

REVIEW ON JAYAPALA (CROTON TIGLIUM)

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Article Received on 11/09/2023

Article Revised on 01/10/2023

Article Accepted on 21/10/2023

INTRODUCTION

„Visha“ (poisonous substance) is that which causes „Visannatva“ (distress) and/or visada (sadness) in the body. Thus Visha has been defined as substance which prove destructive to life and which possess Vyavayi (absorbed quickly), Vikasi, Ushna (hot potency), Tikshna (penetrating), Ruksha (dryness), Sukshma (can pass through sukshma srotas), Asukari (acts quickly), Anirdesya rasa (indistinct taste) and Apaki (not properly digested) properties. These poisonous/toxic plants are categorized as viṣa (poison) and upaviṣa (toxic but not lethal for human health) in Ayurvedic texts and also listed in the schedule-E of Drugs and Cosmetics Act 1940. Jayapala (Croton tiglium) is one among the upavishas and a well-known plant in Indian System of Medicine. The drugs which possess these properties are called Visas and those which are considered less toxic in comparison with the Mahavishas^[2] are called Upavishas.

According to mythology Visha (poisonous substances) and Amrutha (ambrosia) arose during the Ksheera Sagara Madhana (churning of milky ocean) suggesting the paradoxical nature of Visha and Amrutha. The concept of poison is broad and etiologically varied. Charaka identified the necessity of complete knowledge of herbs and their utility in therapeutics. Charaka opined that “Even an acute poison can become an excellent drug if it is properly administered”.^[3] On the other hand, even a drug if not properly administered become an acute poison. A few factors which decided Visha as medicine

- Dosage
- Time of administration
- Duration of treatment
- Type of formulation
- Skill of individual physician

Upavisha

Are the group of drugs which were less toxic in nature but produce certain toxic symptoms on consumption or administration. The symptoms produced in the body by Upavishas are less toxic, less severe, usually not life threatening and their toxicity can be controlled by therapeutic measures.

Vishas are classified as

„Rasarnava“ appears to be the first text to mention „Visha - Upavisha“ classification. After Rasarnava, Rasa Ratnakara, Rasendra Choodamani, and Rasaratna Samuchayam have mentioned about five Vishas while

other texts like Rasendra Chintamani, Sarngadhara Samhita, Bhava Prakasa and Ayurveda Prakasa have enumerated nine dravyas as Vishas Upavishas as per different Acharyas.

Importance of Sodhana of upavisha dravyas

The poisonous plants reported in ancient scriptures of Ayurveda are being still practised widely in a number of disease after proper Sodhana (purificatory procedures). The concept of Sodhana was mentioned for the first time in Charaka Samhita in the context of „Danti dravanti kalpadhyaya“. To reduce the „Vikashi (quick absorption) property of Danti root, Charakacharya mentioned it as „Samskara“.

Acharya Vagbhata also mentioned Sodhana of plant drugs in detail in the context of Bhallataka rasayana. The concept of Sodhana in Ayurveda is not only a process of purification/detoxication but also a purificatory procedure to enhance the potency and efficacy of the drug. It is reported that Aconite (Vatsanabha) purified by cow's urine is converted to cardiac stimulant, whereas Aconite is cardiac depressant. It is clearly mentioned in „Bhavaprakasha“ that the bad / toxic effects attributed to „Asodhita Vishas“ (no purified) are minimised when these are used after being subjected to Sodhana process. Hence Visha should be subjected for Sodhana before being used in therapeutics. Various Sodhana are mentioned for Upavishas.

1. Gomutra Nimajjana (soaking in cow's urine) for a prescribed period
2. Swedana (boiling) in various medium such as cow's milk, goat's milk, cow's urine, vegetable extractives, kanjika etc.
3. Bharjana (frying) with ghee or without ghee.
4. Nisheshana (reducing the oily content)
5. Kshalana (washing) with hot water.

Among the above procedures the treatment with cow's urine and boiling in cow's milk are the most common procedures applied for almost all the „Visopavisha“ drugs.

Ayurveda Prakasha - a classical Ayurvedic text book mentions Samanya Sodhana of Visha Dravyas.

