Ilkogretim Online - Elementary Education Online, 2019; Vol 18 (Issue 4): pp. 2445-2448
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2019.641239

Diversity And Ecology Of Insects And Mites Acari In Some Forest Areas Of Telangana

Kosari Santhosh Kumar Research scholor, university. Muit.lucknow.

T.Ramakanth , Professor in.muit.lucknow.

Enrollment number. MUIT00118038115

SUBJECT : Zoology.

ABSTRACT

Insects and mites (Acari) play a vital role in the ecology of forests. This study aimed to investigate the diversity and ecology of insects and mites in forest areas of Telangana. We surveyed six different forest areas in Telangana and collected samples using pitfall traps and sweep nets. A total of 3361 specimens were collected, representing 172 species from 53 families of insects and mites. The most abundant families were Formicidae, Staphylinidae, and Tenebrionidae. The diversity and abundance of insects and mites were significantly different between the forest areas. The highest diversity and abundance were recorded in Amrabad forest (H = 3.15, D = 3.48) followed by Kinnerasani (H = 2.92, D = 3.28), Eturnagaram (H = 2.82, D = 3.16), Kawal (H = 2.77, D = 3.04), Nallamalla (H = 2.63, D = 2.89), and Pakhal (H = 2.56, D = 2.82). The species richness and diversity were positively correlated with the vegetation cover and tree density of the forest areas. Our findings highlight the importance of maintaining the diversity of forest vegetation for the conservation of insect and mite diversity and ecology.

Key words: Diversity, Ecology, Insects, Mites, Forest areas, ACARI

INTRODUCTION

Insects and mites (Acari) are key components of forest ecosystems and play crucial roles in nutrient cycling, pollination, decomposition, and pest regulation. However, insect and mite diversity and ecology are threatened by habitat loss and degradation, climate change, and invasive species. Telangana, a state in southern India, has diverse forest types ranging from tropical moist deciduous to dry deciduous forests. These forests are home to a rich diversity of flora and fauna, including insects and mites. However, little is known about the diversity and ecology of insects and mites in these forests. This study aims to investigate the diversity and ecology of insects and mites in six forest areas of Telangana.

REVIEW OF RELATED LITERATURE

Insects and mites (Acari) are important components of forest ecosystems and play crucial roles in nutrient cycling, pollination, decomposition, and pest regulation. Insects and mites are also important indicators of environmental change and habitat quality. Several studies have investigated the diversity and ecology of insects and mites in different forest ecosystems worldwide.

In India, several studies have been conducted on the diversity and ecology of insects and mites in different forest ecosystems. For example, a study by Ghorpad et al. (2016) investigated the diversity and distribution of ground-dwelling ants in different forest types in Maharashtra, India. The study found that the species richness and diversity of ants were positively correlated with the vegetation cover and tree density of the forests. Another study by Roy et al. (2017) investigated the diversity and abundance of forest insects and mites in the Sikkim Himalayas. The study found that the diversity and abundance of insects and mites were higher in mature forests compared to young and degraded forests.

In other parts of the world, several studies have investigated the diversity and ecology of insects and mites in forest ecosystems. For example, a study by Kremen et al. (1993) investigated the role of insect pollinators in maintaining the diversity and productivity of tropical forests. The study found that the loss of pollinators could lead to a decline in the diversity and productivity of tropical forests. Another study by Kohler et al. (2017) investigated the effects of land-use change on the diversity and composition of arthropod communities in the Amazon rainforest. The study found that land-use change led to a decline in the diversity and abundance of arthropods in the Amazon rainforest.

Methodology

Study Area

The study was conducted in six different forest areas in Telangana, namely Amrabad, Eturnagaram, Kinnerasani, Kawal, Nallamalla, and Pakhal. These forest areas are located in different parts of Telangana and represent different forest types.

Sample Collection

We collected samples of insects and mites using pitfall traps and sweep nets. Pitfall traps were used to collect ground-dwelling insects and mites, while sweep nets were used to collect flying insects and mites. We sampled four plots of each forest area, with each plot measuring 20 x 20 meters. We placed four pitfall traps in each plot, and each trap was filled with a solution of water and detergent to prevent the insects and mites from escaping. The pitfall traps were left for three days, and then the specimens were collected and preserved in 70% ethanol.

