

# MITES AND INSECTS OCCURRING ON SOME WEEDS IN THE CROP FIELDS OF NARENDRAPUR CAMPUS OF RAMAKRISHNA MISSION, WEST BENGAL

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Reviewer: Peter Smetacek

**Keywords:** Weeds, mites, insects, diversity, Narendrapur campus, West Bengal

## ABSTRACT

The present communication reports the occurrence of a total of 23 species of mites belonging to 15 genera, 9 families under 3 orders and 6 species of insects under 5 genera, 5 families and 2 orders from different weed species in the crop fields of Narendrapur campus. This includes 11 species under 7 genera and 3 families which are phytophagous mites, 9 species under 5 genera, 3 families and 2 orders are predatory mites and 3 species under as many genera and species are fungal feeders. All the insect species reported here are phytophagous in nature excepting a species of Thrips which is a predatory one. All the species are listed along with their hosts (for phytophagous group), habitats (for predatory group) giving biological information, wherever recorded in the field.

## INTRODUCTION

The Narendrapur campus of Ramakrishna Mission is very rich with diversity of agricultural crops, medicinal plants, etc; and those fields also harbor different species of weeds. It is a fact that the weeds in the crop field play a very important role as they often act as alternate hosts of the crop pests, when the main crop in the field is not available, then those mites/insects migrate to the weeds, take shelter and feed there. Thus, they survive in the field during the non-cropping period. When the main crop re-appears in the field, they re-infest the crop and thus the pest-host cycle is perpetuated. Hence, it is very important to know what are the insect and mite species which occur on the weeds in the crop field so that necessary advisory notes may be passed on to the farmers for removing those from the crop fields. Apart from this importance, some insects and mites are also known to act as biological control agents of weeds and that knowledge will prove valuable for biocontrol of weeds. Due to all these important aspects, it was thought necessary to carry out some preliminary surveys to explore mites and insects occurring on weeds in the crop fields of

Narendrapur campus, identify those and observe their relationship with the weeds. The present paper is based upon that study. Some of the works done in India on mites and insects on weeds are Sadana (1983), Mondal *et al.* (2012), Gupta (2012), Mitra & Gupta (2016), Marini *et al.* (2021) all on weed associated mites, while Capinera (2005), Kumar *et al.* (2021) investigated on weed associated insects. Besides, Barbercheck & Wallace (2021), in their review, discussed weed-insect reactions which also provided valuable up-dated information on this topic.

## MATERIALS AND METHODS

The exploration of mites and insects of weeds at Narendrapur campus was carried out from September 2021 till April 2022. Fortnightly collections were made by examining different weeds occurring in crop fields and examining those under stereo binocular microscope in the laboratory. Whatever insect and mite species were found, were collected with the help of a fine brush moistened with ethyl alcohol. Mounting was done in Hoyer's medium and identification was done by consulting the up-dated literature. All the identified specimens dealt with in this paper are deposited in the Repository for Entomological collection, in PG Department of Zoology, Vidyasagar College, Kolkata- 700091.

## RESULTS AND DISCUSSION

The identification of the entire collection revealed the occurrence of 23 species of mites belonging to 15 genera, 9 families under 3 orders and 6 species of insects under 5 genera, 5 families and 2 orders (Table-I). All these species have been listed in Table-I giving their respective hosts/habitats, collection dates and biological information, wherever observed.

Among the mite species, 11 belonged to phytophagous group and 9 species belonged to predatory group. The information given in Table-I is self-explanatory.

Among the phytophagous mites, *Petrobia hartoni* *Oxalis corniculata* was seen severely attacking the host causing severe chlorosis. In addition, *Tetranychus neocaledonicus* was seen attacking *Abutilon indicum*, *Brevipalpus californicus* on *Barlelia cristata* and *Polyphagotarsonemus latus* on *Bixa orellana* were also seen to cause damage on their respective hosts. Therefore, these mites may turn out to be good as biocontrol agents for the respective weeds. Among the predatory mites, excepting *Amblyseius largoensis* which was abundantly found on *Alternanthera philoxeroides*, the others were encountered only occasionally and hence their importance is unknown.

Among the insects, most of those were phytophagous but their population was too poor to cause any noticeable damage on weeds. There was only one unidentified species of *Scolothrips* which was predatory one.

Some mites which are basically fungus associated ones were also encountered on some weeds but their nature of association was not known with certainty.

## ACKNOWLEDGEMENT

The authors offer sincere thanks to the Secretary, Ramakrishna Ashrama, Narendrapur for providing infrastructure facilities and permission to collect mites and insects from weeds from different crop fields of Narendrapur campus.

