

# STATISTICAL ANALYSIS OF CUMULATIVE PERCENTAGE OF ADULT MORTALITY OF PESTS i.e. *R.dominica* & *C. maculatus*. AT DIFFERENT CONCENTRATION AFTER TREATMENT WITH PLANT PRODUCTS i.e. *E. crassipes*, *I. carnea*, & *A. calamus*..

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**ABSTRACT:-** Leaf powder of *E. crassipes*, *I. carnea* & *A. calamus* was taken in different ratio for finding comparative statistical analysis of cumulative percentage of adult mortality of coleopteron pests i.e. *R.dominica* & *C. maculatus* infesting rice & gram respectively.

In this analysis, five pairs of freshly emerged adult of *R.dominica* & *C. maculatus* were released separately in each experimental replication. The weight taken for each experiment was 100gm. of rice & pulse (gram), respectively. All experiments were set up at same temp. & relative humidity 60-70% with equal degree of ventilation. In this experiment; six doses (0.5g, 1g, 1.5g, 2g, 2.5g & 3g) of plant pesticides were used for such treatment. Result showed quicker adult mortality in different percentage that depends upon dose & duration of plant products. Statistical analysis was done for variability of result obtained through various parameters. The measure of proportional variation made to serve about effectiveness of plant products. So, the clear & remarkable picture has been come during comparative study of statistical analysis of effectiveness of different doses of plant products on adult mortality of above pests.

**KEY WORDS :-** Plant products-*Eichhornia crassipes*, *Ipomoea carnea*, *Acorus calamus*, Pests : *Rhizopertha dominica*, *Callosobruchus maculatus*, Petroleum Ether extract.

**INTRODUCTION :-** Agriculture is a backbone of Indian survival & progress. In spite of different revolutions our country suffered from no. of problems, such as hungry food production, grain storage, health, welfare etc. Recent year have seen a rapid advancement in the field of storage of grains, however there is lack of common storage practice even in a given agricultural area, comprehensive principle to storage practice have to be developed with keeping a view on its ecofriendly nature and human health.

The present work is being undertaken to examine use of plant products-*E. crassipes*, *I. carnea* & *A. calamus* leaves powder on most common coleopteron pests-*R.dominica* & *C. maculatus* in different doses and find out ideal plant products to check loss of grains through mortality of attacking pests.

Comparative statistical analysis was done for the variability of results obtained through various parameters. Variability refers to spread of scores from central tendency variance is one of the most importance methods to measure the variability. Variance is the sum of score taken from means & divided by their "N" i.e. Total no. of scores.

This variance is measured by finding the average of the square of each items of series of variables bears to the mean. This gives up the total variance of a series. Thus, the ratio of variation is the measure of proportional variation in a set of two given series. It may happen that the movement of one series may be proportionately greater than that in other series. The measure of the proportional variation made to serve an effectiveness of plant pesticides.

Thus the ratio of variation may be defined as the average ratio of the percentage deviation from mean in one series as compared to the percentage deviation from the mean in the other series. The total variation of the observation can be split into two components. (a) The variation between the classes or variation due to different bases of classification i.e. treatment. (b) The variations with the classes i.e. An inherent variation of the random variability within the observation of class.

The result obtained by graphical and tabular approach have been found to slightly differ from statistical approach. In graphical & tabular approach the variation in the percentage mortality considered.

The total percentage includes emerged insects also but their count has nothing to do with the multiplication rather they can be useful in studying growth processes. In statistical approach effect of different plant products on adult mortality ratio of insect has been considered. The mortality ratio is defined as the ratio of insects dead out of total no. of insect during experimental period. Thus, this mortality ratio includes only those members the population who do not contribute to the multiplication of the population.

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### MATERIALS & METHODS :-

(A) **Procurement of plant products, food grains & insects.** Leaves of *E. crassipes*, *I. carnea* & *A. calamus* taken & dried in sunlight then grinding into powder by mixer machines, separately & mixture form of three plant products were formed in different ratios i.e. 2E : 1I : 2A & IE : 2I : 1A.

After verification both grains were kept incubator to check moisture at temperature 30-40 degree celcius.

(B) **Treatment with mixture of plant products :-** Six doses (0.5g, 1g, 1.5g, 2g, 2.5g. & 3g) of plant products treated on adult population of both pests in separately & mixed form in different ratios.

(C) **Statistical Analysis :-** Calculation of mean of finding data of different mortality percentage of pests. After treatment with different doses of plant products by following formula.

$$\bar{X} = \frac{\sum X}{N}$$

(where  $\sum X$  = sum of variations / observations.)

$N$  = no. of Total observation.

