

**BIODIVERSITY AND DISTRIBUTION PATTERN OF APHIDIPHAGOUS *ENDAPHIS APHIDIMYZA* (CECIDOMYIIDAE: DIPTERA)**

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**Received** : 23.1.16; **Accepted** : 8.3.16**ABSTRACT**

In the present work four districts of Chitrakoot Dham region as well as nearby villages of Parbhani districts Maharashtra were surveyed to search the above endoparasitoid gall midge. No stage of *Endaphis aphidimyza* was seen in samples of the collections in Chitrakoot Dham region while the other natural enemies of aphids like syrphids, coccinellids and lace wings were recorded. Various ecological factors are responsible for the distribution of this gall midge.

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KEY WORDS : Biological control, Cecidomyiid, Endoparasitoids, Gall midge, Safflower.

**Introduction**

*Endaphis aphidimyza*<sup>5</sup> is an endoparasitoid gall midge, feeding within the body of aphid, *Uroleucon sonchi* L.; *U. compositae* Theobald and *U. gobonis* Mat. Aphid is one of the major insect pests of many crops like mustard, safflower, ground nut, cabbage, cauliflower, knol-khol, radish, bean, soybean, wheat, sorghum, peas, potato, cotton and maize etc.

Coccinellids, Syrphids, Lacewings and cecidomyiids are the natural enemies of aphids. In cecidomyiids *Aphidoletes aphidimyza*, *Monobremia rishikeshensis* are predators while, *Endaphis* and *Pseudendaphis* are parasitoids of aphids<sup>1, 2</sup>. Genus *Endaphis* was erected and named *perfidus* as it's species on aphid, *Drepanosiphum platanoides*. In India<sup>4</sup> a new species of this genus is *Endaphis aphidimyza*. Present study was planned to explore the biodiversity of aphidophagous *Endaphis aphidimyza*<sup>5</sup> and their distribution pattern in four districts of Chitrakoot Dham region.

**Materials and Method**

Aphids and their natural enemies were surveyed in mustard, radish, cauliflower, cabbage, wheat, brinjal, cucurbit and bean plants in all blocks of Hamirpur, Mahoba, Banda, Chitrakoot districts of Chitrakoot Dham region as well as campus and research farm, Rajaula of the Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya, Chitrakoot, Satna (MP) *rabi* season. Fifteen samples of highly aphid's infested part of the plants were collected in the polythene bags. Each sample was observed with help of stereoscopic trinocular research microscope in the laboratory.

As per survey report<sup>3</sup> safflower crops were surveyed in the research farm of Marathwada Agricultural University, Parbhani (Maharashtra) and their nearest villages *i.e.* Taroda, Pokharni, Brahman Goan and Umripata. Highly aphid's infested safflower leaves and terminal twigs were collected in plastic container, the mouths of those containers were covered by muslin cloth. Meteorological data were also recorded during *rabi* of the surveyed area.

TABLE-1: Survey report of aphids and their natural enemies in Chitrakoot Dham Region

Name of District	Name of Crop							
	Mustard & Radish		Cauliflower/ Cabbage		Brinjal and Cucumber Plants		Bean	
	Name of aphids	Name of natural enemies	Name of aphids	Name of natural enemies	Name of aphids	Name of natural enemies	Name of aphids	Name of natural enemies
Hamirpur	<i>L. erysimi</i> Kalt.	<i>Coccinella</i> sp. (E., L., A)	<i>M. persicae</i> Sul.	<i>Coccinella</i> sp. (E., L., A.)	<i>A. gossypii</i> Glover	<i>Coccinella</i> sp. (A)	<i>A. crassivora</i> Koch.	<i>Coccinella</i> sp. (E., L)
	<i>B. brassica</i> Lin.	Syrphus sp. (E., L.)	<i>L. erysimi</i> Kalt.	Syrphus sp. (E., L.)	<i>A. crassivora</i> Koch.	Syrphus sp. (L., A.)		Syrphus sp. (E., L.)
	<i>M. persicae</i> Sul.	<i>Chrysoperla</i> sp. (L.)	<i>M. persicae</i> Sul.					<i>Chrysoperla</i> sp. (A., E.)
Mahoba	<i>L. erysimi</i> Kalt.	<i>Coccinella</i> sp. (L., A)	<i>L. erysimi</i> Kalt.	Syrphus sp. (E., L.)	<i>A. gossypii</i> Glover	Syrphus sp. (E., L.)	<i>A. crassivora</i> Koch.	<i>Coccinella</i> sp. (L., A)
	<i>B. brassica</i> Lin.	Syrphus sp. (L.)	<i>M. persicae</i> Sul.	<i>Coccinella</i> sp. (L., A)	<i>A. crassivora</i> Koch.	<i>Coccinella</i> sp. (L.)		Syrphus sp. (E., L.)
Banda	<i>L. erysimi</i> Kalt.	<i>Coccinella</i> sp. (E., L., A)	<i>M. persicae</i> Sul.	<i>Coccinella</i> sp. (L., A)	<i>A. gossypii</i> Glover	Syrphus sp. (L.)	<i>A. crassivora</i> Koch.	<i>Coccinella</i> sp. (L., A)
	<i>M. persicae</i> Sul.	Syrphus sp. (L.)	<i>L. erysimi</i> Kalt.	Syrphus sp. (L.)		<i>Coccinella</i> sp. (L., A.)		Syrphus sp. (E., L.)
			<i>B. brassica</i> Lin.			<i>Chrysoperla</i> <i>carnea</i> (A)		
Chitrakoot	<i>L. erysimi</i> Kalt.	Syrphus sp. (E., L.)	<i>M. persicae</i> Sul.	Syrphus sp. (L.)	<i>A. crassivora</i> Koch.	Syrphus sp. (E., L.)	<i>A. Crassivora</i> Koch.	<i>Coccinella</i> sp. (L., A)
	<i>M. persicae</i> Sul.	<i>Coccinella</i> sp. (L., A)	<i>L. erysimi</i> Kalt.	<i>Coccinella</i> sp. (L., A.)	<i>A. gossypii</i> Glover	<i>Coccinella</i> sp. (L., A.)		Syrphus sp. (E., L.)
	<i>B. brassica</i> Lin.			Syrphus sp. (L.)				
University Agricultural Farm, Rajaula (M.P.)	<i>L. erysimi</i> Kalt.	<i>Coccinella</i> sp. (E., L., A)	<i>L. erysimi</i> Kalt.	Syrphus sp. (L.)	<i>A. gossypii</i> Glover	Syrphus sp. (L.)	<i>A. crassivora</i> Koch.	<i>Coccinella</i> sp. (L., A.)
	<i>M. persicae</i> Sul.	Syrphus sp. (L.)	<i>M. persicae</i> Sul.	<i>Coccinella</i> sp. (L., A.)		<i>Coccinella</i> sp. (A.)		Syrphus sp. (L.)
				<i>Chrysoperla</i> <i>carnea</i> (A)				

