

## DIVERSITY OF INSECT PESTS IN AGRICULTURAL AND FOREST AREAS FROM CHANDGAD TAHSIL, KOLHAPUR DISTRICT OF MAHARASHTRA

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### ABSTRACT

The field investigation in the years 2015 -2016, from Chandgad Tahsil, Kolhapur revealed that 17 insect pests were observed from agriculture and forest areas of Chandgad, which belong to order Hemiptera, Coleoptera, Lepidoptera, Phasmatodea, Thysanoptera, Orthoptera, Isoptera and Hymenoptera. Most of insect pests were identified from agricultural areas, and few pests were identified from forest areas. Hence the present research paper provides useful information about various insect pests from Chandgad Tahsil.

**KEYWORDS:** Pests, Agriculture, Forest, Chandgad, Hemiptera

India is one of the most developed agriculture countries in the world. About 30-40% Indian population lives in urban areas and the rest live in rural areas. The rural Indian people totally depend upon agriculture field and their allied businesses such as apiculture, sericulture, lac culture, fish farming, emu farming, goat farming and poultry farming. The rural Indian population is facing a critical problem of various insect pests in agriculture field. This problem of insect pests is related to different agriculture crops, vegetables, woody plants, and ornamental plants. The forest area is important habitat for a huge diversity of organisms especially, insects. Many species of insects cause damage to different higher and lower plants in the forest region. The class Insecta is a large group in the animal kingdom. They are widely distributed in the world. The members of insects are found in all ecosystems such as terrestrial, desert and aquatic. They are mostly found in tropical regions, but less in Polar Regions. They are serious pests in agriculture, forest, cultivated plants, veterinary and some are included in medical pests. The insects are highly damaging to wood, furniture, stored grain and some important materials for houses and agriculture product. Many insect species transmit various bacterial diseases on crops and vegetables. The varieties of insect species are totally depending upon agricultural field and they are feeding on root, stem, leaf, flower and seed. The larvae of insects are voracious feeder and cause a heavy damage to agriculture crops. More than 10,000 species of insects damaged food plants worldwide (Dhaliwal et al. 2007). There are about 60-70% yield loss caused due to damage of different pests. The agriculture field of India is currently suffering an annual loss of about Rs. 8, 63, 884 million due to insect pests (Dhaliwal et al. 2010). The

order Coleopteran is the largest group in class insect. They include about 25, 000 species. Forty families of this order included harmful to stored products of worldwide (Rees, 1996). Infection of stored bulk grain and processed commodities by insects cause big economic damage (Hagstrum and Flinn, 1995). The heavy crops are loss from insect pests, the farmers use large amounts of pesticides (Aktar et al. 2009). But, both the quantity of food loss due to pests and the cost of pest control in terms of money and human health are significant (Pimentel and Greiner, 1997).

### MATERIALS AND METHODS:

Survey and collection of general insect pests were made during year 2015-2016, from agriculture and forest areas of Chandgad Tahsil. Study area is situated between 15° 56' 0" N to 74° 12' 0" E. The average rainfall of this area is between 3000 to 4000mm/year. The study region consists of a variety of agriculture crops and vegetables, several water bodies and a huge variety of insect biodiversity. Insect pests were collected with the help of two types of methods, hand picking and sweep net method. Small and medium sized insect pests (aphids, mealy bugs and larvae) were collected by handpicked method and large insect pests (Grasshoppers) were picked insect net. The agricultural and forest pests were identified by with the help of research papers and internet sources.

### RESULT AND DISSCUSSION:

For the present study 17 species of insect pests were collected from agricultural and forest areas of Chandgad Tahsil. They belong to order Hemiptera, Coleoptera, Lepidoptera, Phasmatodea, Thysanoptera, Orthoptera,

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Isoptera and Hymenoptera. The order Hemiptera was dominant, which represented by 5 species, followed by Coleoptera, Lepidoptera, Phasmatodea, Thysanoptera, Orthoptera, Isoptera and Hymenoptera with 4, 3, 1, 1, 1, 1, and 1 species respectively (As given in Table No. 1). Order Hemiptera includes 5 insect species like whitefly, stink bug, aphid, jassid and mealy bug. They cause heavy damage to host plants such as brinjal, sugarcane, rice, cowpea and tomato. Coleoptera insect pests occur in forest region cause damage to mango tree. The third order Lepidoptera consists cabbage looper larva, gram poder and green peas moth are instrumental in damaging cabbage, red gram and green peas. The rest of the orders like Phasmatodea, Thysanoptera, Orthoptera, Isoptera and Hymenoptera are responsible for severe damage of rice, brinjal and tomato. In addition termite and ant species were observed on different host plants.

