

## Diapause in *Sternochaetus mangiferae* (Fabricius) a serious pest of mango

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### INTRODUCTION & AIM

Survival of any species depends on how efficiently it can thrive the unfavorable seasons. Diapause in *Sternochaetus mangiferae* (Coleoptera :Curculionidae), a monophagous pest of mango in India and other mango growing countries of the world, was achieved by remaining in a dormant phase during its adult stage

The adult weevil is 7.5 to 9.5 mm long and with body covered with black, greyish or yellowish scales, pronotum subparallel-sided in basal third only, elytra with interstices 3,5,7 strongly carinate, femora with single large tooth ventrally profemora stout distinctly clavate (Bhattacharya et al.,2015). It is distributed among all mango growing areas of the world including Asia, Africa, North America (Hawaii), Central America, Australia, South America French Guinea and several Caribbean countries (Woodruff and Fasulo,2006.) In the present work, diapause of the weevil was studied based on the extensive work carried out in the pest infested areas of Kerala(India) for a period from January 2023 to December 2024

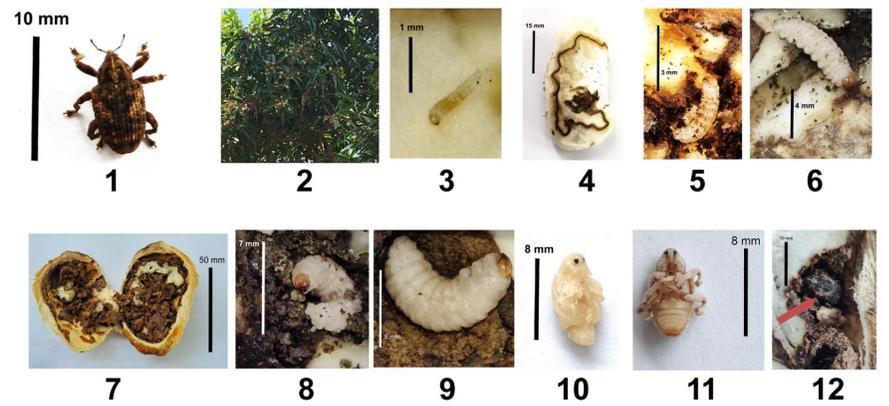
### METHOD

The biology of *Sternochaetus mangiferae* including its adult diapause was studied at Kozhikode, Vadakara,Kerala (11.50N and 75.60E),and at Kannur India for a period from January 2023 to December 2024. Pericarp and mesocarp (pulp) of the mangoes were removed to expose the nuts. Five hundred mango nuts with its intact hard endocarp(nut or shell) were kept in rearing boxes (Plastic containers with small holes in the bottom, sides and on the top) in batches of fifty and were kept in rearing room.

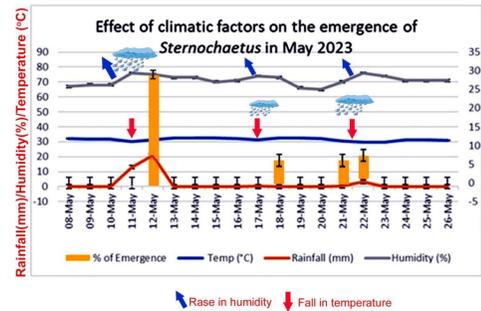
Samples were also collected from the field and were dissected at regular intervals to identify the developing stages of the larvae and pupae. The nuts were observed regularly for the emergence of the weevil. Sudden fall in temperature and relative humidity, the rain falls and the onset of flowering in mango trees were recorded regularly to study their effects on the onset of diapause and its termination. Photos of the immature stages were taken with nothing 3A pro camera. Micro and macro environment were also monitored regularly focusing on temperature rain fall and humidity and flowering of mangoes in the field and also their role in determining the active and dormant phases of the immature stages. Gene barcoding of Cytochrome oxidase 1 was also carried out for species conformation.

The emergence of the adult and its active and dormant phases were recorded regularly to analyze the adult diapause.

### RESULTS & DISCUSSION

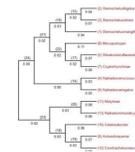


1. Adult weevil, 2. Mango Fruit (1 to 2 month old), 3. First instar larva, 4. Feeding Channel made by first instar larva, 5. Second instar larva, 6. Third instar larva, 7. Severity of damage, 8. Fourth instar larva, 9. Fifth instar larva, 10. Pupa, 11. Adult early stage, 12. Diapausing adult

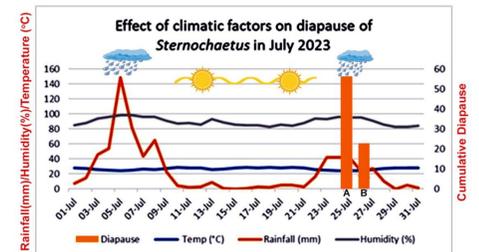
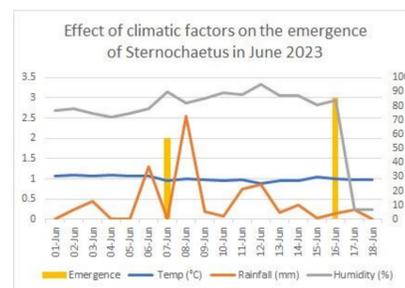


47.9% adults emerged from nuts during the month of May 2023 after short diapause of 1 to 2 months

Strong positive correlation with summer rainfall (Pearson correlation  $R=0.82$ )



• Phylogenetic tree



• A – Cumulative Diapause, B – Diapause in the nut

• 5% emerged in June and 3.6% emerged in July

• All the emerged adults (56.1%) entered in to a phase of diapause by 25th July

• 22% unmerged adults present in the nut entered directly in to diapause inside the nut itself.

### CONCLUSION

The work showed that in Kerala (India) the emergence of the adult from the nut depended on the humidity, fall in temperature and rainfall. Under the cage conditions, all the adults entered in diapause stage by the second week of July, which is influenced by heavy rainfall, humidity and a fall in temperature and further the break in diapause was observed along with flowering of mango. In the study area of Kerala during the years, 2023 and 2024 the exit from diapause was achieved in the months of January and February of the year 2024 which coincided with the flowering of mangoes in the field.

### FUTURE WORK / REFERENCES

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