

UTILIZATION OF *Datura metel* Linn. LEAF TO DECREASE TRANSPORTATION STRESS IN SHEEP

Penggunaan Daun Kecubung (Datura metel Linn.) dalam Menurunkan Stres Transportasi pada Domba

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ABSTRACT

This research aimed to study the effectivity of *Datura metel* Linn. leaf extract to decrease the negative effect of transportation stress in sheep. The first experiment aimed to determine the doses of *Datura metel* Linn. leaf extract. Twenty one of hamsters were administered with the leaf extract at concentration of 0, 5, 10, 15, 20, 25% and no dilution. Hamster were then run to pass through rotary wheel for 1 minute and observed at 20, 30, 60, 120, and 180 minutes after offering the extract. The second experiment was designed to test the effectivity of the leaf extract administration just before the sheep were exposed to transportation stress. The third experiment aimed to study the method of extraction of the leaf. Five size of the leaf particle of >60, 60-40, 40-30, 30-20, and <20 meshes were dissolved in water for 10 minutes. Data were analyzed descriptively. All treatments indicated that anesthesia sensation was observed on up to 180 minutes. Sheepfed with leaf extract had lower degree of transportation stress than control. Mesh size of <20 gave the highest solubility. In conclusion, the leaf extract of *Datura metel* Linn. reduce the effect of transportation stress in sheep.

Key words: *Datura metel* Linn., stress, sheep, transportation

ABSTRAK

Penelitian ini bertujuan mengetahui efektivitas daun *Datura metel* Linn. dalam mengurangi cekaman transportasi pada domba. Penelitian dilakukan 3 tahap. Tahap pertama adalah menentukan dosis yang tepat dengan perlakuan 0, 5, 10, 15, 20, 25%, dan pekat pada hamster melalui kemampuan berputar pada roda berputar selama 1 menit, yang diobservasi pada waktu 10, 20, 30, 60, 120, dan 180 menit pascapemberian ekstrak daun *Datura metel* Linn. Tahap kedua menguji efek sediaan ekstrak daun *Datura metel* Linn. yang diberikan pada domba pratransportasi. Tahap 3, mempelajari bentuk penyajian dengan teknik celup. Lima ukuran partikel tepung daun *Datura metel* Linn. yaitu >60, 60-40, 40-30, 30-20, dan <20 mesh diuji kelarutannya dalam air selama 10 menit. Data diolah dengan deskriptif analisis. Hasil penelitian menunjukkan bahwa pemberian daun *Datura metel* Linn. untuk semua perlakuan memberikan sensasi tenang dan bertahan sampai 180 menit. Domba yang diberi ekstrak daun *Datura metel* Linn. memiliki derajat stres transportasi yang lebih rendah dibandingkan dengan tanpa pemberian ekstrak *Datura metel* Linn. Ukuran mesh <20 memberikan kelarutan yang paling tinggi. Dapat disimpulkan bahwa ekstrak daun *Datura metel* Linn. dapat mengurangi stres transportasi pada domba.

Kata kunci: *Datura metel* Linn., stres, domba, transportasi

INTRODUCTION

Transportation causes stress in sheep. Fernandez et al. (1996) and Rajion et al. (2001) reported live body weight loss and increasing of neutrophil-lymphocyte ratio and concentration glucose in plasma. The stress responses of goats due to transportation begin decreasing within 3 h after transportation and the mean shrinkage losses were 10% (Kannan et al., 2000).

Datura metel Linn. can be used as an anesthetic, anodyne, antiasthmatic, antispasmodic, antitussive, bronchodilator, hallucinogenic, hypnotic, and mydriatic (Duke and Ayensu, 1985). It contains hyoscyamine, hyoscine dan atropine (Chopra, 1986). Flower extracts can be used as an equivalent drug 3-5 g and produce general anesthesia in 5 minutes by oral and effect 5 to 6 hours later (Duke and Ayensu, 1985). This research aimed to study the affectivity of administration of the leaf extract to decrease the negative effect of transportation stress in sheep.

