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A REVIEW ON TECOMA STANS

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Abstract:

The yellow bells plants belonging to the family *Bignoniaceae.Is planted as an ornamental surub. It is 2 to 4 meters hight. It is an important medicinal herb found as a weed throughout India. It seeds, roots and bark are the most important parts which are used medicinally. The present article gives an account of updated information on its phytochemical and pharmacological properties. This plants has more medicinal compound constituents are phytosterols, alkaloids, quinines, aminoacid, monoterpenes, triterpene, glycosides, phenols, tannins, saponins, and flavonoids. This plants were cure anti-diabetic, diuretic, anti- spamodic, antimicrobial, anti-fungal and anti-oxidants even cancer also. This recapitulation supports all information on its, phytochemical and pharmacological activites and its tradicinal uses.*

Keywords: Tecoma Stan, Medicinal Uses & Phytochemical Screening

Introduction:

Plants have been used in virtually all cultures as a source of medicine. Plants have provided a source of inspiration for novel drug compounds, as plant derived medicines have made large contributions to human health and well being. Traditional medicine using plant extracts continues to provide health coverage for over 80% of the world's population, especially in the developing world (WHO, 2002). Genetic biodiversity of traditional medicinal herbs and plants is continuously under the threat of extinction as a result of growthexploitation, environment-unfriendly harvesting techniques, loss of growth habitats and unmonitored trade of medicinal plants [1].

The plant is fast growing evergreen plant with 20-30 ft in height, having moderate growth and yellow flowers. Leaves are green, compound, imparipinnate, and lanceolate with serrate margin. Fruits are elongated and clustered. Ginger thomas leaves, bark and roots contains biologically active chemicals, and extracts from those tissues are in use as traditional folk medicines. Plant is in use through Mexico, India and Central America for diabetes, roots for diuretic and urinary disorder control. *Tecoma stans* was also investigated for antifungal effect in roots. Standardization of a plant is first requirement for its use in herbal medicines [3].

Synonyms: Ginger-Thomas, Yellow Trumpet/ Yellow Bells/ Yellow-Elder.

Vernacular Name:

Hindi – Piliya/ Pila kaner
English – Yellow bells
Kannada – Koranekelar
Tamil –sonnapatti
Telugu – Pachagotla
Bengali –chandaprabha
Marathi – Ghanti ful [4]

Description of Tecoma Stans:

Tecoma stans is a promising species in the trumpet vine family, Bignoniaceae that is native to the Americas with many synonyms and common names. Synonyms include *Bignonia stans L., Gelseminum stans* (L.) Kuntze, *Stenolobium stans* (L.) Seem and Common names, Yellow Trumpet bush**,** Yellow Bells**,** Yellow Elder**,** Ginger-Thomas**,** and *Esperanza***.** *Tecoma stans* is the official flower of the United States Virgin Islands and the national flower of The Bahamas. It is a flowering perennial shrub or small tree, 5-7.6 m in height. Bark is pale brown to grey and roughens with age. Leaves are opposite, compound and imparipinnate with 2 to 5 pairs of leaflets and a larger single terminal leaflet. Leaflets are lanceolate, up to 10 cm long, with serrated margins, mid-green above and soft to the touch. Flowers occur in clusters at the ends of the branches and are trumpet shaped with 5 rounded lobes, 6 cm long, pale to bright yellow, with faint orange stripes at the throat. Fruits are narrow, slightly flattened to pointed capsules, up to 20 cm long, containing many winged seeds; green when young, pale brown on ripening and remain on the tree in untidy clusters for many months [5].

Ethnobotany:

Tecoma stans leaves bark, and roots contain many biologically active chemicals, and extracts from those tissues have been used in traditional folk medicine to treat many diseases and conditions. Leaves are used throughout Mexico and Central America for diabetes and urinary disorder control.Roots are used as diuretic, vermifuge [5].

Phytochemistry:

Chemical constituents of this botanical species are well known; numerous monoterpenic alkaloids have been identified [11-15] and among them, tecomanine and tecostanine possess hypoglycemic effects according to observations performed in animals [16-18] The biosynthesis of these monoterpene alkaloids in callus tissues of *Tecoma stans* has been studied, together with the identification of the presence of lapachol and other primary and secondary plant metabolites such as: sugars (glucose, fructose, sucrose and xylose), triterpenoids (ursolic and oleanolic acids and α-amyrine), p-sitosterol and phenolics (chlorogenic, caffeic, vanillic, o-cumaric and sinapicnacids). All of these compounds have already been identified in the whole plant at different concentrations [19, 20]. Recently the presence of iridoid glycosides, [21] indolic compounds [22] in the leaves and a

Chemical Constituents:

Therapeutically important active principle of *Tecoma stan* is Tecomine (the alkaloids isolated from the plant harvested in Egypt) was shown to be one of the compounds responsible for the hypoglycemic action given the interest in substances able to treat type II diabetes. The two other alkaloids isolated, namely 5β-Hydroxyskitanthine, early called Base C, and Boschniakine were inactive both *in vivo* and *in vitro* assays. Other chemical constitutes are phytosterols, alkaloids, quinones, amino acids, monoterpenes, triterpene, glycosides, phenols, flavonoids, saponins, and tannins [1].

