Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 10, Issue, 05, pp.69904-69905, May, 2018

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

POST MATING CHANGES IN VAGINAL REGION OF FEMALE DROSOPHILA UNDER NORMAL AND PESTICIDES TREATED CONDITION

Parul Gupta, *Tuneera Bhadauria and Ajai Kumar

Feroze Gandhi P.G Degree College, Raebareli, Uttar Pradesh, 229001, India

ARTICLE INFO

Article History:
Received 14th February, 2018
Received in revised form
20th March, 2018
Accepted 09th April, 2018
Published online 31st May, 2018

Key words:
Pesticide,
Drosophila,
Vagina,
Mating,
Reproductive organ.

ABSTRACT

Drosophila punjabiensis is as such common pest reported from India. Pesticides induce minor changes in the structure of reproductive organ of *Drosophila*, Here we examined the effect of Malathion and Chloropyrifos on *Drosophila* at 50% lethal concentration and control condition and influence results were obtained. Thus this study can be used for similar different common pests and induce effective pest management by using *Drosophila* as model organism.

Corresponding author:

Citation: Parul Gupta, Tuneera Bhadauria and Ajai Kumar. 2018. "Post Mating Changes In Vaginal Region of Female Drosophila Under Normal And Pesticides Treated Condition", *International Journal of Current Research*, 10, (05), 69904-69905.

INTRODUCTION

In internally fertilizing organisms, mating consists of a series of coordinated molecular reactions between the sexes that occur in female reproductive tract especially vagina. In many species where females mate multiple times, post mating effects are expected to express rapidly. Females of insects, store sperm and remate several times; therefore, it is likely that ejaculates from several males will compete for the fertilization of the eggs (Parker, 1984). The insemination reaction is a post mating effect in female Drosophila vagina caused by the male ejaculate, (Henar Alonso *et al*., 1994). The insemination reaction, as post mating effect, which occurs in many species of Drosophila, is an enlargement of the vagina caused by the male ejaculate (Patterson, 1947) Therefore, the insemination reaction does not affect the male paternity of offspring. This reaction affects the post mating behavior of the female (Patterson, 1947). Reported that females will expel an excess of sperm around 6 to 7 hrs after mating. This suggests that the female performs actively in removing sperm from her vagina. However, (Lee, 1950) and (Asada, 1987) stated that the insemination reaction disappears gradually from the vagina. A gradual clearance of the reaction suggests the strong possibility of an ongoing physiological (Parker, 1984).

Also discussed the insemination reaction in the context of sperm competition. Insemination reaction in five species was first proposed by (Wheeler, 1947). *Drosophila melanogaster* female expels a droplet of sperm after mating (Wheeler, 1947). *Drosophila mojavensis* has great enlargement of the vagina that disappears gradually (Patterson, 1947; Heed, 1990) found that some species discard a large mass of sperm after mating. Because of doubts on appearance and gradual disappearance of vaginal swelling, we decided to compare the changes in vaginal structures of *Drosophila* in different conditions. However still it is not clear, that postmating effect gives any selective benefit to female (Maynard Smith, 1956).

Except normal condition, pesticides induce minor changes in the structure of reproductive organ of *Drosophila*, so this study could be used for similar different common pests and induce effective pest management by using *Drosophila* as model organism. The study emphasizes adverse effect of organophosphate compound, malathion and chloropyrifos on post matingvaginal swelling in female *Drosophila punjabiensis*.

MATERIALS NAD METHODS

Drosophila punjabiensis were used as the test organism, and to understand the effect of pesticides on *D. punjabiensis* two sets of experiments were conducted one test was used as control where no treatment was done whereas the other set (three replicates of each set) had treated flies. This reaction occurs both in control and treated flies. The pesticides were administered by feeding the first in star larvae at LC50 concentration of Malathion and Chloropyrifos (0.02ppm of malathion and 0.015ppm of chloropyrifos) in every 30 ml of food medium till they emerged into virgin flies. The healthy virgin flies were selected and pair each of male and female flies was put into each of the replicate vials and left for a day or till mating occurred. Subsequently the size of vagina was observed just after mating in the experimental female flies then was compared with control virgin flies.

Many of the *Drosophila* species have been recently reported as agricultural pest and causing heavy damage to the agricultural products. These species are more prominent in agricultural field than to fermenting fruit as their natural habitat. *Drosophila punjabiensis* is as such common pest reported from India. *Drosophila* has long been a favorite model system for studying the evolutionary changes. Based on the above study it can be suggested that chlorpyrifos and malathion induces developmental and reproductive tract related toxic effects in *Drosophila punjabiensis* and therefore can be used as indicator of non-target organism toxicity. Further if a for long time duration, they can induce evolutionary changes leading to formation of new species. This study can be used for similar different common pests and induce effective pest management by using *Drosophila* as model organism. But further detailed studies are needed to arrive to this conclusion.

