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A review on *Wattakaka volubilis* (L.f.) Stapf

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Abstract
Wattakaka volubilis (L.F.) stap *f.* Asclepiadaceae, twinning shrub, it is used in Ayurveda and also used in traditional medicine in no. of countries. Traditionally this plant used for the treatment of snake bites, skin problems, infections, diabetes and etc. Its leaves are used by tribals as a vegetable. The current review provides a summary of the state of our understanding of morphology, phytochemical elements with the activities such as anti-tumor, antimicrobial, anti-inflammatory, anti-diabetic, analgetic, etc., and phytochemicals are isolated from various parts of the plant example**;** alkaloids, flavonoids etc., traditional uses, furthermore, the active chemical constituents of this plant was significant pharmacological values must be isolated and evaluated.

Keywords: Morphology, chemical constituents, pharmacological activities, and traditional and medicinal uses.

1. Introduction
Wattakaka volubilis (Linn.f.) stap *f.* It's also known as *Asclepias volubilis* L.f. family: Asclepiadaceae [5]. And it is frequently familiar as a doodeepalla in Telugu [3]. And this plant is a towering arboraceous creeper plant and its height is 11m and 5cm in densely with bulk lenticulate, branches: sore branches and old one is ash colored, juvenile branches are green, very long, and smooth with small black dots [1] and [6]. Leaves are 6.5 – 14 by 4.5-11cm sub-orbicular, base rounded and cordate [1]. Flower: long flower with yellowish green or multitudinous green, 2.5 to 5 cm long sylphlike sericeous pedicles 1cm-2.5cm long, peduncles arisheing from between the petioles. Flowerings peaks from April-May (hills) and July-November (plains) [1] and [6]. Follicles are generally two types, striated & glabrous [6]. Seeds: yellowish brown broadly ovate and smooth and shiny [1] and [6].

This are distributed throughout the hotter parts of India like thanjavur district Tamil nadu, Maharashtra, common throughout Karnataka, Kerala, Thiruvananthapuram, and up to 1500m in Himalaya w&s China, Sri Lanka, Malesia, Taiwan [5].

This plant is used for various treatments since ancient time [2]. And also helpful in ayurvedic medicine of system in the form of taila and ointments, because it can treat fresh wounds and even fractures, and ointments are effectual in peristomal pyoderma gangrenosum, scabies, tinea, scratch and laceration [9]. The leaves are used as vegetable and roots expectorant and emetic [4] and [7]. It is used as in the treatment of poisonous snake dunk, eye diseases, fever, antibacterial, antifungal activity, useful in stress CNS disorders when it is combination [3] and [9]. Whole plant has been reported for its antipyretic, leukoderma, and astringent, anthelminthic, aphrodisiac etc., [10].

2. Classification
Kingdom: Plantae
Sub-Kingdom: Uridiplantae
Super-division: Embryophyte
Division: Tracheophyta
Class: Magnoliopsida
Order: Gentianales
Family: Apocynoideae
Sub-family: Apocynoideae
Genus: Wattakaka
Species: Volubilis [7].

3. Synonyms
Hoya viridiflora R.br.
Asclepias volubilis L.f

Marsdenia volubilis (L.f.) Cooke.
Hoya volubilis (L.f.) Griff.
Dregea volubilis (L.f) benth, ex hook. F

4. Common NAMES
Sanskrit: Madhumalathi, Hemajeevanti, Hemakshiri, Hemavati, Hemalata, Hemavali & Hemapurna.

Telugu: Dudhi paal, doodeepalla, Palatige, Palakura.

English: Green milkweed, Sneeze Wort, Cotton milk plant, feather coxcomb, Creste
coxcomb, common coxcomb.

Hindi: Akad Bel, Nakchhikini, Murder bel.

Bengali: Titakunga, Jukti.

Malayalam: Kakkalankodi, Vattakakkakkoti, Wattakakacodi.

Tamil: Vattakkakkakodi, Kodi palai, Kurinia

Kannada: Hegala balli, pettajanka

Marathi: Harinvel, Harandodi, Nakhsikani.

Gujrathi: Kadavi Dodi, Hirandodo.

Other: Kodippalai, Kuriniaan, Peria palai/ pasandha ambu [4] and [9].

