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### RESEARCH ARTICLE

## INSECT'S POPULATION PREFERABLE BY BIRDS IN THE DIFFERENT ECOSYSTEMS OF TANDOJAM SINDH, PAKISTAN

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### Abstract

During the present study maximum population of insects was observed in the fields such as Mosquitoes i-e 9.89% followed by 9.02% of Ants larvae, 8.55% of Scale insects, 8.35% of Fruits flies, 8.04% of Thrips and 8.0% of Bugs respectively. Whereas, lowest population of American bollworm and Thin larvae i.e 2.29% and 1.67% was calculated from five different ecosystems of Tandojam. Grasshoppers and locusts population was noted 6.92% in all survey fields. Overall it was observed that insect's population was maximum i-e 566 from Horticulture followed by 528 and 511 from Malir farm and S.A.U Tandojam while lowest No. of insects i-e 487 and 480 were reported from H.M.S Baloch and L.A farm.

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### Introduction:-

Insects are polyphagous plants pest belongs to different orders they are widely distributed from sea level to snowy mountains with significant economic importance due to their destructive role to almost all type of green vegetations. Different members of class insecta probably qualify as best food source for birds. They are the tastiest, nourishing and generally desirable food items for many species of birds, reptiles and mammals. Locust swarms are often accompanied by flocks of birds which gorge themselves as a unit. Insects are easily captured by birds due to variety of reasons such as soft bodied, smaller in size and easier to handle. Most of the birds will comb everything creeping on ground, herbs, shrubs and trees. The proportion of insects in the diet of these birds varies with the seasons. Considerable taxonomic work has been carried out on the insects of plain, cultivated and semi-mountainous area by (Tandon and Shishodia, 1969 and 1989; Tandon, 1975-1976; Riffat and Wagan 2008 and 2010; Mukhtar *et al.*, 2010; Nayeem *et al.*, 2012). Birds can play significant role to control insect's pest population below the threshold level. But very little attention has been paid to use them as a bio-control agent. Introduction of birds as predator to control the insect pest population is new trend in Pakistan. Birds not only contributing to control pest population but they are also playing significant role to maintain the balance in the food chain of ecosystem. Therefore, present initiative has been made to enlist different orders of insects preferable by birds.

### Material and methods:-

#### Insect's sampling:-

Culture of insects (both nymphs and adults) captured from different agriculture ecosystem i-e wheat, sunflower, sugarcane, fruits and vegetables forms which mostly surrounded by wild plantation of various grasses. All samples were captured through insect net (9.5 cm in diameter and 51.5 cm in length) while some of them were picked by

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hand or large forceps. Sampling was done during 2015 during month of February to late December from Tandojam. After collection insects were shifted into plastic bags/ cages/ jars and brought to laboratory.

#### **Recognition of insect:-**

Identification of species was done under stereoscope microscope, through literature and direct communication and guide line of supervisor.

#### **Statistical examination:-**

Experimental data was subject to one way analysis of variance (ANOVA) version (SPSS 16.0) applicable for window -8.

#### **Results and Discussion:-**

During the present study maximum population of insects were observed in different ecosystems i.e Mosquitoes 9.89 % followed by 9.02% Ants Larvae, 8.55% of Scale insects, 8.35% of Fruits flies, 8.04% of Thrips and 8.0% of Bugs respectively. Whereas, lowest population of American bollworm and Thin larvae i.e 2.29% and 1.67% was calculated from five different ecosystems of Tandojam. Grasshoppers and locusts population was noted 6.92% in all survey fields. Over all it was observed that insects population was maximum i-e 566 from Horticulture followed by 528 and 511 from Malir farm and S.A.U Tandojam while lowest No. of insects i-e 487 and 480 were reported from H.M.S Baloch and L.A farm (Table-1).

Grasshopper's population was increased with rains, but they were not migratory and caused less damage. From 1986-90 applications of insecticides for locust control were made to almost 14 million ha in northern Africa (Everts, 1990). About one -half of the area treated was in North Africa from Morocco to Egypt. The rest was in the Sahel from Mauritania and Senegal to Ethiopia. While most applications for locust control were made in relatively small areas (1-12 km<sup>2</sup>), to larger areas (100km<sup>2</sup>) were treated for control of grasshopper populations both with organophosphate and carbonate. Insecticides persisted for only a few days in the dry environments (Everts, 1990). Migrating locusts represent one of the largest biomass of insects ever to congregate on earth. In Somalia, one plague area was estimated to contain 1.6 billion locusts weighing 50, 000 tons (Rowley, 1993).

