FINDING NATURAL PESTICIDE

ACKNOWLEDGEMENT

Firstly I express my hearties gratitude to Almighty Allah (swt) for the blessings showered on us in every step of this venture.

I am indebted to my guides **Miss Nuzhath Jabeen** science teacher of M.S Creative High School under whose active guidance, constant supervision this thesis worked entitled "**Finding Natural Pesticide"** has been carried out. It is a great pleasure for me to acknowledge the assistant and contribution of our teachers. They have been a source of continuous inspiration to us. I owe a deep debt of gratitude to my management M.S Group of Institutions who has given us the opportunity.

I would also like to express my profound gratitude to **Mr. MisbahUddin**, Executive director of M.S Group of Institution for his valuable suggestions.

I owe a deep debt of gratitude to mu principal **Mrs. Ayesha Siddiqua** and academic cell for their supervision and providing all the resources to complete this work successfully.

I sincerely acknowledge the support, valuable advice and encouragement by **Mrs SadiyaSamreen**.

It is a great pleasure to thank all my teachers, non-teaching staff and friends for their valuable support and encouragement.

Last but not least I thank my beloved parents, who helped and encouraged.

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Finding Natural Pesticide Substances

Pesticides are often referred to according to the type of pest they control. Pesticides can also be considered as either biodegradable pesticides, which will be broken down by microbes and other living beings into harmless compounds, or persistent pesticides, which may take months or years before they are broken down: it was the persistence of DDT, for example, which led to its accumulation in the food chain and its killing of birds of prey at the top of the food chain. Another way to think about pesticides is to consider those that are chemical pesticides or are derived from a common source or production method.

Pesticides are substances meant for attracting, seducing, and then destroying, or mitigating any pest.[1] They are a class of biocide. The most common use of pesticides is as plant protection products (also known as crop protection products), which in general protect plants from damaging influences such as weeds, fungi, or insects. This use of pesticides is so common that the term *pesticide* is often treated as synonymous with *plant protection product*, although it is in fact a broader term, as pesticides are also used for non-agricultural purposes. The term pesticide includes all of the following: herbicide, insecticide, insect growth regulator, nematicide, termiticide, molluscicide, piscicide, avicide, rodenticide, predacide, bactericide, insect repellent, animal repellent, antimicrobial, fungicide, disinfectant (antimicrobial), and sanitizer.[2]

In general, a pesticide is a chemical or biological agent (such as a virus, bacterium, antimicrobial, or disinfectant) that deters, incapacitates, kills, or otherwise discourages pests. Target pests

can include insects, plant pathogens, weeds, mollusks, birds, mammals, fish, nematodes (roundworms), and microbes that destroy property, cause nuisance, or spread disease, or are disease vectors. Although pesticides have benefits, some also have drawbacks, such as potential toxicity to humans and other species. According to the Stockholm Convention on Persistent Organic Pollutants, 9 of the 12 most dangerous and persistent organic chemicals are organochlorine pesticides.

> any substance or mixture of substances intended for preventing, destroying, or controlling any pest, including vectors of human or animal disease, unwanted species of plants or animals, causing harm during or otherwise interfering with the production, processing, storage, transport, or marketing of food, agricultural commodities, wood and wood products or animal feedstuffs, or substances that may be administered to animals for the control of insects, arachnids, or other pests in or on their bodies. The term includes substances intended for use as a plant growth regulator, defoliant, desiccant, or agent for thinning fruit or preventing the premature fall of fruit. Also used as substances applied to crops either before or after harvest to protect the commodity from deterioration during storage and transport.[5]

Type of pesticide	**Target pest group**
Herbicides	Plant
Algicides or Algaecides	Algae
Avicides	Birds
Bactericides	Bacteria
Fungicides	Fungi and Oomycetes

Insecticides	Insects
Miticides or Acaricides	Mites
Molluscicides	Snails
Nematicides	Nematodes
Rodenticides	Rodents
Virucides	Viruses

Pesticides can be classified by target organism (e.g., herbicides, insecticides, fungicides, rodenticides, and pediculicides[4][6] - see table), chemical structure (e.g., organic, inorganic, synthetic, or biological (biopesticide),[7] although the distinction can sometimes blur), and physical state (e.g. gaseous (fumigant)).[7]Biopesticides include microbial pesticides and biochemical pesticides.[8] Plant-derived pesticides, or "botanicals", have been developing quickly. These include the pyrethroids, rotenoids, nicotinoids, and a fourth group that includes strychnine and scilliroside

