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Some new records of mite and insect pests and diseases occurring on *Gerbera* and *Chrysanthemum* plants cultivated under polyhouse condition at Narendrapur, West Bengal

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Abstract
Mite pests like *Tetranychus urticae, T. ludeni, Eoteranychus lewisi* and *Polyphagotarsonemus latus*, insect pests like *Bemisia tabaci, Myzus persicae, Ferrisia* sp. and diseases like root rot and powdery mildew attacked gerbera plants maintained in polyhouse at Narendrapur campus of Ramakrishna Mission Residential College, causing severe damage leading to stunting of growth, reduction in flower size and numbers and occasional death. The chrysanthemum plants were also attacked by *T. urticae* and root rot. Application of hexithiazox (5.45 EC @1.25ml/1litre water) for mites, imidacloprid (17.8 SL@3ml/10 L water) for insects and mancozeb (75% WP, 2g/1 lit water) and Neem oil + water for control of diseases, proved effective. Most of the mite and insect pests were new reports for West Bengal on gerbera plants. All the pests/diseases are listed including the damage/disease symptoms, caused by those.

Keywords: *Gerbera*, *Chrysanthemum*, mite-insect pests, diseases, new reports, West Bengal

Introduction
Both *Gerbera* (*Gerbera jamesonii*, commonly known as African daisy) and chrysanthemum (*Chrysanthemum indicum*) are very important commercial decorative flowering plants. Gerbera is cultivated extensively in India in 1.15 thousand ha land, producing 20.53 thousand MT flowers (Indiastat -2015-16) [6]. Both have high economic values in domestic and international markets and India earns foreign exchange substantially by exporting these flowers. Although it grows in many parts in India but leading states for gerbera cultivation are Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Jammu and Kashmir, Himachal Pradesh and West Bengal. Due to their lucrative market values, cultivation of these flowering plants is gaining momentum. The Residential college of Ramakrishnna Mission, Narendrapur established a polyhouse measuring 500 Sq.Mt. area with the grant of West Bengal Horticulture Dept in March, 2023 and started cultivating gerbera and chrysanthemum plants each of 20-30 varieties, for increasing the aesthetic beauty of the campus and earn money by selling the flowers/saplings. Initially, most of the plants were healthy and free from pest attack and produced high quality gerbera flowers of different colours like yellow, orange, red, pink, purple, white, etc. having flower size of 15-20 cm diameter (*Gerbera*) and 10-12 cm dia. (*Chrysanthemum*). Later, during the second year, both these flowerfing plants were found attacked by a number of mite and insect pests as well as some diseases causing substantial damage to the plants and economic loss. The present communication lists for the first time from West Bengal the mite / insect pests and diseases along with their period of occurrence and damage/disease symptoms produced.

Material and methods
The gerbera and chrysanthemum plants cultivated in the polyhouse of Ramakrishna Mission Residential College campus, were examined during July, 2023 to June 2024 and observations were recorded regarding occurrence of mite/insect pests on those plants. Wherever necessary, leaf samples of both gerbera and Chrysanthemum plants were brought to the laboratory in polythene packets and were examined under stereobinocular microscope. The mites/insects were collected with the help of a fine brush, those were preserved in 70% ethyl alcohol and identified (all by the junior author). While taking observation, the nature of damage done, period of occurrence, damage symptoms of pests/diseases, etc. were recorded.

Result
The examination of collected insects and mites under research microscope revealed the occurrence of 4 species of mites, 3 species of insects and 2 types of diseases and those are discussed below:

A. Mites
1. Tetranychus urticae (2– spotted spider mite)
This mite species was observed during the entire period of study reaching maximum infestation during April-May of 2024. Hundreds of mites occurred on undersurface of leaves caused initially yellowing of leaves, then those turned brown and gradually withered. Many of the plants died. Infestation was also noticed on flowers causing discolouration of flowers, reducing in flower diameter, shortening of petiolar stock and finally those dried up. It was indeed a huge economic loss. During winter months of 2023, the infestation reduced considerably. The occurrence of this mite is known from other parts of world also.

2. Tetranychus ludeni (Carmine mite)
The occurrence of this mite was noticed during February-April, 2024 and produced similar type of damage symptoms as was seen in case of T. urticae. The infestation was noticed on flowers also. The occurrence of this mite in gerbera was earlier unknown. This caused premature leaf fall and drying of flowers.

3. Eotetranychus lewisi
The infestation of this mite was recorded for the first time on chrysanthemum plant in the polyhouse but degree of

infestation was poor. The infestation caused chlorophyll damage and drying of leaves in some cases.

4. Polyphagotarsonemus latus (yellow mite)

Its attack was recorded on young leaves of gerbera during May-June, 2024. Its occurrence was on lower surface of leaves and such leaves did not develop properly and later dried up.

B. Insects

1. Bemisia tabaci (white fly)

This infestation of white fly was noticed throughout the year but more during summer months of July, 2024. It is a polyphagous pest and caused serious damage especially to gerbera plants. Adults and nymphs sucked sap from the leaves causing devitalization of plants and premature defoliation. The development of sooty mould was seen on leaves where fungal infection took place. Chrysanthemum plants also were attacked but it was never as serious as was in case of gerbera.

