

Abdominal fat distribution of bali ducks male fed with *Asystasia gangetica* (L) subsp. *Micrantha* leaf water extract

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Abstract

Bali ducks are one type of poultry that has the potential to be a supplier of animal needs besides chickens, but their productivity is still low. This study aims to see the effect of giving *Asystasia gangetica* leaf water extract on the distribution of abdominal fat in bali ducks male. The experimental design used a completely randomized design (CRD) with four treatments and five replications and each treatment unit was filled with 3 ducks, so that were used 60 bali ducks male. The treatment of *Asystasia gangetica* leaf water extract through drinking water was: 0% *Asystasia gangetica* leaf water extract (A); 2% *Asystasia gangetica* leaf water extract (B); 4% *Asystasia gangetica* leaf water extract (C); and 6% *Asystasia gangetica* leaf water extract (D). The variables observed were slaughter weight, percentage (pad fat, mesenteric fat, ventricular fat, and abdominal fat). The results of the study showed that the slaughter weight and percentage of ventricle fat of bali ducks male given 2-6% *Asystasia gangetica* leaf water extract had no different effect ($P>0.05$) compared to ducks given 0% *Asystasia gangetica* leaf water extract, but giving 6% *Asystasia gangetica* leaf water extract was able to reduce the percentage of abdominal fat by 11.013% compared to treatments A, B, and C. It can be concluded that giving *Asystasia gangetica* leaf water extract at levels 2 - 6% did not affect the slaughter weight and percentage of ventricle fat and was able to reduce the percentage of pad fat, mesentery, and abdomen, and at level 6% produced the best results.

Keywords: Abdominal fat; *Asystasia gangetica*; Bali duck male; Fat distribution; Water extract

1. Introduction

The bali duck is one of the local poultry species with great potential as a supplier of animal needs, in addition to chickens. Duck meat is often preferred because of its high fat content, which can affect the texture and taste of the meat. However, the high fat content, especially in the abdomen, poses a challenge in improving carcass quality and bird health. Therefore, various efforts are being made to reduce fat accumulation in poultry, including the use of supplements or herbal extracts that have the potential to regulate fat metabolism. *Asystasia gangetica* (L) subsp. *Micrantha*, which is considered a weed in agriculture and plantations, actually has many benefits, one of which is as animal feed. *Asystasia gangetica* (L) subsp. *Micrantha* has nutrient content such as protein levels reaching 10.90-35.17%; crude fat 0.78-4.17%; crude fiber 10.22%-48.97% [1]. According to [2], *Asystasia gangetica* (L) subsp. *Micrantha* has good nutrient content as animal feed, especially the leaves containing crude protein reaching 24.20%. *Asystasia gangetica* (L) subsp. *Micrantha* leaf extract also contains bioactive compounds such as flavonoids, saponins, alkaloids, terpenoids, steroids and other compounds that act as antibacterials [3]. According to [4], flavonoid compounds play an important role as antibacterials and can increase feed digestibility efficiency. Results of research by [5] stated that the utilization of purple sweet potato leaf forage extract had a significant effect ($P < 0.05$) in reducing duck abdominal fat of 19.30%. Purple sweet potato leaf forage extract contains antioxidants such as flavonoids and polyphenols that can counteract free

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radicals and suppress bad cholesterol (LDL) content. Generally, forage extracts have high antioxidant activity and potential to improve metabolism and fat oxidation in the body.

Based on the description above, a study was conducted on the effect of giving water extract of *Asystasia gangetica* (L) subsp. *Micrantha* leaves on reducing abdominal fat distribution in bali ducks male.

2. Material and Methods

2.1. Material

This research was conducted in Tabanan Regency, lasting 8 week. The cages used in this study were colony battery cages. The ducks used in this study were bali duck male aged 1 day. The feed given was commercial feed produced by PT Charoen Phokphand Indonesia, Tbk. with the code CP 511 B. *Asystasia gangetica* leaves used are leaves that have fully bloomed and are green in color.

2.2. Methods

All bali duck male aged 1 day, were divided into 4 treatments with 5 replicates, each replicate consisting of 3 ducks. The treatments given were A: 0% water extract of *Asystasia gangetica* leaves, B: 2% water extract of *Asystasia gangetica* leaves, C: 4% water extract of *Asystasia gangetica* leaves, and D: 6% water extract of *Asystasia gangetica* leaves. Feed and drinking water were provided *adlibitum*.

2.3. The Process of Making *Asystasia gangetica* Leaf Water Extract

The ratio in making the water extract of *Asystasia gangetica* leaves is 1 kg of *Asystasia gangetica* leaves mixed with 1 liter of water (1:1). For treatment B (2%) required 980 ml of water and 20 ml of *Asystasia gangetica* leaf water extract; for treatment C (4%) required 960 ml of water and 40 ml of *Asystasia gangetica* leaf water extract; and for treatment D (6%) required 940 ml of water and 60 ml of *Asystasia gangetica* leaf water extract.

2.4. Observed Variables

The variables observed in this study were: cutting weight, percentage of pad fat, percentage of mesenteric fat, percentage of ventriculus fat, and percentage of abdominal fat, which were measured when Balinese ducks were eight weeks old. The data obtained in this study were analyzed using variance analysis and if the treatment means had a significant effect ($P < 0.05$), the analysis was continued with Duncan's multiple range test [6].

3. Result and discussion

The results of the study of the effect of giving water extract of *Asystasia gangetica* (L) subsp. *Micrantha* leaves on the distribution of abdominal fat in bali ducks male can be seen (Table 1).

