

Commercial Carcas cuts of Bali duck (*Anas Sp.*) given water extract *Asystasia gangetica* subsp. *Micrantha* in drinking water

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World Journal of Biology Pharmacy and Health Sciences, 2024, 19(01), 107–111

Publication history: Received on 30 May 2024; revised on 08 July 2024; accepted on 11 July 2024

Article DOI: <https://doi.org/10.30574/wjbphs.2024.19.1.0403>

Abstract

The productivity of bali ducks as meat producers needs to be increased in quantity and quality. This study aims to determine the effect of water extract of *Asystasia gangetica* (L) subsp. *Micrantha* in increasing the commercial cut of bali duck. 100 bali ducks were used with four treatments and five replicates, and each replicate consisted of 5 bali ducks. Bali ducks in treatment A were the control and were not given water extract of *Asystasia gangetica* (L) subsp. *Micrantha* in drinking water, while treatments B, C, and D were given water extract of *Asystasia gangetica* (L) subsp. *Micrantha* 2%, 4%, and 6% in drinking water. The results showed that the carcass weight of bali ducks was given 6% water extract of *Asystasia gangetica* (L) subsp. *Micrantha* (D) was significantly ($P < 0.05$) higher by 7.85% compared to bali ducks in treatment A (control). The chest percentage of bali ducks was given 4% and 6% water extract of *Asystasia gangetica* (L) subsp. *Micrantha* (C and D) was 10.17% and 12.94%, significantly ($P < 0.05$) higher than bali ducks in treatment A (control). The back percentage of bali ducks was given 4% and 6% water extract of *Asystasia gangetica* (L) subsp. *Micrantha* (C and D) was 8.64% and 9.6%, significantly ($P < 0.05$) lower than bali ducks in treatment A (control). Based on the research results, it was concluded that the water extract of *Asystasia gangetica* (L) subsp. *Micrantha* in drinking water at a level of 4 - 6% increases the percentage of the chest and reduces the percentage of the back, and up to a level of 6% can increase the carcass weight of bali ducks.

Keywords: *Asystasia gangetica*; Bali duck; Commercial carcass cuts; Water extract

1. Introduction

Balinese ducks are local ducks that produce meat and eggs. One measure of duck meat production is carcass weight and the proportion of carcasses produced. According to [1] carcasses are generally divided into several parts, including commercial carcass cuts such as the breast, wings, thighs, drumsticks and back. To increase commercial carcass cuts, breeders have traditionally used growth-promoting antibiotics (AGP) [2]. However, with the ban on AGP as a growth-promoting hormone in poultry feed [3], alternatives are used with natural ingredients such as the *Asystasia gangetica* plant. *Asystasia gangetica* is a plant species in the *Acanthaceae* family and is considered a weed [4]. The nutritional content of *Asystasia gangetica* includes dry matter 23.30%, crude protein 20.35%, crude fat 3.39%, crude fiber 29.49%, calcium 0.90%, phosphorus 0.38%, and TDN 53.07% [5]. *Asystasia gangetica* also contains phytochemical compounds such as flavonoids, saponins, alkaloids, terpenoids and steroids which act as antibacterial agents [6]. These antibacterial compounds can damage bacterial cell membranes and denature bacterial cell proteins [7]. Besides that, the phytochemical compounds in *Asystasia gangetica* which have antibacterial activity can fight pathogenic bacteria there by increasing nutrient absorption for optimal carcass production [8]. Research results [9] reported that giving juice from *Indigofera* leaves (*Indigofera zollingeriana*) at a level of 2-6% in drinking water can increase the percentage of the

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chest and thighs but decrease the percentage of the back and wings. A week-old male Balinese duck (*Anas platyrhynchos*). Giving noni leaf extract as much as 2 ml-4 ml/duck/day did not improve the performance of male bali ducks, but giving noni leaf extract as much as 4% increased feed consumption[10]. Based on the above background, research on commercial carcass cuts from bali ducks (*Anas Sp.*) was given water extract from the leaves of *Asystasia gangetica* subsp. *Micrantha* through drinking water is carried out.

2. Material and Methods

2.1. Material

The research was conducted in Br. Dinas Darma Tengah, Riang Gede Village, Penebel District, Tabanan Regency. The cages used in this study were colony battery cages. The research used 100 one-day-old male bali ducklings (DOD). The feed provided was commercial feed 511B produced by PT. Charoen Phokphand Indonesia, Tbk. The *Asystasia gangetica* leaves used were fully grown and green.

