BIOECOLOGY OF LALLEMANTIA ROYLEANA (BENTH.) BENTH

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Lallemantia royleana, commonly known as Balangu, is a significant medicinal plant belonging to the Lamiaceae family, primarily found in tropical Asia. Its bioecology is influenced by various factors, including organic fertilization, drought tolerance and phytochemical properties. Studies indicate that organic fertilizers, such as cow, sheep and chicken manure, significantly affect its growth, with optimal results observed at specific application rates (Pulatova & Maxkamov, 2024). Furthermore, ecotypes of Lallemantia royleana exhibit varying drought resistance, with certain ecotypes thriving under severe water stress, showcasing their adaptability in arid regions (Krenn, 2022; Shams et al., 2022). The seeds are rich in proteins, fats and various phytochemicals, contributing to their pharmacological effects, including antimicrobial and antioxidant properties (Saleem et al., 2022; Khan et al., 2019).

Organic Fertilization Effects

- Cow manure (3 kg/m^2) resulted in the highest plant height.
- Variations in manure types led to different growth outcomes, indicating the importance of nutrient management.

Drought Tolerance

- Kondor and Jupar ecotypes showed resilience under drought conditions, maintaining higher seed yields compared to sensitive types.
- Physiological traits like relative water content (RWC) and photosynthetic pigment levels decreased under drought stress.

Phytochemical Composition

- seeds contain 25.60% protein and 18.27% fat, along with various bioactive compounds.
- Exhibits multiple pharmacological effects, including sedative and anti-inflammatory properties.

Despite its beneficial properties, the over-exploitation of Lallemantia royleana could lead to ecological imbalances, necessitating sustainable cultivation practices to preserve its populations and benefits in traditional medicine.

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