Such concentration attracts large numbers of resident and migratory birds that often travel with Swarms of locusts. (Smith and Popov, 1953) observed thousands of eagles and falcons feeding for days on swarm containing tens of millions of locusts. Many raptors feed on locusts and the African Cuckoo Falcon (*Aviceda cuculoides*), Montagu's Harrier (*circus pygargus*), Red-footed Falcon (*Falco vespertinus*), Amur Falcon (*Falco amurensis*) and Lesser Kestrel (*Falco naumanni*) are considered locust and grasshopper specialists (Steedam, 1988; Pickford *et al.*, 1989). Controlled studies of the environmental effects of locust control are not possible during operational applications of insecticides to moving swarms of locusts. However, several experimental applications of insecticides to large study plots have been evaluated. (Risser *et al.*, 1981) reported that insects' population significantly decrease in forest system naturally by insectivores birds, it was necessary to demonstrate similar results in grasslands. Insectivorous birds are relatively scare in green land compared to forest habitats and it has been recommend that avian predation is likely to be significant to control insect pest population in grassland.

Population densities of insects in various ecosystems of Tandojam were found maximum in order Hymenoptera; ants and their thin larvae, leaf cutter ants and their larvae Diptera; mosquitoes, fruit flies, hoverflies, black flies Thysanoptera; thrips Hemiptera; bugs, aphid, scale insects Isoptera Subterranean termites Lepidoptera; army worm, american bollworm, citrus butterfly Coleoptera; beetles Orthoptera; locusts and Grasshoppers Dictoptera; praying mentis. These species of insects are more commonly eaten by birds; this is the first attempt of such comparative examination of co-existing population of birds and insects in this permissive (Table-3).

**Table 1:- Insect population present in different ecosystems of Tandojam during the year 2015-2016.**

S.No.	Insects	Haji MS Baloch Farm	SAU Horticulture	S.A.U Farm	L.A Farm	Malir Farm	Percentage (%)
1.	Ants larvae	29	63	57	48	35	9.02%
2.	Leaf Wasp	15	39	17	14	19	4.04%
3.	Thin larvae	05	18	15	05	00	1.67%
4.	Mosquitoes	82	42	51	39	40	<b>9.89%</b>
5.	Fruit flies	39	56	41	46	33	8.35%
6.	Black flies	00	07	05	13	00	0.97%
7.	Thrips	52	63	37	26	29	8.04%
8.	Scale insect	29	38	42	50	61	8.55%
9.	Bugs	63	52	40	22	29	8.00%
10.	Aphids	21	41	33	16	27	5.36%
11.	Subterranean termites	23	20	39	52	32	6.45%
12.	American Bollworm	05	02	13	20	19	2.29%
13.	Beetle	42	29	30	31	32	6.37%
14.	Army worm	42	32	40	29	40	7.11%
15.	Citrus butterfly	21	24	22	33	07	4.16%
16.	Locust and Grasshopper	19	20	29	36	74	6.92%
	<b>Total</b>	487	566	511	480	528	2572%

**Table 2:- Showing the insect population along with their target crops.**

S.No.	Common Name	Scientific Name	Main Target Crop
1.	Large Grasshopper	<i>Hieroglyphus perpolita</i>	Wheat
2.	Rice Grasshopper	<i>H. nigroripletus</i>	Rice
3.	Small Grasshopper	<i>H. orzivorus</i>	Sun flower
4.	Small Grasshopper	<i>Oxya hyl ahyla</i>	Cabbage
5.	Grasshopper	<i>O. velox</i>	Rice, Tomato
6.	Locust	<i>Locusta migratoria</i>	Chilli
7.	Locust	<i>Schistocerca gregaria</i>	Wheat
8.	Mustard Aphid	<i>Lipaphise rysimidavis</i>	Lady finger
9.	Painted Bug	<i>Badga cruciferum kirk</i>	Sun flower
10.	Mustard Sawfly	<i>Athalico proximaklug</i>	Green Beans

**Table 3:- Showing the orders of different insects preferable by birds.**

S.No.	Order	Insects
1.	Hymenoptera	Ant thin Larvae, Leaf cutter, Ants, Wasps and their larvae
2.	Diptera	Mosquitoes, Fruit flies, Haver flies, Black flies
3.	Thysanoptera	Thrips
4.	Hemiptera	Bugs, Aphids, Scale insects
5.	Isoptera	Subterranean termites
6.	Lepidoptera	Army worm, American boll worm, Citrus butterfly
7.	Coleoptera	Beetles
8.	Orthoptera	Locust, Grasshoppers
9.	Dictoptera	Praying mantis

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