All Kerala Govt. Ayurveda College Teacher's Association
KERALA JOURNAL OF AYURVEDA
An International Journal of Ayurveda Specialties

Vol 1(2): 35–40 (2022)
https://doi.org/10.55718/kja.120

REVIEW ARTICLE

Drynaria quercifolia Linn. J.smith.- A Review on Ethnomedicinal uses and Phytochemical constituents

Aparna G[1], Sree Parvathy S[2], Radhika C[3]

[1]Assistant Professor, Dept of Dravyaguna Vijnana Govt Ayurveda college Kannur, Pariyaram
[2]Assistant Professor, Dept of Dravyaguna Vijnana Govt Ayurveda college Kannur, Pariyaram
[3]Asossiate Professor, Dept of Dravyaguna Vijnana Govt Ayurveda college Kannur, Pariyaram

*Email:- dr.aparnagopinath@gmail.com

ARTICLE HISTORY

Received: 04 December 2022
Accepted: 15 December 2022

Available online
Version 1.0 : 31 December 2022
Version 2.0 : 07 April 2023

Keywords

Drynaria quercifolia, Ethnomedicinal, *Mathilpanna, Pannakkizhangu, Thudimpalakkizhangu, Suryavarta*

Additional information

Peer review: Publisher thanks Sectional Editor and the other anonymous reviewers for their contribution to the peer review of this work.

Reprints & permissions information is available at https://keralajournalofayurveda.org/index.php/kja/open-access-policy

Publisher's Note: All Kerala Govt. Ayurveda College Teacher's Association remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

CITE THIS ARTICLE

Aparna G, SreeParvathy S, Radhika C. *Drynaria quercifolia* Linn. J.smith- A Review on Ethnomedicinal uses and Phytochemical constituents. Kerala Journal of Ayurveda. 2022; 1(2): 35–40.
https://doi.org/10.55718/kja.120

Abstract

Drynaria quercifolia Linn.J.smith. - called as *Mathilpanna, Pannakkizhangu* or *Thudimpalakkizhangu* in Malayalam, is an epiphytic fern commonly seen throughout India, growing upon trees, walls and rocks. It is commonly used in conditions like *Jvara, Vata rakta, Sandhi sopha, Suryavarta* etc. as external and internal application. Various studies have proven the therapeutic actions like anti-inflammatory, analgesic, antipyretic, antibacterial, antidiabetic, hypolipidemic and wound healing potential of rhizome of *Drynaria quercifolia*. This drug is widely used by the tribes in different parts of India for treating typhoid, cough, throat infection, rheumatic disease, diabetes etc. This review throws light on the various uses of this extra pharmacopoeial drug and hopes to bring this in main stream medical practice through further clinical research.

Introduction

Drynaria quercifolia Linn.J.smith. (Synonym. *Aglaomorpha quercifolia* (L.) Hovenkamp & S.Linds.) commonly known as Oak leaf fern, belongs to Polypodiaceae family. It mainly occurs in the plains and in the lower elevations of mountains throughout India. It is an epiphytic or epipetric fern which grows on trees or rocks and has a fleshy rhizome covered with cordate shaped scales. Both sterile and fertile fronds are seen in *Drynaria* spp. The sterile fronds which become brown with age, are small and somewhat concave. They gather humus in which adventitious roots of the plant find nourishment. Fertile fronds are 2-8 feet long with long stalks, pinnately lobed of leathery texture. The cultivated forms are more sturdy and rigid than the wild plants[1].At the base of these frond lobes nector secreting structures are seen. These secretory structures produce nectar which is abundant in amino acids and sugars. *Drynaria quercifolia* propagates through spores. *Drynaria quercifolia* is frequently used as a medicine in many cultures. The useful parts are rhizomes and leaves[4].

Rhizome is bitter and astringent in taste and is used in the treatment of chest infection, cough, fever, dyspepsia etc. Fronds are made in to paste and used externally to treat swellings. Peeled Rhizome with sugar is recom-

mended for urinary disorders and spermatorrhoea.[2] Phytochemical screening has shown the presence of flavonoids, triterpenes, alkaloids, glycosides, saponins and amino acids.

