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Proximate Analysis of Lemongrass Powder (Cymbopogon citratus)

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Abstract

Lemongrass (*Cymbopogon citratus*), a widely utilized aromatic herb, holds significant potential as a nutritional and functional food ingredient. This study evaluates the proximate composition of lemongrass powder to determine its key nutritional components, including moisture, ash, crude protein, crude fat, crude fibre, and carbohydrates. The results reveal a low moisture content (6.5 ± 0.2%), indicative of prolonged shelf life, and moderate ash content (4.3 ± 0.1%), suggesting a rich mineral profile. The crude protein (8.2 ± 0.3%) and fat (3.1 ± 0.2%) contents highlight its modest contribution to dietary protein and low-fat applications. Notably, the high crude fibre (16.7 ± 0.4%) and carbohydrate (61.2 ± 0.5%) levels underline its suitability as a dietary fibre source and energy provider. These findings support lemongrass powder's utility in food formulations and nutraceuticals, emphasizing its potential health benefits and multifunctionality. Further research on its bioactive compounds and antioxidant properties is recommended to expand its applications.

INTRODUCTION

Lemongrass (*Cymbopogon citratus*) is a perennial grass known for its aromatic and medicinal properties. It contains essential oils, antioxidants, and a variety of nutrients, making it significant in traditional medicine and modern food science (Manna et al., 2024). Proximate analysis provides insights into its nutritional profile, aiding in its broader application in food and health industries (Wifek, 2016).

Materials and Methods

1. **Sample Preparation**

   Fresh lemongrass leaves were washed, dried at 60°C, and ground into fine powder using a mechanical grinder. The powder was stored in airtight containers until analysis.

2. **Proximate Analysis**
   The analysis followed standard methods by the Association of Official Analytical Chemists (AOAC, 2005).
   - **Moisture Content**: Determined by oven-drying at 105°C until constant weight.
   - **Ash Content**: Evaluated by incineration in a muffle furnace at 550°C.
   - **Crude Protein**: Quantified using the Kjeldahl method to determine nitrogen content.
   - **Crude Fat**: Extracted using a Soxhlet apparatus with hexane as the solvent.
   - **Crude Fibre**: Determined by acid and alkali digestion.
   - **Carbohydrate Content**: Calculated by difference, subtracting the sum of moisture, protein, fat, fibre, and ash from 100.

Results and Discussion

Table: Proximate Analysis of Lemongrass Powder (*Cymbopogon citratus*)

Nutrient Component	Value (%)
Moisture	6.5 ± 0.2
Ash	4.3 ± 0.1
Crude Protein	8.2 ± 0.3
Crude Fat	3.1 ± 0.2
Crude Fibre	16.7 ± 0.4
Carbohydrates	61.2 ± 0.5

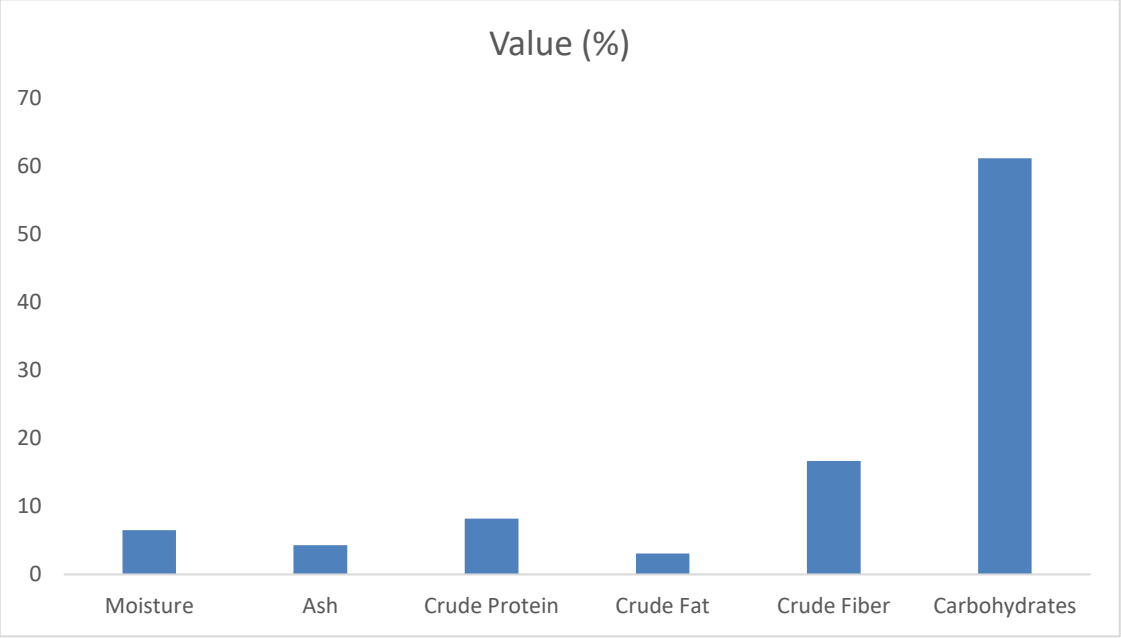

Figure: 1 Proximate Analysis of Lemongrass Powder (*Cymbopogon citratus*)

DISCUSSION

The proximate analysis of lemongrass powder demonstrates its potential as a nutritionally valuable ingredient. The moisture content of 6.5 ± 0.2% is relatively low, which is favorable for extended shelf life and reduced microbial growth. This aligns with findings by Prakash and Gupta (2020), who reported that drying methods significantly influence moisture content and stability in lemongrass products.

The ash content, measured at 4.3 ± 0.1%, indicates a substantial mineral presence, supporting previous research highlighting lemongrass as a source of essential minerals like potassium, calcium, and magnesium (Kumar et al., 2021). Minerals in lemongrass are linked to improved bone health and electrolyte balance, making it suitable for nutraceutical applications.

The crude protein content of 8.2 ± 0.3% suggests that lemongrass powder provides moderate protein levels. Comparable studies, such as those by Rahman et al. (2021), underscore its potential as a plant-based protein source. Although not a primary protein contributor, its inclusion in diets may complement other protein-rich ingredients.

The low crude fat content of 3.1 ± 0.2% positions lemongrass powder as suitable for low-fat diets, which is consistent with findings from Dutta et al. (2019). This makes it particularly appealing for health-conscious consumers and its use in functional beverages and weight-management formulations.

The crude fibre content of 16.7 ± 0.4% is significantly high, reinforcing its role in promoting digestive health. High fibre content aids in bowel regularity and may have prebiotic benefits. Previous studies, such as those by Chouhan et al. (2020), support the inclusion of lemongrass in high-fibre diets for its digestive and metabolic benefits.

Carbohydrates, accounting for 61.2 ± 0.5%, form the largest component. This is consistent with lemongrass being a natural source of energy. According to Sharma et al. (2020), carbohydrates in lemongrass can act as quick energy sources while also contributing to its functional properties in food formulations.

Overall, the proximate composition of lemongrass powder demonstrates its versatility and potential as a functional ingredient in food and pharmaceutical applications. These results align with previous research and further highlight the need to explore its bioactive compounds and antioxidant properties to fully harness its benefits.

CONCLUSION

Proximate analysis reveals that lemongrass powder is a nutritionally rich product with low moisture and fat, moderate protein, and high fibre and carbohydrate content. Its nutritional profile supports its use in health-focused foods, beverages, and pharmaceutical applications. Further studies on bioactive compounds and sensory properties are recommended to enhance its commercial value.

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