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THE EFFECT OF MINERAL ELEMENTS ON THE GROWTH OF INDOOR PLANTS

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Abstract:

This study investigates the influence of mineral elements on the growth, physiological activity, and ornamental characteristics of indoor plants. With increasing urbanization and the growing need for green spaces, indoor plants play a crucial role in improving air quality, human well-being, and interior aesthetics. The research focuses on the comparative effects of organic and inorganic fertilizers—specifically Biogumus and Kemira Lux—on plant species such as ivy, begonia, petunia, and geranium under laboratory conditions. The study revealed that Biogumus improved soil fertility and promoted healthy vegetative growth, while Kemira Lux stimulated faster flowering and enhanced ornamental qualities. The results highlight the importance of balanced mineral nutrition in achieving sustainable growth and aesthetic development of indoor plants.

Keywords: Indoor plants, mineral nutrition, Biogumus, Kemira Lux, nitrogen, phosphorus, potassium, soil fertility, plant growth, fertilizers.

INTRODUCTION

Indoor plants have become an integral part of modern living spaces, valued not only for their decorative appeal but also for their environmental and psychological benefits. They improve air quality, regulate humidity, and create a natural ambiance within enclosed environments such as homes, offices, and public buildings. According to NASA research, over 80% of common indoor plants can absorb toxic substances such as formaldehyde, benzene, and xylene, contributing to a cleaner atmosphere. Ensuring the sustainable growth of indoor plants requires an adequate and balanced supply of mineral elements. Nitrogen (N), phosphorus (P), and potassium (K) are among the most important macronutrients required for plant development. This study aims to evaluate how various sources of mineral elements affect the growth and vitality of selected indoor plants. The findings provide practical insights into optimizing indoor plant care and fertilization strategies.

MATERIALS AND METHODS

The experiment was conducted under controlled laboratory conditions. Indoor plant species including ivy (Hedera helix), begonia (Begonia semperflorens), petunia (Petunia hybrida), and geranium (Pelargonium zonale) were used. The plants were grown under identical environmental parameters—temperature (22–25°C), relative humidity (65–70%), and moderate sunlight exposure.

Three groups of plants were established based on the nutrient treatment applied:

1.Group I – Biogumus Solution:

This group was treated with an organic fertilizer solution prepared by diluting 10–15 ml of liquid Biogumus in 1 liter of water. Biogumus enhances soil structure, enriches microbial activity, and supplies essential elements such as N, P, K, Fe, Mn, Zn, Cu, B, and Mo. It supports stable root formation and increases chlorophyll concentration.

2.Group II – Kemira Lux Fertilizer:

This group received an inorganic fertilizer containing nitrogen (20–25%), phosphorus (10–15%), potassium (15–20%), and microelements (Fe, Mn, and B). The fertilizer was prepared by dissolving 20 g in 1 liter of water and applied at regular intervals. Kemira Lux stimulates vegetative and reproductive growth, increases leaf greenness, and promotes early flowering.

3.Group III – Control Group:

This group was irrigated only with clean water to observe the plants' natural growth response without additional nutrient supplementation.

RESULTS AND DISCUSSION

The analysis demonstrated clear differences in growth dynamics, leaf morphology, and flowering response across the treatment groups. The Biogumus-treated plants displayed steady vegetative development with dark-green, thick leaves and robust root systems. Ivy showed exceptional adaptation and rapid

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propagation through cuttings. Petunia plants exhibited strong vegetative growth but a slight delay in flowering, while Begonia formed numerous healthy leaves.

Plants treated with Kemira Lux exhibited accelerated growth, early blooming, and vibrant flower coloration. Petunia and chrysanthemum developed large, bright flowers, and Begonia maintained consistent vegetative and generative performance. However, when fertilizer concentration exceeded optimal levels, minor root burn was observed, suggesting the need for controlled dosage.

The control group, irrigated only with water, showed limited growth, pale and smaller leaves, and reduced flowering activity. Some plants exhibited stress symptoms such as chlorosis and leaf desiccation, confirming the essential role of mineral nutrients in plant metabolism.

The comparative results indicate that Biogumus serves as a sustainable organic enhancer that improves soil fertility and plant health over long periods, whereas Kemira Lux functions as a potent inorganic stimulant that accelerates growth and flowering. The choice of fertilizer should therefore depend on plant species, growth stage, and desired outcomes—organic for long-term vitality, and inorganic for rapid ornamental performance.

CONCLUSION

The experiment confirmed that mineral nutrition has a significant impact on the physiological, morphological, and reproductive development of indoor plants. Organic fertilizer (Biogumus) enhanced soil biological activity and overall plant resilience, making it ideal for long-term indoor cultivation. Inorganic fertilizer (Kemira Lux) improved flowering intensity and growth rate but required precise application to prevent over-fertilization effects.

In conclusion, balanced fertilization combining organic and inorganic sources ensures both sustainable growth and ornamental appeal of indoor plants, contributing to healthier and more aesthetically pleasing indoor environments.

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