

PHARMACOLOGICAL ACTION OF *ARJUNA* BARK *LEPA* ON VYANGA

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ABSTRACT

Ayurveda is the most ancient science in which proper treatment of various diseases is described. But it is a requirement to revalidate this knowledge on scientific basis, so that whole world can accept it. *Vyanga* is a very common skin problem which is described under *kshudraroga* in *Ayurveda* classics. Its sign and symptoms resembles with a modern disease melasma. So many formulations in form of *lepa* are mentioned for treatment of *vyanga*, among which the most peculiar is *Arjuna* bark local application mentioned by *acharya sharangdhara*. *Arjuna* is the most common herb which is called as herbal hero of heart. But on the basis of chemical constituents it can be understood

that on local application how *Arjuna* bark works on hyper pigmentation. In this way not only we can understand the richness of our ancient knowledge but also can very easily and cheaply treat *vyanga* very effectively.

KEYWORDS: *Ayurveda*, *vyanga*, *Arjuna*, chemical constituents.

INTRODUCTION

Since 7th cent A.D. *Arjuna* is used in *Ayurveda* for treating various diseases. *Acharya charak* has mentioned *Arjuna* under *udardmahakashya* and in various formulations in various diseases. *Acharya sushruta* has mentioned *Arjuna* in *salsaradigana* in *dravyasangrahaniya adhyay*. Disease *vyanga* was firstly described by *acharya sushruta* in *nidansthan* chapter 13 named *kshudrarogadhikara*. According to *Ayurveda* *vyanga* is characterized by presence of *niruja* and *shyavvarna mandalas*. Vitiated *ranjak pitta*, *rakta dhatu* as well as *udan vata* travel in body through *dhamnis* and get *sthan samshraya* in *mukhgata twacha* and causes vitiation of *bhrajak pitta* giving rise to discoloration of skin.^[1] For *vyanga* various formulations are mentioned in classics and mainly drugs which are mentioned under *varnya mahakashya*^[2] by *acharya charaka* are used. *Ayurveda* is very effective in treatment of skin diseases and in *bahiparimarjan chikitsa lep chikitsa*^[3] is very effective. As skin is also a route of administration so it can be easily understood that local application in *vyang* will be more helpful. Various *lepa* are advised for *vyanga* but the peculiar one is *Arjuna twak lepa* as *Arjuna* is a drug which is mainly used for heart disease.

SOURCES AND METHODS

A detail study of drug *Arjuna twak* is compiled from various *Ayurveda* texts, scientific Journals and research papers etc.

DRUG REVIEW

As its stem is white in color so it is called as *Arjuna*.^[4]

Botanical name:- *Terminalia arjuna (roxb.) Wt. & Arn.*

Family:- *combretaceae*

It is large, deciduous/evergreen, up to 6- 15 (-25) m tall, often having a buttressed trunk, and a broad, oval crown with drooping branches. It is mostly found near water banks.

Classification of *Arjuna*

- *Charaka: Kashayaskandha, Udardaprashamana*
- *Sushruta: Nyagrodhadi, Salasaradi*
- *Vagbhata: Nyagrodhadi, Virtarvadi*
- *Bhavaprakash Nighantu: Vatadi*
- *Bhavaprakash: Nyagrodhadi, Salasaradi*
- *Dhanvantari Nighantu: Amradi, Swati Nakshatra Vriksha*

- *Raj Nighantu: Prabhadradi*
- *Keydev Nighantu: Aushadhi*
- *Nighantu Adarsh: Bibhitakadi.*

Properties and action of *Arjuna*^[5]

- **Rasa :-** *Kashaya*
- **Guna :-** *Laghu, Ruksha*
- **Veerya :-** *sheeta*
- **Vipaka :-** *Katu*
- **Prabhava :-** *Hridya*
- **Doshaghnata: -** *Kaphapittashamaka.*

Chemical constituents^[6]: Alicyclic and amino acids and polyols (fruit, leaves, bark, wood); tannin 5,7,2',4', tetramethoxy flavone, arjunglucoside III, hentriacontane, myristyl oleate and arachidic, stearate (fruits); arachidic stearate (fruits); arachidic stearate, cerasidin, hentriacontane, myristyl oleate, mannitol, β - sitosterol, friedelin (bark); methyl oleanolate, ellagic and terminic acid, gallic acids (root); arjunic acid, its saponin, β -sitosterol, arjunetin, β -D- glucopyranosyl- 2 α , 3 β , 19 α - trihydroxy-11-oxoolean-12-en – 28- oate= arjuno side III; 2,3,23- trihydroxy- olean- 12- en28- oic acid; arjunic acid— 28- oate= arjuno side III; 2,3,23- trihydroxy- olean- 12- en28- oic acid; arjunic acid—3-0- β -D-glucopyranosyl $\rightarrow\alpha$ -L-2- deoxyrhamnopyranoside(arjunoside-II), arjunic acid-3-0- α -L(-)-rhamnoside (arjunoside IV) and hydroxyhexadecanoic acid (root bark); baicalein, 6,4'-dihydroxy-7- methoxyflavone(arjunolone), 2 α ,3 β ,19 α -trihydroxy-olean-12-en-28-oic acid, arjunglucosides I&II(bark); 3 β ,13 β -dihydroxy-lup-20(29)-en-28-oic acid, leucocynidine(root);(+)- leucodelphinidine (wood).

