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Ethnomedicinal claims of *Punica granatum* Linn.: A review

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Abstract
Aim and objective: *Punica granatum* Linn., family Lytheraceae, one of the most common domesticated plant and also traditionally used by local traditional healers for various disease conditions. The present review aims to collect all available ethnomedicinal information and research updates on the plant.
Material and methods: The documented ethnomedicinal uses of *P. granatum* from 20 books on medicinal plants and 86 research articles on ethnomedicine, published until December 2020, were reviewed. Name and place of the reporting tribe, parts used along with their therapeutic indications were noted by either external (E) or internal (I) with a particular method of administration if available.
Results and discussion: *Punica granatum* is being reported for its therapeutic uses in 14 states of India and other 10 countries across the globe. Its fruit, fruit rind, leaf, stem bark, seed, flower, stem, root, root bark, twig and whole plant are used in 41 different disease conditions, either through internal administration or external applications in the treatment of diarrhoea, worm infestation, dysentery etc. and through various pharmacological and clinical studies itsantidiarrheal, anthelmintic, antihypertensive, nephron protective, hepatoprotective, estrogenic, uterine contraction etc. activities have been reported.
Conclusion: *Punica granatum* is having multi-layered ethnomedicinal uses. Some of the ethnomedicinal claims are not validated yet. Its use in vomiting, piles, rectal prolapse, conjunctivitis / cataract, leucorrhoea, epistaxis, migraine, fever and anaemia should be evaluated through pharmacological and clinical studies to establish the ethnic claims.

Keywords: *Dadima*, Ethnomedicinal, *Lytheraceae*, Pomegranate, *Punica granatum*

Introduction
Punica Granatum Linn. (Pomegranate) is one among very few plants available in the world which is being extensively used as a fruit as well as medicine. At the global level, India is the world's largest producer of pomegranates followed by Iran, Turkey, USA, Afghanistan and Spain [1]. Pomegranate fruits are available throughout the year and being cultivated in home garden its different parts are extensively used as a source of traditional medicine [2]. It is mentioned as a remedy for roundworm in the Ebers Papyrus (the oldest preserved medical document, from Egypt, ca. 1500 BCE) [3]. Hippocrates used pomegranate seed extracts for numerous ailments including skin and eye inflammation and as a digestive aid, while Dioscorides recommended various pomegranate parts, sometimes in combination with other ingredients, for stomach ailments, mouth and genital sores, gum disorders and loose teeth, as well as for expelling parasites [4].

Geographical Origin and Distribution
Pomegranate (PG) was domesticated in 2000 BC and was one of the first five fruit crops (date palm, fig, olive, grape and pomegranate) to be domesticated by mankind [1]. It is indigenous to Iran and neighboring countries that gradually developed in central Asia regions to Himalaya, Eyelet of Anatolia, Middle East, and Mediterranean area. It also thrive in Arizona and California, and has been cultivated in the Mediterranean region, South Asia, and the Middle East countries; Kandahar in Afghanistan is famous for its high quality pomegranate. Today, pomegranate is cultivated in 11 countries all-around the world [5].

In India, PG is found in the wild only in the Western Himalayan regions comprising the states of Jammu, Kashmir, Himachal Pradesh, and Uttarakhand [6].

Plant Descriptions
Pomegranate is one of only two species in the *Punica* genus; it was the sole genus in the *Punicaceae* family [7] prior to its reclassification in *Lytheraceae* [8]. PG is a deciduous shrub or small tree, sometimes thorny, growing to 16 feet (five meters) tall. It has oblong, shiny, leathery leaves up to three inches (eight centimeters) in length, and the scarlet funnel-shaped flower has five-to-eight rumpled petals with a matching calyx. The fruit is a large berry with tough, leathery skin (called a husk, rind, or pericarp), with a persistent calyx and fleshy pulp enclosing edible seeds [9]. PG as a fruit not only attracts a lot of public interest but research is also focused on its medicinal properties and food industry [10]. In Ayurveda, this is known as *Dadima* and highlighted for its therapeutic uses.
Information about the ethno-medicinal uses of the PG can be traced different platforms (i.e. journals, reports, books, and web-based sources). A single-hand information about its traditional uses is still lacking. Hence, in this article an attempt has been made to report the, and ethnomedicinal uses and reported studies of PG.

Material and methods
Study selection
Inclusion criteria
Publications that described the use of *Punica granatum* (alone or with any combination of other herbs) to treat any

disease conditions either human or animal or used as food i.e. having any economic value were included in the review. This includes both external and internal applications with no language restrictions and date limitation.

Exclusion criteria

Other species of *Punica* were excluded from the present review.

Data Collection

Information on all reported ethnomedicinal uses of the PG from available 20 books related to ethnobotany and more than 86 ethnomedicinal research articles were compiled from library sources as well as from Google Scholar, PubMed, Science Direct and J-Gate from November 2020 to December 2020. The details of number of articles searched from individual search engines and screening method are presented in (Fig 1).

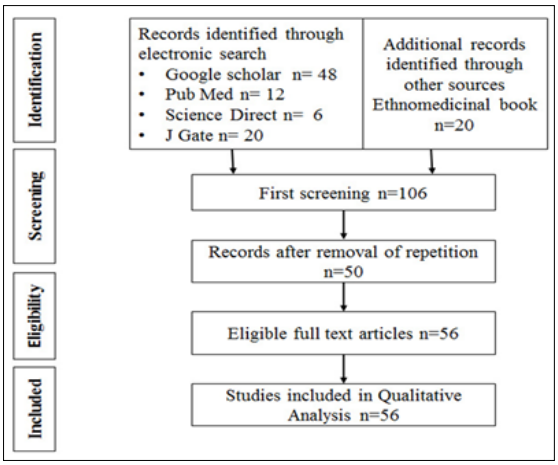

Fig 1: Data collection and screening method.

