STUDI BIJI BUAH PINANG (*Areca catechu*) SEBAGAI ANTELMINTIK *Ascaridia galli* PADA AYAM KAMPUNG (*Gallus gallus domesticus*)

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INTISARI

Perunggasan di Indonesia merupakan ujung tombak dalam pemenuhan kebutuhan akan konsumsi protein hewani. *Ascariasis* merupakan penyakit parasitik pada unggas yang menimbulkan kerugian cukup besar. Penelitian ini bertujuan untuk mengetahui perkembangan telur dan larva *A. galli*, pengaruh infusa biji buah pinang (IBP) terhadap morfologi dan ultrastruktur telur, larva dan cacing dewasa *A. galli*, sifat antelmintik IBP sebagai ovisidal dan larvasidal secara *in vitro* dan sifat antelmintik IBP secara *in vivo*. Perkembangan telur dan larva dilakukan dengan dan tanpa aerator. Pengamatan morfologi dilakukan pada cacing dewasa dengan bantuan kamera lucida, curvimeter dan mikroskop cahaya. Pengamatan ultrastruktur telur dan larva dilakukan dengan *Scanning Electrone Microscopy* (SEM). Uji *in vitro*, pada uji daya tetas telur, 0,3 ml suspensi berisi 1000 telur cacing masing-masing direndam IBP dosis 100, 125, 150, 175, 200, 225, 250 mg/ml, Pyrantel pamoat 50 mg/ml dan akuadestilata dengan masing-masing 3 ulangan. Uji perkembangan larva dilakukan dengan cara yang sama untuk telur berlarva (L2). Pada uji *in vivo*, sebanyak 50 ekor ayam kampung betina 1,5-2 bulan dengan berat badan 250-400 gram dibagi rata 5 kelompok. Semua kelompok diinfeksi 1000 L2 per oral setiap minggu selama 3 minggu. Pada minggu ke-14, kelompok 1 tidak diberi obat, kelompok 2-4 diberikan 1 ml IBP dengan dosis masing-masing 26 mg/ml, 53 mg/ml dan 79 mg/ml perhari selama 14 hari. Kelompok 5 diberi Pyrantel pamoat per oral dosis 0,2 g/kg BB. Pemeriksaan klinis, hematologi dan EPG dilakukan positif terinfeksi dan setelah diobati. Semua hewan diotopsi dan dianalisa patologi pada minggu ke-16. Cacing yang ditemukan di usus diuji SEM dan *Sodium dodecyl sulphate polyacrylamide gel electrophoresis* (SDS-PAGE). Data kuantitatif dianalisis statistik, hasil SEM, SDS PAGE dan histopatologi dianalisa deskriptif. Perkembangan telur dan larva lebih baik dengan aerator. Infusa biji pinang merusak morfologi telur, larva dan cacing dewasa. Hasil *in vitro*, dosis 25% IBP bersifat ovisidal (97,16%) dan larvisidal (100%) terbaik. Hasil *in vivo*, dosis IBP 79 mg/ml memiliki pertambahan berat badan dan penampilan fisik terbaik dapat menghilangkan cacing dalam usus. Nilai FECR terbesar terdapat pada kelompok 3 (90,06%). Nilai HGB, PCV, WBC dan RBC mengalami peningkatan setelah perlakuan. Pada otopsi, tidak ditemukan lagi cacing pada dosis IBP 79 mg/ml. Pemeriksaan histopatologi dengan Hematoxilin Eosin (HE) dan Imunohistokimia (IHK) mukosa usus, pada HE dosis 79 mg/ml dan kontrol positif hanya ditemukan infiltrasi sel radang (kerusakan jaringan ringan), sedangkan pada dosis 26 mg/ml dan kontrol negatif ditemukan infiltrasi sel radang, sel goblet, hemoragi dan oedema (kerusakan jaringan berat). Hasil IHK rerata limfosit CD4+ terbesar pada kelompok perlakuan dengan IBP bertutut-turut adalah pada dosis 79 mg/ml, 53

mg/ml dan 26 mg/ml serta sebaliknya untuk limfosit CD8+. Dosis 26 mg/ml dan 53 mg/ml secara *in vivo* merusakkan ultrastruktur cacing dewasa. Kontrol negatif dan dosis 26 mg/ml menghasilkan 21 pita protein sedangkan dosis 53 mg/ml menghasilkan 12 pita protein, kontrol positif dan dosis 79 mg/ml tidak ditemukan cacing pasca *in vivo*. Hasil uji *in vitro* dan *in vivo* menunjukkan bahwa IBP berpotensi sebagai antelmintik.

