

How to Cite:

Suman, K. G., Kumar, B., & Mukopadayay, S. (2022). Herbal hair oil: A review. *International Journal of Health Sciences*, 6(S2), 13449–13465. <https://doi.org/10.53730/ijhs.v6nS2.8537>

Herbal hair oil: A review

Kumar Gaurav Suman

Research Scholar, Dev Bhoomi Institute of Pharmacy and Research, Dehradun (Uttarakhand), pin code-248007

Corresponding author email: gk776503@gmail.com

Mr. Bhupendra Kumar

Assistant professor, School of Pharmacy and Research, Dev Bhoomi Uttarakhand University, Dehradun (Uttarakhand), pin code-248007

Dr. Sayantan Mukopadayay

Associate Dean, School of Pharmacy and Research, Dev Bhoomi Uttarakhand University, Dehradun (Uttarakhand), pin code-248007

Abstract--Beauty and cosmetic concept is as ancient as mankind and civilization. Cosmetics play a vital role in human life. Herbal cosmetic is one of the most effective areas of cosmetic technology. Herbal cosmetics are developed by the coalition of bioactive ingredients and pharmaceutical products. Herbs are used for beautification purpose of body, preparation of cosmetics, flavouring and colouring agent. Hair plays a vital role in personality of human and we use a lots of cosmetics product for the care of hair. The study aims reviewing the importance of herbal oil and their use in the common hair problem such as baldness, hair fall, hair dryness, dandruff etc. Various beauty and cosmetic products are used which contain herbs to give young and charming look. Various herbal ingredients are used in herbal hair formulation; they provide essential nutrients such as vitamins, antioxidant, etc. Herbal hair oil has been widely used for nourishment of hair and for the protection of hair from hair fall and hair damage. Now a day's side effect is a major problem after using any beauty product due to which herbal products are preferred because of having less probability of any types of side effects.

Keywords--herbal hair oil, dandruff, herbal, cosmetics, hair.

Introduction

Hair is one of the characteristics features of mammals and has various function such as protection against external factors i.e. heat, cold, etc. Hair is one of the

important parts of body considered to be protective appendages on the body and accessory structure of the integument along with sebaceous gland and sweat gland.[1] The basic part of hair is bulb, root and shaft.[2] Hair fall, dandruff, lice, split end, grey hair are some of the well known problems related to hair.[3] A piece of hair looks simple but it is one of the most complicated structures in body. Hair is made up of two structures:-

Hair follicle

The hair follicle is where hair begins to grow and where it is held in place. It is a stocking-like structure that starts in the epidermis. It extends to the dermis. The follicle is lined by an inner and outer sheath that protects and molds the growing hair and ends just before the opening of sebaceous gland.

Hair shaft

The hair shaft is the part of the hair that is made up of three layers of keratin. Those layers are;-

- i. The inner layer:- Also called as medulla. Depending on type of hair, the medulla is not always present.
- ii. The middle layer:- This is called the cortex which makes the majority of the hair shaft.
- iii. The outer layer:- Also called as cuticle, which is formed by tightly packed scales in an overlapping structure that resemble roof shingles.

Structure of hair



Figure- 1 Structure of hair

Hair types

Hair type is primarily based on hair's curl pattern. The amount of curl in the hair is determined by hair follicle. Hair type is determined by genetics. Andre walker, known for decades as Oprah winfreys stylist, is credited with devising a system that classifies hair according to one of four curl pattern.

Type 1:- Straight

Type 2:- Wavy

Type 3:- Curly

Type 4:- Coily

Hair growth cycle

Hair growth cycle consists of 3 stages:-[4]

- a) Anagen phase:- The anagen phase is the growth phase of the hair. The anagen phase will last from between 2-6 years. A new hair pushes the new hair that stopped growing up and out of the follicle.
- b) Catagen phase:- The catagen phase is a transitional stage and 3% of all hairs are in this phase at any given time. This phase lasts for 2-3 weeks.
- c) Telogen phase:- The telogen phase is the resting phase which lasts for about 2-3 months. During the telogen phase, the hair follicle is at rest and the club hair is completely formed.

