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Ethnomedicinal study of *Schleichera oleosa* among the tribals of Satna (M.P.)

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Abstract
Schleichera oleosa (Kusum) is well known tree of medicinal importance in India. All parts of *Kusum* are used in Indian Traditional Healing. The Traditional Healers use *Kusum* in simple as well as complex herbal formulations. *Kusum* based Herbal Formulations are popular among the Healers of present generation. *Schleichera oleosa*, belonging to the Sapindaceae family, has been reported to possess antimicrobial, antioxidant, anticancer activity, and can be used for the production of biodiesel. The plant contains low tannin levels therefore it can be used as fodder for livestock. This species contains important phytochemicals such as terpenoids, betulin, betulinic acid etc. The literature reveals that this medicinal plant can be used as an alternative to synthetic compounds for use in preventing and treating several diseases. Considering the medicinal and environmental uses of this plant, this review is an effort to summarize nearly all the information reported on its various activities.

Keywords: rheumatism, column chromatography, livestock

1. Introduction
Satna forest division is situated between the longitude 80°3" and 82°20'32" east and latitudes 23°60'0" and 25°11'37" north, just north of tropics of in northern hemisphere well within the landmass and remote from the sea. Tribes of Satna have preserved very remarkably their distinct way of life in small isolated communities and the main tribes are the Gonds, Baigas, Ahir, Kols, Khairwar, Panika and Mawasi.

Some tribes are adhering to traditional way of life, native culture and customs, the tribal have vast store of information and knowledge on potentially useful medicinal plants. The traditional knowledge system in India is fast eroding due to steady decline in human expertise capable of recognizing various medicinal plants (Palanuvej, 2008) [1]. The value of medicinal plants to the mankind is very well proven. It is estimated that 70 to 80% of the world population rely chiefly on traditional health care system and largely on herbal medicines.

Only 15% of pharmaceutical drugs are consumed in developing countries. The affluent people have little alternative to herbal medicine, and they depend on traditional health care system. This tree can grow up to 45 feet although some are even taller and they grow around the foothills of the Himalayas and are native to Pakistan, Nepal, Bangladesh, India, Thailand and its islands and Sri-Lanka and has naturalized on the Indonesian islands particularly on Bali and Java (Iwasa, 1997) [2]. It is a member of the *Sapindaceae* family so is a relative of the soap nut tree (*reetha*), *lychee* and *rambutan* trees, the hopbush (*Dodonaea viscosa*), and many others. Like the *dhak* tree, or Flame of the Forest tree, it plays host to the lac insect which secretes resin on its bark to protect itself and its offspring, and which is used in varnishes and also has other industrial uses. It is now being considered as a source of biofuel, and has long been used as fodder for cattle (Rout, *et al*. 2009) [3]. They are fed its leaves and the seed cake which remains after the seeds have had their oil extracted from them. This oil is known as Macassar oil and another name for this tree is the Macassar oil tree. This oil is used in hairdressing and to promote hair growth. The oil can also be used for cooking and lighting, and is used medicinally in traditional medicine systems for skin problems such as acne, itching, and burns. It is used as massage oil to relieve the pain of rheumatism. The powdered seeds are used on the wounds and ulcers of cattle to get rid of maggots in them. The oil contains oleic, stearic, gadoleic and arachidic acid and the cyanogenic compounds