Uses

Pesticides are used to control organisms that are considered to be harmful.[12] For example, they are used to kill mosquitoes that can transmit potentially deadly diseases like West Nile virus, yellow fever, and malaria. They can also kill bees, wasps or ants that can cause allergic reactions. Insecticides can protect animals from illnesses that can be caused by parasites such as fleas.[12] Pesticides can prevent sickness in humans that could be caused by moldy food or diseased produce. Herbicides can be used to clear roadside weeds, trees and brush. They can also kill invasive weeds that may cause environmental damage. Herbicides are commonly applied in ponds and lakes to control

algae and plants such as water grasses that can interfere with activities like swimming and fishing and cause the water to look or smell unpleasant.[13] Uncontrolled pests such as termites and mould can damage structures such as houses.[12] Pesticides are used in grocery stores and food storage facilities to manage rodents and insects that infest food such as grain. Each use of a pesticide carries some associated risk. Proper pesticide use decreases these associated risks to a level deemed acceptable by pesticide regulatory agencies such as the United States Environmental Protection Agency (EPA) and the Pest Management Regulatory Agency (PMRA) of Canada.

Pesticides can save farmers' money by preventing crop losses to insects and other pests; in the U.S., farmers get an estimated fourfold return on money they spend on pesticides.[14] One study found that not using pesticides reduced crop yields by about 10%.[15] Another study, conducted in 1999, found that a ban on pesticides in the United States may result in a rise of food prices, loss of jobs, and an increase in world hunger.[16]

DDT, sprayed on the walls of houses, is an organochlorine that has been used to fight malaria since the 1950s. Recent policy statements by the World Health Organization have given stronger support to this approach.[17] However, DDT and other organochlorine pesticides have been banned in most countries worldwide because of their persistence in the environment and human toxicity. DDT use is not always effective, as resistance to DDT was identified in Africa as early as 1955, and by 1972 nineteen species of mosquito worldwide were resistant to DDT.[18][19]

Benefits

There are two levels of benefits for pesticide use, primary and secondary. Primary benefits are direct gains from the use of pesticides and secondary benefits are effects that are more long-term.[25]

Primary benefits

1. Controlling pests and plant disease vectors

- Improved crop/livestock yields
- Improved crop/livestock quality
- Invasive species controlled

2. Controlling human/livestock disease vectors and nuisance organisms

- Human lives saved and suffering reduced
- Animal lives saved and suffering reduced
- Diseases contained geographically

3. Controlling organisms that harm other human activities and structures

- Drivers view unobstructed
- Tree/brush/leaf hazards prevented
- Wooden structures protected [25]

Health effects

A sign warning about potential pesticide exposure.

Main articles: Health effects of pesticides and Pesticide poisoning

Pesticides may cause acute and delayed health effects in people who are exposed.[28] Pesticide exposure can cause a variety of adverse health effects, ranging from simple irritation of the skin and eyes to more severe effects such as affecting the nervous system, mimicking hormones causing reproductive problems, and also causing cancer.[29] A 2007 systematic review found that "most studies on non-Hodgkin lymphoma and leukemia showed positive associations with pesticide exposure" and thus concluded that cosmetic use of pesticides should be decreased.[30] There is substantial evidence of associations between organophosphate insecticide exposures and neurobehavioral alterations. [31][32][33][34] Limited evidence also exists for other negative outcomes from pesticide exposure including neurological, birth defects, fetal death,[35]

The American Academy of Pediatrics recommends limiting exposure of children to pesticides and using safer alternatives:[36]

The World Health Organization and the UN Environment Programme estimate that each year, 3 million workers in agriculture in the developing world experience severe poisoning from pesticides, about 18,000 of whom die.[37] Owing to inadequate regulation and safety precautions, 99% of pesticide related deaths occur in developing countries that account for only 25% of pesticide usage.[38] According to one study, as many as 25 million workers in developing countries may suffer mild pesticide poisoning yearly.[39]

One study found pesticide self-poisoning the method of choice in one third of suicides worldwide, and recommended, among other things, more restrictions on the types of pesticides that are most harmful to humans.[40]

A 2014 epidemiological review found associations between autism and exposure to certain pesticides, but noted that the available evidence was insufficient to conclude that the relationship was causal.[41]

Environmental effect

Main article: Environmental effects of pesticides

Pesticide use raises a number of environmental concerns. Over 98% of sprayed insecticides and 95% of herbicides reach a destination other than their target species, including non-target species, air, water and soil.[37] Pesticide drift occurs when pesticides suspended in the air as particles are carried by wind to other areas, potentially contaminating them. Pesticides are one of the causes of water pollution, and some pesticides are persistent organic pollutants and contribute to soil contamination.

