

TITLE: ANTIFUNGAL EVALUATION OF NEEM NANOEMULSION IN SEEDS

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ABSTRACT:

Increasingly intensive agriculture provides a greater selection pressure of pests and diseases. It becomes increasingly necessary to search for alternative methods that are safe and efficient control of phytopathogens. Thus the present work had as objective to formulate and characterize nanoemulsions of bio-Neem oil-based and assess their application in the control of the fungus *Aspergillus* and *Penicillium* in soy beans. We used soybean seeds of 1359S SYN cultivar IPRO placed in contact with the nanoemulsion containing different concentrations of Neem oil (0.5; 1.0; 2; 3) for 30 min and 600 min, and two more treatments controls (positive: untreated, infested and non-infested and untreated negative). Before the treatments nanoemulsions made were characterized by dynamic light scattering. It was evaluated the sensitivity of fungi to nanoemulsion of Neem oils. Subsequently, the soybean seeds were treated with nanoemulsion and carried out germination test and test of sanity. It was found that the drops of nanoemulsion showed an average diameter of 59 ± 0.6 nm. Neem Oil presents growth inhibition effect of fungal isolates. The highest antifungal activity was observed at a concentration of 3% (w/v) of Neem Oil. When comparing the treatments with the positive control, it was verified that the nano emulsion provided 78% more germination for the *Aspergillus* fungus and 60% more germination for the fungus *Penicillium*. Evidence that the nanoemulsion was very efficient in controlling the effect of these fungi on the germination of soybean seeds. The operation of infestation was effective, since the seeds inoculated (positive control) showed 100% contamination to both fungi. They selected for the study nanoemulsions and oil based surfactant in a proportion of 1:3. The sizes of drops of nanoemulsion were considered an important parameter for studying antifungal. The treatments carried out with 30 min of immersion were enough to promote a reduction in average 20% of seed contaminated with *Penicillium* in relation to the positive control. To the seeds contaminated with *Aspergillus* this reduction achieved an average of 50%. In our study it was confirmed that the nanoemulsion of neem oil based is efficient in the control of fungi studied and shows no phytotoxic effects for the seeds. The nanoemulsion is easily accessible, economically viable and, moreover, less toxic than the usual synthetic pesticides.

Keywords: Biological control; Fungicide; *Azadirachta indica*; *Azadiractina*

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