

Genus *Plumeria*: Active Constituents and Reported Biological Activities of its various species

Dr. Atul K. Bhatnager

Department of Chemistry, Shri Govind Guru Government Post Graduate College, Banswara, Rajasthan, India

Genus *Plumeria* is also known as Frangipani. This flowering genus belongs to subfamily Rauvolfioideae of family Apocynaceae. Most of the species are deciduous shrub or small trees. Various species of genus *Plumeria* are grown as ornamental plant in India, Indonesia, Phillipines and south Africa. This belongs to family Apocynaceae. Various parts, of this plant are used to cure different diseases in India traditional medicinal system "Ayurveda". Active constituents isolated from this plants have been reported for medicinal properties.

From leaves of *Plumeria acuminata* active principals Antigenotoxin and antifertility, antimutagenic activity have been reported¹⁻⁵. Plumeric acid, Plumeriate, terpenoid derivatives, Plumeride isolated from leaves and stem bark of *Plumeria acutifolia* and are reported for antitumor, antimutagenic activities^{6,7}.

Using stem bark of *Plumeira bicolor* active constituents Plumeride has been isolated, which is reported to exhibit antitumor and antispermetogenic activities⁸⁻¹¹. *Plumeria elegans* has been reported to show cytotoxic activity^{12, 13}.

Plumeria rubra has been reported to show biological activities like Rheumatism, diarrhea, blennorrhoea, venereal disease, leprosy, male antifertility, antibacterial, inhibitory activity and some of the active constituents isolated from this species are Plumerubroside, Plumericine, Isoplumericin, plumeride, protoplumericin, lupin alkaloid¹⁴⁻²². From latex of this plant Acid Phosphatase is isolated²³. Antioxidant and Anti-inflammatory Activities of Flowers of *Plumeria* has been reported²⁴. Anthelmintic effect has been shown by saponin extract of leaves of *Plumeria rubra*²⁵.

From plant *Plumeria sericifolia* Vincubine active component has been isolated and stem of this plant is reported to show cytotoxic activity²⁶.

Plumeria pudica is reported to exhibit anti-inflammatory, ant-nociceptive, anti-diarrhoeal, skin healing activities^{22,27}.

Extracts of *Plumeria alba* has been reported for antimicrobial, antifungal and antibacterial activities²⁸⁻³¹.

From bark of *Plumeria lencifolia* [+], Uline, [+] demethoxyaspidopermine active components have been isolated³².

From leaves of plant *Plumeria obtuse* active constituents Obtusine, Obtusilic Acid, a-Amyrin, Obtusilic Acid, Olendrin, Oleanoic Acid Obtusilinic Acid Betulinic Acid have isolated. The plant is also reported to exhibit antibiotic, purgative, emmenagogue, febrifuge activities³³⁻⁴¹.

The decoction of bark of *Plumeria* species is used in the treatment of asthma⁴². Ethanolic extract of species of *Plumeria* have also shown antimicrobial activity⁴³. Methanolic extract have been reported for anti-inflammatory as well as anthelmintic activities^{44,45}.

References

- [1]. Mishra A, Patra BN: Indian Livestok **12**: 1963.
- [2]. Christopher J: J. Indian Fing **16**: 43, 1966.
- [3]. Muir CK, Hoe KF: Planta Med **44**: 61, 1982.
- [4]. Herra CL, Ramos EV, Villanueva BA: Phillip J Sci **113**: 91, 1984.
- [5]. Guevara AP, Evangeline A, Russei G: Mutant Res **361**: 67, 1996.
- [6]. Fujimoto Y, Made S: Jpn Kokai Tokkyo Koho JP 6360,949 17 March, 1988, Appl 861202,897 29 Aug, 1986.
- [7]. Guevara AP, Cancio E, Gonzales MC, Alipudin SJ Assomps VII Manila 2-7 Feb, 1992.
- [8]. Dobhal MP, Hassan AM, Sharma MC, Joshi BC: Phytochemistry **15**: 319, 1999.
- [9]. Hassan AM, Joshi BC, Dobhal MP: Asian J Chemistry **9**: 571-578, 1997.
- [10]. Dobhal MP, Guolin Li, Gryshuk A, Graham A, Bhatnager AK et al: J Org Chem **69**: 6165, 2004.
- [11]. Gupta RS, Bhatnager AK, Joshi YC, Sharma AR, Sharma A: Phytomedicine **11**: issue 2-3, 169, 2004
- [12]. Rogers DJ, Fish B, Banwell CJ, Loveless RW: Lactins Biol Biochem Clin Biochem **6**: 373, 1988.
- [13]. Fish BC: Counc Natl Academic Awards, London, UK 293, 1989.
- [14]. Perry LM, Metzger J: Medicinal Plants of East and South Asia, MIT, Cambridge, page 9, 1980.
- [15]. Watt JM, Brreyer-Branduijck MG: Medicinal and Poisonous Plants of Southern and Eastern Africa page 94, 1962.
- [16]. Jacob D, Yadara L, Vyas DK: J Adv Zool **9**: 6, 1988.
- [17]. Mahran GH, Abdel-Wahab SM, Ahmed MS: Bull Fac Pharm **12**: 151, 1973.
- [18]. Mahran GH, Abdel-Wahab SM, Ahmed MS: Bull Fac Pharm **12**: 131, 1973 (Pub) 1975.
- [19]. Tan GT, Pezzuoto JM, Kinghorn AD, Hughes SH: J Nat Prod **54**: 143, 1991.
- [20]. Akhatar N, Malik A, Ali SN, Kazami SU: Fitoterapia **65**: 162, 1994.
- [21]. Pino JA, Ferrer A, Alveraz D, Rosado A: Flavour Fragrance J **9**: 343, 1994.