Table No: 1.Taxonomical Classification[3]

Kingdom	Plantae
Class	Filicopsida
Order	Polypodiales
Family	Polypodiaceae
Genus	Aglaomorpha
Species	quercifolia. (L.) J. Sm

Table No:2.Vernacular Names[4]

English name	Oak (basket) fern
Sanskrit name	Ashvakatri
Malayalam	Matilpanna, Pannakkizhangu, Thudimbala kizhangu
Hindi	Asvakatri, Katikapan,
Tamil	Attukkal kizhangu
Bengali	Bandor shoal, Pankhira
Philippines	Pakpak lawin
Chinese	Li ye hu jue

Image No : 1 & 2 : Fern and Rhizome of Drynaria quercifolia Linn.J.smith.

Drynaria quercifolia Linn.J.smith.

Rhizome of Drynaria quercifolia Linn.J.smith.

Details related to Ethnomedicinal claims, Phytotochemical studies etc are collected from Journals and traditional books, then it is tabulated and analysed.

The tribes of Eastern Ghats commonly use the soup prepared out of Drynaria Rhizome for rheumatic complaints.[5] Local tribes of Western Ghats of Maharashtra use the paste of its rhizome to treat enteric fever, cholera, chronic jaundice and skin diseases[6]. Local inhabitants of Bangladesh have been using the drug to treat jaundice, hepatitis, diabetes, gonorrhoea and malaria. Local people in Lakshmipur district of Bangladesh, use the rhizome of this plant to treat mental disorders [7-10].

Local people of Phulpur in Mymensingh District use the paste of its rhizome with coconut oil on head to cure long term insomnia[11]. In South east Asia countries, decoction of its rhizome is used for pyrexia. In traditional Chinese medicine, the drug is topically used to stimulate hair growth.[14].

Fronds are used as poultice on swellings by local people of Malaysia [15]. Tribes of Tripuri and Reang communities of Tripura commonly use the leaves and rhizome of D. quercifolia for the treatment of intestinal worms .[16]Tribals in Kalakad Mundanthurai Tiger Reserve externally use the rhizhome to treat rheumatism[17].

Malasar tribal community in vellangiri hills of Tamil Nadu in Western Ghats use soup of its rhizome for tuberculosis and in COPD conditions[18].

Table No:3: Ethnomedical claim of Drynaria quercifolia Linn.J.smith.

SL NO	Disease	Community	Preparation	Method of administration
1	Rheumatic complaints[5]	Tribes of eastern ghats in Tamil nadu	Soup of rhizome	Internal
2	Enteric fever, cholera, chronic jaundice, skin disease[6]	Tribes of western ghats in Maharashtra	Paste of rhizome	External & internal
3	Jaundice,Hepatitis,Malaria[7-10]	Tribes of Bangladesh, Lakshmipur	Several plant parts	Internal
4	Mental disorder[11]	Tribes of Lakshmipur	Rhizome	Internal
5	Urinary disorders and in spermatorrhoea [12]	Marma tribes of Bangladesh	Peeled rhizome with sugar	Internal
6	Insanity[13]	Local people of Netrakona Distict in Bangladesh	Rhizome-paste with coconut oil, applied on head	External
7	Antipyretic[14]	In southeast asia	Rhizome decoction	Internal
8	Hair growth and to treat baldness[14]	Chinese medicine	Rhizome decoction	External
9	Swellings[15]	Malaysia	Fronds as poultice	External
10	Intestinal worms and abdominal pain[16]	Ethnic people of Tripura and Reang communities	leaves and rhizome	Internal
11	Rheumatism[17]	Tribals in Kalakad Mundanthurai Tiger Reserve	Rhizome	External
13	COPD, Tuberculosis[18]	Malasar tribal community in vellangiri hills of Tamil Nadu	soup	Internal

Table No 4: Phytochemical Screening done on Drynariaquercifolia Linn.J.smith [19]

