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Assessment of chromatographs of pesticides on selected fruits and vegetables in Rewa district

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Abstract
The aim of present study was to Assessment of Chromatographs of pesticides on selected fruits and vegetables in Rewa district. The standard chromatographs of chlorophyriphos, quinalphos, endosulfan, acephate. A total of 30 samples of three fruits and vegetables viz. sweet lime, tomato and bitter gourd collected different locations of Baikunthpur, Nebuha, Hardi, Palhan and Tilkhan villages of Rewa district of Madhya Pradesh.

Keywords: assessment, chromatographs, pesticides, fruits, vegetables

1. Introduction
Pesticides are designed to kill and because their mode of action is not specific to one species, they often kill or harm organisms other than pests, including humans. The WHO estimates that there are 3 million cases of pesticide poisoning each year and up to 220,000 deaths, primarily in developing countries. The application of pesticides is often not very precise. As the contribution of agro-chemicals towards increasing agricultural production is well established, however, it may causes damage to the environment; the ecosystem including the mankind. Pesticides are known to control insect pests, weeds, diseases, rodents and pests in the storage. Though the pesticide industry in the developed world has made good progress in the field of development and production of low risk/low volume user and environment friendly pesticides formulation, pesticides in the developing countries still now are mainly available in conventional formulations such as dust, wet table powder, emulsifiable concentrates and solutions etc. The chemical pesticides and fertilizers (agrochemicals) are commonly used in Indian agriculture. Farm productivity is directly proportional to use of agrochemicals observed from the first green revolution. Improper and unsafe use is quite common in India. Pesticides have been considered potential chemical mutagens several experimental data has revealed that various agrochemical ingredients possess mutagenic properties. The genotoxic potential for agrochemical ingredients is generally low, as they yield positive results in few genotoxicity tests. The lowest effective dose in single test is generally very high. Toxic effect, mainly genotoxic potential is a primary risk factor for short and long-term effects such as carcinogenic and reproductive toxicology.
India is the largest producer of pesticides in Asia and ranks 12th in the world for the use of pesticides. A majority of population in India is engaged in agriculture and is therefore exposed to the pesticides use in agriculture. Although Indian average consumption of pesticide is far lower than many other developed economies, the problem of pesticide residue is very high and has also affected the export of agricultural commodities in the last few years (Abhilash and Nandita Singh 2009) [1].
Residues of pesticides were found remain continuously in food supply. Residues of DDT, DDE, and other pesticides have been found in different vegetables (Salwa *et al*. 1999; Tahir *et al*. 2001; Dogheim *et al*. 2002;, Iqbal, *et al*. 2007) [2-5].

2. Material and Methods
Samples were collected from Rewa district of Madhya Pradesh. Proximate nutrient composition was analysed at Govt. T.R.S. College, Rewa and Research Centre and pesticide residues were analyzed in Quality Control Laboratory, JNKVV University, Jabalpur, Madhya Pradesh.
Information on pesticide usage practices of farmers on vegetables of Rewa district of M.P. was collected from 30 farmers in villages namely Baikunthpur, Nebuha, Hardi, Palhan and Tilkhan.
The selected samples tomato, guava and bitter gourd were procured from the farmers interviewed. The samples were obtained after proper sampling was done using standard sampling techniques.
The standards for most commonly used pesticides by the farmer in the region i.e. acephate, monochrotophas, endosulfan, quinalphos, chlorophyriphos and carbofuran were procured from local market.

3. Results and Discussion
The results obtained from the present investigation are presented in Tables 1 - 3.
The pesticide residue content of selected whole and processed fruits and vegetables was analyzed for the following pesticides namely monochrotophas, quinolphos, endosulfan, chlorpyrifos, acephate and carbofuran.

Processing Technique
Pesticidal content after soaking for 15 minutes in water and washing with 3% salt water. This study has been designed to

determine the extent of pesticide residues removal from sweet lime, tomato and bitter gourd through household processing.
Pesticide residues were extracted from sweet lime, tomato and bitter gourd by solvent extraction and cleaned by chromatographic column by using florisil for elution and then cleaned up residues were analyzed through Gas chromatography.
Residues in processed as well as unprocessed sweet lime, tomato and bitter gourd samples were below detectable levels (BDL).

Standard Chromatographs

Multiple standard chromatographs and sample chromatographs are given in tables below and the graphs pertaining the same are given in figs. 1, 2 and 3.
The average percent recoveries at the spiking levels were not detected (BDL) for any of the pesticides in whole and processed samples. Therefore, statistical analysis was not carried out. The chromatograms of the standards and samples are given in table & Fig. nos. 1, 2 and 3.

