

***Opechona pyriforme* metacercaria (Trematoda: Lepocreadiidae) in *Eirene lactea* (Cnidaria: Hydroidomedusae) from a reef lagoon in the Mexican Caribbean Sea**

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Resumen. Al estudiar la comunidad de medusas de la laguna arrecifal de Puerto Morelos, Quintana Roo, México, de junio a diciembre de 1991, se observaron metacercarias de *Opechona pyriforme* (Linton 1900) parasitando a *Eirene lactea* (Mayer 1900). Los parásitos se encontraron en el pedúnculo gástrico y en la zona interr radial de los hospederos, con una prevalencia del 0.39% y una intensidad de infección de 1.5. La microscopía electrónica de barrido reveló la presencia de espinas en el borde interno de ambas ventosas y papilas sensoriales ciliadas alrededor de las ventosas y entre ellas; asimismo, la ventosa oral presentó 10 papilas arregladas en anillo. Se registra por primera vez a *E. lactea* como hospedero intermediario de *O. pyriforme*, y se extiende el intervalo de distribución conocido de este parásito al mar Caribe mexicano.

Palabras clave: *Opechona pyriforme*, metacercaria, *Eirene lactea*, ultraestructura, mar Caribe mexicano.

Abstract. Metacercaria larvae of *Opechona pyriforme* (Linton 1900) parasitizing *Eirene lactea* (Mayer 1900) were observed from June to December 1991 while studying the medusan fauna in the reef lagoon of Puerto Morelos, Quintana Roo, Mexico. Parasites were found in the gastric peduncle and in the inter-radial zone of the hosts, with a prevalence of 0.39 % and an infection intensity of 1.5. Scanning electron microscopy revealed spines in the internal border of both suckers and ciliated sensorial papillae around and between them. The oral sucker

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presented also 10 papillae in circular arrangement. This is the first record of *E. lactea* as an intermediary host of *O. pyriforme*, and extends the known distribution range of this parasite to the Mexican Caribbean Sea.

Key words: *Opechona pyriforme*, metacercaria, *Eirene lactea*, ultrastructure, Mexican Caribbean Sea.

Introduction

Studies on medusae as intermediary hosts of trematode larvae are scarce. A few studies have been undertaken in the northern waters of the Atlantic Ocean (Stunkard 1967, 1969, 1974, 1980) and in the south Atlantic (Girola *et al.* 1992; Martorelli 1996). Dollfus (1963) presented a summary of studies undertaken in European waters and the Indian Ocean. This study describes and analyze the prevalence and intensity of metacercariae in the hydroidomedusa *Eirene lactea* (Mayer 1900) from the Mexican Caribbean waters.

Methodology

The medusan fauna was sampled monthly from June to December, 1991 near the surface at the reef lagoon of Puerto Morelos, Quintana Roo (20° 51'N, 86° 55'W). A detailed description of the study area and methodology can be found in Álvarez-Cadena *et al.* (1998). From a total of 2548 specimens of *Eirene lactea* examined, only 10 were parasited. Parasites were isolated and dyed with the Harris' hematoxylin and acetic carmin technique, cleared with methyl salicylate and mounted on permanent slides with synthetic resin. Measurements of 20 contracted specimens were made using an optical micrometer; values are expressed in millimeters with the range followed by the mean in parentheses. Specimens were fixed in formalin, dehydrated in a graded ethanol series, followed by acetone and freeze-dried within a Technics dryer were examined with a scanning electron microscope (SEM). The mounted specimens were covered with a thin layer of gold with a Jeol 1100 ion sputter. The photomicrographs were taken with a JEOL JSM-35 microscope. Reference specimens are deposited in the Colección Nacional de Helmintos of the Instituto de Biología, Universidad Nacional Autónoma de México, catalogue number CNHE 3732. Prevalence and intensity of parasitism were obtained according to Margolis *et al.* (1982).

Results

Most of the metacercariae were found freely occupying the gastric peduncle of the hydroidomedusa while others were found in the mesoglea of the inter-radial zone of

the bell. Only one encysted form was recorded. Prevalence was 0.39% and the intensity of infection was 1.5. The general morphology of isolated *E. lactea* metacercariae facilitated their identification as *Opechona pyriforme* (Linton 1900).

