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Incidence of *Oxycetonia versicolor* Fabricius on sunflower from West Bengal, India – A new report

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Sunflower, botanically known as *Helianthus annuus* and representing the family Asteraceae (formerly known as Compositae), is a crucial oil yielding crop that originated in north America. Seeds are the main economic portion of the crop that is processed for several products and commercialization of these products are executed in cooking purpose as well as feed supply for the livestock animals (Yegorov *et al.*, 2019). Significant health benefits are provided by the crop through the supply of premium oil and dietary fibre (Khan *et al.*, 2015). Seed of the crop contains unsaturated fatty acids like palmitic acid (5%), stearic acid (6%), monounsaturated fatty acid like oleic acid (30%) and polyunsaturated fatty acid like linoleic acid (59%) (Anon., 2005). As per the scenario, worldwide sunflower oil production reached up to 18 million tonnes. Ukraine and Russia are the leading sunflower oil producing country among the world accounting for 53% of the total global production. In the Indian context it was observed that total production of sunflower seed during the fiscal year 2021 was 185 thousand metric tonnes (Anon, 2022). In West Bengal during 2016-2017 the production of

sunflower seed was 0.02 million tonnes from an area of 0.01 million ha where as during 2017-2018 the sunflower growing area in West Bengal remains almost same but production level reduces considerably and became 0.01 million tonnes (Anon., 2018). During the past years sunflower production decreased due to several biotic and abiotic constraints in India as well as in West Bengal. Previous investigation revealed that sunflower has been attacked by 43 insect species in India (Sandhu *et al.*, 1973; Makhdoomi *et al.*, 1984). Hassan *et al.* (1984) reported that about 19 insect pests infested sunflower crop and among them *Helicoverpa armigera* Hubn., *Aphis gossypii* Glover., *Bemisia tabaci* Genn., *Amrasca devastans* (Ishi.) and *Atractomorpha crenulata* (Fab.) causes economic damage to the crop (Satter *et al.*, 1984). Climate change over the years may bring changes in the pest and natural enemy complex of crop ecosystem including sunflower in different growing regions (Geetha and Hegde, 2018). Besides this mono-cropping with intensive cultivation using high yielding varieties, using of higher external inputs including fertilizers and pesticides may lead to the change in pest incidence on a particular

crop. Under the changed circumstances some pest which were previously not known for causing economic damage to the concerned crop are becoming a matter of concern as well as some new insects also are appearing on a particular crop of a concerned region which have no previous history of association with that crop of that particular region (Taggar *et al.*, 2012). One such insect is flower chafer beetle, *Oxycetonia versicolor* Fabricius (Scarabaeidae: Coleoptera).

The flower chafer beetle (*O. versicolor*) feeds on floral parts of several crops causing considerable damage as the reproductive parts gets damaged. It is belonging to the family Scarabaeidae and subfamily Cetoniinae under the order Coleoptera. The insect is also known as *Cetonia versicolor* and *Gametis versicolor* Fabricius, 1775. The existence of this insect in the Seychelles was first noticed by Fairmaire (1893) who reported it as *Glycyphana versicolor*. Dupont in 1917 noticed the infestation of this insect in the rose bushes during day (Matot, 2000). Afterwards several provinces and regions of the world like Samoa, China, India, Sri Lanka, Chagos, Madagascar, Mascarenes and South Africa reported this insect (Matot, 2000). In the Indian subcontinent the earliest incidence of this insect was recorded from Indore district of Madhya Pradesh (Arrow, 1910).

The occurrence of these beetles on sunflower cv. KBSH 1 was first noticed in the

farmer's field located at Bhayna (23.3110° N, 88.6386° E) under the district Nadia, West Bengal (Fig. 1). Incidence of the adult beetles was observed during last week of March, 2021 when the crop was at fifty per cent flowering stage coinciding with the peak flowering from March to April. The infestation was low to moderate (2-3 beetles/ flower) and their occurrence on the flowers was recorded after 11 am in the day time. Feeding of the adult beetles was noticed on the floral head (Fig. 2) from where they fed on the petals, pollens (Fig. 3), nectars and ovaries. Feeding of those floral parts causes substantial feeding injury and chaff in the grain. Association of this insect with sunflower is not previously reported from West Bengal. This is the first observation on the occurrence of chafer beetle (*O. versicolor*) on sunflower crop from West Bengal and also from Eastern India as per the available literature.