After finding the mean of mortality percentage of pests, then find out the total average mean from finding data in following ways :-

(A) **Comparative Statistical Analysis of total mean after treatment with *E. crassipes* leaf powder on adult mortality of *R.dominica* infesting rice & *C. maculatus* infesting gram.**

Treatment	Against <i>R.dominica</i> infesting rice (A)		Against <i>C. maculatus</i> infesting gram (B)		Differences (M)
	Mean ( $\bar{X}$ )	Rank	Mean ( $\bar{X}$ )	Rank	
0.5g	53.00	VI	46.00	VI	7.00
1.0g	61.20	V	52.00	V	9.20
1.5g	73.80	IV	60.00	IV	13.80
2.0g	79.20	III	79.00	III	0.20
2.5g	91.00	II	90.00	II	1.00
3.0g	100.00	I	95.00	I	5.00

**Total mean of A = 458.20/6 = 76.36**

**Total mean of B = 422.00/6 = 70.33**

**Total mean of M = 36.20/6 = 6.03**

**(B) Comparative Statistical analysis of total mean after treatment with *A. carnea*. Leaf powder on adult mortality of *R.dominica* & *C. maculatus*.**

Treatment	Against <i>R.dominica</i> infesting rice (A)		Against <i>C. maculatus</i> infesting gram (B)		Differences (M)
	Mean ( $\bar{X}$ )	Rank	Mean ( $\bar{X}$ )	Rank	Mean ( $\bar{X}$ )
0.5g	49.00	VI	46.20	VI	3.20
1.0g	54.20	V	50.20	V	4.00
1.5g	75.00	IV	65.00	IV	10.00
2.0g	80.00	III	74.60	III	5.40
2.5g	80.60	II	80.00	II	0.60
3.0g	100.00	I	90.00	I	10.00

Total mean of A =  $438.8/6 = 73.13$

Total mean of B =  $406.00/6 = 67.66$

Total mean of M =  $33.20/6 = 5.53$

**(C) Comparative Statistical analysis of total mean after treatment with *I. calamus* leaf powder on adult mortality of *R.dominica* & *C. maculatus*.**

Treatment	Against <i>R.dominica</i> infesting rice (A)		Against <i>C. maculatus</i> infesting gram (B)		Differences (M)
	Mean ( $\bar{X}$ )	Rank	Mean ( $\bar{X}$ )	Rank	Mean ( $\bar{X}$ )
0.5g	23.00	VI	19.00	VI	4.00
1.0g	31.80	V	23.00	V	8.80
1.5g	33.20	IV	29.00	IV	4.20
2.0g	37.80	III	30.60	III	7.20
2.5g	41.20	II	34.60	II	6.60
3.0g	54.40	I	55.80	I	-1.40

Total mean of A =  $221.40/6 = 36.9$

Total mean of B =  $192.00/6 = 32.00$

Total mean of M =  $29.40/6 = 4.9$

**(D) Comparative Statistical analysis of total mean after treatment with mixture form of *E. crassipes*, *I. cornea* & *A. calamus* in ratio = 2E : 1I : 2A.**

Treatment	Against <i>R.dominica</i> infesting rice (A)		Against <i>C. maculatus</i> infesting gram (B)		Differences (M)
	Mean ( $\bar{X}$ )	Rank	Mean ( $\bar{X}$ )	Rank	Mean ( $\bar{X}$ )
0.5g	51.80	VI	50.40	VI	1.40
1.0g	60.12	V	58.20	V	1.92
1.5g	66.40	IV	69.60	IV	-3.20
2.0g	84.60	III	74.80	III	9.80
2.5g	95.00	II	90.33	II	4.67
3.0g	96.00	I	93.00	I	2.00

Total mean of A =  $453.92/6 = 75.65$

Total mean of B =  $436.33/6 = 72.72$

Total mean of M =  $16.79/6 = 2.79$

(E) Comparative Statistical analysis of total mean after treatment with mixture of leaf powder *E. crassipes*, *I. cornea* & *A. calamuson* adult mortality of *R.dominica* & *C. maculatus* in ratio 1E : 2I : 1A.

Treatment	Against <i>R.dominica</i> infesting rice (A)		Against <i>C. maculatus</i> infesting gram (B)		Differences (M)
	Mean ( $\bar{X}$ )	Rank	Mean ( $\bar{X}$ )	Rank	Mean ( $\bar{X}$ )
0.5g	22.60	VI	18.00	VI	4.60
1.0g	29.80	V	30.40	V	-0.40
1.5g	38.40	IV	37.20	IV	1.20
2.0g	59.60	III	53.60	III	6.00
2.5g	69.20	II	66.40	II	2.80
3.0g	79.20	I	78.40	I	0.80

Total mean of A =  $298.80/6 = 49.8$

Total mean of B =  $284.00/6 = 47.3$

Total mean of M =  $15.00/6 = 2.5$

#### RESULT:-

A/c to above table the ranking of mean clearly shows the highest mean showed highest mortality rate while minimum mean provides the least mortality rate of insects. When the difference of others are compared with 1<sup>st</sup> Rank mean it appears that *C. maculatus* is slightly less mortality rate than *R.dominica*. It is also quite clear from above table that conc. of *E. crassipes* & *A. cornea* is more effective than *I. calamus*.

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