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Review

Evolvulus alsinoides (Convolvulaceae): An American herb in the Old World

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Abstract

People in the Indian region often apply *shankhapushpi* and *vishnukranti*, two Sanskrit-based common names, to *Evolvulus alsinoides*. These are pre-European names that are applied to a medicinal American species transported into the area. The period of introduction is uncertain, but probably took place in the 1500s or 1600s. Examination of relationships of *Evolvulus alsinoides*, geographic distribution, its names in Asia, medical uses, and chemical and laboratory analysis indicates that the alien plant was adopted, given an ancient Indian name, and incorporated into some Old World pharmacopoeias. The herb apparently was included in medicines because it not only reminded people of certain aspects of their gods and goddesses, but also because the chemicals it contained were useful against some maladies.

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Keywords: Aryans; Chemical constituents; Common names; Ethnobotany; Hinduism; History; Medicinal plants; Name transference

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1. Introduction

1.1. Names and confusion in the ethnopharmacological record

Modern people in India and vicinity use several names for *Evolvulus alsinoides* although the most widespread are based on Sanskrit *shankhapushpi* and *vishnukranti* (Table 1). These

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Table 1
Some common names of *Evolvulus alsinoides*

Language classification family (subfamily) language	Name/comments	Sources
Afro-Asiatic (Chadic, West) Hausa	<i>kálifí máálám</i> (<i>ka-fi-malan</i>) (better than <i>malan</i> , alluding to use as a charm to procure love or favor), <i>máálámíí</i> , <i>máálámíí ná máátáá</i>	Africa, Nigeria (Dalziel, 1937; Blench, 2003a)
Afro-Asiatic (Semitic, South) Amharic and Tigrigna Soqotri	<i>erirao</i> <i>di şefir`iirihon</i> (many-flowered), <i>səwéyini</i> (closely-knotted, woven)	Africa, Ethiopia (Getahun, 1976) Soqotra (Miller and Morris, 2004)
Austro-Asiatic (Mon-Khmer) Vietnamese	<i>bât giao</i> (<i>b[aas]t giao</i>) (<i>bât</i> = negative, <i>giao</i> = entrust, hand-over)	Vietnam (Van Valkenburg and Bunyaphratharsara, 2001; Võ, 2003)
Austro-Asiatic (Munda, North Munda) Santal	<i>tandi-kode-baha</i> . This name has also been applied to a <i>Desmodium</i> (Fabaceae)	India (Watt, 1889)
Austronesian (Malayo-Polynesian) Fiji Malagasy	<i>o-chichi</i> <i>vahimpasika</i>	Fiji, Yasawas Island (Smith, 1991) Madagascar (Ganeshiaiah and Uma Shaanker, 2003–2004)
