

# **RESEARCH ARTICLE**

## PESTICIDE USE AND CONSEQUENCES (LITERARY REVIEW)

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# Manuscript Info Abs

*Manuscript History* Received: 10 November 2021 Final Accepted: 14 December 2021 Published: January 2022 Abstract

..... Pesticides are derived from the Greek word pestis - pest, cido - to destroy, and are substances used to exterminate, repel or reduce plant pests or to act as plant growth regulators, as well as nitrogen stabilizers, plant defoliants, or desiccants. Pesticides are primarily used in agriculture, but about half of the 200 pesticides registered today are widely used by non-agricultural organizations such as hospitals. restaurants, and decontamination services. Pesticide misuse is a big problem not only in Mongolia but all over the world. When this toxic chemical is sprayed on crops, plants, and soil, it accumulates and is released back into the living organism through soil, air, and atmospheric degradation, resulting in poisoning and sickness.Pesticide levels in vegetables and food brought into Mongolia must be kept under strict monitoring.Furthermore, assessments of the types and applications of imported pesticides, as well as their residues in food, reveal the need for further detailed research into pesticide exposure and its negative consequences on human health in Mongolia.

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# Introduction:-

#### **Rationale:**

Pesticides are an internationally accepted term for chemicals used in agriculture andhouseholds to control plant diseases, weeds, pests, larvae, rodents, animal endoparasites and exoparasites. Pesticides are derived from the Greek word pestis - pest, cido - to destroy, and are substances used to exterminate, repel or reduce plant pests or to act as plant growth regulators, as well as nitrogen stabilizers, plant defoliants, or desiccants. Pesticides are primarily used in agriculture, but about half of the 200 pesticides registered today are widely used by non-agricultural organizations such as hospitals, restaurants, and decontamination services. Pesticide misuse is a big problem not only in Mongolia but all over the world. When this toxic chemical is sprayed on crops, plants, and soil, it accumulates and is released back into the living organism through soil, air, and atmospheric degradation, resulting in poisoning and sickness.

Pesticides are categorised according to their intended use. These include:

- 1. Insecticides- substances used to kill insects
- 2. Acaricides pesticides that kill members of the arachnid subclass Acari, which includes ticks and mites
- 3. Molluscicide a substance against molluscs
- 4. Fungicides a substance against fungi (including blights, mildews, molds)
- 5. Herbicides substances destroy or inhibit the growth of weeds
- 6. Zoocides substances that kill small rodents

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- 7. Bactericide- a substance that kills bacteria
- 8. Defoliants a substance that stimulates plants to shed their leaves
- 9. Deflorants-a substance for removal of superfluous flowers
- 10. Desiccants- substances that prevent plants from drying out.
- 11. Ovicides substances that kill eggs of insects and mites
- 12. Larvicides substances that kill mosquito larvae

Long-lasting, broad-spectrum pesticides are called insecto-fungicides. Fruits and vegetables use the most pesticides (38.9%), whereas cotton, rice, and corn use 22.8 percent, 16.1 percent, and 99 percent, respectively. Pesticides are used in 93 percent of rice production in Asia.

According to WHO statistics, annually 800 million people try to commit suicide, and 18 million people die.Researchers believe it's because of the pesticide's effect on the nervous system.In developing countries, pesticide poisoning and suicide are not uncommon. Pesticides have become the silent killers of humanity. Over time, plant pests developpesticide resistance, which has led to the need to increase the dosage and produce new varieties of enhanced pesticides. At the same time, research began on the effects of pesticides on human and animal health and the environment.

In addition to causing cancer, it can also affect the nervous system, leading to speech impairments, depression, concentration difficulties, poor memory, and decreased physical stamina. In addition, some pesticides can affect the reproductive system, resulting in birth defects, infertility, miscarriage, fetal growth retardation, fetal death, and decreased sperm count. Research has shown that children born to parents poisoned with pesticides have congenital neurological and cardiac abnormalities, cleft lip, skeletal malformations, and poor resistance to bacteria, viruses and cancer cells.

The Convention on Persistent Organic Pollutants was adopted in 2001 in Stockholm (Sweden) with the aim to protect human health and the environment from the harmful effects of persistent organic pollutants, supported and acceded to by more than 100 countries, including Mongolia in 2002. Organic pollutants include 12 substances, including aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, polychlorinated biphenyls, polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans, and toxaphene. The convention bans the production, consumption, import and export of pesticides such as aldrin, chlordane, dieldrin, endrin, hexachlorobenzene, mirex toxaphene, and polychlorinated biphenyls. These substances are often used in the food and agriculturesectors. However, DDT is a pollutant whose use is prohibited or restricted by the agreement. 40-80 mg of this persistent organic matter is lethal. Over the past 40 years, more and more attention has been paid to the harmful effects of organic pesticides on human health, especially in infants.For example, dichlorodiphenyltrichloroethane and its metabolites (DDT) have been shown to increase the amount of nucleus in cells, which is considered a key indicator of DNA damage. Some scientists have suggested that organochlorine polychlorinated compounds as hexachlorocyclohexane isomers, biphenyls, such and dichlorodiphenyltrichloroethane and its metabolites have hormone-like effects. While some PCBs exist in within acceptable limits in the environment, some epidemiological studies have shown that they adversely affect the mental development of children. In 2001, Longnesker et al. found a strong correlation between maternal dichlorodiphenyltrichloroethane levels, preterm birth, and low birth weight infants. Chlorpyrifos is the most widely used organic phosphorus compound. The specific and main metabolite of chlorpyrifos in the human body is 3,5,6trichloro-2-pyridinyl. A biomarker for the effects of chlorpyrifos, triclopyr and chlorpyrifos-methyl is the determination of trichloro-2-pyridinyl in urine. Bisphenol A (BPA) is used in the production of polycarbonate plastics for the production of raw rubber. Mixing food with materials containing biphenol can lead to exposure to BPA, and in some cases to dentalfillerscan also lead to BPA exposure. Bisphenol is rapidly excreted by glucose in the urine.

