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***Research Article** (Open Access)*

STUDY OF INDIGENOUS WAY TO COMBAT RAT PROBLEM IN PANCH PARGANA AREA OF JHARKHAND

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ABSTRACT
Rat has always been a problem for agricultural fields. Farmers of Jharkhand are always troubled by these rodents who damage grains in fields and also in their godown. In Jharkhand the two most common rodents affecting the rice crops are *Mus domesticus*sps. and *Bandicota bengalensis*. The cost of various chemicals to kill or repel rat is beyond the affordable limit of the poor tribal farmers in Jharkhand. Farmers of Panch-Pargana area of Jharkhand have indigenous practice to get rid of rats from their fields by the use of plants or plant parts. The aim of this communication is to study and disseminate the indigenous method of rat population management being practiced in the Panch-Pargana area.

***Keywords**: Plants, Rat population management, Jharkhand, Tribes*

INTRODUCTION

Panch Pargana area of Jharkhand is a blend of five regions and thus holds vivid cultural practices and traditional food habits. The five blocks which constitute the Panch Pargana area are Silli, Bundu, Sonahatu, Rahe and Tamar. The ethnic groups residing here are Mundas, Oraons, Santhals, Paharias and Kuarmies. Rice and millet are major staple food here. However, wheat and corn are also grown in some pockets now days. Rats are major problem to their agriculture field and to the stored grain stock. Tribes generally search the solutions of their problem in their own way within their area. They use some plants as rat poison to minimize the loss of grains both in field and house hold stock.

MATERIALS AND METHODS

Both intensive and extensive ethno botanical survey were carried out during the Year 2015-2018 in remote tribal dominated villages of Panch Pargana i.e. Norhi and Deori in Tamar Block; Taimara and Bundu in Bundu Block; Baghadih and Jamudag in Sonahatu Block; Silli in Silli Block; Domundih and Purnanagar in Rahe block information were recorded about the wild plants which are used in the management of rat problem **.** The data were collected through questionnaire and the responses of the respondents.

Identification of these plants specimens were done with Haines (1921-25), Ghosh (1971), Sarma and Sarkar (2002), Singh *et al*. (2001) and also by matching the herbaria at NBRI (LWG), Lucknow. Herbaria are deposited in the Department of Botany, P.P.K. College, Bundu.

RESULTS AND DISCUSSION

Enumeration

Tylophora fasciculata Buch.- Ham. ex Wight [Apocynaceae]

Parts used: Tuberous roots

The plant is locally called 'Bhuidari' in Oraon, 'Adbihir' in Mundari and 'Sondhaini' in Santhali.

Plant is sub erect having 30-90 centimeter height with numerous thick roots and generally grows on hilly slopes.

Roots are being pounded and then mixed with flour as bait for rats in the form of small pills. They are placed beyond the reach of children and pets.


Fig.1: *Tylophora fasciculata* – **Plant**


Fig. 2: *Tylophora fasciculata* - **Flower**


Fig.3: *Tylophora fasciculata* - **Root**


Fig.4: *Semecarpus anacardium* **Fruit & Seed**


Fig.5: *Strychnos nux-vomica* – **Fruit**

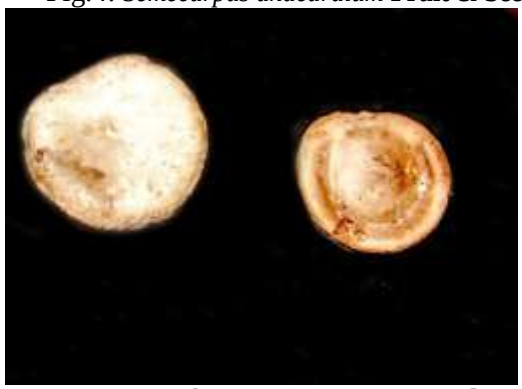
Fig.6: *Strychnos nux-vomica* – **Seed**


Fig.7: *Gliricidia sepium*- **Tree &Flower**


Fig.8: *Gliricidia sepium* – **Leaves**

Figure 9: Map of Jharkhand

Semecarpus anacardium L.f. [Anacardiaceae]
Parts used: Seed
The plant is locally called 'Kiro' in Oraon 'Soso daru' in Mundari and 'Bhelwa' in Santhali.The tree is abundant in the forest of almost all districts of Jharkhand.
Munda people use seed oil of this tree to eradicate rats form rice fields. The oil is spread on Sarjom leaves (*Shorea robusta* Roth) and these leaves are put around the 'bils'(rat holes) .
When rats come in contact with this oil they suffer from continuous itching resulted into wounds and then gradually die.
Strychnos nux-vomica L. [Loganiaceae]
Parts used: Seed
The tree is locally known as 'Kuichila' among all the tribes in Jharkhand.
It is a medium-sized (about12 meters high) deciduous tree that grows in open habitats generally of nearby villages.

