

Tracing the Useful Ethnophytomedicinal Recipes of Angiosperms Used Against Jaundice and Hepatitis in Indo-Pak Subcontinent

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Abstract: Jaundice is not a disease but rather a sign that can occur in many different diseases. Jaundice may result from various diseases or conditions that affect the liver, like hepatitis and others. This paper is based on data recorded from various literatures pertaining to ethnophytomedicinal recipes used against jaundice and hepatitis in Indo-Pak subcontinent (India and Pakistan). In total 134 useful phytorecipes of 112 angiosperms belonging to 100 genera and 48 families were collected. Out of these, three recipes were of spiritual nature. The dominant families having great potential to be used against jaundice and hepatitis were *Asteraceae*, *Cucurbitaceae*, *Euphorbiaceae* and *Fabaceae* (8 spp each) followed by *Lamiaceae*, *Rubiaceae* and *Rutaceae* (4 spp each) and *Acanthaceae*, *Aizoaceae*, *Anacardaceae*, *Apoaceae*, *Moraceae* and *Poaceae* (3 spp. each). These traditional phytorecipes include extracts, leaves, powders, flour, seeds, vegetables, fruits and herbal mixtures. Data inventory consists of botanical name, recipe, vernacular name, English name and habit. Medicinal plants play a key role in the human health care. They have great potential for the treatment of liver diseases. Hence, further work is needed in this regard.

Key words: Liver diseases • Treatment • Medicinal plants • Spiritual phytorecipes

INTRODUCTION

Jaundice is not a disease but rather a sign that can occur in many different diseases. Jaundice is the yellowish staining of the skin and sclera (the whites of the eyes) that is caused by high levels in blood of the chemical bilirubin. The yellowish coloration of the skin and sclera vary depending on the level of serum bilirubin. When the bilirubin level is mildly elevated, they are yellowish. When the bilirubin level is high, they tend to be brown [1].

The word hepatitis comes from the Ancient Greek word *hepar* (root word *hepat*) meaning 'liver' and the Latin 'itis' meaning inflammation. Hepatitis means injury to the liver with inflammation of the liver cells [2]. Hepatitis is usually but not always the result of a virus. Most of the publicity we hear these days concerns the spread of Hepatitis C. In fact hepatitis can be caused by alcohol and chemicals as well as many different viruses [3]. Jaundice may result from various diseases or conditions that affect the liver,

like the different types of viral Hepatitis A, B, C, D, E and G. Autoimmune hepatitis, Liver cirrhosis, Liver cancer, hepatocarcinoma, Hemolytic anaemia and Malaria [4].

There is no unique treatment for jaundice and hepatitis by prescribing modern allopathic and homeopathic medicine. Although different workers have documented medicinal plants from various regions of world particularly Indo-Pak subcontinent which have been presented in this review paper.

Medicinal plants play a key role in the human health care. About 80% of the world population rely on the use of traditional medicine which is predominantly based on plant materials [5]. The use of plants as source of remedies for the treatment of diseases date back to prehistoric times [6].

About 420,000 flowering Angiospermic plants were reported and more than 50,000 tropical species are not yet named [7]. Medicinal plants have great potential for the treatment of liver diseases. Hence, further work is needed in this regard.

Ethnophytomedicinal Recipes Used for Treatment of Jaundice and Hepatitis:

Botanical name: *Abrus precatorius* L.

1. Recipe: The decoction of roots has been used as a folk medicine for diuresis and the relief of fever, sore throat, bronchitis and hepatitis [7].

Botanical name: *Abutilon indicum* Don. Sweet

2. Recipes: The juice of the plant is used for blood dysentery, fever and allergy. Fried leaves are used as a remedy for jaundice, piles, ulcer and leprosy [7].

Botanical name: *Acalypha indica* L.

3. Recipe: Two spoonful of leaf juice mixed with a pinch of salt is administered twice a day for 6 days [8].

Botanical name: *Achillea wilhelmsii*

4. Recipe: The whole plant is soaked in water and the decoction is used for farting, stomach pain, fever and motion of children. The whole plant is boiled in water; take two cups of this decoction in the morning and two cups in the evening to cure jaundice [9].

Botanical name: *Achyranthes aspera* L.

5. Recipe: Seeds along with some sugar is finely powdered, about spoonful of it is advised in water daily to cure Jaundice [10].

Botanical name: *Aegle marmelos* (L.)

6. Recipe: A blend of juice prepared from 5 g of the fresh leaves along with 5 g of the fresh leaves of *Eclipta prostrata* (L.) Linn. (Karisalankanni) is taken with honey twice a day for a period of 2 weeks to treat jaundice. [11]

7. Recipe: Pulp of unripe fruit is mixed with pickled mango (*Mangifera indica* L.) and lemon (*Citrus aruntifoliachristm* S.W) and eaten for jaundice [10].

Botanical Name: *Ajuga bracteosa* Wall. ex Bath

8. Recipe: Fresh plant is powdered and its extract is used before dinner for ulcer, colic and jaundice [1].

9. Recipe: Dry powder is also used for above purpose [12]

10. Recipe: The extract of fresh plant is used before dinner for ulcer, colic and jaundice. Dry powder is also used for above purpose. [13].

Botanical Name: *Alhaji maurorum* Medic.

11. Recipe: Fresh roots are collected and washed with clean water. Then these roots are soaked in water for about 24 hours. Then this water is used for effective relief of Jaundice [14].