1	Aqueous Extract	Tannin, saponnins, flavanoids, Quinones, Cardioglycosides, Phenol, Betacyanin
2	Ethanolic extract	Tannin, saponnin, quinones, cardioglycosides,Terpenoids Phenols,Caumarins,Steroids
3	Petroleum ether extract	Phytosterols, cardioglycosides
4	Chloroform extract	Sterols
5	Methanolic extract	Glycoside, tannins, alkaloids, carbohydrates, and amino acids
7	Hexane and CHCl3 combined extracts	Friedelin , epifriedelinol , β-amyrin ,βsitosterol

Table No 5: Rasa panchaka[20]

Rasa	Tikta
Guna	Laghu,snigdha
Virya	sheeta
Vipaka	katu
Dosha karma	vatahara
Samsthanika karma	Grahi
Rogagnatha	Jwara, Swasa, Kasa, Sandhisopha, Dustavrana, Sooryavartha, Shirasthoda

Table No 6 :Pharmacological studies on Drynaria quercifolia Linn.J.smith

1.	Antimicrobial activity[21]	Ethanolic extract, Methanolic extract,Chloroform extract	Escherichia coli, Klebsiella pneumoniae, Salmonella typhi, Staphylococcus aureus
2.	Antioxidant activity[22]	Methanol extract of rhizome	Presence of Polyphenolic compounds responsible for scavenging assays.
3.	Cataractostatic activity [23]	Methanolic and ethyl acetate extracts	Potential cataractostatic agent to prevent diabetic cataract.
4.	Hepatoprotective activity[24]	Hydroalcoholic extract of Drynaria quercifolia fronds	Significant dose dependent hepatoprotective action is observed in rats pretreated with Dq extract, EA fraction .
5.	Anti-diabetic and Hypolipidemic activity [25]	Ethanolic and Chloroform extract	Reversed glucose and lipid profile near normal values
6.	Wound healing activity[26]	Methanolic and chloroform extract	Wound healing activity is evident from reduction in wound size and epithelization time.
7.	Anthelmintic activity[27]	Alcoholic extracts of leaves and rhizomes	Polyphenolic compounds and tannin binds to the glycoprotein on cuticle of the parasite and kills it
8.	Anti-Urolithiatic activity[28]	Petroleum ether, Chloroform, Alcoholic and Water extract	Reduces the level of calcium and oxalate.
9.	Anti-ulcer activity[29]	Ethanol extract and Aqueous extract of leaves	Antisecretory activity
10.	Analgesic activity[30]	Methanolic crude extracts petroleum ether, ethanolic extract	inhibition of prostaglandin synthesis
11	Anti pyretic[31]	Methanolic extract	Experimental studies proved the reduction in rectal temperature
12	Anti-inflammatory activity[30]	Ethanolic extract	Inhibitory effect on proliferative phases of inflammation.
13	Anti-arthritic effect[32]	Aqueous extract	The significant reduction in the levels of serum pro-inflammatory cytokines (TNF-α and IL-1β) and the increases the levels of anti-inflammatory cytokine (IL-10)
14	Acute toxicity study[33]	Crude extract of Drynaria quercifolia, 3, 4-dihydroxybenzoicacid	No mortality at the dose of 2000 mg/kg body weight.

Table no:7 Uses in Traditional Books of Kerala

SL NO	FORMULATIONS	MODE OF ADMINISTRATION	DISEASES
1	Ellumnishadi choorna[34]	lepana	Vatarakta

Result, Discussion and Conclusion

Studying the ethno medicinal uses and phytochemical constituents of a medicinal plant is an effective way to explore its wide therapeutic applicability. This Paper reviews the drug, Drynariaquercifolia is an epiphytic fern, distributed in the evergreen forests of the Western Ghats of Kerala. There are not much references of this drug is available in Ayurveda classics. Various tribal communities are practising different combinations of its rhizomes and leaves in the form of *kalka, kashaya* etc as internal and external applications for various ailments.