MATERIALS AND METHODS

Experiment 1

Twenty one of hamsters were provided solution of dry leaf at some concentration were 0, 5, 10, 15, 20,

25% and not dissolved, each solution were provided to 3 hamsters. The hardness of the hamsters to turn the rotary wheel had tested for one minute at 0, 10, 20, 30, 60, 120, and 180 minutes after drunk.

Experiment 2

Ten sheep were used in this experiment. Five sheeps were provided concentrated solution of extract leaf and others without solution (control). Animal sample were transported for approximately 5 hours. Body weight was weighed before and after transportation. Blood collection was conducted after transportation.

Experiment 3

Datura metel Linn. leaf were dried, milled and sieved by >60, 60-40, 40-30, 30-20, and <20 mesh to solubility test. Each 10 g filtered were wrapped in gauze and dipped into water for 10 minutes. Dry matter was measured by removed from the gauze and dried by oven. Descriptive method was used to analyze the experimental data.

RESULTS AND DISCUSSION

Experiment 1

Figure 1 showed the hardness of the hamsters to turn the rotary wheel had for 1 minute. The control

which was upper than group of hamster administered extract leaf. This experiment indicated that there were substances in *Datura metel* Linn. that effected on low responses of hamster nerves.

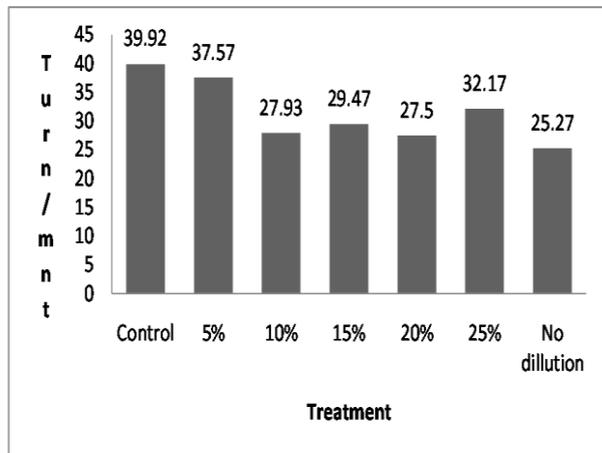


Figure 1. The effects of *Datura metel* Linn. leaf solution level on rotary wheel of hamster

Hallucinations continued to 180 minutes after administration of extract leaf (Figure 2). The average of all treatment decreased than control, when at 180 minutes was still lower (29.00 vs 39.92 turn/minute). This results showed that anesthetic agent which contained in *Datura metel* Linn. leaf effected on hamster nerve. Study previously by Duke and Ayensu (1985) showed that flower of *Datura metel* Linn. could be used as an anesthetic agent equivalent of 3-5 g and produce general anesthesia in 5 minutes via the oral and effect until 5-6 hours later.

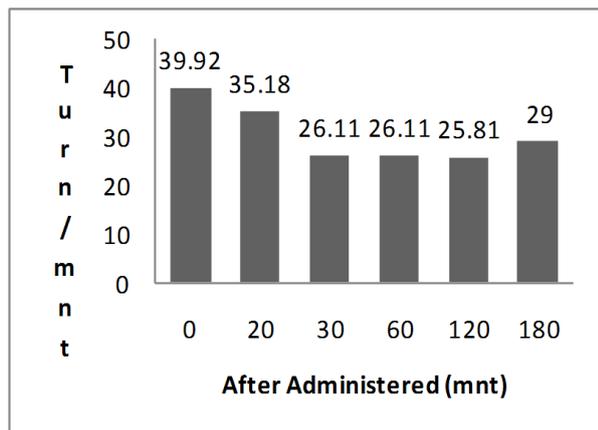


Figure 2. The total turn the rotary wheel by hamster after administered of *Datura metel* Linn. leaf solution

Experiment 2

The effect *Datura metel* Linn. leaf solution on sheep profile of hematologic after transport-stressed for 5 hours, showing in Figure 3. Based on this figure indicated the average of neutrophiles:lymphocytes ratio and blood glucose at sheep group administered *Datura metel* Linn. leaf solution were lower than control (2.91 vs 3.51 mL/dL and 79.20 vs 83.6

mL/dL). Ratio of neutrophiles: lymphocytes and blood glucose were good indicator as transportation stress (Sanhoury et al., 1991). The increasing of glucose in blood was primarily due to breakdown of glycogen in the liver (Mayes, 1990). In past investigation reported that transportation stress had increased on neutrophiles: lymphocytes ratio, and blood glucose (Rajion et al., 2001).

