community ecology, but has received very little attention, as a group of beneficial predators (Caprils 1990). An attempt was made to record the reduviid fauna found in last eight years at the wet lands near the forest areas of Gorakpur district (2004-2012).

Table 1 : Reduviid species recorded from Gorakhpur ecosystem

Sub-family	Niche	Reduviid species
Harpactorinae	Leaves	*Coranus spiniscutis*
	Leaves	*Cydnocoris gilvus*
		Irantha armipus
	Leaves	*Polididus armatissimus*
	Leaves	*Rhynocoris fuscipus*
		Rhynocoris marginatus
		Sphedamolestes sp.
Stenopodinae	Leaves	*Oncocephalus annilipus*
		Pygolyampis foeda
Peiratinae	Litter	*Ectomocoris sp.*
		Ectomocoris casdigera
		Cleptocoris leptuoides
		Cleptocoris atomaculatus
Reduviinae		*Acanthaspis megaspila*
	Leaves	*Edocla* sp.
		Paralenaeus pyrrhomeles
	litter	*Rhiginia cruciata*
		Velitra rubropicta
		Tirarodes sp.
Emesinae	litter	*Emesays* sp.
Triatominae	Mud wall	*Triatoma rubrofasciata*

Twenty one species of reduviids belonging to nineteen genera and seven sub-families were collected. Among them, *Coranus spiniscutis* was predominant. Other highly noticed reduviids were *Rhynocoris fuscipus, Rhynocoris marginatus, Edocla sp*, *Velitra rubropicta, Oncocephalus annilipus, Ectomocoris sp., Emesays sp., Polididus armatissimus*.

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Pest infestation and yield potential of organically grown tomato

Meena Thakur and S.C. Verma
Department of Environmental science, Dr. Y.S. Parmar University of Horticulture, Nauni, Solan (H.P.), India

Organic cultivation and pest investigations were carried out in the experimental farms of Department of the Environmental Science, Dr. Y. S. Parmar University of Horticulture and Forestry, Himachal Pradesh during the year 2011. Tomato crop was planted in the month of June with organic inputs in a fallow land. There were six treatments including control with three replications viz., T_{1-} recommended dose of FYM (farm yard manure) and spray of turmeric in cow urine, T_2 - recommended dose of vermicompost and spray of extract of *Melia azedarach* drupes in cow urine, T_{3-} recommended dose of Azotobacter and spray of extract of *Vitex negundo* in cow urine, T_{4-} compost prepared from municipal solid waste and spray of extract of *Parthenium hysterophorous* in cow urine, T_{5-} double the recommended dose of FYM and spray of extract of *Melia azedarach* leaves in cow urine and T_{6-} Control. Spray of plant extracts was done at the appearance of the pest; it was repeated twice at 15 days interval. The per cent leaf infestation, fruit infestation and yield data was recorded.

Significantly lowest infestation of tomato fruit by fruit fly (10.38%) and fruit borer (6.03%) was recorded in treatment T_2, whereas, highest was recorded with treatment T_4 i.e. 18.82 per cent for fruit fly and 9.18 per cent for fruit borer (Table 1). Treatments T_2 and T_5 were statistically at par with each other against both the pests. The insecticidal properties of extracts of *M. azedarcah* leaves and drupes are reported in literature by various workers whereas, the application of vermicompost itself results in unacceptability of the plants to pests and diseases due to uptake of soluble phenolic materials from the vermicompost extract into the plant tissues (Maruti and Sivasubramanian 2011). Chandrakumar *et al* (2009) reported that application of vermicompost in combination with biofertilizers and neem cake was effective in reducing the shoot and fruit borer *Leucinodes orbonalis* damage in brinjal. Whereas, organic manures are slow releasing fertilizers and provide both macro and micro nutrients. According to a study, increased levels of leucoanthocyanins catechins, flavanol, glycosides and phenol carboxylic acids, were reported in FYM treated plots which are responsible for resistance to many pests (Lyashenko et al.1982). Recommended dose of Azotobacter and spray of *V. negundo* in cow urine (T_3) resulted in 16.59 and 9.13 per cent fruit infestation of tomato fruit with fruit fly (*Bactrocera tau*) and fruit borer (*Helicoverpa armigera),* respectively. Azotobacter used as biofertilizer is known to reduce the incidence of pests in crops (Maruti and Sivasubramanian 2011). Average per cent infestation by fruit fly (17.40%)

and fruit borer (12.47 %) was statistically more at first interval, whereas, second and third intervals though statistically at par with each other but had less values than first interval against fruit fly (15.72, 15.73 %) and fruit borer (9.92, 9.13%). Highest yield of 434.15 q/ha was recorded with T_2 (Table 1). The application of recommended dose of vermicompost and spray of *Melia azedarach* drupes in cow urine can be used for organic production of tomato crop.