Hair Oil

Hair oil are hair care products. Hair care products are defined as the formulations which are used for the purpose of cleansing, modifying the hair texture, providing nourishment to the hair and maintaining the healthy appearance of hair.[5] Hair oil are hair care formulation applied to the hair for the treatment of hair disorder such as baldness, greying of hair, hair fall, dry hair and also helps in providing nourishment to hair.[6] Herbal cosmetics are high in demand due to increasing interest of mankind towards them also herbal cosmetics are more effective with negligible side effects and ingredients are easily available.[7] Herbal hair oil is an essential part of herbal cosmetics. Herbal hair oil is more preferred and used in many ailments of hair.[8] They not only promote hair growth but also provide necessary moisture to the scalp rendering in beautiful hair.[8] Herbal oil which contain herbal drugs are known as hair tonic.[9] Herbal hair oil provides a number of essential nutrient which are important to maintain the normal function of sebaceous gland and promote natural growth of hair.[10] These are one of the most well recognized product for the treatment of hair.[11] The use of hair oil is increasing everyday in line with the improvement in standard of living of people To give natural flavours and colours to hair oil the herbal essences and perfumes are added.

Different types of herbal hair oil available in market

- i. Amla hair oil
- ii. Coconut hair oil
- iii. Bhringraj hair oil
- iv. Jasmine hair oil
- v. Brahmi hair oil
- vi. Cantharidine hair oil
- vii. Onion hair oil

Benefits

We live in polluted world which is not hair friendly. That is when herbal hair oil comes into practice. Herbal oil is a blend of bhringraj, jatamansi, amla, hibiscus, rosemary, almond and other herbs.

Their benefits are as follow:

- It provides natural goodness to hair. Herbal oil contains vitamins and micro nutrients which acts as a food for hair.
- Hair oil helps in preventing hair loss and fames frizzy hair. Hair ends needs special care and herbal oil pampers them throughout their nourishment.
- Regular use of hair oil of hair oils cure problem of premature grey hair.
- Keeps the scalp hydrated.
- Improves hair growth.
- Prevents dandruff.
- Offers shine glow.
- Stress relief.

Different herbs used are as follows

S.NO	BOTANICAL NAME	COMMON NAME	FAMILY	CHEMICAL CONSTITUENTS
1	<i>Eclipta prostrate</i>	Bhringraj	Asteraceae	Alkaloids, flavanoids, terpenoids
2	<i>Phyllanthus Emblica</i>	Amla	Phyllanthaceae	Ascorbic acid, Ellagic acid, Gallic acid
3	<i>Ocimum tenuiflorum</i>	Tulsi	Lamiaceae	Eugenol, Linalool, Carvacrol.
4	<i>Senegalia ruguta</i>	Shikakai	Fabaceae	Alkaloids, Tartaric acid, Citric acid.
5	<i>Rosa- sinensis</i>	Hibiscus	Malvaceae	Polyphenols, Anthocyanins
6	<i>Cocos nucifera</i>	Coconut	Arecaceae	Lauric acid, mristic acid, caprylic acid
7	<i>Azadirachta indica</i>	Neem	Meliaceae	Nimbin, Salannin
8	<i>Allium cepa</i>	Onion	Amaryllidaceae	Methanol, acetic acid
9	<i>Aloe vera</i>	Alovera	Aphodelaceae	Chromone, anthraquinone
10	<i>Asparagus racemosus</i>	Shatavari	Asparagaceae	Mucilage, alkaloids.
11	<i>Bacopa monnieri</i>	Brahmi	Plantaginaceae	Bacosides
12	<i>Chrysopogon zizanioides</i>	Vetiver	Poaceae	Vetiverol, vetivone, benzoic acid
13	<i>Lawsonia inermis</i>	Henna	Lythraceae	Lawsone, anthroquinones, glycosides
14	<i>Glycyrrhiza glabra</i>	Liquorice	Fabaceae	Glabridin, Enoxolone
15	<i>Nardostachys jatamansi</i>	Jatamansi	Caprifoliaceae	Maaliol, seychellene

Plant Profile

Bhringraj

.	Botanical name	Eclipta prostrata
.	Kingdom	Plantae
.	Order	Asterales
.	Family	Asteraceae
.	Genus	Eclipta
.	Species	E.prostrata



Figure:-2 Bhringraj

Eclipta alba is an annual multibranched herbaceous plant. The height of plants is up to 30-50cm. It is found in tropical and subtropical region of the world such as South America, Asia and Africa at an altitude upto 2000 m. In the region of India it is mainly found in state of Bihar, Assam, Uttar Pradesh and Manipur.[12]

Role

- Prevents hair fall
- Promotes hair growth
- Makes hair lustrous
- Repairs hair damage
- Treats baldness.