have to be removed for human consumption. The bark of the tree has astringent properties and is used in decoctions and infusions for inflamed skin and ulcers, and to protect against malaria (Mahaptma and Shoo, 2008 and Ghosh, *et al*. 2011) [4-5]. The bark also yields dye and tannin used in the leather industry. It also contains an analgesic compound, lupeol and betulin and betulic acid, both of which are believed to have anti-cancer properties. The heartwood of the tree is used for agricultural implements, cartwheels and spokes, in heavy construction work, for boat building, oil presses, ploughs and has a variety of other uses. It is said that the shellac obtained from the lac insects on this tree is superior to other yields on other trees. Plant used for Astringent (bark); anti-inflammatory and stimulates the growth of hair (kernel oil); stimulates the central nervous system (aerial part). The oil contains oleic acid (2-3%), Stearic acid (2-6%), Gadoleic acid and arachidic acid as well as cyanogenic compounds, which must be removed for human consumption. *Kusum* oil is unusual, with just 37% of common glycerol esters. The oil also contains Linoleic acid (43-50%), Palmitic acid (5-8%), and hydrocyanic acid, which is poisonous and must also be removed prior to consumption. The oil is yellowish brown, semi-solid, with the faint odour of bitter almond. When allowed to settle, a light coloured solid fat separates. *Kusum* oil contains a cyanogenic compound in concentration of 0.03-0.05% as HCN. But the exact location of the cyanogenic compound in the oil or its nature has not been reported. The stem bark is used for menstrual problems and taken in an infusion (Kawamori, *et al.* 1999 and Choi, *et al.* 2001) [6-7]. The extracts from the tree bark have antioxidant properties and may help in our fight against certain cancers, although research is still ongoing. The triterpenoids which have been extracted from the bark have been shown in one study undertaken by "Triterpenoids from *Schleichera oleosa* of Darjeeling foothills and their microbial activity" showed antimicrobial, antifungal and antibacterial activities (Bhaumik, *et al.* 1999 and Sakagami, *et al.* 2000) [8-9].

2. Antiulcer activity

A localised loss of gastric as well as duodenal mucosa leads to the formation of peptic ulcer. It arises when the normal mucosal defensive factors such as mucus, mucosal blood flow, formation of HCO and PGE 2 are impaired or over powered. Also by the aggressive factors includes acid, pepsin, NSAIDS and helicobacter pylori. A number of drugs are available for the treatment of peptic ulcer but its clinical evaluation shows the incidence of relapses, side effects and drug interactions. This has been the rational for the development of new antiulcer drugs and search for novel molecules. Plants have been an invaluable source of therapeutic agents to treat the various disorders including peptic ulcer disease. A new molecule from folklore (Thind, *et al*. 2010) [10]. Medicinal plant possessing fewer side effect and safer approach for the treatment of peptic ulcer is the object of the present study. Ethanolic extract of *Schleichera oleosa* showed considerable antioxidant activity by DPPH, Hydrogen peroxide and Nitric oxide methods, when compared with the standard ascorbic acid. Hence it may be concluded that, it can be used as natural antioxidant (Forman and Torres, 2002 and Dizdaroglu, *et al.* 2002) [11-12].

3. Anticancer activity

Cancer is a term used for a disease in which abnormal cells tend to proliferate in an uncontrolled way and, in some cases metastasize. Extensive research has been done in order to find therapeutic drug for the treatment of cancer. Plant based products have been frequently examined as potential anticancer agents. The screening of various medicinal plants results in the isolation of bioactive compounds which have been reported as effective chemopreventive as well as chemo therapeutic agents. This study provides a step toward the exploration of *S. oleosa* as a chemo preventive agent against cancer. Some reports provide evidence supporting the involvement of antioxidants in the prevention of carcinogenesis. The phytochemicals induce toxicity in tumor cells either by scavenging constitutive reactive oxygen species or by generating paradoxically additional amount of free radicals resulting in the imbalance of cellular oxidative status, leading to inhibition of cell proliferation and eventually cell death (Cozzi, *et al.* 2003 and Harsh, *et al.* 2013) [13-14].

