ISSN 2330-0280 (Online); CODEN: VRIPBU, VRI Phytomedicine, Vedic Research International, Vedic Research, Inc. USA

VEDIC RESEARCH INTERNATIONAL

PHYTOMEDICINE

eISSN 2330-0280

JOURNAL HOME PAGE AT WWW.VEDICJOURNALS.COM

MINI REVIEW

DOI: http://dx.doi.org/10.14259/pm.v1i2.34

Genus *Morina*: valuable aromatic plants for herbal drug

RAKESH K JOSHI*

Department of Chemistry, Kumaun University, Nainital, India

Article Info: ***Received***: *June 22nd, 2013;* ***Revised***: *June 25th, 2013;* ***Accepted***: *June 26th, 2013*

ABSTRACT

The present review article is an effort to compile the phytochemical and scientific reports of the genus *Morina*. *Morina* species like *Morina chinensis* (Batalin ex Diels) Pai., is used for arthritis and stomach trouble and Tibetan medicine from ancient. *Morina longifolia* Wall, its stem leaves and flowers are used in Tibetan medicine, they are said to have a sweet and astringent taste with a heating potency. They are digestive, emetic and stomachic and are used in the treatment of stomach disorders. Several phytoconstituents has been isolated and identified from the different parts of the plant. A review on chemical constituents present and their pharmacological activities are given in the present article.

Keywords: *Morina, GC/MS, Essential oil, Dispaceae.*

INTRODUCTION

The floras of India have been the source of traditional medicines for millennia. Of the 17,000 species of higher plants described in India, 7500 are known for their medicinal uses [1]. The Charak Samhita, a document on herbal therapy written about 300 BC, reports on the production of 340 herbal drugs and their indigenous uses [2]. The use of alternative medicine is growing because of its moderate costs and increasing faith in herbal medicine. Allopathic medicine can cure a wide range of diseases, however, its high prices and side-effects are causing many people to return to herbal medicines which tend to have fewer side effects [3]. Currently, approximately 25% of allopathic drugs are derived from plant based compounds, and many others are synthetic analogues built on prototype compounds isolated from plant species [4]. According to the World Health Organization (WHO), as many as 80% of the world's people depend on traditional medicine to meet their primary health care needs [5]. The Himalayan range in the northern part of India harbours a great diversity of medicinal plants. Approximately 8000 species of angiosperms, 44 species of gymnosperms and 600 species of pteridophytes that have been reported in the Indian Himalaya [6], 1748 species are known for their medicinal properties [7]. The state of Uttarakhand is a part of north-western Himalaya, and still maintains a dense vegetation cover (65%). The maximum species of medicinal plants have been reported from Uttarakhand [8, 9]. Uttrakhand Himalaya is bestowed with a rich flora of aromatic plants. The climatic variations from subtropical to alpine have favored the growth of many aromatic plants. Several types of medicinal plants are breathing in the nature and effective in different type of diseases. Plants have been the source of drug discovery for a long period because of their unique properties. Due to the side effects that synthetic drugs might elicit, there is an increasing demand for traditional medicine as an alternative. Besides, bioactive components of plant extracts including different class of phytochemicals such as monoterpenoids, sesquiterpenoids, diterpenoid, flavonioids, fatty acids, and lignans have attracted the attention of scientists [10-16].

Taxonomy of genus *Morina*:

An excellent taxonomic revision of Morinaceae was published by Cannon and Cannon in 1984. They recognized 13 species extending from south-eastern Europe and Israel to the Himalayas of Nepal, Bhutan, India and China, and further east and north in the Qinghai-Tibetan Plateau. These plants most often grow at high elevations, sometimes in excess of 4,200 meters, but they occupy a range of habitats, including rock ledges, alpine meadows, dry slopes, the margins of pine forests,

*Corresponding Author

Dr. Rakesh K Joshi,

Department of Chemistry, Kumanun University, Nainital, India.

Email: raakeshjoshi@rediffmail.com

and even swamps. Some common species are *Morina longifolia* Wall., *Morina chinensis* (Batalin ex Diels) Pai., *Morina chlorantha* Diels., *Morina coulteriana* Royl., *Morina kokonorica* Hao., *Morina ludlowii* (M. Connon) D. Y. Hong., *Morina nepalensis* D. Don., *Morina polyphylla* Wall. ex DC [17]. In Uttrakhand Himalaya *Morina longifolia* Wall., is found at the height of 3000-3500 m. It has spiny margined leaves and long interrupted spike of flowers, but flowers white to rose pink and paired bracts subtending whorls with an enlarged ovate base and fused below. Flowers with long slender corolla tube to 2.5 cm, somewhat two lipped the lips to 6 mm, hairy. Leaves strap-shaped with shallow 3-spined lobes and long pointed spiny apex.