The metacercariae are pyriform and vary in size from 0.085 to 0.187 (0.129) in length and 0.072 to 0.133 (0.104) width. The cuticle is spinous. Diffuse, pigmented band regions were observed between both suckers. The oral sucker is subterminal, from 0.022 to 0.066 (0.042) in length and 0.022 to 0.062 (0.047) width. The acetabulum has an equatorial or slightly inferior equatorial position, and measures 0.022 to 0.056 (0.042) in length and 0.022 to 0.062 (0.044) in width. The average ratio between suckers is 1:1.009.

In general, the internal morphology (Fig. 1) coincides with that described by Stunkard (1969). The mouth is in the oral sucker with conspicuous muscular walls. A well-developed pharynx measuring 0.014 to 0.041 (0.026) in length and 0.016 to 0.033 (0.021) in width was observed. Due to specimen contraction, no pre-pharynx, esophagus or pseudo-esophagus was observed. The caecal bifurcation is anterior to the acetabulum. The two intestinal caeca are lateral, and join the excretory vesicle to form the uroproct. Two testes, tandem to slightly oblique, are found in the posterior third of the body. A long cirrus sac extends slightly over the posterior edge of the acetabulum. There is an internal seminal vesicle. Neither the cirrus nor the pars prostatica were clearly observed. An I-shaped globular vesicle extends to the posterior end of the acetabulum. The excretory pore is at the end of the body.

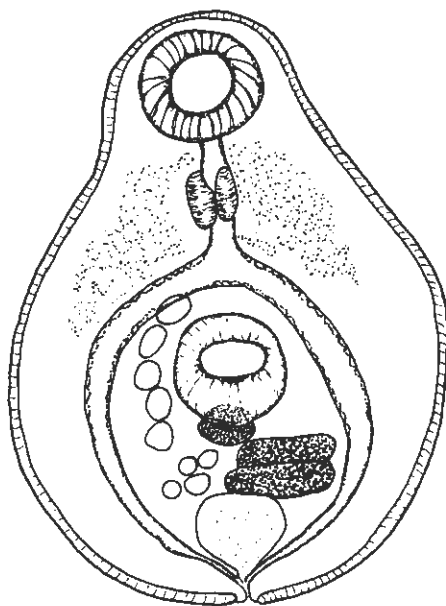


Fig. 1. Ventral view of the metacercariae of *Opechona pyriforme* (Linton 1900) Stunkard 1969.

Ultrastructural examination with SEM shows the cuticle with few ciliated sensory papillae spread between the oral sucker and the acetabulum (Fig. 2A). The oral sucker bears spines in the anterior region of the internal border, presents 10 papillae in circular arrangement and a few ciliated sensorial papillae on and around the sucker (Fig. 2B). The acetabulum is papillated, spiny, and appears to be made of two rings; the internal ring having 9 papillae and more spines on the anterior border, the external ring possessing only posterior spines and ciliated sensorial papillae. The strongly muscular acetabulum suggests this structure to be pedunculated in the adult (Fig. 2C).

Discussion

Opechona pyriforme closely resembles *O. bacillaris* (Molin 1859) and *O. cablei* (Stunkard 1980). *Opechona pyriforme* can be distinguished from *O. bacillaris* by the presence of spines of equal length on both ends of the body, the oral sucker is not infundibular and the excretory vesicle does not extend to the intestinal bifurcation. When considering that the internal anatomy of some *Opechona* species of cercariae do not undergo severe changes in the next larval stage (Stunkard 1969, Køie 1975), the specimens studied here differ from *O. cablei* because their cercariae present well-defined, comma-shaped ocelli, and their metacercariae have only remnants of this pigmentation. In addition, the acetabulum has no papillae and the excretory vesicle extends forward from the acetabulum. Papillae in the oral sucker, ciliated sensorial papillae covering the ventral surface, and spines on the interior edge of both suckers are reported for the first time in this study.