Classification:

Botanical Name	***Tecoma Stans***
Class	*Magnoliopsida*
Common Name	*Yellow trumpet bush, tecoma yellow bells, golden bells, trumpet bush, yellow tecoma, yellow bignonia, yellow elder, ginger-thomas.*
Domain	*Eukaryota*

English Name	*Ginger thomas, tecoma, yellow bignonia, yellow cedar, yellow elder, yellow trumpet tree.*
Family	*Bignoniaceae*
Genus	*Tecoma*
Hindi Name	*Ganer, trumpet flower.*
Infraphylum	*Radiatopses*
Kingdom	*Plantae*
Order	*Scrophulariales*
Other Common Name(S) and Synonyms	*Yellow bells, golden bells, yellow trumpet bush, trumpet bush, yellow tecoma, tecoma, yellow bignonia, yellow elder, ginger-thomas.*
Phylum	*Tracheophyta*
Specific Epithet	*Stans* - (l.) Juss. Ex kunth
Subclass	*Lamiidae*
Subkingdom	*Viridaeplantae*
Subphylum	*Euphyllophytina*
Superorder	*Lamianae*
Tamil Name	*Sannapatti, nagasambagam, sorndpatti, swarna patti, naga chambagam, nakacenpakam, comappatti, cunacci, ponnarali2, tankarali2, nakacanpakam, nakakam (4).*
Telugu Name	*Suvarna ganneru, swama ganneru, panchaganneru, paccagotla, pachagotla, patcha ganner*
Tribe	*Tecomeae*

Phytochemical Studies:

Phytochemical investigation of Tecoma stans fruits and flowers resulted in the isolation of a new phenylethanoid, 2-(3,4- dihydroxyphenyl) ethyl-2-O-[6-deoxy-alpha -L-mannopyranosyl 4-(3,4- dihydroxy phenyl)-2-propenoate]-beta-Dglucopyrano side (7), and a novel monoterpene alkaloid, 5-hydroxyskytanthine hydrochloride (8), 4-OEcaffeoyl- alpha-L-rhamnopyranosyl-(1' -- >3)-alpha/beta-D-glucopyranose (1), E/Z acetoside (9), isoacetoside (14), rutin (15) , luteolin 7-O-beta-D-neohespridoside (16), luteolin 7-O-beta-D-glucopyranoside (16) and sucrose (16) were isolated from the fruits, while luteolin 7-O-beta- Dglucuronopyranoside (14), diosmetin 7-O beta-D-glucuronopyranoside (17), diosmetin -7-O-beta-D-glucopyranoside (18), diosmetin7-O-beta-D-glucuronopyranoside methyl ester (19) and acetoside (9) were isolated from the flowers. The novel compound 8 is effective as antiproliferative agent against MCF-7 cells and extract tecoma stans fruits with compounds isoacteoside exhibited potent growth inhibition of human breast carcinoma cells. In the major alkaloidal compound (-)-delta-n-norethylskytanthin (23) Marzouk et.al. Reported that aqueous extract tecoma stans fruits with compounds isoacteoside exhibited potent growth inhibition of human breast carcinoma cells. (24) Tecomine, Tecomine, 5b-Hydroxyskitanthine, 5b-Hydroxyskitanthine methiodide, 5b-Hydroxyskitanthine, Boschniakine, Boschniakine (25).

Pharmacological Activities:

Tecoma stans has more screened scientifically cured various pharmacological activities like anti-oxidant activity, [26] Antimicrobial Activities, [27] anti-fungal activity, [28] anticancer activity, [29] Antihyperlipidemic activity, [30] Antidiapetic, [31]

Medicinal Use:

Traditional Uses- All part of the plant, and especially it's contain more amount of the compound alkaloids its called tecomine and tecostamine. Traditionally flowers and bark are used for treatment of various cancers. These flowers contain beta carotene and zeaxanthene to treat eye disorder, At the same time cured also antidiabetic, anti spasmodic, anti oxidant, anti proliferative, wound healing, cytotoxic, anti microbial, anti fungal. It is used in the horticulture industry because it is drought and semi-salt tolerant. Yellow elder has been used for a variety of purposes in herbal medicine. [32] Phytochemicals presence of alkaloids, glycosides, carbohydrates, amino acids and steroids

1. Wound Healing Potential: [33] The methanolic extract of *Tecoma stans* Linn (METS) leaf was evaluated for its wound healing potential in two different types of wound models viz., incision and excision at dose levels 100 and 200mg/kg. It exhibited marked reduction in the wound area when compared to controls and this activity is attributed to presence of phytoconstituents like phytosterols, triterpenes, glycosides, phenols, flavonoids, saponins, and tannins.

