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EFFECT OF *Entada rheedii*'s EXTRACT ON *Argulus japonicus* FROM GOLDFISH

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Abstract of thesis presented to the Senate of Universiti Malaysia Terengganu in fulfillment of the requirement for the degree of Master of Science

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Goldfish is a familiar ornamental fish in Malaysia. The culture and breeding of goldfish has contributed to the country economy through import and export activities. However, the major problem of goldfish is the parasite infection which is mainly from the ectoparasite such as *Argulus* sp. High infection of *Argulus* sp. on goldfish leads to increase mortality of fish. In order to decrease the *Argulus* sp. infection, extract of *Entada rheedii* was tested to treat *Argulus* infection on goldfish. Extract of *E. rheedii* was used traditionally as a shampoo due to its saponin content that can eradicate the hair lice. The main objective of this study were to examine *Argulus* sp. that infect on goldfish in Perak and also their life cycle stages in captivity from egg to adult stage. The next objective was to study the survival rate of goldfish and *Argulus* sp. after exposure with *E. rheedii* plant extract. Parasite identification was done based on the morphological approach by compound and scanning electron microscopy (SEM). For life cycle, observation a hand full of *Argulus* were maintained in a freshwater aquarium with temperature set at 30°C. The hard substrates such as stones were provided for laying eggs of *Argulus* sp. For toxicity analysis, the median lethal concentration (LC_{50}) of *E. rheedii* plant extract

was conducted to determine the safety dosage on goldfish. The different concentrations of plant extract used were 10mg/L, 20mg/L, 62.5mg/L, 125mg/L and 250mg/L. The antiparasitic test towards *Argulus* sp. was conducted using different concentrations of extract which were 1mg/L, 5mg/L, 10mg/L, 15mg/L, and 20mg/L. Saponin from quilaja bark (50µg/L) was used for a control experiment. The dead *Argulus* sp. exposed with plant extract were collected and processed for reactive oxygen species (ROS) analysis. The samples of *Argulus* were stained with 2',7' – dichlorofluorescin diacetate (DCFDA) for detection of ROS. ROS plays an important role in the oxidative stress mechanism involved in the organism physiology. The oxidative stress occurs when ROS production exceed the antioxidant activity. In this study, the ROS production was used to determine the oxidative stress in *Argulus* after exposed with *E. rheedii* extract. The result from the present study had identified that *Argulus japonicus* was the species found on goldfish.The toxicity test on goldfish showed LC_{50} value at 24h, 48h, 72h and 96h were 163mg/L, 167mg/L, 159mg/L and 147mg/L respectively. The antiparasitic test on *A. japonicus* showed 100% mortality at 48h in the group exposed to 50µg/L, 10mg/L, 15mg/L and 20mg/L saponin concentrations. The samples of *A. japonicus* which stained with 2,7- DCFDA showed the presence of green colour which detected oxidative stress in *A. japonicus*. *E. rheedii* extract has given the positive effect on the mortality rate of *A. japonicus* and has the potential as an antiparasitic agent as observed in the present study.