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Development of a natural pesticide using practical methods for the protection of fruit trees

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INTRODUCTION & AIM

In light of the harmful impacts of synthetic pesticides on both environmental and human health, the need to identify eco-friendly and sustainable alternatives of natural origin has become increasingly urgent. This study explores the potential of plant-derived extracts combined with beneficial microorganisms to develop a bio-based pesticide. Inspired by traditional agricultural practices, the proposed formulation aims to ensure both biological efficacy and ecological safety.

METHOD

A natural formulation was manually developed using a synergistic blend of essential oils, botanical powders, agricultural sulfur, lactic acid bacteria, and purified water. Each component was specifically selected based on its demonstrated or potential bioactivity on plants, including antifungal, insecticidal, and bio-stimulant properties. The final formulation was applied as a foliar spray to selected fruit trees in order to evaluate its effectiveness under field conditions.

RESULTS & DISCUSSION

The application of the treatment on pear, peach, and apple trees yielded convergent results, demonstrating a notable reduction in pest infestation and a visible improvement in leaf condition. No phytotoxic effects were observed throughout the trials, indicating the formulation's safety for plant health. Moreover, treated plants exhibited enhanced resistance to pests and maintained vigorous growth, outperforming untreated controls in terms of both vitality and resilience.

CONCLUSION

This natural formulation represents a promising alternative to conventional chemical pesticides, offering a combination of safety, environmental sustainability, and tangible efficacy under field conditions. Its successful application highlights its potential as a bio-based plant protection solution. Further research is planned to validate its effectiveness across larger cultivation areas and on a broader range of crops.