

## Record of host plants of *Thysanoplusia orichalcea* Fab. in mid hills of Himachal Pradesh, India

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*Thysanoplusia orichalcea* (Fabricius), commonly known as the slender burnished brass moth, cabbage semilooper or soybean looper belongs to family Noctuidae. The adult of this species is a stout moth with straw coloured forewings which are extensively covered with a metallic golden shimmering surface (Plate 2). The larvae are light green in colour with a thin white lateral line and two white lines on back, active and form loop in motion, swollen at posterior end and tapers anteriorly (Plate 2). The early instar larvae causes damage by feeding on chlorophyll of tender leaves resulting in transparent leaf spots, while later instars feed from margins and defoliate, leaving midribs in case of severe incidence. It is a polyphagous pest which has worldwide distribution. In India, it has been reported from a number of states such as Punjab, Haryana, Uttar Pradesh, Madhya Pradesh, Karnataka etc. besides Himachal Pradesh. The larvae of *T. orichalcea* feed on many host plants including vegetables, herbs, pulses, oilseeds, cereals, weeds and aromatic plants (Kravchenko *et al.*, 2005; Kumar, 2007; Eddaya *et al.*, 2010). Being polyphagous in nature, it is reported to feed on cabbage, cauliflower, carrot, celery, lettuce, pea,

soybean, radish and other vegetables from seedling to harvesting stage and thereby causing significant damage to these crops (Batra, 1956; Sharma and Bhalla, 1964; Sagar and Ramji, 1991). It is also known as one of the key pest of kalazira, *Bunium persicum* in Kinnaur district of Himachal Pradesh (Bhardwaj and Panwar, 1990; Sharma, 1998). The large host range and nutritional divergence of a species is considered as an important factor for better survival during growth and development (Simpson *et al.*, 2002; Despland and Simpson, 2005).

The present investigation was conducted to record the host plants of this polyphagous pest at mid hills of Himachal Pradesh. The investigation for the record of host plants was conducted at CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur (N 32°05'39.96"; E 76°32'46.86" Altitude 1222 mts. amsl), during 2019. In order to study the host plants of *T. orichalcea*, weekly surveys were made in different crops sown in fields at seed farm, vegetables farm, agronomy farm and entomology farm in CSKHPKV, Palampur. The observations were recorded on the larval population on different crops, and

percent leaf infestation by the larvae were recorded simultaneously. For this purpose, we randomly counted damaged and healthy leaf. The percent mean leaf infestation was calculated based on ten observations.

Under field conditions, the pest was found active during March – November, 2019. During this period, the larvae of *T. orichalcea* were observed feeding on 16 different host plants including vegetables, legumes, herbs and weeds at Palampur belonging to 10 different families (Table 1; Plate 1). Among these host plants, the highest plant infestation (35.7%) was recorded on soybean (*Glycine max*) crop belonging to family Fabaceae followed by cabbage (*Brassica oleracea* var. *capitata*) (16.2%) and cauliflower (*B. oleracea* var. *botrytis*) (12.0%) from family Brassicaceae. The lowest infestation of *T. orichalcea* was recorded on spinach (*Spinacia oleracea*) crop (2.4%). Besides soybean, *T. orichalcea* larvae was recorded to feed on black gram (*Vigna mungo*), and other vegetable crops such as potato (*Solanum tuberosum*) and tomato (*Solanum lycopersicum*). Among the herbal and spice plants, it was recorded on mint (*Mentha spicata*) and coriander (*Coriandrum sativum*). Weed plants are alternate and alternative hosts for many insects and diseases in agricultural

