

# BACTROCERA DORSALIS AN INVASIVE FRUIT FLY SPECIES IN MAURITIUS

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## ABSTRACT

The Oriental fruit fly, *Bactrocera dorsalis* was first detected in Mauritius in 1996 and then declared eradicated in 1999. A second interception was made in 2013 and it was eradicated. The insect was recorded a third time in 2015 and it spread to the whole island. Sample of fruits were collected regularly, weighed and incubated in the laboratory to determine the infestation levels. Results showed that *B. dorsalis* has gradually displaced *Bactrocera zonata*, *Ceratitis quilicii* and *C. capitata* in fruits.

## INTRODUCTION

After two successful eradication of *Bactrocera dorsalis* (Hendel) (Diptera: Tephritidae) in 1996 and in 2014 from Mauritius, the fly was trapped for the third time in October 2015 in one mango orchard. An eradication programme using the bait application technique and the male annihilation technique was implemented. Unfortunately, infested fruits were sold outside the eradication area. In 2017, *B. dorsalis* was present island wide. Fruit fly trapping and larval surveillance were pursued.

## METHODOLOGY

From 2015 to March 2020, fruits and vegetables were collected on a fortnightly basis from the field, weighed and incubated on a layer of sand in plastic trays covered with cloth. After 3 to 5 days, the sand was sieved for the first time and a second sieving was done after 7 to 8 days. Collected pupae were counted and placed in Perspex cages (15 cm x 15 cm x 20 cm). Adult food and water were provided. Three days after emergence, the flies were killed by placing the cage in a refrigerator for at least 5 minutes. The flies were identified and counted.

## RESULTS

Tables (i) to (iii) Infestation levels of fruits with *Bactrocera zonata*, *Bactrocera dorsalis*, *Ceratitis quilicii* and *Ceratitis capitata* from 2016 to March 2020

### (i) Indian almond

Year	No. of fruits	Weight (kg)	No. of pupae	Bz/kg	Bd/kg	Cq/kg	Cc/kg	No. of <i>F. arisanus</i>	% parasitism
2015	3167	94.93	5705	31.7	0.00	1.73	0.35	-	-
2016	8882	253.54	8651	13.54	0.60	0.43	0.07	42	0.49
2017	6917	195.00	7191	14.77	5.85	0.06	0.02	88	1.22
2018	2694	73.17	3809	0.26	29.62	0.00	0.00	31	0.81
2019	3142	73.60	6992	0.00	63.55	0.00	0.01	99	1.42
2020	779	18.00	683	0.00	6.34	0.00	0.00	9	1.32

### (ii) Mango

Year	No. of fruits	Weight (kg)	No. of pupae	Bz/kg	Bd/kg	Cq/kg	Cc/kg	No. of <i>F. arisanus</i>	% parasitism
2015	2253	215.44	2365	5.49	0.32	0.12	0.00	-	-
2016	3565	363.27	7011	10.44	1.02	0.05	0.01	7	0.10
2017	2791	273.00	6982	7.05	10.03	0.00	0.00	6	0.09
2018	2411	267.39	10712	0.75	29.69	0.02	0.00	43	0.40
2019	1094	120.41	6584	0.00	35.22	0.00	0.01	25	0.38
2020	755	119.79	6429	0.00	30.19	0.00	0.00	33	0.51

### (iii) Guava

Year	No. of fruits	Weight (kg)	No. of pupae	Bz/kg	Bd/kg	Cq/kg	Cc/kg	No. of <i>F. arisanus</i>	% parasitism
2015	1306	43.04	3344	26.20	0.00	3.64	0.41	-	-
2016	1220	70.38	4049	25.79	0.99	1.15	0.24	13	0.32
2017	1360	59.50	4677	27.75	13.26	1.98	0.20	39	0.83
2018	893	50.30	3008	1.61	41.31	0.10	0.06	51	1.70
2019	703	33.20	5115	0.00	105.24	0.00	0.00	382	7.47
2020	88	5.90	867	0.00	54.58	0.00	0.00	59	6.81

Bz: *Bactrocera zonata*      Bd: *Bactrocera dorsalis*  
 Cq: *Ceratitis quilicii*      Cc: *Ceratitis capitata*

More than 40 fruits and vegetable species were collected and incubated in the laboratory. In 2015, *B. zonata* was the most dominating fruit fly species in most fruits followed by *C. quilicii* and *C. capitata*. One year after its accidental introduction, *B. dorsalis* became the most devastating fruit fly species, followed by *B. zonata*, *C. quilicii* and *C. capitata*. The no. of *B. dorsalis*/kg from Indian almond which is a wild fruit, rose from 0.6 in 2016 to 63.55 in 2019 while the no. of *B. zonata* decreased from 31.70 in 2015 to 0.00 in 2019.

## DISCUSSION AND CONCLUSION

The pitaya and sugar apple which were free from fruit flies are now being damaged by *B. dorsalis*. Citrus fruits were rarely attacked by *B. zonata* or *C. capitata*. They are now a host for *B. dorsalis*. The most cultivated fruit in Mauritius is mango. Unfortunately, this fruit is now highly infested with *B. dorsalis*. The preferred host for *B. dorsalis* was guava with 105.24 *B. dorsalis* flies/kg fruit in 2019 followed by the Indian almond 63.55 *B. dorsalis* flies/kg in the same year. Our results confirm that *B. dorsalis* is a polyphagous species.

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