Table 1: Standard chromatographs of chlorophyriphos, quinalphos, endosulfan, acephate

S. No.	Name of the Pesticide standard	Retention time (in minutes)
1.	Chlorophyriphos	21.294
2.	Quinalphos	23.317
3.	Endosulfan	24.212
4.	Acephate	25.996

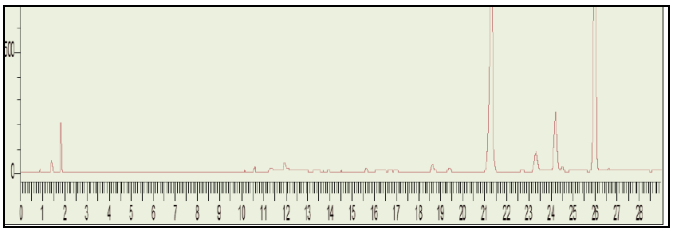

Fig 1: Standard chromatographs I

Table 2: Standard chromatograph-II

S. No.	Name of the Pesticide standard	Retention time (in minutes)
1.	Monocrotophos	16.034
2.	Quinalphos	23.332

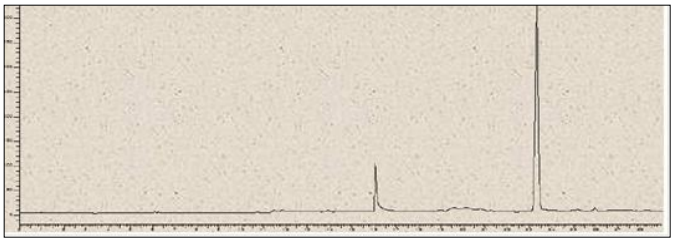

Fig 2: Standard chromatographs II

Table 3: Standard chromatograph-III

S. No.	Name of the Pesticide standard	Retention time (in minutes)
1.	Carbofuran	19.297
2.	Quinalphos	23.312

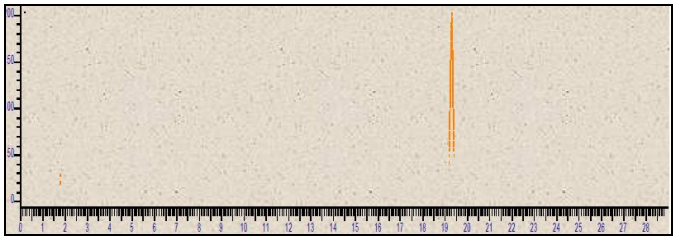

Fig 3: Standard chromatographs III

Chromatographs of pesticides obtained from the selected crops

It was observed that the chromatographs of selected fruits and vegetable did not match with the peak time of the standard chromatograph.
Sweet lime, tomato and bitter gourd samples collected were analyzed to detect pesticide residues if any there in.
The chromatograph of the samples extract shows the absences of pesticides. Status of pesticides residue in sweet lime, tomato and bitter gourd were analyzed and detected by Gas chromatograph (GC) and their results are described below detectable levels.
Pesticide residues of samples in negligible quantities that were below detectable limits (BDL). That might be because of processing techniques contributed to the declinement of pesticide residues.
This study show that washing in salt water contributed to the declinement of pesticide residues.
A similar study conducted by Krol *et al.* (2000) [6] rinsing under tap water reduced pesticide residues which are removed by the mechanical action of rinsing.

4. Conclusion

The pesticide residue analysis, it was found that Pesticide residues in sweet lime, tomato and bitter gourd in processed as well as un processed samples were below detectable levels (BDL). This could be attributed to the post-harvest time reported was to long which could have led to the loss of the pesticides into the environment. Soil adsorption, water solubility, environmental and laboratory handling processes also contribute to degradation of pesticides.

5. Acknowledgements

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6. References

1. Abhilash PC, Nandita Singh. Pesticide use and application: An Indian scenario. Journal of Hazardous Materials. 2009; 165(1-3):1-12.
2. Salwa MA, Dogheim AS, Gad EI-Marsafy Ashraf M. Monitoring pesticide residues in Egyptian fruit and vegetables in. Journal of Official Association Analytical Chemist. 1995-1999; 82 (4):948-955.
3. Tahir S, Anwar T, Ahmad I, Aziz S, Mohammad A, Ahad K. Determination of pesticide residues in fruits and vegetables in Islamabad market. Ecotoxicology Institute, National Agricultural Research Center, Islamabad. Pakistan Journet of Environmental Biology. 2001;

22(1):71-74.
4. Dogheim SM, El-Marasafy MA, Salama YE, Gadalla AS, Nabil MY. Monitoring of pesticide residues in Egyptian fruits and vegetables during. Food Addit. Contam. 1997-2002; (19):1015-1027.
5. Iqbal MF, Maqbool U, Asi MR, Aslam S. Determination of Pesticide Residues in Brinjal Fruit at supervised trial. Journal of Animal Plant Science. 2007; 17(1-2):21-23.
6. Krol WJ, Arsenault TL, Pylypiw HM, Mattina MJI. Journel of Argicultural Food Chemistry. 2000; 48:4666-4670.