



Research Article

INSECT PESTS AND THEIR DAMAGE ON TEA PLANTS IN MYANMAR

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ABSTRACT

A total of 11 insect pests and their damages inflicted were observed in three tea plantations at weekly intervals during 2012-2013 in Tarpon, Lashio Township, Myanmar. The infestation was high during July associated with heavy rainfall followed by cool conditions, and it was also high in the sites nearer to orchards and crop fields.

Keywords: Infestation, Insect pests, Tea, *Camellia sinensis*.

INTRODUCTION

Tea (*Camellia sinensis*) is one of the most favorite beverages of people in Myanmar, being extensively cultivated in Myanmar. Usually, tea leaves are picked up from tea plants and then processed for dried (Zhu *et al.*, 2002). Tea is coming among priority cash crops in Myanmar and is grown in the mountain regions, such as Shan State. Tea being a long term; permanent monocultural crop can be exposed to insect pest infestations. However, all the plant parts - leaf, stem, root, flower, bud and seed - are fed upon by insect and mite pests which typically cause losses to tea plants. Only scanty scientific work is available on the insect pests of tea plantation. Tea plantations continue to face the insect damage and heavy loss of the cash crop in Myanmar. Hence the present work was carried out the insect pests in tea plantations. Insects are not only of economic importance but also threatening as potential pests, thus taxonomic studies on the local insects have been conducted to certain extent but all areas have not been covered. However, there is evidence that the pest status in tea of Myanmar is changing so the current situation may also change. Also, deliberate research on the prevention and control of tea pests has not been carried out in Lashio Environs, Shan State, Myanmar so this investigation would be supplementing some new information on some insect pests in tea plantations.

MATERIALS AND METHODS

The study was made during 2012-13 in three sites located in Tarpon, Lashio Township, Northern Shan State lying between N 22° 59' 42.7" and E 97° 49' 04.7". Sampling was done at weekly intervals from an experimental plot with size of 50 m x 50 m from each of three study sites in tea garden. The insects were identified and classified based on (Blackman & Eastop, 1994; Ghauri, 1975; Lee *et al.*, 1995; Pellizzari & Camporese, 1994; Roy *et al.*, 2015; Scott & Emberson, 1999; Wagner, 2005).

RESULTS AND DISCUSSION

Characteristics of insect pests and their damage inflicted on tea plant recorded are given in table 1 and figure 1. The present study recorded a total of 11 species of insect pests with the highest number of species under order Hemiptera followed by Lepidoptera, Orthoptera, Trombidiformes and Homoptera. The minor insect pests that damaged a little on tea plants were found to be camellia scale, weaver ant, slug caterpillar, stinging nettle caterpillar, small rice grasshopper and yellow tea mites. However, the major insect pests that caused heavy damage were found to be tea mosquito bug, leafhopper, tea aphid, Florida red scale and stink bug (Table 1).

According to Hamasaki *et al.*, (2008) tea pests vary between regions, even though they usually belong to the same groups notably mites, leafhoppers, mosquito bugs, plant bugs, aphids, thrips, leaf rolling and leaf folding caterpillars and stem boring insects. Similar to this, the

present study recorded the highest infested tea plants (72%) in the site 2 and lowest (51%) in the site 3. The site 2 was located nearer to many orchards and other crop fields which served as the source of food for the insect pests.

Table1. Identified insect pests, characteristics and their damage caused on tea plants.

