

Pharmacognostical, Phytochemical and Pharmacological Review of *tinospora cordifolia*

Sapna B. Sayyad¹, Nutan S. Wakale², Akshada D. Dhobale³, Shraddha M. Khaladkar⁴

Samarth Institute of Pharmacy, Belhe, Maharashtra, India^{1,2,3}.

Department of Pharmaceutics (QAT), Samarth Institute of Pharmacy, Belhe, Maharashtra, India⁴

Abstract: The *Tinospora Cordifolia* is important medicinal plant. The family of *tinospora cordifolia* is "Menispermaceae". The all part of plant is used medicinally. They are traditionally used as a common ingredient in the different Folk, Ayurvedic, Unani and Siddha medicine systems. This plant's ceremonial medicinal importance is primarily because of the root, stem, and leaf. This is due to higher alkaloid content in the stems than in the leaves. Presence of wide range of chemical constituents, traditional and medicinal use in the treatment of diabetes mellitus, fever, arthritis, skin diseases and anti-inflammatory, hypoglycemic, immunomodulatory, antioxidant, anti-allergy, antipyretic, antiarthritic and various other medicinal uses. This review paper provides information regarding pharmacognostical, phytochemical and pharmacology of *Tinospora cordifolia*.

Keywords: *Tinospor cordifolia*, pharmacological, phytochemicals, pharmacological study and Medicinal properties

REFERENCES

- [1]. Deepti Grover1*, Satyajit Dutta1, Arvind S Farswan2 1 IIMT College of Medical Science Meerut, India. Gyani Inder Singh Institute of professional studies, Dehradun, India. Received: 19.10.2013 Accepted:29.11.2013
- [2]. Bharath Raj K.C.1, Anjali Krishna M., Gururaja M.P.2*, Rajesh K.S., Prasanna Shama K.2, Ullas Prakash D.2, Zeena F.2 and Himanshu Joshi3
- [3]. Jamshidi-Kia, F., Z. Lorigooini and H. Amini-Khoei (2018). Medicinal plants: Past history and future perspective.
- [4]. Khosa RL, prasad S. Pharmacognostical studies on Guduchi (*Tinospora cordifolia* Miers). J Res Ind Med.
- [5]. Prashant tiwari*, Puravi Nayak, Shakti Ketan Prusty, Pratap Kumar Sahu Department of Pharmacology, School of Pharmaceutical Sciences, Siksha O Anusandhan Deemed to be University, Bhubaneswar, Odisha, INDIA
- [6]. Syed Ismail Jabiullah, Jainendra Kumar Battineni, Vasudha Bakshi and Narender Boggula
- [7]. Abhishek Singh*, Shruti Saxena and Akash Babu Shri Ram Murti College of Engg.
- [8]. Syed Ismail Jabiullah, Jainendra Kumar Battineni, Vasudha Bakshi and Narender Boggula
- [9]. Choudhary, N., M. Siddiqui, S. Azmat and S. Khatoon (2013). *Tinospora cordifolia*: Ethnobotany, Phytopharmacology and Phytochemistry aspects. International Journal of Pharmaceutical Sciences and Research,
- [10]. Ali Ahmed, F., R. Sharmin Bristy and N. Jahan Tasnova (2015). Ethnomedicinal practice of *Tinospora cordifolia* (Willd.) Meirs ex Hook f. & Thoms. by the traditional medicine practitioners at Savar, Dhaka. Jahangirnagar University of Journal of Biological Sciences
- [11]. Joshi V., Joshi RP. Some plants used in Ayurvedic & Homoeopathic Medicine. Journal of Pharmacognosy & Phytochemistry 2013,2: 269-75.
- [12]. Pandey M., Vyas MK., Sharma R. *Tinospora cordifolia*: A climbing shrub in health care management. International Journal of Pharmaceutical & Biosciences 2012;
- [13]. Garish Joshi*and Rajandeep Kaur CT Institute of Pharmaceutical Sciences Jalandhar, Panjab, India
- [14]. Singh, S.S., S.C. Pandey, S. Srivastava, V.S. Gupta, B. Patro and A.C. Gosh (2003). Chemistry and medicinal properties of *Tinospora cordifolia* (Guduchi). Indian Journal of Pharmacology, 35(1): 83-91.