With respect to the prevalence and intensity of infection of *Opechona pyriforme* in medusae, there is little published information. Stunkard (1967, 1969) experimentally infected the medusae *Bougainvillia carolinensis*, *Gonionemus vertens*, *Chrysaora quinquecirrha* and the ctenophore *Mnemiopsis leidyi*, from Woods Hole, USA, with cercariae of *Opechona pyriforme* obtained from the gastropod *Anachis ovara* and observed massive infections in all cases. Natural infections of this metacercariae have been encountered in the anthomedusa *Nemopsis bachei* (Stunkard 1974) as well as in the medusae *Pelagia noctiluca* and *Aequorea forskalea* (Stunkard 1983). In 1980, Stunkard registered a variable incidence of infection by metacercariae of *Opechona cablei* in medusae of *Podocoryne carnea* under experimental conditions at Woods Hole. Metacercariae of *Opechona bacillaris* have been reported from Plymouth (Lebour 1916) in the medusae *Obelia* sp., *Cosmetira pilosella*, *Turris pileata*, *Phialidium hemisphaericum* and the ctenophore *Pleurobrachia pileus*. Køie (1975) experimentally infected the ctenophore *Pleurobrachia pileus* and the medusae *Eutonina indicans* and *Podocoryne carnea* from the northern Øresund with *Opechona bacillaris*. However, neither prevalence nor incidence of infection were reported in either case.

Although Stunkard reported massive infections of *Opechona* species, no values were given, making it difficult to compare with the results obtained in this study. However, we consider that the prevalence of infection (0.39%) in natural conditions

