



**Review Article**

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## Overview of *Pentatropis capensis* (Asclepiadaceae)- An Extra Pharmacopoeial Plant

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### ABSTRACT

Plants are a rich source of many natural products. In India, most of which have been extensively used for traditional human health care systems viz. Ayurveda, Unani and Siddha. Most of these pharmacopoeial unidentified drugs are practiced by the folklore people to cure many diseases. *Pentatropis capensis* is one such plant which is used as nasal drops to alleviate headache, running nose and body ache by folklore practitioners in the name of Kukka bachchataay<sup>[1]</sup>. *Pentatropis capensis* has cooling and alterative properties. 'The Wealth of India' confirmed its the analgesic, antifungal, anti-septic, Keratolytic properties and effective for skin diseases. Similarly, antifungal, anti-septic and keratolytic properties of *Pentatropis capensis* have been mentioned in 'Compendium of Indian Medicinal Plants'. In 'Flora of Saurashtra' the use of ground material and infusion of root was found. It described its use by folk people in fevers, hydrocele and also on rheumatism. In 'Medicinal Plants of Gujarat' *Pentatropis capensis* is described as alterative, antifungal, antiseptic, and coolant and further mentioned it uses in skin diseases. Dr. Koppula Hemadri in 'A Treatise on Tribal Medicine' has described the tribal use of *Pentatropis capensis*. Tribal people heat the leaves in gentle fire and extracted juices and used as nasal drops to alleviate headache, running nose and body pain.

**Keywords:** *Pentatropis capensis*, Kukka bachchataay, Medicinal plant.

### INTRODUCTION

*Pentatropis capensis* is one such plant which is used by folklore practitioners in the name of Kukka bachchataay<sup>[2]</sup>. In Ayurveda it is considered as *Kākanāsā* Siddha system of medicine accepted *Pentatropis capensis* as Uppilankodi and used in the preparation of gold and silver parpams (bhasma)<sup>[3]</sup>. *Kākanāsā* has been used in the indigenous system of medicine since long time. *Caraka* has included *Kākanāsā* in *Madhura skandha*. *Kākanāsā* has been used in preparation of *Chyavanprash*, *Trayausanadi ghrta* and in the treatment of *Apasmara*, *yoni roga*. *Susruta* has mentioned it only *Anuvasan vasti* with other drugs only to two places. *Astanga Hrdaya* mentioned oil preparation in *Guhya Roga Pratishedha*, preparation of *Chyavanprash* and *Anuvasan vasti karma*. Various lexicons has been depicted as emetic, *rasayana*, *balya*, *palitapaha*, analgesic and anti-inflammatory and useful in the treatment of *sotha*, *Raktavikara*, *Shvitra*, *kustha* and in *gulma*. Kirtikar and Basu have been depicted in 'Indian Medicinal Plants.

**Vedic Period: (6000 )** - there is no description or reference regarding the drug *Kākanāsā*.

#### Samhita Period:

Acharya Charaka mentioned the drug *Kākanāsā* in *MadhuraSkanda* (VimanaSthana-8), as an ingredient of *Chyavanprash* (Ca chi-11/62-64) and *Trayausanadi ghrta in kasa chikitsa*, *Yoniroga Chikitsa* (Ca. Chi-30/50), *Kustha Chikitsa*(Ca.Chi.-7/123), *Apasmara Chikitsa* (Ca. chi-10/37), *Anuvasan Vasti* (Ca.Si.-4/5, 9, Ca.Sid-10/37) along with other drugs<sup>[4]</sup>.

*Susruta Samhita* (2ndB.C.) *Susruta* has mentioned *Kākanāsā* in *Anuvasanottara Vastichikitsa*(Su Chi-37/20, 23) with other drugs and second preparation is used in the manner of *Anuvasan-basti* in cases of *gulma* and retention of stool and urine with a distension of abdomen and also acts as an invigorating and constructive tonic, improves digestion, increases strength and creates fresh semen<sup>[5]</sup>.

*Astanga Samgraha* (6thcentury A.D.) It mentioned *Kākanāsā* in enema(*basti*) preparation (AS. KA. 4/36), which is beneficial in excess bouts and in medicated oil preparation (AS. UT.-39/33) which intake orally to cure all type *vataja* and *pittaja* disorders and for embryo production, and in *Chyavanprash avaleha* (AS. UT...49/39-47) which is a well rasayana.

