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Study on Agriculture pest in Khultabad of Aurangabad District of Maharashtra

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ABSTRACT: Field survey and farmers visit was conducted at some selected farm/fields of Khultabad region where some selected crops viz cotton, gram, Sorghum (jowar), maize, wheat, Pigeon pea grown during Kharif and Rabi season in view to study the incidences of insect pests on these crops. The observation of field study revealed that total 18 insect pests belong to 8 orders, out of 18 insects maximum 5 insects were recorded as from order hemiptera. The incidence of *Dysdercus cingulatus* (Red cotton Bug) was found to be the most common insect pest on most of the crops. Besides this presence of termite as a remarkable crop damaging pest observed in the underground field which has potency to damage various range of crops by destroying the root system of plants.

I. INTRODUCTION

India is one of the agricultural country in the world. Near about more than 68% Indian population inhabits in rural areas of the country. In other word majority of Indian populations are rural and depends on agriculture for their expenses and lives. However majority farmer set and perform their agro based industries along with agriculture such as apiculture, sericulture, lac culture, fish farming, emu farming, goat farming and poultry farming etc. It is fact that meanwhile occupation of agriculture is facing a very serious problem of attack of insect pests to the crops. The class Insecta of phylum Arthropoda is a largest group in the animal kingdom. They are cosmopolitan in distribution. These insects are serious pests in agriculture and attack on cultivated plants, some are veterinary and some medical pests too. These pests damage various agriculture crops and causing great economic losses and adversely affects on the yield. These insects are voracious feeder. During their larval stage they cause a heavy damage to agriculture crops. More than 10,000 species of insects damaged food plants worldwide ¹. According to one of the study, an Indian agriculture field is suffering an annual loss of about 8, 63,884 Million due to attack of insect pests ². Stored bulk grain and processed commodities also affects by insects responsible for big economic loss ³. One of the study reveals that in India wheat is attacked by number of insect pests⁴. In other research Deshmukh and Ade have recorded 8 species of cotton pests in Akot area of District Akola of Vidhabha, Maharashtra ⁵. Again in same study Pandey *et al* recorded 66%-100% losses in yield in cowpea due to insect pest ⁶. The heavy crops are loss from insect pests, the farmers use large amounts of pesticides ⁷. Sorghum is the fifth most important cereal crop in the world after wheat, rice, maize and barley. It is grown in the arid and semiarid parts of the world. About 150 insect species have been reported as pests on sorghum ⁸. As per, still higher yield losses to the extent of 66 and 95% were incurred due to bollworms in *arboreum* and *hirsutum* cotton, respectively ⁹. Again there is big problem of invasion of fall armyworm, *S. frugiperda* to India has further worsened the maize production making the farmers helpless. Fall armyworm reported to be feeding on more than 80 plant species from 23 families¹⁰. Many studies have been carried out in various regions of Maharashtra on various crops but not a specific study has been carried out on major crops grown in Khultabad. Therefore, in order to study the population dynamics of insect pests on some major crops including gram, jowar, maize, wheat and pigeon pea crops grown in some selected farms of Khultabad. A field survey was conducted during Kharif and Rabi seasons in the research area.

II. METHODOLOGY

Khultabad is located at 20.05°N 75.18°E. Throughout the year, in Khultabad, there are 124.8 rainfall days, and 680mm (26.77") of precipitation. A field survey of some selected farm of Khultabad was made during Kharif and Rabi season of year 2020-2021. Field survey was conducted on selected farm. Crop viz cotton, gram, Sorghum (jowar), maize, wheat, Pigeon pea etc were observed and recorded. The insect pests observed on the crop during the survey were noted down and photograph was captured using available camera. The insect pests observed were identified with the help of research papers of various researchers and internet sources.

