

NATURAL PRODUCTS CONTAMINATED BY POLLUTANTS

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Abstract : Pesticides are substances that are used to control pests. In farming, pesticides are applied on fruits and vegetables to raise yield and upgrade the quality of the crop. Pesticides are toxic and can cause serious health problems. They pollute air, water and soil. Pesticides diminish biodiversity and reduce nitrogen fixation in the atmosphere. Pesticides may cause neurological and psychiatric complications. The exposure of pesticides is causing damage to the immune system. The main objective of this review paper is to determine the presence of pollutants indicated by showing positive results for nitrogen in various samples of fruits and vegetables during seasonal growth to increase the crop production. Investigation includes collection of various fruits and vegetables from local market and kitchen garden without using pesticides. The samples were prepared by a suitable method and pathway studies to determine the ratio of pollutants by estimating nitrogen qualitatively.

I. INTRODUCTION

Pesticides are defined as plant protection substances which help in advance the yield and upgrade the quality of crops (Dasika et al, 2012). To fulfill the requirements of growing population in the world farmers use expensive fertilizers and latest farming techniques to increase the production of natural product but pests destroy the crops and grains (Chen et al 2007) . For this reason we need to protect the natural products from pests. Pest includes nematodes, rodents, insects, microbes etc. This is only possible by using chemical fertilizers called pesticides which are used as sprays, suspensions and granules..The four types of pesticides are

(i) Herbicides, (ii) Fungicides (iii) Rodenticides (iv) Insecticides .

These are used to protect the crops from insects, rodents, and plant diseases. The common examples of insecticides are DDT [5 6] (p, p'- dichlorodiphenyltrichloroethane), DDD (p, p'- dichlorodiphenyldichloroethane), DDE (p, p'- dichlorodiphenyldichloroethylene), BHC (benzene hexachloride).

On the other hand pesticides are very dangerous and fatal for all the organisms living on the earth during use and after use. It is poisons the natural products including crops, fruits and vegetables (Suwalskya et al 2005). These are non biodegradable. It can cause both acute and chronic diseases.

Due to difference in diets of children and adults, children are more prone to health diseases . There are less affects of pesticides on the health of children who are adapted to organic diets (Lu et al 2006). It can also cause health problems which sometimes lead to death . Pesticides can get in the bodies through mouth, nose, or skin and also through smoking tobacco. The biodegradable chlorinated hydrocarbons (organochlorine) are given preference as compared to organophosphates which is more harmful for organisms these days (Engel et al 2000). There are few insecticides that not only contain S, P, but also contain N group. For example: parathion, Vapum, Diuron etc

METHODS TO DETECT POLLUTANTS IN FRUITS AND VEGETABLES

Salhotra et al. determined the contamination of heavy metals in some vegetables and fruits in samples from the market of Jagdalpur, Chhattisgarh State, by Atomic absorption spectroscopy technique.

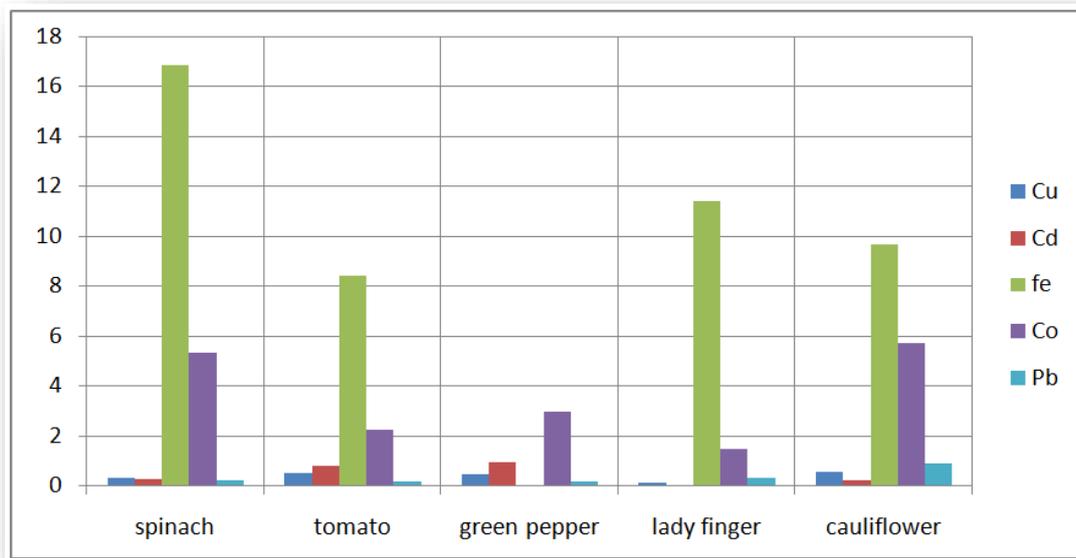


Figure 1: Represents the heavy metal concentration in the edible parts of five vegetables.