- [15]. Qudrat –I- Khuda M, Khaleque M and Ray N. Sci Res (Dacca) 1964; 1, 177.
- [16]. Padhya MA. “Biosynthesis of Isoquinoline alkaloid berberine in tissue cultures of *T. cordifolia*” Indian drugs 1986; 24:47-8.
- [17]. Khan MA, Gray AL and Waterman PG. Tinosporaside, an 18- norclerodane glucoside from *T.cordifolia*. Phytochemistry, 1989; 28: 273- 275.
- [18]. Ghosal S and Vishwakarma RA .Tinocordiside, a new rearranged cadinane sesquiterpene glycoside from *T. cordifolia*. Journal of Natural Product 1997; 60: 839-841.
- [19]. Sipahimalani AT, Noerr H and Wagner H. Phenyl propenoid glycosides and tetrahydro furanlignan glycosides from the adaptogenic plant drugs *T.cordifolia* and *Drypetes roxburghii*. Planta Medica. 1994. 60: 596-597.
- [20]. Kapil A and Sharma S. “Immuno potentiating compounds from *T.cordifolia*.” J. Ethnopharmacol 1997; 58: 89-95. 146. Wazir V, Maurya R and Kapil RS. Phytochemistry 1995
- [21]. Maurya R and Hardass. “Tinocordifolin, a sesquiterpene from *T.cordifolia*.” Phytochemistry 1998; 49: 1343-6.
- [22]. Pathak AK, Agarwal PK, Jain DC, Sharma RP and Howarth OW. Indian J Chem Sci. B 1995; 34, 674.
- [23]. Pathak AK, Agarwal PK, Jain DC, Sharma RP and Howarth OW. “NMR studies of 20b-hydroxy ecdysone, a steroid, isolated from *T. cordifolia*.” Indian j. chem sec b 1995; 34: 674-6.
- [24]. Gangan VD, Pradhan P and Sipahimalani AT. Indian J Chem Sec B
- [25]. Ahmad M, Kazi AB, Karim R, Khaleque A and Miah MAW. Structure of tinosporide, a furanoid diterpene from *T. cordifolia*. Journal of Bangladesh Academy of sciences 1978; 2: 25- 30
- [26]. Dixit SN and Khosa RL. “Chemical investigation of *T. cordifolia*.” Indian J. Appl Chem 1971; 34: 46-7.
- [27]. Khaleque A, Miah MAW, Huq MS and Abdul BK. Sci Res (Dacca)
- [28]. Jagetia GC, Nayak V, Vidyasagar MS. Evaluation of the antineoplastic activity of guduchi (*Tinospora cordifolia*) in cultured HeLa cells. Cancer Lett. 1998;127(1):71-82
- [29]. Mishra R, Kaur G. Aqueous ethanolic extract of *Tinospora cordifolia* as a potential candidate for differentiation-based therapy of glioblastomas. PLoS One. 2013;8(10):e78764.
- [30]. Verma R, Chaudhary HS, Agrawal RC. Evaluation of anticarcinogenic and antimutagenic effect of *Tinospora cordifolia* in experimental animals. J Chem Pharm Res. 2011
- [31]. Bala M, Pratap K, Verma PK, Singh B, Padwad Y. Validation of ethno medicinal potential of *Tinospora cordifolia* for anticancer and immunomodulatory activities and quantification of bioactive molecules by HPTLC. J Ethnopharmacol. 2015
- [32]. Mathew George Pushpagiri College of Pharmacy, Thiruvalla, Kerala, India
- [33]. Sudha P, Zinjarde SS, Bhargava SY, Kumar AR. Potent α -amalyase inhibitory activity of Indian Ayurvedic Medicinal Plants. BMC Complement Altern Med, 2011
- [34]. Umamaheswari S, Prince Mainzen PS. Antihyperglycemic effect of ‘Ilogen-Excel’, an ayurvedic herbal formulation in streptozotocin-induced diabetes mellitus. Acta Pol Pharm. 2007
- [35]. Sangeetha MK, Raghavendran HR, Gayathri V, Vasanthi HR. *Tinospora cordifolia* attenuates oxidative stress and distorted carbohydrate metabolism in experimentally induced type 2 diabetes in rats. J Nat Med. 2011
- [36]. Singh CS, Singh AK, Khandelwal S, Vishwakarma R. Anti-Diabetic Activity of Ethanolic Extract of *Tinospora cordifolia* Leaves. Int J of Drug Discov and Herb Res. 2013
- [37]. Zhang Y, Li X, Zou D, Liu W, Yang J, Zhu N et al. Treatment of type 2 diabetes and dyslipidemia with the natural plant alkaloid berberine. J Clin Endocrinol Metab., 2008
- [38]. Upadhyaya R, PR, Sharma V, Anita KV; Assessment of the multifaceted immunomodulatory potential of the aqueous extract of *Tinospora cordifolia*. Res J Chem Sci., 2011; 1: 71–9.
- [39]. More P, Pai K. In vitro NADH-oxidase, NADPH-oxidase and myeloperoxidase activity of macrophages after *Tinospora cordifolia* (guduchi) treatment. Immunopharmacol Immunotoxicol
- [40]. Aher VD, Wahi A. Pharmacological study of *Tinospora cordifolia* as an immunomodulator. Int J Curr Pharm Res. 2010;2(4):52-4.
- [41]. Umretia B, Vaishnav P, Patgiri B, Shukla V; Immunomodulatory activity of Guduchi Ghana (Aqueous

