



INDIGENOUS TRADITIONAL KNOWLEDGE (ITK) FROM THE FARMERS OF GONDIA DISTRICT REGARDING USE OF PLANTS AGAINST STORED GRAIN PESTS.

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ABSTRACT:

Botanicals have been used since time immemorial for protection of stored products against common pests. They acts as repellents, antifeedants, toxicants and behave as natural grain protectants by behaving as chemosterilants/reproduction inhibitors or insect growth and development inhibitors. Identification and utilization of folk indigenous knowledge regarding use of different parts of plants for the protection of stored grain from the elderly people of rural and tribal belts helps in bridging the gap between the current scientific and age-old practices. It can be a useful component of an IPM strategy for stored grain pest management. Hence, surveys of particular regions are of utmost importance in exploring new avenues for research in this field. In this paper, some of the identified important indigenous storage practices adopted by the people of the area have been described. Documentation of the information was done by questionnaire method.

Key words: - Indigenous technologies, Storage pests

INTRODUCTION:

Botanical insecticides have long been touted as to synthetic chemical insecticides for pest management. Chemicals being harmful to the environment, human beings and animals have created many complex environmental problems. Due to tremendous environmental hazards and residual effects of chemicals, an urgent need of searching alternative in plant and plant products has been emphasized. The scientific literature documenting bioactivity of different plant parts and their derivatives are in ample, yet only a handful of botanicals are currently used as grain protectants. Ethano-botanical knowledge of local communities helps to explore new horizons which can be useful for the coming generations to be benefitted. Hence, the present study was carried out with an objective to document the common botanicals used by farmers of Gondia district as grain protectants.

MATERIAL AND METHODS:-

The present study was conducted throughout the year in and around Gondia City of Maharashtra State of India. Information about the prevalent stored product pest management strategies was

collected from farmers through direct interviews and questionnaire methods.

RESULT AND DISCUSSION

Since ancient times, a lot of efforts have been made to protect harvest production against the pests. In many parts of world, locally available plants are currently in use to protect stored products against damage caused by insect infestation (Hassanalli and Lwande, 1989; Tripathi *et al.*, 2009; Khater, 2012). Numerous studies have documented the use of indigenous local herbs and plant materials used worldwide (Cox *et al.*, 1998; Rauha *et al.*, 2000; Ahmad *et al.*, 2001; Penna *et al.*, 2001). Many of these plants are widely used by local communities in traditional medicine for the treatment of several ailments. Leaves, twigs and flowers have been admixed as protectant in different parts of world, particularly India, China and Africa (Golob *et al.*, 1999). The practical advantage of using locally available material to protect stored products destined for household and small scale use remains compelling (Weaver and Subramanyam, 2000). The advantages of insecticide admixture treatments are that they are generally easy to prepare, inexpensive and a single application is

effective, correctly formulated, give control of existing insect infestation.

Over 450 botanical derivatives are used in traditional agricultural systems in India. The effectiveness of many local plant derivatives against insect pests have been reviewed earlier (Jacobson, 1958, 1975, 1990). The insect repellent and antifeedant properties of Nishinda (*Vitex negundo*), Biskatali (*Polygonum serrulatum*), Tobacco (*Nicotiana tabacum*), Neem (*Azadirachta indica*), Turmeric (*Curcuma longa*), Castor (*Ricinus communis*), Royna (*Aphanamix polystachya*) have been reported against stored product pests viz. *Tribolium castaneum* (Jilani and Malik, 1973; Qadri, 1973; Jilani *et al.*, 1988; Parveen and Mondal, 1992). , *Rhizopertha dominica* (Pereira and Wohlgenuth, 1982), *Sitophilus oryzae* (Khanam *et al.*, 1991) and *Sitotroga cerealella* (Abraham *et al.*, 1973). Subsequently a number of workers have also done work with the repellency test of neem seed kernel and extracts of neem against different insect pests (Nakanishi, 1975; Radwanski, 1977a; Jacobson *et al.*, 1978).

Present studies show that the farmers of this region have been using plant and plant products for biological control of stored grain pests. The plants used belong to 21 families and 24 genera. (Table). Different plants used as grain protectants in Gondia district are enlisted as under.

Most of the plants used as grain protectants have been found to have medicinal properties. The rhizomes of sweet flag (*Acorus calamus*) are used for numerous medicinal purposes. The herb is used both internally as well as externally. In rheumatism, rheumatic fever and in inflamed joints, the paste applied externally alleviates the pain and swelling. Internally sweet flag is valuable in a vast range of diseases. It is effective for digestive ailments such as flatulence, loss of appetite, abdominal dull pain and worms. The powder of sweet flag given with lukewarm salt-water, induces vomiting and relieves phlegm, while easing coughs and asthma. In epilepsy, the powders of sweet flag, Brahmi and jatamansi work well, when given with honey. The popular Ayurvedic formulation Sarasvata Choorna, which contains sweet flag, is commonly used to treat epilepsy, hysteria and as a brain tonic. Granule Asabi (Unani preparation) is an excellent nervine tonic which improves memory, reception as well as the speech. As it stimulates the uterine contractions, so it is used to augment the labour pains. It is also salutary in dysmenorrhoeal. (Chaturvedi, A. and Diwanji, B.B. 1995)

The leaves of *Annona reticulate*, *Arachis hypoglea* and *Azadirachta indica* is used for the treatment of high blood pressure, fever, stomach upset and Malaria respectively. *Moringa oleifera* Leaves are used for the treatment of Asthma, arthritis, rheumatism, and Ulcer, *Cymbopogon citrus* Lemon Grass Leaves are Antipyretic and used for cold, stomach ache. (Akande ,2018). Int. J. Innovative Biosciences Res. 6 (1):20-27, 2018.