The chafer beetles are mainly known for infesting the floral parts particularly they feed on the pollen grains of several crop flowers and most of their activity takes place during daytime. Immature stages of these beetles generally harbored the decomposed soil organic materials and few of them infest plant roots (Taggar *et al.*, 2012). The mouthparts of the adult chafer beetles lack enough potential to penetrate resistant and sclerotized plant tissues as they are less sclerotized. For that reason the main damage is caused by the dentate tibiae rather than the mouthparts as they use the tibiae for making

slits in the floral parts which results in the destruction of the flower. This situation happens frequently when the flower inhabits more population causing competition in between the individuals (Viggiani, 1926; Tremblay, 2000).

There are several reports about the insect infesting different crops having economic importance. The insect was found to be distributed among different parts of South India and some northern parts also. In these regions several crops like sorghum, maize, ragi, ground nut were reported to be infested by this insect (Fletcher, 1914). Previous investigation suggested that the adult chafer beetle not only damaged the flowers but also the leaves and shoots of groundnut and okra whereas grubs were the root feeders but no considerable damage was caused by them (Fletcher, 1917). Grubs generally get nourished from grass compost, sawdust and organic matter (Hinckley, 1967). Bhatnagar (1970) discovered the existence of the insect as a pest in different crops like citrus, cotton, okra, sorghum, maize, and groundnut cultivated in some parts of Rajasthan. Different red gram growing parts of India were infested with this beetle where they mainly fed on the pollen grains (Reed *et al.*, 1989). Voracious feeding by these insects was observed from pearl millet panicles in Rajasthan (Nwanze and Youm, 1995). From Tamil Nadu these chafer beetles were noticed to inflict damage the brinjal crop by devouring the tender shoots, floral buds and flowers (Ambethgar, 2000).

The insects were also known for causing injury to *Jatropha curcas* in mild level (Shanker and Dhyani, 2006). Incidence of chafer beetle (2.08%) was also recorded from Doddaballapur, Lalbagh (Bangalore) where they damaged the rose flowers and leaves also; preferably they fed on the flowers (Kumar *et al.*, 2009). The pest was also recorded from green gram at flowering and pod developing stage of the crop (Duraimurugan and Srinivasan, 2009). Incidence of this beetle was also reported from red gram and green gram from Punjab (Taggar *et al.*, 2012). Recently cotton growing regions of central India became infested with this insect which caused low (0.40%) to moderate (12.92%) damage in Rajkot (Gujarat) and Wardha (Maharashtra), respectively (Naik *et al.*, 2017). Daravath *et al.* (2020) recorded the incidence of flower chafer beetle from Telengana and Southern India, where they found it mainly damaging the cotton. Besides they also noticed some other host plants of this beetle *viz.* brinjal, sesamum, maize, sorghum and *Parthenium hysterophorus* from that region.

It may be concluded that the incidence of flower chafer beetle, *Oxycetonia versicolor* on sunflower as documented above is the first-time report from West Bengal in particular and from Eastern India as a whole as per the existing scientific literatures. In future, further investigations will be needed for assessing the probable population build up of this insect with a pest risk analysis. A comprehensive knowledge on the nature of damages produced

by the insect along with its bionomics and way of sustainable management if required should be studied.