2. Antispasmodic Effect: [34] The Antispasmodic effect of *Tecoma stans* hydroalcoholic leaf extract (TLE) (0.125–2 mg/ml) was evaluated by using distal segment of ileum (2 cm) from male wistar rat which was mounted in an organ bath containing Tyrode solution (10 ml, pH 7, 37 °C) and pre-contracted by carbachol (CCh, 10 μM) or by KCl (60 mM). In Ca2+-free Tyrode solution with high K+, cumulative concentrations of CaCl2 induced contractions were inhibited by TLE dose-dependently which indicate that, the calcium channels are involved in this spasmolytic effect.

3. Antimicrobial Activity*:* [35,36] Three different extracts ethanol, methanol and water of *Tecoma stans leaf* was tested on bacteria *(Pseudomonas fluorescens*, *Clavibacter michiganensis* sub sp. *michiganensis*, *Xanthomonas axanopodis* pv. *malvacearum*, *Staphylococcus aureus, E. coli, Pseudomonas aeruginosa* and *Klebsiella pneumonia*) and was found to be effective . Phytochemical analysis revealed the presence of alkaloids, flavonoids, saponins, phenols, steroids, anthraquinones and tannins. The three extract fractions have showed highest total Phenolic content (177-216 mg gallic acid equivalent/g) which may be attributed to its antimicrobial activity. In another it has been reported that Tecoma *stans* was effective against Helicobacter pylori. The anti-H. pylori activity of methanolic extracts of the plants was determined by using the broth microdilution method.

4. Anti-Proliferative And Antioxidant Activity: [37, 38] Phytochemical investigation of Tecoma stans fruits and flowers resulted in the isolation of a new phenylethanoid, 2-(3,4-dihydroxyphenyl)ethyl-2-O-[6-deoxy-alpha-L-mannopyranosyl-4-(3,4-dihydroxy phenyl)-2-propenoate]-beta-D-glucopyranoside (3), and a novel monoterpene alkaloid, 5-hydroxy-skytanthine hydrochloride (8), along with eleven known compounds; 4-O-E-caffeoyl-alpha-L-rhamnopyranosyl-(1',3)-alpha/ beta-D-glucopyranose (1), E/Z-acetoside (2), isoacetoside (4), rutin (5), luteolin 7-O-beta-D-neohespridoside (6), luteolin 7-O-beta-D-glucopyranoside (7) and sucrose (9) were isolated from the fruits, while luteolin 7-O-beta-D-glucuronopyranoside (10), diosmetin 7-O-beta-D-glucuronopyranoside (11), diosmetin 7-O-beta-D-glucopyranoside (12), diosmetin 7-O-beta-D-glucuronopyranoside methyl ester (13) and acetoside (2) were isolated from the flowers. Their chemical structures have been determined on the basis of chemical and spectroscopic evidences. Biological investigations of a *Tecoma stans* fruits extract and compounds 1, 2, 4, and 8 indicated that the extract, 1, 2, and 4 possessed a strong scavenging activity to DPPH,

5. Cytotoxic Activity: [39] The cytotoxicity of water extracts from *Tecoma stans* in human hepatoblastoma (HepG2) was evaluated by incubating the cells up to 72-h with varying concentrations of herbal extracts (60-100%). Toxic effects of *Tecoma stans* were found to be concentration and time-dependent in the presence and absence of fetal bovine serum (FBS). Cytotoxicity was determined spectrophotometrically by MTT and reported in terms of % cell viability. For IC50 assay (24 h exposure), cytotoxicity was found at concentration of 60-100%.

6. Antifungal Activity: [35, 40, 41] Subcutaneous mycoses are chronic infections caused by slow growing environmental fungi. The organic extract of Tecoma *stans* was tested against two species of subcutaneous fungi: Sporothrix schenckii and Fonsecaea pedrosoi by the agar dilution method at a concentration of 100 µ/mL. Tecoma stans, showed effective activity against F. pedrosoi at MIC 12.5 µg/mL. In another studies the antiyeast and antifungal activities were tested by the drop diffusion method. *Tecoma stans* found to give the best zone of inhibition against the fungal species tested (all species of *Aspergillus* and *Alternaria*).

Conclusion:

The yellow bells plants belonging to the family Bignoniaceae.Is planted as an ornamental surub it is widely cultivateted in gardens as an ornamental plants. As per my survey the majority of medicinal activity has been used the flowers and bark are used for treatment of various cancers. A cured by this plants antidiabetes, digestive problems, and control the urinary desease also. However, requires further testing we will find something, then we can able to cure any other new disease.

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