Creole (Iberian based) Papiamentu	<i>jeerba plaata</i> (<i>jeerba</i> = herb, plant, <i>plaata</i> = yard), <i>jeerba sjieko</i> (herb, <i>sjieko</i> = ?)	Dutch West Indies (Boldingh, 1914)
Dravidian (South-Central) Telugu	<i>vishnukranta</i> ¹ (<i>vishnukrantha</i> , <i>vishnu-kranta</i> , <i>vishnukrantamu</i>)	India (Watt, 1889; Kapoor and Kapoor, 1980; Parrotta, 2001; Ganeshiaiah and Uma Shaanker, 2003–2004)
Dravidian (Southern) Kannada Kannada Malayalam	<i>shankhapushpi</i> ¹ <i>vishnukranti</i> ¹ (<i>visnukranti</i>) <i>krishnakranti</i> ¹ (<i>krsnakranti</i> , <i>krishnakitathi</i>), <i>sivakranthi</i> (Siva's halo), <i>visnuklanti</i> ¹ (<i>vishnukranti</i> , <i>vishnukranthi</i> , <i>vismaklandi</i> , <i>vistmaclandi</i> , <i>vistnu-clandi</i> , <i>vishnukranthi</i>). <i>visnuklanti</i> is applied to <i>Ipomoea quamoclit</i> by some Marathi speakers	India (Parrotta, 2001; FRLHT, 2007) India (Watt, 1889) India (Rheede, 1692; Nicolson et al., 1988; Parrotta, 2001; Nayar et al., 2006; FRLHT, 2007; Nair, 2007)
Tamil Tamil	<i>ishti-kanta</i> . Based on <i>vishnu-kranta</i> or error? <i>Vishnu-kranti</i> ¹ (<i>vichnukiranti</i> , <i>vishnukanti</i> , <i>vishnukirantei</i> , <i>vishnukrendi</i> , <i>vishnukantam</i> , <i>vishnukantam</i> <i>vishnukantamu</i>)	India (Kapoor and Kapoor, 1980) India (Watt, 1889; Karandikar and Satakopan, 1959; Parrotta, 2001; Sandhya et al., 2006); Sri Lanka (Austin, 1980)
Indo-European (Germanic) English	Acapulco <i>evolvulus</i> , Arizona blue eyes (based on Spanish <i>ojitos azules</i>)	Arizona, Pima Co. (Johnson et al., 2005)
English	chickweed <i>evolvulus</i>	Bahamas (Correll and Correll, 1982; Austin, 2004)
English	[slender] dwarf morning-glory	USA (USDA, 2007)
English	[tropical] speedwell. Based on the common name for <i>Veronica</i> (Scrophulariaceae)	Jamaica (Adams, 1972); Australia (Western Australian Herbarium, 1998)
Indo-European (Indo-Iranian) Bengali Gujarati	<i>vishnukranti</i> ¹ (<i>vishnugandhi</i>) <i>shankhavali</i> (<i>kalishankhavli</i> , <i>klisankhavli</i> , <i>klisankhavli</i>) (<i>kali</i> = ?, <i>shankha</i> = conch, <i>vali</i> = climber)	India (Parrotta, 2001) India (Mehta and Shah, 1959; Bhatt et al., 1999; Parrotta, 2001)
Gujarati Hindi	<i>jhinkiphudardi</i> <i>chhoti-shankaphuli</i> (<i>chhoti</i> (<i>chhotaa</i>) = small, <i>shanka</i> = conch, IF <i>phuli</i> = <i>piilaa</i> , yellow)	India (NCL, India, 2007) India, Madhya Pradesh (Anis et al., 2000)
Hindi	<i>sankhaholi</i> ¹ (<i>sankha</i> = conch, <i>holi</i> = ?festival of lights)	India (Kapoor and Kapoor, 1980; Dehlvi Remedies, 2007)
Hindi	<i>shankhapushpi</i> ¹ (<i>shankapuspi</i>)	India (Mehta and Shah, 1959; Kapoor and Kapoor, 1980; Parrotta, 2001)
Hindi	<i>shyamakranta</i> (<i>syamakranta</i>) (<i>shyama</i> = ?, <i>kranta</i> = halo)	India (Parrotta, 2001)

