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**RESEARCH REPORT ON THE BIOACTIVITIES OF ETOGROWTH™-T235**  
**ON MAIN PESTS OF VEGETABLES**

Recently, with the advancement in the environmental science, the use of chemical pesticides is under severance. With the cutting age of pesticides know-how, the quest for safe, non-resistance, environmental friendly, new age pesticide is sought. In the production of vegetable, effective pesticide with low toxicity is very few in the market. With prolong misuse of pesticide, serious resistance has build up, causing ‘veggie poisoning’ and upsurge in population of pests. With the evolution of a new age pesticide, ETOGROWTH™-T235, which has the following advantages : Acts as repellent, antifeedant and ovipositional deterrent; safe for natural enemies and mammals; no resurgence; biodegradable; non-polluting; the evolution of ETOGROWTH™-T235 would have a profound effect on the production of totally safe vegetables for consumption. In this report, the efficacy of ETOGROWTH™-T235 under both laboratory and actual field conditions are evaluated. Intensive research was done on the two main types of pests, *Diamondback moth (Plutella Xylostella Linnaeus)* and *Yellow stripped flea beetle (Phyllotreta Striolata Fabricius)*; and on the natural enemy, honeybee (*Trichogramma Confusum*) which has the most sensitivity towards pesticides.

**1. Method**

- 1.1 Experimental Plot : Shenzhen Province, Longgang City, Biling Ecological Experiment Farm.
- 1.2 Duration : April ~ June 1998.
- 1.3 Tested Crop : Caixin.
- 1.4 Treatment : T1 (1:100)  
T2 (1:200)  
T3 (1:300)  
T4 (1:400)  
T5 (1:500)  
T6 (1:600)
- 1.5 Tested Pests : *Yellow stripped flea beetle (Phyllotreta Striolata Fabricius)*. Collected from the caixin plantation which has been sowed for 7~10 days. The

pests were starved under laboratory condition before treatment was carried out.

1.6 Laboratory Test : Leaf Residue Bioassays. Collect 2~3 caixin leaves from the farm. Each individual treatment was prepared and the leaves soaked in each treatment for 10 secs. and air dried in a porcelain dish before placing in a 9 cm diameter petri-dish. Each *Yellow striped flea beetle* was introduced in the petri-dish and covered with netting. The mortality of the beetle was monitored every 2 hours interval for a period of 3 days. Control used is water. Each treatment with 30 replicates.

1.7 Field Test : Each treatment is allocated test area of 0.1 hectare. Spray treatment was carried out at the beginning stage of seedlings, at 3 days interval for a total of 3 sprays. Evaluation was done 1 day before and after spray. 10 sampling spots, each 1 m<sup>2</sup> was selected. Water is used as Control. After 5 days, 10 days, 15 days and 30 days after the 1<sup>st</sup> spray, 100 leaves were collected for laboratory evaluation.

1.8 Effect on Natural Enemies : Honeybee (*Trichogramma confusum*)

1.8.1 Adults

Dilute ETOGROWTH™-T235 with distilled water at the specified dilution. Soaked *Diamondback moth eggs (Plutella Xylostella Linnaeus)* in the different treatment for 2 secs and placed in cylinder (diameter 4 cm and length 10 cm) after air-dried. 50 Honeybees (*Trichogramma confusum*) were introduced into the cylinder and sealed. Each treatment with 3 replicates. Observation was made for 8 hrs at 28°C, before putting into the incubator at 28°C, RH 80%. The mortality of the honeybees was observed every 3~8 hrs. Distilled water as Control.

1.8.2 Eggs, Larva, Pupa

Collect 400 eggs and soaked into the treatments for 2 secs before putting into the cylinder after air-dried (ay day 0, day 2 and day 5) and monitored the growth into adults. (Note : 0 day = eggs, 2 days = larva, 5 days = pupa). Distilled water as Control.

## 2. Conclusion

### 2.1 Effect of ETOGROWTH™-T235 on *Yellow striped flea beetle (Phyllotreta Striolata Fabricius)*.

No of Hrs	Survival Rate (%)					
	12 hrs	24 hrs	36 hrs	48 hrs	60 hrs	72 hrs
Treatment						
1:100	58.3	47.2	36.1	36.1	36.1	27.7
1:300	48.6	42.9	40.0	37.1	34.3	34.3
1:600	58.1	41.9	41.9	41.9	41.9	35.5
Control	100	90.9	90.9	90.9	90.9	90.9

From the results thus obtained, the efficacy of ETOGROWTH™-T235 against *Yellow striped flea beetle (Phyllotreta Striolata Fabricius)* is very significant.

### 2.2 Toxicity of ETOGROWTH™-T235 on *Yellow striped flea beetle Larvae (Phyllotreta Striolata Fabricius)*.

No of Hrs	Damage / Day (0.01 x cm <sup>2</sup> / Leaf)				Damage (%) (0.01 x cm <sup>2</sup> / Leaf)						Damage %	Damage Index (ρ <sub>1</sub> )
	1day	2day	3day	Ave.	12 hrs	24 hrs	36 hrs	48 hrs	60 hrs	72 hrs		
Treatment												
1:100	4.24	4.88	4.18	4.43	58.3	47.2	36.1	36.1	36.1	27.7	13.98	0.2865
1:300	6.87	4.00	4.73	5.20	48.6	42.9	40.0	37.1	34.3	34.3	16.41	0.3363
1:600	8.14	7.96	3.70	6.60	58.1	41.9	41.9	41.9	41.9	35.5	20.82	0.4267
Control	15.8	13.9	16.7	15.47	100	90.9	90.9	90.9	90.9	90.9	48.79	1

With increased in concentration of ETOGROWTH™-T235, the damages also decreased. With the decreased in the percentage of damages, an indication of the growth of the larvae is also under checked. The results indicated that the toxicity of ETOGROWTH™-T235 on *Yellow striped flea beetle Larvae (Phyllotreta Striolata Fabricius)* is very significant.