Result and discussion

Local name: *Punica granatum* is known by 14 names in 16 languages. Anar: Bihar, Jharkhand, Karnataka, Punjab, Uttar Pradesh, Uttrakhand and Iran; Dalim: Asam; Dadam: Gujarat; Dadu: Kashmir; Daan Kul: Kashmir; Darooni: Kashmir; Dalimba: Maharashtra, Odisha; Darimba: Maharashtra; Darima, Dadima: Uttarakhand; Gulnar: Saudi Arab; Madhulai: Tamil nadu; Kamphoi: Manipur; Shi Liu Pi: China; Pomegranate: Fiji, Mexico, Philippines, Mauritius and Indonesia. (Table 1).

Area of reporting

P. granatum is observed to be used as medicine in 14 states of India viz. Assam, Bihar, Gujarat, Himanchal Pradesh, Jharkhand, Kashmir, Karnataka, Maharashtra, Manipur, Punjab, Saurashtra, Tamil Nadu, Uttar Pradesh, Uttrakhand and in 10 countries, such as Bhutan, China, Indonesia, Iran, Mauritius, Mexico, Philippines, Saudi Arabia, South Pacific Fiji and Tibet. This shows the availability and wide spread use of this plant across India and other part of the world (Fig 2 and Table 1 & 2).

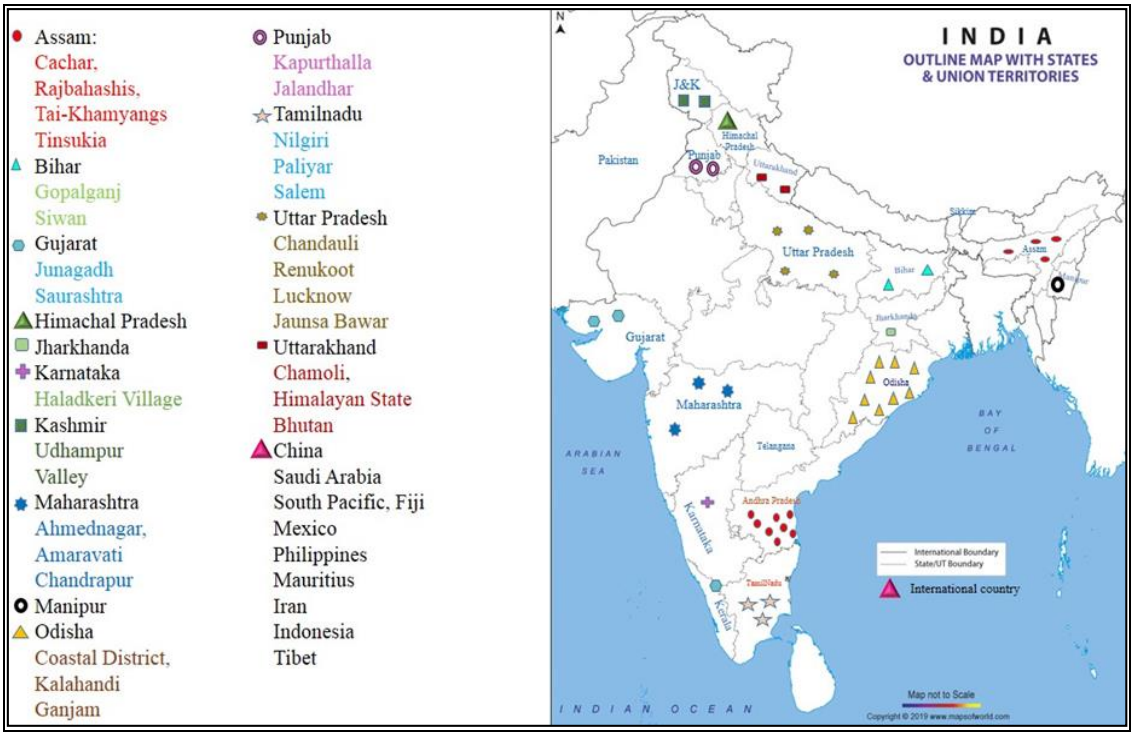

Fig 2: Ethnomedicinal claims of *P. granatum* in different state according to tribes.

Therapeutic uses

The whole plant of *Punica granatum* or its fruit, fruit rind, seed, flower bud, root, root bark, stem, stem bark, leaves and twig are observed to be used in 41 different disease conditions. Out of the 65 reporting, maximum 18 reports for its use in diarrhoea followed by 16 in worm infestation; 14 in dysentery; 5 each in cough and jaundice; 4 each in anaemia, loss of appetite; 3 each in piles, vomiting, stomach pain; 2 each in asthma, cardiac diseases, fever, gastritis, leucorrhoea, nausea, nasal bleeding, oral cavity inflammation and urinary disorder; 1 each in abdominal bloating, amenorrhoea, bed sore, conjunctivitis, cataract, dental diseases, diabetes, miscarriage, post-delivery complications, premature ejaculation, rectal prolapse, syphilis, snake bites, migraine, eye-ear disease, uterine bleeding, lungs disease, pimples, healthy gum, memory enhancer. (Table 1).

Table 1: Reported uses of *P. granatum* in various disease conditions.