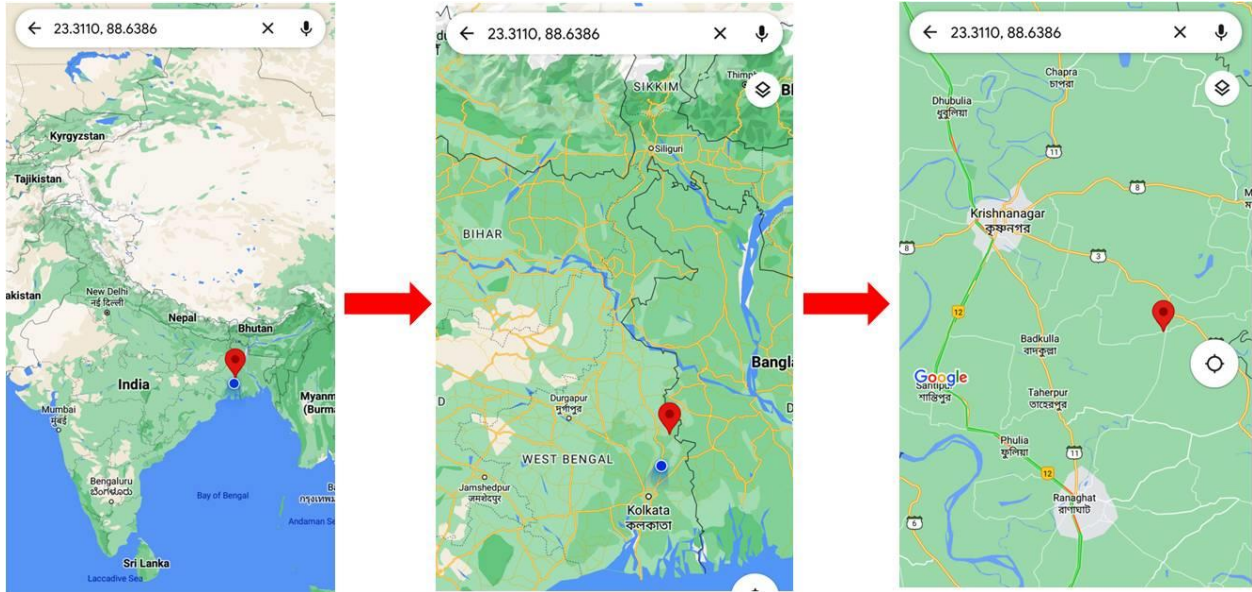


Fig. 1: Place of record as per GPS



Fig. 2: Incidence of flower chafer beetle (*Oxycetonia versicolor* Fab.) on the flower head of sunflower

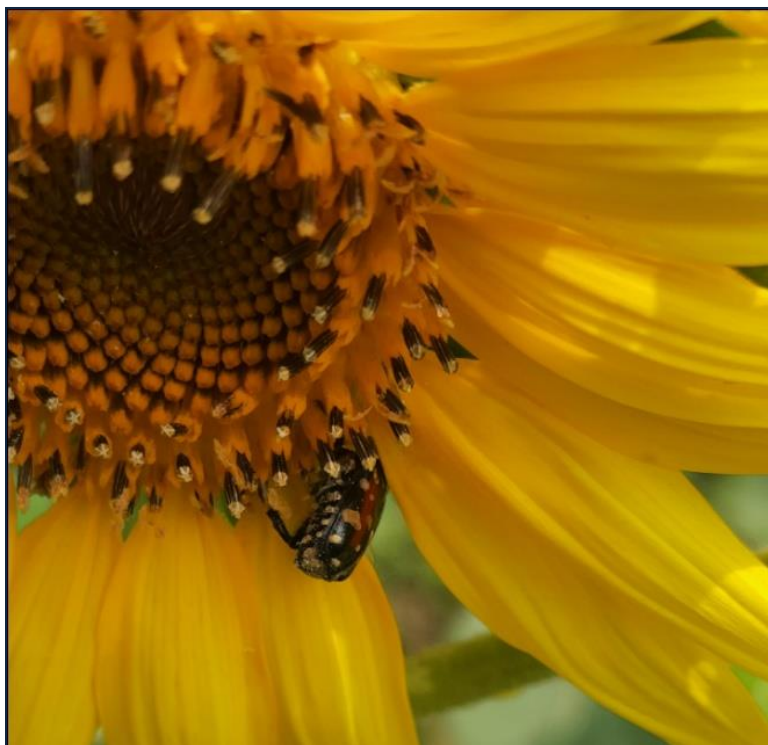


Fig. 3: Flower chafer beetle (*Oxycetonia versicolor* Fab.) feeding on sunflower pollens

References

- Ambethgar, V. 2000. Report of cetonid beetle *Oxycetonia versicolor* Fab. on brinjal from Tamil Nadu, India. *Insect Environment*, **5**: 170.
- Anonymous. 2005. British Pharmacopoeia Commission (2005). "Ph Eur monograph 1371". British Pharmacopoeia 2005. Norwich, England: The Stationery Office.
- Anonymous. 2018. Agricultural Statistics at a Glance. Directorate of Economics and Statistics, Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India.
- Anonymous. 2022. Sunflower oilseed production volume in India FY 2016-2021. Statista Research Department, Mar 22, 2022.
- Arrow, G.J. 1910. The fauna of British India including Ceylon and Burma, Col. Lamell. I (Cetoniinae and Dynastinae). London, UK: Taylor and Francis.
- Bhatnagar, S.P. 1970. Records of new cetonides pests in Rajasthan state. *Labdev Journal of Science and Technology*, **2**: 119-120.