Amla

.	Botanical name	Phyllanthus emblica
.	Kingdom	Plantae
.	Order	Malpighiales
.	Family	Phyllanthaceae
.	Genus	Phyllanthus
.	Species	P.emblicca



Figure-3 Amla

Phyllanthus emblica is an important medicinal plant in Indian traditional system of medicine.[13] The tree is of 1-8 meter in height. The leaves are simple and intently set alongside branchlets. The flowers are of greenish yellow colour. The fruit is nearly round in shape and having hard appearance.

Role

- Condition your scalp.
- Minimize greys
- Reduce dandruff
- Promote healthy hair growth.
- Strengthens the hair roots

Tulsi

.	Botanical name	<i>Ocimum tenuiflorum</i>
).	Kingdom	Plantae
).	Order	Lamiales
).	Famlily	Lamiaceae
).	Genus	<i>Ocimum</i>
).	Species	<i>O. tenuiflorum</i>



Figure- 4 Tulsi

Tulsi is one of the most well recognized herb from the family Lamiaceae that is indigenous to the Indian subcontinent and has been used inside Ayurvedic medication over 3000 years. Holy Basil is an erect, many branched sub shrub 30-60 cm tall having hairy stem. Leaves are of green or purple colour. The plant of tulsi has many medicinal properties. Leaves of tulsi are a nerve tonic a nerve tonic and also sharpen memory.[14]

Role

- Coagent remedy for hair loss
- Hair loss treatment
- Strengthening the hair roots
- Prevent bacterial and fungal infection.

Shikakai

.	Botanical name	Senegalia rugata
.	Kingdom	Plantae
.	Order	Fabales
.	Family	Fabaceae
.	Genus	Senegalia
.	Species	S.rugata



Figure- 5 Shikakai

Shikakai is a woody climber, shrub upto 5 metres tall. Leaves are bipinnate. Shikakai has a naturally mild pH that gently cleans the hair without stripping it of natural oil. The regions having dry hot weather like South India is best suited for these trees. The extract from the bark, leaves, of shikakai is used as hair cleansing agent[15]. Shikakai is traditionally used in shampoo preparations for the purpose of hair growth.[16]

Role:

- Makes hair soft and shiny
- Heals scalp and prevents the agony of the dry scalp
- Boosts hair growth
- Delaying greying of hair
- Works as natural hair cleaner

Hibiscus

.	Botanical name	Rosa-sinensis
.	Kingdom	Plantae
.	Order	Malvales
.	Family	Malvaceae
.	Genus	Hibiscus



Figure-6 Hibiscus

The leaves are alternate, ovate to lanceolate, frequently with a toothed or lobed margin. The flowers are large conspicuous, trumpet-shaped with five or more petals. This plant is extensively cultivated as an ornamental plant in tropical and subtropical region.[17] This plant is commonly found throughout the tropics and is found as a house plant throughout the world.[18]

Role:

- Stops hair loss
- Prevent premature graying
- Thicken hair and add volume
- Treat dandruff

Coconut oil

.	Botanical name	Cocos nucifera
.	Kingdom	Plantae
.	Order	Arecales
.	Family	Areaceae
.	Genus	Cocos
.	Species	C.nucifera



Figure-7 Coconut

Coconut oil is derived from milk of the coconut palm fruit. Coconut oil is used as a meals oil, and is used in industrial applications for cosmetics and detergent production.

Role:

- Masks hair
- Moisturizes hair
- Seal hair
- Makes hair look shinier.

Neem

.	Botanical name	<i>Azadirachta indica</i>
.	Kingdom	Plantae
.	Order	Sapindales
.	Family	Meliaceae
.	Genus	<i>Azadirachta</i>
.	Species	<i>A.indica</i>



Figure-8 Neem

Neem tree are found commonly in India, Africa and America. Due to having medicinal properties, it has been used in ayurvedic medicine from 4000 years. It is a fast growing tree and can reach a height upto 15-20 metres. The Sanskrit name of neem is Arista. US National Academy of Science recognized the importance of neem tree, published a report in 1992 entitled Neem- a tree for solving global problems. Leaves, bark, and gum are the non woody product of

13458

neem tree and have various uses.[19] They have antifungal, antibacterial, insecticidal and other biological activities.[20]

Role:

- Cure scalp problems
- Makes lustrous and healthy hair
- Promotes thicker, stronger hair growth
- Prevents premature greying
- Cooling and soothing effect

Onion

.	Botanical name	Allium cepa
.	Kingdom	Plantae
.	Order	Asparagales
.	Family	Amaryllidaceae
.	Genus	Allium
.	ISpecies	A.cepa



Figure-9 Onion

The onion is also known as the bulb onion or common onion, is a vegetable that is most widely cultivated species of genus Allium. The onion plant has been grown and selectively bred in cultivation for at the least 7000 years. Modern varieties grow to a height of 15-45 cm. The leaves are yellowish to bluish green. They are hollow, cylindrical with one flattened side. Onion has been valued as a food and a medicine plant since ancient times.[21]

Role:

- Treats dandruff
- Inhibits hair thinning
- Fights scalp infection
- Slows down premature greying
- Nourishes dry or brittle hair.