Table 1 (Continued)

Language classification family (subfamily) language	Name/comments	Sources
Hindi	<i>phooli</i>	India (Ganeshaiah and Uma Shaanker, 2003–2004)
Hindi	<i>vishnukranta</i> ¹ (<i>vishnugandhi</i>)	India (Parrotta, 2001; Aravindh, 2007)
Marathi	<i>shankapushti</i> ¹	India (Aravindh, 2007)
Marathi	<i>shankhāvalli</i> (<i>shankavall</i>) (<i>shankha</i> = conch, <i>valli</i> = creeper)	India (Watt, 1889; NCL, India 2007)
Nepali	<i>khunkhune jhar</i>	Nepal (Manandhar, 2002)
Punjabi	<i>shankhapushpi</i> ¹ (<i>shankpushpi</i>)	India (Watt, 1889; Parrotta, 2001); Pakistan (Austin and Ghazanfar, 1979)
Sanskrit	<i>mahArasa</i> (having much flavor, but literally <i>maha</i> = big, <i>rasa</i> = moisture, humidity). Also used for <i>Indigofera tinctoria</i> and <i>Clitoria ternatea</i> (both Fabaceae)	India (Monier-Williams, 1899)
Sanskrit	<i>nilapushpi</i> (<i>nilapushi</i>) (<i>nila</i> = blue, <i>pushpi</i> = flower). This name was not given by Monier-Williams (1899)	India (Mehta and Shah, 1959; Ganeshaiah and Uma Shaanker, 2003–2004)
Sanskrit	<i>shankhapushpi</i> (<i>sankpuspi</i> , <i>shankpushpi</i>) (<i>shankha</i> = conch, <i>pushpi</i> = flower). Used by Ayurveda practitioners in Kerala for <i>Clitoria ternatea</i> (Fabaceae); also used for <i>Canscora decussata</i> (Gentianaceae) in Bengal, and <i>Convolvulus pluricaulis</i> in other parts of India (Dubey et al., 2004, Unnikrishnan, 2004). Gopalakrishna Pillai (1976) listed many names he considered synonyms	India (Watt, 1889; Monier-Williams, 1899; Parrotta, 2001); Pakistan (Austin and Ghazanfar, 1979)
Sanskrit	<i>viSNukrAnti</i> (<i>viSNukrAnta</i> , <i>vishnugandhi</i> , <i>vishnugrandhi</i>) (Vishnu's halo). Monier-Williams said it meant "bestriden by Vishnu." A kind of dark <i>sankha-pushpi</i> ; also used for <i>Clitoria ternatea</i> (Fabaceae). Watt noted that the white-flowered form is called <i>sivakranti</i> (<i>sivagrandie</i>), or Siva's halo. Unnikrishnan says that <i>visnukranti</i> is used exclusively for <i>Evolvulus</i> by everyone except the Ayurveda practitioners in Kerala. There are sometimes modifiers, as in <i>laghuvishnukranta</i>	India (Guruswamy et al., 1956; Krishnamurthy, 1959; Watt, 1889; Monier-Williams, 1899; Parrotta, 2001; Ganeshaiah and Uma Shaanker, 2003–2004; Unnikrishnan, 2004)
Sinhala	<i>vishnu-kraanta</i> ¹ (<i>visnu-kranti</i>) (Vishnu's halo)	India (Watt, 1889; Austin, 1980)
Urdu	<i>sankhaholi</i> (<i>sankha</i> = conch, <i>holi</i> = ?festival of lights)	Pakistan (FRLHT, 2007)
Urdu	<i>sankhapushpi</i> ¹	Pakistan (Austin and Ghazanfar, 1979)
Indo-European (Italic)		
French	<i>lin</i> (flax, comparing the plants with those <i>Linum usatissimum</i> , Linaceae)	Martinique and Guadeloupe (Fournet, 1978; Austin, 2004)
Portuguese	<i>corre-corre</i> (run-run)	Brazil (Austin, 2004)
Spanish	<i>cenicito</i> (little ashy one)	El Salvador (Austin, 2004)
Spanish	<i>fulgencia</i> (brilliance), <i>ojitos azules</i> (blue eyes; source of the English name "blue eyes")	Mexico (White, 2003)
Spanish	<i>ilusión haitiana</i> (Haitian dream)	Hispaniola (Liogier, 1974; Austin, 2004)
Spanish	<i>ojo de vibora</i> (snake's eye)	USA (Correll and Johnston, 1970; Lehr, 1978)
Spanish	<i>oreja de ratón</i> (rat's ear)	El Salvador (Austin, 2004)
Spanish	<i>oretama de sabana</i> (<i>retama de sabana</i>) (<i>retama</i> of the savana, <i>Retama</i> refers to the European legume <i>Lygos</i> , Fabaceae, called white broom in English), <i>Santa Lucía</i> (Saint Lucy, refers to <i>flor de Santa María</i> , which is <i>Chrysanthemum parthenium</i> , Asteraceae), <i>yerba de sabana</i> (savanna herb)	Venezuela (Austin, 2004)
Spanish	<i>pata de paloma</i> (<i>pate paloma</i>) (dove's foot)	Honduras (Austin, 2004)
Spanish	<i>quiebra-cajete</i> (box-breaker). Allusion to laxative use of many members of the family.	Guatemala (Austin, 2004)
Spanish	<i>tebenque</i> . Probably based on Taino. There is a broad use of this name for plants also including <i>Pectis</i> (Asteraceae) and <i>Stylosanthes</i> (Fabaceae)	Cuba (Austin, 2004)

Table 1 (Continued)

