
<tr>
<td>Himasthla rhigedana</td>
<td>Echinostomatidae</td>
<td>Cerithidea californica</td>
<td>North America, Pacific Coast</td>
<td>RFH, repeatedly 2001-present; ACW, 2006-present</td>
</tr>
<tr>
<td>Parorchis sp. †</td>
<td>Philophthalmidae</td>
<td>Cerithidea cingulata</td>
<td>Persian Gulf</td>
<td>RFH, 18 March 2001</td>
</tr>
<tr>
<td>Philophthalmid sp. I ‡</td>
<td>Philophthalmidae</td>
<td>Batillaria attramentaria</td>
<td>Japan</td>
<td>RFH, 22 June 2003</td>
</tr>
</tbody>
</table>

*In addition to these species, a colleague has initiated study of another trematode species with probable soldiers in New Zealand (T. Leung, pers. comm.).

†, This species may be equivalent to "Philophthalmid Cercaria I" listed in Abdul-Salam and Sreelatha (1998).

‡, sensu Hechinger (2007) who indicated that this trematode is likely a species of *Philophthalmus.*
ESM References.