Aloe vera

.	Botanical name	Aloe vera
∴	Kingdom	Plantae
∴	Order	Asparagales
∴	Genus	Aloe
∴	Species	A.vera



Figure-10 Aloe vera

Aloe vera is a stemless or very short stemmed plant growing to 60-100 centimeters tall. Leaves are thick and fleshy, grey to green. Aloevera is a species of Aloe that is particularly known for its medicinal properties.[22] Aloe species are distributed widely in the eastern European continents and are spread almost throughout the world.[23]

Role:

- Strengthen and repair hair strands
- Deep cleans oily hair
- Calms an itchy scalp

Shatvari

.	Botanical name	Asparagus racemosus
∴	Kingdom	Plantae
∴	Order	Asparagales
∴	Family	Asparagales
∴	Genus	Asparagus
∴	Species	A.racemosus



Figure-11 Shatvari

Shatavari has small pin needle like photosynthetic branches that are uniform and shiny green. Shatavari is considered both a general tonic and female reproductive tonic.[24] The plant have a wide range of secondary metabolites inclusive of steroids, alkaloids, flavonoids, furan derivatives and essential oils.[25]

Role:

- Smoothe the scalp
- Promote hair growth
- Strengthens the roots of hair
- Maintain colour and luster

Brahmi

Botanical name	Bacopa monnieri
Kingdom	Plantae
Family	Plantaginaceae
Order	Lamiales
Genus	Bacopa
Species	B.monnieri



Figure-12 Brahmi

Brahmi is a non-aromatic herb. The leaves of brahmi plants are succulent oblong and 4-6 mm thick. Leaves are oblanceolate and are organized oppositely at the stem. The flowers of plant are small, actinomorphic and white with four to five petals. It is found in warm wetlands and local of India and Australia and is also found in United State and East Asia.

Role:

- Elimination of dandruff
- Cleanses scalp
- Gives soothing effect
- Reduction of hair loss
- Prevention of split ends

Vetiver

.	Botanical name	Chrysopogon zizanioides
.	Kingdom	Plantae
.	Order	Poales

.	Family	Poaceae
.	Genus	Chrysopogon
.	Species	C.zizanioides



Figure-13 Vetiver

Vetiver grows to 150 centimetres high and forms clump as wide. The stems are tall and leaves are long, thin and rather rigid. The root system is finely structured and very strong. Its cultivation is basically scattered over small holdings in Kerala, Karnataka, Tamil Nadu and Andhra Pradesh. The vetiver oil is having very soothing and cooling impact, calms and pacifies all styles of inflammation.[26]

Roles:

- Flavouring agents
- Nervine tonic

Henna

.	Botanical name	Lawsonia inermis
.	Kingdom	Plantae
.	Order	Myrtales
.	Family	Lythraceae
.	Genus	Lawsonia
.	Species	L.inermis



Figure-14 Henna

Henna is a tall shrub or small tree standing 1.8 to 7.6m tall height. It is multi branched with spine –tipped branchlets. For over 9000 years it has been used for cosmetics and medicinal purpose.[27] The leaves of henna are source of reddish brown dye used for temporary body art and to dye fabrics.

13462

Roles:

- Antifungal and antimicrobial properties.
- Helps in maintaining the scalp health.
- Repair hair damage.
- Improving hair elasticity.
- Reduces premature greying of hair.

Liquorice

.	Botanical name	Glycyrrhiza glabra
.	Kingdom	Plantae
.	Order	Fabales
.	Family	Fabaceae
.	Genus	Glycyrrhiza
.	Species	G. glabra



Figure- 15 Liquorice

Licorice is a herbaceous perennial, height of 1 metre, with pinnate leaves about 7-15cm long with 9-17 leaflets. The flowers are of purple to pale whitish blue colour and are 8-12mm long. This species is native of Mediterranean areas, but now is also present in India, Russia and in China. The extracts of this plant is used in pharmaceutical and food industries and also in the manufacturing of functional food and food supplements.[28]

Roles:

- Moisturizes the scalp.
- Helps with hair growth.
- Prevents premature baldness.
- Effective hair treatment.

