

***Goussia chalupskyi* n. sp. (Apicomplexa: Eimeriidae) from the chub *Leuciscus cephalus* (Cyprinidae)**

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Abstract

Oöcysts of *Goussia chalupskyi* n. sp. are described from the faeces of the chub *Leuciscus cephalus* (Cyprinidae) from Southern Bohemia, Czech Republic. The oöcysts are spherical, 11.0 (10.5–11.5) µm in diameter. The sporocysts are broadly oval to subspherical, 7.7 (7.0–8.5) × 5.7 (5.0–6.5) µm, with a sporocyst residuum composed of 2–4 granules. Merogonial and gamogonial stages were found in the posterior part of the intestine.

Introduction

During a survey of several cyprinid fishes for coccidian parasites in Southern Bohemia, a *Goussia* species was found in the faeces of chub *Leuciscus cephalus*. Since this species represents a previously unknown representative of the genus *Goussia* Labbé, 1897, its description is given below.

Materials and methods

A total of 35 chub *Leuciscus cephalus* were collected between March and May during 1990 and 1991 from the Blanice River, Černovický Brook and Hejlovka Brook, Southern Bohemia, Czech Republic. With the exception of two, all fish were killed and tissue scrapings of the mucosa of the anterior, central and posterior parts of the intestine were prepared and examined fresh. In addition, faecal smears were treated in the same way. The two live fish, which were shedding oöcysts, were placed separately in a small aquar-

ium, and, after 48 hrs, they were killed and tissue samples from parts of the anterior, central and posterior regions of the intestine were fixed in 10% neutral buffered formalin and processed for routine histology. Oöcysts were measured fresh. All measurements are in micrometres and are presented as a mean with the range in parentheses.

***Goussia chalupskyi* n. sp. (Figs 1–5)**

Description

Sporulated oöcysts (= 20) spherical, thin-walled, 11.0 (10.5–11.5) in diameter. Micropyle, polar granule and oöcyst residuum absent. Broadly oval to subspherical sporocysts, 7.7 (7.0–8.5) × 5.7 (5.0–6.5), with thin, smooth wall, without Stieda body, almost completely fill oöcyst. Sporozoites elongate, 6.5 × 1.5, arranged parallel to longitudinal axis of sporocyst or often partly curled around each other. Very small sporocyst residuum composed of 2–4 granules. Longitudinal suture of sporocyst wall indistinct.

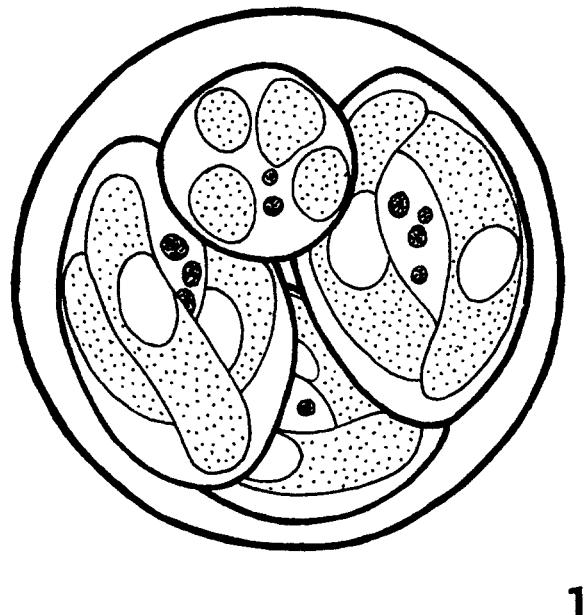


Fig. 1. Diagram of sporulated oöcyst of *Goussia chalupskyi* n. sp.

Comments

In one specimen which shed oöcysts of *Goussia chalupskyi* n. sp., merogonial and gamogonial stages were found; however, they were confined only to the region of the posterior part of the intestine close to the anus, whereas other parts of the intestine examined were free of infection. During merogony 8–12 elongate merozoites arranged in parallel were formed (Fig 4). Gamonts were found in almost all epithelial cells within the infected region (Fig. 5). They were localised supranuclearly, close beneath the microvillar portion of the epithelial cells. A large halo apparent around them was probably an artefact.

Type-host: chub *Leuciscus cephalus*.

Type-locality: Blanice River, near Strunkovice, Southern Bohemia.

Site: Posterior part of the intestine, faeces.

Sporulation: Edogenous, oöcysts most frequently found within yellow bodies.

Prevalence: Five of 35 (14%) chub infected.

Type-material: Tissue stages only, H-Pa-52 of the type-collection of the Institute of Parasitology, České Budějovice.

