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## **The Effects of Endophytic Bacteria LKM1 and LKM2 on The Growth of Chili Seedlings**

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### **Structured Abstract**

**Background:** Indole-3-acetic acid (IAA) shown to be synthesized by endophytic bacteria is one of the main findings of plant growth hormone (PGH). This research proposed the use of *Capsicum frutescens* to study the growth effect of the chili seedling stage after inoculating with the endophytic bacteria. This study originates from the slow growth of chili seedlings, which require chemical fertilizers that lead to environmental dangers. In Malaysia, poor native chili production necessitates a reliance on imports. This research aims to help *Capsicum frutescens* grow better and address the shortage of local chili supply. This research used LKM1 and LKM2 isolated from *Theobroma cacao* L. The research purpose to determine IAA production by mix and to determine antagonistic relationship between LKM1 and LKM2 via dual culture method and to study the effect of the dual culture on the growth of chili seedling based on the number of leaves and height of plants.

**Methods:** The cross-streaking method used to observe the antagonistic behaviour of the dual culture of LKM1 and LKM2. Dual culture of LKM1 and LKM2 proved the synthesis of IAA by observing the absorbance using spectrophotometer. The culture was mixed with tryptophan and Salkowski reagent (indicator) producing pink color indicating the presence of IAA. LKM1 and LKM2 from Lembaga Koko Malaysia was used to inoculate the chili seedling and treatment of the plant for every two weeks.

**Results:** This study shows that showing no antagonistic activity between them, corresponds to Lembaga Koko Malaysia article. The results indicate that greatest concentration of IAA at around 4.0 µg/mL while pH 7 is an optimum pH for synthesizing IAA. In relation to essential for promoting plant health, these bacterial inoculants have a detrimental effect on plant health as result show the decreasing in the height of chili plant and the number of leaves.

**Conclusion:** In conclusion, the findings of this study indicated that there were no antagonistic characteristics observed between the dual culture of LKM1 and LKM2, thereby the presence of Indole-3-acetic acid was confirmed, highlighting its potential role in influencing plant growth. However, despite these positive aspects, the overall effect on chili growth was negative.

**Keywords:** Endophytic Bacteria, *Capsicum frutescens*, Indole-3-Acetic Acid, and Antagonistic.

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