Language classification family (subfamily) language	Name/comments	Sources
Isolated Japanese	アサガオカラクサ <i>asa-gao-kara-kusa</i> (morning face China herb)	Okinawa (Walker, 1976)
Mayan (Yucatecan) Maya, Yucatán	<i>sia-siu</i> (<i>xia-xiu, xiatiu</i>) (<i>sian</i> = enchantment, <i>xiw</i> = herb), <i>tsoots ts'ul</i> (Spaniard's hair), <i>x-havay</i> (<i>haway</i>) (refers to leprosy and other contagious skin diseases)	Mexico (Austin, 2004)
Niger-Congo (Atlantic-Congo) Dagomba Ffulde/Fulani Rundi [Kirundi] Rwanda [Kinyarunda] Yoruba	<i>kálifí mádlám</i> . Probably borrowed from Hausa <i>ndottiyel</i> (<i>dottiyel</i>) (little old man) <i>umuinira</i> <i>kajuju</i> <i>ěfúnlè</i> . This name is sometimes used to refer to chalk deposits or to <i>Chamaesyce</i> [<i>Euphorbia</i>] <i>hirta</i> (Euphorbiaceae)	Africa (Blench, 2006) Africa (Dalziel, 1937; Blench, 2003b) Africa, Burundi (Lejoly and Lisowski, 1993) Africa, Rwanda (Lejoly and Lisowski, 1993) Africa (Dalziel, 1937)
Niger-Congo (Mande) Maninkakan	<i>dubryémetré</i>	Africa (Dalziel, 1937)
Nilo-Saharan (Eastern Sudanic) Maasai	<i>leleswa ekopo</i> (<i>leleshwa</i> (<i>o'leleshua</i>) = generic for a small plant with grayish hairs, <i>ekopo</i> (<i>enkopu</i>) = pool)	Africa, Kenya (Bussmann et al., 2006)
Tai-Kadai (Kam-Tai) Thai	<i>bai to kaan</i> (<i>bai</i> = leaf, <i>to</i> = join, with, <i>kaan</i> = stem)	Thailand (Smitinand, 1979)
Sino-Tibetan (Cantonese) Chinese	土丁桂 (<i>t'u</i> = soil, earth, <i>ting</i> = male, <i>kuai</i> = cinnamon, cassia)	China (Mathews, 1944)
Sino-Tibetan (Mandarin) Chinese	土丁桂 (<i>tu</i> = soil, earth, <i>ding</i> = male, <i>gui</i> = cinnamon, cassia). There are at least local names for the variants, including 银丝草 (silver grass) for var. <i>decumbens</i> and 圆叶 (round leaf) for var. <i>rotundifolia</i>	China (Fang and Staples, 1995)
Chinese	鹿含草 (<i>lu</i> = deer, <i>han</i> = cherish, <i>cao</i> = herb). This is equated with <i>Evolvulus alsinoides</i> in several places, but is mostly given as the name for <i>Pyrola rotundifolia</i> in herbal sources. Chinese dictionaries and floras have 土丁桂 for <i>Evolvulus alsinoides</i> and 圆叶鹿蹄草 (<i>yuan</i> = round, <i>ye</i> = leaf, <i>lu</i> = deer, <i>ti</i> = hoof, <i>cao</i> = herb) for the <i>Pyrola</i>	China (Ganeshaiah and Uma Shaanker 2003–2004)
Sino-Tibetan (Sino-Tibeto-Burman) Tibetan Tibetan	<i>sa nkha pu spa</i> <i>kha isa pus syi</i>	Tibet (FRLHT, 2007) Tibet (FRLHT, 2007)

Language names follow Gordon (2005). Scientific names without a family listed are Convolvulaceae. A superscript (1) indicates names cognate with Sanskrit. Words in angled brackets (()) are alternate transcriptions; those in regular brackets ([]) are either added or excluded from the name by different individuals.

two names figure prominently in the ethnopharmacology of the region because they refer to medicinal plants with both an ancient history and modern use. The most widespread application of both *shankhapushpi* and *vishnukranti* is for mental problems, but they have been considered medicine for an array of other human maladies.

Watt (1889) and Monier-Williams (1899) were among many who recorded the Sanskrit names. These two authors considered the words only the common names of plants, although that is an

oversimplification of usage. While it is true that *vishnukranti* is a plant name, *shankhapushpi* is primarily the name of a medicine or drug from plants and only secondarily the name of individual species (Shah and Bole, 1960–1961).

