Although, the commercial anthelmintic drugs can inhibit nematode infection, but they have documented cases of resistant populations including Haemonchus spp. in Thailand. The drug discovery is urgent. Reportedly, the anthelmintic effect of purified plumbagin of Plumbago indica inhibited the motility of nematode and some trematodes. Therefore, this work aimed to investigate the anthelmintic effect of plumbagin (PB) of P.indica root on adult Haemonchus placei on relative motility (RM) assay and histopathological changes. Two hundred and forty flukes were divided into 6 treatment groups (n=10 per group). Groups 1, 2, 3, and 4 flukes were incubated with M-199 medium containing plumbagin in the serial concentrations; 0.01, 0.1, 1.0, and 10 mg/ml, respectively. Group 5, as incubated with medium mixed with albendazole (ABZ) at 10 mg/ml as the positive control and group 6, they were incubated with medium containing 0.1% DMSO as the negative control. Flukes were evaluated the RM values on 3, 6, 12 and 24 h incubation using scoring under the stero-microscopy. Then, they were collected from each observation time to run tissue processing for histopathological changes using H&E staining. The results showed that RM values of PB-treated groups at the concentration 10 mg/ml in H.placei were progressively decreased more than ABZ-treated group since 3 to 12 h exposure, and few activity of P. cervi was observed at 24 h exposure. Observation under the stereo-microscope, adult H.placei were partial move on 3 h and 6 h incubation in PB at concentration 10 mg/ml. At 12 h and 24 h exposure, they were dead which were confirmed by vital dye staining. The swelling tegumental surface of H.placei was occurred, but their tegument did not peel off. The slowly motility of H.placei was observed after 12 h and 24 h incubation with plumbagin at 0.1 and 1 mg/ml. Light microscopic observation showed similar tegumental layer as normal group of H.placei. But, the parenchymal cells and vitelline cells in deeper of parasites-treated plumbagin were found apoptotic appearance. These results suggest that plumbagin of P.indica could be against the motility of adult stage of H.placei.

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Fig. 1: Light microscopes of PB-treated adult H. placei at 10 mg/ml. The tegumental (T) layer is covered by the external sheath. The vitelline (Vit) gland show apoptotic damages (arrow), whereas the gastrointestinal (G) tract has still normal appearance.