The essential oil of the leaves called tejpat oil is medicinally used as carminative, anti-flatulent, diuretic, and in cardiac disorders. It is also used in pharma-ceutical preparations because of its hypoglycemic, stimulant and carminative properties. Owing to its high medicinal value and being an important ingredient of the spices, (Sharma & Nautiyal, 2011).

Curcuma longa has been commonly used as a traditional remedy for a variety of symptoms such as inflammation, gastritis and gastric ulcer. One study showed that an ethanol extract from *C. longa* specifically inhibits gastric acid secretion by blocking H(2) histamine receptors in a competitive manner (Kim 2005).

Linum usitatissimum, commonly known as Flaxseed has traditionally been used for the management of diarrhea and gastrointestinal infections. Pharmacological basis for the medicinal use of *Linum usitatissimum* (Flaxseed) in infectious and non-infectious diarrhea. (Palla *et al.*, 2015).

CONCLUSION:

Storage of grains and seeds without pest infestation is essential. Since the plants found in this study are medicinal, they are quite safe for human consumption and thus can be included in stored grain pest control strategy. However, further work aimed at isolation of the specific compounds acting against the insects and nature of the effects of the compounds at the cellular level is recommended.

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Botanical name	Vernacular name	Family	Plant part used	Application
<i>Acorus</i>	Sweet flag	Acoraceae	Rhizome	Dried rhizomes are placed with cereals and pulses to protect from Cowpea bruchid, the Rice weevil, The Khapra beetle and some other storage pests.
<i>Acacia</i>	Babul	Mimosaceae	Ashes of twigs	Used to protect sorghum, paddy and pulses
<i>Aegle marmelos</i>	Bael	Rutaceae	Leaves	Dried leaves are layered with pulses and paddy
<i>Annona reticulata</i>	Custard apple	Annonaceae	Leaf	Used to mix with and cover sorghum.
<i>Arachis hypogea</i>	Groundnut	Leguminaceae	Seeds	Oil found effective against infestation in beans.
<i>Azadirachta indica</i>	Neem	Meliaceae	Leaves	Used to protect Sorghum, Paddy and pulses
<i>Brassica sps.</i>	Sarsoon	Brassicaceae	Seeds	Oil is found effective against infestation in cereals.
<i>Cinnamomum tamala</i>	Indian Cassia (Tejpat)	Lauraceae	Leaves	The whole leaves of this plant are layered between the beans and the rice.
<i>Curcuma longa</i>	Haldi	Zingiberaceae	Rhizome	Powder is used as repellent.
<i>Cymbopogon citrates</i>	Lemon grass	Poaceae	Leaves	Used as repellent
<i>Glycine max</i>	Soyabean	Papilionaceae	Seeds	5 ml of oil is effective against infestation in beans.
<i>Gossypium sps.</i>	Cotton	Malvaceae	Seeds	oil is used against infestation in pulses
<i>Hyptis sps.</i>	Ran tulsi	Labiatae/Lamiaceae	Leaves	Dried leaves protect stored millets.
<i>Linum usitatissimum</i>	Linseed	Linaceae	Seeds	Oil is effective against infestation in cereals.
<i>Madhuca indica</i>	Mahua (Mahogany)	Capotaceae	Leaves	Thick layers are admixed with millet in earthen ware pots.
<i>Mangifera indica</i>	Mango	Anacardiaceae	Bark	Used to protect sorghum, paddy and pulses
<i>Murraya koenigii</i>	Curry patta	Rutaceae	Leaves	The whole leaves of this plant are layered between the cereals and the pulses.
<i>Ocimum sps.</i>	Tulsi	Lamiaceae	Leaves	Used as repellent against stored grain pest.
<i>Ricinus communis</i>	Castor	Euphorbiaceae	Seeds	Oil is effective against infestation in beans and cereals.
<i>Sesamium indicum</i>	Til	Pedaliaceae	Seeds	Oil is effective against infestation in beans and cereals.
<i>Syzygium aromaticum</i>	Clove	Myrtaceae	Buds	Used as repellent against stored grain pest.
<i>Tamarind sps.</i>	Tamarind	Caesalpinaceae	Leaves	Used to protect sorghum, paddy and pulses.
<i>Trigonella sps.</i>	Fenugreek (Methi)	Papilionaceae	Seeds	Mixed with grains.