

## SCANNING ELECTRON MICROSCOPIC OBSERVATION OF THE SCOLEX OF *DIPLOGONOPORUS GRANDIS*

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*Abstract* : Observations using scanning electron microscopy were carried out on the scolex of *Diplogonoporus grandis* (Blanchard, 1894). A live specimen of *D. grandis* was obtained from a Japanese patient who was treated with Gastrografin.

The scolex had prominent sucking grooves on both sides and in a dorsal view, the scolex had a half-open scallop-like shape.

This is the first report on the observations of the scolex of a living *D. grandis* obtained from a human patient using scanning electron microscopy.

### Index Terms

*Diplogonoporus grandis*, scolex, scanning electron microscope, Gastrografin

## INTRODUCTION

Recent developments in scanning electron microscopy (SEM) have contributed to progress in parasitology, and some available reports observing surface structure of the scolex of cestodes have also been published<sup>1),2)</sup>.

Since a *Diplogonoporus grandis* (Blanchard, 1894) obtained from humans was first reported in 1892, at least 183 cases have been documented<sup>3)</sup>, and so far as the past records are concerned the occurrence of the cases was restricted to Japan.

In this paper, a three-dimensional observation was carried out on the scolex of a live *D. grandis* which was obtained from a Japanese patient treated with Gastrografin (Shering)<sup>4)</sup>.

## MATERIALS AND METHODS

**Case** : A 55-year-old man, an inhabitant of Osaka City, was admitted to the Nara Medical University Hospital, with the complaints of abdominal distension, tenesmus and discharging segments of *D. grandis* in stools. In the treatment, 400 ml of Gastrografin was administered using a duodenal tube to the patient. The living worm, 273 cm in length, was successfully expelled with the scolex<sup>4)</sup>.

**Worm** : This living worm of *D. grandis* was killed in distilled water for 1 h at room temperature, and fixed with half-strength Karnovsky solution. This was followed by several alternating treatments with 1 % OsO<sub>4</sub> and 4 % tannic acid. After dehydration and critical point drying, the specimen was observed under a SEM (field-emission type).

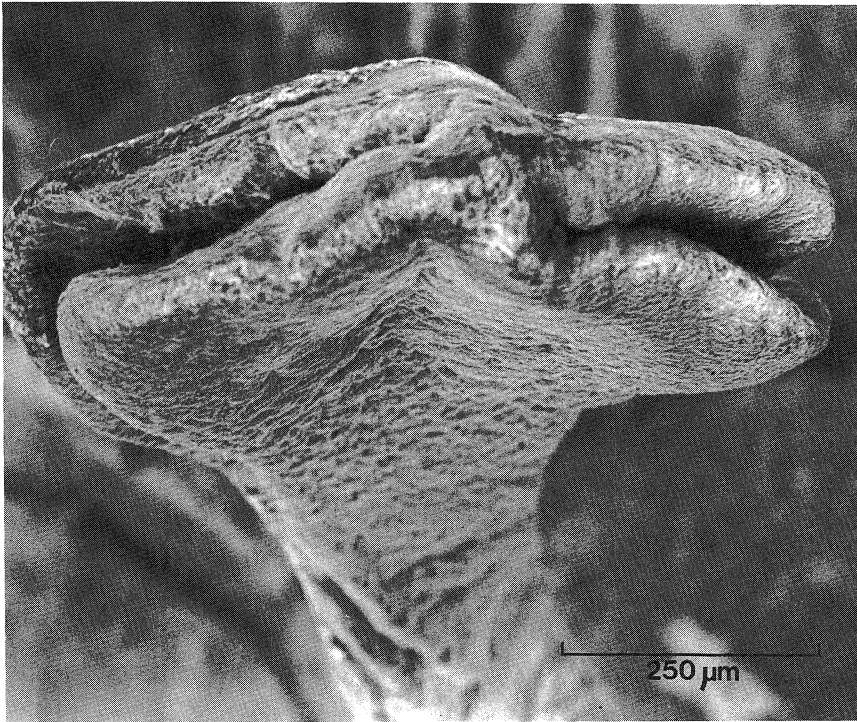


Fig. 1. The scolex of *D. grandis* (anterior view).

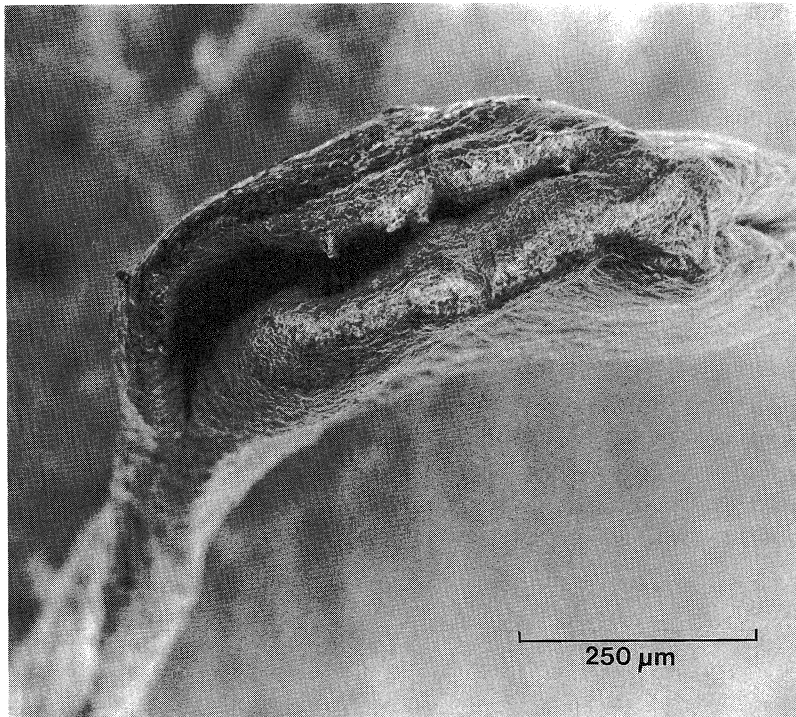


Fig. 2. The scolex of *D. grandis* (dorsal view).

## RESULTS AND DISCUSSION

The scolex (0.81 mm × 0.57 mm × 0.25 mm) had prominent sucking grooves on both the dorsal and ventral sides. The grooves were separated by a transverse bar at the apex of the scolex and these grooves extended along the entire length of the latter, then opened anteriorly and somewhat obliquely (Fig. 1). The margins of the grooves overlapped each other. A dorsal view is depicted in Fig. 2; the scolex had a half-open scallop-like shape. The maximum width (0.81 mm) was generally near the anterior margin, from there it gradually became narrower. The transitional zone from the scolex to the neck was indistinct.

The anthelmintic effect of various drugs has been assessed by determining the changes in worms at the site of attachment to the host intestine. Early studies<sup>5),6)</sup> demonstrated the forms of scolex of *D. grandis*, which might be slightly damaged by anti-tapeworm drugs, but these changes could not be clearly observed, because of the low resolving power of light microscopy.

Gastrografin is a very effective drug against intestinal tapeworms and the expelled worms are damaged little or not at all with this drug<sup>7)</sup>. In the present case, the worm was still moving actively when expelled and the scolex was not damaged.

This is the first report on the scolex of a living *D. grandis* obtained from a patient which was not damaged by an anthelmintic drug, and these observations deal with the surface structure of the scolex of *D. grandis* revealed by scanning electron microscopy, providing new information on its morphology.

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