2.2. Methods

All one-day-old ducks (DOD) were divided into 4 treatments with 5 replicates, each replicate containing 5 DOD. The treatments given were P0: 0% *Asystasia gangetica* leaf extract in drinking water, P1: 2% *Asystasia gangetica* leaf extract in drinking water, P2: 4% *Asystasia gangetica* leaf extract in drinking water, and P3: 6% *Asystasia gangetica* leaf extract in drinking water. Feed and drinking water were provided ad libitum.

2.2.1. The process of making *Asystasia gangetica* leaf water extract

The ratio of water to *Asystasia gangetica* leaves in the preparation of the water extract of *Asystasia gangetica* leaves is 1 kg of *Asystasia gangetica* leaves mixed with 1 L of water (1:1) (kg/L). For treatment P1 (2%), 980 ml of water and 20 ml of the water extract of *Asystasia gangetica* leaves are needed; for treatment P2 (4%), 960 ml of water and 40 ml of the water extract of *Asystasia gangetica* leaves are needed; and for treatment, P3 (6%), 940 ml of water and 60 ml of the water extract of *Asystasia gangetica* leaves are needed.

2.2.2. Observed Variables

The observed variables were: carcass weight, breast percentage, wing percentage, back percentage, thigh percentage, and drumstick percentage, which were measured when the bali ducks were eight weeks old. The data obtained in the study were analyzed using analysis of variance (ANOVA), and if the treatment means showed a significant effect ($P < 0.05$), the analysis was continued with Duncan's multiple range test [11].

3. Result and discussion

The results of the study on the effect of water extract of *Asystasia gangetica* (L) subsp. *Micrantha* in drinking water of commercial cut bali ducks (*Anas Sp.*) aged 8 weeks, are shown in Table 1.

Table 1 Effect of Water Extract of *Asystasia gangetica* (L) subsp. *Micrantha* in Drinking Water of Commercial Cut Bali Ducks (*Anas Sp.*) Aged 8 Weeks

Variable	Treatment ¹⁾				SEM ³⁾
	A	B	C	D	
Carcass Weight (g)	752 ^b	767 ^{ab}	779 ^{ab}	811 ^{a2)}	15,11
Chest Percentage (%)	25,65 ^b	27,39 ^{ab}	28,26 ^a	28,97 ^a	0,69
Wing Percentage (%)	15,55 ^a	15,86 ^a	15,31 ^a	14,67 ^a	0,39
Back Percentage (%)	31,03 ^a	29,73 ^{ab}	28,35 ^b	27,99 ^b	0,55
Upper Thigh Percentage (%)	14,08 ^a	14,22 ^a	14,23 ^a	14,43 ^a	0,46
Lower Thigh Percentage (%)	13,70 ^a	13,80 ^a	13,86 ^a	13,95 ^a	0,28

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 of research on the carcass weight of Bali ducks given water extract of *Asystasia gangetica* (L) subsp. *Micrantha* 2% (B) and 4% water extract of *Asystasia gangetica* (L) subsp. *Micrantha* (C) was 1.99% and 3.59% respectively, not significantly different ($P>0.05$) compared to Bali ducks in treatment A (control) (Table 1). Carcass weight increased significantly ($P<0.05$) to 7.85% in Bali ducks given *Asystasia gangetica* (L) subsp. *Micrantha* 6% water extract (D) compared with treatment A (control). Because the ducks received 6% water extract of *Asystasia gangetica* (L) subsp. *Micrantha* received a higher dose through drinking water compared to treatments B and C. By increasing the water extract of *Asystasia gangetica* (L) subsp. *Micrantha* in drinking water, the content of phytochemicals such as flavonoids, saponins, alkaloids, terpenoids and steroids in *Asystasia gangetica* also increases. These compounds act as antibacterials which can improve the balance of microorganisms in the digestive tract so that nutrient absorption is better so that carcass weight is higher compared to other treatments. This research is in line with [9] which found that the carcass weight of male Balinese ducks given 6% indigofera extract in drinking water significantly ($P<0.05$) increased the carcass weight of male Balinese ducks given water extract of *Asystasia gangetica* (L) subsp. *Micrantha* through drinking water. Author [12], stated that phytochemicals in plants in the livestock's body can increase good microorganisms, thereby increasing livestock productivity. Researcher [13] confirmed that phytochemicals such as flavonoids, saponins, and tannins affect poultry digestive microorganisms, increasing the efficiency of nutrient absorption. Researcher [14] showed that flavonoids can increase the height of duodenal villi in birds, maximize nutrient absorption and increase livestock carcass weight.