Among the plants for which one or both of these names are recorded are *Clitoria ternatea*, *Convolvulus prostratus*, and *Evolvulus alsinoides*. Monier-Williams (1899) did not include *Convolvulus prostratus*, and Watt (1889) listed only Punjabi names, including *dodak*. Some modern people apply each term

to one species, while others use a single name for more than one. For example, Austin and Ghazanfar (1979) were told in Pakistan that *shankhapushpi* (Urdu) was *Evolvulus alsinoides*; the names *dodak* and *sireen* were given for *Convolvulus prostratus*. *Clitoria ternatea* is known there as *okran* or *supli* (Ali, 1977). Similarly, in Sri Lanka, *vishnukranti* was applied only to *Evolvulus alsinoides* (Austin, 1980); *Clitoria ternatea* is called *nil-katarodu* (blue clitoria), *katarodu-wel* (clitoria vine) (Sinhala) or Tamil *karuttappu* (clitoria) (Maxwell, 1991). Others found that *shankhapushpi* is used largely or entirely for *Convolvulus prostratus* in northwestern India, and for *Evolvulus alsinoides* farther south. Also in the south, *shankhapushpi* is applied commonly to *Canscora decussata* in the Gentianaceae (Dubey et al., 2004; Unnikrishnan, 2004). Clearly, the application of these names has been used differently by practitioners of Ayurveda, villagers, and scholars since at least the 1800s, probably before.

All four genera have been used to treat a variety of maladies, but modern people particularly consider *Evolvulus alsinoides* a treatment for mental disturbances. Parrotta (2001) and many others note that the other three are also known for treating those same problems. One of the persistent difficulties with these four species sharing common names is that both *Clitoria* and *Evolvulus* are natives of the New World, a point not addressed by previous authors. This paper will concentrate on *Evolvulus alsinoides*, but mentions the others in passing.

1.2. Objectives of this study

Although a large body of literature exists on medical uses of *Evolvulus alsinoides*, it is clear that the common names applied to the plants are used differently by distinct people, languages, and cultures. That complexity has not always been considered in evaluating the ethnopharmacology of the plants and has resulted in mixing and confusion of actual and alleged identities and effectiveness in medical applications. This study will summarize the previous studies and discuss the claims made for *Evolvulus alsinoides*.

2. History

2.1. Taxonomy

Convolvulus prostratus is the species now especially closely linked with the name *shankhapushpi*. While Shah and Bole (1960–1961) considered *Convolvulus pluricaulis* and *Convolvulus microphyllus* synonymous, it was Sa'ad (1967) who pointed out that *Convolvulus prostratus* had priority over the other two. Superficially, *Convolvulus prostratus* is similar enough to *Evolvulus alsinoides* that a different taxonomic philosophy might consider them simply white-flowered (*Convolvulus*) and blue-flowered (*Evolvulus*) variants of the same species. Varadan et al. (1958) even comment on them being confused.

Evolvulus is an American genus, with its 100 or so species originally confined to the New World (van Ooststroom, 1934). *Evolvulus nummularius* is now introduced to the Old World,

but it arrived recently (Austin, 1980). More problematical is *Evolvulus alsinoides* that became known to science in the late 1600s and early 1700s.

The first reports of *Evolvulus alsinoides* found in the Americas are Linnaeus (1737, 1753) and Browne (1756). All three included the plants in *Convolvulus*, and subsequently the binomial *Evolvulus alsinoides* was created by Linnaeus (1762). Linnaeus (1737) had a plant from the Bahamas; Browne knew *Evolvulus alsinoides* in Jamaica. However, the species was based by Linnaeus (1753) on a specimen collected by Paul Hermann between 1670 and 1677 near Columbo in Sri Lanka (Trimen, 1888; Lourtig, 1966; Stearn, 1972). *Evolvulus alsinoides* in the Old World was first thought to be an *Alsine* (Burman, 1737, Table 2). Thus, the species was gathered in India perhaps 60–67 years before being recorded in the Americas.

