



Study on the diversity of insect pests of some fruit trees in south 24 parganas, West Bengal, India with their economic importance

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Abstract

The present paper documents diversity of insect pests infesting fruit trees of South 24 Parganas District conducted during December, 2021- April, 2022. The study shows the presence of 18 species of insects belonging to 18 genera, 15 families and 5 orders occurring in. Out of those, 7 Hemipteran species belonged to cause severe damage to their respective host fruit plants, While rest of the species belonging to the order Hemiptera and the other 4 orders shows no significant damage symptoms. Lastly, the Hemipteran species *Leptocoris acuta* under the Family Alydidae found to be new report associated with *Carissa carandas* (Koromcha). Though its presence shows no damage symptoms to the host plant. This paper also documents the Indian and global distribution of different insect pest species recorded during the study.

Keywords: insects, pest, fruit plants, south 24 parganas district, West Bengal, India

Introduction

India is one of the largest and most varied fruit producing nations in the world, accounting for 10 percent of all fruits produced globally [1]. The main fruits grown in India are mango, citrus and banana followed by other fruits such as apple, guava, pomegranate, grape, jackfruit, pineapple, papaya, sapota, aonla and others. Many fruits are exported to different countries, including grape, banana and mango. India leads the world in the production of mango, banana, papaya, sapota and lime and in productivity of grapes per unit land area [2]. West Bengal is the largest producer of pineapple and second largest producers of litchis in India. West Bengal also holds significant shares in the total mango production [3]. Like other agricultural crops the fruit plants also faces production losses every year. The most common pests of the fruit plants are insects, mites, etc. Among these pests which are doing quiet noticeable damage towards Fruit plants, the insects are becoming more and more important and in some places they are turning out to be more important pest. So the knowledge of the occurrence of the different pests species along with their hosts are very necessary. Earlier very few works on the mite pests occurring on fruit trees in South 24 Parganas have been observed [5, 6] but no relevant literatures were found on the pest insets of fruit trees from this District. So to fulfill these lacunae, a survey was carried out during December, 2021-April, 2022 to document the insects on fruit trees from this region with their economic importance, if any.

Material and Methods

During the present study different collection sites were selected in 24 Parganas Districts viz., Canning, Baruipur, Falta, Kakdwip, Namkhana, Jaynagar, Magrahat, Basanti, Narendrapur, Sonarpur, Gosaba. The collection was done during 2021-22 and field was visited thrice a month. Collection was done by using Hand picking and Sweep net method. Small sucking pest like aphids and mealy bugs and large sized insects were handpicked. For storage and preservation the killing jars with nail polish remover were

used to killed large insects. The small insects were preserved in glass vials consisting of 70-90% ethyl alcohol. In many cases, the leaves were brought to laboratory in polythene bags covering the mouth tightly and examined under a stereo binocular microscope and the insect were collected from there for identification.

Results and Discussion

List of insect species collected during the present study with their host/habitat records and importance, if any, are mentioned below:

Order I- Orthoptera

Family 1- Pyrgomorphidae

1. *Poeciloceris pictus* (Fabricius.)

Collection Records: This specimen was collected from the host plant *Carica papaya* L. at Narendrapur, South 24 Parganas District, West Bengal, in December, 2021.

Distribution in India - Andhra Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal, Lakshdweep Island.

Global distribution - Afghanistan, Bangladesh, India, Nepal, Pakistan, Maldives Islands, Sri Lanka, Bhutan.

Remark- Infestation caused no noticeable damage.

Order II- Hemiptera

Family 2- Coccidae

2. *Parasaissetia nigra* (Nietner)

Collection Records: This specimen was collected from the host plant *Mangifera indica* (Mango) L. at Narendrapur, South 24 Parganas District, West Bengal, in February, 2022.

Distribution in India- Andaman and Nicobar Island, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Punjab, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal.

Global distribution- Bangladesh, Bhutan, China, India, Israel, Japan, Maldives, Mongolia, Myanmar, Nepal,

Pakistan, Philippines, Saudi Arabia, Sri Lanka, Africa, America, Kenya, USA, Mexico, Florida, Colombia, Fiji, Brazil.

