

## Surveillance of tephritid fruit flies in the sapota orchards of South Gujarat

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### Abstract

Studies were carried out in Navsari and Valsad districts of South Gujarat, India during the month of January 2021 to find out species diversity of fruit flies in the sapota fruit orchards. The roving survey was conducted by taking count of fruit flies attracted to an open cotton swab/plywood block of ethyl alcohol, methyl eugenol and DDVP mixture (6:4:1) in 30 minutes. The results revealed that the maximum population of fruit flies belonged to Genus *Bactrocera*, *Bactrocera dorsalis* (Hendel) was found predominant in the survey area.

**Keywords:** Tephritid fruit flies, species diversity, *Bactrocera dorsalis*, etc

### Introduction

South Gujarat is leading in fruits and vegetable production in Gujarat state of India. Three districts viz., Surat, Navsari and Valsad are included in agri-export zone for fruits and vegetables, which require quality production. Fruit flies are the major constraint which cause considerable loss in terms of quality and production. Moreover, these flies are good fliers and thereby their spread is also very high and hence area wide adoption of management strategy can only be useful against the flies. Fruit flies, although a serious pest, are largely uncontrolled or controlled by cover sprays of insecticides which are undesirable in fruits and vegetables. Intensity of damage recorded was high as over 30 per cent in mango and sapota, while 20-40 per cent in cucurbitaceous vegetables. Navsari Agricultural University has designed and commercialized an eco-friendly, economical and easily adoptable fruit fly trap popularly known as "Nauroji-Stonehouse Fruit Fly Trap" through Male Annihilation Technique (MAT). To know the diversity of different species of sapota fruit fly prevailing in the South Gujarat, the present study was undertaken.

## Materials and Methods

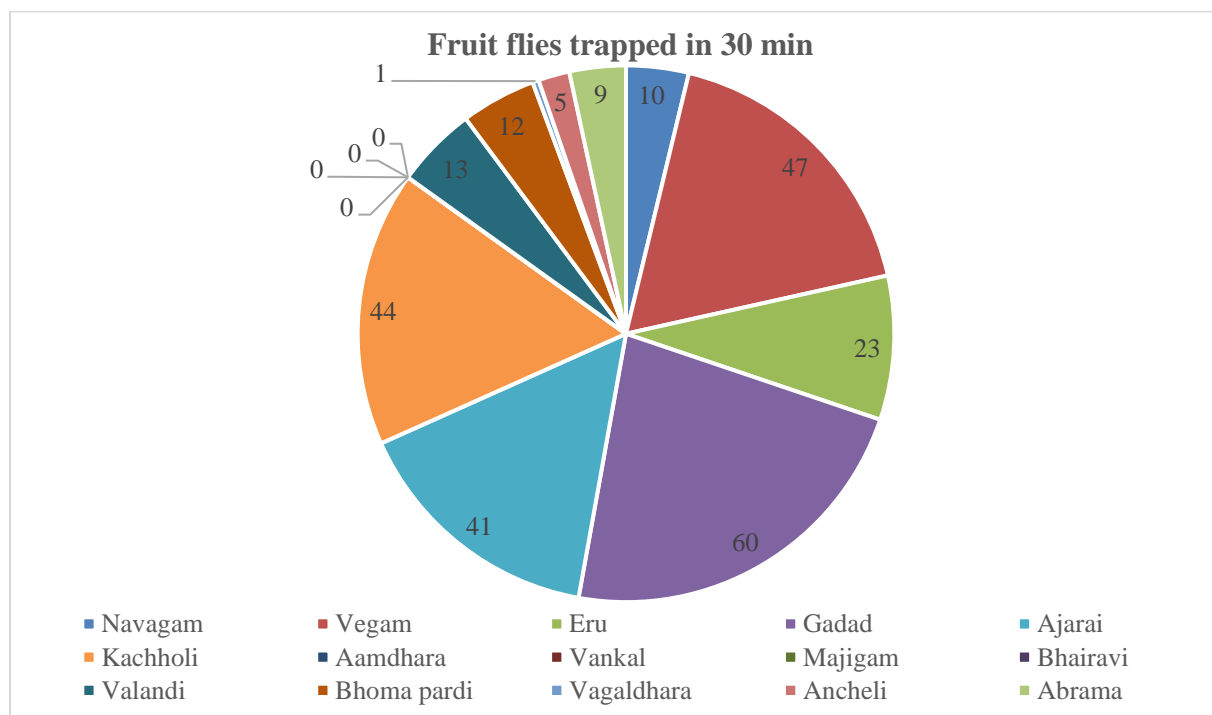
The roving survey of fruit fly in sapota orchards was conducted in fifteen villages of various taluka of Navsari (20.7695° N, 73.1350° E) and Valsad districts (20.4925° N, 73.1350° E) through Male Annihilation Technique (MAT) by taking count of fruit flies attracted with an open cotton swab/plywood block of ethyl alcohol, methyl eugenol and dichlorvos (DDVP) mixture (6:4:1) in 30 minutes. The collected fruit flies were counted and brought to the Research laboratory, Department of Entomology, N. M. College of Agriculture, Navsari Agricultural University, Navsari for primary identification and further samples were sent to the NBAIR, Bengaluru, Karnataka India for further identification and confirmation up to species level. Moreover, the Nauroji-Stonehouse Fruit Fly Trap was also installed for the monitoring of the fruit flies at surveyed orchards.