In addition, pesticide use reduces biodiversity, contributes to pollinator decline,[42] destroys habitat (especially for birds),[43] and threatens endangered species.[37]
Pests can develop a resistance to the pesticide (pesticide resistance), necessitating a new pesticide. Alternatively a greater dose of the pesticide can be used to counteract the resistance, although this will cause a worsening of the ambient pollution problem.

Since chlorinated hydrocarbon pesticides dissolve in fats and are not excreted, organisms tend to retain them almost indefinitely. Biological magnification is the process whereby these chlorinated hydrocarbons (pesticides) are more concentrated at each level of the food chain. Among marine animals, pesticide

concentrations are higher in carnivorous fishes, and even more so in the fish-eating birds and mammals at the top of the ecological pyramid.[44] Global distillation is the process whereby pesticides are transported from warmer to colder regions of the Earth, in particular the Poles and mountain tops. Pesticides that evaporate into the atmosphere at relatively high temperature can be carried considerable distances (thousands of kilometers) by the wind to an area of lower temperature, where they condense and are carried back to the ground in rain or snow.[45]

In order to reduce negative impacts, it is desirable that pesticides be degradable or at least quickly deactivated in the environment. Such loss of activity or toxicity of pesticides is due to both innate chemical properties of the compounds and environmental processes or conditions.[46] For example, the presence of halogens within a chemical structure often slows down degradation in an aerobic environment.[47] Adsorption to soil may retard pesticide movement, but also may reduce bioavailability to microbial degraders.[48]

Effectiveness

Some evidence shows that alternatives to pesticides can be equally effective as the use of chemicals. For example, Sweden has halved its use of pesticides with hardly any reduction in crops.[37][*unreliable source?*] In Indonesia, farmers have reduced pesticide use on rice fields by 65% and experienced a 15% crop increase.[37][*unreliable source?*] A study of Maize fields in northern Florida found that the application of composted yard waste with high carbon to nitrogen ratio to agricultural fields was highly effective at reducing the population of plant-parasitic nematodes and increasing crop yield, with yield increases ranging from

10% to 212%; the observed effects were long-term, often not appearing until the third season of the study.[50]

However, pesticide resistance is increasing. In the 1940s, U.S. farmers lost only 7% of their crops to pests. Since the 1980s, loss has increased to 13%, even though more pesticides are being used.[*dubious*– *discuss*] Between 500 and 1,000 insect and weed species have developed pesticide resistance since 1945.[55][*unreliable source?*]

Health effects of pesticides

From Wikipedia, the free encyclopedia

A sign warning about potential pesticide exposure.

Health effects of pesticides may be acute or delayed in those who are exposed.[1] A 2007 systematic review found that "most studies on non-Hodgkin lymphoma and leukemia showed positive associations with pesticide exposure" and thus concluded that cosmetic use of pesticides should be decreased.[2] Strong evidence also exists for other negative outcomes from pesticide exposure including neurological problems, birth defects, fetal death,[3] and neurodevelopmental disorder.[

Acute health problems may occur in workers that handle pesticides, such as abdominal pain, dizziness, headaches, nausea, vomiting, as well as skin and eye problems.[7] In China, an estimated half million people are poisoned by pesticides each year, 500 of whom die.[8]Pyrethrins, insecticides commonly used in common bug killers, can cause a potentially deadly condition if breathed in.[9]

Long-term effects

Cancer

Many studies have examined the effects of pesticide exposure on the risk of cancer. Associations have been found with: leukemia, lymphoma, brain, kidney, breast, prostate, pancreas, liver, lung, and skin cancers.[6] This increased risk occurs with both residential and occupational exposures.[6] Increased rates of cancer have been found among farm workers who apply these chemicals.[10] A mother's occupational exposure to pesticides during pregnancy is associated with an increases in her child's risk of leukemia, Wilms' tumor, and brain cancer.[6][11] Exposure to insecticides within the home and herbicides outside is associated with blood cancers in children.[12]

Neurological

Evidence links pesticide exposure to worsened neurological outcomes.[3] The risk of developing Parkinson's disease is 70% greater in those exposed to even low levels of pesticides.[13] People with Parkinson's were 61% more likely to report direct pesticide application than were healthy relatives. Both insecticides and herbicides significantly increased the risk of