4. Antioxidant activity

Oxygen is used for generating metabolic energy in our body but it also produces reactive oxygen species as by product during its various reactions in the body (Mukhopadhyay and Maiti, 2010) [15] Reactive oxygen species are usually atoms or a group of atoms having odd (unpaired) electrons, in aerobic cells these are produced during mitochondrial electron transport and several oxidation reactions Hydroxyl radical which was used to determine radical scavenging potential of extracts, was generated by Fenton's reaction, in site-specific and non-site-specific deoxyribose degradation assays. The extracts showed radical scavenging potential following the order of inhibition at 100 mg/mL as ethyl acetate extract (67.72%) > water extract (65.68%) > methanol extract (64.32%) in site-specific assay and as methanol extract (83.38%) > ethyl acetate extract (81.21%) > water extract (72.45%) in non-site-specific assay (Das and Maiti, 2008 and Chaturvedi, *et al.* 2012) [16-17]. Antioxidants are molecules which can safely interact with free radicals and terminate the chain reaction before vital molecules get damaged. The free radical damage can be prevented by several enzymes and the principal antioxidants such as vitamin E, beta-carotene, and vitamin C, present in the defense system of our body. Several studies have shown that plant phenolics also have antioxidant properties (Porra, *et al.* 1989 and McLeod, 1974) [18-19].

5. Antimicrobial activities

In a recent study, two triterpenoids, namely taraxerone and tricadenic acid A were isolated from the outer bark and preliminary study on their antimicrobial activities were done against five different fungal pathogens namely *Colletotrichum camelliae*, *Fusarium equiseti*, *Alternaria alternata*, *Curvularia eragrostidis*, Colletotrichum (Singleton, 1981 and Mitalaya, *et al.* 2003) [20-21].

Gloeosporioides by *in vitro* antifungal assay and against four bacterial pathogens. It was found that both taraxerone and tricardenic acid A had prominent activities against the fungal and bacterial pathogens. On a comparative basis, it was noted that taraxerone showed better results than tricardenic acid A on all microorganisms (Newman and Cragg, 2007) [22].

6. Conclusion

This review collectively shows the various pharmacological activities of *S. oleosa*. It has potential of anticancer,

antioxidant and antimicrobial activities Traditional medicines are used by about 60 percent of the world's population. These are not only used for primary health care just in rural areas, in developing countries, but also in developed countries, where modern medicines are predominantly used. There are about 45,000 plant species in India, with high concentration in the region of Eastern Himalayas, Western Ghats and Andaman & Nicobar Island. The officially documented plants with medicinal potential are 3000 but traditional practitioners use more than 6000. India is the largest producer of medicinal herbs and is appropriately called the botanical garden of the world. In this review article, we specifically discuss about *Schleichera oleosa*. Schleichera is a monotypic genus of plants in the family, Sapindaceae. *S. oleosa* is a tree and commonly known as *Kusum* that occurs in the Indian subcontinent and Southeast Asia. The oil extracted from the seed, called '*kusum* oil' is used for culinary and lighting purpose, cure of itching, acne, burns, other skin troubles, rheumatism (external massage), hair dressing and for promoting hair growth. The pinkish-brown heartwood is very hard, durable and excellent to make pestles, cartwheels, axles, plows, tool handles and rollers of sugar mills and oil presses.

It also has many medicinal uses and is used in traditional medicine for several indications. The powdered seeds are applied to wounds and ulcers of cattle to remove maggots. The bark is used as an astringent and against skin inflammations, ulcers, itching, acne and other skin infections. It is generally used as an analgesic, antibiotic and against dysentery. It was also found that this plant has various environmental aspects to it as well. The biodiesel produced from it, is found to have many properties similar to that of diesel e.g. viscosity and volatility. This article can provide tremendous opportunities to conduct research related to a variety of aspects of this plant.