## Results and Discussion

The data presented in Table-1 indicated that the fruit fly abundance ranged between 0 to 60 flies per 30 minutes during the month of January 2021 in the sapota orchard from different locations in south Gujarat. From the different villages surveyed, the maximum (60 Nos.) fruit fly population caught in 30 minutes was from Gadad village of Gandevi taluka and the minimum (01 Nos.) fruit fly observed from Vagaldhara village of Valsad taluka. Among the fruit flies collected, *B. dorsalis* was found predominant in the survey area. The present findings are accordance with Nandre and Shukla (2014) who revealed that the fruit fly population in sapota prevailed throughout the year and the maximum activity (172.1 flies/trap) was found during March to August and population was found to be low during month of December and January (11.1 to 21.3 flies/trap). According to Bansode (2009), there are three species of fruit flies present in south Gujarat. Among them, *Bactrocera zonata* was pre-dominant (62.05 %) species of fruit fly followed by *Bactrocera dorsalis* (37.27 %) and *Bactrocera correcta* (< 1 %).

**Table 1: Relative abundance of Tephritid fruit fly species at different locations in south Gujarat**

Sr. No.	District	Taluka /Block	Name of village	No. of flies trapped in trap within 30 min	Abundance of Tephritid fruit fly species
1	Navsari	Navsari	Navagam	10	<i>Bactrocera dorsalis</i> (100)
2	Navsari	Navsari	Vegam	47	<i>Bactrocera dorsalis</i> (100)
3	Navsari	Navsari	Eru	23	<i>Bactrocera dorsalis</i> (100)
4	Navsari	Gandevi	Gadad	60	<i>Bactrocera dorsalis</i> (100)
5	Navsari	Gandevi	Ajarai	41	<i>Bactrocera dorsalis</i> (100)
6	Navsari	Gandevi	Kachholi	44	<i>Bactrocera dorsalis</i> (100)
7	Navsari	Chikhli	Aamdharma	00	00
8	Navsari	Chikhli	Vankal	00	00
9	Navsari	Chikhli	Majigam	00	00
10	Navsari	Chikhli	Bhairavi	00	00
11	Navsari	Jalalpore	Ancheli	05	<i>Bactrocera dorsalis</i> (100)
12	Navsari	Jalalpore	Abrama	09	<i>Bactrocera dorsalis</i> (100)
13	Valsad	Valsad	Valandi	13	<i>Bactrocera dorsalis</i> (100)
14	Valsad	Valsad	Bhoma pardi	12	<i>Bactrocera dorsalis</i> (100)
15	Valsad	Valsad	Vagaldhara	01	<i>Bactrocera dorsalis</i> (100)
<b>Total flies</b>			--	<b>265</b>	--

**Figure 1: Total number of fruit flies attracted to an open cotton swab/plywood block of ME mixture for 30 min of exposure period**



**Plate 1: Fruit flies attracted and killed in open ME mixture**



**Plate 3: Fruit fly, *B. dorsalis* under binocular microscope**



**Plate 2: Nauroji-Stonehouse Fruit Fly Trap in sapota orchard**



**Plate 4: Preparation of an open cotton swab/plywood block of ME mixture**

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The authors are highly grateful to Dr. K. J. David, Scientist, ICAR-NBAIR, Bangalore for the identification and confirmation of the fruit fly species collected during the course of investigation.

**Disclaimer:** DDVP was used for trapping/killing of fruit fly species. Now, we are working on replacement chemical/lure toxicant for our popular technology i.e., Nauroji-Stonehouse Fruit Fly Trap. Moreover, use of DDVP was made for only purpose of research and not for sale.

**References:**

Bansode, G. M. (2009). Studies on comparative biology, population dynamics and management of orchard fly (*Bactrocera* spp.) Ph. D. Thesis (Unpublished) submitted to Navasari Agricultural University, Navasari, Gujarat, pp -177.

Nandre, A. S. and Shukla A. (2014) Population dynamics of fruit fly [*Bactrocera dorsalis* (Hendle)] on sapota. *Agric. Sci. Digest.*, 34 (1): 70 – 72.