It is commonly known as "Whorl flower" [18].

Phytochemical reports of genus *Morina*:

Previous reports on *Morina* species showed that phenylpropanol derivatives, called morinins, as well as two known compounds as 3, 4-dimethoxycinnamylalcohol methyl ether, and *p*-methoxy cinnamaldehyde, reported from the methanolic extracts of the roots of the Chinese medicinal plant *Morina chinensis* [19], also four novel phenylpropanol ester lipid metabolites [20], twelve novel sesquineolignans and neolignans [21], morinins L—P five new phenylpropanol are reported [22]. A novel acylated flavonol glycoside, quercetin 3-O-[2' "-O-(E)-caffeoyl]-alpha-L-arabinopyranosyl-(1-6)-beta-D-galactopyranoside, four new ursane-type saponins and two new acylated flavonoids isolated from *Morina nepalensis* [23-25]. New triterpenoid saponins and neolignans reported form *Morina kokonorica* [26]. The essential oil composition of leaves of *Morina longifolia* contains 75 constituents in which the major constituents in leaf oil were germacrene D (10.75 %) α-pinene (4.84 %), bicyclogermacrene (4.26 %), α-cadinol (4.26 %), (*E*)-citronellyl tiglate (4.20 %) β-phellandrene (3.24 %) [27]. A new aromatic glycoside characterized as 2,6-dihydroxy-5-methoxy-(3-C-glucopyranosyl) benzoic acid was isolated along with four known compounds from the aerial parts of *Morina longifolia* [28].

Medicinal Uses:

From different species of *Morina*, stem leaves and flowers are used in Tibetan medicine of *Morina chinensis*. They are said to have a sweet and astringent taste with a heating potency. They are digestive, emetic and stomachic and are used in the treatment of stomach disorders [29]. *Morina longifolia* possesses strong aromatic properties, used as incense and in the preparation of dhup, agarbatties, etc. The root paste has been applied externally on wounds and the aroma of the flowers has been used for unconsciousness in Indian traditional medicine. The plant used in treatment of maggot wounds. In general, wild plants have been regarded as a natural reservoir of novel and more exotic fragrances however even after the assessment of *Morina longifolia* properties and its use in traditional medicine; the attention has been limited because of the lack of information about its chemical studies [30-33].

Bioactivity shown by genus *Morina*:

According to an estimate of the World Health Organization, approximately 80% of the people in developing countries depend on traditional medicine for primary health care needs; a major portion of these involves the use of medicinal plants [34]. Traditional healers claim that their medicine is cheaper and more effective than modern medicine. With the continuous use of antibiotics, microorganisms have become resistant. This has created immense clinical problem in the treatment of infectious diseases [35]. It is necessary to evaluate, scientifically, the potential use of folk medicine for the treatment of infectious diseases produced by common pathogens. Medicinal plants might represent an alternative treatment in non-severe cases of infectious diseases. Natural antimicrobials can be derived from barks, stems, leaves, flowers and fruits of plants, various animal tissues or from microorganisms [36]. Plants have been used in ethnopharmacy for various diseases such as hypertension, cholesterol, eczema and diarrhea for centuries and today their scientific validation was provided by identification and isolation of bioactive phytochemicals [37]. Phytochemicals are the secondary metabolites that have several subgroups possessing various bioactivities such as antioxidant, antimicrobial, antivirus, anticancer etc [38-41]. Exploration of the chemical constituents of the plants and pharmacological screening is of great importance which leads for development of novel agents [42]. The essential oil of *Morina longifolia* and different extract had shown very good antimicrobial activity against pathogenic microorganisms [43]. The in vitro antibacterial activities of the essential oils were evaluated against a total of six bacteria, viz, *Salmonella typhi, Klebsiellap neumoniae, E.coli, Staphylococcus aureus, Streptococcus mutans, Bacillus subtilis* and antifungal activity tested against *Candida albicans* and *Candida glabrata.* The antibacterial activity of essential oil of *Morina longifolia* against *Staphylcoccus aures,* showed that ZOI 10 mm, and *Bacillus subtilis* ZOI 9 mm with respect to standard, *viz* chloramphenicol, ZOI 22 mm and 24 mm showed comparative activity. In case of antifungal activity showed by volatile oil of *Morina longifolia* against *Candida albicans* and *Candida glabrata,* exhibit largest ZOI 14 mm and 19 mm with respect to standards viz amphotericin B (20 µg), ZOI 16 mm and 11 mm respectively [44].

