



# Effect of bio pesticide of *Euphorbia grantii*, Oliv. On *Sitophilus oryzae* (Rice weevils)

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## ABSTRACT:

The history of herbals is as old as human civilization. Nature always stands as a golden mark to exemplify the outstanding phenomenon and remedies. *Euphorbia grantii*, Linn member of Euphorbiaceae family is a wild, thorny, xerophytes, succulent plant, commonly used in fencing of the agricultural field and also in dry barren areas. Collection of plants and leaves was carefully made to ensure healthy and damage free samples to established different concentrations of extracts. This gives us opportunity to study herbal formulations for controlling insect *Sitophilus oryzae*, extract is tested as biopesticide, alternative to pesticides. It possesses antimicrobial, wound healing, insecticidal, nematocidal and cytotoxic activity. A new tetracyclic triterpene, nerifoliene and euphol were isolated from the latex. It contains chemicals such as terpenes, glycoproteins, phyto-elements and phytochemicals. This article provides informative data on ethno botanical importance and bio prospecting of *Euphorbia grantii*, Oliv.

**KEY WORDS:** Botany, Medicinal Plants, Pharmacognosy, Biopesticides, *Sitophilus oryzae*.

## INTRODUCTION:

*Euphorbia* (Euphorbiaceae) is a large and widely distributed genus consisting of more than 2000 species (Wallis 1967). Approximately 68 species, including a few exotics are found in India. Of these, the three species *E. antiquorum* L., *E. grantii* Oliv and *E. tirucalli* L., especially their latexes, are used extensively in the Indian system of medicine, such as Ayurveda and Siddha (Durry, G., 1893).

*Euphorbia grantii* is a large succulent shrub or small tree up to 7.5 m in height, with stipular thorns. It is commonly known as *Sehundah* (Ayurveda) and *Ilachevikalli* (Siddha) and is attributed with properties such as *Ushnaveerya* (hot), *Snigdha* (oily), *Katu* (pungent), and *Laghu* (light) (Cooke, T., 1967).

The latex is considered a purgative and rubefacient. It is also used as an expectorant and to remove warts and cutaneous eruptions. For external use it is of service in chronic rheumatism and paralysis as a counter irritant (Daniel, M., 1991).

It is violent irritant and caustic poison. Forensic science is the study and application of the science to law in the search of truth in civil, criminal and social matters to any member of the society.

It is an interdisciplinary science, covers biological, physical, chemical, mathematical and behavioral science. Poisonous properties of plants are due to presence of certain toxic constituents, those are responsible for the specific physiological action on living organism (Nadkarni, A. K., 1927).

Generally crude plant powder or extract of plant are used as a poison. The present study includes macroscopy, microscopy, phytochemical study and qualitative analysis for starch, protein alkaloids etc. (Kirtikar, K. R. and Basu, B. D, 1937).

### MATERIALS AND METHODS:

Plant material of *E. grantii* Oliv was collected along with stem, leaves, flowers, fruits and seeds for correct botanical identification from various places of Pune district of Maharashtra. Thin transverse sections were taken from stem and leaves.

Macro and microscopic characters were studied (Wallis, 1967; Trease and Evans, 1982). Stem and leaves were separated and dried in shade, so as to prevent the decomposition of active principles. Powder was sieved in 70 mm mesh and stored for phytochemical screening (Chopra, R. N., 1933).

### MICRO PILL PREPARATION:

The pills are prepared as follows. 9 g of rice flour, 1 g of gluten and 1 mL of glycerol with 1 mL latex were added. By adding water, little by little, dough was obtained. From the dough small spherical pills were prepared manually. These pills dried at 25°C in shade so that moisture content was reduced to around 14- 15%. Dried water and methanol extract of Leaf and Stem is also used in pill preparation (Ewing Galen W., 1982 and Henry, T. A., 1949).

