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Redescription of *Isospora vanriperorum* Levine, 1982 (Apicomplexa: Eimeriidae) from the Northern Cardinal, *Cardinalis cardinalis* (L.) (Passeriformes: Cardinalidae), in North Texas, USA

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Abstract

Little is known about the coccidian parasites of North American birds of the family Cardinalidae. A single isosporan, *Isospora vanriperorum* was previously described over 40 years ago from the northern cardinal, *Cardinalis cardinalis* from Hawaii. Since then, it was also reported in the green-winged saltator, *Saltator similis* from Brazil but the identification was invalidated recently. Feces were collected in July 2022 from two *C. cardinalis* found dead in Lamar County, Texas, USA. One sample contained oöcysts representing *I. vanriperorum*. Oöcysts are spheroidal to subspheroidal with a smooth uni-layered wall, measure (L × W) 23.8 × 22.4 µm and have a length/width (L/W) ratio of 1.04; a micropyle and oöcyst residuum are absent but polar granule(s) are present. Sporocysts are ovoidal and measure 15.5 × 10.5 µm, L/W 1.5; a knob-like Stieda body and a rounded sub-Stieda body are present. The sporocyst

residuum is more often composed of various-sized granules dispersed between and across the sporozoites; it is less often in a compact rounded mass. This isosporan has now been reported from the northern cardinal for the second time but most importantly, from the mainland USA for the first time.

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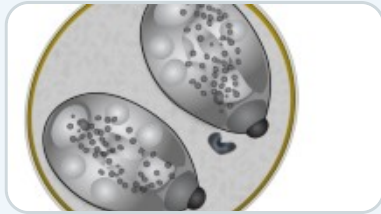
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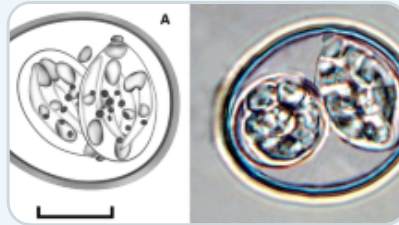
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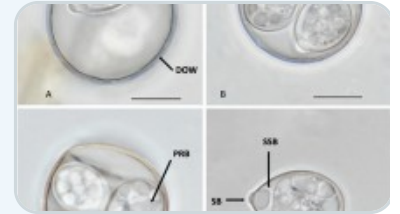
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Data availability

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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Contributions

This study was designed by both authors. Field collections were performed by CTM. Laboratory procedures for recovery of oöcysts were performed by CTM. Laboratory procedures for measurements, photomicrographs, and isolation of oöcysts were performed by JAH. The line drawing was prepared by CTM. The manuscript was written by both authors and subsequently revised by both authors. Both authors read and approved the final manuscript.

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Ethics declarations

Conflict of interest

The authors declare that they have no conflict of interest.

Ethical approval

All applicable institutional, national and international guidelines for the care and use of animals were followed.

The Texas Parks and Wildlife provided a Scientific Collecting Permit (No. SPR-0620-076) to CTM that allowed for salvaging birds.

Additional information

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