

International E-Conference on

PLANT SCIENCE AND BIOLOGY

May 05, 2021 | Webinar

Efficacy of clove oil- a plant product in enhancing shelf life of food/seeds of pigeon pea

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Pigeon pea [*Cajanus cajan* (L.) Millsp.] in India due to improper storage have a lot of deterioration. This is due to fungal and insect infestations. For its storage farmers use salphos that have carcinogenic and teratogenic effects. So plant based essential oils were investigated for its antifungal and insect repellent potential for storage of food/seeds of pigeon pea because of having least negative effects. Therefore fungal investigations on stored food/seeds of Pigeon pea were carried out by agar plate as well as blotter paper methods on 25 samples from grocery stores of Gurgaon and Gorakhpur. This revealed occurrence of 16 fungal species. Out of these fungal species *Aspergillus flavus*, *A. niger* was found to be dominant on the basis of % occurrence. Insect pest analysis of food seed revealed the presence of *Callosobruchus chinensis* infestations in all 25 samples of this region. The Essential oils were extracted separately from 100 plants. MIC, nature, spectrum were decided. The efficacy of most active-clove oil was evaluated which revealed absolute toxicity (100%) against dominantly present *Aspergillus flavus*, *Aspergillus niger* at concentration of 300 ppm and fungicidal at 400 ppm. At 400 ppm inhibited 10 fungi and at 600 ppm concentration it checked growth of all 16 fungal species. The clove essential oils showed 100% insect repellent activity against *Callosobruchus chinensis* at 0.01 ml dose and found insecticidal at 0.02ml dose. There was no adverse effect of physical variants on oil. In vivo investigation on clove oil and synthetic pesticide-Salphos revealed that clove oil preserved food/seeds of pigeon pea up to 120 days very well from fungus and insect infestation in comparison to Salphos. There was no changes in organoleptic behaviour of food seeds after storage. GC-MS investigations of clove oil revealed 75.63 % eugenol as a major component. It revealed that clove essential oil have more fungitoxic and insect repellent efficacy in comparison to synthetic pesticide-Salphos.

Keywords: Pigeon pea, clove oil, biodeterioration, *Aspergillus flavus*, *A. niger*, synthetic pesticide, Salphos

Biography:

Dr. Narendra Kumar earned his Ph.D. in 2002 from Gorakhpur University (Subject-BOTANY). Since then he is doing research and teaching UG/PG students. Presently working as an Associate Professor, Amity Institute of Biotechnology at Amity University-Haryana, Gurgaon (India). He has attended and presented a large number of papers in several National and International conferences and was the recipient of Young Scientist and also the Best Paper awards for his research work. So far two PhDs have been awarded and some more students doing research work under his guidance; published four books, and has More than 140 research papers to his credit in reputed Journals.