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Invited Speakers and abstracts of their Talk

IV. Ecological Entomology

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Title of the talk

“DIAPAUSE IN *CHILO PARTELLUS*: A RESEARCH JOURNEY

ABSTRACT

Spotted stem borer, *Chilo partellus* (Swinhoe) is one of the most widely distributed pests of coarse cereals, causing 18 to 25% yield losses in Asia and Africa. The larvae of *C. partellus* pass through hibernation under North Indian and aestivation under South Indian conditions. Although diapause helps *C. partellus* in adapting under unfavorable conditions, there is 17.2 to 28.3% and 7.0 to 33.7% population sacrifice during hibernation and aestivation, respectively. The population heterogeneity in *C. partellus* could be due to hibernation or aestivation, wherein Ikemoto & Takai (linear), and Lactin-1 and Lactin-2 (non-linear) models are efficient for describing temperature-dependent development and estimating the temperature thresholds of diapausing larvae and help in predicting the occurrence, seasonal emergence, number of generations and population dynamics. Diapause results in differential regulation of hormonal and biochemical profiles, impose deleterious effects on the post-diapause development, reproductive physiology and population growth of *C. partellus*. The diapause, developmental and morphometric traits in *C. partellus* are governed by overdominance gene effects, mainly depend on parental diapause history. Four different biotypes of *C. partellus* viz., Hisar, Hyderabad, Parbhani and Coimbatore exist in India, suggesting that sorghum and maize genotypes need to be tested against these four populations to identify stable sources of resistance. The whole genome sequencing will be useful for understanding mode of action of different insecticides, mechanisms of detoxification and designing target-specific insecticides to develop appropriate strategies to control *C. partellus* for sustainable crop production. The temporal distribution of mating systems among adults of diapause, nondiapause and/or ecologically diverse populations, and

their behavioral and physiological consequences under a given demographic framework could be rewarding, thus suggest to devise appropriate mating disruption techniques to suppress *C. partellus* population.