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Astanga Hrdaya (7<sup>th</sup> century A.D.) The drug Kākanāsāi mentioned in *Guhya Roga Pratishedha* (AH.UT.-34/42), as an ingredient for restoration of conception and in *Rasayana vidhi* (A.H.U.S. - 39/34) as an ingredient of *Chyavanprash*. Further reference found in *Kalpa -Siddhi sthana*, *Anuvasan basti* for all type of arthritical problems also in *putrayanuvasan basti* and this special type of *basti* helps to give birth of male child *Vangsen* In *Basti Karmādhikara* (VS. BK.. 93-95) to eradicate all type of rheumatoid complaints by *Anuvasan basti* manner and in *Jivantyadya Yamaka* (V. S. B. 96-8). The *basti* of this preparation used for *brimhana*, gives strength, semen and appetite and to eradicate the problems of micturition, semen and menstruation. Further reference found in *Kshayaja kasa nidana* (VS. KK.-159-165), *Vrihat Vasakadya Ghṛta* and indicated in all type of cough, helpful for emaciated people, clears voice and purifies blood [6].

*Vrinda Madhava* or *Siddha Yoga Vrindha madhava* mentioned *Kākanāsāin Rajkshmadikar* (V.M.-10/34-48), in the preparation of *Chyavanprash* and it is a well-known *rasayana* [7].

*Cakradatta* (11th century) *Cakrapani Datta*, in his commentary, mentioned *Kākanāsā* in *Rajkshmadikara* (C.D.-10/46-59), in formulation of *Chyavanprash* [8].

*Sarangadhara Samhita* (13th century A.D.) *Sarangadhara* mentioned *Kākanāsā* in *Chyavanprash Avaleha Kalpana* (Sh. Mad. Kh. -8/11), the commentator Adhamalla, mentioned as "Kakanasikakouadodi iti Loke" Another reference of *Kākanāsā* found in Uttara khanda, *bastidhikar* (Sh. Ut. Kh. →5/47-49), in the formulation of *Guduchyadi taila* and indicated in all type of rheumatoid disorders [9].

*Bhavaprakasa Samhita* (16<sup>th</sup> Century A.D.) In this samhita, Bhava Mishra mentioned *Kākanāsā*, in oil enema preparation (Bh. Pk.5/130-132) and it used to cure all diseases caused by aggravation of vata. *Vrihat Nighantu* Ratnakara The author mentioned *Kākanāsā* under *sotharoga chikitsa*, in the preparation of *Panchamuladi taila*, in any type of *sotha* caused by *vata* and *kapha* [10].

## Nighantu Period

*Dhanvantari Nighantu* (10<sup>th</sup> Century A.D.) Mahendra Bhogika had mentioned this drug under '*Karaviradi varga*' - as wound disinfecting agent and helpful in defects of fat metabolism. It is having bitter, pungent taste and hot in potency [11]. *Dhanvantari Nighantu* (10<sup>th</sup> Century A.D.) Mahendra Bhogika had mentioned this drug under '*Karaviradi varga*'. It is having bitter, pungent taste and hot in potency. *Amar Kosa* (11<sup>th</sup> Century A.D.) Amar Singh has mentioned *Kākanāsāin dwitiya Kānda* under '*Vanausadhi varga*' with the synonyms like *Kākāngi*, *Kaowathodi* etc [12]. *Sodhala Nighantu* (12<sup>th</sup> Century A.D.) Sodhala has mentioned *Kākanāsā* in '*Laksmanadi Varga*' as the name of *Singriti* and has mentioned the insecticidal and *vata* eradicating properties. The root is indicated in earache [13]. *Raj Nighantu* (15<sup>th</sup> Century A.D.): Pandit Narahari has mentioned 13 synonyms of *Kākanāsā* and included it in '*Guduchyadi varga*'. He mentioned it having *Madhura* rasa, *sheeta* Virya and eradicates pitta disorders and also having *rasayana*, *balya* & *palitapaha* properties. *Kaiyadeva Nighantu* (15<sup>th</sup> Century A.D.) [14] *Kaiyadev nighantu* described *Kākanāsā* under '*Ousadhi Varga*' as emetic & effective in *Sotha*, *Raktavikar*, *Shvitra* & *Kustha* [15]. *Bhavaprakash Nighantu* (16<sup>th</sup> Century A.D.) 1.18: *Bhavaprakash* has classified *Kākanāsā* under '*Guduchyadi varga*'. He mentioned it having *katu*, *tikta*, *kasaya* rasa and having indication in *Sotha*, *Arsha*, *Svitra* and *Kustha* [16]. *Saligram Nighantu* (19<sup>th</sup> Century) *Saligram nighantukar* described *Kākanāsā* under '*Guduchyadi varga*'. Its emetic, analgesic, anti-inflammatory activities were enumerated with indications in *Arsha*, *Svitra* & *Kustha* [17]. *Hridayadipaka Nighantu* -The nighantukar has mentioned *Kākanāsāin* '*Dwinama Varga*' and '*Kaphagna Varga*' and described the synonyms like *Kākanāsā*, *Kakatundi* [18]. *Nighantu Kalpadrum*, -The author mentioned its taste as astringent and sour, *vipaka* as *amla* and *virya* as *usna*. The indications are *ruja*, *arshas* and

*kustha* and *karma as vamaka* [19]. *Adarsha Nighantu* - *Shree Bāpālāla Vaidya* described *Kākanāsā* under *Arkādi varga*. The local name of this drug has been described as *Shringroti* or *Kwoathodi* and *Pentatrollais* accepted as *Kākanāsā* by the author [20].