5. History
Wattakaka volubilis belong to the family Apocynaceae, has a history of used in tribal medicines and traditional medication in some countries like India, Sri Lanka, China, Taiwan [5] and [7].
Traditionally the whole plant is used for the treatment for jaundice, snake bites, diabetes, eye infections, bolis, skin problems etc. kurinjan it is a tribal community there are used the plant for reducing blood glucose levels, and used as vegetables [7].

6. Description
6.1 Wattakaka volubilis: *Wattakaka volubilis* is a tall woody climber plant with 11m high and densely lenticel late with 5cm and pustular branches, flowers are yellowish green, seeds are yellowish brown and broad elliptic, leaves opposite, cordate, acuminate, suborbicular [1] and [4]. and the leaves are used as green vegetable, and it is commonly known as doodeepalla in Telugu [4].

6.2 Leaves: The leaves are 6.5 by 4.5cm sub orbicular, acuminate gently pubescent, and base cordate [1] and [4].

6.3 Flowers: Long flower with numerous green, 2.5 – 5cm long, 1cm – 2.5cm long pedicles, colour is yellowish green in drooping umbellate gymes, peduncles arisheing from btwn the petiole. Plants blooms from April-May and July-November [1] and [6].

6.4 Seeds: Seeds are yellowish brown colour, broad ovate shape, smooth and shiny [1] and [4].

6.5 Branches: branches are pustular, old branches are ash in color and young once are green slender with very long and smooth with small black dots [1] and [6].

6.6 Fruits: 7-10 × 2.5 cm long, woody follicles. When it is young it is golden indumentum.

a) Wattakaka volubilis plant.

b) Flowers of Wattakaka volubilis.

c) Seeds of Wattakaka volubilis.

d) Fruits of Wattakaka volubilis.

7. Geographical Distrubution

This are distributed throughout the hotter parts of India like thanjavur district Tamil nadu, Maharashtra, common throughout Karnataka, Kerala, Thiruvananthapuram, and up to 1500m in Himalaya w&s China, Sri Lanka, Malesia, Taiwan [5].

8. Uses / Traditional

The whole plant is used in the treatment of general debilit, this plant is Consider as classic ayurvedic drug jeevanti, and activities are reported are antipyretic, asthma, astringent, anthelminthic, aphrodisiac, leukoderma and anti-pyretic [5].

The leaves are used in furuncles and abscesses [1] and [5]. Th roots are used in the treatment of vomiting and induce the expulsion of phlegm from lungs [1], and [5]. And also help in diaphoretic, purgative, root paste is used to treat headache after child birth. Roots and Tenders stalks are used in the snake bites and eye diseases [1] and [7]. The roots Posses anti-fungal, anti-bacterial and anti-microbial activities are reported [1] and [7]. In leaf anti-diabetic and antioxidant was reported [7]. Its relief stress inducing CNS disorder [7]. The desiccated leaf product has antipyretic, anti-inflammatory and analgestic properties. Boils are cleared using the leaf mixture. For bladder issues, plant paste is combined with warmed milk and consumed. Sneezing can be stooped by inhaling leaf fluid [2]. A variety of illnesses, including rodent attacks, urinary secretions, leukoderma and irritation of lungs. Hydroalcoholic extract of the plants blossoms was found to have anti-diabetic and anti-oxidant properties [5]. Contusions the extracted oils are provided in the ointments, and theses ointments are found to be an effective in, tinea pedis, scabies, and even fractures. and wounds, cuts. Its taila is to be similarly effective as Murivenna [9].

9. Phytochemical

9.1 Phyto chemicals: The Wattakaka volubilis plant contain phytochemicals are saponins, cardiac glycosides, flavonoids, tannins, alkaloids and terpenoids are present [1].

Ascites cancer in Ehrlich the anti-inflammatory, anti-pyretic and analgestic actions that have been noted may be due to the saponins found in the extract [2].

Wattakaka volubilis ethanolic extract, in which 1,3-diazacyclooctane-2-thione, 2-undecanol, 2-ethyl-2-(hydroxymethyl), myo-inositol, vitamin d3, 1-3-propanediol, 4-C-methyl, and other molecular components have been discovered. Three-hydroxy hexadic anoxic acid, oxirane, linoleic acid, lactose and 2-methyl, Hexadecenal, glucose trimethylsilyl, 3-dimethyl-5-triflurомethyl is Undecanal [7] and [4].