Botanical name: *Andrographis paniculata* (Burm. f.) Wall. ex Nees

12. Recipe: Fifty ml of whole plant decoction mixed with half spoon of dried ginger powder is administered twice a day for 7 days. [8]

Botanical Name: *Argyrolobium roseum* (Comb) Jaub & Spach.

13. Recipe: Fresh plant material is crushed and mixed along with water and sugar. One cup of juice is taken orally early at morning for two weeks [1]

Botanical name: *Aristolochia bracteolata* Lam.

14. Recipe: Twenty ml of leaf juice is administered twice a day for 5 days. [8]

Botanical name: *Asparagus racemosus* Willd.

15. Recipe: Two spoonful of tuber decoction is administered twice a day for 6 days [8].

16. Recipe: Root extract mixed with milk after boiling it, one spoonful of this consumed with honey per day to cure jaundice [10].

Botanical name: *Azadirachta indica* A. Juss.

17. Recipe: Two spoonful of stem bark decoction is taken orally twice a day for 5 days. [8]

18. Recipe: Leaves are crushed and strained. One part strained water, 3 parts pure water and common salt as needed, are mixed to form syrup. The syrup is used in the morning after breakfast and in the evening before meal [1].

19. Recipe: Clayey pitcher is filled with water and leaves. The strained water is used as needed. The above two recipes are recommended for Jaundice [15]

Botanical name: *Balanites aegyptiaca* (L.) Del.

20. Recipe: Fruit pulp ground with whole plant of *Boerhavia diffusa* is administered in one spoonful once a day till cure. [8]

Botanical Name: *Berberis lycium* Royle.

21. Recipe: Fresh leaves are boiled in water and the decoction is given to the patient thrice a day for two to three weeks. [1].

Botanical Name: *Boerhaavia procumbens* L.

22. Recipes: Fresh plant material is boiled in water along with sugar. Half cup of the decoction is given to the patient thrice a day for three weeks. [1].

23. Recipe: The decoctions of roots are used for the treatment of dyspepsia, jaundice, enlargement of spleen, abdominal pain and as an antistress agent [7].

24. Recipe: About one cup of decoction of leaves is given twice a day to cure Jaundice till cure [10].

25. Recipe: One teaspoon of the leaf paste is taken twice a day for period of one week to treat jaundice [11].

- Botanical name: *Cajanus cajan* L. Mill
26. Recipe: 30 ml of the salted boiled water extract of the fresh leaves is taken in empty stomach for a period of 2 weeks to treat jaundice. [11].
- Botanical name: *Caralluma tuberculata* N. E. Brown
27. Recipe: The whole plant is dried and ground to obtain powder which is taken with water for jaundice, dysentery, stomach pain, constipation and hepatitis B & C. The fresh plant is chewed for freckles, pimples and for blood purification. The plant is also cooked as a vegetable and is used for diabetes and high blood pressure [9].
- Botanical Name: *Carissa opaca* Stapf.ex. Haines
28. Recipe: Fresh leaves of *C. opaca* and roots of *S. brandrethiana* are boiled in water. One cup of the decoction is taken orally twice a day for two to three weeks. [1].
- Botanical name: *Carthamus oxyacantha* M. Bieb
29. Recipe: 1. The powder obtained by grinding the plant is prescribed for Jaundice and cooling effect. The oil obtained from the seeds of this plant is also recommended for Jaundice [14].
30. Recipe: 2. Seeds are collected, dried under shade and ground to obtain powder. 1 tea-spoon of powder is taken twice a day for 3 to 4 weeks for jaundice. [16].
- Botanical name: *Cassia fistula* L.
31. Recipe: Tender leaves ground with tamarind is taken with rice orally once a day till cure. [8].
32. Recipe: One teaspoon of leaf and flower powder is taken with a glass of cow's milk once a day for a period of 2 weeks to treat jaundice. [11]
- Botanical Name: *Cichorium intybus* L.
33. Recipe: Fresh plant material is boiled along with sugar. Half cup of the decoction is given to the patient thrice a day two weeks [1].
34. Recipe: Washed Fresh plants are crushed and pure extract is boiled until ppt. is formed. The upper clear liquid is removed by filtration and is used 25 gm twice a day for a period as needed for diseases of liver particularly hepatitis [17].
- Botanical Name: *Citrus aurantifolia* (Christm.) SW
35. Recipe: Juice of one fruit mixed in glass of water. Some sugar is added to it and consumed thrice a day to cure jaundice [10].
- Botanical Name: *Citrullus lanatus* (Thunb.) Mats. & Nakai
36. Recipe: The ripe fruit is extensively used by local patients of jaundice. So this is an effective phytotherapy for the said disease.[15]
- Botanical Name: *Citrullus colocythis* (L.) Schrad.
37. Recipe: About 10 kg.fruit crushed daily, under feet until bitterness is felt, for 3-4 days. If proved ineffective, 1 kg common salt is mixed and continued the practice for 3 days more [15]
- Botanical name: *Cordia dichotoma* Forst. f.
38. Recipe: Two spoonful of leaf paste mixed with a cup of water is taken orally twice a day for 3 days. [8].
- Botanical Name: *Cucumis sativus* L.
39. Recipe: Fresh fruit is cut into small pieces and is given to the patient thrice a day for a month.) [1]
- Botanical Name: *Cuscuta reflexa* Roxb.
40. Recipe: Fresh plant material is cocked and three to four teaspoons of the paste are taken orally once a night for two weeks [1].
- Botanical Name: *Cynara scolymus* L.
41. Recipe: Infusion of 2 spoonful of dried leaves per liter of water. Taken three times daily before meal [18].
- Botanical Name: *Dalbergia sissoo* Roxb.
42. Recipe: 70 gms of young leaves of buds are crushed. One glass of water is added to it and strained. The strained decoction is taken daily and continued for 10 days. This is useful recipe for piles, night emission, jaundice, feeling of hotness in sole of the feet [15]
- Botanical name: *Diplocyclos palmatus* (L.) Jeffrey
43. Recipe: Thirty ml of whole plant decoction is administered twice a day for 3 to 5 days. [15]
- Botanical name: *Eclipta prostrata* (Linn.) L.
44. Recipe: The leaves boiled in hot water combined with extracts of *Leucas aspera* (Willd.) Link (Thumbai) and *Phyllanthus amarus* Schum.& Thonn. (Keela nelli) is taken with buttermilk twice a day for a period of one week to treat jaundice.[11]
45. Recipe: Leaf juice mixed in Jaggan and 40 gm of seed powder of *Piper nigrum* L. and advised to consume with spoonful honey two times per day. [10].
- Botanical name: *Ensete superbum* (Roxb.) Cheesm.
46. Recipe: 3 gm of seeds of *Brassica juncea* (L.) (Czern. Etcoss and Jagary are crushed in fruit and consumed a week to cure Jaundice [10].
- Botanical name: *Euphorbia nivulia* Buch.-HamKalli
47. Recipe: 20 ml of the salted leaf extract is taken for a period of one week to treat jaundice [9]

