

Diversity and Economic Importance of Scarabaeid Beetles of Sindhudurg.

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Abstract

The study on Scarabaeid (Family: Scarabaeidae) was conducted in five talukas -Kudal, Sawantwadi, Malvan, Devgad and Vaibhavwadi of Sindhudurg district in Maharashtra. The study has given the basic idea of the Scarabaeid beetle diversity and their abundance with respect to different regions and the agricultural practices. Total 25 species from 16 genus and 5 sub-families are found in study regions. The *Oryctes rhinoceros* has 10% population composition which is considered as major pest on *Cocos nucifera*. Also this species is observed to be highly active in dung pits and is able to convert raw or partially decayed organic matter in simple form giving it an exclusive importance in agro-economy. Exclusive studies were conducted in Kudal taluka. Public awareness programmes were conducted to sensitize farmers and students about importance of dung beetles and sustainable agriculture.

Introduction

Scarabaeid beetles though well studied ecologically, are quite neglected as agriculture friendly organisms. Pest species are well known from this group. The Australian Dung Beetle Project (1965-1975) has shown promising results of using dung beetles in the farms and pastures increasing plant yield by allowing higher rate of root growth and uptake of nutrient elements².

The traditional farming in the mega diverse Sindhudurg district of Konkan involves cattle dung manuring supporting local insect fauna specially the dung beetles and worms useful for agriculture³. But this practice has become less popular due to use of chemical fertilizers, which have shown promising growth in agricultural yield at the cost of loss of natural decomposer and biological pest controlling agents⁴ beneficial for agriculture with increased cost of farming.

The study was intended to assess the current status of diversity and distribution of scarabaeid beetles. The results will enable us to plan further strategies in line with Australian project. Public awareness programmes were conducted to initialize sensitization and get involvement of farmers and students in the project.



Materials and Methods

Insect collection: Light traps, Pit fall traps using dung as bait, flight intercept traps and hand picking. Dry and wet preservation.

Public Awareness: Theme of program was 'Insects and Sustainable Agriculture', included Poster presentation, public meetings and poster competitions.

Results

In total 25 species were identified, in Scarabaeinae 6 species of tribe Coprini & 6 species of Onthophagini, 4 species of Rutelinae, 4 species of Citiiniinae, 3 species of Melolonthinae and 2 species of Dynastinae.

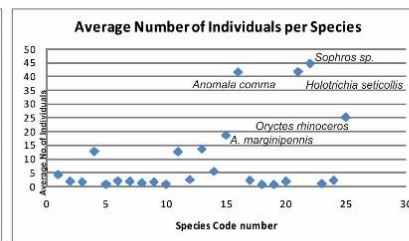
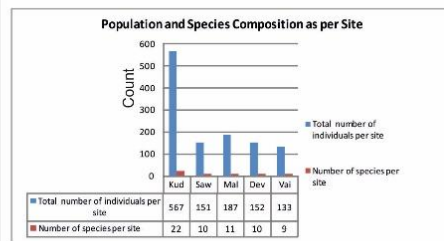
Kudal region harbours 22 species.

Shannon index(H) Kud>Dev>Mal>Vai>Saw : 2.520>1.857>1.856>1.602>1.585
Menhinick's index(D) Kud>Saw>Dev>Mal>Vai : 0.923>0.837>0.811>0.804>0.780

Sophros sp., *Holotrichia seticolis* and *Anomala Comma* show wide distribution and population. These species showed 18.74%, 17.48% and 17.40% population composition. *Oryctes rhinoceros* had 10.50% composition.

The agricultural practice study revealed that use of chemical insecticides is more in Vaibhavwadi and Devgad region in orchards and sugarcane farms.

The public awareness programs were attended by 148 farmers and 381 students in 5 sessions.



Discussion

The most species rich area is Kudal where organic practices. Vaibhavwadi has higher forest cover around farm fields as compare to Sawantwadi due to which though there are less number of species in record, the distribution of species slightly even.

Major pest species groups Rutelinae and Melolonthinae are highly concentrated in areas where more or less chemical farming is practised. These might have some resistance to low levels of chemicals. The *Oryctes rhinoceros* found concentrated in areas where dense coconut plantation was done.

Conclusion

- Study shows that there may be a relation between agriculture practices and Scarabaeid species richness in particular area.
- The chemical farming zones have lesser Scarabaeinae fauna. This indicating less role of telecoprid transporters in nutrient cycling.
- The rigorous public awareness about relation of natural agents of nutrient cycling and agriculture. Also after affects of biomagnification needs to be conveyed in chemical farming zones.
- Positive research studies towards preserving scarabaeid fauna (scarabaeinae specially) are needed.

Future Directions

- Application of these Scarabaeid beetles in agriculture is under study.
- Grubs of Rhinoceros beetle (*Oryctes rhinoceros*) could be rear to get the processed dung.
- Initial lab tests revealed that the product is equal in nutrient content as Vermicompost.
- Captive rearing and breeding of these beetles to get fertilizer(Grub Compost).
- Recording more species and study of the community structure all over Sindhudurg.

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