Remark- This scale insect found infesting on the tender leaves, shoots and twigs. Sooty mould fungus is observed on leaves due to honey dew secretion by this insect.

Family 3- Aleyrodidae.

3. *Aleurodicus dispersus* (Russell.)

Collection Records: This specimen was collected from the host plant *Psidium guajava* (Guava) L. at Jaynagar, South 24 Parganas District, West Bengal, in January, 2022.

Distribution in India- Sri Lanka or Maldives. In India, it was first reported in 1993 at Thiruvananthapuram on tapioca and later several others parts of Kerala, Tamil Nadu, Karnataka, Andhra Pradesh and Maharashtra, West Bengal.

Global distribution- It is of Neotropical origin, and is native to Central America and the Caribbean region, Asia, Africa, North (Florida, Hawaii), Europe (restricted), Oceania, Australia.

Remark- This white fly was more common on under surface of leaves adjoining peteolar region. Both the nymphs and adults suck the sap from leaves causing yellowing of leaves resulting in dropping of the affected leaves.

Family 4- Pseudococcidae.

4. *Paracoccus marginatus* (Williams & Granara de Willink)

Collection Records: This specimen was examined collected from the host plant *Carica papaya* L. at Canning, South 24 Parganas District, West Bengal, in April, 2022.

Distribution in India- The introduction of this species has caused damaged to papaya cultivated in South India, especially in states of Karnataka, Kerala, Tamil Nadu, it has also invented Assam, West Bengal.

Global distribution- This species is believed to be native to Belize, Costa Rica, Guatemala and Mexico. It has spread to certain Caribbean Islands, Hawaii and French Guiana, and also to parts of Southeast Asia, including India, Indonesia and Thailand.

Remark- This papaya mealybug in both nymphs and adults forms were found to suck the leaf sap, causing deformity, wrinkling and rolling of the leaf edges and also early leaf drop.

Family 5- Margarodidae

5. *Drosicha stebbingii* (Stebbing.)

Collection Records: This specimen was collected from the host plant *Mangifera indica* L. at Gosaba, South 24 Parganas District, West Bengal, in January, 2022.

Distribution in India- It has spread to India [Bihar (Darbhanga, Saran, Muzaffarpur), Haryana (Karnal), Himachal Pradesh (Shimla), Madhya Pradesh, Rajasthan (Jodhpur), Uttarakhand (Dehra Dun), Uttar Pradesh (Saharanpur, Kanpur, Varanasi), West Bengal (Howrah & Darjeeling Dist.)].

Global distribution- Bangladesh, China, Pakistan,

Remark- It is a voracious pest of the mango plants. The adult bugs are covered with whitish powder and colonize between bark of tree trunk, young shoots and panicle.

Family 6- Aphididae.

6. *Pentalonia nigronervosa* (Coquerel)

Collection Records: This specimen was collected from the host plant *Musa acuminata* Linn. at Narendrapur, South 24 Parganas District, West Bengal, in December, 2021.

Distribution in India- Punjab, Maharastra, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha, Bihar, West Bengal.

Global distribution- It occurs in tropical Africa, Atlantic Islands, Australia, California, Central America, Cook Is., Egypt, Fiji, Florida, Hawaii, Kiribati, India, Indonesia, Malaysia, Madagascar, Marshall, Is., Mauritius, Mexico, Micronesia, the Middle East, Mozambique, New South Wales, Papua New Guinea, the Philippines, Reunion, Samoa, northern South America, Taiwan, Tokelau, Tonga, Tuvalu, Vanuatu, Wallis Is., and much of the West Indies (Waterhouse, 1989).

Remark- This banana aphid was seen in large colonies on leaf axils and pseudo- stem. Leaves were bunched into a rosette appearance, stunted growth and leaf margins are wavy with upward rolling due to infestation of this insect.