- Botanical name: *Euphorbia nerifolia* L
48. Recipe: Two drops of latex with jaggary is taken at morning only for few days [10].
- Botanical name: *Fagonia arabica* L.
49. Recipe: The whole plant is boiled in water and the patient of the hepatitis takes bath from this water [9].
- Botanical name: *Ficus carica* L.
50. Recipe: Twenty ml of leaf juice mixed with a cup of goat milk is administered early in the morning once a day for 3 days. [8]
- Botanical name: *Gallium aparine* L.
51. Recipe: Leaves are used in jaundice, externally used on wounds as antiseptic. [13]
- Botanical name: *Gardenia resinifera* Roth.
52. Recipe: Gum a spoonful of exudates mixed in powder sugar and consumed daily till cure hepatic Disorder [10].
- Botanical name: *Gentianodes olivieri* (Griseb.) Omer, Ali and Qaiser
53. Recipe: The whole plant is boiled in water and the decoction is used for jaundice, cough and chest problems [9].
- Botanical name: *Glycosmis pentaphylla* (Retz.) DC
54. Recipe: One teaspoon of the leaf powder is taken with honey twice a day for a period of 2 weeks to treat jaundice. [11]
- Botanical name: *Gossypium herbaceum* L.
55. Recipe: One spoonful of leaf juice drunk with honey twice a day to cure hepatic disorder [10].
- Botanical name: *Holarrhena pubescens* (Roxb. ex Fleming) Wall.
56. Recipe: Stem bark mixed with whole plant of *Andrographis paniculata* is ground and made into peanut seed size pills and one pill is administered twice a day for 6 days. [8].
- Botanical Name: *Hordeum vulgare* L.
57. Recipe: Dried seeds are grounded. Powder is mixed with water and sugar and is taken orally thrice a day for a month
58. Recipe: Decoction of dried seeds is used orally for hepatitis in Iran [19].
- Botanical name: *Hygrophila auriculata* (Schum.)Heine
59. Recipe: Root of bajra and male inflorescence of *Borassus flabellifer* are roasted and powdered and 10 g of powder mixed with a glass of water is administered twice a day for 5 days. [8]
- Botanical name: *Indigofera tinctoria* Linn
60. Recipe: The leaf infusion in goat's milk is taken in the early morning hours for a period of 2 weeks to treat jaundice. [11]
- Botanical Name: *Ipomea aquatica* Forssk.
61. Recipe: Leaves juice is used in jaundice [20].
- Botanical name: *Jatropha gossypifolia* L.
62. Recipe: Tender leaves are ground with tomato fruit and the paste is eaten with rice only once. [8]
- Botanical Name: *Justicia adhatoda* L.
63. Recipe: Fresh roots are boiled in water. Half cup of the decoction is taken orally before breakfast for two to three weeks [1].
- Botanical Name: *Lagenaria siceraria* (Molina) Standley
64. Recipe: Decoction of leaves, mixed with sugar is given in jaundice [21].
- Botanical Name: *Lawsonia inermis* L.
65. Recipe: A spoonful of leaf juice is consumed daily till cure the jaundice. [10].
- Botanical name: *Leucas aspera* (Willd.) Link.
66. Recipe: Flower paste is applied as eyetex once a day till cure [8]
- Botanical name: *Luffa acutangula* (L.) Roxb.
67. Recipe: Three drops of fruit juice is instilled into the nose once a day for 3 days [8]
68. Recipe: Powdered fruit snuff is smelt as snuff to cure the jaundice [10].
- Botanical name: *Mehtha spicata* L.
69. Recipe: Leaf juice about half cup is given at morning and evening for Hepatic disorder [10].
- Botanical name: *Merremia aegyptia* (L.) Urban.
70. Recipe: Leaves are ground and 30 ml of the extracted juice is taken once a day till cure [8]