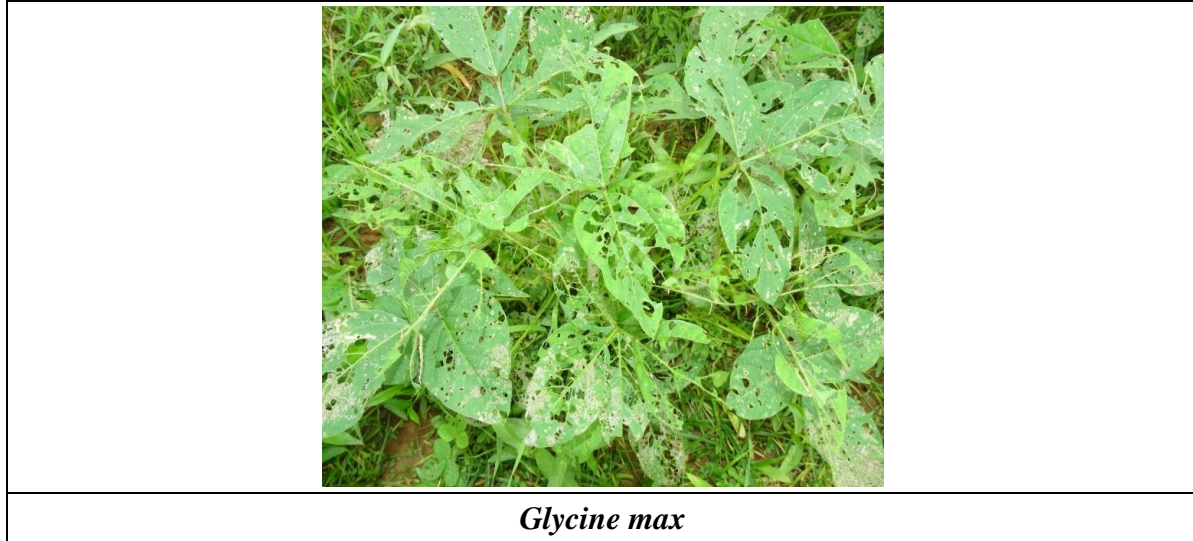
ecosystem (Kumar *et al.*, 2021). In the present investigation, white clover (*Trifolium repens*) was reported to support population buildup of *T. orichalcea*. The pest was also reported to infest red clover (*T. pretense*), pink morning glory (*Ipomea carnea*), Mexican fleabane (*Erigeron karvinskianus*), hairy beggar-ticks (*Bidens pilosa*), isabgol (*Plantago ovata*) and wandering jew (*Commelina benghalensis*) (Table 1; Plate 1).

The present study provides an insight about the host range as well as damaging potential of *T. orichalcea* in different crops grown in the region. The knowledge of host range of a pest is important for exploring the integrated pest management options against the pest species (Conlong and Rutherford, 2009; Smit *et al.*, 2021). This information on host range of *T. orichalcea* can be used in IPM programs, where alternate and alternative weed hosts can be completely destroyed from the crop ecosystem to avoid the completion of life cycle of pest on these weed host in the absence of main crop. Crop rotation strategies can also be followed based on the host range of pest in order to avoid regular pest attack throughout the year in different seasons. The pest voltinism can be affected by this strategy thereby reducing economic damage due to *T. orichalcea* in different crops.