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8. References

1. Palanuvej C, Vipunngeun N. Fatty acid constituents of *Schleichera oleosa* (Lour) Oken seed oil. J Health Res. 2008; 22:203e212.
2. Iwasa S. *Schleichera oleosa* (Lour.) Oken. In: Faridah Hanum I, van der Maesen LJG, eds. Plant Resources of South-east Asia No. Auxiliary Plants. Bogor Indonesia: Prosea Foundation; 1997, 227e229.
3. Rout SD, Panda T, Mishra N. Ethno-medical plants used to cure different diseases by tribal of Mayurbhanj district of North Orissa. Ethno-med. 2009; 3:27e36.
4. Mahaptma SP, Sahoo HP. An ethano medico botanical study of Bolangi, Orissa, India: native plant remedies against gynecological diseases. Ethanobot Leafl. 2008; 12:846e854.
5. Ghosh P, Chakraborty P, Mandal A, Rasul MG, Chakraborty Madhumita, Saha A. Triterpenoids from *Schleichera oleosa* of Darjeeling foothills and their antimicrobial activity. Indian J Pharm Sci. 2011; 73:231e233.
6. Kawamori T, Lubet R, Steele VE *et al*. Chemopreventive effect of curcumin, a naturally occurring anti-inflammatory agent, during the promotion/progression stages of colon cancer. Cancer Res. 1999; 59:597e601.
7. Choi JA, Kim JY, Lee JY *et al*. Induction of cell cycle arrest and apoptosis inhuman breast cancer cells by quercetin. Int J Oncol. 2001; 19:837e844.
8. Bhaumik S, Anjum R, Rangaraj N, Pardhasaradhi BVV, Khar A. Curcumin mediated apoptosis in AK-5 tumor cells involves the production of reactive oxygen intermediates. FEBS Lett. 1999; 456:311e314.
9. Sakagami H, Jiang Y, Kusama K *et al*. Cytotoxic activity of hydrolysable tannins against human oral tumor cell linesda possible mechanism. Phytomedicine. 2000; 1:39e47.
10. Thind TS, Rampal G, Agarwal SK, Saxena AK, Arora S. Diminution of free radical induced DNA damage by extracts/ fractions from bark of *Schleichera oleosa* (Lour.) Oken. Drug Chem Toxicol. 2010; 33:329e336.
11. Forman HJ, Torres M. Reactive oxygen species and cell signaling: respiratory burst in macrophage signaling. Am J Respir Crit Care Med. 2002; 166(12 II):S4eS8.
12. Dizdaroglu M, Jaruga P, Birincioglu M, Rodriguez H. Free radical-induced damage to DNA: mechanisms and measurement. Free Radicals Biol Med. 2002; 32:1102e1115.
13. Cozzi R, Ricordy R, Aglitti T, Gatta V, Perticone P, De Salvia R. Ascorbic acid and b-carotene as modulators of oxidative damage. Carcinogenesis. 1997; 18:223e228.tr Cancer. 2003; 45:218e225.
14. Harsh Bhatia, Jaspreet Kaur, Shreya Nandi, Vinita Gurnani, Anushua Chowdhury, Hemalatha Reddy P *et al*. A review on *Schleichera oleosa*: Pharmacological and environmental aspects. 2013.
15. Mukhopadhyay S, Maiti SK. Phytoremediation of metal mine waste. Appl Ecol Environ Res. 2010; 8:207e222.
16. Das M, Maiti SK. Comparison between availability of heavy metals in dry and wetland tailing of an abandoned coppertailing pond. Environ Monit Assess. 2008; 137:343e350.
17. Chaturvedi Nilima, Dhal NK, Rama Reddy PS. Comparative phytoremediation potential of *Callophyllum inophyllum* L., Bixa orellana L. and *Schleichera oleosa* (lour.) Oken on iron ore tailings. Int J Min Reclam Environ. 2012; 26(2):104e108.
18. Porra RJ, Thompson WA, Kriedmann PE. Determination of accurate extinction coefficients and simultaneous equations for assaying chlorophylls a and b extracted with four different solvents: verification of the concentration of chlorophyll standards by atomic absorption spectroscopy. Biochem Biophys Acta. 1989; 975:384e394.
19. McLeod MN. Plant tannins-their role in forage quality. Nutr Abstr Rev. 1974; 44:803e815.
20. Singleton VN. Naturally occurring food toxicants; phenolic substances of plant origin common in food Adv Food Res. 1981; 27:149e242.
21. Mitalaya KD, Bhatt DC, Patel NK, Didia SK. Herbal remedies used for hair disorders by tribals and rural folk in Gujurat. Indian Journal of Traditional Knowledge. 2003; 2:59-62.
22. Newman DJ, Cragg GM. Natural products as source of new drugs over the last 25 years. J Nat Prod, 2007; 70:461-477.