



Eucalyptus essential oil as an alternative to chemical pesticides

Controlling pests with natural products can have greater environmental benefits than using chemical pesticides. A recent study reviews the use of eucalyptus essential oil as a natural pesticide and offers recommendations for its future application.

Chemical pesticides have played a major role in securing food supplies the world over. However, excessive use has led to increased environmental pollution, harmful effects on human health and resistance among pests to the chemicals used. This has driven the search for less harmful alternatives.

Essential oils derived from natural plant products are easy to extract, biodegradable and do not persist in soil and water. Eucalyptus is particularly useful as it possesses a wide range of desirable properties for pest management and is regarded as non-toxic to humans.

Eucalyptus essential oil can act directly as a natural insect repellent and the study lists numerous pieces of research that demonstrate this property. For example, previous research has found that eucalyptus essential oil can protect plants against rice weevils, pine processionary moths and mushroom flies.

The study also lists examples of research which have found that eucalyptus essential oil is toxic to microbes including bacteria and fungi. Eucalyptus essential oil could therefore have a role to play in the protection of crops against mould, mildew and wood rot fungi. In addition, when applied in a vapour form, eucalyptus essential oil has potential to manage weeds, especially as its toxicity appears to be species-specific.

The study also highlights several benefits of using essential oils over chemical pesticides. Since essential oils are a complex mixture of components (unlike chemical pesticides which are based on a single product), they work together within a plant and it is unlikely that pests will become resistant to them.

Additionally, they can be used for non-agricultural pest management in urban areas, homes and other sensitive areas such as schools, restaurants and hospitals. Since eucalyptus oils are particularly strong when in vapour form, they could also be used commercially as a fumigant (gaseous pesticide) for stored products and impregnated into packaging to prevent insect infestation.

The authors also draw attention to some drawbacks of essential oils. For example, essential oils do not persist for long in the environment and need to be continually reapplied to achieve the desired results. They also point out that the properties of eucalyptus may change depending on species, season, changing climate and even age. Because eucalyptus oils are insoluble in water, they are not as effective in controlling pests that live in soil or for weeds under field conditions. The authors suggest that this could be overcome by emulsifying the oil.

The study explains that eucalyptus essential oil could have a large role in the control of pests and provide an alternative to chemical pesticides. However, the costs of extraction and application need to be better understood to decide how cost-effective it is.

Source: Batish, D.R., Singh, H.P., Kohli, R.K. *et al.* (2008). Eucalyptus essential oil as a natural pesticide. *Forest Ecology and Management*. 256: 2166-2174.

Contact: daizybatish@yahoo.com

Theme(s): Agriculture, Chemicals

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To cite this article/service: "[Science for Environment Policy](#)"; European Commission DG Environment News Alert Service, edited by SCU, The University of the West of England, Bristol.