S. No	No. of claims	Disease conditions	Area of reporting (part used)
1.	18	Diarrhoea	Manipur (Fr,S,Sb,R), Jharkhand (Fr), Uttarakhand (P,Sb), Tamil Nadu (P,Fl), Gujarat (P), China (P), Odisha (L,Sd,F,Fr), Assam (S), Mauritius (Sb), Indonesia, Bhutan
2.	16	Worm infestation	Manipur (Fr,S,Sb,R), Uttarakhand (Fr,P,Sb), China (P), Bihar (Fl,Sb,L), Himachal Pradesh (Sb), Kashmir (Sb), Mauritius (Sb), Uttar Pradesh (Rb), Tamil Nadu (Rb)
3.	14	Dysentery	Manipur (Fr,S,Sb,R), Jharkhand (Fr), Uttarakhand (P,Sb), Assam (P,L), China (P), Tamil Nadu (Fl), Mauritius (Sb), Odisha (L,Sd), Maharashtra (Fr,Sb)
4.	5	Jaundice	Uttar Pradesh (Fr), Kashmir (Fr, P, Sd), Bihar (L)
		Cough	Tibet (Fr), Bihar (Fl,Sb), Tamil Nadu (Fl),
5.	4	Anaemia	Uttarakhand (Fr), Punjab (Fr,S), Kashmir (Sd), Indonesia
		Loss of appetite	Karnataka (Fr), Tibet (Fr), Punjab (Sd), Bhutan
6.	3	Piles	Gujarat (Fr), Punjab (Sd), Bihar (Fr,L)
7.		Vomiting	Utar Pradesh (Fr), Himachal Pradesh (Sd), Bihar (Fr,L)
8.		Stomach pain	Tamil Nadu (P), Kashmir (P), Indonesia
9.	2	Asthma	Maharashtra (P), Mauritius
10.		Cardiac diseases	Bihar (Fr,L), Indonesia
11.		Fever	Uttrakhand (Fr), Maharashtra (Fr)
12.		Gastritis	Assam (L), Iran
13.		Leucorrhoea	China (P), Indonesia
14.		Nausea	Uttar Pradesh (Rb), Tamil Nadu (Rb)
15.		Nasal bleeding	Assam (L), Assam (Sb)
16.		Oral cavity inflammation	Mexico (Fl), Philippines (L)
17.		Urinary disorder	Assam (R), Indonesia
18.	1	Abdominal bloating	Gujarat (P)
19.		Amenorrhoea	Odisha (Fr)
20.		Bed sore	Saudi Arabia (P)
21.		Conjunctivitis	Assam (Fr)
22.		Cataract	Assam (Sd)
23.		Dental diseases	Karnataka (Fr)
24.		Diabetes	South Pacific Fiji (P)
25.		Miscarriage	Jharkhand (L)
26.		Post-delivery complications	Jharkhand (L)
27.		Premature ejaculation	China (P)
28.		Rectal prolapse	China (P)
29.		Syphilis	South Pacific Fiji (P)
30.		Snake bites	Uttar Pradesh
31.		Migraine	Bihar (L)
32.		Eye-ear disease	Bihar (L)
33.		Uterine bleeding	China (P)
34.		Lungs disease	Tibet (Fr)
35.		Pimples	Tamil Nadu (P)
36.		Healthy gum	Odisha (T)
37.		Memory enhancer	Uttar Pradesh (Fr)
38.		Anti-microbial	Uttrakhand (P)

Fr=Fruit, S=Stem, Sb= Stem bark, R= Root, Rb= Root bark, P=Peel, Sd=Seed, Fl= Flower, T=Twig

Parts used

The whole plant of PG or its fruit, fruit rind, seed, flower bud, root, root bark, stem, stem bark, leaves and twig are observed to be used in 41 different disease conditions. Fruits is reported by maximum 18 tribes / area. Fruit rind is reported by 12 tribes followed by 10 for leaf, 8 for bark / stem bark; 6 for seed; 4 for flower / bud; 3 for stem / shoot, 2 each for root and root bark, 1 each for twig and whole plant. 4 tribes / area did not report any part used. (Table 2).

Dosage form

Fruit, fruit rind, seed, flower bud, root, root bark, stem, stem bark, leaves and twig of PG are used in 4 dosage forms. Among them, Juice (12) and paste (12) are maximum dosage form found followed by powder (9) and

Decoction (8). Raw fruits has been in use by 6 reportings. (Table 2).