Kata Kunci**:** *Areca catechu*, antelmintik,*Ascaridia galli*, ayam kampung

A STUDY OF ARECA CATECHU AS AN *Ascaridia galli* ANTHELMINTICS IN CHICKENS (*Gallus gallus domesticus)*

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Abstract

Poultry was in Indonesia at the cutting edge of the effort to meet the need for animal protein consumption. *Ascariasis* was parasitic disease in birds and inflicted significant loss. The study aimed at finding out the development of the egg and the larva of *A. galli,* the impact of *Areca catechu* crude aqueous extract on the morphology and the ultrastructure of the egg, the larva and the adult worm of the *A. galli*, the anthelminthic properties of the *Areca catechu* crude aqueous extract as *in vitro* and *in vivo* ovicidal and larvicidal agents. The development of the egg and the larva was observed with and without aerator. The morphology of the adult worm was observed using lucida camera, curvimeter and light microscope. The ultrastructure of the egg and the larva was observed using dengan *Scanning Electrone Microscopy* (SEM). The *in vitro* test of the hatchability of the egg was carried out as follows: 0.3 ml of the suspension containing 1000 worm eggs was soaked in the *Areca catechu* crude aqueous extract at the doses of 100, 125, 150, 175, 200, 225, 250 mg/ml, pyrantel pamoate 50 mg/ml and aquadestilata in 3 replicates for each. The development of the larva was examined using the same method for the eggs with the larva (L2). There were in the *in vivo test* 50 female chickens of 1.5-2 months of age and 250-400 grams of body weight equally distributed to 5 groups. All of the groups were infected by 1000 L2 per oral every week for 3 weeks. In the 14th week the group 1 was not given any drug, while the groups 2-4 were given 1 ml of the *Areca catechu* crude aqueous extract at the doses of 26 mg/ml, 53 mg/ml and 79 mg/ml every day for 14 days. The group 5 was given Pyrantel pamoat per oral at the dose of 0.2 g/kg BW. Clinical examination, hematology and EPG were conducted at the positif of infection and after treatment. Autopsy was conducted to all of the animals and the pathology was analyzed in the 16th week. SEM and *Sodium dodecyl sulphate polyacrylamide gel electrophoresis* (SDS-PAGE) tests were conducted to the identified worms. Quantitative data were statistically analyzed, while the results of the SEM, the SDS-PAGE and the histopathology were descriptively analyzed. The eggs and the larvae were better developed with aerator. The *Areca catechu* crude aqueous extract damaged the morphology of the eggs, the larvae and the adult worms. The results of the *in vitro* test showed that the dose of 25% of the *Areca catechu* crude aqueous extract had the best ovicidal (97.16%) and larvicidal (100%) impacts. The results of the *in vivo* test showed that the dose of 79 mg/ml

of the *Areca catechu* crude aqueous extract had the best impact on the body weight gain and physical appearance and eradicated the worms in intestine. The biggest FECR value was found in the group 3 (90.06%). The HGB, PCV, WBC and RBC values increased after the treatments. The autopsy did not show any worm at the dose of 79 mg/ml of the *Areca catechu* crude aqueous extract. The results of the histopathological examination with Hematoxilin Eosin (HE) and Imunohistochemistry of intestinal mucosa showed that there was only inflammatory cell infiltration found at the dose of 79 mg/ml of the HE and in the positive control (minor tissue damage), while there were inflammatory cell infiltration, goblet cell, hemorrhage and oedema found in the negative control and the dose of 26 mg/ml (heavy tissue damage). The results of the imunohistochemical examination showed that the biggest mean lymphocyte CD4+ was found in the group with the IBP treatment at the doses of 79 mg/ml, 53 mg/ml and 26 mg/ml, respectively and the opposite case took place to the lymphocyte CD8+. The doses of 26 mg/ml and 53 mg/ml *in vivo* damaged the ultrastructure of the adult worms. The negative control and the dose of 26 mg/ml gave 21 protein bands, while the dose of 53 mg/ml gave 12 protein bands. Post in vivo no worms were found in the doses 79 mg/ml and positive control. The results of in vitro and in vivo tests showed that *Areca catechu* crude aqueous extract was potential as anthelmintic.

Key words: *Areca catechu*, anthelmintics, *Ascaridia galli*, chickens