- Botanical name: *Mimosa pudica* L.
71. Recipe: Decoction of root (3 to 4 gm) is given along with Honey in chronic liver problem [10].
- Botanical name: *Momordica charantia* L.
72. Recipe: Leaf juice mixed with a pinch of turmeric powder is administered in two spoonful once a day for 3 days [8]
- Botanical Name: *Morus alba* L.
73. Recipe: Fresh fruits are crushed. One cup of the juice is given to the patient twice a day for two weeks [1].
- Botanical Name: *Morus nigra* L.
74. Recipe: Fresh fruits are crushed. One cup of the juice is given to the patient twice a day for two weeks [1]
- Botanical name: *Murraya koenigii* (L.) Spreng.
75. Recipe: Leaf powder mixed with honey is administered daily once for 7days [8]
- Botanical Name: *Myrsine africana* L.
76. Recipe: Fresh leaves are boiled in water. One cup of the decoction is taken orally twice a day for a week [1].
- Botanical Name: *Oldenlandia corymbosa* L.
77. Recipe: Whole plant Juice is good for liver trouble, jaundice, fever and bilious infection [20].
- Botanical name: *Ocimum sanctum* L.
78. Recipe: Juice of fresh leaves about one spoonful is given twice daily for 10 days in chronic liver problem [10].
- Botanical Name: *Oxalis corniculata* L.
79. Recipe: Fresh leaves are crushed and mixed in water. One cup of the juice is given to the patient twice a day for two weeks [1].
- Botanical name: *Pandanus amaryllifolius* Roxb.
80. Recipe: Tender shoots are directly eaten in the case of severe jaundice. The oil obtained from the leaf is described as stimulant and antispasmodic and is effective against headaches, rheumatism and epilepsy and as a cure for sore throats [7].
- Botanical name: *Pavetta indica* L.
81. Recipe: Ten ml of root decoction is taken twice a day for 5-7 days [8].
- Botanical name: *Phyllanthus amarus* Schum. & Thonn.
82. Recipe: Whole plant decoction mixed with cumin seed powder is administered in two spoonful twice a day till cure [8]
83. Recipe: 30 ml of the extract obtained by squeezing some tender leaves together with few tender leaves of *Eclipta prostrata* and *Leucas aspera* (Thumbai) is taken with cow's milk twice a day for a period of 2 weeks to treat jaundice [11].
84. Recipe: A cup of decoction of entire plant is given orally twice day for jaundice till cure [10].
- Botanical name: *Phyllanthus emblica* (L.) Gaertn.
85. Recipe: The decoction obtained by continuously boiling some shade dried fruits, few shade dried leaves of *Alternanthera sessilis* (L.) R.Br. ex DC. (*Ponnankanni keerai*), few fresh roots of *Glycyrrhiza glabra* Linn (Adhimathuram), few cardamom [seeds of *Elettaria cardamomum* (L.) Maton], few seed kernels of *Myristica fragrans* Houtt. (Jathikkai) and one or two pericarp of *Terminalia bellirica* (Gaertn.) Roxb (Thandri) in 200 ml of diluted cow's milk is taken twice a day for a period of 2-3 weeks to treat jaundice [11]
86. Recipe: Dried fruit of *P. emblica* and seeds of *P. granatum* are grounded together along with sugar. Three teaspoons of the powder are dissolved in one cup of water and taken orally thrice a day for three weeks [1].
- Botanical Name: *Phyllanthus niruri* L.
87. Recipe: Fresh roots are crushed and mixed with water. Half cup of the extract is taken twice a day for 10-15 days [1].
- Botanical Name: *Pistacia integerrima* Stewart ex Brandis
88. Recipe: Fresh fruits are crushed and mixed in water. One cup of the extract is given to the patient thrice a day for a week.
89. Recipe: Bark is removed and boiled and the extract is used for jaundice and hepatitis [12].
- Botanical name: *Pistacia atlantica* Desf. subsp. *cabulica* (Stocks) Rech. f.
90. Recipe: Leaves are boiled in water and the decoction is used for dysentery and cough. Gum of *Pistacia atlantica* Desf. subsp. *cabulica* and *Caralluma tuberculata* plant are cooked in a pot with water, dried and make powder of it , which is given for jaundice and gas trouble[9].
- Botanical Name: *Plantago ovata* Forssk.
91. Recipe: Two teaspoons of fruit or seeds husk are soaked in water for a night. Two cups of this extract are mixed with sugar and taken orally early in the morning before breakfast for 20-25 days.
92. Recipe: 12 gm seeds are taken with milk at night.
93. Recipe: 12 gm seeds, sugar and 1glass of water are mixed and shaken well and is used twice a day.