7. *Myzus persicae* (Sulzer)

Collection Records: This specimen was studied. The specimens were collected from the host plant *Carica papaya* (Papaya) L. at Canning, South 24 Parganas District, West Bengal, in March, 2022.

Distribution in India- Jammu & Kashmir, Himachal Pradesh, Punjab, Uttarakhand, Haryana, Rajasthan, Uttar Pradesh, Gujarat, Madhya Pradesh, Bihar, Jharkhand, Odisha, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, West Bengal.

Global distribution- Worldwide distributed. It is found in Africa, Asia, Europe, North America, Oceania, South America.

Remark- High Infesting of this aphid was found on the tender shoots and under surface of the leaves. Curling and crinkling of the infested leaves were noticed.

8. *Aphis gossypii* (Glover)

Collection Records: This specimen was examined collected from the host plant *Carica papaya* L. at Baruipur, South 24 Parganas District, West Bengal, in January, 2022.

Distribution in India- Jammu & Kashmir, Himachal Pradesh, Punjab, Uttarakhand, Haryana, Rajasthan, Uttar Pradesh, Gujarat, Madhya Pradesh, Bihar, Jharkhand, Odisha, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Maharashtra, West Bengal.

Global distribution- *Aphis gossypii* is now found in tropical and temperate regions throughout the world except extreme northern areas.

Remark- This aphid was found in colonies under the surface of the leaves. There infestation first causing yellowing of the leaves later the infested leaves become puckered, and curled.

Family 7- Cicadellidae

9. *Idioscopus nitidulus* (Walker)

Collection Records: This specimen was examined which was collected from the host plant *Mangifera indica* L. at Sonarpur, South 24 Parganas District, West Bengal, in April, 2022.

Distribution in India- Andhra Pradesh, Gujarat, West Bengal.

Global distribution- This mango leaf hopper were reported from Papua New Guinea and Palau, Australia, India, Sri

Lanka, Burma, China, Taiwan, Japan, the Philippines, Pakistan, Indonesia and Malaysia.

Remark- Infestation caused no noticeable damage.

Family 8- Diaspididae

10. *Aspidiotus destructor* (Signoret)

Collection Records: This specimens were collected from various areas of Narendrapur, South 24 Parganas District, West Bengal, in April, 2022. The specimen were collected from the host plant *Mangifera indica* L. in December, 2021.

Distribution in India- Assam, Jammu & Kashmir, Punjab, Gujarat, Uttar Pradesh, Maharashtra, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Madhya Pradesh, Bihar, Odisha, West Bengal.

Global distribution- It has been recorded worldwide in tropical and subtropical areas, including China, Southeast Asia, India, Pakistan, Russia, Brazil, Central America and Caribbean, the Pacific Islands, Africa and North America

Remark- The insects were found to feeds on plant sap from leaves, stems and fruits, causing yellowing, tissue distortion and die back.

Family 9- Pyrrhocoridae

11. *Dysdercus koenigii* (Fabricius)

Collection Records: This specimen was examined; collected the host plant *Theobroma cacao* L. at Narendrapur, South 24 Parganas District, West Bengal, in February, 2022.

Distribution in India- Himachal Pradesh, Uttarakhand, Madhya Pradesh, West Bengal.

Global distribution- It has been recorded worldwide in tropical and subtropical areas, including China, Southeast Asia, India, Pakistan, Russia, Brazil, Central America and Caribbean, the Pacific Islands, Africa and North America

Remark- Both nymphs and adults were observed on the twigs and fruits of the host plant. But no damage symptoms were observed due to their infestation.

Family 10- Pentatomidae

12. *Nezara viridula* (Linnaeus)

Collection Records: This specimen was collected from the host plant *Passiflora edulis* (passion fruit) Sims, 1818 at Narendrapur, South 24 Parganas District, West Bengal, in April, 2022.

Distribution in India- Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Maharashtra, Odisha, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal.

Global distribution- This green stink bug is believed to have originated in Ethiopia. Its distribution now includes the tropical and subtropical regions of Europe, Asia, Africa and the Americas.