Powdered seed is mixed with flour, sugar and mustard oil .This bait is used in the form of small pills generally in the night. Since it is extremely poisonous even to the big animals, the unused bait must be collected early morning before Sunrise.

Gliricidia sepium *(*Jacq.*)*Walp. [Fabaceae]

Parts used: Leaves

Gliricidia sepium is a small tree of family Fabaceae. It is exotic to Jharkhand and planted by the Forest department for its quick growing character and for other various uses like fodder and floral beauty. The folk here locally called it Meetha Karanj.

The grounded bark or leaves are mixed with corn or wheat before it is boiled. Whole mixture is left overnight to become ferment and then used as a rat poison. These fermented grains are spread on the movement routes of rats on alternate days for three days.

Discussion

Tylophora fasciculata is also used in the Southern Konkan as a poison for rats and other vermin (Watt 1893)**.** Both roots and leaves can be used in this area, but the leaves are more commonly employed, being pounded and then mixed with flour as bait.

Method of controlling the rat population by *Semecarpus anacardium* seed oil is unique and was earlier reported in Jharkhand by Kumari and Kumar (2007).

The use of the seeds of *Strychnos nux vomica* as a rat poison is rarely practiced in some villages. People are very cautious during its use because it make causalities to big animals and even children. The *Gliricidia sepium* is used with boiled and fermented grains for the rat poison. The boiling and fermentation of grains is a prerequisite for the rat poison to work (Hochman 1966). Hochman isolated a substance called 'coumarin' from the leaves of *Gliricidia*. This compound is itself not especially toxic but it is converted by bacteria into 'dicoumarol' which is chemically so similar to vitamin K that it mimics and interferes with the normal role of vitamin K in permitting the blood to clot. It is not an instant poison, but repeated doses result in fatal hemorrhages within a few days. Tariq *et al*. (2016) evaluated the toxicological effects of *Gliricidia sepium* leaf mixed with wheat flour and broken rice, against rice field rat.

However very few people of Panch Pargana area of Jharkhand are acquainted with this type of rodenticidal activity of this plant.

CONCLUSION

As rodents produce damage to a large extent to the crops as well as to the stocked grains, it becomes compulsion to kill them to some extent. In place of synthetic and chemical rodenticide these plants are easily available to the forest dwellers of Jharkhand. It has been observed that they prefer to use *Semecarpus anacardium* seed oil and root of *Tylophora fasciculata* because they suppose that the use of these plants are safer than the use of *Strychnos nux-vomica.* Since *Gliricidia sepium* is exotic plant, only a pocket of people near urban areas know about use of this plant. Figures of plants and plant parts used for these purposes are shown in PLATE -1.

REFERENCES

Ghosh TK (1971). *Studies on Flora of Ranchi District*. *Ph.D. Thesis*. Ranchi University, Ranchi-**I-II**.

Haines HH (1921-25). *The Botany of Bihar and Orissa*. BSI, Calcutta **I-IV**.

Hochman H (1966). Mechanism of rodenticidal activity of *Gliricidia sepium*. Final Technical Report, Naval Civil Engineering Lab. Port Hueneme California.

Kumari B and Kumar S (2007). An indigenous way of management of rat population by Bhelwa seed oil treatment in and around Silli, Jharkhand state ,India. *Biospectra* **2** (1) 185-186.

Sarma TK and Sarkar AK (2002). *Flora of Palamu district, Jharkhand*. Botanical Survey of India, Calcutta.

Singh NP, Mudgal V, Khanna KK, Srivatava SC, Sahoo AK, Bandopadhyay S, Aziz N, Das M, Bhattacharya RP and Hazra PK (2001). *Flora of Bihar* Analysis, Botanical Survey of India, Calcutta.

Tariq S A, Nazli R, Pervez A and Zafar H (2016). Evaliuation of bioefficacy of *Gliricidia sepium* (Jacq.)Steud. against rice field rat ,*Bandicota bengalensis* Gray & Hardwicke. *International Journal of Biology and Biotechnology* **13** (3) 399-406.

Ujváry A (2010). *Hayes' Handbook of Pesticide Toxicology* (Third Edition). Chapter 3 - Pest Control Agents from Natural Products. Academic Press : 119-229.

Watt George (1893). *A Dictionary of the Economic Products of India.* Cambridge University Press, **6** Part **4** 206.