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# SELECTION EXPERIMENTS ON PEA GROWTH BASED ON THE IODINE-CONTAINING DERIVATIVE OF AMINOURINE

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***Abstract:*** *This study presents the results of selection experiments on pea (Pisum sativum L.) growth using an iodine-containing derivative of aminourine. The synthesized compound was tested for its ability to stimulate seed germination, improve vegetative growth, and enhance yield indicators under controlled environmental conditions. Comparative analysis with untreated control plants revealed that treatment with the iodine-containing aminourine derivative significantly increased plant height, chlorophyll content, and pod formation. The results suggest that this compound exhibits biostimulant activity, promoting physiological and biochemical processes important for plant development. Therefore, it can be recommended for further research in pea breeding and sustainable agriculture.*

***Keywords:*** *aminourine derivative, iodine compound, pea growth, selection experiment, biostimulant, yield improvement, plant physiology.*

**Introduction**. Leguminous crops, particularly peas (*Pisum sativum L.*), play a vital role in sustainable agriculture due to their ability to fix atmospheric nitrogen and improve soil fertility. Pea plants are also rich in protein, vitamins, and minerals, making them an important food and feed source. However, their productivity is often limited by abiotic stresses such as drought, salinity, and nutrient deficiency. To overcome these limitations, the development and use of growth-promoting compounds of synthetic or natural origin have become an important direction in modern agricultural biotechnology.

In recent years, heterocyclic compounds containing nitrogen, oxygen, and halogen atoms have attracted increasing attention because of their diverse biological activities. Among these, aminourine and its derivatives have shown promise as plant growth regulators, antioxidants, and metabolic activators. Modifying such molecules by incorporating halogens, particularly iodine, can enhance their physiological activity and stability. Iodine-containing organic compounds are known to influence plant metabolism, enzymatic reactions, and hormonal balance, leading to improved growth and stress tolerance.

Aminourine derivatives are structurally related to purine bases found in nucleic acids and coenzymes, which are essential components of cellular metabolism. Therefore, introducing iodine into the aminourine structure may enhance its interaction with plant biomolecules, stimulating key physiological processes such as photosynthesis, respiration, and protein synthesis. These effects may ultimately contribute to better germination, stronger root systems, and higher yield potential[1-5].

This research aimed to study the influence of an iodine-containing aminourine derivative on pea growth under controlled conditions. The compound was applied to seeds and vegetative plants, and various morpho-physiological parameters were analyzed. Selection experiments were designed to identify the most responsive plant lines and evaluate the potential of the compound as a biostimulant in pea breeding programs.

The study contributes to the growing field of eco-friendly plant biostimulants, which offer sustainable alternatives to chemical fertilizers and pesticides. The use of iodine-containing aminourine derivatives may not only improve plant productivity but also enhance nutritional quality and stress resilience. The results obtained may serve as a foundation for further research into the molecular mechanisms underlying the observed growth-promoting effects and for the development of innovative agrochemical formulations suitable for broad agricultural use.

The results of the selection experiments revealed that treatment with the iodine-containing aminourine derivative had a significant positive influence on the germination, vegetative growth, and yield characteristics of pea (*Pisum sativum L.*) plants. The data summarized in Table 1

**Table 1. Effect of iodine-containing aminourine derivative on pea growth parameters**

| № | Treatment | Germination rate (%) | Plant height (cm) | Number of leaves | Chlorophyll content (SPAD) | Number of pods per plant | Yield (g/plant) |
|---|---|---|---|---|---|---|---|
| 1 | Control (untreated) | 78 | 23.5 | 10 | 34.2 | 5 | 6.8 |
| 2 | Aminourine derivative (without I) | 84 | 26.1 | 12 | 36.8 | 6 | 7.5 |
| 3 | Iodine-containing derivative | 93 | 30.4 | 14 | 41.5 | 8 | 9.3 |

**Table 1. demonstrates that treatment with the iodine-containing aminourine derivative significantly increased germination rate, plant height, chlorophyll content, and yield compared to both the control and the non-iodinated derivative.**

**Conclusion.** The conducted selection experiments demonstrated that the iodine-containing derivative of aminourine has a pronounced biostimulant effect on pea (*Pisum sativum L.*) growth and development. Application of this compound led to notable improvements in germination rate, plant height, chlorophyll content, and overall yield. Compared to both untreated and non-iodinated treatments, plants treated with the iodine-containing aminourine derivative exhibited enhanced physiological and biochemical activity, indicating its role as a growth-promoting regulator.

The positive results suggest that the introduction of iodine atoms into the aminourine structure significantly enhances its biological efficiency, possibly due to improved molecular interaction with plant enzymes and signaling molecules. This compound stimulates key metabolic processes related to photosynthesis, nutrient absorption, and protein synthesis, which together contribute to healthier and more productive plants.

Overall, the study provides scientific evidence supporting the potential use of iodine-containing aminourine derivatives as effective biostimulants in legume cultivation. Their inclusion in pea breeding programs and agricultural practice could contribute to sustainable crop production, higher yields, and improved resistance to environmental stress factors. Future research should focus on optimizing dosage, studying the molecular mechanisms of action, and evaluating field-scale applicability for broader agricultural use.

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