



Title	Electronmicroscopic Observations on the "Costa" as One of the Organelles in Trichomonas foetus
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**Electronmicroscopic Observations on the "Costa"
as One of the Organelles in *Trichomonas foetus***

Inoki and his associates have been investigating the fine structure of pathogenic protozoa by electronmicroscope since 1950 (Inoki *et al.*, 1957; Inoki, 1957; Inoki *et al.*, 1958, 1959, 1960).

The costa is commonly seen in trichomanades by light microscope with iron-hematoxylin stain as a linear partition between the undulating membrane and the body.

The *T. foetus* used in this investigation was a pure culture of the so-called "Tricho" strain which was received from the Chugoku Veterinary Hygiene Laboratory of the Department of Agriculture and Forestry and maintained in F-bouillon at pH 7.4 (Inoki and Hamada, 1953; Inoki, 1957).

Forty-eight hour cultures were centrifuged at 1,500 rpm and then washed several times with phosphate buffer (pH 7.4). Organisms were fixed in 1 per cent osmic acid solution, buffered with phosphate buffer at pH 7.4, for 30 to 40 minutes at 10°C in an ice box. Then they were dehydrated by the routine method through an alcohol series and embedded in methacrylate resin using 0.2 per cent 2,4-dichlorobenzoyl peroxide as a catalyst. Ultra-thin sections were made with a Porter-Blum microtome.

Fig. 1 illustrates a cross section of the protozoa. The nucleus (E) can be seen as a dense part in the center. A striated collagen-like fibril (D) is seen in the cytoplasm. Four cross sections of the undulating membrane (B) are seen on the surface arranged like the cogs of a wheel. The membrane seems to consist of a homogeneous amorphous component surrounding the flagella (A) like a sheath. The border line between the body and the sheath is dense and straight suggesting that there is a true costa.

Anderson and Beams (1959) have recently presented electron micrographs of ultra-thin sections of *T. musri*, *E. muris* but the costae they referred to might be collagen like fibrils because from the illustrations they give they seem to be identical in structure with the collagen-like fibrils already demonstrated in the cytoplasm of *Trichomonas vaginalis* (Inoki *et al.*, 1959, 1960). Furthermore, the fact that the organelle are not located along the body surface but are within the body supports the above conclusion. The present paper is believed to be the first showing the costa in *Trichomonas*. Fig. 2 shows the structures of the flagellum, undulating membrane and costa schematically.

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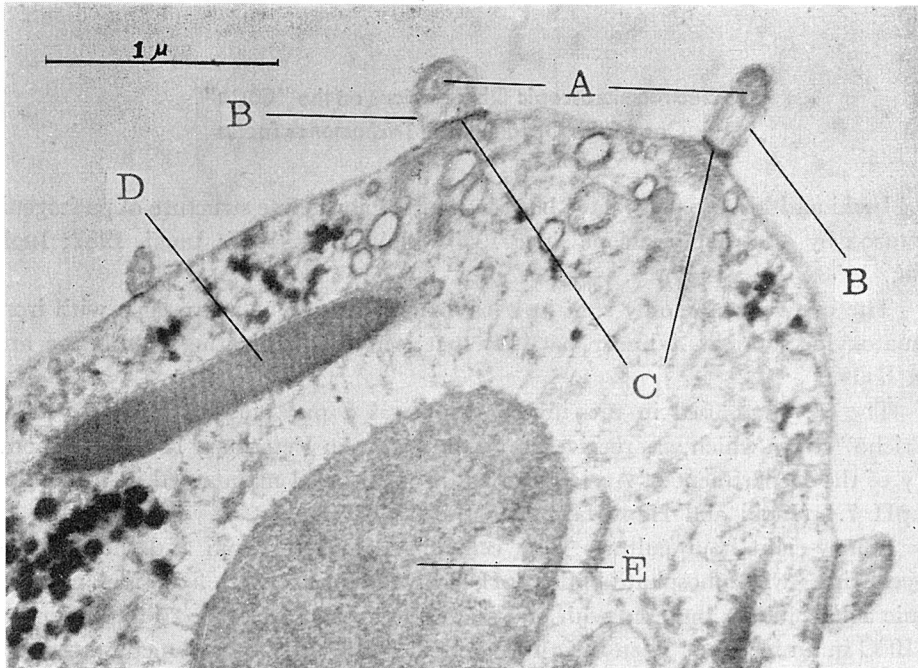


Fig. 1. An ultra-thin section of *Trichomonas foetus*, showing flagella, undulating membrane, nucleus, collagen fibril and costa

- A: flagellum
- B: undulating membrane
- C: costa
- D: collagen-like fibril
- E: nucleus

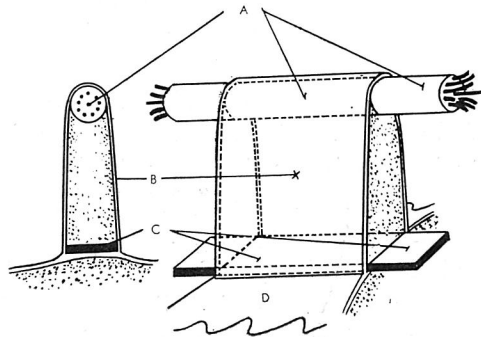


Fig. 2. Scheme of the structures of the flagellum, undulating membrane and costa

- A: flagellum
- B: undulating membrane
- C: costa
- D: body of the parasite

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