III. RESULTS AND DISCUSSIONS

Field survey and the study in the research area found the incidence of total 18 insect pest. The order Hemiptera and order Lepidoptera were found dominant order in respect to insect pest. Hemiptera order which represented by each 5 species affecting different 7 crops, followed by Lepidoptera representing 4 species affecting 5 crops respectively followed by diptera, Orthoptera and Coleoptera, Hymenoptera and Isoptera. Maximum 5 insect pests were recorded from order Hemiptera and 4 insect pests were recorded from order Lepidoptera. Insects from order Hemiptera were found on 5 different crop as a host plant viz cotton, Pigeon pea, maize, Sorghum and wheat. However Lepidopteran Insects found on 5 different plants as a host plants like Gram, Cotton, Pigeon Pea, maize and Sorghum. In one of the study Siddiqui and Marwaha recorded that maize stem borer, pink stem borer, armyworm, gram pod borer and maize aphid causes economic yield losses to maize crop during different seasons all over the country¹¹. In recent similar study Farook *et al.* reported that wheat crops are heavily attacked by Armyworm, Cereal leaf beetle, wheat aphid, Grasshopper, and termites¹². In the present study during field survey was found that Red Cotton Bug *Dysdercus cingulatus* was recorded as common pest on 4 major crops i.e., Cotton, Maize, Sorghum and wheat. In recent study it is also observed that presence of termite as a remarkable crop damaging pest which has potency to damage various range of crops by destroying the root system of plants. In one of the study it was found that Termite attacks on annual and perennial crops cause significant yield losses damaging the plants at all growth stages¹³. The attack usually begins on the roots and then spreads to upper parts. In older plants the bark and underlying tissue is eaten up, which are gradually exposed to attack by pathogenic microbes resulting ultimate death of the plant. In the same study, Pardeshi *et al.* observed that termites *O. obesus* acted as pest to all crops, irrespective of the plant stages. However, attack was more prominent in sugarcane (43%) than in cotton (27%), wheat (19%) and castor (10%)¹⁴. In the same study further it was recorded that 15 species of termites belonging to two families and seven genera from Vadodra and Gujarat, during 2002–2005 also observed along with sugarcane, wheat, cotton and castor was also affected adversely¹⁴. The termites feed on the roots and make tunnels in them. The plants show symptoms of wilting because the root tissues are replaced with soil by the termites, eventually leading to the plant's death which is also observed prominently in the research area.



Fig 1: Maize Shoot eater (*Atherigona soccata*)

Termites cause extensive damage to agricultural and horticultural crops, agroforestry, stored timbers, books and records, woodworks in buildings and stored products containing cellulose (Rashmi and Sundararaj 2013). The losses caused in India alone run into several hundred million rupees per year. Termites cause extensive damage to agricultural and horticultural crops, agroforestry, stored timbers, books and records, woodworks in buildings and stored products containing cellulose (Rashmi and Sundararaj 2013). The losses caused in India alone run into several hundred million rupees per year. Termites cause extensive damage to agricultural and horticultural crops, agroforestry, stored timbers, books and records, woodworks in buildings and stored products containing cellulose (Rashmi and Sundararaj 2013). The losses caused in India alone run into several hundred million rupees per year.



Fig 2: Asian lady Beetle (*Harmonia axyridis*)



Fig 3: Tussock Moth Caterpillar (*Orvasca* Sp.)



Fig 4: Pod borer (*Helicoverpa armigera*)

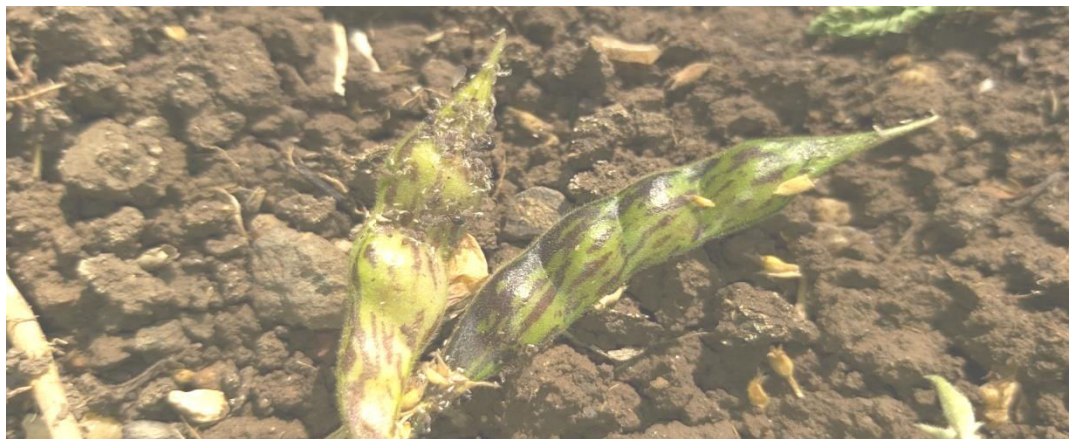


Fig 5: Aphids on Pigeon pea (*Acyrtosiphon pisum*)



