

A Study on the Plants Used as *Chopachini*

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Abstract

Chopachini/Dvipantaravacha or China root is used in many alternative systems of medicine. The plant, first mentioned in Bhavaprakasha in 16th century has been attributed to variety of scientific names in literature. A study was conducted to find out the plants that have been used as *Chopachini*. The study resulted in several varieties of genus *Smilax* as well as *Gynura pseudo-china* of family Asteraceae. *Smilax china* is native to China and Japan and could be the reason the plant is called “*Cheenaala*” in Sinhala. *Gynura pseudo-china* is native to Indonesia, Thailand, and China. Both the plants are used in venereal diseases in the traditional systems of medicine in their native countries but have not been scientifically proven to be effective for treating syphilis. Therefore, it is unclear whether the plant mentioned in Bhavaprakasha is *Smilax china* or *Gynura pseudo-china*. However, considering the medicinal properties, *Smilax china* qualifies to be used as *Chopachini/Dvipantaravacha*.

Keywords: *Chopachini*; *Dvipantaravacha*; *Smilax china*; *Gynura pseudo-china*; China root

Introduction

Chopachini or *Dvipantaravacha* is an herbal ingredient used in Ayurveda and Indigenous medicine in Sri Lanka. In Ayurveda, the first reference to *Chopachini* is in Bhavaprakasha in 16th century. *Chopachini* is mentioned in the texts of Indigenous medicine in Sri Lanka such as *Vaidyaka Hasthasaraya*, but whether it has been used prior to 16th century is unclear. *Chopachini* is referred to as “*Cheena ala*”, “*Seena ala*” or “*Ala beth*” within the indigenous system of medicine. In Ayurveda texts, it is sometimes referred to as *Madhusnuhi*. Evidently 4 species from the genus *Smilax* and *Gynura pseudo-china* of family Asteraceae are used as *Chopachini* (Table 1). Among these, *Smilax china* is officially considered as the authentic identification as per The Wealth of India series [1]. This raises the question why a *Gynura* species has been used instead in some instances. In India, always a *Smilax* species has been used as *Chopachini* but in Sri Lanka use of *Gynura pseudo-china* can be seen. According to “A checklist of flowering plants in Sri Lanka” only 3 *Smilax* species found in Sri Lanka and those are *S. perfoliata* (*Maha Kabarossa*), *S. zeylanica* (*Heen Kabarossa*) and *S. aspera*. Two *Gynura* species are found in Sri Lanka; *G. pseudo-china* which is identified as *Chopachini* (*alabeth* in Sinhala) and *G. hispida* (*Hulantala*). All of these plant species have been called China root masking exactly what species was in use in the past.

Phiranga roga- syphilis

Chopachini or china root was renowned to be effective in the treatment of Syphilis and used extensively in various indigenous medical systems. The plant is indicated especially for *Phiranga roga*, a new disease that makes its first appearance in Bhavaprakasha. *Phiranga roga* was not found or has not reached to epidemic levels in India by the time the great Ayurveda treatises were written. Hence the authors were unaware of the disease. Syphilis began to raise its dreadful head in Europe in 1493 A.D [2] and was a new disease in Asia around 1500. *Phiranga roga* is Syphilis or Yaws that found its way to India with the with the first Portuguese fleet, in 1498, and by 1504/5 who had established themselves at Goa and some parts of India by early sixteenth century A.D [3]. Since then it has become a widely known was also used by the Maldivians. Portuguese were also held responsible for syphilis in Sri Lanka. The disease arrived in Canton between 1504 and 1506, about 15 years before the Portuguese established there. In 1505, or, according to another source, 1512, syphilis landed in Japan, where the disease was called Chinese ulcers, or Portuguese disease [3].