Table 1: Per cent tomato fruit infestation and yield of organically grown tomato crop

Treatments	Fruit fly				Fruit borer				Yield
	Sampling intervals			Mean	Samplingi intervals			Mean	
	I_1	I_2	I_3			I_1	I_2	I_3	
(T_1)	17.26	12.63	15.12	**15.00**	12.14	6.05	4.89	**7.69**	**425.52**
(T_2)	10.57	11.22	9.37	**10.38**	10.0	3.49	4.6	**6.03**	**434.15**
(T_3)	18.42	17.41	13.97	**16.60**	12.90	8.28	6.20	**9.13**	**422.59**
(T_4)	19.74	17.3	19.43	**18.82**	12.41	8.48	6.64	**9.18**	**414.44**
(T_5)	11.79	15.30	10.88	**12.66**	8.12	6.20	7.69	**7.34**	**426.66**
Control	26.61	20.48	25.61	**24.24**	19.25	27.04	24.74	**23.67**	**393.77**
Mean	**17.40**	**15.72**	**15.73**		**12.47**	**9.92**	**9.13**		

CD(p=0.05) Sampling intervals I= 2.675 Treatment= 3.784 Interaction= 6.554 CD(p=0.05) Sampling intervals=1.855 Treatment= 2.669 Interaction= 4.62 CD(P=0.05) = 21.899.

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First record of the spiralling whitefly on fruit and ornamental plants in Chhattisgarh plains

A.K. Awasthi and R. K. S. Tomar
IGKV, TCB College of Agriculture and Research Station, Sarkanda, Bilaspur, Chhattisgarh 495 001, India

The spiralling whitefly, *Aleurodicus dispersus* Russell (Aleyrodidae: Homoptera) is a pest of many horticultural crops, as well as an extensive

range of ornamentals and shade trees. In India, it was first recorded in 1993 at Thiruvananthapuram, Kerala on tapioca. The pest is highly polyphagous and attacks around 500 plants in different countries and 280 in India alone. Recently, heavy infestation of the insect was observed in guava, papaya and several ornamental plants at Bilaspur and Chhattisgarh. The population of white fly adults on guava leaves was recorded to vary from 63 to 167 adults per leaf. The pest infests guava, papaya, custard apple, almond, *Hibiscus* spp., eggplant, rose, money plant and several other ornamental plants shown its preference towards the egg laying in peculiar spiral form on the underside of the leaves. The fruits of papaya were also observed to be preferred by the pest for egg laying. Immature and adult stages of the insect have been observed to cause damage to the plants by sucking cell sap, secreting honey dew along with white, waxy material and further creating sooty mould on leaves, as a result, photosynthetic activities and growth of the plant is adversely affected. Infested leaves become yellow, dry and drop down finally. The lady bird beetle, *Coccinella septumpunctata* and *Menochilus sexmaculatus* were also found to be associated with the pest as naturally occurring predator.

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Effect of over ripened sapota fruit as a uzi trap

S. Shrikant S., Chavan and Aski S.G.
College of Agriculture, Bijapur - 586 101, UAS, Dharwad, Karnataka, India

The uzi fly, *Exorista bombycis* (Louis), is a serious endoparasitoid of silkworm. Considering the menace of the uzi fly to the sericulture industry,

Table : Comparative performance of sapota fruit with uzi trap and uzi trap alone

Larval instars	Adult trapped			
	Sapota fruit with uzi trap (No.)	Increase over uzi trap alone (%)	Uji trap (No.)	Decrease over sapota with uzi trap (%)
III instar	20.33 ± 3.00	4.43 ± 1.42	7.00 ± 2.00	1.87 ± 0.37
IV instar	29.66 ± 4.52	6.15 ± 1.98	12.66 ± 3.00	2.39 ± 0.89
V instar	35.00 ± 6.72	8.29 ± 2.19	16.33 ± 4.00	3.32 ± 0.99
Total	**84.99 ± 14.24**	**18.87 ± 3.59**	**35.99 ± 6.49**	**7.58 ± 2.21**
Mean + S.D.	27.66 ± 10.76	6.29 ± 2.07	12.00 ± 4.16	2.53 ± 0.99