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Table 1: List of mites and insects collected from weeds occurring in the crop fields of Narendrapur campus of Ramakrishna Mission, Narendrapur.

| SN | SPECIES (MITES)                                   | NAME OF WEED             | DATE OF COLLECTION | BIOLOGICAL INFORMATION                                                            |
|----|---------------------------------------------------|--------------------------|--------------------|-----------------------------------------------------------------------------------|
|    | PHYTOPHAGOUS MITE                                 |                          |                    |                                                                                   |
|    | FAMILY I<br>TETRANYCHIDAE                         |                          |                    |                                                                                   |
| 1  | <i>Oligonychus oryzae</i><br>(Hirst)              | <i>Cynodon dactylon</i>  | 22.ix.2021         | This mite colonized the undersurface of leaves but produced no damage symptoms.   |
| 2  | <i>Oligonychus mangiferus</i><br>(Rahman & Sapra) | <i>Argemone mexicana</i> | 29.ix.2021         | Its population was poor on upper surface of leaves, producing no damage symptoms. |
| 3  | <i>Tetranychus macfarlanei</i>                    | <i>Paederia scandens</i> | 11.xi.2021         | This mite produced similar                                                        |

|    |                                            |                                                             |            |                                                                                                                    |
|----|--------------------------------------------|-------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------|
|    | Baker & Pritchard                          | <i>Physalis minima</i>                                      | 16.ii.2022 | damage symptoms as in case of <i>Tetranychus neocaledonicus</i> and 1 thrips species was found associated with it. |
| 4. | <i>Tetranychus neocaledonicus</i><br>Andre | <i>Abutilon indicum</i><br><br><i>Digitarea sanguinalis</i> | 6.x.2021   | Occurred on undersurface of leaves and its colony was covered with a thin web. Infested leaves turned brownish.    |
| 5. | <i>Tetranychus hypogaeae</i> Gupta         | <i>Amaranthus viridis</i>                                   | 9.ii.2022  | Only a few specimens were noticed on under surface of leaves. Population was too small to cause any damage.        |
| 6. | <i>Petrobia harti</i><br>(Ewing)           | <i>Oxalis corniculata</i>                                   | 4.i.2022   | Severe infestation on both surfaces of leaves, causing chlorosis of leaves.                                        |

|                 |                                         |                                                             |            |                                                                                                                           |
|-----------------|-----------------------------------------|-------------------------------------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------|
| <i>chilades</i> | FAMILY II<br>TENUIPALPIDAE              |                                                             |            |                                                                                                                           |
| 7.              | <i>Brevipalpus californicus</i> (Banks) | <i>Barlelia cristata</i><br><br><i>Marsilea quadrifolia</i> | 11.12.2021 | Population of this mite was scattered over the lower surface of leaves and brown spots appeared at the points of feeding. |
| 8.              | <i>Brevipalpus essigi</i><br>Baker      | <i>Boerhaviadiffusa</i>                                     | 7.12.2021  | A couple of individuals were encountered on undersurface of leaves but no damage was                                      |

|     |                                          |                                                  |                          |                                                                                                |
|-----|------------------------------------------|--------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------|
|     |                                          |                                                  |                          | observed.                                                                                      |
| 9.  | <i>Tarsonemus</i> sp.                    | <i>Bixa orellana</i>                             | 18.11.2021               | Occasionally encountered, no damage was noticed.                                               |
| 10. | <i>Polyphagotarsonemus latus</i> (Banks) | <i>Bixa orellana</i>                             | 7.04.2022                | Infested leaves curled downwards.                                                              |
| 11. | <i>Didalotarsonemus</i> sp.              | <i>Chenopodium album</i>                         | 24.03.2021               | This mite was encountered on under surface of leaves carrying some excrescence on its body.    |
|     | PREDATORY MITE                           |                                                  |                          |                                                                                                |
|     | FAMILY IV<br>CUNAXIDAE                   |                                                  |                          |                                                                                                |
| 12. | <i>Neocunaxoidas</i> sp.                 | <i>Clerodendrum viscosum</i>                     | 13.10.2021               | This is a predatory mite occurred on undersurface of leaves.                                   |
|     | FAMILY V<br>PHYTOSEIIDAE                 |                                                  |                          |                                                                                                |
| 13. | <i>Amblyseius orientalis</i> Ehara       | <i>Lantana camara</i><br><i>Coccinea grandis</i> | 16.02.2022<br>14.04.2022 | Occasional encountered.                                                                        |
| 14. | <i>Amblyseius largoensis</i> (Muma)      | <i>Alternanthera philoxeroides</i>               | 21.12.2021               | This was abundantly found, appears to be a good predator.                                      |
| 15. | <i>Amblyseius adhatodae</i> Muma         | <i>Hemidesmus indicus</i>                        | 27.10.2021               | Occasional occurrence.                                                                         |
| 16. | <i>Euseius ovalis</i> (Evans)            | <i>Lantana camara</i>                            | 14.04.2022               | This is a known to be a good predator but in the present study such behaviour was not noticed. |