- Botanical Name: *Podophyllum emodi* Wall
94. Recipe: Folk Medicinal Recipe: The rhizome is cleaned, dried and crushed. The powder is used in toothache and curing hepatitis. Tablets are made from the rhizome powder mixed with Ghur (Desi sugar) and used for curing abdominal pain [22].
- Botanical name: *Polycarpaea corymbosa* (L.) Lam.
95. Recipe: One teaspoon of the leaf paste is taken once a day for a period of 2 weeks to treat jaundice. [11]
- Botanical Name: *Primula macrophylla* D. Don.
96. Recipe: Flowers are anti-inflammatory and febrifuge and are used in the treatment of diarrhoea, inflammation of the liver, gall bladder, stomach and intestines. It is especially used for children with high fever [13].
- Botanical Name: *Prunus domestica* L.
97. Recipe: Dried fruit of *P. domestica* and *T. indica* are soaked in water for a night. One cup of this extract is given to the patient for two to three weeks [1].
- Botanical Name: *Punica granatum* L.
98. Recipe: Dried fruit of *P. emblica* and seeds of *P. granatum* are grounded together along with sugar. Three teaspoons of the powder are dissolved in one cup of water and taken orally thrice a day for three weeks [1].
Dried rind is grounded and two teaspoons of the powder are mixed with sugar and taken orally along with water at morning for a week.
99. Recipe: Half cup of fruit juice for twice a day given for two weeks to the patients suffering from jaundice [10].
- Botanical Name: *Raphanus sativus* L.
100. Recipe: Fresh roots are cut longitudinally and hanged over a night at open place. These pieces are given to the patient early in the morning for a month [1].
- Botanical name: *Rhazya stricta* Dcne.
101. Recipe: The roots are soaked in water at night and early in the morning mix some sugar in it, which is very useful for jaundice [9].
- Botanical Name: *Rhus chinensis* Mill.
102. Recipe: Dried fruits are grounded along with sugar and three teaspoons of the powder are taken orally with water at morning for three weeks. Fresh roots are boiled in water along with sugar. One cup of the decoction is given to the patient at morning for two to three weeks [1].
103. Recipe: Dried fruit and seeds of *R. chinensis*, *P. granatum* and *F. vulgare* are grounded. Two teaspoons of the powder are taken orally along with water at morning for a month [1].
- Botanical name: *Ricinus communis* L.
104. Recipe: One teaspoon of the blend made by grinding some shade dried leaves and few shade dried leaves of *Phyllanthus amarus* (Keelanelli) is taken with ghee thrice a day for one week to treat jaundice. [11]
105. Recipe: Extract of one leaf is added in half cup of fresh unboiled cow milk and given for three days to cure Jaundice [10].
- Botanical Name: *Rumex hastatus* D. Don.
106. Recipe: Fresh leaves are crushed along with water and sugar. One cup of this extract is given to the patient twice a day for two weeks [1].
- Botanical Name: *Saccharum officinarum* L.
107. Recipe: Fresh stems are crushed. Two cups of the juice are given to the patient four to five times per day for a month.
108. Recipe: Juice of the culm is drunk twice day to cure Jaundice [10].
- Botanical Name: *Silybum marianum* (L.) Gaertn.
109. Recipes: Fresh leaves are crushed along with water and sugar. Half cup of the Juice is taken orally twice a day for two weeks [1].
Infusion of a spoonful of crushed fruits by glass of water for 1 / 4 hour. Three cups are daily for 1or 2 months [23].
110. Recipes: Roasted seeds are ground to obtain powder. Half teaspoon with water is taken thrice in a day for 20 days. This phytotherapy is recommended for hepatitis and other disorders of liver [14].
- Botanical name: *Scoparia dulcis* L.
111. Recipe: The leaf extract is used to treat respiratory, gastric and hepatic disturbances diabetes and hypertension [7].
- Botanical name: *Solanum nigrum* L.
112. Recipe: Two spoonful of whole plant decoction is administered twice a day for 5 days [8].
- Botanical name: *Sophora mollis* (Royle) Baker
113. Recipe: Paste is made from the dried powdered seeds, applied on the fore head 2-3 times a day. It is believed that if the paste sticks to the fore head after application, then the type of hepatitis is curable [24].
- Botanical name: *Tamarix aphylla* (L.) Karst.
114. Recipe: Ash of the leaves is mixed with water; after half an hour the water is strained (filtered) and boiled. After boiling the water is evaporated and the salt is left behind. Then ½ -1gm salt is taken with Shurbat-e Bazoori twice a day for a period as needed. Useful traditional phytotherapy for jaundice [15]
- Botanical name: *Tamarindus indica* L.
115. Recipe: Roots and fruit of *T. indica* and fruit of *P. domestica* and are soaked in water for a night. One cup of this extract is given to the patient for two to three weeks [1].

116. Recipe: Rind of pods is burnt. Three gm of ash mixed in spoonful of cow using is taken orally for three to four times a day to cure jaundice [10].

Botanical Name: *Taraxacum officinale* Weber.

117. Recipes: Dried rhizomes are boiled along with sugar. One cup of the decoction is taken orally at morning for two weeks [1].

118. Recipes: It is effective and valuable as a diuretic. Root is slightly depurative, strongly diuretic, hepatic, laxative, stomachic and tonic. The tea made up of flowers is used internally in the treatment of gall bladder and urinary disorders, gallstones and jaundice, distilled water made from the ligules (thin appendages at the base of the leaf blades) is used cosmetically to clear the skin and is particularly effective in fading freckles [13].

Botanical Name: *Terminalia chebula* Retz.

119. Recipe: Consumption of two fruit boiled in cow urine at morning for three days to cure jaundice [10].

120. Recipe: A cup of decoction of entire plant is given orally twice a day for jaundice still cure [10].

Botanical name: *Tinospora cordifolia* (Willd.) Miers ex Hook.f. & Thoms.

