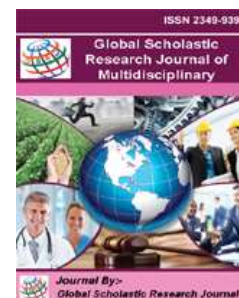




A PEER REVIEWED INTERNATIONAL
JOURNAL OF GLOBAL SCHOLASTIC
RESEARCH JOURNAL
GSRJ
GLOBAL SCHOLASTIC RESEARCH
JOURNAL OF MULTIDISCIPLINARY



STUDY OF SOME BIOLOGICAL PARAMETERS OF BACTROCERA DORSALIS HENDEL (DIPTERA: TEPHRITIDAE) IN RELATION TO THE DEVELOPMENT OF THE STERILE INSECT TECHNIQUE AS PART OF AN AUTOCIDAL CONTROL

DABIRE A. RÉMY¹; OUEDRAOGO N. SYLVAIN²; BAMA B. HERVÉ³; OUATTARA MAXIME⁴; BANCE Z. AUGUSTIN⁵

¹Institut de l'Environnement et de Recherches Agricoles, Station de Recherche de Farako-Bâ, 01 BP 910 Bobo-Dioulasso, Burkina Faso

²Centre Universitaire Polytechnique de Dédougou, Burkina Faso

³Institut de l'Environnement et de Recherches Agricoles, Station de Recherche de Farako-Bâ, 01 BP 910 Bobo-Dioulasso, Burkina Faso

⁴Institut de l'Environnement et de Recherches Agricoles, Station de Recherche de Farako-Bâ, 01 BP 910 Bobo-Dioulasso, Burkina Faso

⁵Institut de l'Environnement et de Recherches Agricoles, Station de Recherche de Farako-Bâ, 01 BP 910 Bobo-Dioulasso, Burkina Faso

Abstract

Fruit flies (Diptera: Tephritidae) are a major constraint for fruit production and marketing in tropical and subtropical Africa. It is therefore necessary to reduce their population below the economical threshold to strengthen the production systems of these countries by adopting effective methods of control. Several control methods are currently being used in West Africa to control mango fruit flies. In the prospect of integrated pest management, this study is exploring the possibility of using the sterile insect technique (SIT) to control these mango fruit flies. But its implementation is very complex and requires a perfect knowledge of the biology of the target insect. So, three essential biological parameters of *Bactrocera dorsalis* have been studied, first, the technique of quantitative determination of pupae, second, the determination of the sex ratio and third, the flying ability of sterile male flies. The work was carried out at a temperature of 25 ± 1 °C, relative humidity of $65\% \pm 2$ and photoperiod of 12D: 12L. The number of pupae per unit volume (1 ml for about 42 pupae) allows us to estimate the quantity of flies produced. The estimate of the quantity of males produced and irradiated is determined by the sex ratio of the generation, which gives the mean proportions of 27% of males and 33.5% of females with an average rate of unhatched pupae of 39.5%. The irradiation of *B. dorsalis* with the dose of 70 Gy showed a highly significant effect on the average flight capacity of sterile males compared to unirradiated males, 39% and 60.25%, respectively. It would therefore be important to take these parameters into account in order to define a successful autocidal control program against mango fruit flies in West Africa in general and in Burkina Faso in particular.

Key words: *Bactrocera dorsalis* - Autocidal control - Mass rearing - irradiation - Sterile insect technique.

References

Anonymous, 2014. Citée par Sidwaya N° 7789 du 11 Novembre 2014

Fadhel S., 2008. *Etude du Comportement sexuel chez les mâles stériles de la Cératitite Ceratitis Capitata (Wied). Dans le cadre d'un programme de lutte par la technique de l'insecte Stérile.* Mémoire de Master. Institut National Agronomique de Tunisie (INAT), 8p.

Lachiheb A., 2008. *Optimisation de la dose d'irradiation dans le cadre du projet de lutte par la Technique de l'Insecte Stérile (TIS) contre la cératite (Ceratitis capitata).* Ingénieur Agronome option Production Végétale.

Mille C., 2010. *Les Mouches des Fruits de Nouvelle- Caledonie (Diptera, Tephritidae) : Systématique, Comportement, Dynamique et Gestion des Populations.* Thèse de Doctorat Spécialité Physiologie et Biologie des Organismes, Université de la Nouvelle- Calédonie 48p.

Ouédraogo O., 2014. *Eléments de Biologie de Bactrocera dorsalis (Drew et al 2005) (Diptera Tephritidae) au Burkina Faso.* Mémoire d'ingénieur Agronome. CAP/M, 22p.

Ouédraogo N. S., 2011. *Dynamique Spatio-temporelle des Mouches des Fruits (Diptera, Tephritidae) en Fonction des Facteurs Biotiques et Abiotiques dans les vergers de manguiers de l'ouest du Burkina Faso.* Thèse de Doctorat Spécialité Ecophysiologie, Université Paris Est, 156p.

Ekese S. & Billah M.K., 2010. *Un Guide Pratique pour la Gestion des Mouches des Fruits (Tephritidae) d'Importance Economique en Afrique,* p. A 1 & B 2.

White I.M. & Elson- Harris M.M., 1992. *Fruit Flies of Economic Significance: Their identification and bionomics.* International Institute of Entomology, London England.