

The effect of household washing methods on reduction of malathion residue in cabbage

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ABSTRACT

Field and laboratory experiments were carried out to estimate the effect of household washing methods on malathion residues in cabbage. This vegetable was raised in the kitchen garden area of Home Science College, MAU, Parbhani and sprayed with insecticide malathion at fruiting and marketing stage. The residue reduction for cabbage was recorded according to the waiting periods and household washing methods. A significant reduction of malathion residues was noticed after each wash and waiting period. Higher reduction was found in warm water washing with third day waiting period.

Key words : Tolerance limit, MTL- Maximum residue limit, Cabbage, Malathion

Pesticides play an important role in crop protection technology. In vegetables, they are used to avoid or control the infestation for healthy growth of the crops. Though protective to the crops, the pesticide residues left on the surface penetrate inside the crop and create harmful effects on human health. A significant amount of residues have been found to be persisting even after washing. Waiting period is an important aspect in insecticide utilization to bring down the residues below the maximum permissible limit. A tolerance limit of 2-3 ppm has been prescribed in India for malathion on vegetables (Verma and Lal, 1981). The alarming situation challenging the healthy existence of the mankind requires immediate conscious efforts at every level, including household. In the household, washing of vegetables prior to consumption is a common practice. But washing may not bring the commodity under safe level of consumption (Verma and Lal, 1981). In the light of these facts, the different washing methods need to be tested for their efficacy. So, the study was undertaken to estimate the efficiency of selected household washing methods on malathion residue in cabbage.

METHODOLOGY

For this study, commonly used vegetable *i.e.* cabbage was selected as it is susceptible to infestation of insects and hence commonly sprayed with insecticide *i.e.* malathion. The seedlings of cabbage were obtained from the Department of Horticulture, MAU, Parbhani and were raised in plots 10x10 ft each in triplicate in the kitchen garden areas of Home Science College, Parbhani.

Untreated plot was also maintained for comparison. The commonly advised commercial insecticide malathion 50 EC (Emulsible concentrate) was selected for application and sprayed at fruit stage and marketing stage (0.05 % concentration). The samples of cabbage were randomly drawn from treated and controlled plot after 1,3,5 and 7 days of application. They were labelled and stored in deep freezer for further analysis.

50 gm sample of cabbage vegetables was washed by following methods.

- Washing cabbage four times by holding under the running cold tap water for half minute.
- Washing cabbage four times by holding under the running warm tap water for half minute.
- Dipping with light rub in cold water for 1,2,3 minutes.
- Dipping with light rub in 42°C warm water for 1, 2, 3 minutes.

The procedure for washing under tap was standardized for water pressure (at 0.7 pound/inch² pressure) and time. Dipping methods were standardized for size of vessel, volume of water, immersion period, temperature and the size and weight of the sample. Numbers of frequencies of washing were also fixed.

The samples were chopped uniformly in 1-1.5 cm size with steel knife (weight 50 g) with the selected spray intervals. Extracts of malathion were blended in mixer with 100 ml of acetone for 3-4 minutes. Then it was filtered through funnel. This filtrate was further washed with chloroform and was stored in deep freeze with labeling. The elutes were collected and reduced to 10 ml