2. Myzus persicae (Green fly)

This aphid attacked both gerbera and chrysanthemum during March-May, 2024. Like white fly, the nymphs sucked plant sap from undersurface of leaves making the plants unhealthy and affected growth.

3. Ferrisia sp. (Mealy bugs)

Occasionally this insect colonized on leaves and petioles of gerbera plant and covered the infested part, with white waxy coating. Such plants had shown poor growth. In some cases plants died.

C. Diseases

1. Root Rot (Rhozoctonia solani)

This fungal disease attacked gerbera plant during April-May which caused wilting. The roots turned reddish brown, then became green and started rotting. It was also seen in chrysanthemum where the leaves became discoloured.

2. Erysiphe sp. (powdery mildew)

Due to attack of this disease, powdery coating appeared on leaves and stems in gerbera. In case of Chrysanthemum, the leaves became distorted. Attack was more during July.

Management

- For management of sucking insect pests, application of imidacloprid 17.8 SL (3ml/10L water) gave good control.
- For management of mites, application of Hexithiazox 5.45EC@ 1.25 ml/1 litre water could control mites.
- For powdery mildew control, mixture of neem oil + water proved to be good
- For root rot control, application of Maneozelo 45% WP (M-45) @ 2 gm/1 L. water yielded good result.

Discussion

Gupta (1985, 2012) [4, 5] reported some mites like, Agistemus sp. Brevipalpus deleoni, B. phoenicis on gerbera plant in India but in the present study none of these mites could be collected from gerbera under polyhouse condition. Likewise, Gupta (1977, 1985, 2012) [3, 4, 5], Karmakar *et al*. (2010) [7], Sadana and Gupta (1982) [11], reported several mites like, Bryobia eharai, Tetranychus urticae, T. macfarlanei, Brevipalpus karachiensis, Paraphytoptus chrysanthemi, Neoseiulus cucumeris, Amblyseius channabasavannai, Euseius ovalis and Typhlodromus neosoleiger on Chrysanthemum but excepting to T. urticae, none of the other mite species could be recorded in the present study. Since the present observations were done under polyhouse condition, and not in the open field, mite infestation was limited. So far as insects are concerned, Rane and Mohan (1997) [10], Bhusal (2007) [1], Sood (2010) [12], Pal Sarkas (2009) [9], Ya sasvi (2020) reported insect pests on gerbera • However, majority of the insect pests like Thrips, scale insects, borers, etc., which were reported by them, could not be found in the present study and the reason was same as mentioned for mites.

As regards diseases, Yeasmen and Shasmi (2013), Reddy (2016), Suneeta *et al*. (2017) [13], Goutam *et al*. (2020) reported some disenses on gerbera plant but most of those could not be recorded in this study excepting white fly and root rot. Hence, more investigation on pests / diseases on gerbera cultivation under polyhouse condition is needed.

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References

1. Bhusal AT. Management of sucking pests in gerbera under polyhouse condition.M.Sc. (Agri-) Thesis, Agriculture University, Navsari, 2007, 114.
2. Gautam KK, Kumar S, Raj SK. Diseases affecting gerbera cultivation and their control measures. Int. J. Floriculture Sci. and Landscaping. J. Green and Gardens,2020:3(5):1-16.
3. Gupta SK. Indian J. Acarology,1977:1(1):28-37.
4. Gupta SK. Handbook: Plant mites of India. Zoological Survey of India, Calcutta, 1985, 520.
5. Gupta SK. Handbook: Injurious and beneficial mites infesting agri-horticultural crops in India and their management. Nature Books India, New Delhi, 2012, 362.
6. Indiastat 2015-16. Area and production of gerbera in India, 2019. https://www.indiastat.com.
7. Karmakar K, Gupta SK. Bhattacharya DK. Phytophagous and predatory mites (Acari) occurring on ornamental plants in South Bengal, with their economic importance. Abstract. Int. Symp.-Workshop in Acarology, Kalyani, 2010, 40-41.
8. Pal S, Karmakar K. Population dynamics and management of yellow mite Polyphagotarsonemus latus (Bank) (Acari: Tarsonemidae) infesting gerbera under protected condition, J. Entomol. Zool. Stud,2017:5(5):795-799.
9. Pal SK, Sarkar I. Pests infesting ornamental plants in hilly region of West Bengal. J. Pl. Prot. Sci,2009:1(1):98-101.
10. Rani BJ, Mohan NG. Pest management in ornamental crops. Progressive Floriculture, 1997, 169-181.
11. Sadana GL, Gupta BK. Distribution and new host records of phytophagous mites (Acarina**:** Tetranychoidea). Indian J. Ent,1982:1:65-68.

12. Sood AK. Integrated pest management: Principles and practices, 2010. http:// agropedia. Itk.ac.in / content / management-insect-pests-protected environment (7 Jan, 2020).
13. Suneeta P, Eraivan AA, Nakkceran S. Experiment on collar rot of gerbera by using biocontrol agents and fungicides in pot culture conditions. Int. J. Agri. Sci. Res,2017:7(3):481-486.
14. Yasasvi P. Incidence and management of sucking pests on gerbera. M.Sc. Thesis, Faculty of Agriculture, KAU, Trisur, 2020.
15. Yasmin F, Shamsi S. Phylloplane Mycoflora of Gerbera spp. and their pathogenic potentiality. Indian Res. J. Pl. Sci,2013:37(2):211-217.