Table 2: Ethnomedicine claims of different parts of *Punica granatum*

Local name	Tribes/ areas	Dosage form: External (E); internal (I) uses	Therapeutic claims
Fruit			
Darima	Uttrakhand	Juice (I)	Fever (diuretic and cooling effect) [11]
Kamphoi	Manipur	Raw fruit (I)	Worm infestation, Diarrhoea, Dysentery [12]
Dalim	Tinsukia, Assam	Juice (E)	Conjunctivitis [13]
Anar	Jharkhand	Raw fruit (I)	Diarrhoea, Dysentery [14]
Anar	Chamoli District, Uttrakhand	Raw fruit (I)	Anaemia [15]
Dadim	Himalayan state, Uttrakhand	Raw fruit (I)	Worm infestation [16]
Anar	Chandauli, Uttar Pradesh	Decoction, Raw Fruit (I)	Jaundice and Vomiting [17]
Anar	Renukoot, Uttar Pradesh	Raw Fruit (I)	Memory booster. [18]
Dalimba	Ahmednagar, Maharastra	Juice (a full glass) twice a day. (I)	Fever. [19]
Dalimba	Kalahandi District, Odisha	Paste unripe fruit with fermented rice water for 3-5 days. (I)	Amenorrhoea [20]
Anar	Haladkeri Village, Karnataka	-	Loss of appetite and Dental disease [21]
Darooni	Udhampur, Kashmir	Juice Fruit mixed with *Phyllanthus emblica* juice. (I)	Jaundice [22]
Anar	Kapurthala District, Punjab	Juice (I)	Anaemia [23]
Dadam	Saurashtra, Gujarat	Powder (I)	Piles [24]
-	Tibet	Powder (I)	Loss of appetite, cough and Lungs disease [25]
Fruit Rind / Peel / Pericarp / Skull of Fruit			
Darima	Uttrakhand	-	Diarrhoea, Dysentery / Worm infestation [11]
Madhulai	Nilgiri, Tamil Nadu	Paste made up of powder of fruit pericarp and 15gm butter (E)	Pimples [26]
Madhulai	Paliyar Tribe, Tamil Nadu	Paste- dried fruit coat is grounded and mixed with water (I)	Stomach pain and Diarrhoea [27]
Dalim	Tai-Khamyangs of Assam	Paste prepared by mixing dried root of *Garcinia pedunculata*, Peel of *Punica granatum* and 1 dried *Terminalia chebula*. (I)	Dysentery [28]
Darim	Uttrakhand	Decoction given with Jaggery (I)	Anti-microbial [29]
Dalimba	Amravati District, Maharastra	Decoction prepared from fruit bark along with stem bark of *Azadirachta indica* from which half cup is taken once in a day for 21 days. (I)	Asthma [30]
Darooni	Udhampur, Kashmir	Powder- dried and finely powdered fruit rind (I)	Jaundice [22]
Darooni	Udhampur, Kashmir	Powder- crushed rind along with curd (I)	Stomach pain [22]
Dadam	Junagadh, Gujarat	Decoction (I)	Diarrhoea and Abdominal bloating [31]
-	Northern part of Saudi Arabia	Paste of fruit rind	Bed sore [32]
Shi liu pi	China	(I), (E)	Diarrhoea, Dysentery, Rectal prolapse, Premature ejaculation, Uterine bleeding, Leucorrhoea, Worm infestation [33]
-	South pacific, Fiji	Powder with water (I)	Diabetes [34]
Seeds			
Dalim	Assam, India	Juice (E)	Cataract [35]
Dadu	Himachal Pradesh	Juice (I)	Vomiting [36]
Daan Kul	Kashmir Valley	-	Jaundice and Anaemia [37]
Anar	Kapurthala District, Punjab	(I)	Loss of appetite and Piles [18]
-	South pacific, Fiji	Decoction (I)	Syphilis [38]
Flower bud			
Anar	Gopalganj, Bihar	(I)	Worm infestation, Cough [39]
Madhulai	Salem District, Tamil Nadu	(I)	Cough, Dysentery, Diarrhoea [40]
-	Mexico	Decoction (E)	Oral cavity inflammation [41]
Leaf			
Dalim	Assam, India	Juice (E)	Epistaxis (Nasal Bleeding) [35]
Dalim	Rajbahshis, Assam	Extract (I)	Gastritis [42]
Dalim	Cachar, Assam	Juice (I)	Dysentery [43]
Anar	Jharkhand	Leaves of *Punica granatum* and wood of *Symplocos racemosa* Roxb (I)	Miscarriage [14]
Anar	Jharkhand	(I)	Post-delivery complaints[14]
Dalimba	Coastal district, Odisha	15-16 fresh Leaf Juice (1 spoon) twice daily (I)	Diarrhoea [44]
-	Philippines	Decoction (E)	Oral cavity inflammation [45]
Stem / Shoot			
Dalim	Tinsukia, Assam	Decoction (I)	Diarrhoea [13]

Kamphoi	Manipur	(I)	Worm infestation, Diarrhoea, Dysentery. [12]
Anar	Jalandhar District, Punjab	(I)	Anaemia, Dental Problems [46]
Bark / Stem Bark			
Darima	Uttrakhand	(I)	Diarrhoea, Dysentery / Worm infestation. [11]
Kamphoi	Manipur	(I)	Worm infestation, Diarrhoea, Dysentery. [12]
Dalim	Rajbahshis, Assam	Paste made up of bark of *Punica granatum* pounded with few drops of extract of *Cynodon dactylon*. (E)	Epistaxis (Nasal Bleeding) [42]
Anar	Gopalganj, Bihar	(I)	Worm infestation, Cough [39]
Dadu	Himachal Pradesh	-	Worm infestation [36]
Darooni	Udhampur, Kashmir	Powder- dried and powdered stem bark (I)	Worm infestation[22]
-	Mauritius	Powder- macerated bark extract	Asthma, Diarrhoea, Dysentery, Worm infestation [47]
Root			
Dalim	Tinsukia, Assam	Juice (I)	Urinary Disorder [13]
Kamphoi	Manipur	(I)	Worm infestation, Diarrhoea, Dysentery. [12]
Root Bark			
-	Lucknow, Uttar Pradesh	(I)	Worm infestation, Nausea [48]
Madhulai	Nilgiri District, Tamil Nadu.	(I)	Worm infestation, Nausea [49]
Seed and Leaf			
Dalimba	Odisha	Paste (I)	Diarrhoea and Dysentery [50]
Fruit, Leaf and whole Plant			
Anar	Siwan, Bihar	-	Cardiac diseases, Eye – ear disorder, Migraine, Jaundice, Vomiting, Piles Worm infestation [51]
Fruit and bark			
Darimba	Chandrapur, Maharashtra	-	Dysentery [52]
Twig			
Dalimba	Kalahandi District, Odisha	Tooth Brush (E)	For strong teeth and healthy gum[20]
Leaf, bud or Unripe fruit			
Dalimba	Ganjam District, Odisha	Paste with rice washed water administrated along with a minute pinch of *Opium* half cup taken twice a day. (I)	Diarrhoea [53]
Part not specified			
Anar	Iran	(I)	Gastritis [54]
-	Indonesia	(I)	Leucorrhoea, Stomach pain, Urinary Disorder, cardiac diseases, cough and Diarrhoea [55]
-	Bhutan	(I)	Loss of appetite and Diarrhoea [56]
Anar	Jaunsar Bawar Hills, Uttar Pradesh	Paste (E)	Snake Bites [57]

Research update

Many of the ethnomedicinal claims on PG are already noted in the classical texts of Ayurveda. But there are certain claims which are not noted in classical texts of Ayurveda also. When analysed critically it is observed that PG is being included in many classical formulations which are indicated in many of the ethnomedicinal claims. Details of updated pharmacological and clinical research reported on PG are presented in systematic manner in Table 3.