Experimental studies on Sub-acute toxicity proves the safety of rhizome for clinical trials. Presence of Flavonoids, Triterpenes, Alkaloids, Saponins, Amino acids, Glycosides etc. are considered to be responsible for multiple therapeutic actions discussed above and the drug being widely available, has to be explored for further research

References

1. The Wealth of India first suppliment series Vol 3:D-1,CSIR NISCOM ,
2. C P Khare Indian Medicinal PLants An Illustrated Dictionary ed.1st 2007;p.226
3. G Prasanna , R Anuradha A Comprehensive Review on Phytopharmacological Activities of DrynariaquercifoliaL.International Journal of Pharmacognosy and Phytochemical Research 2016; 8(8); 1304-1313
4. Warrier P.K, Nambiar V.P, Ramankutty C. Indian medicinal plants: a compendium of 500 species, volume 2: Orient Longman Ltd. Chennai. 1996;p.345
5. Samydurai P, ThangapandianV., Aravinthan V, Wild habitats of Kolli Hills being stale food of inhabitant tribes of eastern Ghats, Tamil Nadu, India. Indian J Nat Prod Res 2012;3:432-437.
6. Nejad, B.S., Deokule, S.S., Anti-dermatophytic activity of Drynariaquercifolia(L.) J. Smith. Jundishapur J Microbiol 2009;2:25-30.
7. Mollik, A.H., Hasan, N., Hossan, S., Jahan, R., Rahmatullah, M., Medicinal plants used against malaria in several regions of Bogra district, Bangladesh. Planta Med 2009;75:39.DOI: 10.1055/s-0029-1234518.
8. Rahman, M.A., Uddin, S.B., Wilcock, C.C., Medicinal Plants used by Chakma tribe in Hill Tracts districts of Bangladesh. Indian J Trad Know 2007;6:508-517
9. Rahim Z.B, Rahman M.M, Saha D, Hosen S.M.Z, Paul S, Kader S.Etnomedicinal plants used against Jaundice in Bangladesh and its economical prospects. Bul Pharmac Res 2012;2:91-105
10. Rahmatullah M, Jahan R, Seraj S, Islam F, Jahan F.I, Khatun Z, Sanam S, Monalisa M.N, Khan T, Biswas K.R. Medicinal Plants Used by Folk and Tribal Medicinal Practitioners of Bangladesh for Treatment of Gonorrhea, Am Euras J Sust Agric 2011;5:358-363.
11. Rahmatullah M, Azam N.K, Khatun Z, Seraj S, Islam F, Rahman A, Jahan S, Aziz S. Medicinal plants used for treatment of diabetes by the marakh sect of the Garo tribe living in Mymensingh district, Bangladesh. Afri J Trad Comp Alt Med 2012;9:380-385.
12. Alam, M.K., Medical ethnobotany of the Marma tribe of Bangladesh. Eco Bot 1992;46:330-335.
13. Rahmatullah M, Mukti I. J, Haque A.K.M, Mollik M.A.H, Parvin K, Jahan R, Chowdhury M.H, Rahman, T. An Ethnobotanical Survey and Pharmacological Evaluation of Medicinal Plants used by the Garo Tribal Community living in Netrakona district, Bangladesh. Adv Nat App Sci 2009;3:402-418.
14. Holttum, R.E., A Revised Flora of Malaya and Ferns of Malaya. Government Singapore 1997;2:275-279.
15. Dixit, R.D., Vohra, J.N., A Dictionary of Pteridophytes of India, Botanical Survey of India, 1984,Howrah, India
16. Das, H.B Majumdar, K., Datta, B.K., Ray, D., Ethnobotanical uses of some plants by Tripuri and Reang tribes of Tripura. Nat Prod Rad 2009;8:172-180.
17. Sutha, S., Mohan, V.R., Kumaresan, S., Murugan, C., Athiperumalsamy T.Ethnomedicinal plants used by the tribals of Kalakad-Mundanthurai Tiger Reserve (KMTR), Western Ghats, Tamil Nadu for the treatment of rheumatism. Indian J Tradit Knowledge, 2010;9:502-509.
18. V Manjula and Dr.T Selvin Jebaraj Norman Drynaria quercifolia: A luring cure for chronic pulmonary obstructive disease with relapsed tuberculosis The Pharma Innovation Journal 2017; 6(11): 109-111
19. Ramesh N, Viswanathan MB, Saraswathy A,Balakrishna K,Brindha P,Lakshmanaperumalswamy P. Phytochemical and antimicrobial studies on Drynaria quercifolia, Filtoterapia 2001;72:934-6.
20. Warrier P.K, Nambiar V.P, Ramankutty C. Indian medicinal plants: a compendium of 500 species, volume 2: Orient Longman Ltd. Chennai. 1996;p.345
21. Ramesh N, Viswanathan MB, Saraswathy A, Balakrishna K, Brindha P, Lakshmanaperumalsamy P. Phytochemical and antimicrobial studies on Drynaria quercifolia. Fitoterapia. 2001;72:934–6.
22. Beknal AK, Korwar PG, Halkai M, Kulkarni U, Patil BS, Soodam SR. Phytochemical investigation and antioxidant activity study of Drynaria quercifolia Linn. rhizome. Int J Curr Pharmaceut Res. 2010;4:36–9.
23. Md. Miraj Kobad Chowdhury, Md. Jakir Hossain, M Aftab Uddin Cataractostatic Activity of DrynariaquercifoliaTuber Extract,Bio research communications vol- 03 issue o2 july 2017
24. Kamboj, Pradeep, Kalia, Ajudhia Nath. Hepatoprotective Effect of Drynariaquercifoliafronds hydroalcoholic extract and isolated constituent against CCl4-induced hepatocellular damage. British Journal of Pharmaceutical Research 2013; 3(4): 563.
25. Rajimol EK, Mohammed SP, Latheef N, Sriganesan P. Evaluation of antidiabetic and hypolipidemic potential of Drynaria quercifolia Linn rhizome in streptozotocin induced diabetic rats. Int J Pharm Sci Rev Res. 2014;25:118–24.
26. Ranjan Padhy, Santosh Kumar Dash, Sunita Patra,Sanjeeb Kumar Patro, Studies on healing activity Vis-à-vis microflora of acute induced wounds against solvent extracts of rhizome of DrynariaquercifoliaLinn. Journal of Pharmacy and Biological Sciences 2014
27. Gauri Kaustubh Kulkarni,Renuka V. Kadolkar, Amit B. Maisale et al Anthelmintic activity of Drynariaquercifolia(L.) Journal of Pharmacy Research 2010, 3(5),975-977 975-977
28. Soodam S, Beknal AK. Effects of Boerhaavia diffusa roots and DrynariaquercifoliaRhizome extracts on urolithiatic rats. J Pharm Res 2012; 5:2846-2851
29. Soni, DK, Jagan Mohan A, Sai Goud, Mantena VR, Krishna Raju. Anti-ulcer activity of ethanolic extract of DrynariaquercifoliaLinn. Leaves. Journal of Pharmacy Research 2012; 5 (1):117-119
30. Anuja GI, Latha PG, Suja SR, Shyamal S, Shine VJ, Sini S, Pradeep S,