121. Recipe: Whole plant decoction is administered in 30 ml dose once a day for 7 days [8]

Botanical name: *Trianthema decandra* L.

122. Recipe: Leaves with tuberous roots of *Mirabilis jalapa*, *Boerhavia chinensis*, seeds of *Piper nigrum* and bulbs of *Allium sativum* taken in equal quantities are ground. Two spoonful of paste mixed in a glass of buttermilk is administered daily once early in the morning for 11 days [8].

Botanical name: *Trianthema portulacastrum* L.

123. Recipe: Two spoonful of whole plant paste mixed with one spoon of pepper powder is administered twice a day for 7 days [8].

Botanical name: *Tridax procumbens* L.

124. Recipe: Whole plant along with that of *Euphorbia hirta* is made into juice and two spoonful of it mixed with a spoon of old jaggery is taken orally once a day for 7 days [8].

Botanical name: *Viola canescens* Wall ex Roxb.

125. Recipe: Ethnomedicinal use: Flowers and leaves are used in cough, cold, fever and jaundice. Young leaves and flower buds are cooked and used as a vegetable. The leaves are emollient and laxative. The stems and fragrant blossoms are placed in the clothes cupboard to impart a nice smell to the clothes. [13].

Botanical Name: *Viola serpens* Wall.

126. Recipe: Fresh or dried plant material is first boil in water along with sugar. Two cups of this decoction are taken orally at night for one week [1]

Botanical name: *Wedelia chinensis* (Osborne) Merr.

127. Recipe: Three spoonful of stem decoction is administered with a spoon of honey twice a day till cure. [8]

Botanical Name: *Woodfordia fruticosa* (L.) S. Kurz.

128. Recipe: Fresh flowers are crushed and mixed with water. One cup of the extract is given to the patient twice a day for two weeks.

Botanical name: *Zaleya pentandra* (L.) Jeffrey

129. Recipe: It is a camel food. Its roots are hanged on the neck like bead and it is thought to cure jaundice. [16]

Botanical name: *Ziziphus mauritiana* Lam.

130. Recipe: Three spoonful of stem bark decoction mixed with one spoon of honey is administered twice a day for 5-7 days. [8]

Botanical Name: *Zizyphus numularia* (Burm.f.) Whight & Arn.

131. Recipe: The dried fruits are soaked in new earthen pot with equal quantity of *Ficus carica* L. fruit at night. In the following morning, this infusion is given to the patient for effective relief in jaundice [14].

Spiritual treatment:

Botanical Name: *Boerhaavia procumbens* L.

132. Recipes: A Qureshi family at village Kabe Khurd and Malvana family at village Penjvana of Attack district are known for the treatment of jaundice by spiritual means for last three generations. They also use *B. procumbens* for treatment of jaundice. They prepare a garland from its fresh roots and put it around the neck of the patient. (Ahmed, 2003).

Botanical name: *Carthamus oxyacantha* M. Bieb

133. Recipe: A malik family at village Pehū (Chhachh area) is known for the treatment of jaundice by spiritual means for last two generations. Firstly the patient is checked by a traditional test of jaundice. Aerial parts of this plant are dipped in a cup containing mustard oil for three weeks. After this period of time, if colour of oil is changed, it means that patient is affected from jaundice. After this test, patient is recommended to drink the fresh juice of pomegranate and eat the radish for two weeks for effective relief of jaundice (Ahmad, 2003).

Botanical name: *Saccharum bengalensis* Retz.

134. Recipe: In Lakkai Marwat District in some places the treatment of jaundice by spiritual means is also made. The leaves of *S. bengalensis* are stirred in a cup containing mustard oil till the colour of oil is changed. This spiritual method is practiced only on Sunday and repeated for three weeks (three Sundays) for effective remedy (Personal Observations).

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Table: General Information of Plants used against Jaundice and Hepatitis