- [22]. Hamburger MO, Cordell GA, Runagrungsi N: *Ethnopharmacol* 33: 289, 1991.
- [23]. Kazami SN, Ahmed Z, Ahmed W, Malik A: *Heterocycles* 29: 1901, 1989.
- [24]. Kalam S, Yegnambatla R, Periasamy G, Kasarla S, Yasmeen N.: *Journal of Pharmaceutical, Biological and Chemical Sciences*. 4: 743, 2013.
- [25]. Kumar A, Chand I, Singh AK.: *Pharmacologyonline*. 1: 969, 2009.
- [26]. Ceullar A, O'Farril TH: *Rev. Cubana Farm* 10: 25, 1976.
- [27]. Gupta M, Mazumdar UK, Gomathi P. *Tamil V: Altr Med*, 14: 72, 2006.
- [28]. Zahid Z, Khan SW, Patel KA, Konale AG, Lokre S.: *J Pharm Phytochem Sci* 2: 155, 2010.
- [29]. Radha R, Sriram L, Narayanan N: *Nat Prod* 4: 13, 2008.
- [30]. Nargis A, Malik A, Saminanoor A: *Fitoterapia* 2: 162, 1993.
- [31]. Kumari S, Mazumdar A, Bhattachareya S: *Inter J Pharm Tech Res* 4: 208, 2012.
- [32]. Franca OO, Brown RT, Santos CAM: *Fitoterapia* 71: 208, 2000.
- [33]. Krishnamurthi A: *The wealth of India CSIR, New Delhi* 8: 164, 1969.
- [34]. Nazir E, Ali S: *Flora of Pakistan* 48: 22, 1983.
- [35]. Siddiqui S, Siddiqui BS, Naeed A, Begum S: *Phytochemistry* 31: 4279, 1992.
- [36]. Siddiqui S, Siddiqui BS, Naeed A, Begum S: *J Chem Soc Pak* 13: 115, 1991.
- [37]. Siddiqui S, Siddiqui BS, Begum S, Naeed A: *Pak J Sci Ind Res* 32: 781, 1989.
- [38]. Siddiqui S, Siddiqui BS, Begum S, Naeed A: *Phytochemistry* 29: 3615, 1990.
- [39]. Siddiqui S, Siddiqui BS, Begum S, Naeed A: *Phytochemistry* 28: 3143, 1989.
- [40]. Siddiqui S, Siddiqui BS, Naeed A, Begum S: *J Nat Prod* 53: 1332, 1990.
- [41]. Siddiqui BS, Naeed A, Begum S, Siddiqui S: *Phytochemistry* 37: 769, 1994.
- [42]. Patil GG, Mali PY, Bhadane VV: *Nat Prod Radiance* 7: 354, 2008.
- [43]. Rasool SN, Jaheerunnisa S, Chitta SK, Jayaveera KN: *J Med Plant Res* 2: 77, 2008
- [44]. Rastogi S, Rastogi H, Singh V: *Ind J Nat Prod* 25: 15, 2009.
- [45]. Gupta M, Mazumdar UK, Gomathi P, Selvan VT *Alter Med* 6: 36, 2006