Aqueous extract of T. Arjuna bark was analysed for its composition and molecular weight distribution by dialysis. Compositional analysis revealed that it has 44% polyphenols and dialysis study showed that 70% of polyphenols have molecular weight greater than 3.5kDa. HPTLC confirmed that it contains flavon-3-ols such as (+)- catechin, (+)- gallicocatechin and (-)- epigallocatechin.

Phenolic acids such as gallic acid, ellagic acid and its derivatives are also found in T. Arjuna extract. Triterpene glucosides are arjunetin, arjunoglucoside 1, arjunoglucoside2, arjunoglucoside3, arjunocide 1 and 2. Polyphenols are arjunin, arjunone and arjunotone.

DISCUSSION

Probable Mode of action of drug

Changes in the skin are the most visible signs of ageing. The appearance of epidermis is affected by hyperpigmentation. The main mechanism of skin cell disturbance is based on oxidative stress reaction. Phenolic compounds possess a broad spectrum of biological activities. Plant phenolic compounds are a promising target for new dermal cosmetics that possess the ability to maintain the skin homogeneity and a proper healthy look due to effective skin cell renewal, elastin and collagen stimulation and inhibition of excessive melanin synthesis.

The main phenolic compound is epigallocatechin which acts on hyperpigmentation. Domingo *et al.* conducted a study on effect of a cream containing 2.5% w/w of epigallocatechin. It shows an inhibitory effect on angiogenic growth and transcription factors, vascular endothelial growth factor and hypoxia-inducible factor -1. It is an antiangiogenic compound may be potential agent in prevention of hyperpigmentation. Moreover epigallocatechin is very effective in improving the skin condition by reactivation of the damaged or old cells due to DNA protection and production of more energy in the cells. Tests performed on skin cell culture have shown that phenolic compounds are effective in suppression of melanin synthesis.^[7]

Tannin, Epigallocatechin, gallic acid, ellagic acid \Rightarrow inhibits matrix metalloproteinases



Maintain proper skin structure- collagen protection and restoration, maintenance of the skin cells.

Excessive production of melanin caused predominantly by UV exposure, as well as cosmetic drugs, chemicals and particular disease states, may lead to dermal disorders. The melanin inhibitors are supposed to act mostly by the suppression of tyrosinase and phenols have similar structures to tyrosine.

The most effective way of skin treatment is surface and topical application. Plant phenolic compounds are the promising target for new dermal cosmetics that possess the ability to maintain the skin homogeneity and proper healthy look due to effective skin cell renewal, elastin and collagen stimulation and inhibition of excessive melanin synthesis. The most

common properties of polyphenols are- antioxidant, anti-inflammatory and anti microbial which indicate that they deserve recognition in natural medicine and may be highly effective in treatment of various skin problems. These three mentioned properties constitute the main potential mechanisms of action against various skin disorders.

Ayurveda mode of action

On the basis of inherent properties of drug the mode of action can be understood. *Rasa* of *Arjuna* is *kashaya*, *laghu* and *ruksha* are *guna* and it is *sheeta* in *veerya*. *Arjuna* mainly has *raktaprasadak* and *pittashamak* property.

Pitta and *rakta dosha* will be encountered by its *kashaya rasa* and will remove *twak vaivarnyata* so as to attain normal skin color. Due to *sheeta veerya* it will encounter *pitta dosha* and *prasadana* property of *sheeta veerya* helps in purifying accumulated *doshas* in *vyanga*. So *twak prasada* property of *Arjuna* will help in removing locally accumulated *doshas* in *vyanga*.^[8]

CONCLUSION

As healthy skin is most important for healthy mental state of person but in this fast going world it has become very difficult to take care. So for maximum skin problems local applications are the easiest way for treatment. But modern cosmetic treatment is not so cost effective and many have adverse reactions too. *Arjuna twak lep* is effective in all the parameters as it is cost effective, easily available, and potential in treatment. *Arjuna* is a versatile drug which is useful in so many diseases and among all the herbs which are used for treatment of *vyanga*, is most easily available and cost effective drug.

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