Botanical Name	Family	Vern. Name	English name	Habit
<i>Abrus precatorius</i>	Fabaceae	Gunja (H)	Rosary pea	Perennial climber
<i>Abutilon indicum</i>	Malvaceae	Ganghi (U)	Monkeybush	Undershrub-shrub
<i>Acalypha indica</i>	Euphorbiaceae	Khokli (H)	Indian acalypha	Ann. herb or shrub
<i>Achillea wilhelmsii</i>	Asteraceae	-----	Gozh madar	Perennial shrublet
<i>Achyranthus aspera</i>	Amaranthaceae.	Puthkanda (U)	Prickly flower.	Perennial herb
<i>Aegle marmelos</i>	Rutaceae	Bel (U)	Bengal quince	Tree
<i>Ajuga bracteosa</i>	Lamiaceae	Kauri bootii(U)	Bracted bugleweed	Perennial herb
<i>Alhaji maurorum</i>	Papilionaceae	Juvansa (U)	Camel-thorn	Annual herb
<i>Andrographis paniculata</i>	Acanthaceae	Kirayat (H)	King of bitters	Annual herb
<i>Argyrolobium roseum</i>	Papilionaceae	Makhani booti (U)	-----	Prostrate herb
<i>Aristolochia bracteolata</i>	Aristolochiaceae	Kidamari (H)	Worm killer	Perennial herb
<i>Asparagus racemosus</i>	Liliaceae	Satavar(H)	Wild asparagus	Climb.subshrub
<i>Azadirachta indica</i>	Meliaceae	Nim (H,U)	Margosa Tree	Tree
<i>Balanites aegyptiaca</i>	Balanitaceae	Engua, hingan (H)	Desert date	Shrub or tree
<i>Berberis lycium</i>	Berberidaceae	Sumbal (U)	Berberry	Perennial shrub
<i>Boerhaavia procumbens</i>	Nyctaginaceae	Biskhapra (U)	Hogweed	Perennial herb
<i>Cajanus cajan</i>	Fabaceae	Arhar ki dal (U)	Pigeon pea	Cultivated shrub
<i>Caralluma tuberculata</i>	Asclepiadaceae	Chunga.(U)	Carrion.	Wild herb
<i>Carissa opaca</i>	Apocynaceae	Granda (U)	Bengal current	Annual herb
<i>Carthamus oxyacantha</i>	Asteraceae	Pohli (U)	Safflower	Annual herb
<i>Cassia fistula</i>	Caesalpiniaceae	Amaltas (U,H)	Indian laburnum	Small tree
<i>Cichorium intybus</i>	Asteraceae	Kasni (U)	Blue daisy	Annual herb
<i>Citrullus colocythis</i>	Cucurbitaceae	Thuma, Indrain (U)	Bitter Apple	Spreading herb
<i>Citrullus lanatus</i>	Cucurbitaceae	Thurbooz (U)	Water melon	Spreading herb
<i>Citrus aurantifolia</i>	Rutaceae	Nimboo (U)	Lemon	Shrub
<i>Cordia dichotoma</i>	Boraginaceae	Bara Lasora (U)	Sebesten plum	Tree
<i>Cucumis sativus</i>	Cucurbitaceae	Khira (U)	Garden cucumber	Spreading herb
<i>Cuscuta reflexa</i>	Cuscutaceae	Akash bail (U)	Dodder	Perennial herb
<i>Cynara scolymus</i>	Asteraceae	Hatichu (H)	Globe artichoke	Perennial herb
<i>Dalbergia sissoo.</i>	Papilionaceae	Shishum(U)	Indian rosewood	Tree
<i>Diplocyclos palmatus</i>	Cucurbitaceae	Pinna chettu (H)	Marble vine	Annual herb
<i>Eclipta prostrata</i>	Asteraceae	Bhringaraj (H)	False daisy	Annual herb
<i>Ensete superbum</i>	Musaceae	Jungli kela (U)	Rock banana	Shrub
<i>Euphorbia nivulia</i>	Euphorbiaceae	Katathohar (H)	Leafy milk tree	Deciduous tree
<i>Euphorbia nerifolia</i>	Euphorbiaceae	Thohar (H)	Milk hedge	Erect shrub
<i>Fagonia arabica</i>	Zygophyllaceae	Dhamasa (H)	Fagonia	Ann/bien. shrublet.
<i>Ficus carica</i>	Moraceae	Anjeer (U)	Common fig.	Small tree
<i>Gallium aparine</i>	Rubiaceae	Warri bootii(U)	Bedstraw	Perennial herb
<i>Gardenia resinifera</i>	Rubiaceae	Dikamala (H)	Brilliant gardenia	Shrub/ small tree
<i>Gentianodes olivieri</i>	Gentianaceae	Nilkant	-----	Perennial herb
<i>Glycosmis pentaphylla</i>	Rutaceae	Ban Nimbu (H)	Ash Sheora	Medium sized shrub
<i>Glycyrrhiza glabra</i>	Papilionaceae	Mulathi (H,U)	Liquorice	Perennial herb
<i>Gossypium herbaceum</i>	Malvaceae	Kapas (U)	Cotton	Shrublet
<i>Holarrhena pubescens</i>	Apocynaceae	Karva indrajau (H)	Ivory tree	Small tree
<i>Hygrophila auriculata</i>	Acanthaceae	Talmakhana (U)	Long-leaved barleria	Tall herb
<i>Hordeum vulgare</i>	Poaceae	Jau (U)	Barley	Annual herb
<i>Indigofera tinctoria</i>	Fabaceae	Nil (U,H)	True indigo	Shrub
<i>Ipomea aquatica</i>	Convolvulaceae	Nali, kalmi sag (H)	Water spinach	Herb
<i>Jatropha gossypifolia</i>	Euphorbiaceae	Ratan Joyat (H)	Blley-ache bush	Shrub
<i>Justicia adhatoda.</i>	Acanthaceae	Arusha (H)	Malabar nut	Erect shrub
<i>Lagenaria siceraria</i>	Cucurbitaceae	Lauki, kadu (U)	Bottle gourd	Perennial herb
<i>Lawsonia inermis</i>	Lythraceae	Mehndi (H,U)	Camphire	Fragrant shrub
<i>Leucas aspera</i>	Lamiaceae	Chhota halkusa (H)	Common Leucas	Annual herb
<i>Luffa acutangula</i>	Cucurbitaceae	Kali Tori (U)	Ridged gourd	Spreading herb
<i>Mehtha spicata</i>	Lamiaceae	Pudina (U)	Pepper mint	Perennial herb
<i>Merremia aegyptia</i>	Convolvulaceae	-----	Hairy Woodrose	Climbing herb

