**Tephrosia purpurea: A Natural Herb/ Bliss**

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**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, cytotoxicity and diabetics.

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

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**Introduction**

The medicinal plant used for human medicine has been a long history, one of the important plant is discussed in this article is *Tephrosia 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].


**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, aperient, 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 purpurea* 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]; (+)-tephromins (+)-tephromine A [6]; purpureonene7 (+)-purpurin [7]; (−)purpurin [8]; Dehydroisoderticin, (−)-maackiain, pseudosemiglabrin, (−)-semiglabrin, terpurin inflavone [9]; (−)-isolonchocarpin [10]

Ester presents are stigmast-5, 22-dien-34; 21dihexadecanoate [11] and Neoflavonoid are glycoside serratin 7-O-β-D-glucopyranosyl(1,4)-O-β-D-galactopyranoside [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,
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 thiouacetamide-induced hepatotoxicity [22]. There is still need more research regarding leaves healing property for renal injury in rats [21]. Observation also indicates the activity 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 purpurea 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 200m/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**

Ty 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: silver nanoparticle
Acknowledgment

Authors are sincerely obliged to Dr. Aparna Datta, Executive Director, Dr. B. Lal Institute of Biotechnology for their encouragement and providing necessary administrative and research facility. DST Rajasthan for funding the research work.

Conflicts of interests

The authors declare no conflicts of interests.

References

[7]. Rao EV, Raju NR. Two flavonoids from Tephrosia purpurea. Phytochemistry 1984; 23, 2339-2342.
[8]. Chang LC, Gerhäuser C, Song L, Farnsworth NR, Pezzuto JM, Kinghorn AD. Activity guide disolation of constituents of Tephrosia purpurea with the potential to induce the phase II enzyme, quinone reductase. Journal of natural products 1997; 60, 359-360.
[9]. Chang LC, Gerhäuser C, Song L, Farnsworth NR, Pezzuto JM, Kinghorn AD. Activity guide disolation of constituents of Tephrosia purpurea with the potential to induce the phase II enzyme, quinone reductase. Journal of natural products 1997; 60, 359-360.
[10]. Chang LC, Gerhäuser C, Song L, Farnsworth NR, Pezzuto JM, Kinghorn AD. Activity guide disolation of constituents of Tephrosia purpurea with the potential to induce the phase II enzyme, quinone reductase. Journal of natural products 1997; 60, 359-360.
[12]. Chang LC, Gerhäuser C, Song L, Farnsworth NR, Pezzuto JM, Kinghorn AD. Activity guide disolation of constituents of Tephrosia purpurea with the potential to induce the phase II enzyme, quinone reductase. Journal of natural products 1997; 60, 359-360.
[13]. Chang LC, Gerhäuser C, Song L, Farnsworth NR, Pezzuto JM, Kinghorn AD. Activity guide disolation of constituents of Tephrosia purpurea with the potential to induce the phase II enzyme, quinone reductase. Journal of natural products 1997; 60, 359-360.
[14]. Chang LC, Gerhäuser C, Song L, Farnsworth NR, Pezzuto JM, Kinghorn AD. Activity guide disolation of constituents of Tephrosia purpurea with the potential to induce the phase II enzyme, quinone reductase. Journal of natural products 1997; 60, 359-360.
[15]. Chang LC, Gerhäuser C, Song L, Farnsworth NR, Pezzuto JM, Kinghorn AD. Activity guide disolation of constituents of Tephrosia purpurea with the potential to induce the phase II enzyme, quinone reductase. Journal of natural products 1997; 60, 359-360.
[16]. Chang LC, Gerhäuser C, Song L, Farnsworth NR, Pezzuto JM, Kinghorn AD. Activity guide disolation of constituents of Tephrosia purpurea with the potential to induce the phase II enzyme, quinone reductase. Journal of natural products 1997; 60, 359-360.
[17]. Chang LC, Gerhäuser C, Song L, Farnsworth NR, Pezzuto JM, Kinghorn AD. Activity guide disolation of constituents of Tephrosia purpurea with the potential to induce the phase II enzyme, quinone reductase. Journal of natural products 1997; 60, 359-360.
[25]. Kumar AS, Amudha P, Kannan CS. Evaluation of antiplasmodial activity of hydroalcoholic activity of Tephrosia purpurea (L) PERS on swiss albino mice. International Journal of...


[29]. Kavitha K, Manoharan S. Anticarcinogenic and antilipidperoxidative effects of Tephrosia purpurea (Linn.) Pers. in 7,12-dimethylbenz(a)anthracene (DMBA) induced hamster buccal pouch carcinoma Indian J Pharmacol I 2006; 38: 3,185-69

[30]. Nile, Shivraj H K, CN. Phytochemical analysis, antioxidant and xanthine oxidase inhibitory activity of Tephrosia purpurea Linn. root extract Indian Journal of Natural Products and Resources 2011 ;2(1)


[35]. Nigam Sonali , Saxena RC and Shrivastava PN. Screening for antimicrobial activity of methanol extract of roots of Tephrosia purpurea against Staphylococcus aureus.

[36]. Mbomi SE, Ogungbesan AM, Babayemi OJ, Nchinda VP. Chemical composition, acceptability of three Tephrosia species and use of Tephrosia purpurea as supplement for grazing animals in the western highlands of Cameroon. Journal of Environmental Issues and Agriculture in Developing Countries 2011;3, 132-139.