Parkinson's disease.[14] There are also concerns that long-term exposures may increase the risk of dementia.[15]

The United States Environmental Protection Agency finished a 10-year review of the organophosphate pesticides following the 1996 Food Quality Protection Act, but did little to account for developmental neurotoxic effects, drawing strong criticism from within the agency and from outside researchers.[16][17] Comparable studies have not been done with newer pesticides that are replacing organophosphates.[18]

Reproductive effects

Strong evidence links pesticide exposure to birth defects, fetal death and altered fetal growth.[3] In the United States, increase in birth defects is associated with conceiving in the same period of the year when agrochemicals are in elevated concentrations in surface water.[19]Agent Orange, a 50:50 mixture of 2,4,5-T and 2,4-D, has been associated with bad health and genetic effects in Malaya and Vietnam.[20][21] It was also found that offspring that were at some point exposed to pesticides had a low birth weight and had developmental defects.

Environmental impact of pesticides

From Wikipedia, the free encyclopedia

(Redirected from Effects of pesticides on birds)

Preparing to spray a hazardous pesticide

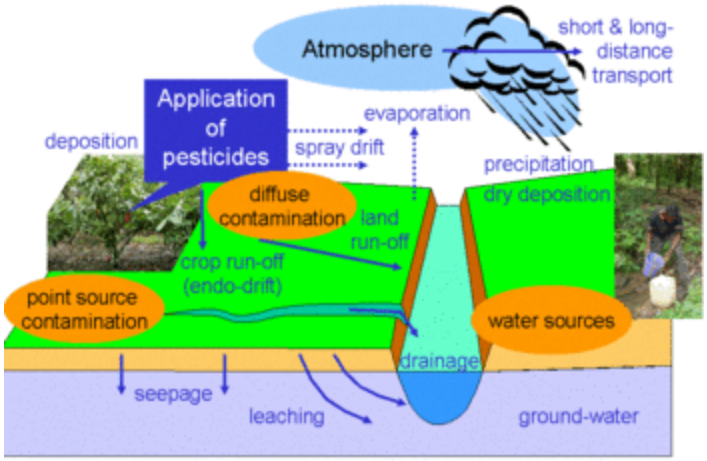
Drainage of fertilizers and pesticides into a stream

The **environmental impact of pesticides** consists of the effects of pesticides on non-target species. Over 98% of sprayed insecticides and 95% of herbicides reach a destination other than their target species, because they are sprayed or spread across entire agricultural fields.[1] Runoff can carry pesticides into aquatic environments while wind can carry them to other fields, grazing areas, human settlements and undeveloped areas, potentially affecting other species. Other problems emerge from poor production, transport and storage practices.[2] Over time, repeated application increases pest resistance, while its effects on other species can facilitate the pest's resurgence.[3]

Each pesticide or pesticide class comes with a specific set of environmental concerns. Such undesirable effects have led many pesticides to be banned, while regulations have limited and/or

reduced the use of others. Over time, pesticides have generally become less persistent and more species-specific, reducing their environmental footprint. In addition the amounts of pesticides applied per hectare have declined, in some cases by 99%. However, the global spread of pesticide use, including the use of older/obsolete pesticides that have been banned in some jurisdictions, has increased overall.[

Water



Pesticide pathways

In the United States, pesticides were found to pollute every stream and over 90% of wells sampled in a study by the US Geological Survey.[30] Pesticide residues have also been found in rain and groundwater.[31] Studies by the UK government showed that pesticide concentrations exceeded those allowable for drinking water in some samples of river water and groundwater.[32]

Pesticide impacts on aquatic systems are often studied using a hydrology transport model to study movement and fate of chemicals in rivers and streams. As early as the 1970s quantitative analysis of pesticide runoff was conducted in order

to predict amounts of pesticide that would reach surface waters.[33]

There are four major routes through which pesticides reach the water: it may drift outside of the intended area when it is sprayed, it may percolate, or leach, through the soil, it may be carried to the water as runoff, or it may be spilled, for example accidentally or through neglect.[34] They may also be carried to water by eroding soil.[35] Factors that affect a pesticide's ability to contaminate water include its water solubility, the distance from an application site to a body of water, weather, soil type, presence of a growing crop, and the method used to apply the chemical.[36]

Maximum limits of allowable concentrations for individual pesticides in public bodies of water are set by the Environmental Protection Agency in the US.[31][36] Similarly, the government of the United Kingdom sets Environmental Quality Standards (EQS), or maximum allowable concentrations of some pesticides in bodies of water above which toxicity may occur.[37] The European Union also regulates maximum concentrations of pesticides in water.[37]