Table: Continued

<i>Mimosa pudica</i>	Mimosaceae	Lajwanthi (U)	Touch me not	Small herb
<i>Momordica charantia</i>	Cucurbitaceae	Karella (U)	Bitter gourd	Spreading herb
<i>Morus alba</i>	Moraceae	Safaid toot (U)	White mulberry	Tree
<i>Morus nigra</i>	Moraceae	Kala Toot (U)	Black mulberry	Tree
<i>Murraya koenigii</i>	Rutaceae	Karivepaku(H)	Curry leaf	Tree
<i>Myrsine africana</i>	Myrsinaceae	Baibarang (H)	African boxwood	Small shrub
<i>Oldenlandia corymbosa</i>	Rubiaceae	Damanpaper (H)	Oldenlandia	Annual herb
<i>Ocimum sanctum</i>	Lamiaceae	Tulsi (H,U)	Holybasil	Subshrub
<i>Oxalis corniculata.</i>	Oxalidaceae	Khatti booti (U)	Indian sorrel.	Perennial herb
<i>Pandanus amaryllifolius</i>	Pandanaceae	Kenr (H)	Fragrant screwpine	Evergreen herb
<i>Pavetta indica</i>	Rubiaceae	Kankara(H)	Indian pavetta	Shrub
<i>Phyllanthus amaru</i>	Euphorbiaceae	Jar-Amla(H)	Sleeping plant	Annual herb
<i>Phyllanthus emblica</i>	Euphorbiaceae	Amla(H,U)	Indian gooseberry	Deciduous tree
<i>Phyllanthus niruri</i>	Euphorbiaceae	Bhuinavalah (H,U)	Stone-breaker	Annual herb
<i>Pistacia atlantica</i>	Anacardiaceae	-----	Turpentine tree	Deciduous tree
<i>Pistacia integerrima</i>	Anacardiaceae	Kakar-Singhi (H)	-----	Dioecious tree
<i>Plantago ovata</i>	Plantaginaceae	Ispighol (U)	Indian plantain	Perennial herb
<i>Podophyllum emodi</i>	Podophylaceae	Ban Kakdi (U)	Wild Mandane	Perennial herb
<i>Polycarpaea corymbosa</i>	Caryophyllaceae	Bugyale (H)	Oldman's Cap	Annual herb
<i>Primula macrophylla</i>	Primulaceae	-----	-----	Perennial herb
<i>Prunus domestica</i>	Rosaceae	Nashpathi (U)	Pear	Tree
<i>Punica granatum</i>	Punicaceae.	Anar (U)	Pomgranate	Shrub/tree
<i>Raphanus sativus</i>	Brassicaceae	Mooli (U)	Radish	Biennial herb
<i>Rhazya stricta</i>	Apocynaceae	Sihar (U)	-----	Shrub
<i>Rhus chniensis.</i>	Anacardiaceae	-----	Chinese gall	Shrub/tree
<i>Ricinus communis</i>	Euphorbiaceae	Arand(U)	Castor oil plant	Shrub
<i>Rumex hastatus</i>	Polygonaceae	Khati Buti (U)	Yellow Sock	Annual herb
<i>Saccharum benglensis</i>	Poaceae	Sarkanda (U)	-----	Perennial shrub
<i>Saccharum officinarum.</i>	Poaceae	Ganna (U)	Sugarcane	Annual herb
<i>Scoparia dulcis</i>	Scrophulariaceae	Mithi Patti (H)	Sweet Broom Weed	Annual herb
<i>Silybum marianum.</i>	Asteraceae	-----	Milk thistle	Annual herb
<i>Solanum nigrum</i>	Solanaceae.	Mako(U)	Black night shade	Perennial herb
<i>Sophora mollis</i>	Leguminosae	-----	Umbrella tree	Deciduous shrub
<i>Tamarindus indica.</i>	Caesalpinaceae	Imli, (H,U)	Tamarind	Tree
<i>Tamarix aphylla</i>	Tamaricaceae	Frash, Kagal(U)	Athel tamarisk	Shrub
<i>Taraxacum officinale</i>	Asteraceae	Dudhi (H)	Dandelion.	Perennial herb
<i>Terminalia chebula</i>	Combretaceae	Harra, Harad (H)	Myrobalan	Evergreen tree
<i>Tinospora cordifolia</i>	Menispermaceae	Giloy (H)	Gulbel	Climb.shrub
<i>Trianthema decandra</i>	Aizoaceae	Gadabani (H)	-----	Prostrate herb
<i>T. portulacastrum</i>	Aizoaceae	Narma, Itsit (U)	Horse-purslane	Prostrate herb
<i>Tridax procumbens</i>	Asteraceae	Khal-muriya (H)	Coat-buttons	-----
<i>Viola canescens</i>	Violaceae	Banafsha (U)	Himalayan	White Violet
<i>Viola serpens.</i>	Violaceae	Banafsha (U)	-----	Perennial herb
<i>Wedelia chinensis</i>	Asteraceae	Bhanra (H)	Chinese Wedelia	Spreading herb
<i>Woodfordia fruticosa</i>	Lythraceae	Dawa, Santha (H)	Red bell bush	Leafy shrub
<i>Zaleya pentandra</i>	Aizoaceae.	-----	Horse purslane	Prostrate herb
<i>Ziziphus mauritiana</i>	Rhamnaceae	Ber (H,U)	Indian jujube	Tree
<i>Zizyphus numularia</i>	Rhamnaceae	Jhar Beri (H,U)	-----	Small tree

Key: H= Hindi, U= Urdu