Fletcher (1922) studied on the larvae of *Spilosoma obliqua* (Walker) which was found damaging several types of crops including cereals, pulses, oilseeds, fibers, ornamentals and vegetables. Bhutani (1974) studied on scale insect pests that cause damage to mango. Shen-Sharma P.K (1983) studied on insect pests and their management from Indian forestry. Mall et al. (1992)

studied on pests and reported that *S. melongena* was damaged by several insect pests, consisting of jassids, aphids, shoot and root borer. Usmani et al. (2012) studied rice pests and 34 species of grasshoppers reported from Bihar and Jharkhand. Singh et al (2014) recorded 19 insect pests from Talwandi Sabo, Punjab, were Hemiptera and Lepidoptera insects causing damage to both kharif and rabi crops. Sathe et al (2015) studied on color attractivity and the occurrence of some cell sucking pests on crop plants from Kolhapur region and reported four sap sucking insect pests. Sathe et al. (2016) recorded 12 species of Brinjal pests from Kolhapur region. Patil et al. (2016) studied on diversity and biology and control insect pests from Western Maharashtra and reported 30 species. Noor Ul Ane and Mubashar Hussain (2016) reported Lepidoptera, Hemiptera, Coleoptera, Diptera, Orthoptera and Thysanoptera from major rice growing areas of the world. In Chandgad Tahsil, the farmers are facing various agricultural insect pests especially in case of Rice, Red gram, Brinjal and Cow peas. From the present study we observed that red gram poder is highly destructive feeder and its damage was a serious problem for small scale farmers. Other pests such as Aphids, Mealy bug and white flies are damaging various crops and they were observed in winter and summer season.

**Table 1: Occurrence of insect pests in Chandgad Tahsil**

Sr. No.	Common Name	Order	Host Plant
1	White fly	Hemiptera	Brinjal, Sugarcane
2	Stink bug	-	Rice
3	Apid	-	Brinjal, Cowpea, Sugarcane
4	Jassid	-	Rice
5	Mealy bug	-	Brijal, Tomato, Sugarcane
6	White grub beetle	Coleopteran	Sugarcane
7	Mango stem borer	-	Mango
8	Red palm weevil	-	Palm, Coconut
9	Coconut rhinoceros beetle	-	Coconut
10	Cabbage looper larva	Lepidoptera	Cabbage
11	Gram poder	-	Red gram
12	Green peas moth	-	Green peas
13	Stick insect	Phasmatodea	Rice
14	Thrip	Thysanoptera	Rice, Brinjal, Tomato
15	Grasshopper	Orthoptera	Rice
16	Termite	Isoptera	Several host plants
17	Ant	Hymenoptera	Several host plants



**Figure 1: Sugarcane woolly aphid**



**Figure 2: Mango stem borer damage**



**Figure 3: Red palm weevil on coconut tree**



**Figure 4: Gram poder on red gram**





Figure 5: Green peas moth damage



Figure 6: Aphids on Cow pea

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## REFERENCES

- Aktar M.W., Sengupta D. and Chowdhury A., 2009. Impact of pesticide use in Indian agriculture - Their benefits and hazards. *Interdisciplinary Toxicology*, **2**(1):1-12.
- Ane N. U and Hussain M., 2016. Diversity of insect pests in major rice growing areas of the world, *Journal of Entomology and Zoology Studies*, **4**(1): 36-41
- Butani D. K., 1974. Insect pests of fruit crops and their control: 7-Mango.Pesticides, **8**(3):37-41.
- Dhaliwal G.S., Jindal V. and Dhawan A.K., 2010. Insect Pest Problems and Crop Losses: Changing Trends. *Indian J. Ecol.*, **37**(1): 1-7.
- Dhaliwal G.S., Dhawan A. K. and Singh R., 2007. Biodiversity and ecological agriculture: Issues and perspectives. *Indian J. Ecol.*, **34**(2):100- 109.
- Fletcher, 1922. Report of the imperial entomologist, *Sci. Rep. Agric. Res. Inst, PUSA*, pp. 41-59.
- Hagstrum D.W. and Flinn P.W., 1995. Integrated pest management. In: Subramanyam, B., Hagstrum, D.W. (Eds.), *Integrated Management of Insects in Stored Products*. Marcel Dekker, New York, pp. 399-408.
- Mall N.P., Pandey R.S., Singh S.V. and Singh S.K., 1992. Seasonal incidence of insect pests and estimation of the losses caused by shoot and fruit borer on Brinjal. *Indian J. Ent.*, **54**(3):241-247.
- Patil S.S., Sutar M.V and Sathe T.V., 2016. Diversity, Biology and Control of Insect pests of teak *Tectona grandis (Linnaeus)* from western Maharashtra. *Biolife*, **4**(1):141-146.
- Pimentel D. and Greinier A., 1997. Environmental and socio-economic costs of pesticide use. In D.

- Pimentel (Ed.), Reducing Pesticides: Environmental and Economic Benefits, Chichester, UK: John Wiley & Sonspp.51-78.
- Rees D.P., 1996. Coleoptera. In: Subramanyam, B., Hagstrum, D.W. (Ed.), Integrated Management of Insects in Stored Products. New York: Marcel Dekker, Inc., pp.1-39.
- Sathe T.V, Gophane A. and Sendage N., 2015. Colour attractivity and occurrence of some cell sap sucking pests of crop plants. *Biolife*, **3**(2):540-546.
- Sathe T.V., Patil S.S., Bhosale A.M., Devkar S.S., Govali C.S. and Hankare S.S., 2016. Ecology and Control of Brinjal insect pests from Kolhapur region, India. *Biolife*, **4**(1):147-154.
- Sen-Sharma P.K., 1983. Forest Entomology in India. *Indian Rev. Life Sci.*, **3**:89-103.
- Singh A. and Sharma A. L., 2014. Agriculturally important insects diversity in Kharif and Rabi crops, Talwandi Sabo, Pujjab. *International Journal of Scientific and Research Publications*. ISSN 2250-3153.
- Usmani M.K., Nayeem M.R. and Akhtar M.H., 2012. Field observations on the incidence of Grasshopper fauna (Orthoptera) as a pest of Paddy and pulses. *European Journal of Experimental Biology*, **2**(5):1912-1917.