According to Van Linschoten, in India it was an everyday disease. It was cured with *Radix china* or *chinae* which, according to Jan Huyghen van Linschoten, who came to India in the 1580s, had not been introduced in India from China until 1535 [3]. He said that „the pox” was so common in China, that God had sent them *Radix china*. It is evident that a plant which the westerners called China root was used to treat the disease. Apart from the vague descriptions, no authentic information could be found about the plant used as China root. China root had sudorific (sweat inducing) properties [4]. It had been used in Asia as a panacea for many illnesses, including jaundice, leprosy and many other skin diseases. It was reportedly used as a cure for beriberi. Sudorifics were also used in Europe against syphilis from a syphilis, which according to contemporary medical opinion came from the West Indies, should be cured. In 1516, Portuguese arrived in China and many valuable Chinese products of vegetable origin were carried to Europe in the 16th Century, especially medicines. Among the latter China root was found in Europe, since about the year 1535. The emperor Charles V is reported to have been cured of gout by this drug [5].

The drug imported by westerners from China known as “China root”, “China wood” or simple “China” is controversial. Many *Smilax* species are called China root and in European countries and in South America it is called Sarsaparilla. The original species, *Smilax aspera*, is found in above areas whereas other species are found in other parts of the world. Another celebrated species is *Smilax china* which is inhabited in China. Two species, *Smilax glabra* and *lancefolia* can be found in India and their roots are so similar to that of *Smilax china* that it is difficult to differentiate the species. A similar species is common in the southern part of North America and has been called *Smilax pseudo-china*, a name which is probably used to name more than one species. However, CRC world dictionary of medicinal plants and poisonous plants mentions that *Gynura pseudo-china* as a source of china root [6].

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Source	Type	Species Used	Botanical Family
Srilanka Ayurveda Materia Medica	Book	<i>Smilax glabra</i>	Smilacaceae
Indian Materia Medica	Book	<i>Smilax china</i>	Smilacaceae
Deshiya Vaidya Shabda Koshaya	Book	<i>Gynura pseudochina</i>	Asteraceae
Medicinal Plants	Book (D.M.A, 2006)	<i>Gynura pseudochina</i>	
Evaluation of adaptogenic and anti-stress effects of Ranahamsa Rasayanaya-A Sri Lankan classical Rasayana drug on experimental animals	Research (Somarathna, 2010)	<i>Gynura pseudochina</i>	Asteraceae
Medicinal plants of Sikkim in Ayurvedic practice	Research (Panda,2007)	<i>Smilax lanceaefolia roxb</i>	Smilacaceae
In vitro studies of antimicrobial properties of extracts from unani medicinal plants	Research (Namra H,)2012	<i>Smilax glabra</i>	Smilacaceae
Demand and Supply of Medicinal Plants in India	Report (DK Ved,2007)	<i>Smilax glabra</i>	Smilacaceae
Ethno medicinally important plants of Pachmarhi region, Madhya Pradesh, India	Research (Mishra,2012)	<i>Smilax lanceifolia</i>	Smilacaceae
Nutritional assessment of some selected wild edible plants as a good source of mineral	Research (Shivprasad Mahadkar, 2012)	<i>Smilax zeylanica</i>	Smilacaceae
CRC World Dictionary of Medicinal and Poisonous Plants: Common Names Scientific Names, Eponyms, Synonyms, and Etymology (5 Volume Set)	(Quattrocchi, 2012)	<i>Gynura pseudochina</i>	
A Hand Book of the Flora of Ceylon	(Trimen, 1895)	<i>Gynura pseudochina</i>	

Table 1: The literature in recent history uses different scientific names for *Chopachini*. These differences range from variants within a genus to plant from different botanical families.

Gynura pseudochina extends from Sierra Leone eastwards through the Central African Republic and Ethiopia to Somalia and south to Malawi, Zambia and Angola. It also occurs in Sri Lanka, India, Bhutan, China, Myanmar, Thailand, Vietnam and Australia. It is cultivated in Java (Indonesia) and Peninsular Malaysia [7].

