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Review Article

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Tephrosia purpurea: A Natural Herb/ Bliss

Richa Bhardwaj[1], Shilpa Shrivastava[1]

***Corresponding author:**

Richa Bhardwaj

[1]Dr. B.Lal Institute of Biotechnology
Malviya Industrial Area, Jaipur 302020,
Rajasthan

Abstract

Herbal medicine is in demand due to its fewer side effects and more or better curable techniques. The *Tephrosia purpurea*, claimed to be healing, curing and lower the various diseases according to Indian medicinal history. This genera species is well known for its therapeutic purpose, in this review we are explaining about the T.P most important characteristics which have been reported. This plant due to its good antioxidant and antibacterial property show best medicine against various diseases such as diuretic, cyto-toxicity and diabetics.

Keywords: Tephrosia, herbal medicine, Indian medicine, antioxidant, antibacterial

Introduction

The medicinal plant used for human medicine has been a long history, one of the important plant is discussed in this article is *Tephorsia purpurea*. It's an ayurvedic medicinal importance.

Tephrosia purpurea is a species of flowering plant in the pea family, Fabaceae that has a pantropical distribution. It is a common wasteland weed. In many parts it is under cultivation as green manure crop. It is found throughout India and Sri Lanka in poor soils [1].

Botanical classification: Its classified as Family: Fabaceae (pea family) Genus: Tephrosia Botanical name: *Tephrosia purpurea* (Linn.) Plant name in different languages Sanskrit: Sarapunkha, Bana,Banapunkha, Pleehasatru Hindi: Saraphonka English: Purple tephrosia, Wild indigo, Fish Poison, Tephrosia Malayalam: Kozhinjil, Kattamari, Kozhuva [2].

Uses

Used as a fish poison; the leaves and seeds contain tephrosin, which paralyzes fish. Larger doses are lethal to fish, but mammals and amphibians are unaffected. It is also used traditionally as folk medicine. According to Ayurveda, the plant is anthelmintic, alexiteric, restorative, and antipyretic; it is used in the treatment of leprosy, ulcers, asthma, and tumors, as well as diseases of the liver, spleen, heart, and blood. A decoction of the roots is given in dyspepsia, diarrhea, rheumatism, asthma and urinary disorders [3]. The root powder is salutary for brushing the teeth, where it is said to quickly relieve dental pains and stop bleeding. An extract, termed 'betaphroline' (not a systematic name) is claimed to promote release of endorphins, and finds use in certain cosmetic preparations.

Chemical constituents

Presence of valuable phytochemical or chemical components in genus *Tephrosia purprea* makes this plant more precious. Because of the presence of biological important chemical it may be used for various medicinally activity. Notably flavanoids are the major group which is used to isolate and used in this genus. Various Flavonoids isolated from tephrosia namely pongaglabol, semiglabrin [4] purpuritenin, purpureamethide, pongamol [5]; karanjin, lanceolatin B [5,6]; (+)-tephrorins (+)-tephrorins B (+)-tephrosone A [6]; purpurenone[7] (+)-purpurin [7]; ( )purpurin [8]; Dehydroisoderricin, ( )-maackiain, pseudosemiglabrin, ( )-semiglabrin, terpurinflavone [9]; (-)-isolonchocarpin [10]

Ester presents are stigmast-5, 22-dien-34; 21diol-34, 21-dihexadecanoate [11] and Neoflavonoid are glycoside serratin 7-O-[β-D-glucopyranosyl-(1 4)-O-β-D-galoctopyranoside [12]. Sterol is β-sitosterol [13,14]

Medicinal property

Aqueous extract of *Tephrosia purpurea* prevents not only the streptozotocin-induced metabolic abnormalities but also cardiovascular complications as well as reduce the risk of development of cataract [15]. Studies also find promising role in the treatment of acute renal injury caused by nephrotoxins like gentamicin [16]. T.p has potent anti-hyperglycemic and anti-lipid peroxidase effects in streptozotocin induced diabetic rats [17]. Against heavy metal like As T.P has shown potent activity in nephrotoxicity [18,39] and [40]. Accordingly we suppose its better curable quality against heavy metals and other disease. This plant has been extensively used in the treatment of jaundice, gastritis,

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dyspepsia, diarrhoea, tumors, bronchitis, asthma, rheumatism, urinary and kidney disorders.[19,20]

It was also concluded that TP leaf extracts can provide a radical cure for drug-induced diabetic nephropathy by a reduction in renal damage [21]. Study demonstrates the hepatoprotective activity of the aerial parts of *Tephrosia purpurea* against thioacetamide-induced hepatotoxicity [22].There is still need more research regarding leaves healing property for renal injury in rats [21].