It is observed that many of ethnomedicinal claims have also been scientifically proved through pharmacological and clinical studies.

Table 3: Ethnomedicinal claims, Ayurvedic indications, formulations and reported studies of *P. granatum*.

	Ethnomedicinal claims	Indications of PG in Ayurveda	Ayurvedic formulations containing PG	Reported research activities
Gastrointestinal system				
1.	Diarrhoea / Dysentery	*Atisarajita* [58] *Pravahika* [59]	-	Antidiarrhoeal activity [60]
2.	Worm Infestation	-	*Dadimadi Kashaya* [61]	Anthelminthic activity [62]
3.	Vomiting	*Chardi* [58]	-	-
4.	Antispasmodic	-	*Dadimadi Churna* [63]	Analgesic activity [64]
5.	Gastritis	*Daha* [65]	-	Gastroprotective activity [66]
6.	Piles	*Arshajita* [67]	-	-
7.	Rectal prolapse		*Ajakadi Yoga* [68]	-
Respiratory system				
8.	Asthma	-	*Dadimadi Churna* [69]	Effect on COPD[70]
9.	Cough	-	*Dadimadi Ghrita* [71]	
Cardiovascular system				
10.	Heart problem / High BP	*Hridya* [65]	-	Antihypertensive activity [72]; Cardio protective activity [73]
Urinary system				
11.	Frequent urination	-	*Dadima Kanji* [74]	Nephro protective activity [75]

Reproductive System				
12.	Premature ejaculation	*Shukrala* [65]	-	Sperm Protective activity [76]
13.	Amenorrhea / Uterine bleeding	-	*Jambavadi Ghrita* [77]	Estrogenic activity [78]
14.	Post-delivery complication	-	*Mangalyaka Ghrita* [79]	Uterine Contractile activity[80]
15.	Leucorrhoea	-	*Somanatha Rasa* [81]	-
Others				
16.	Conjunctivitis / Cataract	-	*Dadima Patra Lepa* [82]	-
17.	Dental / Strong Gum	-	*Dadimadi Churna* [83]	Antigingivitis activity / Antiplaque activity [84]
18.	Epistaxis (nasal Bleeding)	-	*Dadima Phalatvaka Churna* [85]	-
19.	Migraine	-	*Dadimi Kalika Nasya* [86]	-
20.	Memory enhancer	*Medhya* [65]	-	Memory Enhancement [87]
21.	Fever	*Jvara* [65]	-	-
22.	Anaemia	-	*Dadima Ghrita* [88]	-
23.	Jaundice	-	-	Hepatoprotective activity [89]
24.	Pimples, Skin diseases	-	*Vasarudra Taila*[90]	Skin whitening activity [91]
25.	Diabetes	-	*Dadimadi Ghrita* [92]	Antidiabeteic activity [93]

Conclusion

Present ethnomedicinal review highlights the multiple use of seven different parts of *Punica granatum* L. to combat 42 disease conditions. The plant is maximum reported for its use in diarrhoea, worm infestation, dysentery etc. Fruit, fruit rind and leaf are maximum reported parts used. Some of the ethnomedicinal claims for its use in various disease such as vomiting, piles, rectal prolapse, conjunctivitis / cataract, leucorrhoea, epistaxis, migraine, fever and anaemia are not validated yet through scientific studies. The present review may help to better utilization of the commonly available medicinal plant, for its pharmacological actions.