Table 1 Effect of *Asystasia gangetica* Leaf Water Extract on Abdominal Fat Distribution of 8-week-old Bali Ducks Male

Variable	Treatment 1)				SEM ³⁾
	A	B	C	D	
Cutting Weight (g)	1268 ^{a2)}	1287 ^a	1316 ^a	1349 ^a	26.422
Pad Fat (%)	1.344 ^a	1.295 ^{ab}	1.218 ^b	1.092 ^c	0.032
Mesentery Fat (%)	0.598 ^a	0.538 ^b	0.474 ^c	0.409 ^d	0.019
Ventriculus Fat (%)	0.137 ^a	0.131 ^a	0.124 ^a	0.116 ^a	0.005
Abdominal Fat (%)	2.079 ^a	1.964 ^a	1.816 ^b	1.616 ^c	0.047

Information: A: 0% *Asystasia gangetica* leaf extract in drinking water; B: 2% *Asystasia gangetica* leaf extract in drinking water; C: 4% *Asystasia gangetica* leaf extract in drinking water; D: 6% *Asystasia gangetica* leaf extract in drinking water; Values with different letters on the same line have significantly different meanings ($P < 0.05$); SEM: "Standard error of the treatment means".

The results showed that the average cutting weight in treatment A (0% water extract of *Asystasia gangetica* leaves) was 1268 g (Table 1). In the treatment of 2% *Asystasia gangetica* leaf water extract (B), 4% *Asystasia gangetica* leaf water

extract (C), and 6% *Asystasia gangetica* leaf water extract (D) respectively 1.48%; 3.65%; and 6.00% were not significantly ($P>0.05$) higher than bali duck male that received treatment A. This is because the ration given in each treatment has the same nutrient content derived from commercial rations with CP 511 B code. Poultry cutting weight is influenced by factors such as genetics, nutrition, age, and health. In addition, environmental factors such as temperature, air humidity, and lighting can also affect feed consumption, physical activity, and duck metabolism which can affect body weight growth. Based on research by [7], it is known that giving forage extract to 10-week-old magelang ducks male has no significant effect ($P>0.05$) on carcass weight and percentage of internal organs of magelang ducks.

Pad fat percentage in treatment A gave the highest result of 1.344% (Table 1) and with treatment B of 3.65% was not significantly ($P>0.05$) lower than A, but with treatment C and D respectively 9.38% and 18.75% significantly ($P<0.05$) lower than treatment A. In treatment C of 5.95% was not significantly ($P>0.05$) lower than treatment B. In treatment D, 15.68% and 10.35% were significantly ($P<0.05$) lower than B and C, respectively. This is due to the content of active substances in the water extract of *Asystasia gangetica* leaves that have an effect on reducing fatty in ducks. Active substances such as flavonoids, saponins, alkaloids, terpenoids, and steroids in *Asystasia gangetica* leaves can reduce fat accumulation. The percentage of fat pads can be influenced by the energy content in the ration and the excess energy will be deposited in the form of fat, besides that *Asystasia gangetica* also contains serotonin which functions to overcome stress and reduce fat [8].

Mesentery fat percentage in treatment A was 0.598% (Table 1). In treatments B, C and D respectively 10.03%; 20.74%; and 31.60% were significantly ($P<0.05$) lower than treatment A. In treatments C and D respectively 11.90% and 23.98% were significantly ($P<0.05$) lower than treatment B. In treatment D, 13.71% was significantly ($P<0.05$) lower than treatment C. *Asystasia gangetica* leaves contain flavonoid compounds that are thought to inhibit fat absorption. Flavonoids are thought to be polyphenolic compounds found in *Asystasia gangetica* leaves. In addition, the saponin content in *Asystasia gangetica* leaves can improve blood serum lipid profiles by forming bile fluid through extra-epatic cholesterol excretion [8].

The average percentage of ventriculus fat in treatment A was 0.137% (Table 4.1). In treatments B, C and D respectively 4.38%; 9.40%; and 15.33% were not significantly ($P>0.05$) lower than treatment A. This is because the crude fiber content in the ration is still within the standard range and the ventriculus functions to destroy incoming feed. The ventriculus has strong muscles and a thick surface, functioning as a food breaker into smaller parts. The size of the ventriculus is influenced by its activity, if ducks are accustomed to being given feed that has been ground, the ventriculus will have a normal weight [9]. Active substances such as flavonoids, saponins, alkaloids, terpenoids, and steroids are also able to reduce fat accumulation. The intake of amino acids in the body is fulfilled, causing the process of cell metabolism in the body to take place well which in turn will have an impact on increasing slaughter weight and carcass, so as to reduce the percentage of fat [8].

The average percentage of abdominal fat in treatment A gave the highest result of 2.079% (Table 1). In treatment B of 5.53% was not significantly different ($P>0.05$) with A, but with treatment C and D respectively 12.65% and 22.27% significantly ($P<0.05$) lower with treatment A. The lowest average percentage of abdominal fat was in treatment D of 11.01% and significantly different ($P<0.05$) with treatment A, B, and C. This indicates the ability of ducks to utilize the water extract of *Asystasia gangetica* leaves given to ducks. The results of this study are in line with the results of previous research by [5], the utilization of green extract of purple sweet potato leaves has a significant effect ($P<0.05$) in reducing abdominal fat by 19.30% in ducks that consume green extract of purple sweet potato leaves.

4. Conclusion

Based on the results of this study, it can be concluded that the administration of water extract of *Asystasia gangetica* (L) subsp. *Micrantha* leaves through drinking water at the level of 2-6% does not affect the cutting weight and percentage of ventriculus fat, but can reduce the percentage of pad fat, mesentery fat and abdominal fat, and giving 6% gives the best results in reducing abdominal fat in bali duck male.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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