Observation also indicates the ability of the flavonoidal fraction of T. purpurea to modulate both the cell-mediated and the humoral components of the immune system [23]

Patel and Thakor, 2012 researched on seed dry powder subjected orally during estrous cycle resulted in reduction in weight of reproductive system and/or ovary [24]. Kumar et al. 2011 found *Tephrosia purpuria* hydro alcoholic extract to be effective anxiolytic agent and was comparable to the standard drug, Diazepam. The experiments also show the ethanol extract to be more potent than the aqueous decoction which is claimed traditionally [25]. However *T. purpurea* Linn. (Leguminosae) leaves possess the antioxidant substance which may be responsible for the treatment of jaundice and other oxidative stress-related diseases [28].

Antioxidant activity

T.P has a good antioxidant activity and contains two biologically active flavonoidal compounds quercetin and rutin [26]. Flavonoids act against free radicals [27] and decrease lipid peroxidation and reduces oxidative stress in the body. Earlier it has been reported that TPE reduces MDA levels and increases GSH levels significantly in gentamicin-induced acute renal injury in albino rats [26].

T.purpurea Linn. (Leguminosae) leaves possess the antioxidant substance which may be responsible for the treatment of jaundice and other oxidative stress-related diseases. Earlier studies also show the ethanolic extract to be more potent than the aqueous decoction which is claimed traditionally [28]. Tp ethanolic extract showed potent anti lipid peroxidative effect, as well as enhanced the antioxidant status in DMBA- painted animals [29].

T. purpurea root extract possess prominent medicinal properties and can be exploited as natural drug to treat the diseases associated with free radical formation, oxidative stress and xanthine oxidase activity [30].

Antimicrobial activity

Some research also support antimicrobial activity in *Tephrosia purpurea* report the green synthesis of silver nanoparticles (Ag NPs) using leaf extract [31]. The biomolecules found in leaves extract play dual role of both reducing as well as capping agents. Antimicrobial activity of Ag NPs showed better inhibitory activity towards *Pseudomonas* spp. and *Penicillium* spp. compared to other test pathogens using standard Kirby–Bauer disc diffusion assay.

The antimicrobial activities of the extracts of *T. purpurea* plants at different maturity levels, against 3 standard cultures (*Staphylococcus aureus* [NCTC 6571], *Pseudomonas aeruginosa* [NCTC 10662], E. coli [NCTC 10418] there were found no differences between [32].

In another study on, the roots of *Tephrosia purpurea* showed antimicrobial activity against *P. aeruginosa* and no activity against *S. aureus* and *E.coli* [32] results also indicate *Tephrosia purpurea* to have antibacterial activity against *H. pylori*, an agent responsible for GIT ulcers [33]. The T.P methanol extract also showed marked antifungal activity against *A. niger* and *C. albicans* [34]. *T. purpurea* extracts have considerable promise to be used as antimicrobial agents. It can be concluded that the methanolic root extract of *T. purpurea* shows significant activity against *Staphylococcus aureus* [35].

Uses as feeder/ insecticidal

This genus is well known for feeding element for animals, easily available for animals and good source of energy. *Tephrosia purpurea* also be a good addition in the diet of ruminants [36]. The insecticidal property of *Tephrosia purpurea* was studied [37] complete plant was tested against *Callosobruchus maculates* the pest on *Phaseolus mungo* and it was also proved its anti-insecticidal property.

Unsafe dose limit

Talib *et al.,* in 2012, noted T.P for its toxicity in rodents. A dose up to 2000mg/kg was well tolerated in the acute toxicity studies whereas in sub acute toxicity studies, a dose 200mr/kg and 400 mg/kg showed no significant change in any of the parameters thus concluding that the plant is safe for use in treatment of different diseases [38]

Conclusion

T.P well knows plant for herbal medicine due to its magical chemical constituent's presence. More focused on flavanoids compounds isolation whereas there is more disease related compound may be present which need to be isolating with their proper know functions? Its work against various disease and there is need to do proper work for their drug preparation which is easily available in market with low cost as well their dose limit should also be mention. The next level is how its effect at DNA levels so the more proper and efficient mechanism at which extent it effect on human and animal.

Abbreviations: T.P: *Tephrosia purpurea,* TPE: ethanol extract of *Tephrosia purpurea,* GSH: glutathione estimation, Ag NP: sliver nanoparticle

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Conflicts of interests

The authors declare no conflicts of interests.

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