FORMULATION OF POLYHERBAL INSECTICIDE FOR GRAINS PROTECTION

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Abstract

Protection of grain is essential after postharvest or in household practices. Now-a-days integrated pest management along with postharvest infestation control is a extensively accepted strategy of pest control which involves using the chemical insecticides with fumigants. Using chemical insecticides which are is neither permitted nor used restrictively due to the problem of residue and consumers' health risk. So potential alternatives should be present for the formerly used insecticides. Plant-derived insecticides or insecticidal compounds has great potential. Which include natural herbs but herbs are unavailable at all the time and everywhere so polyherbal insecticide formulation was prepared which is effective grain protectant for stored product wheat and Pulses. This is an insecticidal from natural origin.

Keyword: Natural plants, Extraction, Formulation, Optimization, Polyherbal, Insecticide.

1.INTRODUCTION

Pesticides are any substances or mixture of the substances, which are intended to mitigate, destroy, or prevent any pest, or intended to use as plant growth regulator. Pesticides repel, prevent or destroy pests, such as rodents, insects, and weeds, but they may also cause harmful effects on human health, including dysfunction of the endocrine (hormone) as well as immune systems, cancer, short- as well as long-term injury to the nervous system, reproductive dysfunction, lung damage, and. (Rajendran S., 2008) Thus only the safe and best alternative is to use natural pesticides. Pesticides are used in developing countries must continue to expand to maintain agricultural productivity and to permit farmers to reap the benefits of related agricultural investments. (Zeng L., 2001) Natural pesticides are a inexpensive and safer alternative for the products as well as human beings who always exposed to pesticides during use. (Kulkarni. S. K., 2007) Insecticides are the substances used to kill insects. Insecticides contain chemical constituents like methyl bromide, aluminum phosphide (phosphine), malathion, pyrethrins. (Ayvaz A., 2009) Poisoning of these substances may cause nausea, vomiting, diarrhea, headache, etc. So, to overcome all these problems we have formulated polyherbal insecticide. (Tian B., 2015) Formulation containing herbal plants doesn't show any side effects. It is eco-friendly as well as non-carcinogenic. (Handa S. S., 2015).

2. MATERIALS AND METHODS

2.1. Material

Turmeric (Curcuma longa), Neem (Azadirachta indica), Clove (Eugenia caryophyllus, Custard Apple (Annona squamosal), Petri plates, Whatman filter paperAcetone.

2.2. Method

Maceration is a method of extraction by water herbal or plant material to dissolve the chemicals of the material, which may include stems, roots, bark and rhizomes and then in water to extract oils, volatile organic compounds, and other various chemical substances.

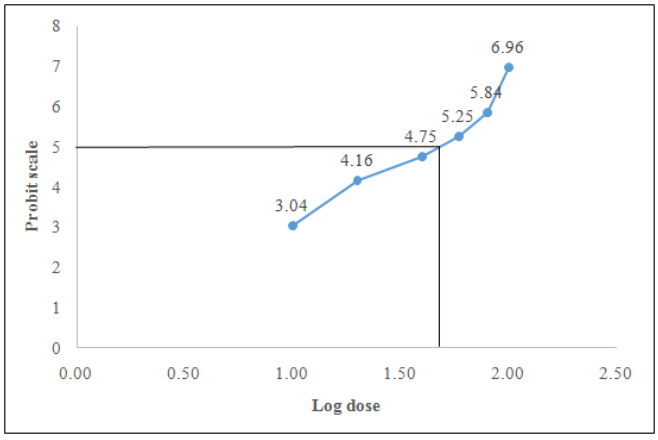
It is helpful to grind or crush the whole root, bark, and seeds before preparing the extract. This is prepared by shaking the required quantity of herbs with water for about 30-60 min (or more than 1 hour). The vessel must be closed during shaking to prevent any essential constituents from being lost. The extract is then

removed strained using a filter, and the extract is used either as a whole or after suitable dilution.

Toxicity of various solvent extracts was screened against grain borer (Rhyzopertha dominica) adults using a residual bioassay method. 4 ml of stock solution containing 4 mg was applied on Watmann No. 1 filter paper and placed in a glass Petri dish. The solvent was allowed to evaporate for 10 min prior to the release of 10 adults of grain borer into each dish. Control filter paper discs were treated with acetone. Each treatment consisted of four replicates. Insect mortality was recorded after 24 h exposure and percent mortality was determined.

3. RESULT

Group	Dose mg/ml	Log dose	Dead/Total (x/10)	% Dead	Corrected %	Probit
1	10	1.00	0	0	2.5	3.04
2	20	1.30	2	20	2	4.16
3	40	1.60	4	40	40	4.75
4	60	1.77	6	60	6	5.25
5	80	1.90	8	80	80	5.84
6	100	2.00	10	100	97.5	6.96



4. DISCUSSION

- Various concentrations were taken to check the % mortality in the interval of 10, 20, 40, 60, 80, 100 mg/ml.
- The % mortality found to be increasing with increasing dose concentration. The highest % mortality was found at a concentration of 100 mg/ml.
- All the 10 insects were found to be dead. The LC50 value was found at 50 mg/ml, where it had shown 50% mortality.

5. CONCLUSION

The acetonic extracts of Turmeric, Clove, Neem, Custard apple could be a potential natural grain protectant through its residual effects on stored grain insect pests. Since the extracts of Turmeric, Clove, Neem, Custard apple are edible and given the long history of human use, it stands a good chance of being the source of a new eco-friendly price effective with no side effects bioinsecticide and grain protectant of natural origin. Because of its polyherbal nature, it doesn't show any adverse effects and it is non-carcinogenic.

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