SCANNING ELECTRON MICROSCOPY OF LESIONS CAUSED BY *STRONGYLUS VULGARIS* IN THE INTESTINAL WALL OF THE HORSE.

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SUMMARY: Ileal lesions produced by *Strongylus vulgaris* in naturally parasitized horses were studied using scanning electron microscopy (SEM).
Host intestinal mucosa filled the buccal capsule of the parasite. When the worm was removed, a papilla - like structure remained at the site of attachment, moulded by the buccal capsule, including the teeth, dorsal gutter and outer leaf crown, on the papilla surface. A hole was found at the top of the papilla through which blood was obtained by the parasite.
After detachment of the worm, the external layer of the papilla desintegrated, leaving the mucosa denuded.

KEY WORDS: *Strongylus vulgaris*, horse, SEM, intestinal wall.

INTRODUCTION

Strongylus vulgaris is cosmopolitan, and one of the most pathogenic helminth parasite of the large intestine of equines. It is 15-24mm long by 1-4mm thick, with a well developed globoid buccal capsule that has an external leaf-crown in the inner wall. The bucal capsule contains two earshaped dorsal teeth at its base. The elements of the external leaf - crown are fringed at their distal extremities (ELS *et alii*, 1983; GIBBONS, 1984).
The worm attaches itself to the intestinal mucosa and ingests blood. Macroscopic lesions produced by the parasite are small haemorrhagic ulcers at the side of attachment
The purpose of this paper is to present a study of these lesions using SEM.

MATERIALS AND METHODS

Pieces of the large intestines of horse were obtained at the horse slaughterhouse in Campo Belo Country, State of Minas Gerais. The large intestines were opened immediately after the animals were killed and fragments 3cm in diameter were cut around parasite attachment sites. Samples were fixed in 10% formalin at 60^{0} C. Worms were removed under a stereomicroscope, and pieces 5x5mm were cut around the attachment sites, processed through a series of ethanol baths and dried in a critical point drying apparatus using liquid carbon dioxide. Dried pieces were mounted on metal specimen stubs, sputter-coated with gold, viewed, and photographed by SEM operated at 15kv.

RESULTS

The worm attached by filling its buccal cavity with intestinal mucosa. When it was pulled from the site of attachment, a papilla - like structure remained; the dorsal gutter, which carries the duct of the dorsal oesophageal gland, left a marked impression around this papilla, which had, at its top, a thin portion that extended to the esophageal lumen (Fig.1).
At the tip of this thin portion was a foramen for the flow of blood (Fig.2). Impressions of the external leaf crown were seen at the base of the papilla (Fig.3), and impressions of the two round teeth were visible laterally (Fig.4). Presumably, as the papilla ages and the worm releases it, the external tissue layers desintegrate, (Fig.5), peel off (Fig.6), and leave behind an eroded mucosa (Fig.7 and 8).

DISCUSSION

DUNCAN (1974) mentioned that there was a lack of information on the pathogenic effects of adult *S.vulgaris* in the lumen of horse intestines. Since then, most published papers have examined the pathogenicity of the larva and their association with colic (BURKHARDT, 1983). Mucosal examination by SEM indicated that adult worms may play a role in this syndrome. The mechanical damage observed promotes superficial, hyperplastic, diphtheroid or necrotizing lesions (VIBE-PETERSEN & NIELSEN, 1979), and the inoculation of microrganisms (KADYRON, 1982), and haematophagism (LOSEVA, 1978).
As shown in Fig. 6, the outer layer of the papilla was sloughed off, revealing a living tissue. The presence (Fig.7) or

Figs. 1-6. Scanning electron micrographs of the attachment site of *Strongylus vulgaris* in the intestine of the horse.