Jatamansi

.	Botanical name	Nardostachys jatamansi
.	Kingdom	Plantae
.	Order	Dipsacales
.	Family	Caprifoliaceae
.	Genus	Nardostachys
.	Species	N.jatamansi



Figure-16 Jatamansi

Jatamansi is a flowering plant that grows in the eastern Himalayas, in the belt of Kumaon, Nepal, Sikkim and Bhutan. The height of plant is 10-50cm and has pink, bell shaped flowers. Jatamansi is used as a good stimulant, antispasmodic, tonic and laxative. [29] The rhizomes of jatamansi are used in traditional medicines in different medicinal system.

Roles

- Promotes growth of hair.
- Beneficial for smooth, silky and healthy hair etc.

Conclusion

Overall, herbal oils that are formulated provide a lot of nutritious food. Hair values such as vitamins, minerals, and essential oils. Finished products are within the limits. In conclusion, oil useful to prevent hair from damage and loss caused by pollution and dull hair. And provide alternative sources from hazardous chemicals.

References

1. T.Usha Kiran Reddy, S. Rajesh, G.Sindhu, B.Aruna, Herbs Used in Formulating Poly-herbal Hair Oil- A Review, Indo American Journal Of Pharmaceutical Sciences ISSN:- 2349-7750
2. R.R Shah, S.A. Mohite, Preparation and evaluation of polyherbal hair oil- an effective cosmetic, Asian Journal of Pharmaceutical Research, ISSN: 2231-5691
3. X. Fatima Grace, S. Rahul Raj, S.Shanmughanathan, D. Chamundeeshwari, Preparation And Evaluation Of Polyherbal Hair Oil, ISSN: 2394-2789
4. Mr. Shrikant M. Madhekar, Mrs. Surekha S. Tayade, Ms. Vaishali N. Tidke, Formulation And Evaluation Of Poly-herbal Anti-dandruff Hair Oil: A Hair Care Preparation, Journal Of Emerging Technologies and Innovative Research, ISSN: 2349-5162
5. Swarnlata Saraf, Manjusha Jharaniya, Herbal Hair Cosmetics: Advancement and Recent Findings, World Journal Of Pharmaceutical Research, ISSN: 2277-7105

6. B. Ramya Kuber, Ch. Lavanya, Ch. Naga Haritha, S. Preethi, G. Rosa, Preparation and evaluation of poly herbal oil, *Journal of Drug Delivery and Therapeutics*, 2019; 9(1):68;73
7. Rahathunnisa begum and Afzalunnisa begum, Preparation and Evaluation of Herbal Oil, *International Journal of Research and Analytical Reviews*, E ISSN: 2349-5318
8. Omkar V. Narule, Manohar D. Kengar, Pranali P. Mulik, Sohel I. Nadaf, Bhagyashree A. Mote, D. dudhagaonkar, Formulation and Evaluation of Poly Herbal Oil. *Research J.Topical and Cosmetic Sci.*10(1):09-12. doi: 10.5958/2321-5844.2019.00003.7
9. Harshali Wadekar, Rizwan Thara, Preparation and Evaluation of Herbal Hair Oil, *International Journal of Science and Research*, ISSN: 2319-7064
10. Amitkumar K. Jhadav, Ulhas S. Surwase, Aditya V. Thengal, Formulation and Evaluation of Polyherbal Hair Oil, *International Journal of Scienceand Reseaech*, ISSN: 2319-7064
11. K.D Mali, R.M. Shroff, S.D. Chaudhari, S.S. Bacchav, Formulation and Evaluation of Ayurvedic Herbal Oil, *Indo American Journal of Pharmaceutical Reseach*, ISSN NO: 2231-6876
12. Isha Kumari, Hemlata Kaurav, Gitika Chaudhary, Eclipta Alba (Bhringraj): Apromising Hepatoprotective And Hair Growth Stimulating Herb, *Asian Journal of Pharmaceutical and Clinical Research*
13. BM Gupta., et al, *Phyllanthus emblica* (Medicinal Plant) Research: A Scienometric Assessment of Global Publication Output during 2008-2017, *EC Pharmacology and Toxicology* 7.1 (2019): 18-28
14. Lopamudra Sethi, Preetha Bhadra, A Review Paper on Tulsi Plant, *International Journal of Natural Science*, Vol.10/ ISSUE 60/June/2020, ISSN: 0976-0997
15. Vinay Kumar Mediseti, Ganga Rao Battu, Ravindra.S, Sandhiya R.S, R.V.Subbarao, Antibacterial and Antihelmintic Activities of Aqueous Extract of *Acacia Conconna* Linn, *Indo American Journal of Pharmaceutical Sciences*, ISSN: 2349-7750
16. Siddhi S.Jadhav, Kajal S. Jadhav, Yogita V. Dalvi, Formulation and Evaluation of Herbal Liquid Shampoo, *Research J. Topical and Cosmetic Sci.*9(2): July-Dec.2018
17. Vincenta Khristi and V.H. Patel, Therapeutic Potential of *Hibiscus Rosa Sinesis*: A Review, *International Journal of Nutritional and Dietetics*, Volume 4, 2016, ISSN: 2347-5277.
18. Shrinivas K Sarje, Shital Narwade, Mahesh Thakur, Nitin B Ghiware, Pharmacognistic and Pharmacological review on herbal plant: *Hibiscus rosa sinensis* Linn, *International Journal of ChemTech Research*, Vol.12, ISSN: 0974-4290, ISSN (online) : 2455-9555
19. Sharma Pankaj, Tomar Lokeshwar, Bachwani Mukesh, Bansal Vishnu, Review on Neem (*Azadirachta Indica*): Thousand Problems One Solution, *International Research Journal of Pharmacy*, ISSN:2230-8407, 2011
20. Mohammad A. Alzohairy, Therapeutic Role of *Azadirachta indica* (Neem) and Their Active Constituents in Diseases Prevention and Treatment, *Evid Based Complement Alternat Med.* 2016
21. Sunil Pareek, Narashans Alok Sagar, Sunil Sharma, Vinay Kumar, Onion (*Allium ceoa* L.) sept 2017