Effect on plants

Crop spraying

Nitrogen fixation, which is required for the growth of higher plants, is hindered by pesticides in soil.[42] The insecticides DDT, methyl parathion, and especially pentachlorophenol have been shown to interfere with legume-rhizobium chemical signaling.[42] Reduction of this symbiotic chemical signaling results in reduced nitrogen fixation and thus reduced crop yields.[42]Root nodule formation in these plants saves the world economy $10 billion in synthetic nitrogen fertilizer every year.[43]

Pesticides can kill bees and are strongly implicated in pollinator decline, the loss of species that pollinate plants, including through the mechanism of Colony Collapse Disorder,[44][45][46][47][*unreliable source?*] in which worker bees from a beehive or western honey bee colony abruptly disappear. Application of pesticides to crops that are in bloom can kill honeybees,[23] which act as pollinators. The USDA and USFWS estimate that US farmers lose at least $200 million a year from reduced crop pollination because pesticides applied to fields eliminate about a fifth of honeybee colonies in the US and harm an additional 15%.[1]

On the other side, pesticides have some direct harmful effect on plant including poor root hair development, shoot yellowing and reduced plant growth.[48]

Humans

Pesticides can enter the body through inhalation of aerosols, dust and vapor that contain pesticides; through oral exposure by consuming food/water; and through skin exposure by direct contact.[59] Pesticides secrete into soils and groundwater which

can end up in drinking water, and pesticide spray can drift and pollute the air.

The effects of pesticides on human health depend on the toxicity of the chemical and the length and magnitude of exposure.[60] Farm workers and their families experience the greatest exposure to agricultural pesticides through direct contact. Every human contains pesticides in their fat cells.

Children are more susceptible and sensitive to pesticides,[59] because they are still developing and have a weaker immune system than adults. Children may be more exposed due to their closer proximity to the ground and tendency to put unfamiliar objects in their mouth. Hand to mouth contact depends on the child's age, much like lead exposure. Children under the age of six months are more apt to experience exposure from breast milk and inhalation of small particles.

REVIEW OF LITERATURE

LEMON AS A NATURAL PESTICIDE:

Lemon juice can sometimes act as an organic pesticide.

Many gardeners look for natural and cheap alternatives to the sometimes expensive, chemical pesticides found in most garden centers. Often, you don't need to go any farther than your pantry to find such alternatives. Lemon juice, for example, can sometimes help control small infestations of garden pests, such as ants, aphids and leaf beetles. Because lemon juice is also an ingredient found in some natural herbicides, often coupled with vinegar, use it with caution so you do not cause more harm than good in the garden.

Evaluation of pesticide residue in grape juices and the effect of natural antioxidants on their degradation.

Various studies have been drawn toward the beneficial properties of fruit juices because they have several components, such as phenols, vitamins, and flavonoids, with antioxidant effects. However, fruit juices can also contain residues of pesticides used as standard pest control methods in crops. Many of these pesticides are degraded through oxidative mechanisms, and their persistence in juices can be enhanced by antioxidants.

Finding Natural Pesticide Substances

The purpose is to try to find natural substances that will act as a pesticide that can be safely used around the home.

Insect pests are something everyone must deal with around their home. Sour flies around fruit and ants in the kitchen can be a nuisance. Hardware stores and supermarkets sell chemical pesticides, often in aerosol bottles, to spray in your home. But, some pesticide chemicals have the potential of being hazardous to our health. We want to be careful about using chemicals around the eating areas of our home, in rooms where children play, and in our yards when well water supplies our home.

Are there more natural substances we could use to keep away common household pests, such as flies, sour flies, and ants? Natural substances (lemon juice or tea, for example) would not only be safer, but they also might smell better than a commercial pesticide product.

EXPERIMENTAL WORK

HYPOTHESIS:-

I base my hypothesis on a serious note whenever my mother prepares any sweet dish. She gets afraid of flies and ants that will gather around the eating areas. I thought of preparing pesticide with citrus fruits and vegetables as it has anti-oxidant and anti-repellant activity.

MATERIALS REQUIRED:-

- 1 empty bottle
- Black ants (collected from anthill)
- 1 pair of gloves
- 1 lemon
- 1 tomato
- 1 orange
- 3 plastic containers

PROCEDURE:-

For this experiment the independent variable is the type of juice used lemon, orange, tomato. The dependent variable is the movement of ants in and out of the circle this is determined by observing the ants cross the line made from the juice

A small anthill is located weaving laten gloves collect as many ants as possible on an empty bottle once you can have collected the ants close the cover and put the bottle aside.