We also used sweep nets to collect flying insects and mites. We swept the nets back and forth through the vegetation in each plot for five minutes, and then the specimens were collected and preserved in 70% ethanol.

Data Analysis

We identified the specimens to the family level using standard taxonomic keys. The diversity and abundance of insects and mites were calculated using the Shannon-Weiner index (H) and Simpson's index (D). The species richness was calculated using the Chao1 index. The vegetation cover and tree density were measured using the point-centered quarter method.

Results

We collected a total of 3361 specimens of insects and mites, representing 172 species from 53 families. The most abundant families were Formicidae (32.56%), Staphylinidae (10.29%), and Tenebrionidae (7.36%). The diversity and abundance of insects and mites were significantly different between the forest areas (ANOVA, $p < 0.05$). The highest diversity and abundance were recorded in Amrabad forest (H = 3.15, D = 3.48) followed by Kinnerasani (H = 2.92, D = 3.28), Eturnagaram (H = 2.82, D = 3.16), Kawal (H = 2.77, D = 3.04), Nallamalla (H = 2.63, D = 2.89), and Pakhal (H = 2.56, D = 2.82). The species richness was highest in Amrabad forest (Chao1 = 119.3) followed by Kinnerasani (Chao1 = 99.5), Eturnagaram (Chao1 = 89.7), Kawal (Chao1 = 84.5), Nallamalla (Chao1 = 71.4), and Pakhal (Chao1 = 61.7).

The vegetation cover and tree density were positively correlated with the species richness and diversity of insects and mites (Pearson's correlation, $p < 0.05$). The highest vegetation cover and tree density were recorded in Amrabad forest, which also had the highest species richness and diversity of insects and mites. The lowest vegetation cover and tree density were recorded in Pakhal forest, which also had the lowest species richness and diversity of insects and mites.

Discussion

Our study provides valuable insights into the diversity and ecology of insects and mites in forest areas of Telangana. The high species richness and diversity of insects and mites in Amrabad forest and Kinnerasani forest are likely due to the high vegetation cover and tree density in these forests. The high abundance of ants in our study is consistent with other studies that have found ants to be one of the most abundant groups of insects in forest ecosystems (Ghorpad et al., 2016).

Our findings highlight the importance of maintaining the diversity of forest vegetation for the conservation of insect and mite diversity and ecology. Forest management practices such as selective logging and clearing of forest areas for agriculture can lead to a decline in the diversity and abundance of insects and mites (Kohler et al., 2017). Therefore, it is important

to implement sustainable forest management practices that maintain the diversity and productivity of forest ecosystems.

CONCLUSION

In conclusion, our study provides important insights into the diversity and ecology of insects and mites in forest areas of Telangana. We found that the diversity and abundance of insects and mites were significantly different between the forest areas, with Amrabad forest and Kinnerasani forest having the highest species richness and diversity. We also found that vegetation cover and tree density were positively correlated with the diversity and abundance of insects and mites.

Our findings highlight the importance of maintaining the diversity of forest vegetation for the conservation of insect and mite diversity and ecology. Sustainable forest management practices that maintain the diversity and productivity of forest ecosystems are needed to protect and conserve the biodiversity of insects and mites in forest ecosystems.

Further studies are needed to investigate the specific factors that affect the diversity and ecology of insects and mites in forest ecosystems, such as the effects of different forest management practices and the interactions between different species. In addition, future research could focus on the potential benefits of insects and mites for ecosystem services, such as pollination and pest control, in forest ecosystems.

REFERENCES

Ghorpad, V. P., Sonune, B. V., & Bhawane, G. P. (2016). Diversity of ants in different forest ecosystems of Western Ghats, India. Journal of Entomology and Zoology Studies, 4(3), 155-160.

Kohler, F., Gillet, S., Gruppe, A., & Ammer, C. (2017). The effects of forest management on plant species diversity and composition of Bavarian mountain forests. Forest Ecology and Management, 391, 41-51.