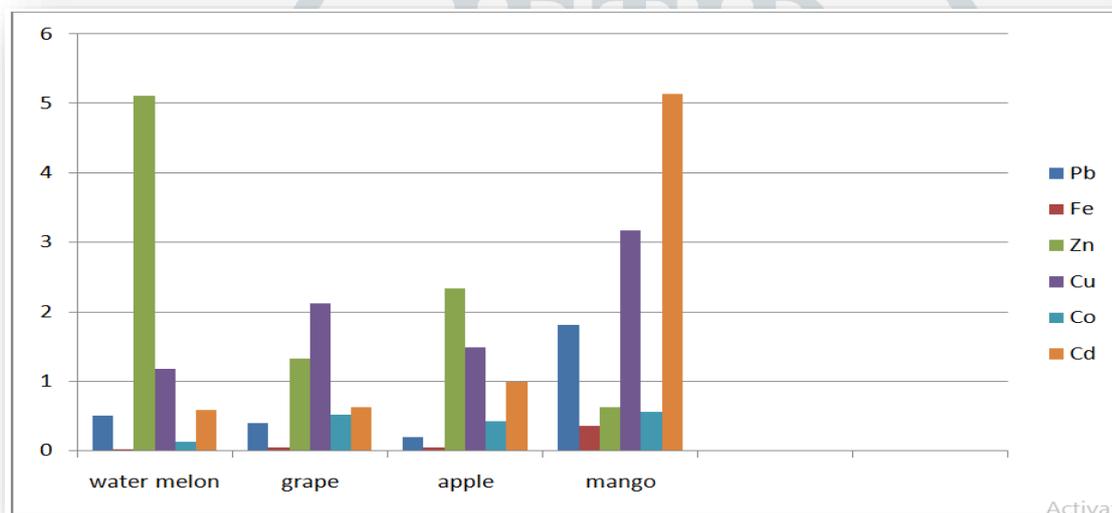


Figure 2: Represents the heavy metal concentration in the four different fruits

Author has determined the presence of nitrogen qualitatively in various samples of fruits and vegetables from market (with insecticides) and also from kitchen garden (without insecticides).

II. MATERIALS AND METHOD

Sample of different types of fruits and vegetable, alcohol, sodium metal, ferrous sulphate crystals, distilled water, dilute sulphuric acid.

Sample Preparation

Different samples of fruits and vegetables are taken from local market (treated with chemicals) and kitchen garden (which are free from pesticides or other chemical). Cut into small pieces separately and crushed in the mortar with the help of pestle separately. While crushing each kind of vegetables and fruits add small amounts of alcohol every time into mortar and continue grinding the content with pestle. Transfer the mixture in a beaker. Filter and collect the filtrate in china dish. Sample is ready for the experiment.

III. EXPERIMENT

Place the china dish one by one over the water bath to evaporate the alcohol with occasional stirring with glass rod. Use dessicator to place china dish containing solid residue to gets completely dried during cooling. Take a small piece of freshly

cut dry sodium metal in a fusion tube. Heat the fusion tube till sodium metal melts to form shiny globule. Then add solid residue in the fusion tube. Heat it again till it becomes red hot. Break the fusion tube in china dish containing 10 ml distilled water. The unreacted sodium left will react with water to form sodium hydroxide. Concentrate the solution to nearly half volume by heating . Collect the filtrate. Add freshly prepared 1 ml ferrous sulphate solution in the filtrate. The green precipitates will form. Boil ,cool the contents, and add few drops of sulphuric acid in it. If Prussian blue colour is obtained, nitrogen is present in the residue and hence nitrogen containing insecticides/pesticides/ are present in sample of fruits and vegetables. Repeat this experiment with different sample of fruits and vegetables

IV. OBSERVATIONS

TABLE: 1 The observation of those vegetables and fruits taken from kitchen garden

S.No	Name of vegetables/fruits	Test for N (positive/negative)	insecticides/pesticides present/absent
1.	MULBERRY	NEGATIVE	ABSENT
2.	GARLIC	NEGATIVE	ABSENT
3.	BRINJAL	NEGATIVE	ABSENT
4.	GUAVA	NEGATIVE	ABSENT
5.	POTATO	NEGATIVE	ABSENT

TABLE: 2 The observation of those vegetables and fruits taken from the local market showing absence /presence of nitrogen

S.No	Name of vegetables/fruits	Test for N (positive/negative)	insecticides/pesticides present/absent
1.	BANANA	POSITIVE	PRESENT
2.	POTATO	POSITIVE	PRESENT
3.	TOMATO	POSITIVE	PRESENT
4.	GRAPES	POSITIVE	PRESENT
5.	GINGER	POSITIVE	PRESENT
6.	GARLIC	POSITIVE	PRESENT
7.	BRINJAL	POSITIVE	PRESENT
8.	POTATO	NEGATIVE	-

V. RESULTS AND DISSCUSSION

Table 1 illustrates the observation of those vegetables and fruits taken from kitchen garden showing absence of nitrogen which means these vegetable are free from pesticides/insecticides and Table 2 illustrates that fruits and vegetables collected from local market show presence of nitrogen and thus we can infer that pesticides /insecticides are present in these natural products The absence of nitrogen in potato sample does not rule out the fact that it is free from insecticides or pesticides but maybe insecticide used is nitrogen free and more study need to be done.

Effect on human beings:

Pesticides are very toxic and even small amount of these pesticides can cause long time illness. It can cause cancer, miscarriages, depression, birth defects (Quest et al 1993), tumors, genetic changes and neurological deficiencies . Acute and chronic health problems can also occur. An acute health effect involves rashes, nausea, and diarrhea while a chronic health problem includes immunotoxicity, infertility and disruption of endocrine glands.

Effects on soil:

The overuse of pesticides in agriculture land can damage the microorganisms and decrease biodiversity present in the soil. Biochemical processes are disturbed by using pesticides in nutrient cycle (Hussian et al 2009). It has detrimental consequences on soil conservation.

VI. CONCLUSION

As pesticides/insecticides are poisonous and toxic. Its residue remaining in natural products can cause danger to human beings and environment. It's important to determine the presence of pesticides/insecticides after spray. Thus from the afore mentioned experiment, we get to the conclusion, that natural products including fruits and vegetables which are basic necessities of everybody's life contain nitrogen showing presence of insecticides and pesticides.

VII. REFERENCES

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