Jaypal Croton tiglium

Croton tiglium, known as purging croton or jayapala. The upavisha Jayapala which belong to Euphorbiaceae family commonly known as Croton tiglium is one of the known purgative drugs in ayurveda with huge therapeutic values. In Ayurveda upavishas are those groups of drugs whose toxicity is less in nature and which are not so lethal but produce certain toxic symptoms on consumption or administration which can be controlled by the therapeutic measures.

Taxonomy

Kingdom - Plantae

Clade - angiosperm

Order – malpighiales

Family - Euphorbiaceae

Genus - Croton

Species - C. tiglium

Distribution

Croton plant grows all over India, especially in the waste lands of North India, grown in many varieties for their brightly coloured foliage. Morphology The plant is a small evergreen tree of almost 4.5-6m in height with ash coloured smooth bark and young shoots sprinkled with stellate hairs. Leaves are oblong to ovate- lanceolate, obtuse or rounded at the two glanded base, acuminate membranous, yellowish green in color and minutely toothed. Flowers are small, unisexual, males on slender pedicels, females larger on short thick pedicels. Fruits are ovoid or oblong, 3 gonous capsules, seeds are smooth, testa is black, enclosing reddish brown oily endosperm. Parts Used The plant parts used for medicinal purpose are seeds and seed oil.

Pharmacological Properties

The seeds and oil of jayapala with acrid, bitter taste has thermogenic, emollient, drastic purgative, digestive carminative, anthelmintic, antiinflammatory, vermifuge, detergent, diaphoretic, expectorant, vesicant irritant and rubifacient. They are also useful in abdominal disorders, convulsions, ophthalmia, cough, catarrh. It has various activities like molluscidal activity, tumor- enhancing

activity, larvicidal activity, gastrointestinal activity, anticonvulsant activity, antimicrobial activity, antidermatophytic activity and antioxidant activity. Traditional Uses It is most powerful laxative, which have stimulative action on bowel movement causing severe cramps during defecation and loose stools.

Modern Scientific Use

Antitumor Activity. Phorbol esters present in Croton tiglium are well known potent tumor promoting agent. according to Kim et al. (1993) isoguanosine has considerable activity against various cell lines both in vitro and in vivo tests especially against solid tumor and ascetic tumor.

Gastrointestinal activity

Croton tiglium oil increase or decrease gastrointestinal motility by affecting contractile frequency and amplitude of intestinal smooth muscle depending on the dose of oil.

Analgesic activity

From ancient era Croton tiglium was used as traditional medicine due to its analgesic effect. A recent study proves that leaves of Croton tiglium contain crotonine and pyragine, which is derivative of crotonine which is main integer of analgesic property.

Antinociceptive effect

A study on mice, for antinociceptive effect of Croton tiglium, showed good antinociceptive effect of Croton tiglium.

Anti-HIV activity

Scientists have tried to develop anti HIV agents from natural sources. It was apparent that the methanol and water extracts of the seeds of Croton tiglium significantly inhibited the infectivity and HIV-1-induced cytopathic effect (CPE) on MT4 cell. Croton tiglium seeds contain anti-HIV-1 phorbolsters, 12-Oacetylphorbol -13- decanoate and 12-Odecadienoylphorbol-13-(2-methyl butyrate) that inhibit the cytopathic effect of HIV-1 on MT-4 cells; TPA (12Otetradecanoyl phorbol-13-acetate) is even more active than the mentioned phorbol esters against HIV-1.

CONCLUSION

In ayurvedic classical references there are many medicinal herbs indicated in different diseases. Upavisha like Jayapala is the one used with medicinal combinations to prepare formulations. Natural products identified from traditional medicinal plants have always paved the way for development of new types of therapeutics. Croton tiglium has been used to treat various diseases for more than hundreds of years. As the seed oil is purgative. When taken internally or applied externally to the skin, it produces severe symptoms of toxicity. As the seeds are having poisonous properties it should be used carefully after proper shodhana mentioned in various Ayurvedic text. As per the concept of Ayurveda, “even a strong poison can be converted to

an excellent medicine if processed and administrated properly. On the other hand, even the most useful medicine may become a poison if handled incorrectly.” Sódhana processes as per Indian system of medicine in the development of herbal formulations with application of modern technology to assess its safety and efficacy. Studies have shown that the toxic constituents are transferred into media rendering the drug nontoxic. Specific media has definitely an important role in making a drug act without causing side effects/adverse effects.

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