Chest percentage of Bali duck treated with water extract of *Asystasia gangetica* (L) subsp. *Micrantha* in drinking water ranged from 25.65% to 28.97% (Table 1). Chest percentage in Bali ducks in treatment B was 6.78%, not significantly different ($P>0.05$) but higher than in Bali ducks in treatment A (control), while in Bali ducks in treatments C and D it was 10.17% and 12.94% significantly ($P<0.05$) higher than male Bali ducks in treatment A (control). This is due to the content of flavonoids, saponins, alkaloids, terpenoids and steroids as antibacterial agents in *Asystasia gangetica*, which can improve intestinal health and optimize the absorption of nutrients, especially protein, which is important for the carcass. Researchers [15] reported that protein plays an important role in the formation of meat. Researcher [16], stated that the chest is a commercial cut with a large amount of muscle tissue affected by protein. Researcher [17] confirmed that chest, as a commercial carcass cut, contains a large amount of muscle tissue whose development is strongly influenced by certain nutrients, especially protein. An increase in chest percentage in ducks that received water extract of *Asystasia gangetica* (L) subsp. *Micrantha* 4% and 6% in drinking water is associated with high protein content in *Asystasia gangetica*, contributing significantly to protein intake, thereby increasing the percentage of chest in treatments C and D. Researchers [5] stated that *Asystasia gangetica* contains 20.35% protein. Both chest and thighs of ducks are economically valuable parts of the carcass [18].

The wing percentage of Bali ducks that received treatment B was 1.95%, not significantly different ($P>0.05$) compared to ducks that received treatment A (control) (Table 1), while ducks that received treatments C and D were 1.54% and 5.66% was not significantly different ($P>0.05$) and was lower than ducks in treatment A (control). This shows that the water extract of *Asystasia gangetica* (L) subsp. *Micrantha* in drinking water as an antimicrobial does not affect the percentage of wings. Because wings are dominated by bone rather than muscle tissue [19]. Researchers [20] state that the wings and back consist mostly of bone and are unlikely to produce meat, whereas according to [1], body parts with lots of bones include the wings, back, head, neck and legs. Researchers [21] mentioned that the similar weight of wings and back in each treatment is because wings and back are not the primary sites for meat deposition.

Bali ducks were given leaf extract of *Asystasia gangetica* (L) subsp. *Micrantha*. The back percentage of *Micrantha* in drinking water can be seen in Table 1. Bali ducks in treatment B were 4.19% not significantly ($P>0.05$) lower than treatment A, but in treatments C and D they were 8.64% and 9.6% significantly ($P<0.05$) lower than treatment A (control). Researchers [22], reported that the back is the part that is dominated by bones and has less potential to produce meat. Researchers [23] states that carcass components consisting of muscle, fat, skin and bones have different growth rates. The bone component has a relatively smaller growth coefficient than the others, while the other three components have a relatively balanced growth coefficient relative to the cut weight.

Bali ducks treatment B; C and D were respectively 0.99%, 1.07%, and 2.49% not significantly ($P>0.05$) the upper thighs were higher than those of Bali ducks treated with A (control) (Table 1), and Bali ducks treated with B; C and D were 0.73%, 1.17% and 1.82% not significantly ($P>0.05$) higher than Bali ducks that received treatment A (control). This shows that the water extract of *Asystasia gangetica* (L) subsp. *Micrantha* through drinking water as an antimicrobial does not affect the percentage of upper and lower thighs. Author [24], stated commercial cuts of thighs grow earlier than other parts. The muscles in commercial thigh cuts are thought to have reached maximum growth, resulting in the same thigh weight.

4. Conclusion

Based on the research results, it was concluded that the water extract of *Asystasia gangetica* (L) subsp. *Micrantha* in drinking water at a level of 4 - 6% increases the percentage of the chest and reduces the percentage of the back, and up to a level of 6% can increase the carcass weight of bali ducks.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

The Animal Ethics Commission has approved 100 one-day-old ducks (DOD) used in this research from the Faculty of Veterinary Medicine, Udayana University, Badung, Bali, Indonesia.

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