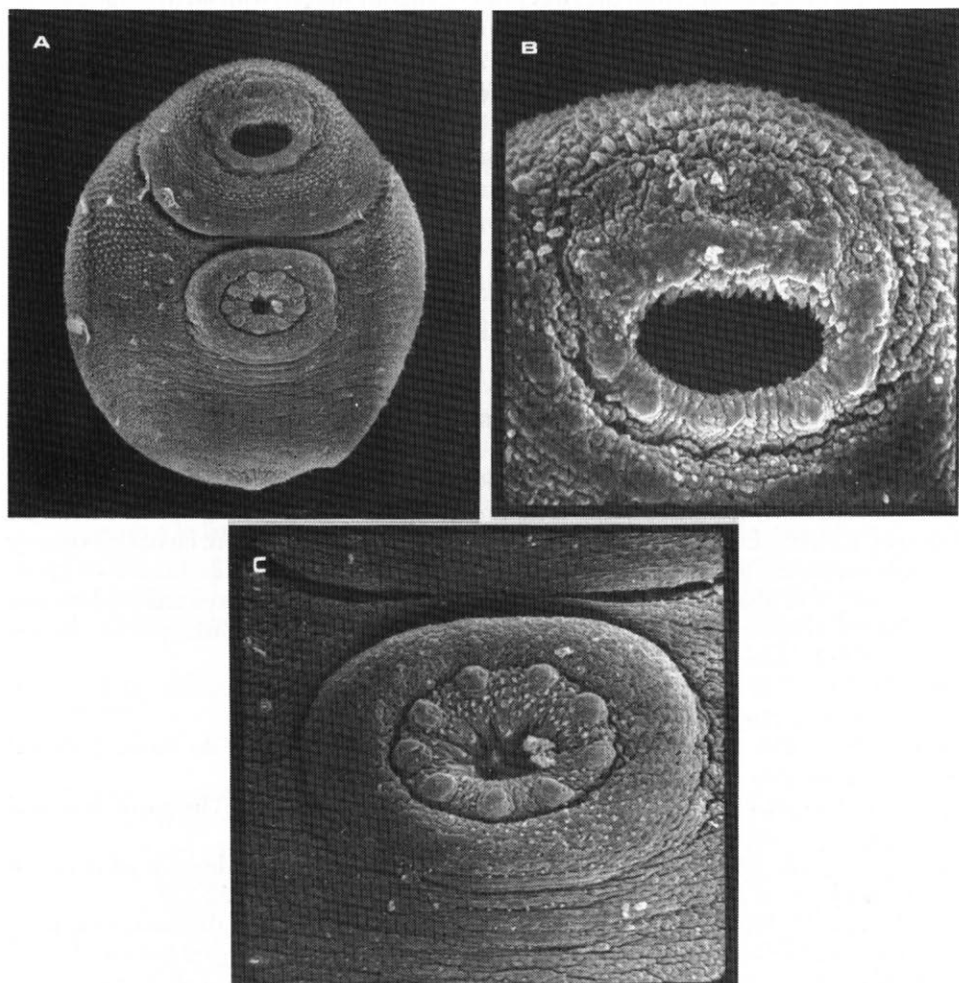


Fig. 2. Photomicrographs of metacercariae of *O. pyriforme* (Linton 1900). A) ventral view (780X); B) detail of the oral sucker showing the ten papillae in circular arrangement (2400X); C) acetabulum showing the two rings and the spines (2400X).

reported for the metacercaria of *Opechona pyriforme* is low, in comparison with published results for other species. Girola *et al.* (1992) described metacercariae of *Monascus filiformis* in *Phialidium* sp. from the Argentine-Uruguay waters, with an average prevalence of 29.22% and 13.58% in *Liriope tetraphylla*. Martorelli (1996) reported encysted metacercariae in the mesoglea of *Phialidium* sp., *L. tetraphylla* and the ctenophore *Mnemiopsis mccradyi*, with prevalences of 25%, 0.5% and 1% respectively, from Mar del Plata, Buenos Aires.

This is the first study in Mexico reporting *Eirene lactea* as a new intermediary host for the metacercaria of *Opechona pyriforme* and the reef lagoon of Puerto Morelos as a new geographic area, extending the known distribution range for this parasite.

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Literature cited

- ÁLVAREZ-CADENA, J.N., E. SUÁREZ-MORALES & R. GASCA. 1998. Copepod assemblages from a reef-related environment in the Mexican Caribbean Sea. *Crustaceana* 71:411-433.
- DOLLFUS, R. 1963. Liste des coelenteres marins, palearctiques et indiens, ou ont été trouvés des trematodes digenétiques. *Bulletin de l'Institut des Pêches Maritimes du Maroc* 9-10:33-57.
- GIROLA, V.C., S.R. MARTORELLI & N.H. SARDELLA. 1992. Presencia de metacercarias de *Monascus filiformis* (Digenea, Fellodistomidae) en hidromedusas del océano Atlántico Sur. *Revista Chilena de Historia Natural* 65:409-415.
- KØIE, M. 1975. On the morphology and life-history of *Opechona bacillaris* (Molin 1859) Looss 1907 (Trematoda, Lepocreadiidae). *Ophelia* 13:63-86.
- LEBOUR, M.V. 1916. Medusae as hosts for larval trematode. *Journal of the Marine Biological Association of the United Kingdom* 11 (1): 57-59.
- MARGOLIS, L.G., W. ESCH, J.C. HOLMES, A.M. KUIS & G.A. SCHAD. 1982. The use of ecological terms in parasitology. *Journal of Parasitology* 68:131-133.
- MARTORELLI, S.R. 1996. First record of encysted metacercariae in hydrozoan jellyfish and ctenophores of the southern Atlantic. *Journal of Parasitology* 82:352-353.
- STUNKARD, H.W. 1967. The life-cycle and developmental stages of a digenetic trematode whose unencysted metacercarial stages occur in medusae. *The Biological Bulletin* 133:488.
- STUNKARD, H.W. 1969. The morphology and life-history of *Neopechona pyriforme* (Linton, 1900) n. gen., n. comb. (Trematoda: Lepocreadiidae). *The Biological Bulletin* 136:96-113.
- STUNKARD, H.W. 1974. New intermediate hosts of the digenetic trematodes, *Monorcheides cumingiae* (Martin, 1838) and *Neopechona pyriforme* (Linton, 1900). *Journal of Parasitology* 60:859.
- STUNKARD, H.W. 1980. Successive hosts and developmental stages in the life history of *Neopechona cablei* sp. n. (Trematoda: Lepocreadiidae). *Journal of Parasitology* 66:636-641.
- STUNKARD, H.W. 1983. The marine cercariae of the Woods Hole, Massachusetts region, a review and a revision. *The Biological Bulletin* 164. 143-162.

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