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Exploration of Indian Medicinal Plant i.e, *Uraria Picta* in term of their extraction and processing for pharmacological and toxicological studies

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Abstract: *Uraria picta* is a woody herb found throughout Asia, Africa and Australia. It has been long known to possess significant ethno-medicinal value. It is a key ingredient of more than a hundred Ayurvedic formulations and an important component of many patents in countries like India, China, Japan and USA. *U. picta* is commercially important and in high demand in India and Western African countries. As a consequence, *U.picta* has now been classified as a rare, bioactive and threatened species in India. Biochemical analysis of different plant parts of *U. picta* and its tissue culture has shown that it is a valuable source of several bioactive phytochemicals. In this work, relevant details on ethnobotany, bioactive compounds, pharmacology, toxicology, tissue culture and commercial applicability.The plant possesses several medicinal properties viz., anticancer, anti-inflammatory, anti-diabetic, antimicrobial, etc.
Keywords–ethno-medicinal , phyto-chemicals,bioactive, investigation, endangered.

Introduction

Geographical Distribution: *Uraria Picta* is widely distributed throughout India .It is commonly found in dry grasslands, growing densely and producing poorly viable seeds and it also extend upto Tarai Region of the Himalayas .Apart from India it can also be found in various parts of Asia including China, Japan, Bangladesh, Pakistan, Bhutan and Nepal. The plant is also found in regions of Africa like Nigeria, Egypt, Ethiopia, Congo, South Africa, Queensland Australia and in Philippines, Malaysia.

Uraria Picta (Syn.doodia Picta, family- Leguminasae) is commonly called prishnaparni or pithvan plant. It is also found throughout India and almost all place in Madhya Pradesh and Uttar Pradesh, Uttarakhand , New Delhi, Jammu and Kashmir, Andhra Pradesh, Kerala and this Bundelkhand comprises, Agra, Jhansi, Lucknow, (All in Uttar Pradesh). The study sitewise regularly visited to collect the plant sample. The whole plant *Uraria Picta* samples were collected from the natural habitate plant sample were identified by using the available literature.

Various therapeutic values and traditional uses of *Uraria Picta:* It is an interdisciplinary science that connects knowledge of biology,chemistry, physics,engineering and material science. Remarkable advance are made in the field of biotechnology and nanotechnology to harness the benefit of life science, health care and industrial biotechnology. It also have extensively been achieved for the treatment of cancer diabetes allergy, infection, inflammation.

Almost all parts of the *U. picta* have therapeutic value and used for treating fatigue, oral sores and several gynecological disorders in Indian system of medicine (Yadav et al., 2009; Bhattacharya and Datta, 2010; Kale et al., 2012; Saxena et al., 2016). It has also been reported as an antidote to snake *Echis carinatus* and in fracture healing It has antiseptic, antimicrobial, acaricidal, antiulcerogenic, anti-hypodyanamic and anti-pulmonary hypertensive properties and exhibited partial vasorelaxing effect (Yadav et al., 2009; Pathak et al., 2005).

Besides use in the traditional system of medicines, it is highly exploited by the drug and pharmaceutical industries for preparation of various formulations. The quality and efficacy of herb depend on their biologically active compound rhoifolin (Apigenin-7-o-neohesperidoside) which is used as a chemical marker and the rhoifolin content considerably influenced by the environment, genotype, season, etc. (Saxena et al., 2016). Saxena et al. (2016), reported that the rhoifolin content varied from 0.039 % to 0.195 % among the aerial part of samples collected from eight places belonging to seven agro-climatic regions of the Madhya Pradesh. The highest content was found in aerial parts collected from Pandado, Sehore (0.25 %)

followed by Kapoornala, Chhindwara (0.167 %) and Pamakhedi, Khandwa (0.152 %) and lowest content in plant sample from Navali, Mandsaur (0.039 %). Prishniparni herb sold in market @ Rs. 1,500–2000/kg with frequent adulteration and substitution of Desmodium gangeticum. Due to high demand and indiscriminate collections from wild, the natural population of this plant is depleting day-by-day and has become rare and critically endangered species (Anand et al.,1998) and enlisted in threatened species in the red list of IUCN (Groom, 2012). WHO and modern pharmacopeia are also giving strong emphasis on quality and efficacy of medicinal plants concerning their biologically active ingredients (Saxena et al., 2016).

Uraria picta. (Prishnaparni) is one of the most important medicinal plants used in different traditional systems of medicines including the Ayurveda and Traditional Chinese medicine. The major use of this plant was found in the most popular Ayurvedic formulation “Dashmula” and in several many other important Ayurvedic formulations. IUCN placed this woody herb in the least concern category as per version 3.1. It has extensive therapeutic uses and pharmacological activities. Though this plant is a source of many phytochemicals, the uses are uncertain because the raw plant parts or crude extracts are being used in all formulations. Therefore, extensive investigations are necessary to focus on the identification of these phytochemicals. It is an urgent need to give special attention to collecting various aspects and more efforts are required in all areas for utilization and conservation of this valuable medicinal herb. Herein, a compilation of all information with various aspects has been presented, including the authors published work on *Uraria picta*. This review pursues attention towards biological activity, phytochemical profile, utilization, propagation and conservation of *Uraria picta.*