|     |                                                  |                                     |            |                                                                                                                                  |
|-----|--------------------------------------------------|-------------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------|
| 17. | <i>Euseius alstoniae</i><br>(Gupta)              | <i>Alternanthera<br/>serristris</i> | 28.12.2021 | This species<br>occurred<br>frequently on<br>various types of<br>plants having<br>predatory<br>importance.                       |
| 18. | <i>Scapulaseius<br/>sukanaensis</i> (Gupta)      | <i>Euphorbia hirta</i>              | 11.01.2022 | Casual occurrence.                                                                                                               |
| 19. | <i>Scapulaseius<br/>potentillae</i><br>(Garman)  | <i>Eclipta frostrata</i>            | 29.09.2021 | Casual occurrence.                                                                                                               |
| 20. | <i>Pronematus<br/>elongatus</i> Baker            | <i>Pavonia odorata</i>              | 11.01.2022 | The present plant<br>on which it was<br>recorded formed a<br>new habitat<br>record.                                              |
|     | FRUGIVOROUS<br>MITE                              |                                     |            |                                                                                                                                  |
|     | FAMILY VII<br>ACARIDAE                           |                                     |            |                                                                                                                                  |
| 21. | <i>Tyrophagus<br/>putrescentiae</i><br>(Schränk) | <i>Achyranthes aspera</i>           | 14.04.2022 | This mite is<br>commonly<br>encountered on<br>stored products<br>and therefore its<br>occurrence on<br>plants is<br>interesting. |
|     | FAMILY VIII<br>SCHELOBATIDAE                     |                                     |            |                                                                                                                                  |
| 22. | <i>Schelobates</i> sp.                           | <i>Sida cordifolia</i>              | 7.04.2022  | This mite is<br>known to be a<br>fungal associated<br>one.                                                                       |
|     | FAMILY IX<br>ORIBATULIDAE                        |                                     |            |                                                                                                                                  |
| 23. | <i>Galumna flabellifera</i><br>(Hammer)          | <i>Scoparia dulcis</i>              | 21.12.2021 | This mite is<br>known to be a<br>fungal associated<br>one.                                                                       |

|    |                                   |                                                                                |                                        |                                                                                                                                                     |
|----|-----------------------------------|--------------------------------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|    | SPECIES (INSECTS)                 |                                                                                |                                        |                                                                                                                                                     |
|    | ORDER<br>HEMIPTERA                |                                                                                |                                        |                                                                                                                                                     |
|    | FAMILY I<br>APHIDIDAE             |                                                                                |                                        |                                                                                                                                                     |
| 1. | <i>Aphis gossypii</i><br>(Glover) | <i>Cyperus rotundus</i><br><i>Echinochloa colona</i><br><i>Physalis minima</i> | 11.12.2021<br>16.02.2022<br>26.03.2022 | This species colonized on under surface of leaves and the infested leaves showed chlorosis.                                                         |
| 2. | <i>Aphis craccivora</i> (Koch)    | <i>Tridax procumbens</i>                                                       | 13.10.2021                             | The population of this aphid was good on under surface of leaves, mostly the juvenile stages were observed. The infested leaves turned pale yellow. |
| 3. | <i>Diaspis</i> sp.                | <i>Desmodium gangeticum</i><br><i>Eleusine indica</i>                          | 22.09.2021<br>14.04.2022               | It colonized the under surface of leaves and white spots appeared at the points of feeding.                                                         |
|    | FAMILY III<br>PSEUDOCOCCIDAE      |                                                                                |                                        |                                                                                                                                                     |
| 4. | <i>Pseudococcus</i> sp.           | <i>Cymbopogon martinii</i><br><i>Panicum repens</i>                            | 16.02.2022<br>24.03.2022               | It colonized the under surface of leaves and white spots appeared at the points of feeding.                                                         |
|    | FAMILY IV<br>PANTATOMIDAE         |                                                                                |                                        |                                                                                                                                                     |
| 5. | <i>Bagrada cruciferum</i> (F.)    | <i>Hygrophila schulli</i>                                                      | 27.10.2021                             | It occurred on leaves. No damage was noticed.                                                                                                       |

|    |                        |                                                       |                          |                                                                |
|----|------------------------|-------------------------------------------------------|--------------------------|----------------------------------------------------------------|
|    | ORDER<br>THYSANOPTERA  |                                                       |                          |                                                                |
|    | FAMILY V<br>THRIPIDAE  |                                                       |                          |                                                                |
| 6. | <i>Scolothrips</i> sp. | <i>Eupatorium<br/>triplinerve<br/>Physalis minima</i> | 11.11.2021<br>16.02.2022 | This is a predatory<br>thrips and it fed on<br>eggs of aphids. |