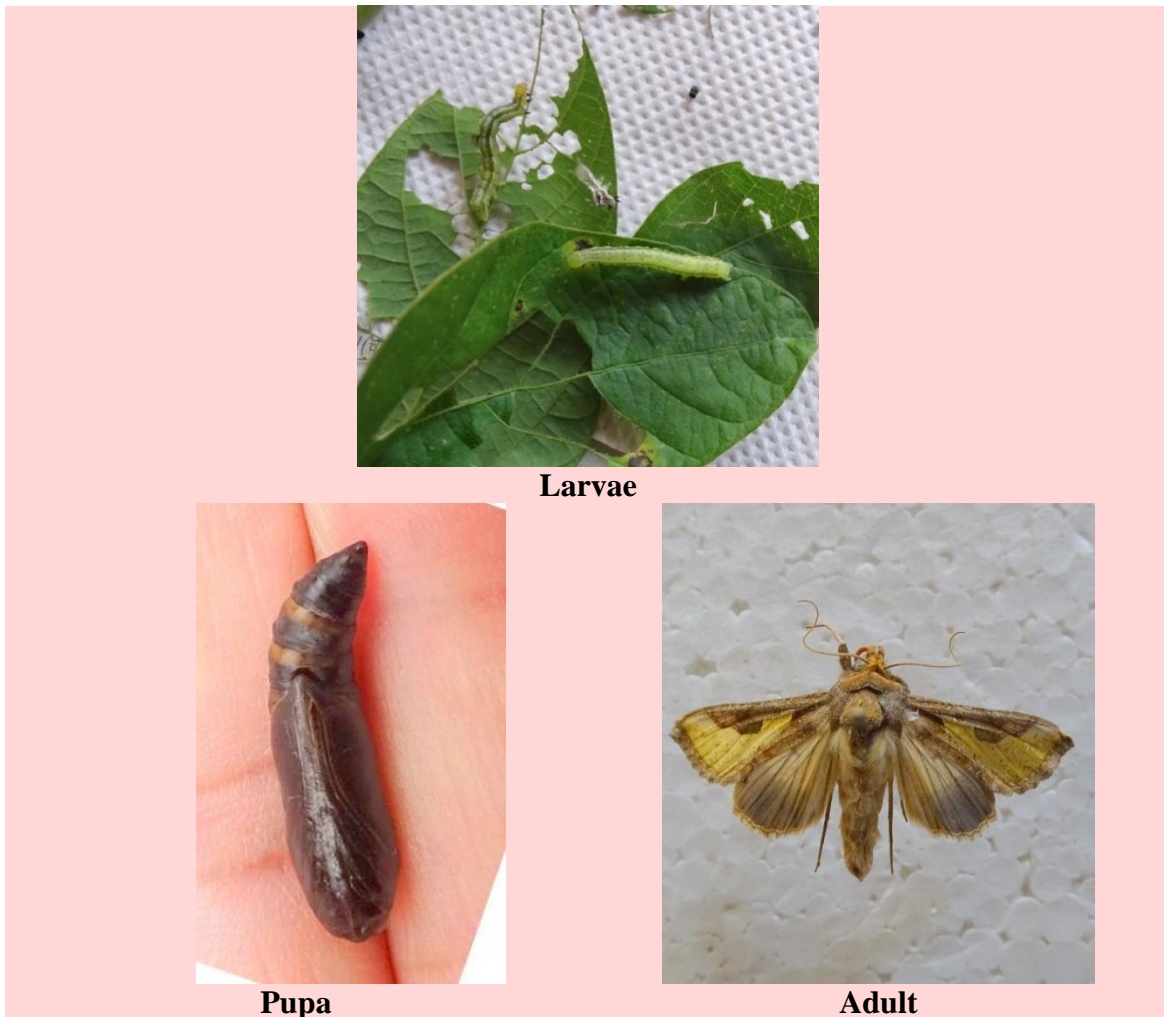
**Table 1. Record of host plants of *T. orichalcea* at Palampur during 2019**

Sr. No.	Common Name	Scientific name	Family	Plant infestation (%)
<b>A</b>	<b>Vegetables</b>			
1	Cabbage	<i>Brassica oleracea</i> var. <i>capitata</i> L.	Brassicaceae	16.2
2	Cauliflower	<i>Brassica oleracea</i> var. <i>botrytis</i> L.	Brassicaceae	12.0
3	Potato	<i>Solanum tuberosum</i> L.	Solanaceae	8.5
4	Tomato	<i>Solanum lycopersicum</i> L.	Solanaceae	6.0
5	Spinach	<i>Spinacia oleracea</i> L.	Amaranthaceae	2.4
<b>B</b>	<b>Herbs</b>			
6	Mint	<i>Mentha spicata</i> L.	Lamiaceae	7.8
7	Coriander	<i>Coriandrum sativum</i> L.	Apiaceae	7.4
<b>C</b>	<b>Legumes</b>			
8	Soybean	<i>Glycine max</i> (L.) Merr	Fabaceae	35.7
9	Mash	<i>Vigna radiata?</i> (L.) Hepper	Fabaceae	10.3
<b>D</b>	<b>Weeds</b>			
10	White clover	<i>Trifolium repens</i> L.	Fabaceae	11.0
11	Red clover	<i>Trifolium pratense</i> L.	Fabaceae	9.0
12	Pink morning glory	<i>Ipomea carnea</i> Jacq.	Convolvulaceae	4.7
13	Mexican fleabane	<i>Erigeron karvinskianus</i> DC.	Asteraceae	4.0
14	Hairy beggar-ticks	<i>Bidens pilosa</i> L.	Asteraceae	3.4
15	Isabgol	<i>Plantago ovata</i> Forssk.	Plantaginaceae	3.2
16	Wandering jew	<i>Commelina benghalensis</i> L.	Commelinaceae	2.6

	
<p><i>Coriandrum sativum</i></p>	<p><i>Vigna radiate</i></p>
	
<p><i>Trifolium repens</i></p>	<p><i>Erigeron karvinskianus</i></p>
	
<p><i>Bidens pilosa</i></p>	<p><i>Commelina benghalensis</i></p>



**Fig. 1** *T. orichalcea* feeding on different host plants



**Fig. 2:** Different stages in life cycle of *T. orichalcea*

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*MS Received 03 January 2022*

*MS Accepted 25 February 2022*