**Studies of Ethno-botany and Various Flora:** the study of ethno-medicine and local flora helps to an idea about folk medicine or traditional medicine. The *Flora of British India* (Sir J.D. Hocker-1875) In flora of British India the author has given 2 species of *Pentatropis* genus i.e. *Pentatropis capensis* and *Pentatropis microphylla* [21].

Reviews on Indian Medicinal Plants (A.K. Gupta and Neeraj Tandon) *Asclepias curassavica* described as Ayurvedic 'Kakatundi'. The indications are mentioned for Piles and Helminthisis [22]. *Flora of Saurashtra* (P.V. Bole & J.M. Pathak) Detailed botanical descriptions of *Pentatropis capensis* found in this flora, used in fevers and hydrocele, rheumatism, used to prepare vegetables and pickles by the poor [23]. *Medicinal Plants of Gujarat* (C.N. Pandey, B.R. Raval, S.Mali, H.Salvi) Detailed botanical description is available in this flora. The whole plant is used as antifungal, antiseptic, coolant and useful in skin diseases [24]. *Pharmacographia Indica- A History Of Principle Drugs* (Dymock *et al*; 2005) Cooling and alterative properties has been attributed to *Pentatropis capensis*, used in Gonorrhoea. *A Treatise on Tribal Medicine* (Dr. Koppula Hemadri, 2011) The author has pointed out the tribal uses of *Pentatropis capensis* leaf which is used as nasal drops to alleviate headache, running nose and body pain [25]. *Glossary of Vegetable Drugs in Brihatrayi* (Balwant Singh & K.C Chuneekar) *Pentatropis microphylla* (W. & A.) finally suggested that *Martynia* may serve as a substitute of *Kākanāsā* [26].

**The previous studies** on *Pentatropis capensis* has been shorted out and explained below.

A study on medicinally important agro weeds of north eastern coastal Tamil Nadu has indicated the use of *Pentatropis capensis* in acidity and fever [27].

An Ethno botanical study in the Pudukkottai District shows a high degree of Ethno botanical innovation and the use of plant sources for medicine by the rural communities reflects many species of the family Fabaceae and Asclepiadaceae are frequently used whereas *Pentatropis capensis* also used by this people in constipation, colic, and diarrheal problems [28]. Assessment of bioactivity of Indian medicinal plants using brine shrimp (*Artemia salina*) lethality assay shows 3000 µg/ml extract of *P. capensis* lethal cooling agent [29]. PhD thesis on "A Contribution to Ethnobotany of Mehsana District, North Gujarat" by Modhvia Avdabhai Rambhai illustrated about 490 plants of Mehsana district. He pointed out the medicinal use of whole plant of *Pentatropis capensis* (Local Name: Singroti) in curing of skin diseases and mentioned the properties as anti-fungal, antiseptic [30]. The quarterly newsletter of *envieson Indian estuaries, mangroves, coral reefs and lagoons* carried out on the diversity of fauna of the mangrove afforested area situated in the gradient zone of manakkudy estuary, explains *Pentatropis capensis* (Local name: Chhagal lata) medicinally used as alternative, refrigerant [31]. The phytochemical screening of whole plant extracts shows presence of carbohydrate, flavonoids, tannins, glycosides as major constituents. The antibacterial and antioxidant activity also evaluated of whole plant extract. It was effective against bacterial organism [32]. In Sastra University, the pharmacognostical work on *Pentatropis capensis*, highlighted the botanical parameters, microscopical standards, phytochemical screening, fluorescence analysis, quantification of inorganic and biochemical standards to establish the identity of *P. capensis* in its crude form [33]. The Analgesic and Anti-inflammatory activities have been found from ethanolic extract of *Pentatropis capensis* (K. Chandrasekaran *et al*, IJPBS 2011) [34,35].

