

# Ethnobotany of a medicinal plant *Mirabilis jalapa* L.

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## Abstract

The *Mirabilis jalapa* L. has a large history of ethnobotanical studies, with a main focus on its connection with folk medicine practice in countries around the globe. Its leaves, roots, and flowers have been utilized for their purported medicinal properties, including anti-inflammatory, analgesic and laxative effects. Additionally, it is often used in herbal remedies for conditions such as fevers, skin ailments and digestive issues. Ethnobotanical research highlights the significance of *M. jalapa* in local herbal practices, its cultural relevance and the need for further scientific investigation to validate its traditional uses and pharmacological potentials.

**Keywords:** *M. jalapa*, anti-inflammatory, digestive issues.

## Introduction

*Mirabilis jalapa* L. is a medicinal plant used for centuries for the treatment of various ailments, which belongs to family Nyctaginaceae (Saha et al., 2020). This plant is also known as Gul' A'bbas and is sometimes referred to as the Four O'clock plant because its blossoms usually arrive in the late afternoon or early evening. It is distributed throughout world, this plant is widely cultivated around the world for its ornamental value due to its vibrant, fragrant flowers (Rozina, 2016). It is a perennial, herbaceous, leafy, multibranched, shrub like bushy plant. It having showy flowers, coriaceous obovoid fruit and prominent tuberous roots which are planted as ornamental plant all over the world, which grows up to 1-meter height and just as wide. (Peiris et al., 2022). *M. jalapa* flowers can be yellow, pink, red, orange, white or any of these colors according to Akaji et al., (2016).

## *Mirabilis jalapa* L.: Ethnobotanical Review:

Various parts of *Mirabilis jalapa* L. has reported to have medicinal uses in several regions of the world, such as Latin America, South Africa, Zaire, Madagascar, India, and Pakistan, where they are used as a laxative and to treat

infections, inflammation, allergies, and painful conditions. In Mexico and Madagascar, *M. jalapa* is employed as an analgesic to cure a range of unwanted diseases, including intestinal pain and bee and scorpion sting pain. Mexicans also use a number of plant preparations and decoctions for the alleviation of dysentery. (Kusamba et al., 1991; Encarnacion et al., 1998; Arroyo et al., 2004). In Malagasy, the plant was used to treat intestinal pains (Zhou et al., 2012). Individuals from numerous countries use the entire plant to treat diarrhoea, gastrointestinal colic and muscle pain, as per Holdsworth et al., (1992) the decoction of the entire plant is taken orally to treat kidney diseases for diuresis (Sharma et al., 2001). In Pakistan, juice of the whole plant used to relief from pain and also to provide a cure from typhoid (Ahmad et al., 2011).

The leaves used medicinally in Ayurveda, Siddha and other traditional systems of medicine for curing various ailments (Devi et al., 2011). An infusion prepared from the leaves is applied topically to alleviate swelling associated with bone fractures or sprains (Sharma et al., 2001; Khurian 2003; Al-Snafi 2021).

According to Goleniowski et al., (2006) the leaves of *M. jalapa* have been utilized in traditional medicine for the treatment of inflammation and boils and are recognized for exhibiting purgative and emetic activities. Leaves are taken as a laxative in southern Brazil and further used to treat inflammatory and painful diseases. (Bogle, 1974). According to Peiris et al., (2022) *M. jalapa* exhibits significant diuretic properties, enhancing urine production. Leaf juice is traditionally administered to individuals suffering from bladder inflammation and urinary retention. Furthermore, topical application of the juice is employed to manage skin infections including rashes and boils facilitating accelerated healing. Leaves of *M. jalapa* also utilized for treating wounds and skin lacerations. Leaves are crushed and mixed with salt in sprain and bruises (Boulogne et al., 2011). Bhatia et al., 2014 observed the leaves are fried in clarified butter and applied to abscesses, while boiled leaves are consumed to alleviate body pains. Warmly heated leaf juice is applied as a poultice to wounds and abscesses to assist in their healing. Additionally, the juice is also utilized as an eye drop to soothe eye inflammation. In women the paste of leaves is used in amenorrhea and dysmenorrhea (Srithi et al., 2012). Khurian, (2003) reports that leaves were employed as a poultice against boils and abscesses.