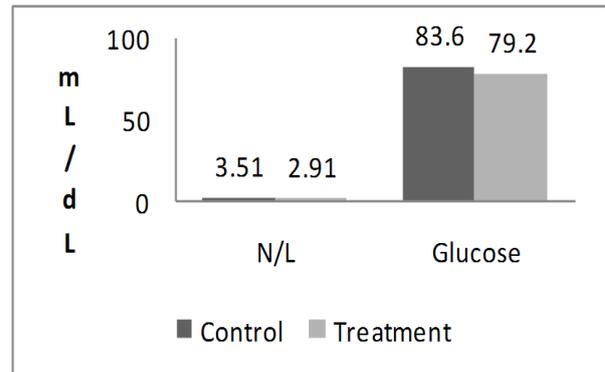


Figure 3. Profile of neutrophile:lymphocytes (N/L) ratio and glucose on sheep after transportation stress for 5 hours

The lowest N:L ratio and blood glucose on sheeps drunk extract leaf might caused body weight loss lower than control, 2.22 vs 3.09% (Figure 4). Gortel et al. (1992) have reported that sheeps had released many electrolyte ions in urine and feces, till reduced body weight and carcass quality after transported.

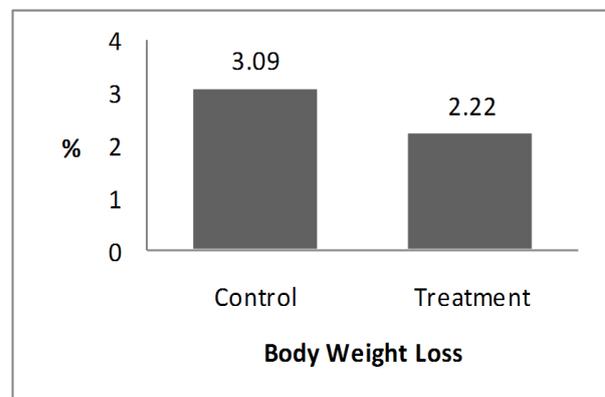


Figure 4. The effect *Datura metel* Linn. leaf solution on body weight loss of sheep after transport-stressed for 5 hours

Experiment 3

Solubility test used to determine the amount of dry *Datura metel* Linn. leaves which dissolved in water to maximize the existing potential a sedative substance can be soluble in water. The results showed that the mesh size effects on the solute (Figure 5). The smaller of mesh size gave lower part of the solute. This was due to the finer particles would close the pores of gauze causing delayed the movement of water out into the mesh bag, so that decreased the chance of water in dissolving a part of *Datura metel* Linn. leaf.

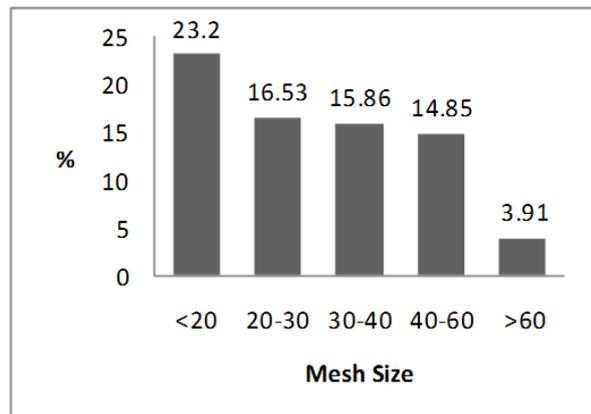


Figure 5. Solubility test of dry *Datura metel* Linn. leaf by various mesh size

CONCLUSION

Datura metel Linn. could be used to decrease in transport-stressed on sheep.

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