- Daravath, V., Kasbe, S.S. and Musapuri, S. 2020. Flower chafer beetle (*Oxycetonia versicolor* Fabricius) on the verge of becoming a major pest on cotton in Telangana region of India: A first report. *Journal of Entomology and Zoology Studies*, **8**(2): 242-246.
- Duraimurugan, P. and Srinivasan, T. 2009. Insects and mite assuming status of pests in mungbean. *Pulses Newsletter*, 20, 3. IIPR, Kanpur, India.
- Fairmaire, L. 1893. Sur quelques Coléoptères de Séchelles. *Bulletin de la Société Entomologique de France*, **19**: 322-325.
- Fletcher, T.B. 1914. Some south Indian insects and other animals of importance. The Superintendent Government Press, Madras.
- Fletcher, T.B. 1917. Report of the proceedings of the second entomological meeting. Vol. 2. Calcutta, India: Superintendent Government Printing.
- Geetha, S. and Hegde, M.G. 2018. Incidence of insect pests and natural enemies in sunflower. *International Journal of Current Microbiology and Applied Sciences*, **7**(9): 1593-1601.
- Hassan, A.M., Mahmood, T. and Ahmad, M. 1984. Insect pests of sunflower at Faisalabad. Proceedings of the National Workshop, April 28-30, Barani Agriculture and Development Project, NARC, pp. 39-42.
- Hinckley, A.D. 1967. Associates of the coconut rhinoceros beetle in Western Samoa. *Pacific Insects*, **9**(3): 505-511.
- Khan, S., Choudhary, S., Pandey, A., Khan, M.K. and Thomas, G. 2015. Sunflower oil: Efficient oil source for human consumption. *Emergent Life Sciences Research*, **1**: 1-3.
- Kumar, S., Sankar, M., Sethuraman, V. and Musthak, A. 2009. Population dynamics of white grubs (Coleoptera: Scarabaeidae) in the rose environment of Northern Bangalore, India. *Indian Journal of Science and Technology*, **2**: 46-52.
- Makhdoomi, S. M. A., Bhatti, M.N., Zia, M.A. and Shafiq, M. 1984. Studies on insect pests associated with sunflower crops in Faisalabad. *Journal of Agricultural Research*, **22**: 51-62.
- Matot, P. 2000. Note on the flower scarab *Oxycetonia versicolor* (Fabricius, 1775) (Coleoptera: Scarabaeidae) in the Seychelles. *Phelsuma*, **8**: 77-78.

- Naik, V.C.B., Giri, N.H., Kumbare, S., Kranthi, S. and Kumar, N. 2017. New report of *Oxycetonia versicolor* Fabricius, as a pest on cotton from Central India. *National Academy Science Letters*, **42**: 387-390.
- Nwanze, K.F. and Youm, O. 1995. Panicle insect pests of sorghum and pearl millet: Proceedings of an International Consultative Workshop (1993, ICRISAT Sahelian Center, Niamey, Niger).
- Reed, W., Lateef, S.S., Sithanatham, S. and Pawar, C.S. 1989. Pigeonpea and chickpea insect identification handbook. Information Bulletin 26. Patancheru, India: ICRISAT.
- Sandhu, G.S., Brar, K.S. and Bhalla J.S. 1973. Pests of sunflower and other insects associated with sunflower crop. *Oilseed Journal*, **3**: 19-26.
- Satter, A., Karimullah and Yousuf, M. 1984. Insect pests of sunflower in NWFP, Pakistan. *Pakistan Journal of Agricultural Research*, **5**: 239-240.
- Shanker, C. and Dhyani, S.K. 2006. Insect pests of *Jatropha curcas* L. and the potential for their management. *Current Science*, **91**: 162-163.
- Taggar, G.K., Singh, R., Kumar, R. and Pathania, P.C. 2012. First report of flower chafer beetle, *Oxycetonia versicolor*, on pigeonpea and mungbean from Punjab, India. *Phytoparasitica*, **40**(3): 207-211.
- Tremblay, E. 2000. Entomologia applicata. Coleotteri (da Cicindelidi a Lucanidi). *Liguori editore, Napoli*, **4**(1): 1-104.
- Viggiani, G. 1926. Alcune notizie sulla morfologia e sulla biologia della *Tropinota hirta*, con speciale riguardo ai danni da essa recati alle coltivazioni erbacee ed arboree. *Bollettino della Società dei Naturalisti in Napoli*, **37**: 28-53.
- Yegorov, B., Turpurova, T., Sharabaeva, E. and Bondar, Y. 2019. Prospects of using by-products of sunflower oil production in compound feed industry. *Journal of Food Science Technology Ukraine*, **13**: 106-113.

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