References

1. National Research Centre on Pomegranate. Indian Council of Agricultural Research. New Delhi, 2015, 12.
2. Al-Said FA, Opara LU, Al-Yahyai RA. Physical, chemical and textural quality attributes of pomegranate cultivars (Punica granatum L.) cultivars in Eastern Mediterranean region of Turkey. Afr J Biotechnol. 2009; 7:1294-1301.
3. Ebbell B (Translator). The Papyrus Ebers: The Greatest Egyptian Medical Document. Copenhagen: Levin & Munksgaard; 1937. Available at http://web.archive.org/web/20050226100008/http://www.macalester.edu/~cuffel/ebers.htm. Accessed, 2020.
4. Stover E, Mercure EW. The pomegranate: a new look at the fruit of paradise. *Hort Science*. August. 2007; 42(5):1088-1092.
5. Shahr Babaki B. Genetic Diversity of Pomegranate Genotypes in Iran. Karaj, Iran: Agriculture Education Publication, 1997.
6. Narzary D, Mahar KS, Rana TS, Ranade SA. Analysis of genetic diversity among wild pomegranates in western Himalaya, using PCR methods. *Sci Hort*. 2009; 121:237-242.
7. Dhiman AK. Medicinal plants of Uttaranchal states. Varanasi: Chaoukhambha Krsihnadas Academy, 2004, 221-222. https://www.theplantlist.org [Assessed on 12 Dec 2015]
8. Engles Gayle, Brinckmann Josef. Pomegranate. The Journal of American Botanical Council. 2013; 100:1-7.
9. Mercola B. What are pomegranates good for? http://articles.mercola.com/sites/articles/archive/2014/05/10/pomegranates.aspx. Accessed, 2020.
10. Dehar N, Walia R, Verma RB, Pandey P. Hepatoprotective Activity of Berberis aristata Root Extract Against Chemical Induced Acute Hepatotoxicity In Rats. Asian J Pharma Clinic Res. 2013; 6(5):53-56.
11. Hazarika Ridip, Kumar S, Abujam S, Neog Bijoy. Ethno Medicinal Studies of Common Plants of Assam and Manipur. International Journal of Pharmaceutical & Biological Archives. 2012; 3(4):809-815.
12. Buragohain J. Ethnomedicinal Plants Used by the ethnic Communities of Tinsukia District of Assam, India. Recent Research in Science and Technology. 2011; 3(9):31-42.
13. Singh H. Ethno-medicinal plants of Jharkhand, India. Herbal cures: Traditional Approach, Jaipur: Aavishkar Publishers, 2008, 248-263.
14. Singh A, Hart R, Chandra S, Nautiyal MC, Sayok AK. Traditional Herbal Knowledge among the Inhabitants: A Case Study in Urgam Valley of Chamoli Garhwal, Uttarakhand, India. Evidence-Based Complementary and Alternative Medicine. Article ID 5656925, 2019, 21. https://doi.org/10.1155/2019/5656925
15. Dwivedi Tripuresh, Kanta Chandra, Singh Raj, Sharma IP. A list of some important medicinal plants with their medicinal uses from Himalayan State Uttarakhand, India. Journal of Medicinal Plants Studies. 2019; 7(2):106-116.
16. Maurya SK, Seth Ankit, Dev nath singh Gautam, Singh Anil Kumar. Biodiversity and Indigenous Uses of Medicinal Plant in the Chandra Prabha Wildlife Sanctuary, Chandauli District, Uttar Pradesh. International Journal of Biodiversity Article ID 394307, 2015, 11. http://dx.doi.org/10.1155/2015/394307.
17. Singh Anurag, Singh GS, Singh PK. Medico-ethnobotanical inventory of renukoot forest division of district, Uttar Pradesh, India. Indian journal ofnatural products and Resources. 2012; 3(3):448-457.
18. Salve NR, Mishra DN. Ethnomedicinal List of Plants Treating Fever in Ahmednagar District of Maharashtra, India. Advances in Zoology and Botany. 2019; 7(3):35-46.
19. Panda Tribhubana, Padhy RN. Ethnomedicinal plants used by the tribes of Kalahandi district, Orissa. Indian journal of Traditional knowledge. 2008; 7 (2):242-249.
20. Suryawanshi Pooja, Vidyasagar GM. Ethnomedicinal plants used by Rajgond tribes of Haladkeri village in