In the only revision of *Evolvulus*, van Ooststroom (1934) pointed out that the specimen on which Linnaeus based *Evolvulus alsinoides* was typical of the Indian plants. He added that those plants (var. *alsinoides*) also occurred in Southeastern Asia, the Philippines, the Netherlands Indies, Madagascar, and tropical East Africa. American plants were considered distinct and placed in a number of varieties (var. *acapulcensis*, var. *adscendens*, var. *debilis*, var. *grisebachianus*), although Ooststroom also recognized several other Old World taxa (var. *decumbens*, var. *glaber*, var. *javanicus*, var. *linifolius*, var. *philippinensis*, var. *rotundifolius*, var. *sericeus*, var. *thymoides*, var. *villosicalyx*, var. *wallichii*). van Ooststroom (1934) did not provide a key to distinguish the varieties, but many of them differ primarily in the density and type of pubescence. For example, var. *hirsutus* (based on a specimen from India) has somewhat reddish indumentum (ferrugineous). Ooststroom's var. *philippinensis* he considered "closely related to var. *hirsutus* but different in the dense, sericeo-villose, fulvous indumentum." The American var. *grisebachianus* he noted as "... much resembling that of the typical [i.e., Indian] form." In his list of specimens studied he admitted that he could not assign all samples to a variety because of the intergradation.

Modern genetic studies indicate that the variation recognized and named by van Ooststroom (1934) is often part of the distinctions one might expect in disjunct parts of ranges. Although no genetic studies have been made of this species, the wide range of pubescence and other traits used to distinguish these named forms suggests genetic drift. When it is studied further, I suspect that the many named "kinds" of *Evolvulus alsinoides* will be found to be analogous to the deviant populations in house sparrows (*Passer domesticus*) that have been introduced around the world and diverged from their ancestors (e.g., Selander and Johnston, 1967; Johnston and Selander, 1971; Lepage, 2003).

van Ooststroom (1934) was probably the first to comment that *Evolvulus alsinoides* was introduced outside the New World. In part, he concluded this because the other species with which he considered it related (section *Alsinoidei*) are restricted to the Americas. He pointed out that the genus has its greatest diversity in Brazil, and that the "centre of development" lies in western South America. Thus, relationships of *Evolvulus alsinoides* indicate that the species originally was native to the New World.

2.2. Geographic ranges

Of the four species most commonly associated with the Sanskrit names *shankhapushpi* and *vishnukranti*, only two are native (*Canscora decussata*, *Convolvulus prostratus*). The *Canscora* is native to southern India, Sri Lanka, tropical Africa, and South-eastern Asia (Cramer, 1981). *Convolvulus* is known from the margins and within the Sahara and Sind deserts (Fig. 1), a distribution that Sa'ad (1967) called "Saharo-Sindian."

Clitoria is cultivated throughout India, but is naturalized in the more tropical regions (Fantz, 1980; Parrotta, 2001; Nayar et al., 2006). *Evolvulus* is naturalized widely in India and elsewhere (Fig. 1).

Europeans moved plants with zeal when new areas were discovered. For example, Ubrizsy and Heniger (1983) listed dozens of American species that were recorded in Europe by Charles de L'Ecuse by the late 1500s and early 1600s, although these authors were confused about the origin of several Old World species they considered American (e.g., *Abutilon theophrasti*, *Cannabis sativa*, *Citrullus lanatus*, *Saccharum officinarum*).

Several members of the Convolvulaceae are known for having been dispersed by people. Those most studied are American species that were taken into the Old World by early explorers in the 1500s and 1600s. Some of these are *Dichondra micrantha*, *Merremia tuberosa*, *Ipomoea batatas*, and *Ipomoea nil* (Austin, 1978, 1998a,b, 2000; Austin et al., 2001). There are three common traits of morning glories and other species moved by humans—(1) they are edible (e.g., *Ipomoea batatas*); (2) they are medicinal (e.g., *Ipomoea nil*); and (3) they are ornamental. Some fit more than one criterion such as *Ipomoea alba* (Table 2), which has been moved because it has ornamental flowers and is medicinal. Now, the medicinal use of *Ipomoea alba* is overshadowed and almost forgotten (Austin, 2004).

2.3. History in names

Some of the common names of *Evolvulus alsinoides* allude to Hindu deities, particularly Krishna [Krisna], Lakshmi [Laksmi], Shiva [Siva, Śiva, Siwa], and Vishnu [Visnu] (Table 1). Before discussing individuals, it is important to establish their context in the Hindu pantheon. The essence of Brahmanic doctrine is that of the *Trimurti* (trinity). This concept is sometimes depicted as a trifurcated lotus-tree-of-life sustaining a member of the *Trimurti*: Brahma the creator, Vishnu the preserver, and Shiva the destroyer (McDonald, 2004). These three are in fact the stages of life—birth, existence, and death. The Hindu philosophy is that all living things picture this trinity.