Remark- Their infestation causes no damage to the plants.

Family 11- Alydidae

13. *Leptocoris acuta* (Thunberg, 1783)

Collection Records: This specimen was collected from the host plant *Carissa carandas* L. at Basanti, South 24 Parganas District, West Bengal, in December, 2021.

Distribution in India- Arunachal Pradesh, Assam, Bihar, Delhi, Gujarat, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal.

Global distribution- This rice seed bug has been recorded from Asia, Central America, Oceania.

Remark- Stray occurrence. Their presence causes no damage to the plants. Found to be new report associated with *Carissa carandas* (Koromcha).

Order III – Coleoptera.

Family 12- Cerambycidae

14. *Batrocera rufomaculata* (De Geer)

Collection Records: This specimen was examined which were collected from the host plant *Mangifera indica* L. at Magrahat, South 24 Parganas District, West Bengal, in February, 2022.

Distribution in India- Assam, Bihar, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Punjab, Tamil Nadu, Uttar Pradesh,

Global distribution- It is generally found to South-East Asia, the Middle East, Iran, Turkey, Yemen, East Africa and Central America, Bangladesh.

Remark- No damage symptoms observed due to its infestation.

Family 13- Curculionidae

15. *Ochyromera artocarpi* (Pascoe)

Collection Records: This specimen was collected from various areas of Baruipur, South 24 Parganas District, West Bengal. The specimen were collected from the host plant *Artocarpus heterophyllus* Lam. in March, 2022.

Distribution in India- Andhra Pradesh, Kerala, Karnataka, Maharashtra, Tamil Nadu, West Bengal.

Global distribution- It is found in India, Burma, Ceylon, southern China, Malaya, and the East Indies. It is common in the Philippines, both cultivated and naturalized. It is grown to a limited extent in Queensland and Mauritius. In Africa, it is often planted in Kenya, Uganda and former Zanzibar.

Remark- No damage symptoms noticed.

16. *Odoiporus longicollis* (G.A.K.Marshall)

Collection Records: This specimen was examined. They were collected from the host plant *Musa acuminata* Linn. at Jaynagar, South 24 Parganas District, West Bengal, in January, 2022.

Distribution in India- Assam Bihar, Haryana, Kerala, Manipur, Sikkim, Uttar Pradesh, West Bengal.

Global distribution- This species is widely distributed throughout Bhutan, Cambodia, China, Hong Kong, India, Andaman and Nicobar Islands, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, Thailand and Vietnam.

Remark- They were very few in number, no damage symptoms noticed because of their infestation.

Order IV – Diptera

Family 14- Cecidomyiidae

17. *Procontarinia mangiferae* (Felt)

Collection Records: This specimen was examined, collected from the host plant *Mangifera indica* L. at Kakdwip, South 24 Parganas District, West Bengal in January, 2022.

Distribution in India- Andhra Pradesh, Bihar, Haryana, Karnataka, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.

Global distribution– Africa, Asia, North America, South America.

Remark- Only few adults were noticed but the larvae (maggots) were collected in large number by pricking the galls (with needles) on the leaves made by them as a result of infestation.

ORDER V - Lepidoptera

Family 15- Papilionidae

18. *Papilio demoleus* (Linnaeus)

Collection Records: This specimen was collected from different areas of Namkhana, South 24 Parganas District, West Bengal. The specimen were collected from the host plant *Aegle marmelos* (L.) Correa in April, 2021.

Distribution in India- Andhra Pradesh, Assam, Gujarat, Himachal Pradesh, Jammu & Kashmir, Bihar, Karnataka, Maharashtra, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal.

Global distribution- It is widely distributed swallowtail in the world. The butterfly can be found in South Asian Subcontinent (India including the Andamans, Bangladesh, western Pakistan, Sri Lanka, Nepal), Myanmar Thailand, the Philippines, Cambodia, Vietnam, southern China.

Remark- Only adult butterfly was observed, no eggs or larval forms recorded, so no infections noticed on the host plant.

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