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BIOCHEMICAL IMPACT OF PESTICIDES IN FRUITS AND VEGETABLES: A REVIEW

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Abstract

Concern over the pollution of our food supplies with hazardous pesticide residues has increased as a result of the debate in India over pesticide residues in food. Unfortunately, the discussion was limited to the rules and regulations for food and water purity at the point of consumption. It is common to overlook the more serious issue of the poisoning of all natural resources with chemical pesticide residues as a result of subpar and dangerous agricultural technology used at the farm level. No amount of standard-setting at the consumer level will be able to remedy the issue if the fundamental issue is not resolved, particularly in developing nations where regulation enforcement is infamously lax or nonexistent. Despite some pesticides being outlawed, due to their unlawful use and persistence, their residues continue to be present in food and the environment. In order to prevent the illicit use of pesticides, it is crucial to spread awareness of GAP (Good Agricultural Practices) among farmers

Keywords: Fruits, vegetables, legumes, fiber, spices, domestic procedures, pesticide residue.

1. Introduction

India has a vast range of climates and soil types, allowing a diversity of vegetable crops to be cultivated there. The cultivation of these products in our nation has received great attention over the past 20 years, and vegetable exports have increased (CHADDA, 2000). India produces 81 million t of vegetables annually from 5.12 million hectares of land, ranking second only to China in terms of global production. However, worries about chemical residues and insufficient monitoring impede the growth of the export market. Post-harvest losses are another issue, which are due to inadequate harvesting equipment, a shortage of collecting centers in important producing regions, as well as inadequate containers, industrial storage facilities, and cold chains.

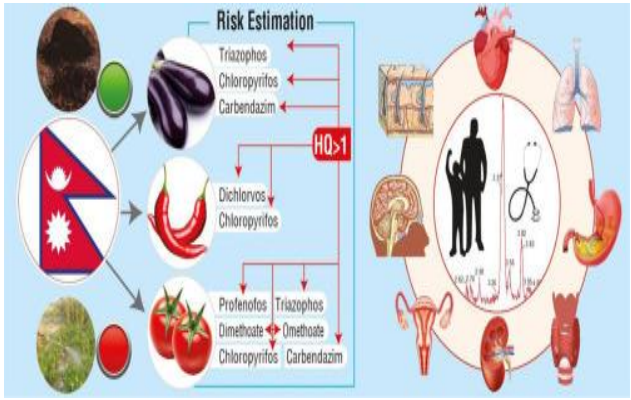
Significant losses also occur during shipment, primarily as a result of inadequate packaging and handling technology [1-5].

2. The Vegetable Pesticide Burden

2.1 India's Pattern of Pesticide Use

Currently, India uses 60 000 t of pesticides, a 33% decrease from five years ago. Over the past ten years, there has been a global 44% increase in the use of herbicides and a corresponding 30% decrease in the use of insecticides. Even if the trend in use continues to decline, insecticide residues are anticipated to remain a problem for at least another ten years as they still make up 70% of all pesticides used in India [6-9].

Figure 1: Pesticide residue and potential



health risks

2.2 The Challenge

In recent years, we have become aware of the unfavorable consequences of pesticide use, such as insect resistance to agricultural chemicals. Furthermore, the prolonged environmental persistence of some agrochemicals causes food and feed contamination, which has a number of negative effects. The 30 million non-target bioforms, which were previously safe in nature's womb, are now in danger of going extinct. They are getting fewer in number. The weak links in the food chain are now the bioaccumulation of pesticides and biomagnification processes [10].

2.3 Unsavory Chemicals

Among the pesticides that have become well-

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known, DDT and BHC (also known as HCH, Gammaxane, and Lindane) are crucial. The two main chemicals employed in agriculture and public health initiatives in India were DDT and BHC. Although they are currently only partially prohibited particularly popular because to their large range of activities and easy access at affordable prices. The fact that these compounds are stable in the environment is our main worry [11].