While this concept is basic, the actual beliefs and practices of Hinduism are remarkably more complex. The religion consists of numerous branches and sects who have distinctive ideas. To make it more complicated, few interpretations of icons are unique. Most of them (perhaps all) have multiple facets, meanings, and interpretations. For example, the four arms of Vishnu may indicate the cardinal compass points, his powers over those directions, his multiple powers, or even other interpretations (ReligionFacts, 2004–2007; Encyclopedia Britannica Online, 2007). Thus, the points dis-

cussed here are to be taken for only one way of viewing the ideas.

According to McDonald (pers. commun., March 2007), many of the Hindu divinities are symbolized by the lotus flower (*Nelumbo nucifera*), and one of Vishnu's many names is Indiver (blue lotus). The lotus is the preeminent plant illustrated with any of the divine beings and McDonald (2004) has argued that it was the species of importance in Hindu *Vedas* (scriptures, literally "sacred lore") and traditions. Colors are significant plant characteristics and are clearly important in Hindu genesis tales. Blue is associated with Vishnu. The goddess Lakshmi is the consort of Vishnu, as she was with the name Rukmini to his incarnation as Krishna. White is associated with Lakshmi, Shiva, and his consort Kamala (lotus girl). Both blue and white appear in lotus flowers (*Nelumbo* and *Nymphaea*), and in plants called *shankhapushpi* and *vishnukranti*.

Use of names incorporating Vishnu ("all-pervader," from Sanskrit *vish*) and Krishna ("black" or "dark" in Sanskrit) are not confined to *Evolvulus* or the lotus. Another important plant to Hindus, especially those espousing Vishnavism, is *Ocimum tenuiflorum* (= *Ocimum sanctum*) (Simoons, 1998). This herb is known in English as holy basil or Thai basil, but in India as *vishnupriya* ("dear to Lord Vishnu," Sanskrit), *tulsi* ("savory," derived from Sanskrit *surasā*, Hindi, Gujarati), and *krishnatulsi* ("dark" or "Krishna's basil," Bengali). There are numerous allusions and connections between these names and the deities (Simoons, 1998), but the most pertinent is to the blue flowers and foliage and Vishnu (see Austin, 2000 for synopsis of color concepts).

Typically the name of *Evolvulus alsinoides* referring to blue-flowered plants is *vishnukranti* or some variant of it (Table 1). Moreover, Sanskrit-based words distinguish between white-flowered and blue-flowered *vishnukranti*, calling the former *sivakranti*. Whether or not *sivakranti* was used in the original texts or a later distinction is not clear. I was told in Sri Lanka that the blue of the *Evolvulus* flowers denoted its association with Vishnu (Austin, 1980). That notation alludes to the color of Lord Vishnu's skin in Hinduism. The *Puranas* ("accounts of ancient times," but literally "old") described Vishnu as being dark-blue. It has been said that "The color of his skin has to be new-cloud-like-blue: The blue color indicates his all-pervasive nature, blue being the color of the infinite sky as well as the infinite ocean on which he resides" (Wikipedia, 2007). In fact, the story is markedly more complicated than that simple statement, and is closely tied up with the origin narratives of the Hindus.

Since Vishnu was reincarnated as Krishna (*atavara* number eight), that association links *vishnukranti* with *krishnakranti*. In his youth, Krishna is depicted as a cow-herd, having been adopted and raised by a man with that as his profession. It is tempting to speculate that there is a link between this ancient story and the modern Chinese name *qian niu* (牽牛) of blue-flowered *Ipomoea nil* (cf. Austin et al., 2001). The Chinese name means "herd-boy, ox-herd, or cow-herd." Since Hinduism is older than Buddhism and had strong influence on the latter, perhaps the connection is real.

While the normal flower color is blue in both *Clitoria* and *Evolvulus*, there are white-flowered forms (van Oostroom,