Traditionaly various species of *Uraria Picta* are used by the in habitat of Indian country for the treatment of variety of including asthma, cough, fever, cancer, renal diseases. Several pharmacological attributes of *Uraria Picta* species such as anti oxidant , anti viral, anti bacterial , anti tumor have already been provided.In the recent years , plenty of research has been conducted to explore the phytochemical composition and pharmacological activities crude extract and isolated compounds obtained from different parts of *Uraria Picta.*

Botanical Description: *Uraria picta* is annual herb, stem woody at maturity, and it covered with scarce modified fine, short, straight and hooked hairs. Plant body is erect, height ranging from 0.5 to 2.0 m. Leaves are dimorphic, young leaves are simple and at maturity they are odd-pinnately compound covered with the hairs as present of stem (Figure 1). Inflorescence is of raceme type. Racemes are terminal and elongated upto 1.5 feet. The flowers are small, present in large number (35-75) on dense spike (figure 1). The inflorescence axis is pink, purple or pale lead in colour. Flowers are purple, pink or bluish in colour. Flowers are bracteate, bracts persistent at the base and apex. Calyx is four mm long; teeth plumose much longer than the short tube. Corolla papilionaceous, sepals are 4-5 mm long.Pods are segmented with 3-6 segments, each 2-3 mm broad and 5-9 mm long, smooth, polished, folded on one another (Bhattacharya & Datta, 2010). Pods contain 2-6 seed and segments are nearly separated (Waghire et al.,2011).

Figure 1

Material and Methodology: The prepared extract of *Uraria Picta* was used to detect the presence of various compounds in the aerial part of plant to confirm the presence of nanoparticle. The available information about the traditional uses phytochemical and pharmacological properties of Uraria Picta was searched through web of science , google, scholar science direct and springer using english as the search language. The keywords use are *Uraria Picta* prishnaparnia traditional use, phytochemistry, bioactive substance, pharmacological activities, toxicological and other related words investigation the essential oils from 25 species of medicinal plant were tested as mycelia growth inhibitors six important pathogenic and toxinogenic fungal species (Zabka et.al.2009).

Recently develop techniques like UV, IR, NMR and ,mass spectroscopy can be used for spectral analysis and structural elucidation of the isolated biodynamic constituets.Common separation techniques like thin layer chromatography, column chromatography can be used and important biophysical technique that enable the separation, identification, purification of the components of a mixture for qualitative and quantitative analysis.

Quantitative analysis accounts for the quantity or the concentration of the phyto-chemical present in the plant sample. It’s a part of the analytical chemistry, in which quantitative analysis help in the determination of the absolute or relative abundance (often expressed as a concentration) of one, several or all particular substance present in the sample. Column chromatography is a preparative technique used to purify compounds depending on their polarity. In column chromatography, a mixture of molecules is seprated based on their differentials partitioning between a mobile phase and a stationary phase (Dhanalakshmi et.al. 2023).

Morphological Characteristics : *Uraria Picta* is a straight free between one and two meter tall. At the bottom are

wooden stems. The leaves are composed of 2-6 leaves and pinnate pares. In the vegetation phase, in the pare of leaves appear without the final sugar and honey, powdered route prishnaparni with meat soup for promotion adhesion fractured bone.

Photochemistry, Pharmacology, Toxicology : The plant is said to contain alkaloids steroids, terpenoids, phenols and all the which are components of plants the tannis were not in the stem and root the glycosides in the internal organs were in the roots(26). Recently flavanoid (Apigenin 7- o-neohesperido side) has been isolated from this plant (10).Pharmacological activities like antioxidant , anti-diabetic, anti-inflammatory, anti-arthritis , antimicrobial, antifungal, anticancer.

A cute toxicity studies on different extract of *Uraria Picta* were conducted using albino mouse and rat models. Three different seed extract i.e. petroleum ether, ethyl acetate and alcoholic did not provoke any of toxicities during the first 24 hours and no mortality in any of the test groups was observed (Jalalpure at.al.2013)

Conclusion: This study t is based on the comprehensive study conducted on *U. picta,* which summarizes the botany, geographical distribution, propagation, phytochemical constituents and pharmacological properties of plant. This shows that the plant treasures a great medicinal wealth as each part of the plant reportedly has various phytochemical constituents having their respective pharmacological properties. These pharmacological properties are providing the evidence to various ethno-medicinal uses of the plant which have been in practice in many continents for centuries. Hence the whole plant plays an important area of research and developmental properties for pharmacologists and researchers. Due to its high therapeutic use and growing need, the plant is becoming rare and endangered; therefore it is necessary to create awareness of this plant to support its propagation in large numbers.

The development of modern drugs from less toxic plant products with proven medicinal properties is now being supported globally. There is no doubt that the products of this plant consecrate bright prospects as a reliable cure for various ailments.

The study of nanoparticle and flavenoid constituents and their antimicrobial properties may be an important substitution for various important drugs. *Uraria Picta* as an excellent medicinal plant with traditional bioactive ingredients such as antioxidant , anti-diabetic, anti-inflammatory, anti-arthritis , antimicrobial, antifungal, anticancer. The reported pharmacological studies indicated that this plant.These synthesis methods may be require the use of different raw material and yield reaction by using toxic products or wastes. This formulation also known as green chemistry, an environmental- friendly approach has become a new option in chemistry.

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