

Eimeria zarudnyi n. sp. (Apicomplexa: Eimeriidae) from the
amphisbaenid lizard, *Diplometopon zarudnyi*,
in Saudi Arabia

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Abstract. *Eimeria zarudnyi* is described from the gall bladder of the Amphisbaenid lizards, (*Diplometopon zarudnyi*) collected from Al - Thumamah, central region, Saudi Arabia. Sporulated oocysts of this coccidian are ellipsoid, 27.4 X 22.1 (25.1-31.5 X 18.8-24.2) μm , with smooth brownish - yellow bilayered wall. Micropyle, polar body and oocyst residuum are absent. Sporocysts are boat- shaped, 11.2 X 7.1 (10.6 - 12.3 X 6.5 - 8.0) μm . The sporocyst residuum is present, the Stieda and substieda bodies are lacking. Sporozoites are banana- shaped, broad at the posterior end and slightly tapered anteriorly, each with one refractile globule at its broad end.

Key words : Oocysts, *Eimeria*, *Diplometopon zarudnyi*, Lizards.

Introduction

The amphisbaenian family Trogonophiidae is represented in the central region of Saudi Arabia by only one species, *Diplometopon zarudnyi* (Al-Sadoon, 1988). *D. zarudnyi* is usually found burrowing in low sand dunes and in soils of date palm farms. Also it may be found in ant and termite tunnels (Al-Johany, 1999). This amphisbaenian is a nocturnal animal whose diet consists of small insects and their larvae. Recent surveys of the literature on eimerian parasites indicate that these parasitic protozoa were reported in different Countries of the world (Aquino-Shuster *et. al.* 1990 and Telford Jr, 1997) from parasitizing lizards, including Saudi Arabia

(Amoudi, 1989; Alyousif, *et. al.* 1997 and Al-Rasheid & Alyousif, 1998). Two distinct group of species of *Eimeria* are found in lizards. One inhabiting the endothelium of the gall bladder, sometimes its duct and the nearby biliary ducts of the liver and the other inhabiting the endothelium of the small intestine. In this study we present our findings of a new species of *Eimeria* from the gall bladder of the amphisbaenid lizard, *Diplometopon zarudnyi* which has never been described from this host.

Materials and Methods

During August 2000, a total of 13 adult *Diplometopon zarudnyi* lizards were captured by hand from Al-Thumamah, central region of

Table 1. Comparison of *Eimeria zarudnyi* n. sp. and other *Eimeria* species sited in this paper.

Original structure	<i>E. schmidtii</i>	<i>E. scinci</i>	<i>E. sinaitae</i>	<i>E. zarudnyi</i> (Present study)
Oocyst shape	Ellipsoidal	ellipsoidal	Elongat- ellipsoidal	ellipsoidal
size (µm)	31.2 × 23.3	36 × 25	34.4 × 22	27.4 × 22.1
shape index	1.31	1.44	1.56	1.24
Sporocyst shape	Ellipsoidal	ellipsoidal	ellipsoidal	Boat-shape
Size (µm)	12.6 × 9.3	14 × 10	11.4 × 7.6	11.2 × 7.1
shape index	1.35	1.40	1.50	1.56
Sporozoite shape	Banana – shaped	Vermiform – shaped	Crescent – shaped	Banana - shaped
Host	<i>Acanthodactylus schmidtii</i>	<i>Scincus officinalis</i>	<i>Agama sinaita</i>	<i>Diplometopon zarudnyi</i>

Saudi Arabia. These animals were caged separately and their fecal pellets were placed individually in a thin layer of 2.5 % aqueous potassium dichromate solution and examined microscopically for the incidence of eimerian oocysts after concentration by flotation technique. The infected reptiles were autopsied, gall bladder and intestinal contents were examined. To determine the sporulation time, oocysts collected were pipetted onto a clean slide, covered with a coverslip, sealed with petroleum jelly and incubated at 23 ± 2 °C. Fifty sporulated oocysts and fifty sporocysts were measured using Zeiss photomicroscope fitted with a 100 X apochromatic oil immersion objective and a 10 X ocular micrometer. The number of layers of the oocyst wall, its thickness and the detailed structure of the sporocysts were examined after crushing oocysts by applying pressure to the

coverslip. All measurements are in micrometers with ranges in parentheses following the means.

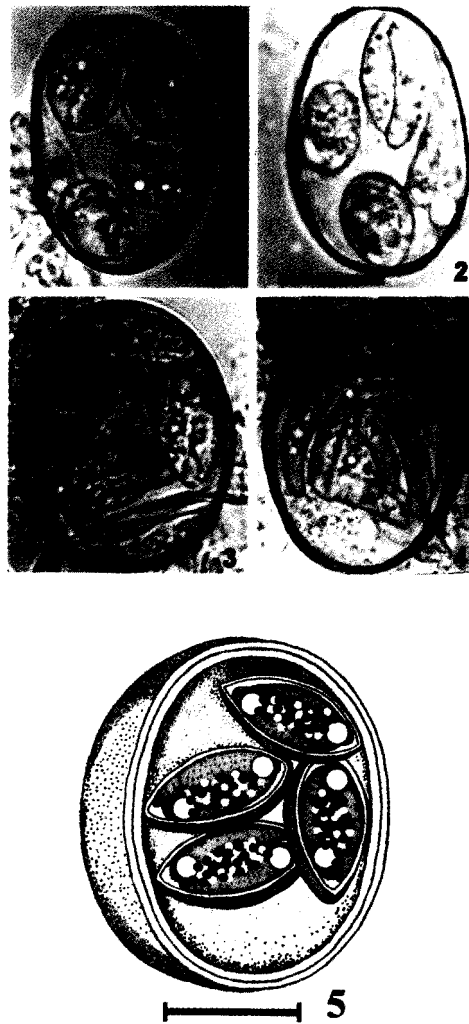
Results

During a survey of the parasitic fauna of the central region of Saudi Arabia, a total of 13 adult *Diplometopon zarudnyi* were examined for coccidian infection, four of them had large numbers of oocysts in their gall bladder contents, and there is no doubt that these oocysts representing a new species of coccidia which we describe below.

