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Sunil Dutt Choudhary

Post Graduate Institute of Veterinary Education and Research, India

Sheela Choudhary

Post Graduate Institute of Veterinary Education and Research, India

Poonam Yadav

Post Graduate Institute of Veterinary Education and Research, India

Manish Kumawat

Post Graduate Institute of Veterinary Education and Research, India

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Evaluation of nutritive value of *Azolla pinnata*

Sunil Dutt Choudhary, Sheela Choudhary*, Poonam Yadav, Manish Kumawat
Post Graduation Institute of Veterinary Education and Research, Jaipur, India
*Corresponding author e-mail : manjuchoudhary2103@gmail.com

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Introduction

The water fern *Azolla*, which grows in association with the blue-green algae *Anabaena azollae*, a nitrogen fixing organism, is the most promising from the point of view of ease of cultivation, productivity and nutritive value. It grows naturally in stagnant water of drains, canals, ponds, rivers, marshy lands. *Azolla* can be used in animal feed and it is a potential feed ingredient for livestock; it is an income generating crop. *Azolla* is easily propagated but requires abundant standing water, relative humidity of 85-90%, pH of 4.5-6.5, salinity between 90-150 mg/L and adequate phosphorus for its nutritional needs. It is labour intensive, grows fast. *Azolla* doubles its weight in 3-5 days. From a start of 1t/ha, it can reach a fresh weight of 15-20 t/ha in about 20 days. *Azolla* is rich in protein, essential amino acids, vitamins and minerals.

Materials and Methods

Whole plants of *Azolla pinnata* were collected and washed properly in running fresh water. The sample was dried in oven at $100\pm 2^{\circ}\text{C}$ for 48 hours, weighed and stored for chemical analysis. Sample of the *Azolla* was chemically analyzed in triplicates according to AOAC (2000). Crude protein was calculated by multiplying $\text{N}\times 6.25$. Total ash content was measured by ignition of the dried sample in muffle furnace at 600°C for 4 hours. The per cent organic matter in the sample was determined by subtracting per cent ash contents of the samples from 100. Neutral detergent fiber (NDF) and acid detergent fiber (ADF) were determined.

Results and Discussion

The proximate analysis of the *Azolla pinnata* shows that it contain 8.42% dry matter, 20.20% crude protein, 3.53% ether extract, 12.12% crude fiber, 15.53% ash, 40.20% nitrogen free extract and 84.47% organic matter.(Table1) *Azolla* contain 35.18% neutral detergent fiber (NDF) and 45.88% acid detergent fiber (ADF). Earlier reports indicated that the crude protein content of *Azolla* might vary from 13.0 to 34.5%. The crude fibre content of *Azolla* not exceeds or equals its protein content. Thus the tendency to depress the overall crude protein digestibility when it constitutes a significant portion of the diet is low. Its nutrient composition makes it a highly efficient and effective feed for livestock.

Table1: Chemical composition of *Azolla*

Proximate constituent	% on DM basis
Dry matter	8.42 \pm 0.27
Crude protein	20.20 \pm 0.64
Ether extract	3.53 \pm 0.28
Crude fiber	12.12 \pm 0.12
Ash	15.53 \pm 0.30
Nitrogen free extract	48.62 \pm 0.93
Organic matter	84.47 \pm .30
NDF	35.18 \pm 0.42
ADF	45.88 \pm 0.15

Conclusion

Based on the results of the study, it could be concluded that *Azolla* is a potential source of nitrogen and thereby a potential feed ingredient for livestock. Livestock easily digest it due to its low lignin content. *Azolla* can be mixed with concentrates or can be given directly to Livestock. So *Azolla* is considered as the most economic and efficient feed substitute and a sustainable feed for livestock.

References

AOAC (2000). *Official Methods of Analysis*, Association of Official Analytical Chemists, Washington, DC.