Alkaloids, steroids, phenolic compounds, anthocyanidins, glycosides, proteins, tannins, lipids, amino acids, phytosterol, carbohydrates, flavonoids, coumarins, terpenoid, and some unknown compounds are among the additional phytonutrients found in *W. volubilis* (Linn.) Benth of the shrub [4] and [6].

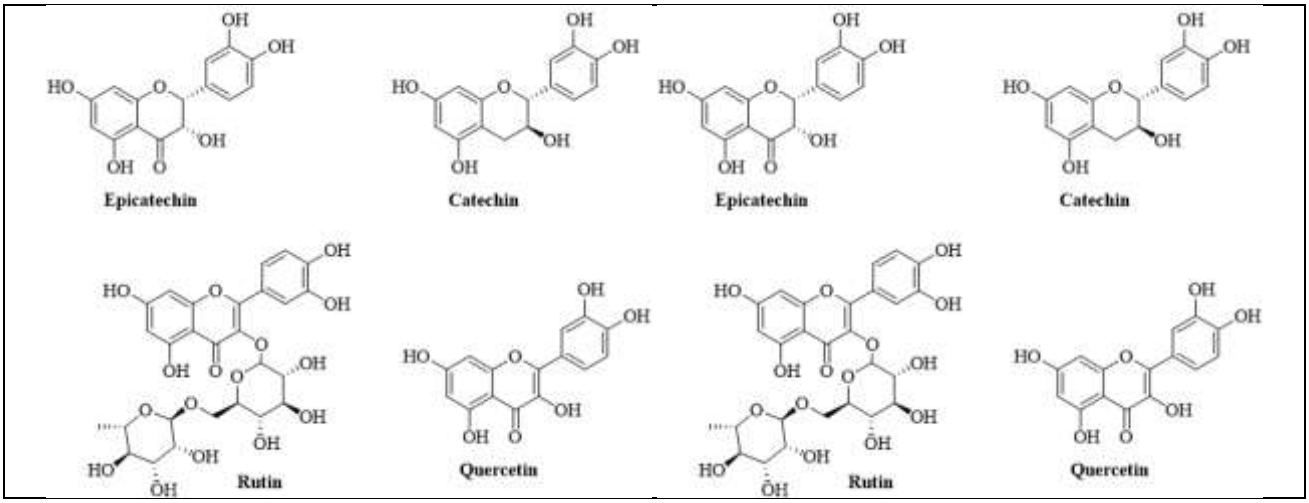
Wattakaka volubilis Linn.f. stapf. Have folic acid, vitamins B3, B1, B6 and C [5].

Octadecatrienic acid, ethyl ester, dodecanoic acid, tetra decanoic acid, n-hexadecenoic acid, and squalene are all found in foliage. A methanol preparation of the leaf of *W. volubilis* was found to contain oleanolic acid and ursolic acid [12].

Phosphatidic acid is one of the lipids found in the berry juice. Phosphorylated forms of serine, inositol, and choline phosphatidyl ethanolamine and diglyceride of dilactosyl glycerol phosphatidyl [13].

Drevogenin A, Quinic acid, and diisooctyl ester are among the phytoconstituents found in root. The W. volubilis roots ethanolic preparation contains 8 distinct chemicals [7].

10. Structure of isolated constituents



11. Pharmacological studies

11.1 Antibacterial & antifungal: The results of this research demonstrated that the plant Wattakaka volubilis roots have potent antibacterial and antifungal properties. A steroid called sitosterol, a triterpenoid called drevogenin A, an aromatic ester called di-octyl phthalate, flavonoids called 5,7-dihydroxy-6, 8-dimethoxy flavone, a phenolic compound called quinic acid, a desoxy sugar digitoxose, an alkaloid called N-[4-Bromo-n-Butyl]-2-piperidinone, These bioactive elements existence and the combined effects of other ingredients may be responsible for the antimicrobial action [15].