### OBSERVATIONS:

**Table 1: Quantitative microscopy of Leaf:**

Sr. No.	Observations	Readings
1	Stomatal number of upper epidermis	2.00
2	Stomatal number of lower epidermis	21.00
3	Stomatal index of upper epidermis	2.98
4	Stomatal index of lower epidermis	26.92
5	Vein-islets number	50.00
6	Vein let termination number	13.00
7	Palisade ratio	2.06

**Table 2: Histochemical studies:**

Test, Water extract	Chemical/ reagent	<i>E. grantii</i> , Stem	<i>E. grantii</i> , Leaf
Starch	Iodine	Ground tissue	palisade
Protein	NaOH + CuSO <sub>4</sub>	Cortex, Ground tissue	palisade
Saponin	O <sub>4</sub>	Cortex	Ground tissue

Tannin	10% FeCl <sub>3</sub>	Cortex	Ground tissue
Fat	Sudan III	Cortex	Ground tissue
Sugar	Benedict's reagent	Hypodermis, Cortex	Ground tissue
Glycosides	KOH + Alcohol + FeCl <sub>3</sub>	Phloem, Cortex	palisade
Alkaloid	Mayer's reagent	Cortex	Ground tissue
Alkaloid	Wagner's Reagent	Cortex, Ground tissue	palisade
Alkaloid	Dragendorff's reagent	Cortex, Ground tissue	palisade

**Table 3: Phytochemistry:**

Test, Water extract	Chemical/ reagent	<i>E. grantii</i> , Stem	<i>E. grantii</i> , <i>Leaf</i>
Starch	Iodine	+ve	+ve
Saponin	Water	+ve	+ve
Protein	Biuret reagent	+ve	+ve
Tannin	10% FeCl <sub>3</sub>	+ve	+ve
Sugar	Benedict's reagent	+ve	+ve
Anthraquinone	Benzene +NaOH	+ve	+ve
Alcoholic extract			
Alkaloid	Mayer's reagent	+ve	+ve
Alkaloid	Wagner's Reagent	+ve	+ve
Alkaloid	Dragendorff's reagent	+ve	+ve
Flavonoids	HCl + Mg turning	+ve	+ve

**Table 4: Percentage extractives and ash analysis:**

Chemical/ reagent	<i>E. grantii</i> , Stem	<i>E. grantii</i> , Leaf
Water	13g	15 g
Methanol	5 g	6 g
Petroleum ether	4 g	5 g
Solvent ether	3 g	4 g
Benzene	7 g	9g

**Table 5: Ash analysis and acid constant:**

Chemical/ reagent	<i>E. grantii</i> , Stem	<i>E. grantii</i> , Leaf
Total Ash	13.4 g	11.4 g
Acid insoluble ash	0.33 g	0.23 g

**EXPERIMENTAL BEHAVIOR:**

In insect feeding the following symptoms were observed stepwise:



Fig.1. Paralysis of body parts in some insects.



Fig.2. Ultimately death of the insects.

**RESULTS and DISCUSSION:**

The present investigation effect of biopesticide of *Euphorbia grantii*, Oliv on *Sitophilus oryzae* (rice weevils), revealed the change in behavior such as drowsiness, and ultimately leading to death (Chopra, R. N., 1933). These pills may affect in- digestion because of toxicity present in them. Phytochemical investigations were carried out on stem and leaves (Parikh CK. 1985). It confirmed the presence of tetracyclic triterpene, nerifoliene and euphol were isolated from the latex and alkaloid in the organs. All these chemical are toxic in nature. Hence from the foregoing account it was proved that the death of *Sitophilus oryzae* (rice weevils) occurred due to toxic principles of stem and leaves (Chopra, R. N., Nayar, S. L. and Chopra, S. L., 1956).

This plant *Euphorbia grantii*, Oliv. (Euphorbiaceae) is not grazed because of poisonous chemicals. Common tiger (*Danaus genutia*, Draner. Nymphalidae) named butterfly feed on this plant successfully. Because of its occurrence in dry places animals do not come near to this plant, hence number of xerophytic plant also get protected from grazing animals and that locality becomes the home for many microorganisms.

From the above observations and discussion it is clear that *Euphorbia grantii*, Oliv. (Euphorbiaceae) is important medicinal and poisonous plant as bio pesticide.

**ACKNOWLEDGEMENTS:**

The authors are thankful to the Principal, S. P. College (Autonomous), Pune -411030 and Dr. A. B. Telang College, Nigadi, Pune 411038, India, for providing constant encouragement during present investigation.

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