Chopachini or china root is also called *Dwipantaravacha* in Sanskrit and the name bears some significance. The word *Dwipantara* can be separated in to “*Dvipa*” and “*Antara*” with *Dvipa* meaning island and *antara* meaning in between or across. “*Dwipantara*” is historically used to denote Indonesia [7]. Indonesia has adopted the name during the time of King Hayam Wuruk the Majapahit Empire who ruled from 1331-1364, that is at the end of the 13th century. Therefore it is possible that material imported from the area has adopted the name *Dwipantara* and Bhavaprakasha which was written in 16th century mentioned it as *Dwipantaravacha*. According to India Major: Congratulatory volume Presented to J.Gonda, *Dwipantara* in old Javanese being either “Indonesia, the islands” as in Sanskrit or “the islands other than Java” [7]. *Gynura pseudochina* being extensively cultivated in Java and Indonesia might have been called *Dwipantaravacha* to denote its origin.

Garcia d’Orta, the First physician to the Portuguese Viceroy of India at Goa and a resident in India for 30 years gives an account of Indian spices and medicines in his book. The author mentions several Chinese drugs including *Radix chinae* and its medicinal virtues, stating that in China it is used for venereal and cutaneous diseases. China root become first known in India in A.D. 1535 through Chinese traders. The Chinese call the plant *Lampatam*. The latter name given by Garcia seems to be a corruption of long *Jan tu’an*, which according to the Chinese Herbal is *t’u fuling* or China root [5]. Miller-Martyn’s Dictionary mentions *Smilax pseudochina* stating that it occurs in China. It is frequently used instead of true China root. A small quantity of it, even in cold water tinges of a deep red, whereas the true root yields a light yellow brown [5].

This poses a question as to what plant is meant as *Dwipantaravacha* by *Bhavamishra*. However, according to many texts, China root is not a native of India and imported to India around A.D. 1535, is provided as a cure for Syphilis.

Indian Sanskrit texts mention characteristics of *Dwipantaravacha* or *Chopachini* as follows.

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-*Dwipantaravacha* is a bit bitter and of hot potency. It kindles digestive fire, alleviates *adhmana*, *shula*, and purifies *malas*. *Dwipantaravacha* is to be used in *vatavyadhi*, *apasmara*, *unmada*, *shula*, and especially in *Phiranga roga*.

Bhavaprakasha lacks description of the plant. The name *Dwipantaravacha* is mentioned in *Haritakyadi varga* in Bhavaprakasha whereas the name *Chopachini* is mentioned in the *Phirangadikara*. However there is no reference whether the two terms are synonymous other than the fact that they are indicated for *Phiranga roga*.

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 द्विपन्तरे द्विपिनो द्विपिनो द्विपिनो द्विपिनो (Shavabala)

The name *Chopachini* is used Shiva Nigantu and some information on identification has given saying it is like *Ashwagandha* (*Withania somnifera*). However, it is not clear as to what aspect of *Ashwagandha* the text is referring to. Whether it looks like *Withania somnifera* plant or whether it has an odor similar to the characteristic odor of the plant.

In Bhaishajya Rathnavali *Chopachini* is indicated for *Phiranga roga*.
 चोपचीनी भवेत्तु शाणमानं समस्त्रिणम्, किञ्च त्व्यधिनशाय मक्षयेद्भवति त्यजेत्

Yogarathnakara indicates *Chopachini* for rejuvenation in *Chopachini paka*. Sahasrayoga also indicates it for rejuvenation but it uses the name *Mahusnuhi*.

In Siddha Bhaishajya Manimala *Chopachini* is indicated for *Sandhivata*.

द्विपन्तरे द्विपिनो द्विपिनो द्विपिनो द्विपिनो द्विपिनो (Bhaishajya Manimala 4477)

Smilax china

It is a common mountain plant, which sometimes climbs, but its stem is strong, hard and covered with spines. The leaves are large, round like hoof of a horse and shining. In the autumn it bears yellow flowers followed by red fruits. The root is very hard and is covered

with bristle like hairs. A decoction which is sour and harsh is made of the root. It is a kind of shrub indigenous to China and Japan where it is called *Toojuh*. It is not grown in India although the china root is common in all the bazaars. It is believed that the root of *Smilax glabra* probably constitute part of the dried tuberous roots. It has long held the reputation of possessing properties allied to those of Sarsaparilla, which is the root of several species of *Smilax* indigenous to tropical America. The drug is imported from China to a considerable extent by coating steamers trading with Calcutta and Bombay” [8].