Extract of *Tinospora cordifolia* Miers). NJIRM. 2013

- [42]. Bhawya D, Anilakumar KR; In Vitro Antioxidant Potency of *Tinospora cordifolia* (gulancha) in Sequential Extracts. International Journal of Pharmaceutical & Biological Archives, 2010; 1(5): 448-456.
- [43]. Sivakumar V, Rajan MS; Antioxidant Effect of *Tinospora cordifolia* Extract in Alloxaninduced Diabetic Rats. Indian J Pharm Sci, 2010
- [44]. Chi, S., G. She, D. Han, W. Wang, Z. Liu and B. Liu (2016).
- [45]. Prince, P.S., Kamalakkannan, N. and Menon, V.P. (2004). Restoration of antioxidants by ethanolic *Tinospora cordifolia* in alloxan induced diabetic wistar rats. Acta Poloniae Pharmaceutica
- [46]. Mathew George, Lincy Joseph, Minu Mathew
- [47]. Narayanan AS, Raja SS, Ponmurugan K, Kandekar SC, Maripandi A. Antibacterial activity of selected medicinal plant against multiple antibiotic resistant uropathogens: A study from Kolli Hills, Tamilnadu, India. Benef Microbes 2011;
- [48]. Veeramuthu Duraipandiyar, Savarimuthu Ignacimuthu, Kedike Balakrishna; Antimicrobial activity of *Tinospora cordifolia*: an ethnomedicinal plant. Asian Journal of Traditional Medicines, 2012
- [49]. Kalikar, M., V. Thawani, U. Varadpande, S. Sontakke, R. Singh and R. Khiyani (2008). Immunomodulatory effect of *Tinospora cordifolia* extract in human immuno-deficiency virus positive patients. Indian Journal of Pharmacology
- [50]. Jacob, J. and B.P. Kumar (2013). Ayurvedic Herb, *Tinospora cordifolia*: Validation of Anti-Inflammatory and Immunomodulatory Activity by Effect on Inflammatory Mediators,