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Comparative Effects of *Moringa oleifera* upon Blood of *Clarias batrachus (Linnaeus, 1758)* Infected by Fenvalerate and Cypermethrin

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Abstract: ***After the application of Moringa oleifera as a herbal agent upon the infected Catfish Clarias batrachus (Linnaeus, 1758) by Fenvalerate and Cypermethrin used as Insecticide and Pesticides shows many Biochemical fluctuations in their Comparative parameters. Fishes were acclimatized with pesticides for 96 hours (4 days) in two different tanks. Concentration of toxic agent Cypermethrin and Fenvalerate was taken as 0.25 µg/l of LC50 ¼ from 20EC stock solution and 25 µg/l of LC50 1/10 respectively which was continued as studies at every 24h of time interval as lethal concentration for acute toxicity. Powder of dried grinded green leaves and pod of herbal agent Moringa oleifera used in ratio of 1:1 proportion respectively taken as 0.125 gm / litre according to the capacity of water per day continued till 120 h of dose acclimatization upon fish infected with both pesticidal agents individually. Haematological changes were observed and compared among Normal, Fenvalerate, Cypermethrin, Fen Mo and Cyp Mo conditions.***

Keywords: Moringa oleifera, Clarias batrachus (Linnaeus, 1758), Fenvalerate, Cypermethrin, Blood, Toxicity.

I. INTRODUCTION

Fenvalerate and Cypermethrin are types of Pyrethroid group of insecticides also used as Pesticides widely for preventing, destroying, or repelling any organism that may be considered harmful in commercially grown fruits, vegetables, and meats; which give support for the rise of toxicity in the blood and other body system of either in insects or in other animals, when these are conveyed *via* the different fruits and vegetables taken as food.

Fenvalerate is most toxic to bees and fish. It is found in some emulsifiable concentrates, ULV, wettable powders, slow-release formulations, insecticidal fogs and granules. It is most used to control insects in food, feed and cotton products as well as control the flies and ticks in barns and stables. These long-lasting trains can cause hundreds to thousands of repetitive nerve impulses in the sense organs.

This action is especially critical to fish and aquatic insects where ATPase enzymes provide the energy necessary to active transport, and are very important at sites of oxygen exchange. ATPase inhibition and disruption of active transport, possibly affect ion movement and the ability to maintain ion balance, and disrupt respiratory surfaces, indicating that Cypermethrin is inherently more toxic to aquatic organisms (Siegfried, 1993).

Cypermethrin can induce impairments of the structure of seminiferous tubules and spermatogenesis in male rats at high doses (Hu, *et al.*, 2011). Long-term exposure to cypermethrin during adulthood is found to induce dopaminergic neurodegeneration in rats, and postnatal exposure enhances the susceptibility of animals to dopaminergic neurodegeneration if rechallenged during adulthood (Singh, *et al.*, 2012).

Moringa oleifera (Drumstick) is used in the medicinal terms by the different extracts of their wholly parts in the terms of the roots which are bitter, acrid, thermogenic, digestive, carminative, constipating, emmenagogue, diuretic, ophthalmic, expectorant and stimulant. Leaves are anti-inflammatory, anodyne, anthelmintic, ophthalmic and rich in Vitamin A and C. Leaves of *Moringa oleifera* are anodyne, anthelmintic, and rich in Vitamin A and C. They are useful in treating diabetes, scurvy, tumors, inflammations and helminthiasis. The approximate composition of *Moringa oleifera* seeds shows levels of proteins 377.5 ± 1.9 g/kg dry matter higher than those found in important legumes for human nutrition 149-220 g/kg .In fact, cytochemistry analysis performed in detected a large amount of cotyledonary protein bodies .The oil content 363.2 ± 2.6 g /kg is greater than that of soybean varieties (Ferreira *et al.*,2009).