The same book gives the following description on *Dvipantaravacha*.

It is a kind of twining plant found in many parts of India. It is slightly bitter, stimulant, conductive of digestive fire and beneficial in Pains, Hysteria, Rheumatism, Insanity and pains in the body. It is especially alleviative of syphilis and mercurial poison”. This description is similar to what is mentioned in Bhavaprakash, and could be a mere translation.

Smilax pseudochina

Smilax pseudochina is a climbing plant, having a spotted stem and the leaves which are not opposite, somewhat resemble large bamboo leaves, but are thicker, more glabrous and five or six inches long. The root somewhat resembles that of *Smilax china*, but is round and consist of a conglomeration of tubers, being found at varying depths in the ground. The flesh is very tender and can be eaten raw. Flesh could be either red or white. The latter is used in medicine. This is the principle substance known as China root, although *Pachyma, cocos* is also included under this name, and it is sometimes difficult to separate the two products or distinguish them on the market [8]. It is found on the market in the form of brown, irregular, nodulated, branching, tuberous roots, with wiry radicals of some length attached to them. The interior is white and starchy, and sweet to the taste, with patches of yellow near the surface. It can be used as food strengthening the body and assisting in keeping one awake on journeys prolonged into the night. It is regarded as tonic, astringent or corrective in diarrheas, and curative in ulcers and mercurial sores. But it is mainly used in Syphilitic difficulties, especially the secondary and tertiary manifestations. Dr Waring found the large tuberous roots of the Burmese variety, the *Smilax prolifera* of Roxburgh, very useful in the form of a decoction of the fresh root, in secondary Syphilis, cachexia and chronic skin diseases [8].

Smilax species also demonstrate pharmacological actions similar to those mentioned for *Chopachini*. It is anticonvulsant, testicular antioxidant (Saraswati, 2012) and useful in treating syphilis.

Gynura pseudochina

Gynura pseudochina is a perennial, erect, semi-succulent herb up to 130cm tall. Roots are tuberous, round or lobed, 2-6cm in diameter. Leaves are arranged in a rosette, simple, often shallowly lobed, petiole 0.3-3 cm long. Blade obovate, spatulate, and elliptical or ovate. Upper leaves are more dissected and smaller.

Flower is an inflorescence a camoanulate head, loosely racemously or paniculately grouped, peduncle up to 4 cm long, inner involucre bracts 13, 7-12 cm long. Corolla 10-13mm long. Yellow to red Fruit an achene, 3-4mm long [9]. *Gynura pseudochina* is extensively cultivated in Indonesia and is used in the indigenous medical system of the country. It is mentioned that the plant is used to treat various kinds of skin irritation, herpes infections, breast tumors and sore throat [10]. In Thailand, *Gynura pseudochina var hispida* (Thai name- *Wan Mahakaan*) is externally used as anti-itching, anti-inflammatory, and

anti-herpes virus. In Singapore, Malaysia and Indonesia the plant has been traditionally used as remedies for eruptive fever, rash, kidney diseases, migraine, constipation, hypertension, DM and Cancer [11]. *Gynura pseudochina* is used as a medicine in African continent as well. In northern Nigeria it is cultivated as a medicinal plant to treat fever. The fresh leaves are used for their demulcent property and leaf sap is applied to sore eyes. In Asia, leaves are used to reduce skin irritation caused by insect stings, pimples and bruises and to cure scabies and erysipelas. Leaves, stems and roots are variably accredited with haemostatic, antipyretic and vulnerary activity. Plant parts are used to regulate menstruation, to treat breast tumors, herpes infections and sore throats [2].