11.2 Antidiabetic & Anti-oxidant: With various amounts of this choice, Wattakaka volubilis leaf samples this are used to test antidiabetic effects on Albino Swiss rats. Swiss albino rodents were given alloxan monohydrate (150 mg/kg, i.p) to cause diabetes. In diabetes-induced rats, the ethanol extracts of Wattakaka volubilis was given daily in separated doses at a quantity of 150mg/ml of body weight a total of 14 days. The effects of an extracts of W. volubilis leaf extracts on blood

sugar, serum enzymes (SGPT, SGOT, ALP), and antioxidant enzymes (CAT, GRX) were assessed in diabetic rats. The diabetic rodents blood glucose levels were significantly reduced by the ethanol preparation of W. volubilis leaf, and their plasma levels of insulin and antioxidant enzymes were significantly increased. The study found that W. volubilis is efficient and anti-diabetic benefits in diabetic rats induced by alloxan [17].

11.3 Anti-asthmatic: Dregea volubilis aerial portion has been proven to be a successful therapeutic plant for the treatment of asthma in conventional medicine. The finding of this research Show that Dregea volubilis methanolic extract can be used as an expectorant and anti-asthmatic plant remedy [4].

11.4 Anti-leishmanial and Anti-Tumor Activities: Study: the motive of the research is clarified of the active ingredients and their anti-tumor and anti-leishmanial properties.
Technique: W. volubilis scorched & pulverized fruits are extort using petroleum ether at 40 to 60 degrees Celsius after analytical thin layer chromatography had confirmed it was the finest solvent system. (TLC). To separate the purified chemicals from the extract, TLC and column chromatography (CC) were used. For the purpose of elucidating the structure of the separated substance, spectra data were collected using carbon magnetic resonance (CMR), including proton magnetic resonance (PMR), mass spectroscopy, distortion less enhancement by polarization transfer (DEPT), infrared spectroscopy and mass spectroscopy. For anti-tumor activity on leukemic cell line K562, one of the isolated substances is tested.
Results: In addition to β-sitosterol and Taraxerone & a long chain lipid fraction, a pentacyclic triterpenoid molecule, was extracted and dramatized as d-friedoolean-14-en, 3one. This substance displayed anti-tumor activity on K562 & in vitro anti-leishmanial action contra promastigotes of donovani leishmania (strain AG 83).
Conclusion: successful isolation of the pentacyclic triterpenoid complex Taraxerone, also known as Dfriedoolean-14-en-en, 3 one together. The substance showed in vitro anti-tumor and anti-leishmanial actions, the structure was established using spectral analysis (MASS, IR, PMR, DEPT, NMR and CMR) [16].

11.5 Anti-microbial & anti hyperglycemic effects: study: Utilizing W. volubilis leaves educe as a diminish and enclosing substance, zinc oxide nano particles (ZnONPs) were symphonized.
Methods: The techniques included scanning electron microscopy (SEM) combined with energy dispersive X-ray spectroscopy, (FTIR), X-Ray diffraction (XRD), and ultraviolet -visible spectroscopy to characterize the produced ZnONPs. (EDX). The well diffusion technique was used for the anti-bacterial research.
Results: the synthesized ZnONPs ranged in size from 100 to 200nm and were cylindrical in form. The FTIR bands had significant absorption peaks and were precise.

11.6 Anti-inflammatory: Study: this study's objectives were to determine the MeOH extract of W. volubilis leaf anti-inflammatory properties as well as its components potential mechanisms of action.
Materials & methods: In a Irish moss – persuade model of critical inflammation, MEDV's Anti-inflammatory properties were examined along with those of its petroleum ether and chloroform components. It was also investigated how MEDV affected macrophage's ability to produce nitric oxide (NO) in response to endotoxin.
Results: carrageenan-induced paw edema was substantially decreased by MEDV (200,400 and 100 body weight mg/kg); The chloroform fraction was the most effective (66%, p= 0.001). In rat peritoneal macrophages, MEDV decreased lipopolysaccharide-induced NO production and was innocuous until 125ug/Ml.
Conclusion: significant anti-inflammatory action is present in MEDV. The MEDV chloroform component exhibited the strongest anti-inflammatory properties [13].