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Moringa oleifera is Zeatin king, in comparison to other plants. Zeatin is linked to anti-aging or the slowing down of aging processes in the human body. Zeatin is a more natural way to support skin health by regenerating new skin cells. When the diet includes these plant nutrients, the body as a whole can fight aging, starting at the cellular level. Zeatin plays a vital role in keeping the plants green for a longer period of time (Yasmeen, 2011).

II. METHODOLOGY

A. *Fish*

Adult Catfish *Clarias batrachus (Linnaeus,1758)* of the same stock having mean weight of 400-600 grams and the length was ranging from 40-45 cm were purchased from the nearby hatchery dealer acclimated in the laboratory conditions for 96 hours were fed daily with commercial pedigree pellets (Discus Tokyu) and wheat flour mixed meat mincer pellets.

B. *Chemical and Method*

Fishes were acclimatized with pesticides Fenvalerate and Cypermethrin mixed toxic agent in two different tanks for 96 hours (4 days) as 20EC stock solution concentration was taken as LC50 ¼ for 24 h, was found to be 0.25 µg/l in Cypermethrin and for Fenvalerate as LC50 1/10 for 24 h was 25 µg/l, which was continued as studies at every 24h of time interval as lethal concentration for acute toxicity.

The ratio of 1:1 proportion of dried and grinded green leaves and pod of *Moringa oleifera* as herbal test dose powder used respectively with concentration of 0.125 gm / litre according to the capacity of water per day and continued till 120 h of dose acclimatization upon fish infected with both pesticidal agents individually.

Water changed at every level of Normal, Fenvalerate, Cypermethrin, Fen Mo and Cyp Mo. Fishes were brought to unconscious by the help of anaesthetic agent without sacrificing of fish during withdrawal of blood and then brought back into consciousness stage in water tanks. Biochemical changes were observed and compared among Normal, Fenvalerate, Cypermethrin, Fen Mo and Cyp Mo conditions.

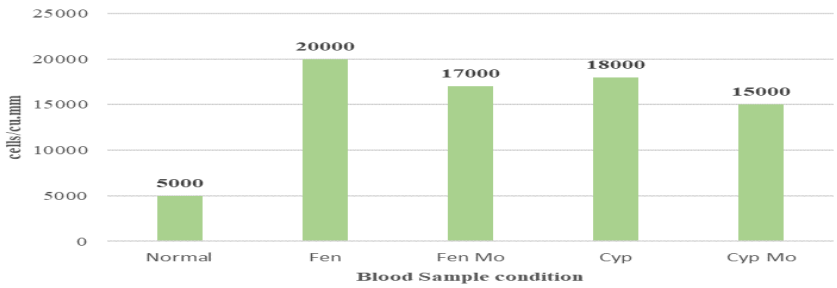
III.RESULT AND DISCUSSION

After the applied dose of Fenvalerate of 25 µg/l of LC50 1/10 and Cypermethrin of 0.25 µg/l of LC50 ¼ from 20EC stock solution shows that both Fenvalerate and Cypermethrin poses harmful reaction with the Fish blood parameters as shown in Table 1.

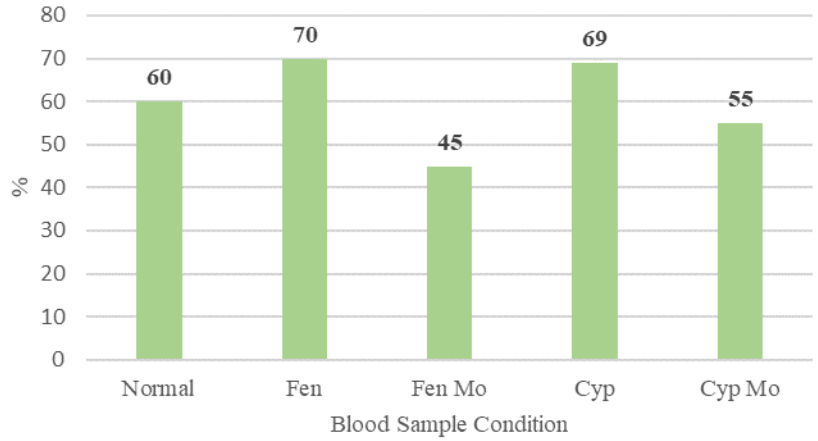
Some parametric measures of these blood components also show fluctuation when herbal agent *Moringa oleifera* was given in Fenvalerate and Cypermethrin infected fishes as shown in graphs. Total WBC Count shows recovery sign at the given estimated dose of *Moringa oleifera* in both Fenvalerate and Cypermethrin infected Fish. Same situation of recovery also seen in Neutrophils; but in case of Lymphocyte there are no recovery sign seen after the application of *Moringa oleifera* fish infected by Fenvalerate and Cypermethrin. The FenMo and CypMo crosses above the Normal range according to the estimate dose duration. It also indicates that if dose will be controlled earlier accordingly before the estimated dose duration, then in Lymphocyte case a Recovery sign can also been seen.

