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Asian soybean rust (*Phakopsora pachyrhizi*) treatment using a new bioactive controlled delivery system

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Statement of the Problem: Nanomed Inc. has been developing a new method for natural compounds controlled delivery system. A biodegradable polymeric nanoparticle is a new approach to delivery a natural and reactive compound to improve the treatment in soy culture, the most important culture in Brazil. This is a bioactivity essential oil against insects and other pests, flavoring agent used in cosmetic and food products however it was previously reported to have a skinsensitizing ability and to cause allergic reactions (1,2). In spite of huge bioactivity, its reactivity and volatility reduce the action time. So, a controlled delivery system was developed, changing the surface area which may influence its toxicity.

Methodology & Theoretical Orientation: The objective of this study is assay the essential oil nanoparticle fungicidal effect on Asian soybean rust (*Phakopsora pachyrhizi*). Results: It was observed that these essential oil loaded nanoparticles showed a fungicidal activity against asian soybean rust (*Phakopsora pachyrhizi*) in vitro. Soy leaves (BRS1010 IPRO) was used as host and the nanoparticles concentrations had effect similar or higher than commercial fungicides used as positive control (Opera and Unizeb Gold).

Conclusion & Significance: Based on this study, it is possible to conclude that the essential oil loaded nanoparticles have a high fungicidal activity. Therefore, in field studies should challenge this capability on cultivation.

Recent Publications:

1. ATSUMI, T.; FUJISAWA, S.; TONOSAKI, K. (2005) A comparative study of the antioxidant/prooxidant activities of eugenol and isoeugenol with various concentrations and oxidation conditions. *Toxicology in vitro*, v. 19, n. 8, p. 1025–33..
2. MURRAY B. ISMAN, C. M. M. (2006) Pesticides based on plant essential oils: from traditional practice to commercialization. In: CARPINELLA, R. AND (Ed.). *Naturally Occurring Bioactive Compounds*. [s.l.] Elsevier, p. 29–44.
3. SINCLAIR, J.B.; HARTMAN, G.L. Soybean rust. In: HARTMAN, G.L.; SINCLAIR, J.B.; RUPE, J.C. (1999). *Compendium of soybean diseases*. 4. ed. Saint Paul MN. APS Press. p. 25-26..
4. GODOY, C.V.; KOGA, L.J.; CANTERI, M.G. (2006) Dia-grammatic scale for assessment of soybean rust severity. *Fitopatologia Brasileira*, v.31, p.63-68..
5. YORINORI, J.T.; PAIVA, W.M.; FREDERICK, R.D.; COSTAMILAN, L.M.; ERTAGNOLLI, P.F.; HARTMAN, G.E.; GODOY, C.V.; NUNES JUNIOR, J. (2005) Epidemics of soybean rust (*Phakopsora pachyrhizi*) in Brazil and Paraguay. *Plant Disease*, v.89, p. 675-677.

Biography

Thiago Cardoso Cruz undergraduated in Industrial Engineering – Central University Paulista (2009), Entrepreneurship Management- FATEC/SP (2016), Graduating at Technological Chemistry at UFSCAR (2018). Experienced in Regulatory issues, with emphasis in Healthy, working mainly in controlled release systems and polymeric and lipid nanoparticles. Currently responsible for development projects and regulatory issues of the agriculture sector, cosmetic and veterinary at Nanomed.

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