Bidar District, Karnataka, India. Int J Pharm Pharm Sci. 7(8):216-220.
21. Bhatia Harpreet, Sharma Yaspal, Manhas RK, Kumar Kewal. Ethnomedicinal plants used by the villagers of district Udhampur, J&K, India. Journal of Ethnopharmacology. 2014; 151:1005–1018.
22. Kaur J, Kaur R, Nagpal AK. Traditional use of ethnomedicinal plants among people of Kapurthala District, Punjab, India. Phcog Mag. 2020; 16:S69-80.
23. Jadeja BA, Odedra NK, Odedra KR. Herbal remedies used for hemorrhoids by tribals of Saurashtra, Gujarat. Indian Journal of Traditional Knowledge. 2006; 5(3):348-352.
24. Dawa D. *Punica granatum* L. In: A Clear Mirror of Tibetan Medicinal Plants, Volume One. Rome, Italy: Cultural Association Tibet Domani, 1999.
25. Maheshwari JK. Ethnobotany and medicinal plants of Indian Subcontinent. Jodhpur: Scientific Publishers India, 2003, 428.
26. Duraipandiyan V, Ayyanar M, Ignacimuthu S. Antimicrobial activity of some ethnomedicinal plants used by Paliyar tribe from Tamil Nadu, India. BMC Complementary and Alternative Medicine, 2006, 6:35
27. Sonowal R, Barua I. Ethno medical Practices among the Tai-Khamyangs of Assam, India. Ethno Med. 2011; 5(1):41-50.
28. Topwal Mukesh, Uniyal Shailendra. Review on Important Ethno- Medicinal Plants in Uttarakhand. Int. J. Pure App. Biosci. 2018; 6(2):455-464.
29. Jagtap SD, Deokule SS, Bhosle SV. Some unique ethnomedicinal uses of plants used by the Korku tribe of Amravati district of Maharashtra, India. Journal of Ethnopharmacology. 2006; 107:463–469.
30. Bhatt PR, Pandya Kajal B, Patel UD, Patel HB, Modi CM. Survey on Ethno veterinary Practices around Junagadh, Gujarat, India. Indian Journal of pharmaceutical science. 2019; 81(1):161-167.
31. Alshammari Nouf Dughayshim, Fatima Nudrat, Nayeem Naira. Punica granatum Rind, a Traditional Herbal Medicine: Effect on wound healing. International Journal of Pharmaceutical Research & Allied Sciences. 2017; 6(1):53-58.
32. Bensky D, Gamble A. *Chinese Herbal Medicine Materia Medica*, Revised Edition. Seattle, WA: Eastland Press, 1993.
33. Singh YN. Traditional medicine in Fiji: some herbal folk cures used by Fiji Indians. J Ethnopharmacol. 1986; 15:78–88
34. Maheshwari JK. Ethnobotany and medicinal plants of Indian Subcontinent. Jodhpur: Scientific Publishers India, 2003, 593.
35. Shalini Vidyarthi, Sher S. Samant, Pankaj Sharma. Traditional and indigenous uses of medicinal plants by local residents in Himachal Pradesh, North Western Himalaya, India, International Journal of Biodiversity Science, Ecosystem Services & Management. 2013; 9(3):185-200.
36. Dar Pervaiz Ahmad, Rashid Nahida, Athar Parwez, Kalam Afsahul. Ethnomedicinal practices of Kashmir valley: A Review. Journal of Pharmacognosy and Phytochemistry. 2018; 7(6):278-284
37. Singh YN. Traditional medicine in Fiji: some herbal folk cures used by Fiji Indians. J Ethnopharmacol. 1986; 15:78–88
38. Prasad SK, Singh BN. Documentation of Ethno Medicinal Plants of Gopalganj District of Bihar (India). *IOSR* Journal of Pharmacy and Biological Sciences. 2014; 9(3):80-89.
39. Alagesaboopathi C. Ethnomedicinal plants and their utilization by villagers in Kumaragiri hills of Salem District of Tamilnadu, India. Afr. J. Traditional, Complementary and Alternative Medicines. 2009; 6(3):222-227
40. Lim TK, Punica granatum. Edible Medicinal and Non-Medicinal Plants. 2012; 5:136-194.
41. Maheshwari JK. Ethnobotany and medicinal plants of Indian Subcontinent. Jodhpur: Scientific Publishers India, 2003, 613.
42. Das Ajit Kumar, Dutta BK, Sharma GD. Maedicinakl plants used by different tribes of Cachar district, Assam. Indian journal of Traditional Knowledge. 2008; 7(3):446-454.
43. Sahu SC, Pattnaik SK, Sahoo SL, Lenka SS, Dhal NK. Ethnobotanical study of medicinal plants in the coastal districts of Odisha. Current Botany. 2011; 2(7):17-20.
44. Lim TK, Punica granatum. Edible Medicinal and Non-Medicinal Plants. 2012; 5:136-194.
45. Sidhu MC, Kaur Kuljinder, Ahluwalia AS. Ethno-Medicinal Studies of Plants in Jalandhar District of Punjab, India. International Journal of Plant Research. 2102; 25(2):143-150.
46. G Rouillard, J Gu´eho. *Les PLantes Et Leur Histoire `A L'Ile Maurice*, 1999.
47. Maheshwari JK. Ethnobotany and medicinal plants of Indian Subcontinent. Jodhpur: Scientific Publishers India, 2003, 217.
48. Maheshwari JK. Ethnobotany and medicinal plants of Indian Subcontinent. Jodhpur: Scientific Publishers India, 2003, 386.
49. Panda Sujogya Kumar. Ethno-medicinal uses and screening of plants for antibacterial activity from Similipal Biosphere Reserve, Odisha, India. Journal of Ethnopharmacology. 2014; 151:158-175.
50. Mourya GC, Kumari GP, Kumar G. Indigenous knowledge on medicinal plants of Siwan district of Bihar, India. Journal of Global Biosciences. 2018; 7(1):5358-5362.
51. Harney NV. Ethnomedicinal plants diversity of Bhadrawati Tahsil of Chandrapur district, Maharastra, India. International Journal of Scientific and Research Publications. 2013; 3(8):1-6.
52. Mohanty RB, Padhy SN, Dash SK. Traditional Phytotherapy for Diarrhoeal Diseases in Ganjam and Phulbani Districts of South Orissa, India. Ethnobotany. 1996; 8:60-65.
53. Safavi M, Shams-Ardakani MR, Seyedbagheri MS, Foroumadi A. The Efficacy of Iranian Traditional and Folk Medicinal Plants for Some Gastroduodenal Disorders. Trad Integr Med. 2016; 1(1):3-17.
54. Lestari MW, Soemardji AA, Fidrianny I. Review of traditional use, pharmacological effects, and toxicity of medicinal plants for women's health in Indonesia. Asian Journal of Pharmaceutical and clinical research. 2016; 9(1):41-46.
55. Sebru-4. In: *Traditional Medicine National Formulary*, second edition. Institute of Traditional Medicine Services. Available at:

www.health.gov.bt/itms/06medicine/06htm/06meng_s/72se.bru-4l.htm. Accessed, 2013.
56. Jain SP, Puri HS. Ethno medical plants of Jaunsar-Bawar Hills, Uttar Pradesh, India. J Ethnopharmacol. 1984; 12:213–222
57. Vyas keshava Ram, Laghu Nighantu. (E–nighantu). Developed by NIIMH (National Institute of Indian Medical Heritage), Hyderabad for CCRAS (Central Council for Research in Ayurvedic Science) New Delhi, 2012. (Available from: http://www.niimh.nic.in/ebooks/e-Nighaṇṭu.)
58. Vaghbhata, Astanga Hridaya, Gupta Atrideva. Editor. 2nd ed. Varanasi: Chaukhamba Prakashan, 2012.
59. Das AK, Mandal SC, Banerjee SK, Sinha S, Das J, Saha BP, Pal M. Studies on antidiarrhoeal activity of *Punica granatum* seed extract in rats. J Ethnopharmacol. 1999; 68(1–3):205–208
60. Nishteswar K, Vidyanath R. Sahasrayogam. Varanasi: Chaukhamba Krishnadas Academy, 2006, 40.
61. Wibaut JP, Hollstein U. Investigation of the alkaloidsof *Punica granatum*. Arch Biochem Biophys. 1957; 69:27–32
62. Shah Naginadasa Chhaganlal. Bharat Bhaishajya Ratnakar. 1st ed. New Delhi: B. Jain Publishers. 1999; 3:27
63. Chakraborthy GS. Analgesic activity of various extracts of *Punica granatum* (Linn) flowers. Int J Green Pharm. 2008; 2:145-146
64. Bhavamishra, Bhavaprakash Nighantu, Chunekar KC. editor. Amradi Phala varga, Varanasi: Chaukhamba Bharati Academy, 2013, 300-302.
65. Ajaikumar KB, Asheef M, Babu BH, Padikkala J. The inhibition of gastric mucosal injury by *Punica granatum* L. (pomegranate) methanolic extract. J Ethnopharmacol. 2005; 96(1–2):171–176
66. Madhava, Madhava Dravyaguna. (E–nighaṇṭu). Phala Varga, Sreshtha Varga, Panabhakshya Varga. Developed by NIIMH (National Institute of Indian Medical Heritage), Hyderabad for CCRAS (Central Council for Research in Ayurvedic Science) New Delhi, 2012. (Available from: http://www.niimh.nic.in/ebooks/e-Nighaṇṭu.)
67. Dasa Bhagwan, Rasaraj Mahodadhi. Mumbai. Khemaraja Shri Krishna Dasa Academy. 2012; 2:169
68. Shri Vallabhacharya. Vaidya Cintamani. Ram Nivas Shrma., editor. Delhi: Chaukhamba Snskrita Prakashan, 2000, 274.
69. Cerdá B, Soto C, Albaladejo MD, Martínez P, Sánchez-Gascón F, Tomás-Barberán F, *et al*. Pomegranate juice supplementation in chronic obstructive pulmonary disease: a 5-week randomized, double blind, placebo-controlled trial. Eur J Clin Nutr. 2006; 60(2):245-253.
70. Vaghbhata, Astanga Hridaya, Gupta Atrideva. Editor. 2nd ed. Chikitsa Sthana 3/165, Varanasi: Chaukhamba Prakashan, 2012, 429.
71. Waghulde H, Mohan M, Kasture S, Balaraman R. *Punica granatum* attenuates angiotensin-II induced hypertension in Wistar rats. Int J PharmTech Res. 2010; 2(1):60–67
72. Sumner MD, Elliott-Eller M, Weidner G, Daubenmier JJ, Chew MH, Marlin R, *et al*. Effects of pomegranate juice consumption on myocardial perfusion in patients with coronary heart disease. Am J Cardiol. 2005; 96(6):810–814
73. Harita, Harita Samhita, Tripathi Harihar Prasad. editor. 30/18, Varanasi: Chaukhamba Krishnadas Academy, 2009, 395.
74. Singh AP, Singh AJ, Singh N. Pharmacological investigations of *Punica granatum* in glycerol-induced acute renal failure in rats. Indian J Pharmacol. 2011. 43(5):551–556
75. Türk G, Sönmez M, Aydin M, Yüce A, Gür S, Yüksel M, *et al*. Effects of pomegranate juice consumption on sperm quality, spermatogenic cell density, antioxidant activity and testosterone level in male rats. Clin Nutr. 2008; 27(2):289–296
76. Shree Basavaraja. Basavrajiyam. Krishnamurthy M.S., editor. 16/36, Varanasi: Chaukhamba Orientalia. 2000, 403.
77. Mori-Okamoto J, Otawara-Hamamoto Y, Yamato H, Yoshimura H. Pomegranate extract improves a depressive state and bone properties in menopausal syndrome model ovariectomized mice. J Ethnopharmacol. 2004; 92(1):93-101
78. Kashyapa, Kashyapa Samhita, Tiwari PV. editor. 11/168, Varanasi: Chaukhamba Vishwabharati, 2008, 593
79. Promprom W, Kupittayanant P, Indrapichate K, Wray S, Kupittayanant S. The effects of pomegranate seed extract and {beta}-sitosterol on rat uterine contractions. Reprod Sci. 2010; 17(3):288-296
80. Shah Naginadasa Chhaganlal. Bharat Bhaishajya Ratnakar. 1st ed. New Delhi: B. Jain Publishers. 1999; 5:388.
81. Sharangadhara, Sharangadhara Samhita, Srivastava Shailaja. editor. 13/34, Varanasi: Chaukhamba Orientalia, 2013, 485.
82. Bhatta Krushnarama, Siddhabheshaja Manimala. 4/47, Varanasi: Chaukhamba Krishnadas Academy. 2008, 321.
83. Bhadbhade SJ, Acharya AB, Rodrigues SV, Thakur SL. The antiplaque efficacy of pomegranate mouthrinse. Quintessence Int. 2011; 42(1):29-36
84. Harita, Harita Samhita, Tripathi Harihar Prasad. editor. 10/47, Varanasi: Chaukhamba Krishnadas Academy, 2009, 286
85. Bhishagvara Vidyapati, Vaidya Rahasya. Tripathi Indradeva., editor. Verse 6, Varanasi: Chaukhamba Krishndas Academy, 2008, 325.
86. Cambay Z, Baydas G, Tuzcu M, Bal R. Pomegranate (Punica granatum L.) flower improves learning and memory performances impaired by diabetes mellitus in rats. Acta Physiol Hung. 2011; 98(4):409-20.
87. Agnivesh, Charaka Samhita, 2nd ed. Shastri Rajeswara Datta. editor. Chikitsa Sthana 16/44, Varanasi: Chaukhamba Bharati Academy, 2011, 494.
88. Celik I, Temur A, Isik I. Hepatoprotective role and antioxidant capacity of pomegranate (*Punica granatum*) fl owers infusion against trichloroacetic acidexposed in rats. Food Chem Toxicol. 2009; 47(1):145-149
89. Shah Naginadasa Chhaganlal, Bharat Bhaishajya Ratnakar. 1st ed. New Delhi: B. Jain Publishers. 1999; 4:660.
90. Adhikari A, Devkota HP, Takano A, Masuda K, Nakane T, Basnet P, *et al*. Screening of Nepalese crude drugs traditionally used to treat hyperpigmentation: *in vitro* tyrosinase inhibition. Int J Cosmet Sci. 2008; 30(5):353-360

91. Vangasena. Vangasena Samhita. Tripathi Harihar Prashada., editor. 41/72, Varanasi: Chaukhamba Krishna Das Academy. 2009, 582.
92. Katz SR, Newman RA, Lansky EP. *Punica granatum*: heuristic treatment for diabetes mellitus. J Med Food. 2007; 10(2):213-217