## **Kākanāsā Karma Vivecana (Evam- Gunam)**

### Action on Dosa:

Almost all the texts have clearly mentioned its action on *kapha* and *vata*. Kākanāsā alleviates *kapha* due to its *katu*, *tikta* and *kasaya rasa*, *ushna virya* and *ushna guna*. Because of *Ushna Virya* and *ushna guna* it alleviates provoked *vata*.

### Action on Dhatus:

The drug is generally used as ingredient of *Chyavanprash* in *Rajyaksha chikitsa*. It shows that it nourishes all the dhatus including *rasa*, *rakta* etc. That's why it develops the immunity

### Action on Mala:

The *agneya guna* helps to increase blood circulation at renal tubules and irritate kidney to increase quantity of micturition.

### Karma: (Evam- Prabhavam)

**1) Vaman:** Kākanāsā by its *kasaya rasa* and *usna virya* helps to increase agni and *vayu mahabhuta* in the body. It has tendency to cause vomiting by upward direction.

**2) Sula Prasaman:** Kākanāsā by its *usna virya* and *snigdha guna* normalises the disarrange *vayu* which responsible for *sula*.

**3) Sotha hara:** Due to *usna virya* Kākanāsā pacifies mainly *vata* and simultaneously normalise *pitta* and *kapha*. By normalizing dosas, it remedies *sotha*.

### Therapeutic Uses: (Asmin -vyadhaya)

**Official Parts:** The medicinally useful-*Mula*, *Patra*, *Beeja*, *Panchanga*

### Dose Fixation: (Anaya-ca-Matraya Yuktam)

Maharshi Kasyapa has stated doses in Ka Khi. 3/101. As a controversial drug and rarely referred in ancient texts, the optimum dose of Kākanāsā is unavailable. In Ayurvedic Pharmacopoeia optimum dose 2-5 g should be accepted. (According to 'The Ayurvedic Pharmacopoeia of India', Part-I, Vol. – III, I.S.M. and H. New Delhi).

### Compounds or Preparations of Kākanāsā In Ayurvedic Classics

#### (Evam- Upasamskrutam):

**Caraka Samhita ( c.s.):** *Yoga Rogadhikara Ref.* *Chyavanprash avaleha*, in *Rasayana*. (Ca chi-1-1/62-64) , *Trayausanadi Ghrta*, in *Kasa chikitsa* (Ca. Chi-30/50)

**Astanga Samgraha: ( A.h. )** *Yoga Rogadhikara Ref.*, *Chyavanprash Avaleha*, *Rasayana* (As. Us- 49/40) , *Jivantyadya Yamak*, *Siddhi nasty* (As. Ka- 5/48)

**Vangsen:Yoga Rogadhikara Ref.** *Guduchyadi Taila* (VS. BK.. 93-95), *Jivantyadya Yamak* (V. S. B. 96-8), *Vrihat Vasakadya Ghrta* (VS. KK.- 159-165)

**Virya- Usna** *Bhavaprakash Nighantu*, *Sheeta Raja. Nighantu*.

**Vapaka-Madhura Raja.** *Nighantu*. *Amla Bhavaprakash Nighantu*

**Method of Propagation:** As a dehiscent fruit, seed are removed naturally from the mature and ruptured fruit and due to containing of coma seeds are distributed to a large area.

### CONCLUSION

From the literature review it can be clearly affirmed that Kākanāsā having *Madhura rasa*, *valya*, *vamak*, *garbha sthapak*, *Vata hara*, *Kasa hara*, *sotha hara*, *manasdosa hara* & *rasayana* property and that's why it also useful in *Rajkshma* (tuberculosis), *kasa* (cough), *swasa* (Dyspnoea), *Jwara* (fever), *Shosa* (consumption), *Hridroga* (heart disease), *Vatarakta* (gout) and also a potent aphrodisiac, tonic, clears voice and purifies blood. It also indicated in *Kustharoga* (skin diseases), *Apasmara* (epilepsy), all type of *vataja* disorders or rheumatoid complains, *Sotha* (Inflammation), *Raktavikar* (Bleeding disorder), *Shvitra* (vitiligo), *Arsha* (Piles), *sula* (colic pain), *karna sula* (earache), and *palitya* (greyness of hair). The medicated oil enema of Kākanāsā with other drugs helpful in *Yoni roga* (Vaginal problem), *vataja vikara*, *gulma*, *vishtambha* (constipation), *Aanaha* (abdominal distension), in excess bouts, digestive problems, beneficial for stoutening and subdues *vata* and *pitta*, helps in conception, eradicate the problems of semen and menstruation. the analgesic activity shows significant increase in basal reaction time (K. Chandrasekharan *et al*, 2011). The methanolic extract of the plant showed significant effect on hydrogen peroxide radical scavenging activity (Mohan Gandhi *et al*, 2012).

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