Fasciolosis, caused by *Fasciola hepatica* (temperate species) and *Fasciola gigantica* (tropical species), is a serious veterinary disease and zoonotic infection worldwide. Triclabendazole (TCBZ) is the drug of choice to treat *Fasciola* infection due to its potent efficacy against both juvenile and adult liver flukes. In the present study, the effect of *in vivo* treatment with TCBZ on immature *F. gigantica* was investigated. Five goats were infected with 150 *F. gigantica* metacercariae each by oral gavage and four of them were treated with a single oral dose of TCBZ at 10 mg/kg at four weeks post-infection. They were euthanized at 0 (untreated), 24, 48, 72 and 96 hours post treatment. Juvenile flukes were recovered from the livers and processed for scanning electron microscopy (SEM) and transmission electron microscopy (TEM).

In control flukes, the SEM shows normal morphology and TEM reveals normal ultrastructure. No noticeable changes were observed at 24 h post-treatment. By 48 h post-treatment, there were some tegumental blebbing, swelling and deposition of secretions displayed by the SEM of flukes and moderate level of disruption to the basal infoldings, mitochondria, musculature, nuclei and, formation of vacuoles and reduced number of T1 and T2 secretory bodies were observed by TEM. At 72 h post-treatment, SEM displayed severe disruption and dislodging of spines, sloughing off the tegument to expose basal lamina and isolated lesions to expose underlying musculature. The TEM revealed complete sloughing off the tegument to expose basal lamina, severe disruption of circular and longitudinal muscle fibres, mitochondria, nuclei and granular endoplasmic reticulum were observed. By 96 h post-treatment, SEM of the flukes showed extremely severe disruption and, the tegument was completely sheared off and deeper lesions to expose underlying musculature. The ultrastructural changes were at their most advanced level, including severe disruption to basal lamina, circular and longitudinal muscle fibres, mitochondria, nuclei and degeneration of a substantial area of cytoplasm. This is the first *in vivo* study describing the TCBZ action in juvenile *F. gigantica* at SEM and TEM level.