Table: 1 Pesticide traces in a product

Product	No. of sample analysed	Samples with no detected residues	Samples with detected residues	Samples with detection of non approved pesticides
Fruits	179	132	47	28
Pulses	79	74	5	4
Rice	72	69	3	0
Spices	219	125	94	90
Vegetables	396	290	106	66

2.4 Health risks

The majority of research on the health consequences of pesticides has been on those who are exposed to them at work, such as farmworkers and pesticide applicators. Acute OP pesticide poisonings cause symptoms like nausea, pains in the abdomen, diarrhea, dizziness, anxiety, and confusion. Although these symptoms can be fairly severe, they are frequently treatable.

There have also been a lot of research done on populations of people who use pesticides but haven't had acute poisonings severe enough to cause these kinds of symptoms. According to these research, long-term, low dose exposure is linked to a number of health issues, including cancer, Parkinson's disease, miscarriages, memory problems, skin ailments, depression, and neurological conditions including Parkinson's. Less research has been done on those who have no known occupational exposures, but one study with a nationally representative sample found an increased risk of ADD/ADHD in children aged 8 to 15 who had higher urine levels of OP pesticide metabolites. The group most at risk for negative health effects from pesticide exposure includes fetuses, newborns, growing children, pregnant and nursing mothers, and women of childbearing age.

Children are more vulnerable than adults because they consume more calories per unit of body weight than do adults. Exposures at risky stages of development can be very harmful. Pregnancy, early childhood, puberty, and infancy are among these susceptible times. Through the mother's diet, fetuses are exposed to pesticides. Breast milk exposes babies to contaminants. When agricultural and industrial employees handle pesticides and track those chemicals into their homes, where family members are exposed, acute poisoning is a recurring concern. Drift from aerial spraying may expose residents who live close to agricultural fields [12-15].

2.5 The most pesticides are found in fruits and vegetables.

The Environmental Working Group (EWG) publishes the Shopper's Guide to Pesticides in Produce, which outlines the produce categories that are most likely to contain pesticide contamination. The 'Dirty Dozen' fruits and vegetables include apples, celery, sweet bell peppers, peaches, strawberries, nectarines (imported), grapes, spinach, lettuce, cucumbers, blueberries (domestic), and potatoes. EWG advises eating organic versions of these foods. Organic kale and green beans are also suggested by EWG. Notably, juices made from fruits and vegetables can also contain pesticide traces. Furthermore, the EWG provides a list of 15 conventionally grown produce items that are free of the top 15 pesticides. Included on this list are cantaloupe (domestic) sweet potatoes, grapefruit, watermelon, onions, sweet corn, pineapple, avocado, cabbage, sweet peas, asparagus, mangoes, and kiwis [16].

2.6 According to studies, eating an organic diet can lower kids' pesticide exposure.

Children who eat conventional meals have been shown to have much greater amounts of OP pesticide metabolites in their urine than children who eat organic diets, according to studies.4 Children's meals from conventional to organic were swapped in one study5. The OP pesticide metabolite content in the urine quickly decreased to undetectable levels. The OP metabolite concentration in the urine returned to normal levels after a regular diet was resumed. It's extremely simple for parents to lessen their children's exposure to OP pesticides by purchasing organic produce when it's available and reasonably priced [17-21].

3.Conclusion

In conclusion, pesticide residues were discovered in every sample of fruits and vegetables tested from every market in the Kumasi city. A total of 37.5% of the fruit and vegetable samples examined did not contain any measurable amounts of the monitored pesticides, 19.0% of the samples produced results with pesticide residue levels above the MRL, and 43.5% of the samples produced results below the MRL. The results mentioned above imply that consumers in the Kumasi metropolitan area are exposed to levels of pesticides that may lead to chronic disorders. The results suggest the need for ongoing surveys and monitoring programs for pesticides in all food commodities in order to protect the end user from pesticide exposure that occurs without cause or warning. This recommendation is based on the findings discussed above. A longer-term study in the future might enable learning

more about the use of pesticides and the presence of these chemicals in the fruits and vegetables grown in Ghana.

Conflict Of Interest: Nil

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