Modern findings

No study has been done to demonstrate the effectiveness of *Smilax* species or *Gynura pseudochina* against Syphilis. But *Gynura pseudochina* has an effect against herpes virus. But *Smilax* species have been proven to possess other properties of *Chopachini*. Traditionally *Smilax* species are being used for the treatment of epilepsy and scientifically the anti-epileptic property has been proven in two *Smilax* species, *Smilax china* and *Smilax zeylanica* which is the substitute of *Smilax china* used in Sri Lanka [12,13]. The study substantiates the use of *Smilax zeylanica* as an additional botanical source for the Ayurvedic drug *Chopachini* in the treatment of epilepsy. Another study has been carried out to demonstrate the anti-stress activity of *Smilax china* on male infertility in rats [14]. According to the study the aqueous extract of the tuber *Smilax china* has been reported to possess anti-nociceptive activities in rats. However, other *Smilax* species also said to possess anti-inflammatory beneficial effects such as immuno-modulatory activity in the aqueous extract from the rhizome of *Smilax glabra* and anti-oxidant activity in the leaf extract of *Smilax excels*. *Smilax china* has also proven to have an anti-diabetic effect [12]. The available scientific data on *Smilax china* confirms the usage of *Chopachini* for *Apasmara* (epilepsy).

Gynura pseudochina has been proven to possess anti-cancer effect. In Thailand, *Gynura pseudochina var hispida* is externally used as anti-itching, anti-inflammatory and anti-herpes virus. In Singapore, Malaysia, and Indonesia, the plant has been traditionally used as remedies for eruptive fever, rash, kidney diseases, migraine, constipation, hypertension, diabetes mellitus, and cancer [14]. The results of the researches done on *Gynura pseudochina* do not confirm properties of *Dvipantaravacha* mentioned in Bhavaprakasha, but its practical usage in indigenous medicine justifies the properties; *shulaprashamana* (Pain relieving property), *mala shodhaka* (purifying excrement), and use in *Vata vyadhi* [15-25].

Discussion

When compared with the description in Bhavaprakasha, one cannot conclude what plant species is referred by *Chopachini*. In Bhavaprakasha, usually, for a single plant many synonyms which are suggestive of the appearance or other characteristics of the plant are given. The reason for lack of description of characteristic for *Dvipantaravacha* or synonyms could be due to this plant being foreign to the country. It is also possible that only the dried parts were exported to the country at that time. A vague description of the appearance of the plant is given on Shivadatta which was written much later than Bhavaprakasha [26]. According to Shivadatta, *Dvipantaravacha* is similar to *Ashwagandha* (*Withania somnifera*). The *Smilax* species bears some resemblance to outward appearance of *Withania somnifera* in the fact that both plants bear bright red berry like fruits. The dried

root, which is the parts used of both the species do not have any outward similarities. However, *Withania somnifera* is a shrub and *Smilax* is a perennial vine. Considering the resemblance with *Gynura pseudochina*, the only similarity that can be pointed out is that the leaves look somewhat similar and the musky odor of the root.

Available data suggests that few number of *Smilax* species including *Smilax china* and *Smilax glabra* are used as China root or *Dwipantaravacha*. Certain other species like *Smilax pseudochina* and *Smilax zeylanica* are also used as China root but they are more often used as substitutes. Apart of the *Smilax* species [27], *Gynura pseudochina* is also called as China root. Based on the available data conclusion cannot be drawn as to what species is meant by Bhavamistra as *Chopachini* nor does it reveal why *Gynura pseudochina* is called China root. However, according to the available data, *Smilax china* is more eligible to be used as *Chopachini* [28,29].

Recommendations

The effectiveness of *Smilax china* and *Gynura pseudochina* plants against *Treponema pallidum* is worth investigating.