No.	Order	Family	Species	Characteristics	Symptom and damage caused on tea plant
1	Lepidoptera	Limacodidae	<i>Thosea sinensis</i> (Walker, 1855)	Body is slug-like, short and rather stout, quite flat, beneath green in color, 3mm long. Along the middle of the back is a row of tufts of hairs or slender hairs.	The larvae feed on leaf-blades it can cause holes in leaves due to removal of leaf tissues and veins and damaged leaves curl up and wither off. They were frequently found eating on tea leaves but rarely occurred in large numbers.
2			<i>Macroplectra nararia</i> (Moore, 1859)	Caterpillar is soft body, dark brown brightly coloured 1.2 mm long, many sting spines.	Young caterpillars feed on young leaves and mature larvae prefer older leaves so it may cause severe defoliation. The damage caused by young larvae is in the form of small, irregular patches on the under surface of the leaf where the larvae have nibbled and scraped away the lower portion of the leaf leaving the upper epidermis intact and then gradually turned brown and fall off.
3	Hemiptera	Diaspididae	<i>Chrysomphalus aonidum</i> (Linnaeus, 1758)	Adult female scales are conical and 2 mm in diameter. Immature male scales are smaller and paler. They are elongated, oval and half the size of adult females. The scales appear as dark circular spots on leaves especially on the lower surfaces. They found near the tip of the cone appears pale of leaves.	The florida red scales mainly infest only on leaves, where they feed on plant sap and then spread to other plant parts. When their population were very highly infested leaves drop off prematurely in dry condition.
4		Miridae	<i>Helopeltis theivora</i> (Waterhouse, 1886)	Head is brown with a broad yellow stripe, long antennae and the back has a small club striking out of it. Eyes are brown to black. Legs are dark red colour, size 13 mm long. The abdomen is	They suck the sap of young leaves, puncturing the plant tissues with their needle-like rostrum and injects toxic saliva. So the leaves are curled up, badly deformed and damaged mostly in shaded areas.

			green colour. They hide generally under surface of leaves and move actively.	
5	Diaspididae	<i>Lepidosaphes camelliae</i> Hoke, 1921	The adult shell has dark brown, slightly convex, pear-shaped, anterior rounded and elongated posterior to meso-thorax, 23 mm in length.	Large population of the adult scales occurred in sooty mould on the leaves that can cause host plant death.
6		<i>Nezara viridula</i> (Linnaeus, 1758)	The body is shield-shaped with a V-shaped marking dorsally with brightly yellowish colour and orange or red edges, 4.3 mm in length. It has black spots on their sides and has sharp mouth parts. It discharges large amounts of foul-smelling liquid when disturbed.	Stink bugs sucked juices from leaves, flowers, fruits and stems. Damage caused to the crop by sucking sap of adults and nymphs from the growing shoots and developing fruits. So shoots and developing fruits were withered or retarded
7	Aphididae	<i>Toxoptera aurantii</i> (Boyer de Fonscolombe, 1841)	Body is tiny soft, black and pear-shaped with long legs, 1.5 mm in length and vary in colour from black to dark brown. They live in groups on the underside of leaves at the shoot tips, generally wingless and can move very slowly.	Tea aphids have piercing-sucking mouthparts that enable them to feed on plant sap. They excrete sweet and sticky honeydew attractive to ants and a substrate for sooty mold fungus. Infested tea shoots become cupped and distorted. The aphid infestation results in the plants turning yellow and stunted then the leaves drying up.
8	Cicadellidae	<i>Jacobiasca formosana</i> (Paoli, 1932)	Tea leaf hopper is very small insect, 1.3 mm in length with light green colour, a few white spots in belly. The wings are almost transparent and the edges of the wings are light green and a little yellow. It prefers to stay on the underside of leaves. They can jump very rapidly.	They use their needle-like mouth parts to suck sap from the shoots, causing wounds and discoloration of leaf margin that turns brownish, dry and fall off. It may cause to reduce the yield and quality of tea.
9	Orthoptera	Acrididae	<i>Oxya chinensis</i>	Body is slender, They feed upon leaf tips or leaf