Table 1. Duration of copulation and insemination reaction (in minutes) and enlargement of vaginal pouch (in mm) of control and Malathion treated *Drosophila punjabiensis* flies

Crosses	No of females tested	Duration of copulation (in minutes) Mean± S.E.	Duration of insemination reaction (in minutes)		Enlargement of vaginal pouch (in mm) Mean± S.E.
			Begins at Mean± S.E.	Ends at (in minutes) Mean± S.E.	
D.punjabiensis female X *D.punjabiensis* male	50	4.12 ± 0.23	10.39± 0.18	1.52 ± 0.16	0.25 ± 0.03
Treated (0.2ppm) *D.punjabiensis* female X Treated (0.2ppm) *D.punjabiensis* male	50	3.57± 0.18	8.86± 0.42	9.07 ± 0.07	0.30 ± 0.02

Table 2. Duration of copulation and insemination reaction (in minutes) and enlargement of vaginal pouch (in mm) of control and Chloropyrifos treated *Drosophila punjabiensis* flies

Crosses	Number of females tested	Duration of copulation (in minutes) Mean. S.E.	Duration of insemination reaction		Enlargement of vaginal pouch (in mm) Mean± S.E.
			Begins at (in minutes) Mean± S.E.	Ends at (in minutes) Mean± S.E.	
D.punjabiensis female* *D.punjabiensis* male	50	4.14 ± 0.23	10.29± 0.17	1.53 ± 0.16	0.25 ± 0.03
Treated (0.015ppm) *D.punjabiensis* female* Treated (0.015ppm) *D.punjabiensis* male	50	3.76± 0.19	9.86± 0.45	8.27 ± 0.08	0.31 ± 0.02

RESULT AND DISCUSSION

In case of control mating the vagina returned to a normal condition, usually in few hours, but in treated mating it remained swollen for many hours even for several days. Table. 1 shows the change in vaginal pouch due to the effect of mating in control and Malathion treated flies. Similar results were observed in the Chloropyrifos treated flies (Table 2). Insemination reaction showed the effect of mating, swelling and rupturing of vagina of females were observed in all treatments including the controlset, however treated females showed higher level of distortion when compared with control flies. The structural changes appears in some species of female vagina and disappears gradually in others suggesting different phenomena, the sperm sac, the mating plug, and vaginal swelling describes a distinct structure associated with a specific female postmating behavior Asada, 1987) explained the enzymatic analysis of the insemination reaction in Drosophila. Studies suggest that this could be due to hormonal deficiency due to pesticide could be one of the factors for the swelling and greater distortion in the treated flies. The studies are in progress to know the exact reasons for greater distortion in the treated flies. Insemination in other species of *Drosophila* also revealed that the vaginal region of female become distorted.

REFERENCES

Asada, N., Kitagawa, O. 1988. Insemination reaction in Drosophila nasuta subgroup. *Jpn J Genet*., 63:137–148.

Asada, N., Watanabe, T.K. 1987. Enzymatic analysis of the insemination reaction in Drosophila. *Zool. Sci*., 4:1001.

Chevrier, C. and C. Bressac, 2002. Sperm storage and use after multiple mating in Dinarmus basalis (Hymenoptera: Pteromalidae). *J. Insect Behav.,* 15, 385-398.

Heed, WB. 1990. Origin of Drosophila of the Sonoran Desert revised: description of new species in Drosophila complex.Oxford University Press, Oxford,pp 253-278.

Henar Alonso, Leslie P. Tolbert, William B. 1994.Ultra structural examination of the insemination reaction in Drosophila. Volume 275, Issue 3, pp 467-479.

Lee, HT. 1950 A preliminary histological study of the insemination reaction in D. gibberosa. Biol Bull 98:25–33.

Maynard Smith, J. 1956. Fertility, mating behavior and sexual selection in Drosophila subobscura. *J Genet.,* 54:261–279.

Parker GA. 1984. Sperm competition and the evolution of animal mating strategies. In: Smith RL (ed) Sperm competition and the evolution of animal mating systems. *Academic Press, San Diego*, pp 2–55.

Patterson, JT. 1947. The insemination reaction and its bearing on the problem of speciation in the mulleri subgroup. Univ Texas Publ Genet 4720:42–77.

Wheeler, M.R. 1947. The insemination reaction in intra specific matings. *Univ Texas Publ Genet.,* 4720:78–115.

****