(L.- Larva, A.- Adult, E.- Egg)

TABLE-2: Survey report of aphids and their natural enemies in Parbhani District (Mahashtra)

Name of Place	Name of Crop					
	Mustard		Safflower		Niger	
	Name of aphids	Name of natural enemies	Name of aphids	Name of natural enemies	Name of aphids	Name of natural enemies
Marathwada Agricultural University, Parbhani	<i>L. erysimi</i> Kalt. <i>U. sonchi</i> Lin.	<i>Coccinella</i> sp. (L.,A) Syrphus sp. (E., L.)	<i>U. gobonis</i> Mat. <i>U. sonchi</i> Lin.	<i>Coccinella</i> sp. (E.,L.A.) <i>E. aphidimyza</i> (E.,L.)	<i>U. compositae</i> Lin.	- <i>Coccinella</i> sp. (L.)
Taroda	<i>L. erysimi</i> Kalt. <i>U. gobonis</i> Mat.	<i>Coccinella</i> sp. (E.,L., A) <i>E. aphidimyza</i> (E. L.)	<i>U. sonchi</i> Lin.	<i>Coccinella</i> sp. (L.,A) <i>E. aphidimyza</i> (E.,L.)	<i>U. compositae</i> Theo.	<i>Coccinella</i> sp. (L.,A.) <i>E. aphidimyza</i> (L.)
Pokharni	<i>L. erysimi</i> Kalt.	<i>Coccinella</i> sp. (A.) Syrphus sp. (L.)	<i>U. gobonis</i> Mat.	<i>Coccinella</i> sp. (L.,A) Syrphus sp. (L.) <i>E. aphidimyza</i> (L.)	<i>U. sonchi</i> Lin. <i>U. compositae</i> Theo.	<i>Coccinella</i> sp. (L.,A.) Syrphus sp.(E.L.) <i>E. aphidimyza</i> (A, L.)
Brahman Gawn Umripata	<i>L. erysimi</i> Kalt.	<i>Coccinella</i> sp. (L., A)	<i>U. sonchi</i> Lin.	<i>Coccinella</i> sp. (A.) <i>E. aphidimyza</i> (E.L.A) Syrphus sp. (L.)	<i>U. compositae</i> Theo.	<i>Coccinella</i> sp. (L.,A.) Syrphus sp. (E., L.)
Umripata	<i>L. erysimi</i> Kalt. .	<i>Coccinella</i> sp. (E.,L.,A)	<i>U. sonchi</i> Lin..	<i>Coccinella</i> sp. (A.) <i>E. aphidimyza</i> (E.L.A)	Crop not Available	Crop not Available

(L.- Larva, A.- Adult, E.- Egg)

### Results and Discussion

Table-1 shows that the Eggs, larvae and adults of natural enemies of aphids like Syrphids, coccinellids and lace wings (*Chrysoperla* species) were recorded during the observation of collected samples while, different stages of endoparasitoid gall midge, *Endaphis aphidimyza* (eggs, larvae and adults) were not seen in any collected sample from Chitrakoot Dham region. But in nearby villages of Parbhani district of Maharashtra all stage of natural

enemies like Coccinella, Syrphid as well as *Endaphis aphidimyza* (eggs, larvae and adults) were recorded of aphids on Mustared, Safflower, Niger crops (Table-2). Earlier workers<sup>3</sup> also reported the presence of this *Endaphis* species in the nearby areas of Parbhani district. It was noted that the variation in ecological factors (maximum and minimum temperature, humidity and rainfall) play important role in the distribution of *Endaphis aphidimyza* in above working stations.

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