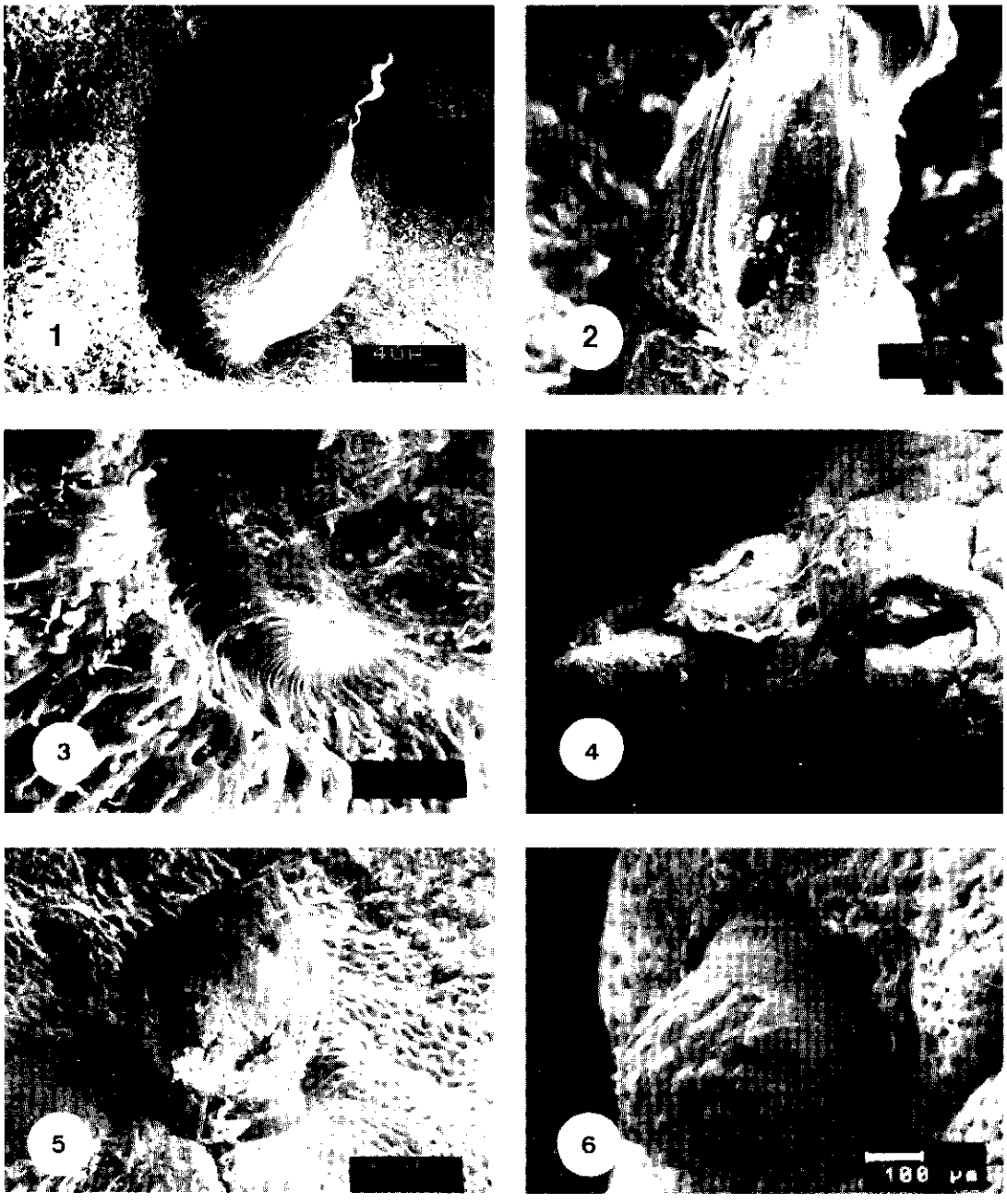


Fig. 1 – The papilla-like structure that remains at the site of attachment.

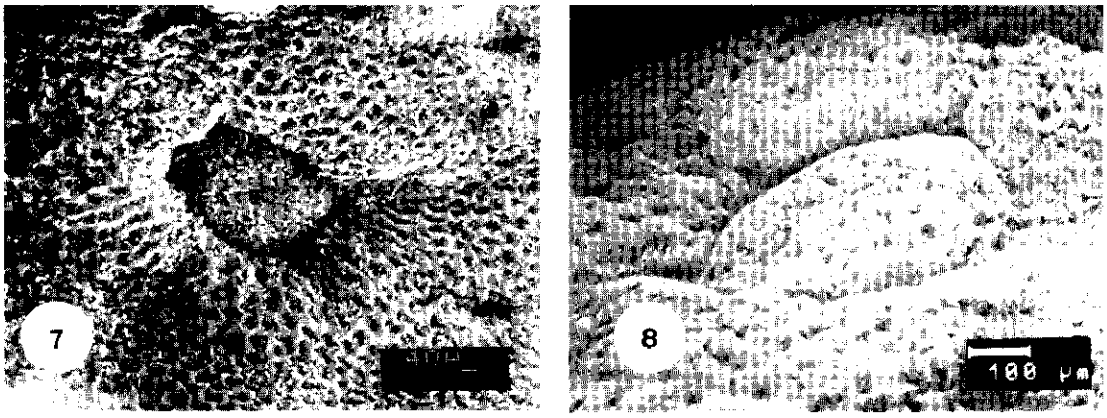
Fig. 2 – The foramen for the flow of blood at the tip of the papilla.

Fig. 3 – Impressions of the external leaf crow of the buccal cavity.

Fig. 4 – Impressions of the two round teeth worm in the papilla.

Fig. 5 – Papilla beginning to desintegrate.

Fig. 6 – The peeled papilla.



Figs. 7 and 8 - Presence and absence of villi in the area where papillae had existed previously.

absence (Fig.8) of villi in the area where a papilla had existed previously may depend, perhaps, on how deep the destruction of the mucosa was; this may also have some relation with the length of time the worm remained sucking.

The small hole at the tip of the papillae for blod flow was well- defined, and probably carries blood directly to the esophageal lumen of the worm.

SUMÁRIO

Foram estudadas lesões produzidas por *Strongylus vulgaris* no íleo de cavalos naturalmente parasitados, por meio de microscopia eletrônica de varredura.

A mucosa intestinal do hospedeiro enchia a cápsula bucal do parasita. Quando o helminto foi removido, uma estrutura semelhante à papila permaneceu no ponto de fixação, moldada pela cápsula bucal, incluindo os dentes, sulco dorsal e coroa franjada externa, na superfície da papila.

Encontrou-se um orifício no topo da papila, através do qual o parasita sugava sangue.

Após o desprendimento do helminto, a camada externa da papila desintegrou-se, deixando a mucosa desnuda.

PALAVRAS CHAVE: *Strongylus vulgaris*, eqüino, microscopia eletrônica de varredura, parede intestinal.

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