Haematological Blood Parameter	Normal	Fen	Fen Mo	Cyp	Cyp Mo
Total WBC Count (4000-17500cells/cu.mm)	5000	20000	17000	18000	15000
Neutrophils (38-62 %)	60	70	45	69	55
Lymphocytes (30-37 %)	30	28	43	28	43

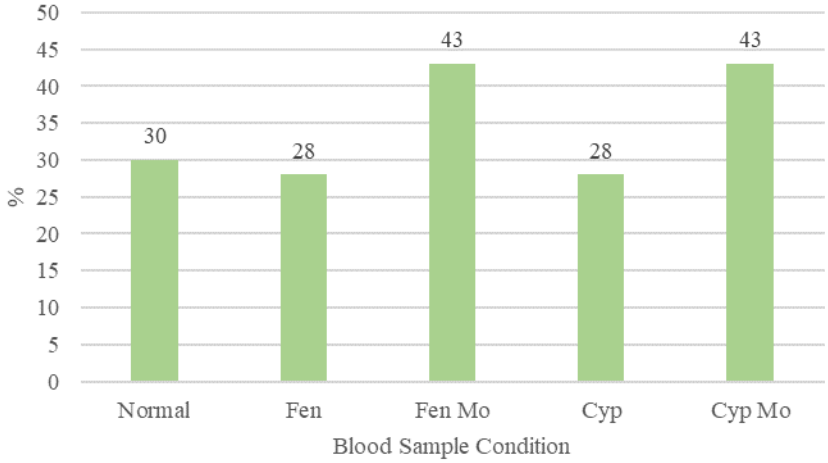
Table1: WBC Group test results of *Moringa oleifera* in Fenvalerate and Cypermethrin



Graph 1: Total WBC Count (4000-17500 cells/cu.mm)



Graph 2: Neutrophils (38-62%)



Graph 3: Lymphocytes (30-37%)

IV. CONCLUSIONS

Thus, it is justifying that *Moringa oleifera* can help in recovery of estimated dose concentration of 0.125 gm / litre according to the capacity of water per day continued till 120 h of dose acclimatization upon fish *Clarias batrachus (Linnaeus ,1758)* infected by Fenvalerate and Cypermethrin.

Also, the applied herbal agent *Moringa oleifera* appear as a Recovery agent in recover of Total WBC Count and Neutrophils infected by Cypermethrin and Fenvalerate.

V. GLOSSARY

1) Cyp- Blood sample of fish *Clarias batrachus (Linnaeus ,1758)* infected with Cypermethrin
2) Fen- Blood sample of fish *Clarias batrachus (Linnaeus ,1758)* infected with Fenvalerate
3) Mo- Blood sample of fish *Clarias batrachus (Linnaeus ,1758)* with recovery agent *Moringa oleifera*
4) CypMo – Blood sample of fish *Clarias batrachus (Linnaeus ,1758)* after dose of *Moringa oleifera* upon fish infected with Cypermethrin
5) FenMo – Blood sample of fish *Clarias batrachus (Linnaeus ,1758)* after dose of *Moringa oleifera* upon fish infected with Fenvalerate