Conclusion

Medicinal plants that have been treating a wide range of human diseases since millennia are providing crude drugs to more that 70 % of the human population to get rid of various human draconian diseases for a long while. From asthma to cancer and the like, these medicinal plant species has been curing human and animal at very nominal prizes. Interestingly, following the developmental trajectory of the medicinal systems in India, the tribal's and the rural folks dwelling near about the forests have been the first ones using these medicinal plants by different names, characteristics and usage. Thus the use of these plants in the treatment of pathogenic diseases associated with the infection of these pathogens is validated and scientifically supported by the results obtained in this work. As we have seen that the many species of genus *Morina* are rich in phenylpropanoids glycosides, which are responsible for significant biological activities such as anti bacterium, anti tumor, antivirus, anti oxidation and so on. It can be now

concluded that particularly the *Morina longifolia* which is found in Utrakhand Himalaya in huge amounts, by proper and managed exploitation of this plant is used in future as a herbal drug.

References

1. Shiva MP: Inventory of forestry resources for sustainable management and biodiversity conservation. New Delhi: Indus Publishing Company; 1996.
2. Prajapati ND, Purohit SS, Sharma AK, Kumar T: A handbook of medicinal plants. Jodhpur: Agrobios; 2003.
3. Kala CP: Current status of medicinal plants used by traditional Vaidyas in Uttaranchal state of India. Ethnobot Res Appl. 2005: 3:267–278.
4. Rao MR, Palada MC, Becker BN: Medicinal and aromatic plants in agro-forestry systems. Agro for Syst. 2004: 61, 107–122.
5. Azaizeh HS, Fulder K, Khalil SO: Ethnomedicinal knowledge of local Arab practitioners in the Middle East Region. Fitoterapia. 2003: 74, 98–108.
6. Singh DK, Hajra PK: In: Changing perspective of biodiversity status in the Himalaya. Gujral GS, Sharma V, editor. New Delhi: British Council Division, British High Commission Publ. Wildlife Youth Services; 1996: 23–38.
7. Samant SS, Dhar U, Palni LMS: Medicinal plants of Indian Himalaya: diversity distribution potential values. Almora: G.B. Pant Institute of Himalayan Environment and Development; 1998.
8. Singh D, Srivastava RK, Khanduri VP: Marketing strategies and trade of medicinal plants in Uttaranchal: Present and future prospects. Indian Forester 2005: 131(3), 330–340.
9. Kala CP: Assessment of species rarity. Curr Sci. 2004: 86(8), 1058–1059.
10. Lin CW, Tsai FJ, Tsai CH, Lai CC, Wan L, HO TY: Anti-SARS coronavirus 3C-like protease effects of Isatis indigotica root and plant-derived phenolic compounds. Antiviral Res. 2000: 68, 36-42.
11. Ojwang JO, Wang YH, Wyde PR, Fischer NH, Schuehly W, Appleman JR: Novel inhibitor of respiratory syncytial virus isolated from ethnobotanicals. Antiviral Res. 2005: 68,163-72.
12. Khan MTH, Ather A, Thompson KD, Gambari R: Extracts and molecules from medicinal plants against herpes simplex viruses. J Ethnopharmacol 2005: 67, 107-19.
13. Mothana RAA, Mentel R, Reiss C, Lindequist U: Phytochemical screening and antiviral activity of some medicinal plants from the Island Soqotra. Phytother Res. 2006: 20, 298-302.
14. Jassim SAA, Naji MA. Novel antiviral agents: a medicinal plant perspective: J Appl Microbiol. 2003: 95, 412–27.
15. Yang CM, Cheng HY, Lin TC, Chiang LC, Lin CC: Acetone, ethanol and methanol extracts of Phyllanthus urinaria inhibit HSV-2 infection in vitro. Antiviral Res. 2005: 67, 24-30.
16. Niedermeyer THJ, Lindequist U, Mentel R, Gordes D, Schmidt E, Thurow K: Terpenoid constituents of Ganoderma pfeifferi. J Nat Prod. 2005: 68, 1728-31.
17. Cannon MJ, Cannon JFM: A revision of the Morinaceae (Magnoliophyta-Dipsacales). Bull. Brit. Mus.1984: 12, 1-35.
18. Polunin, O, Stainton A: Flowers of the Himalaya, Oxford University Press, New Delhi. 1984.