12. Conclusion

The Wattakaka volubilis are used as traditional source to cure different ailments in several regions of the world, and the whole plant parts are used in the various medical applications such as rheumatoid arthritis, jaundice, kidney stone, skin diseases, diabetes etc., this plant have no.of phytoconstituents there are steroids, flavonoids, phenolics, triterpenoids, and glycosides etc., the pharmacological activity of this plant hepatoprotective, antidiabetic, anti-inflammatory, antitumor, antipyretic etc., further comprehensive research is needed to be safety and efficacy to generate new dosage forms from this plant.

13. References

1. Babu K, Poornima N, Umarajan KM, Austin A. Studies on Histology and Phytochemical Evaluation of Wattakaka volubilis (L.f) Stapf. International Journal of Pharmaceutical Sciences Review and Research, 2016, 41(1).
2. Debkumar Nandi, Shila E. Anti-inflammatory and analgesic activities of leaf extract of *Wattakaka volubilis* (*Dreagea volubilis*). International Journal of green pharmacy, 2009, 195-200.
3. Arumugam Maruthupandian, Arumugam Eswari. Pharmaco-chemical characterization of *Wattakaka volubilis* (L.f.) Stapf – an antidiabetic ethnomedicinal plant. Nature of pharmaceutical technology. 2015;5(1):10-16.
4. Kanhopatra Bhagwat Suryawanshi, Dr. Rajesh Mandade. Review article on Medicinal uses of Dregea volubilis. World journal of pharmacy and pharmaceutical sciences, 784-792.
5. Devika Sharma, Sudipta Roy, Pharmaco-Nutraceutical and chromatographic study of *Wattakaka volubilis* (Linn.f.) Stapf. Leaves. A journal of pharmacognosy, 23-28.
6. Bhaskar das, Arnab de. Pharmacognostic studies on flowers of *Dregea volubilis*: Evaluation for authentication and standardization. Asian journal of pharmaceutical and clinical research. 2019;12:79-89.
7. Sukanya Vijayan *Wattakaka volubilis*-an overview. International journal of pharmaceutical sciences and research, 3900-3906.
8. Shahla Najafi Studies on *Wattakaka volubilis* (L.f.) stap. A medicinally important plant. Research journal of pharmaceutical, Biological and chemical sciences, 164-169.
9. Moni Thomas, Hepsibah PTA. Pharmacognostical and clinical studies on Wattakaka volubilis (Linn.f.). Ancient science of life, 1996 Apr;15(4):277.
10. Rajadurai M, Vidhya VG. Ethno-medicinal plants used by the traditional healers of pacchamalai hills, Tamil

nadu, India Studies on ethno-medicine, 2009 Jan 1;3(1):39-41.
11. Purushoth Prabhu T, Selvakumari S. Preliminary phytochemical and standardization on the plant Dregea volubilis., benth International journal of bioassays, 15-17.
12. Ravi Shankar K, Sanjoy Das, Pavani Bujala. Phytochemical screening and *In vitro* antibacterial activity of ethanol and aqueous extracts of *Dregea volubilis* leaves. 2016 May 6;7(2):975-9.
13. Emdad Hossain, Debjani Sarkar Anti-inflammatory effects of a methanolic extracts of leaves of *Dregea volubilis* Journal of Ethnopharmacology, 2010 Nov 11;132(2):525-8.
14. Subhaschandrabose jeyabharathi Biological synthesis of zinc oxide nanoparticles from the plant extract, Wattakaka volubilis showed anti-microbial and anti-hyperglycemic effects. Journal of King Saud University – Science. 2022 Apr 1;34(3):101881.
15. Yogita S, Prachi A. Antibacterial and antifungal activity of roots of *Wattakaka volubilis.* Global journal of pharmacology. 2013;7(3):283-7.
16. Biswas Moulisha, Mandal Nirup Biksh In *vitro* anti-leishmanial and anti-tumor activities of a pentacyclic triterpenoid compound isolated from the fruits of *Dregea volubilis* Benth *Asclepiadaceae.* Tropical journal of pharmaceutical research. 2009;8(2):127-131.
17. Sridhara Vishnusithan K, Jerome Jayakumar J. Antidiabetic and antioxidant property of Wattakaka volubilis. International journal of pharma research & review. 2014;3:12-5.