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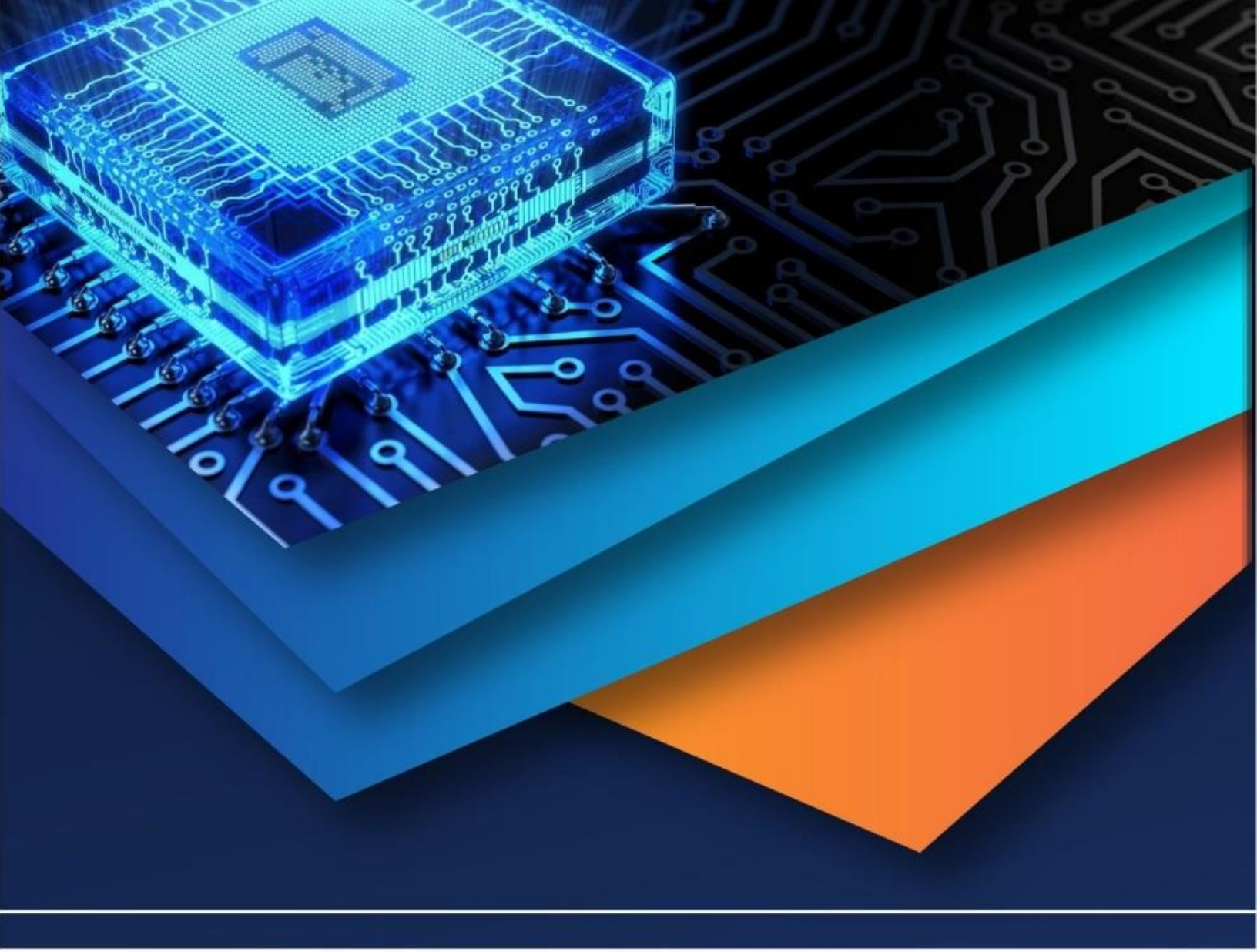
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