Shikha P, Rajasekharan S. Anti-inflammatory and analgesic properties of Drynaria quercifolia (L.) J. Smith. J Ethnopharmacol. 2010;132:456–60.

31. B.Janaranjani, G. Prasanna ,M.Chitra PG e tal Antiinflammatory and Antipyretic Activities of DrynariaquercifoliaRhizome in Rats Int. J. Pharm. Sci. Rev. Res., 29(1), November – December 2014; Article No. 13, Pages: 57-61
32. Saravanan S, Mutheeswaran S, Saravanan M, Chellappandian M, Gabriel Paulraj M, Karunai Raj M, Ignacimuthu S, Duraipandiyan V. Ameliorative effect of Drynaria quercifolia (L.) J. Sm., an ethnomedicinal plant, in arthritic animals. Food Chem Toxicol. 2013;51:356–63.
33. Ranjan Padhy,sanjeeb kumar patro ,Mrutunjaya Jena ,Santosh Kumar Dash , Toxicity evaluation of methanolic rhizhome extracts obtained from Dryneria quercifolia (Linn) J. smith in experimental animals. Haya:saudi J.Life Sci:oct ,2017;2(7):255-258.
34. Sreeman namboothiri , chiktsamanjari ,Vidyarambam publishers ,ed 13 th 2017 vata rakta chikitsa adhyaya 3.

§§§