According to Mahmood et al., (2012) and Vankar and Dhara, (2010) the leaves of *M. jalapa* has skin eruptions and emollient properties. Leaf juice is taken orally to treat Hepatitis (Mahmood et al., 2013 and Sharma et al., 2012). The decoction of the leaves is utilized to heal injuries and genitourinary system illnesses, as indicated by Weckerle et al., (2009). The juice extracted from the leaves is used to treat skin allergies, indigestion and earaches particularly in children. Decoction of *M. Jalapa* leaves was used orally as diuretic and in the treatment of kidney infections. Juices of the leaves were used in treatment of skin allergy (Al-Snafi,

2021). For depigmentation, the leaves and stems are utilized (Kamagaju et al., 2013). According to Chen et al., (2016) a decoction prepared from the roots and leaves of *Mirabilis jalapa* is utilized in the treatment of pain and inflammation in arthritis. *M. jalapa* leaves have been traditionally applied in folk medicine in southern Brazil to cure inflammatory and painful diseases.

Flowers are used in food colouring, edible crimson dye is used to colour cakes and jellies (Devi et al., 2011). The flower of *M. jalapa* exhales a strong odour at night, which can drive away mosquitos (Kirtikar and Basu, 1935).

The rhizome of *M. jalapa* is endowed with diuretic, purgative, healing of wounds, aphrodisiac, anti-inflammatory, anti-tumor, laxative, and anti-poison properties as cited by Peiris et al., (2022). In line with Bhatia et al., (2014) piles have been traditionally managed using small quantities of *Mirabilis jalapa* tuber. Roots were used to treat the accumulation of pus or liquid in cavities, cellular tissues and inflamed and enlarged lymph nodes. The roots are effective in treating syphilitic sores (Kirtikar and Basu, 2001). Additionally, a paste made from the roots is applied to reduce inflammation (Sher et al., 2011; Ghatapanadi et al., 2011). For the treatment of snake bites, an oral suspension of tuber paste is administered (Marandi and Britto, 2014). According to Quer, F. and Medicinales, P. (1962) 2-4 grams of root powder dissolved in water is prescribed as a laxative for adults. Because of its cathartic, emetic and purgative properties the roots of *M. jalapa* have been used for a long time in South Africa and Latin America (Zhou et al., 2012). *M. jalapa* is commonly used as an ethnic drug in China and in traditional Chinese medicine for the cure of diabetes (Swarnkar and Katewa, 2008). Due to its nutrient value, the native inhabitants of the Shivalik Hills region in Himachal Pradesh employ the root tubers as a pickle (Parinitha, 2004). Additionally, in the tribal regions of Rajasthan, a paste made from the root tuber is applied to prevent the growth of old tumors. Kusamba et al., (1991) reported that in Latin America the roots were used as a purgative and emetic. In Malagasy the plant was used to treat intestinal pains. In South Africa the roots were used as a purgative (Kusamba et al., 1991).

It is reported that the powdered seed is used as a cosmetic powder by the natives of Japan (Watt and Breyer-Brandwijk, 1962). The seed powder was used in Zaire externally for infected wounds (Kusamba et al., 1991). The Bhadra wildlife sanctuary area in Karnataka employs an external use of fruit paste prepared with coconut oil to relieve headaches in both individuals and pets, as cited by Chetty et al., (2008) *M. jalapa* has a great anti-poison effect and is one of the best herbs for treating animal bites. It is beneficial for treating snake, scorpion and insect bites.

## Conclusion

*Mirabilis jalapa* is a versatile plant with significant ethnobotanical importance

due to its variety of uses, particularly in traditional medicine and ornamental horticulture. Further research is necessary to explore its potential benefits fully, especially regarding its medicinal applications and to document local knowledge related to this plant. The existing literature provides a foundation for understanding its place within both cultural practices and ecological systems.

