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Fauna of genus *Bactrocera* fruit flies in guava orchards of district Larkana, Sindh Pakistan

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Abstract
This present study started in the month of July 2017 to November 2017. 14465 fruit flies were captured through bottles filled with the methyl eugenol and sex pheromone from the guava orchards of three different localities of district Larkana namely village sher Muhammad jamali, village choharpur and village naudero and sorted out into genus *bactrocera* along with two species namely *Bacrtocera zonata* and *B. dorsalis*. They have central job in guava orchards of different places of district Larkana and above genus is first time recorded from three different localities of Larkana district.

Keywords: *Bactrocera*, fruit flies, guava orchards, Larkana, Sindh

1. Introduction
Guava fruit is commonly attacked by fruit fly in sindh province and main pests are bugs along with aphids. The family Tephritidae with order *Diptera* consists of over 4000 known species but 700 known species belongs to Dacinea fruit flies [1]. In Pakistan these types of flies are very serious pest of variety of tree fruits. They have very much economic importance in Pakistan due to their heavy losses of fruits at the farm level with estimated loss of 200 million US dollar from annual income and the most of farmers suffer in particular due to the lack of knowledge, being the main growers of highly susceptible of guava, mango, peach and cucurbits are being unable to afford existing protection measures [2]. The fruit fly, (*Diptera*: Tephritidae) genus *Bactrocera*, is one of the most vicious pest of many pliable fruits and vegetables around the world. Fruit flies attack fruit trees, vegetables and not only reduce their yield but also affected the quality. Crop loss varies from a few per cent to 100% depending on fruit fly population, locality, variety and season [3]. The female fruit fly ruptures the fruits by its ovipositor and lays six or more banana like eggs into healthy, ripening fruits just beneath the skin. The sting sites appear as discolored or blackish spots, which may exude distinctive blobs or filaments of gum as the skin of fruit is breached as well as infected by bacteria induces decaying of fruit tissue. Fruit flies are one of the most captivating and diversified group of insects often referred to as 'peacock flies' due to their habit of strutting and vibrating their wings and rank among the worlds most serious pests of horticultural crops [4]. These flies Damage to fruits cause major loss to formers besides the losses to traders, retailers and exporters. The losses caused to fruits by (*Diptera*: Tephritidae) genus Bactrocera, species is depend on type of *Bactrocera* species and the type of host fruit plant [5] and [6]. It also indicates that rate of infection can vary among fruit fly species and that climatic conditions and type of host plant can affect attraction within fruit fly species [7].

2. Materials and Methods
The present research study was researched at District Larkana during 2017. The research work was started from the month of July 2017 to November 2017. 14465 *Bactrocera* flies were captured through green colour bottles filled with the methyl eugenol and sex pheromone from different localities of target area. Three different guava orchards (target areas) were selected for sampling purpose with the distance of 08 to 25 km away from Larkana city. Those areas were Village Sher Mohammad Jamali, Village Choharpur and Village Naudero.
Five different varieties of guava fruit were taken to observe rate of *Bactrocera* species, those were Riali, Thadharami, Sindhi and Malto/Golo. All specimens moved to the laboratory for the further research under binocular microscope one by one and identification applied on the basis of the morphology with the help of keys [8].

All species of the specimens were permanently preserved in separate vials finally.

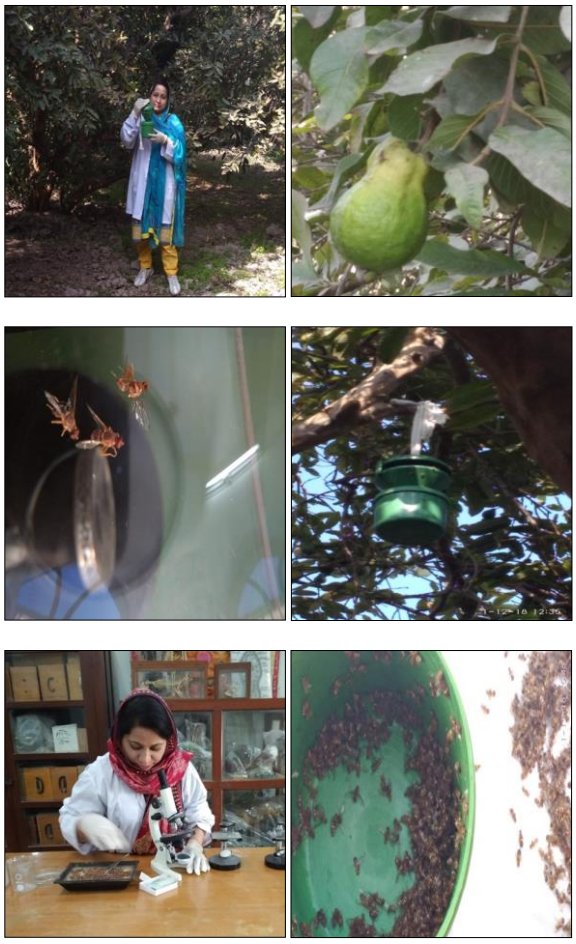

Fig 1: Different Activities during the Research Work

3. Results and Discussion

During the present study of fruit flies genus: *Bactrocera* in guava Orchards of District Larkana, Sindh, Pakistan is wonderfully constrained to systematic test. Total 14465 *Bactrocera* flies were captured during the survey of district Larkana along with the three localities of guava orchards namely Village Sher Mohammad Jamali, Village Choharpur and Village Naudero during from the month of July 2017 to November 2017. During research monthly status of collected *Bactrocera* flies is given below (table no. 01), status of collected *Bactrocera* flies at species level is also given below (table no. 02), status of collected *Bactrocera* flies at varieties level is also given below (table no. 03) and status of collected *Bactrocera* flies at localities level is again given below (table no. 04). Also work is done on above genus by the different researchers from, Egypt [9], Pakistan [10], etc and also comparative study has been worked from the India on the *Bactrocera* [11]. This project will increase the knowledge about the guava orchards among local peoples of district larkana, especially former of the guava orchards.

Table 1: Monthly Status of Collected *Bactrocera* flies

Month	Collected Specimens	% of Collected Specimens
July	1561	10.79
August	4140	28.62
September	3390	23.43
October	3089	21.35
November	2285	15.79

Table 2: Status of collected *Bactrocera* flies at species Level

Species	Collected Flies	% of Collected Flies
Bactrocera zonata	8783	60.71
Bactrocera dorsalis	5682	39.28

Table 3: Status of collected *Bactrocera* flies at varieties Level

Varities	Collected Specimens	% of Collected Specimens
Riali	1320	9.12
Thadharami,	1975	13.65
Sindhi	1310	9.05
Malto/Golo	9860	68.16

Table 4: Status of collected *Bactrocera* flies at Localities Level

Locality	Collected Specimens	% of Collected Specimens
Village Sher Mohammad Jamali	4119	28.47
Village Choharpur	7414	51.25
Village Naudero	2932	20.26

4. Conclusion

During the study of Prevalence of Tephridae fruit flies genus: *Bactrocera* in guava Orchards of District Larkana, above species along with genus *Bactrocera* are first time recorded from guava Orchards of Five varieties such as Thadharami, Malto, Golo, Sindhi and Riali. All species with genus are identified on the basis of morphological characters. This project will provide foundation data and consciousness among local peoples as well as farmers about the flies' fauna of district Larkana, which will be supportive to begin and evaluate the prospect management exercise for guava Orchards in larkana district. These studies will also good quality calculation in the scientific literature of Pakistan.

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