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References

- Anonymous (1950) The wealth of India, Vol. VIII. New Delhi: Council of Scientific and Industrial Research, 365.
- Sidkar JC (1982) Phirangiroga (syphilis) and its management as described in Vaidyaka Samgraha, an old Gujarati manuscript of an unknown author (18th century AD). Indian J Hist Sci 17: 132-153.
- Madhavan V (2008) Antiepileptic activity of alcohol and aqueous extracts of roots and rhizomes of *Smilax zeylanica* linn, Pharmacologyonline, 3: 263-272.
- Malalavidhane TS, Wickramasinghe SM, Jansz ER (2000) Oral hypoglycaemic activity of *Ipomoea aquatica*. J Ethnopharmacol 72: 293-298.
- Boomgaard P (2007) Syphilis, Gonorrhoea, Leprosy and Yaws in the Indonesian Archipelago, 1500-1950, Journal of Humanities.
- Panda AK (2007) Medicinal plants of Sikkim in Ayurvedic practice. Tadong, Gangtok (Sikkim): Regional Research Institute.
- Davis JF (1848) The Chinese: A general description of the empire of China and its inhabitants, New York, 2: 543
- Stuart G, Porter F Chinese materia medica (p. 410). Shanghai? Presbyterian Mission Press
- Ved DK, Goraya GS (2007) Demand and Supply of Medicinal Plants in India. New Delhi: National Medicinal Plants Board.
- Jacob Ensink PG (1972) India Maior: Congratulatory Volume Presented to J. Gonda. Brill Archive.
- Quattrocchi U (2012) CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology (5 Volume Set). CRC Press.
- Bret Schneider E (1898) History of European Botanical Discoveries in China. Sampson Low, Marston and Company.
- Dr. Duke's Phytochemical and Ethnobotanical Databases. Online Database (2014)
- EJ Brill L (1972) India Major: Congratulatory Volume Presented to J Gonda (PG Jacob Ensink, Ed.) Netherlands: Brill Archive.
- Bosch CH (2004) *Gynura pseudochina* (L.) DC. In: Grubben GJH, Denton OA (eds). PROTA 2: Vegetables/Légumes. [CD-ROM]. PROTA, Wageningen, Netherlands.
- Grubben G (2004) *Gynura pseudochina*. In Vegetables (p. 309). Netherlands: Backhuys.
- Gupta KN (1914) The Ayurvedic System of Medicine or Indian Indigenous Drugs and Plants.
- Jarikasem S, Charuwichitratana S, Siritantikorn S, Chantratita W, Iskander M, et al. (2013) Ant herpetic Effects of *Gynura procumbens*. Evid Based Complement Alternat Med 2013: 394-865.
- MV S (2011) Anti-stress activity of *Smilax china* on male infertility in rats. Bangalore: Nargund College of Pharmacy.
- Namra H (2012) In Vitro Studies of Antimicrobial Properties of Extracts. International Journal of Pharma and Bio Sciences, 240-249.
- Rao S (2005) Encyclopedia of Indian Medicine: Historical perspective. Bangalore: Ramadas Bhatkal.
- Ray P (2004) History of Chemistry in Ancient and Medieval India. Varanasi: Chawkanha Krishnadas Academy.
- Shivprasad Mahadkar SV (2012) Nutritional assessment of some selected wild edible plants as a good. Asian J Plant Sci Res, 2: 468-472.
- Siriwatanametanon N, Fiebich BL, Efferth T, Prieto JM, Heinrich M (2010) Traditionally used Thai medicinal plants: in vitro anti-inflammatory, anticancer and antioxidant activities. J Ethnopharmacol 130: 196-207.
- Somarathna KI, Chandola HM, Ravishankar B, Pandya KN, Attanayake AM, et al. (2010) Evaluation of adaptogenic and anti-stress effects of Ranahamsa Rasayanaya-A Sri Lankan classical Rasayana drug on experimental animals. Ayu 31: 88-92.
- Trimen H (1895) A Hand-Book of the Flora of Ceylon (Vol. Part III). London: Dulau & Co.
- Vijayalakshmi A, Ravichandiran V, Anbu J, Velraj M, Jayakumari S (2011) Anticonvulsant and neurotoxicity profile of the rhizome of *Smilax china* Linn. in mice. Indian J Pharmacol 43: 27-30.
- Xu Y, Liang JY, Zou ZM (2008) Studies on chemical constituents of rhizomes of *Smilax china*. Zhongguo Zhong Yao Za Zhi 33: 2497-2499.
- Yance D (2013) Adaptogens in medical herbalism: Elite herbs and natural compounds for mastering stress, aging, and chronic disease. Inner Traditions / Bear.