### **References**

1. Ahmad, I., Ibrar, M., Barkatullah, and Ali, N. (2011). Ethnobotanical study of tehsil kabal, swat district KPK, pakistan. *Journal of Botany*: 2011(1), 1-9.
2. Akanji, C., Cyril-Olutayo, M., Elufioye, T. and Ogunsusi, O. (2016). The antimalarial effect of *Momordica charantia* L. and *Mirabilis jalapa* leaf extracts using animal model. *Journal of Medicinal Plants Research*: 10(24), 344–350.
3. Al-Snafi, E. (2021). Traditional uses of Iraqi medicinal plants (part 2). *International Journal of Biological and Pharmaceutical Sciences Archive*: 2(1), 22-41.
4. Arroyo, A., Chacon, B. and Maki, K. (2004). Screening and selection of plants by positive pharmacologic effect on jejunum muscular contractility. *Pharmaceutical Biology*: 42(1), 9-24
5. Bhatia, H., Manhas, K., Kumar, K. and Magotra, R. (2014). Traditional knowledge on poisonous plants of Udhampur district of Jammu and Kashmir, India. *Journal of Ethnopharmacology*: 152(1), 207-216.
6. Bogle, L. (1974). The genera of Nyctaginaceae in the Southeastern United States. *Journal of the Arnold Arboretum*: 55(1), 1-37.
7. Boulogne, I., Germosen-Robineau, L., Ozier-Lafontaine, H., Fleury, M. and Loranger-Merciris, G. (2011). TRAMIL ethnopharmacological survey in Les Saintes (Guadeloupe, French West Indies): a comparative study. *Journal of Ethnopharmacology*: 133(3), 1039-1050.
8. Chen, P., Zheng, F., Zhang, Y., Gao, F., Chen, Y. and Shi, G. (2016). Ethnobotanical study of medicinal plants on arthritis used by Chaoshan in Guangdong, China. *Journal of Medicinal Chemistry*: 6, 715-723.
9. Chetty, K., Sivaji, K. and Tulasi Rao, K. (2008). Flowering plants of Chittoor district, Andhra Pradesh, India. Published by Students Offset Printers, Tirupati, 61.
10. Devi, L., Sunny, M., Janaipriya, N., Nagatami, S., Babu, S. and Vinupriya, S. (2011). Pharmacognostical and phytochemical studies of *Mirabilis jalapa* Linn. *South Asian Journal of Biology and Science*: 1(1), 1-6.
11. Encarnacion, R., Virgen, M. and Ochoa, N. (1998). Antimicrobial activity of medicinal plants from Baja California Sur (Mexico). *Pharmaceutical biology*: 36(1), 33-43.