		(Thunberg, 1815)	cylindrical abdomen, anterior pro-thorax is large, narrow forewings, broad and membranous hind wings, head large, slender; jointed antennae, fine sensory bristles, large and unstalked compound eyes. The broad upper lip, under slender sensory palps are bright yellow and the back pale brown in colour, 2.5 mm in length and they can move actively.	margins so it causing to wither and then fall off.
10	Trombidiformes Tarsonemidae	<i>Polyphagotarsonemus latus</i> (Banks, 1904)	The body is flattened bright yellowish brown and more easily seen under the microscope, four legs are extending forward and four legs extending behind move very slowly, 0.6 mm in length. The clusters of their bright reddish-orange eggs are more easily seen with the naked eye.	They feeds plant sap on the upper surface of leaves and scarring and so the leaves are distortion. The scarred tissue of leaves may appear to be a greasy darkened discoloration and later turns to a brown surface on the undersides of leaves. The results of leaves infestation can see in appearance of white patches on leaves which turns yellow.
11	Hymenoptera Formicidae	<i>Oecophylla smaragdina</i> (Fabricius, 1775)	The body is elongated and narrow portion between thoracic and abdominal masses with green in color, 7.5 mm in length, social insects and lives together in colonies.	They make to fold of leaf blade together and tied it with silk strands. The folded leaves have a tubular design where the weaver ants are hiding and the leaves turn yellowish brown and dry and then fall off.



A. *Thosesia sinensis* and holes of leaf



B. *Chrysomphalus aonidum* and damaged leaves





C. *Macroplectra nararia* and damage leaves



D. *Helopeltis theivora* and damage brown leaves



E. *Lepidosaphes camelliae* and sooty mold



F. *Nezara viridula* and withered fruits



G. *Toxoptera aurantii* and damage leaf



H. *Jacobiasca formosana* and curled, brown tea



I. *Oxya chinensis* and damaged leaf margins



J. *Polyphagotarsonemus latus* and damaged leaves



K. *Oecophylla smaragdina* and nest of weaver ant



Figure 1. Insect pests and their damage inflicted on tea plant.

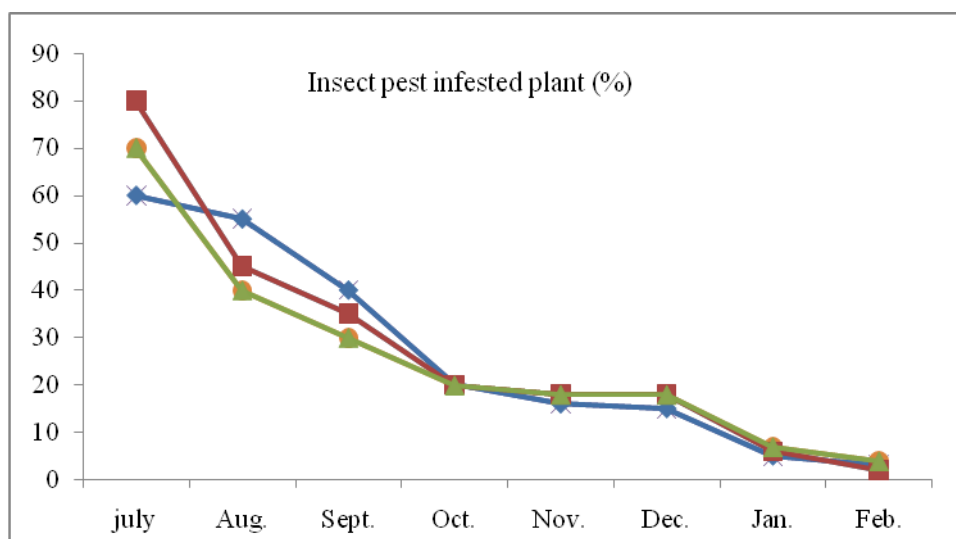


Figure 2. Monthly percentage of insect pest infestation in three sampling stations.

CONCLUSION

Hot rainfall is the most important climatic factor that influences the plant phenology, and the abundance of insects is related to the seasonal pattern of flowering, fruiting and leafing of the vegetation. This is true with the present finding that most of insect pests were found to cause highest infestation during July (Figure 2). This is associated with more rainfall than other months followed by cool conditions that favored leaf sprouting and insect pests.

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