Fig 6: Farmer showing incidence of Pink bollworm

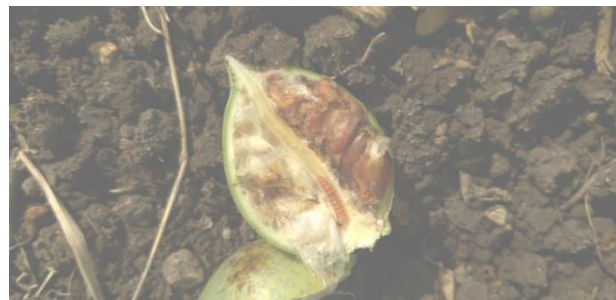


Fig 7: Pink bollworm (*Pectinophora gossypiella*)



Fig:8 Cotton aphid (*aphis gossypii* G)



Fig:9 Gram pod Borer

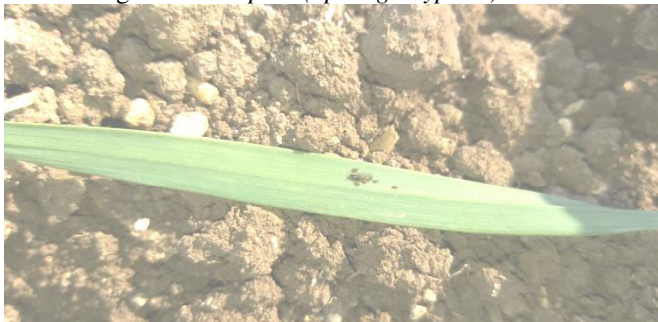


Fig:10:Aphids (*Sitobion miscanthi*)



Fig:11: Grasshopper



Fig:12: Female Termite with workers (*Odontotermes horni*)

Table 1: List of Incidence of insect pests on major crop grown in Khultabad of District Aurangabad of Marathwada region

Sr. No.	Common Name	Scientific Name	Order	Host Plant
1	Gram pod Borer	<i>Helicoverpa armigera</i>	Lepidoptera	Gram
2	Grasshopper	<i>Tylotropidius varcorini</i>	Orthoptera	Gram
3	Red Cotton Bug	<i>Dysdercus cingulatus</i>	Hemiptera	Cotten
4	Shield Bug/Jewel Bug	<i>Chrysocoris</i> Sp.	Hemiptera	Cotten
5	Pink Ballworm	<i>Pectinophora gossypiella</i>	Lepidoptera	Cotton
6	Cotton aphids	<i>Aphis gossypii</i> G	Hemiptera	Cotton

7	Tussock Moth Caterpillar	<i>Orvasca</i> Sp.	Lepidoptera	Pigeon pea
8	Aphids	<i>Aphis</i> sp.	Hemiptera	Pigeon pea
9	Spotted Stem Borer	<i>Chilo partellus</i>	Lepidoptera	Maize
10	Red Cotton Bug	<i>Dysdercus cingulatus</i>	Hemiptera	Maize
11	Shoot fly caterpillar	<i>Atherigona soccata</i>	Diptera	Maize
12	Asian lady beetle	<i>Harmonia axyridis</i>	coeloptera	Maize
13	Jowar stem borer	<i>Chilo partellus</i>	Lepidoptera	Sorghum (Jowar)
14	Red Cotton Bug	<i>Dysdercus cingulatus</i>	Hemiptera	Sorghum
15	Shoot fly	<i>Atherigona soccata</i>	Diptera	Sorghum
16	Aphids	<i>Sitobion miscanthi</i>	hemiptera	Wheat
17	Red Cotton Bug	<i>Dysdercus cingulatus</i>	Hemiptera	Wheat
18	Green sting bug	<i>Nezara viridula</i>	Hemiptera	Wheat
19	Grasshopper	<i>Tylotropidius varcorini</i>	Orthoptera	Wheat
20	Wheat aphids	<i>Aphelinus Spp.</i>	Hymenoptera	Wheat
21	Termite	<i>Odontotermes horni</i>	Isoptera	Several host plants

IV. CONCLUSION

Present study in the research area found that insect of order Hemiptera and order Lepidoptera were found dominant pests. Insects of order Hemiptera affecting different 7 crops, followed by Lepidoptera affecting 5 crops respectively followed by diptera, Orthoptera and Coeloptera, Hymenoptera. On the other hand presence and spread of underground termite is also play remarkable role in destroying the crop plants and affecting the yield so needed to proper solution time to time.

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