19. Su Bao-Ning, Takaishi Y, Duan Hong-Quan, Chen Bei: Phenylpropanol Derivatives from Morina chinensis J. Nat. Prod. 1999: 62, 1363-1366.
20. Su BN, Takaishi Y, Kusumi T: Four novel phenylpropanol ester lipid metabolites from Morina chinensis. J Nat Prod. 1999; 62, 1325-1328.
21. Su BN, Takaishi Y, Kusumi T: Morinols A-L. Twelve novel sesquineolignans and neolignans with a new carbon skeleton from Morina chinensis. Tetrahedron. 1999; 55, 14571.
22. Su BN, Takaishi Y: Morinins L—P, Five New Phenylpropanol Derivatives from Morina chinensis Chem. Pharm. Bull. 1999: 47(11), 1569-1572.
23. Tang R, Xie H, Liu X, Wang D, Yang C: A novel acylated flavonol glycoside from Morina nepalensis var. alba. Fitoterapia. 2002: 73, 1-9.
24. Teng RW, Xie HY, Wang DZ, Yang CR: Four new ursane-type saponins from Morina nepalensis. Magn Reson Chem. 2002: 40, 603-5.
25. Teng RW, Xie HY, Li HZ, Liu XK, Wang DZ, Yang CR: Two new acylated flavonoid glycosides from Morina nepalensis. Magn Reson Chem. 2002: 40, 415-18.
26. Zhu Y, Lu ZP, Xue CB, Wu WS: New triterpenoid saponins and neolignans from Morina kokonorica. Helv Chim Acta. 2009: 92, 536-40.
27. Joshi RK, Mathela CS: Volatile Oil Composition of Morina longifolia Wall. ex. Dc. from Himalayan region of Uttarakhand. Asian J. Res. Pharm. Sci. 2013: 1 (3),12-14.
28. Bodakhe SH, Ram A, Pandey DP: A new aromatic glycoside from Morina longifolia Wall. Asian Journal of Chemistry. 2010: 22, 2789-93.
29. Tsarong TJ: Tibetian Medicinal Plants, Tibetian Medical Publications, New Delhi. 1994, pp.94
30. Chopra RN, Nayer SL,Chopra IC: Glossary of Indian Medicinal Plants, Council of Industrial and Scientific Research, New Delhi. 1956, pp.105
31. Gaur RD: Flora of District Garhwal North West Himalaya (With ethno botanical notes). 1st ed. Srinagar Garhwal, India, Trans Media, 1999, pp.550.
32. Handoo S: A surveys of plants used for wound healing in animals, Veterin J, 2006: 1, 2-5.
33. Bhattacharje SK: Handbook of Aromatic Plants. Pointer Publisher, Jaipur 2000.
34. Kumari P, Singh BK, Joshi GC, Tewari LM: Veterinary Ethnomedicinal Plants in Uttarakhand Himalayan Region, India, Ethnobotanical Leaflets, 2009: 13, 1312-27
35. Davis J: Inactivation of the antibiotics and the dissemination of resistance genes, Science, 1994: 264, 375-382.
36. Gordon MC, David JN: Natural product drug discovery in the next millennium, Pharm Biol., 2001: 39, 8-17.
37. Littleton J, Rogers T, Falcone D: Novel approaches to plant drug discovery based on high throughput pharmacological screening and genetic manipulation, Life Sciences , 2005: 78, 467– 475.
38. Rajan S, Mahalakshmi S, Deepa Vm, Sathya1 K, Shajitha S, Thirunalasundari T: Antioxidant potentials of Punica granatum fruit rind extracts, International Journal of Pharmacy and Pharmaceutical Sciences, 2011: 3 (3), 10-15.
39. Jaiganesh KP, Arunachalam G: Preliminary Phytochemical Screening And Antimicrobial Potential Of Pterospermum Canescens Roxb, (Sterculiaceae), International Journal of Pharmacy and Pharmaceutical Sciences, 2011: 3 (3), 405-412.
40. Hidayathulla S, Chandra KK, Chandrashekar KR: Phytochemical Evaluation and Antibacterial Activity of Pterospermum diversifolium Blume, International Journal of Pharmacy and Pharmaceutical Sciences, 2011: 3 (2), 201-207.
41. Duffy CF, RF: Power, Antioxidant and antimicrobial properties of

some Chinese plant extracts, International Journal of Antimicrobial Agents, 2001: 17,527-529.

42. Goyal BR Goyal RK, Mehta AA: Phyto-pharmacology of Achyranthes aspera, A Review. Pharmacognosy Reviews, 2007: 1, 496-502.
43. Yousuf S, Bachheti RK, Joshi A, Bhat M: Invitro antibacterial screening of different ectract of Morina longifolia on pathogenic microorganisms, Int J Pharm Pharm Sci, 2011: 1 (3), 303-306.
44. Joshi RK: Phytochemical analysis and antimicrobial activity of leaf essential oil of Morina longifolia Wall. Chapter-5 Thesis, Kumaun University, Nainital 2012: pg. 70-93.

Visit us @ www.vedicjournals.com :
DOI: http://dx.doi.org/10.14259/pm.v1i2.34

Authors Column