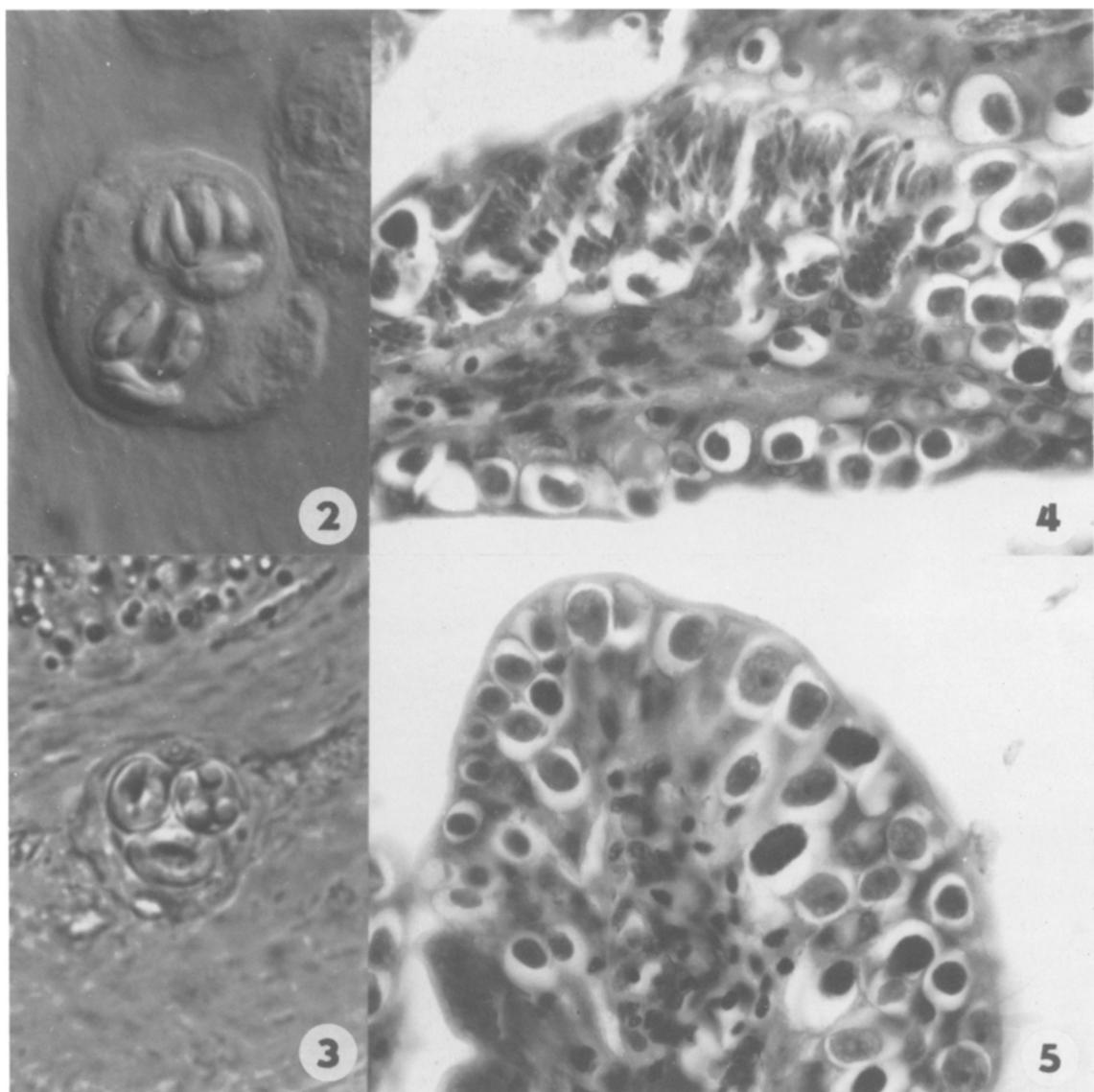
Etymology: The species was named for Dr Josef Chalupský, an eminent Czech parasitologist.

Discussion

The presence of the longitudinal suture indicated that this coccidian belongs to the genus *Goussia* Labbé, 1897. In fish of the genus *Leuciscus*, five intestinal coccidiens have hitherto been found: *Emeria schulmani* Kulemina, 1969 in *Leuciscus idus* (see Kulemina, 1969) and *L. cephalus* (see Jastrzebski, 1984); *Goussia carpelli* (Léger & Stankovitch, 1921) in *L. cephalus cabeda* (see Alvarez-Pellitero & González-Lanza, 1986) and *L. leuciscus* (see Lukeš *et al.*, 1991); *Goussia* sp. III and *Goussia* sp. IX in *Leuciscus cephalus* (see Molnár, 1989); and *G. janae* Lukeš & Dyková, 1990 in *L. cephalus* and *L. leuciscus* (see Lukeš & Dyková, 1990). *G. chalupskyi* n. sp. clearly differs from these species in the following characteristics: its oöcysts and sporocysts are smaller; the sporocyst residuum is composed of only 2–4 granules; and the shape of the sporocysts is broadly oval.

Oöcysts of *G. cyprinorum* (Stankovitch, 1921), which was found in many cyprinid fishes (Jastrzebski, 1984) and could also be expected to occur in *Leuciscus cephalus*, contain ellipsoidal sporocysts with a compact, elliptical sporocyst residuum. The broadly oval shape of the sporocysts is rare among fish coccidia (e.g. *G. lucida* Lom & Dyková, 1982; see Lom & Dyková, 1982) and represents a good feature for the determination of *G. chalupskyi* n. sp.

Almost nothing is known about the distribution of the developmental stages of fish coccidia within the intestine. Sharply delimited regions, with almost all epithelial cells being infected, have been described in *G. janae* Lukeš & Dyková, 1990 infections (Lukeš & Dyková, 1990), whereas some predilection for the anterior part of the intestine has been reported for *G. carpelli* (see Steinhagen *et al.*, 1989) and *G. pannonica* Molnár, 1989 (see Lukeš, 1992). The restriction of the cells infected by developmental stages of *G. chalupskyi* n. sp. to a single small region of the intestine is interesting and is perhaps due to the limited capability of the merozoites to spread the infection.



Figs 2–5. Oocysts and developmental stages of *Goussia chalupskyi* n. sp. 2, 3. Sporulated oocysts within "yellow bodies" in faeces. ($\times 1700$) 4, 5. Merogonial and gamogonial stages within intestinal epithelium ($\times 750$).

Acknowledgements

Fig. 2 is by courtesy of Dr Jiří Lom. The help of Dr Iva Dyková with the processing of the histological material is gratefully acknowledged.

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