12. Quer, F. and Medicinales, P. (1962). *El Dioscorides Renovado*. Editorial Labor, Madrid: 543.
13. Ghatapanadi, R., Johnson, N. and Rajasab, H. (2011). Documentation of folk knowledge on medicinal plants of Gulbarga district, Karnataka. *Indian Journal of Traditional Knowledge*: 10(2), 49-353.
14. Goleniowski, E., Bongiovanni, A., Palacio, L., Nunez, O. and Cantero, J. (2006). Medicinal plants from the “Sierra de Comechingones”, Argentina. *Journal of Ethnopharmacology*: 107(3), 324-341.
15. Holdsworth, K. (1992). A preliminary study of medicinal plants of Easter Island, South Pacific. *International Journal of Pharmacognosy*: 30(1), 27-32.
16. Kamagaju, L., Bizuru, E., Minani, V., Morandini, R., Stévigny, C., Ghanem, G. and Duez, P. (2013). An ethnobotanical survey of medicinal plants used in Rwanda for voluntary depigmentation. *Journal of Ethnopharmacology*: 150(2), 708-717.
17. Khurian, C. (2003). *Plants that heal*. 5th ed., Vol. 1, Oriental Watchman Publishing House Pune: 214-215.
18. Kirtikar, R. and Basu, D. (1935). *Indian medicinal plants*, Allahabad. Publisher Lalit Mohan Basu: 2, 457.
19. Kirtikar, R. and Basu, D. (2001). *Indian medicinal plants*. 2nd ed Uttaranchal, Oriental Enterprises Publishers: 9, 2824-2825.
20. Kusamba, C., Byamana, K. and Mbuyi, M. (1991). Antibacterial activity of *Mirabilis jalapa* seed powder. *Journal of Ethnopharmacology*: 35(2), 197-199.
21. Mahmood, A., Mahmood, A. and Malik, N. (2012). Indigenous knowledge of medicinal plants from Leepa valley, Azad Jammu and Kashmir, Pakistan. *Journal of Ethnopharmacology*: 143(1), 338-346.
22. Mahmood, A., Mahmood, A., Malik, N. and Shinwari, K. (2013). Indigenous knowledge of medicinal plants from Gujranwala district, Pakistan. *Journal of Ethnopharmacology*: 148(2), 714-723.
23. Marandi, R. and Britto, J. (2014). Ethnomedicinal plants used by the Oraon tribals of Latehar district of Jharkhand, India. *Asian Journal of Pharmacological Research*: 4(3), 126-33.
24. Parinitha, M., Harish, U., Vivek, C., Mahesh, T. and Shivanna, B. (2004). Ethno-botanical wealth of Bhadra wild life sanctuary in Karnataka. *Indian Journal of Traditional Knowledge*: 3(1), 37-50.
25. Peiris, D., Fernando, D., Senadeera, S., Chandana, A. and Ranaweera, C. (2022), *Mirabilis jalapa* Linn. A Folklore ayurvedic medicinal plant in Sri Lanka, *Asian Plant Research Journal*: 10(2), 21-41.
26. Rozina R. (2016), Pharmacological and biological activities of *Mirabilis jalapa* L. *International Journal of Pharmacy*: 6(5), 160-168.
27. Saha, S., Deb, J. and Deb, N. (2020). Review on *Mirabilis jalapa* L.

- (Nyctaginaceae): a medicinal plant, *International Journal of Herbal Medicine*: 8(2), 14-18.
28. Sharma, K., Chhangte, L. and Dolui, K. (2001). Traditional medicinal plants in Mizoram, India. *Fitoterapia*: 72(2), 146-161.
  29. Sharma, J., Gairola, S., Gaur, D. and Painuli, M. (2012). The treatment of jaundice with medicinal plants in indigenous communities of the Sub-Himalayan region of Uttarakhand, India. *Journal of Ethnopharmacology*: 143(1), 262-291.
  30. Sher, Z., Khan, Z. and Hussain, F. (2011). Ethnobotanical studies of some plants of Chagharzai valley, district Buner, Pakistan. *Pakistani Journal of Botany*: 43(3), 1445-1452.
  31. Srithi, K., Trisonthi, C., Wangpakapattanawong, P. and Balslev, H. (2012). Medicinal plants used in Hmong women's healthcare in northern Thailand. *Journal of Ethnopharmacology*: 139(1), 119-135.
  32. Swarnkar, S. and Katewa, S. (2008). Ethnobotanical observation on tuberous plants from tribal area of Rajasthan (India). *Ethnobotanical Leaflets*: 12 (1), 647-666.
  33. Vankar, P. and Dhara, B. (2010). Preparation of gold nanoparticles from *Mirabilis jalapa* flowers. *Indian Journal of Biochemistry and Biophysics*: 47(3), 157-60.
  34. Watt, M. and Breyer-Brandwijk, G. (1962). The medicinal and poisonous plants of Southern and Eastern Africa. Publisher Edward and Stuart Livingstone: 2, 1457.
  35. Weckerle, S., Ineichen, R., Huber, K. and Yang, Y. (2009). Maos heritage: medicinal plant knowledge among the Bai in Shaxi, China, at a crossroads between distinct local and common widespread practice. *Journal of Ethnopharmacology*, 123(2), 213-228.
  36. Zhou, Y., Zhou, W., Zeng, Y., Zhou, Y., Jiang, J. and He, Y. (2012). Hypoglycemic and hypolipidemic effects of ethanolic extract of *Mirabilis jalapa* L. root on normal and diabetic mice. *Evidence-Based Complementary and Alternative Medicine*, 2012(1), 01-09.