Azolla Pinnata as Promising Source for Animal Feed in India: An Experimental Study to Evaluate the Nutrient Enhancement Result of Feed

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Abstract : The world's largest livestock population resides in India. Existing strategies must be modified to increase the production of livestock and their by-products in order to meet the demands of the growing human population. Even though India leads the world in both milk production and the number of cows, average production is not very healthy and productive. This may be due to the animals' poor nutrition caused by a chronic under-availability of high-quality fodder and feed. This article explores Azolla pinnata to be a promising source to produce high-quality unconventional feed and fodder for effective livestock production and good quality breeding in India. This article is an exploratory study using a literature survey and experimentation analysis. In the realm of agri-biotechnology, azolla sp gained attention for helping farmers achieve sustainability, having minimal land requirements, and serving as a feed element that doesn't compete with human food sources. It has high methionine content, which is a good source of protein. It can be easily digested as the lignin content is low. It has high antioxidants and vitamins like beta carotene, vitamin A, and vitamin B12. Using this concept, the paper aims to investigate and develop a model of using azolla plants as a novel, high-potential feed source to combat the problems of low production and poor quality of animals in India. A representative sample of animal feed is collected where azolla is added. The sample is ground into a fine powder using mortar. PITC (phenylisothiocyanate) is added to derivatize the amino acids. The sample is analyzed using HPLC (High-Performance Liquid Chromatography) to measure the amino acids and monitor the protein content of the sample feed. The amino acid measurements from HPLC are converted to milligrams per gram of protein using the method of amino acid profiling via a set of calculations. The amino acid profile data is then obtained to validate the proximate results of nutrient enhancement of the composition of azolla in the sample. Based on the proximate composition of azolla meal, the enhancement results shown were higher compared to the standard values of normal fodder supplements indicating the feed to be much richer and denser in nutrient supply. Thus azolla fed sample proved to be a promising source for animal fodder. This would in turn lead to higher production and a good breed of animals that would help to meet the economic demands of the growing Indian population. Azolla plants have no side effects and can be considered as safe and effective to be immersed in the animal feed. One area of future research could begin with the upstream scaling strategy of azolla plants in India. This could involve introducing several bioreactor types for its commercial production. Since azolla sp has been proved in this paper as a promising source for high quality animal feed and fodder, large scale production of azolla plants will help to make the process much quicker, more efficient and easily accessible. Labor expenses will also be reduced by employing bioreactors for large-scale manufacturing.

Keywords : azolla, fodder, nutrient, protein