Eimeria zarudnyi n. sp. (Figs. 1-5).

Description:

Sporulated oocysts were ellipsoidal in shape with smooth surface, 50 oocysts from the four infected *Diplometopon zarudnyi* were measured 27.4 X 22.1 (25.1-31.5 X 18.8-24.2), shape index (length / width ratio) 1.24 (1.18-



Figs. 1-4. Photomicrographs of living oocysts of *Eimeria zarudnyi* from the gall bladder of *Diplometopon zarudnyi*. X 1000. Fig. 1. Newly mature oocyst. Fig. 2. Sporulated oocyst showing four sporozoites emerging from two sporocysts. Fig. 3. Fully sporulated oocyst showing four boat-shaped sporocysts each with many scattered granules. Fig. 4. Late mature oocyst showing eight sporozoites after emerging the sporocysts. Fig. 5. Line drawing of sporulated oocyst of *Eimeria zarudnyi* n. sp. Scale bar = 10 μ m.

1.35). The oocyst wall is brownish-yellow measured 1.1 (1.0-1.2) μ m thick and bilayered by light microscopy. Micropyle, oocyst residuum and polar granule are absent. Meanwhile, sporocysts are boat-shaped, with a smooth single layered boundary, measuring 11.2X7.1 (10.6-12.3X6.5-8.0), with length/width ratio of 1.56 (1.42-1.67). Stieda and/or substiedal bodies are absent, while a sporocyst

residuum is present and consists of a large number of granules spread throughout the sporocyst. Sporozoites are banana-shaped, broad at one end (posteriorly) and slightly tapering at the other. These measure 13.7X 3.1 μ m (12.9-14.4 X 2.9-3.3), and usually lying head to tail in the sporocysts. A large refractile globule is present at the broad end of the sporozoite.

Taxonomic summary

Type host: *Diplometopon zarudnyi* (Amphisbaenia : Trogonophiidae)

Type locality: Al-Thumamah, central region, Saudi Arabia.

Prevalence: Found in four of 13 (31%) infected *D. zarudnyi*.

Site of infection: Epithelial cells of gall bladder and bile ducts.

Sporulation time: The majority of oocysts examined had completed sporulation within the gall bladder contents.

Type specimens: Syntypes (oocysts in 10% formalin) and a phototype are deposited in the parasitological collection of the Zoology Department Museum, King Saud University, Riyadh, both as (KSUC.-115).

Etymology: The new species name reflects the species name of the host.

Discussion

To our knowledge, no coccidian species belonging to genus *Eimeria* has yet been described from the amphisbaenid lizard, *Diplometopon zarudnyi*. In this study, *Eimeria zarudnyi* sp. n. is the first eimerian to be described from members of the suborder Amphisbaenia. The description of the new *Eimeria* species as a distinct form, mainly based on the oocyst structure, site of infection and host differences. *Eimeria zarudnyi* sp. n. slightly resembles in shape of oocysts numbers of other eimerians described from the gall bladder of other lizard hosts as *E. scinci* (Phisalix, 1923) from *Scincus officinalis*; *E. sinaitae* (Kasim and Al-Shawa, 1988) from *Agama sinaita* and *E. schmidtii* (Alyousif, et. al. 1997) from *Acanthodactylus schmidtii*. On the other hand, *E. zarudnyi* differs from all these species in having much smaller oocysts

and length to width ratio of the oocysts. Also, the shape and structure of the sporocysts in *E. zarudnyi* is boat-shaped rather than ellipsoid, and has a fine grained and dispersed sporocyst residuum rather than compact. Moreover, it differs from *E. scinci* and *E. schmidtii* (Phisalix, 1929 and Alyousif, et. al. 1997) in having much smaller sporocysts. The sporozoites of *E. zarudnyi* are banana - shaped rather than crescent-shaped in *E. sinaitae* (Kasim and Al-Shawa, 1988) or vermiform - shaped in *E. scinci* (Phisalix, 1923).

These structural characteristics and host differences lead us to conclude that *E. zarudnyi* is a distinct and hitherto undescribed species.

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وصف نوع جديد من طفيليات الاميريا التي تصيب السحالي ذات الأتجاهين من رتبية *Amphisbaenia* في المملكة العربية السعودية

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ملخص البحث : تم في هذا البحث دراسة تواجد ووصف نوع جديد من الأميريا وهو *Eimeria zarudnyi* لأول مرة في السحلية ذات الأتجاهين *Diplometopon zarudnyi* في منطقة الثمامة بمدينة الرياض بالمملكة العربية السعودية وقد تم التعرف على شكل وقياسات كل من الحويصلات والأكياس البوغية والأبواغ لهذا الطفيل وقد استنتج من هذه الدراسة ان هذا النوع من طفيليات الكوكسيديا لم يسبق تسجيله في هذا النوع من السحالي التي يكثر انتشارها في المملكة العربية السعودية.