Eimeria halleri sp. n. (Apicomplexa: Eimeriidae) from the Round Stingray, Urolophus halleri (Rajiformes: Dasyatidae)

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ABSTRACT: Eimeria halleri sp. n. (Apicomplexa: Eimeriidae) is described from the rectal contents of the round stingray, Urolophus halleri Cooper (Rajiformes: Dasyatidae) from Puerto Peñasco, Mexico. Oocysts are spherical or subspherical, 16.9 x 16.8 (15.0-18.0 x 15.0-18.0) μm, with a smooth, thin wall. Micropyle, polar granule, and oocyst residuum are absent. Sporocysts are ovoid, 11.1 x 6.8 (10.0-13.0 x 6.0-7.5) μm and possess Stieda and substieda bodies. Sporozoites are comma-shaped, 9.9 x 3.2 (9.0-11.0 x 2.8-4.0) μm and contain an ovoid posterior and a spherical anterior refractile body. The sporocyst residuum consists either of numerous finely granular particles scattered among the sporozoites or as a spherical mass.

During a survey of marine fish for parasites at Puerto Peñasco, Mexico, we noted many round stingrays, Urolophus halleri Cooper, to be passing unsporulated coccidian oocysts in the feces. Further examination of these oocysts revealed a previously unknown species of Eimeria. This paper describes the morphological characteristics of this new species of coccidian.

Materials and Methods

Both male and female round stingrays, Urolophus halleri, were collected either with a Hawaiian sling or by seining along the coastline at Puerto Peñasco, Mexico, in October 1984. Spiral valve contents from each stingray were divided into four equal portions and each portion placed within one of the following solutions: 1) 2.5% (w/v) potassium dichromate (K₂Cr₂O₇) in tap water; 2) 1.0% (w/v) K₂Cr₂O₇ in 1:1 seawater-tap water; 3) 1.0% (v/v) H₂SO₄ in tap water; or 4) seawater supplemented with 100 IU/ml penicillin G, 100 μg/ml streptomycin, and 0.25 μg/ml Actidione. Samples were stored in screw-top vials at room temperature (~25°C) for three days, placed in petri dishes at room temperature for five days so that oocysts could sporulate, and examined by brightfield and Nomarski interference contrast microscopy for parasites. All measurements were made with a calibrated ocular micrometer and are reported in micrometers (μm), with the mean followed by the range in parentheses. Fifty parasites were used for each measurement.

Figures 1-2. Nomarski interference contrast photomicrographs of oocysts of Eimeria halleri sp. n. x 2,000.
1. Sporulated oocyst. Note concave side of sporocyst wall (CC), oocyst wall (OW), refractile body (RB), Stieda body (SB), sporocyst residuum (SR), substieda body (SSB), and sporocyst wall (SW). 2. Three sporulated oocysts.
Results

Seven of 21 (33%) *Urolophus halleri* were found to be passing a previously undescribed species of *Eimeria* in the feces. Only oocysts placed in seawater supplemented with antibiotics sporulated. Below is the description of the form that we saw.

**Apicomplexa: Eimeriidae**

*Eimeria halleri* sp. n.

(Figs. 1–3)

**DESCRIPTION:** Oocysts spherical or subspherical, 16.9 × 16.8 (15.0–18.0 × 15.0–18.0); shape index (length/width) 1.0 (1.0–1.1). Wall smooth, composed of a single colorless layer <1.0 thick (confirmed by crushing oocysts between slide and coverslip). Micropyle, polar granule, and oocyst residuum absent. Sporocysts ovoid, 11.1 × 6.8 (10.0–13.0 × 6.0–7.5); shape index 1.7 (1.4–2.0). Wall smooth and thin, and appears to be composed of a single colorless layer. The pointed end of the sporocyst is often curved to one side (Figs. 1, 3) and has a thin, knoblike Stieda body; substieda body present, large and homogenous, ~2.5 wide × 2.0 high. Sporozoites comma-shaped, with the anterior end distinctly more pointed than the posterior end, 9.9 × 3.2 (9.0–11.0 × 2.8–4.0) in situ. Each sporozoite contains an ovoid posterior refractile body 4.0 long × 3.0 wide (3.0–5.0 × 2.0–3.5) and, usually, a spherical anterior refractile body, 2.1 (1.0–3.0). Sporocyst residuum present, consisting of numerous fine granules, ~0.2–0.5 in diameter, scattered among the sporozoites or (sometimes) as a compact sphere.

**TYPE HOST:** *Urolophus halleri* Cooper “round stingray” (Rajiformes: Dasyatidae).

**TYPE LOCALITY:** Puerto Peñasco, Mexico.

**SITE OF INFECTION:** Unknown. Oocysts found in feces and contents of spiral valve.

**SPORULATION:** Exogenous. All oocysts recovered from the feces and spiral valve were unsporulated but became fully sporulated after 5 days in seawater supplemented with 100 IU/ml penicillin, 100 µg/ml streptomycin, and 0.25 µg/ml Actidione at ~22°C.

**PREVALENCE:** 7/21 (33%) stingrays.

**TYPE SPECIMENS:** Syntypes (sporulated oocysts in 10% formalin) USNM Helm. Coll. No. 78490.

**REMARKS:** Only four species of coccidia have been described previously from stingrays: *Eimeria ottojiroveci* Dyková and Lom, 1983 from *Raja clavata*; *E. raiarum* van den Berghe, 1937 from *Raja batis*; and *E. quentini* Boulard, 1977, and *E. southwelli* Halawani, 1930 from *Aetobatis narinari* (see Halawani, 1930; van den Berghe, 1937; Boulard, 1977; Lom and Dyková, 1981; Dyková and Lom, 1983). *Eimeria halleri* differs from these species by the following characteristics: Oocysts and sporocysts of *E. ottojiroveci* are smaller, the Stieda and substieda bodies are structurally different, and the sporocyst residuum is compact and coarse, rather than fine grained and often dispersed; oocysts of *E. raiarum* are larger, the sporocysts smaller, and an oocyst residuum is present; oocysts of *E. quentini* and *E. southwelli* are larger and far more elongate and an oocyst residuum is sometimes present.

**Acknowledgments**

We wish to thank Mr. Kevin D. Roy and Mr. Russell R. Broaddus for aiding in the collection of many of the stingrays represented in this study.

**Literature Cited**


Obituary Notice
MYRON G. RADKE
September 26, 1928–July 9, 1985

Obituary Notice
LAWRENCE R. PENNER
March 29, 1913–June 28, 1985
Elected Member April 18, 1952