#### Food contamination with pesticides:

Violation of safety and hygiene rules during the use, transportation and storage of chemical toxins can lead to food contamination with pesticides and adverse effects on human health. A study in the United States found that more than half of the 1 mg of pesticide that enters the human body each week comes from animal products The Expert Committee on Pesticide Residues in Food (PRiF) in the United Kingdom studied milk, honey, canned salmon, kiwi, fruit, grapes, lemons, cereals, and other items in 2001, finding pesticides in 29 percent of the 450 samples and high quantities of residues in roughly 10%. According to the results of the analysis conducted by the Pesticides and

Toxicology Laboratory of the Metropolitan Professional Inspection Department of Mongolia, in 2006, pesticides were detected in 1.5% of the 550 samples of fruits and vegetables. In 2007, 1950 samples of fruits and vegetables weretested for organochlorine and phosphorus levels and hexachloride benzene, diazinon, and metaphos were found in tomatoes, carrots, potatoes, fuji apples, Chinese onions, beets, cabbage, and garlic.

#### Pesticide use in Mongolia:

Since 2000, a joint order of the Ministry of Environment, Food, Agriculture and Ministry of Health has approved a "List of pesticides that can be used for plant protection purposes and their dosage" and only pesticides in this listisimported by licensed companies. For example, in 2013, a total of 107 types of substances were approved for import, including 150 tons of insecticides, 1,100 tons of herbicides, 150 tons of fungicides and 15 tons of rodenticides. The relevant professional organizations should pay attention to the fact that paraquat which is approved in Mongolia was banned from general use in the "List of pesticides prohibited for global use" issued by Sustainable Agriculture Network's International Standards Committee andBoard of Directors in 2011. "Prevalence of Non-Communicable Disease Risk Factors", a joint 2010 study by the Public Health Institute and the MCA-Mongolia has shown that since some Mongolian laboratories analyze pesticide residues in food only by thin-layer chromatography and report that the content of pesticides in imported and domestic fruits and vegetables is high enough to cause cancer, consumers (45% of respondents due to poor food quality) are unable to consume fruits and vegetables properly following healthy eating recommendations.

According to a study carried out by professors and students of the HSUM Department of Food Chemistry in 2007-2008, pesticide residues detected in amounts that can adversely affect human health in imported vegetables to Mongolia (150 mg% -73 mg%) and vegetables grown in Mongolia(30 mg%). In 2010-2012, the Center for Nutritional Research of the Institute of Public Health conducted a study "Chemical pollution and risk assessment of imported food for the population of Mongolia" on 152 samples of 9 types of imported food. The analyses of 10 pesticide residues such as aldicarb, azinphos-ethyl, boscalid, flusilazole, carbendazim, azinphos-methyl, buprofezin, lambda-cyhalothrin, diphenylamine and diazinonwere carried out in the accredited laboratory of Chemistry and Toxicology of the Mongolian Center for Disease Control and Prevention according to the analytical methods used in the European Union. The study showed that 1-5 types of pesticides were found in products such as white rice and millet, barley, pasta, buckwheat, raisins, tomatoes, carrots, garlic, potatoes, canned fish, nuts, and tea, and azinphos-methylin milk and sour cream samples; azinfos-ethyl in pasta; diazinon in 9 products such as pasta, wheat flour, millet, rice and nuts; buprofezin in rice, wheat flour, carrots, potatoes, butter, cheese, tea; lambda-cyhalothrin in rice, wheat flour, carrots, potatoes, butter, cheese, tea; lambda-cyhalothrin in rice, wheat flour, nuts, and spices; boscalid in nuts; residual levels of flucylazole in 13 foods such as rice, flour, potatoes, vegetables, etc. all exceeded Mongolian and international standards and guidelines for pesticide residues.

However, residual levels of diazinon which was found in rice and garlic samples; buprofezin in millet samples, boscalid in buckwheat, diphenylamine in buckwheat and nutswere within the permitted level specified in the relevant standard. In accordance with international recommendations, the assessment of the risk of food consumption in relation to pesticide residues is statistically significant, since the daily dose of flusilazole for some imported foods does not pose a risk to human health equal to the acceptable daily dose of the pesticide. In 2008, the Central Laboratory of the Moscow Specialized Inspection Directorate analyzed the residues of chlorine organic pesticides in 243 food products, in the analysis of 309 food products, it was determined that potatoes, cabbage, carrots, onions, carrots, tomatoes, kimchi and pickles, apples, grapes and other fruits were all within the permissible limits specified in the standard.In addition, in 2009-2011, 162 samples of imported potatoes and vegetables were found to contain acceptable levels of organochlorine and organophosphate pesticides, and, levels of permethrin, hexachlorobenzene and deltamethrin in 266 samples were found to be acceptable.

## **Conclusion:-**

Pesticide levels in vegetables and food brought into Mongolia must be kept under strict monitoring.Pesticides are one of the main causes of miscarriages and premature birth in pregnant women, as they alter other hormones in humans and animals; damage the immune system, cause cancer and mental retardation. This is an alarming signal for our small country. Therefore, it is important to educate farmersonthe type of pesticides that can be used, how to use them correctly, and train consumers checking where and how much fertilizer was used when buying vegetables. Furthermore, assessments of the types and applications of imported pesticides, as well as their residues in food, reveal the need for further detailed research into pesticide exposure and its negative consequences on human health in Mongolia.

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