

DBT-IBSD studies insect toxicity of oil from *T.diversifolia*

New Delhi, Feb 16: About one-third of the world's food production gets lost due to insects. Most of this damage is caused by the stored grain insect pests belonging to the Coleoptera which are distributed worldwide. Their effective control has been commonly based on synthetic gaseous fumigants such as methyl bromide and phosphine. However, synthetic insecticides are toxic and hazardous and many are banned and are restricted for use. These insecticides also generate environmental pollution, and their residues often persist in food products.



The situation demands a serious effort to discover some safe, viable, biodegradable, eco-friendly and effective substitute from natural origin. One alternative is the use of essential oil (EO) from aromatic plants. Several essential oils are currently being used in the manufacturing process of many industrial products in the fields of cosmetics, perfumery, cleaning, pharmacology, chemistry and also as insecticides. *T. diversifolia* essential oil has been found to have insecticidal activity against the aphids, bean foliage beetles and flower beetles feeding on common bean plants.

This plant has been used traditionally as herbs with agricultural benefits in some developing countries because of its insecticidal properties. Scientists at DBT-Institute of Bioresources

and Sustainable Development (DBT-IBSD) investigated the essential oil (EO) from the leaves of *Tithonia diversifolia* (Hemsl.) A. Grey to determine chemical composition and fumigant toxicity against two major stored grain beetles such as rice weevil, *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae) and red flour beetle, *Tribolium castaneum* (Herbst.) (Coleoptera: Tenebrionidae).

A total of 78 compounds were identified by GC-MS. EO from leaves of *T. diversifolia* showed strong fumigant activity against the two beetles respectively. These naturally occurring materials derived from EO of *T. diversifolia* could be used to manage the populations of *S. oryzae* and *T. castaneum*. It was found that the EO's of *T. diversifolia* is very effective as a fumigant against stored grain insect pests and can also be used as an alternative to the synthetic fumigants.

References

Devi, T. B., Raina, V., Sahoo, D., & Rajashekar, Y. (2021). Chemical composition and fumigant toxicity of the essential oil from *Tithonia diversifolia* (Hemsl.) A. Grey against two major stored grain insect pests. *Journal of Plant Diseases and Protection*, 1-9.

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