22. Malik Itrat, Zarnigar, Aloe Vera: A Review of Its Clinical Effectiveness, International Research Journal of Pharmacy, ISSN: 2230-8407, 2013
23. Maharajan H. Radha, Nampoothiri P. Laxmipriya, Evaluation of Biological Properties and Clinical effectiveness of Aloe Vera: A Systematic Review, Journal of Traditional and Complementary Medicine, Volume 5, Issue 1, January 2015
24. Komal Sharma, Mahdeep Bhatnagar, Asparagus Racemosus (Shatavari): A Versatile Female Tonic, International Journal of Pharmaceutical & Biological Arcieves 2011;2(3): 855-863, ISSN: 0976-3333.
25. Ramit Singla, Vikas Jaitak, Shatvari (Asparagus Racemosus Wild): A Review on its Cultivation, Morphology, Phytochemistry and Pharmacological Importance, International Journal of Pharmaceutical Science and Research, ISSN(online): 0975-8232, ISSN(print):2320-5184, March 2014
26. D. Balasankar, K.Vanilarasu, , Traditional and Medicinal Uses of Vetiver, Journal of Medicinal Plants Studies, ISSN: 2320-3862, vol.1, Year:2013
27. Dr. Sreenivasarao Vepachedu, Esq. Mana Sanskriti (Our Culture), Vepachedu Educational Foundation,
28. Giulia Pastorino, Laura Cornara, M.Beatriz P.P. Oliveira, Liquorice (Glycyrrhiza Glabra): A Phytochemical Pharmacological Review, Phytotherapy Research, PMID:PMC7167772, 2018
29. Renu Sahu, H.J. Dhongade, Ajit Pandey, Poonam Sahu, Medicinal Properties of Nardostachys Jatamnsi: A Review, Oriental Journal of Chemistry, Vol.32, ISSN: 0970-020 X, 2016
30. <https://howtoreducestressnaturally.com/wp-content/uploads/2018/09/dried-cassia-24>
31. <https://tse4.mm.bing.net/th?id=OIP.IuHo13qsQuFQxKXB9dnlXQHaE8&pid=Api&P=0&w=>
32. <https://tse2.mm.bing.net/th?id=OIP.8FHk69fYL55ShcC08BhXcwHaE7&pid=Api&P=0&>
33. https://images-na.ssl-images-amazon.com/images/I/91W4yuQzR%2BL._SL1500_.jpg
34. <https://thumbs.dreamstime.com/z/structure-hair-growing-hair-structure-hair-growing-h>
35. <https://prajapatinatural.com/wp-content/uploads/2021/02/brahmi-whole-scaled.jpg>