Using the juice extractor prepare lemon tomato orange juice and pour them into 3 cups

Make 3 circles with all the three juices of lemon juice, tomato juice and orange juice.

This is determined by observing the ants crossing the circle made from the juices.

Collect some of the ants from anthill and release into each of the circle and observe that the ants are able to cross the circle drawn with the juices and can exit it.

QUESTIONING:-

What are pesticides?

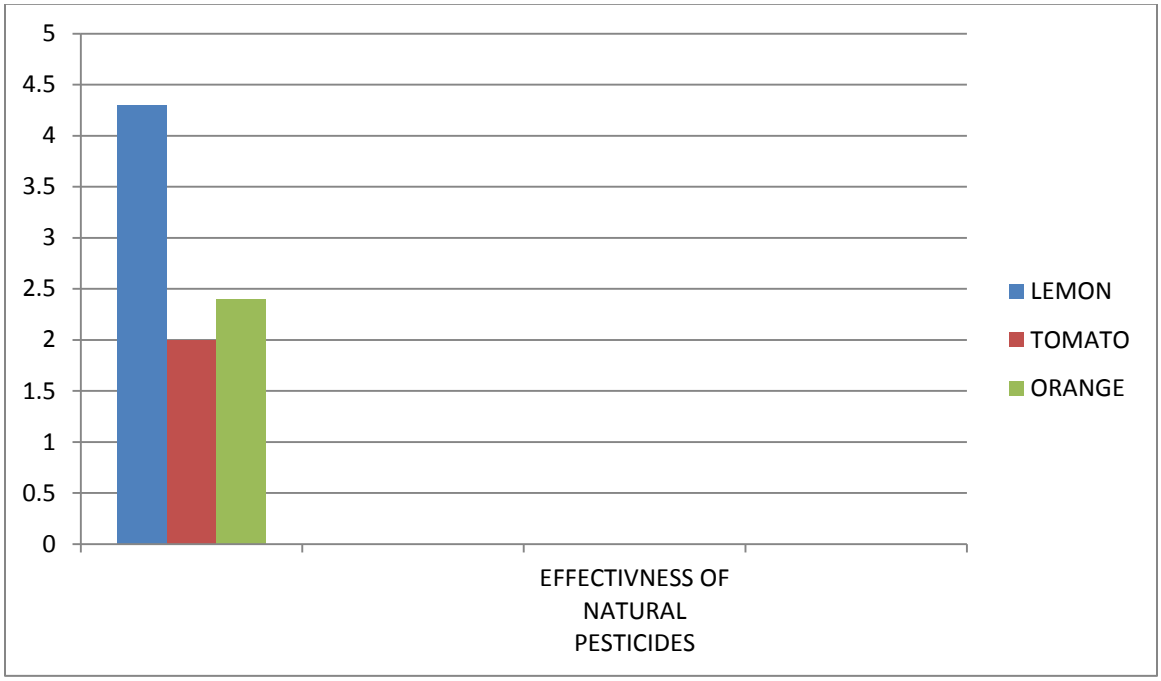
Are chemical pesticides harmful?

Can we prepare pesticide from home ingredients?

RESULT:

By the above conducted experiment it was clearly seen that the citrus fruits and vegetables can be used as natural pesticides.Ants have crossed the circle of tomato and carrot but they did not cross the circle of lemon. I have found lemon juice to be more effective than orange and tomato juice.

GRAPH:


5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
LEMON
TOMATO
ORANGE
EFFECTIVNESS OF
NATURAL
PESTICIDES

DATA ANALYSIS

S.NO	VARIABLES	RESULT
1	LEMON JUICE	MORE EFFECTIVE
2	TOMATO JUICE	LESS EFFECTIVE
3	ORANGE JUICE	LESS EFFECTIVE

Natural pesticide	Lemon juice	Orange juice	Tomato juice
Result	Y	X	X

Y- The ants did not exit the circle.

X- The ants escaped from the circle.

CONCLUSION: -

By the above conducted experiment my hypothesis was proven to be correct as citrus fruits and vegetables are proved to be used as natural pesticides.We can use lemon as a natural pesticide. Rather than using chemicals harmful pesticides.

BIBLIOGRAPHY:

www.education.com/science-fair/

https://www.wikipedia.org/

www.encyclopedia.com/topic/Pesticides.aspx

www.thefruitpages.com/citrus.shtml