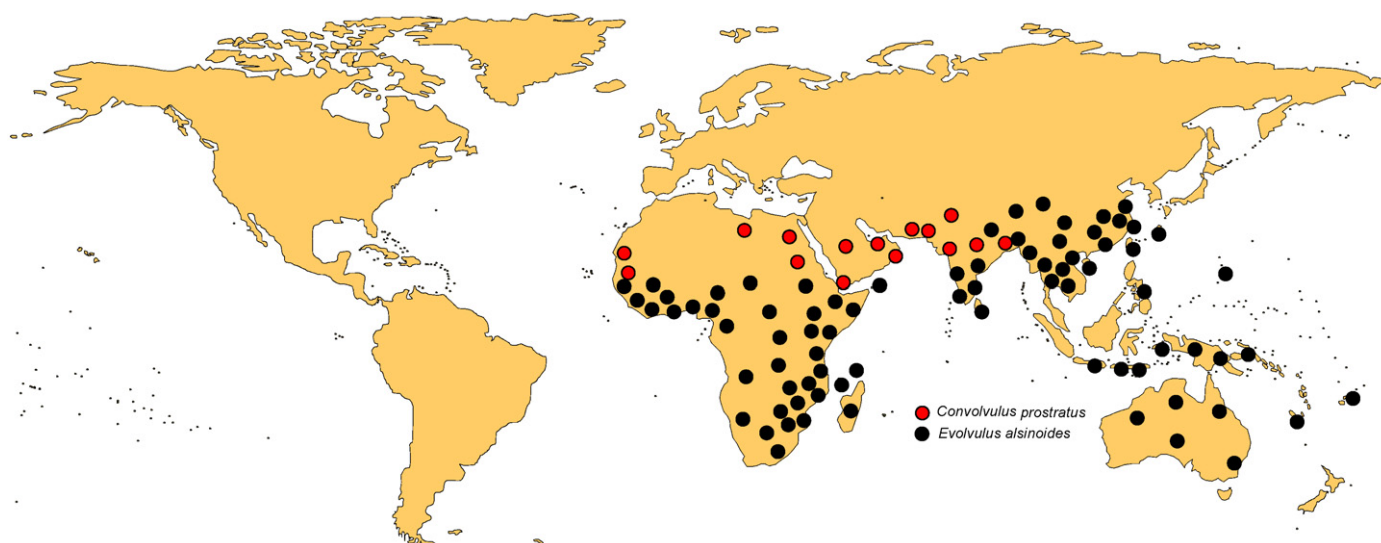


Fig. 1. Distribution of *Convolvulus prostratus* and *Evolvulus alsinoides* in the Old World. Circles represent localities documented with herbarium or literature records.

1934; Parrotta, 2001). Flowers are typically white in *Convolvulus* and *Canscora* (Parrotta, 2001) although they too may be tinged with pink or blue. Moreover, three of the four are small herbs with narrow leaves (*Canscora*, *Convolvulus*, *Evolvulus*).

Aulakh et al. (1988) cite Sanskrit texts that described *shankhapushpi* as a “prostrate herb with conch-like white flowers . . .” Several names alluding to white contain the element *shankha* or divine conch, and this shell is depicted as white in both literature and paintings. According to the Vedic scriptures, the *shankha* is one of the most auspicious objects that emerged during the churning of the sea (*Ksheersagara manthan* or *Ksheersagara samudra manthan*; from *ksheera* = milk, *sagara* = ocean, *samudra* = ocean, *manthan* = churn), an important event in origin stories. Some of the gods hold the *shankha* in their hands. For example, Lord Vishnu holds the *shankha*, the *padma* (lotus), the *gada* (mace), and the *chakra* (discus or wheel) in his four hands. Blowing the *shankha* is considered to be an auspicious sound at the start or end of any ceremony because the “om” sound that it makes is thought to be the breath of Vishnu (ReligionFacts, 2004–2007). The *shankha* is regarded by Hindus as the brother of goddess Lakshmi (“wealth, beauty” in Sanskrit), and both she and Vishnu have as their abode the “ocean of milk” (*Ksheersagara*), another allusion to white.

The reference to Shiva is more complex. Shiva (Sanskrit for the “auspicious one”) is the supreme deity of Shaivism, one of the main branches of Hinduism in India. Some of the Vedic texts say that Maya (often equated with illusion) is destroyed by Shiva or his manifestations, thus allowing absolute truth to be seen; hence Shiva’s name “destructor” arose. Or, comparing the plants with Shiva may be as simple as comparing the plants to “one who purifies everyone by the utterance of his name” or “the pure one,” and as such his name is considered the holiest of holy names (Wikipedia, 2007). Shiva is often illustrated as having white skin. In at least Western cultures, white is the color associated with purity. In parts of southern Europe and Asia (e.g., China, Korea, Japan) white is the color of mourning.

3. Medicine and chemistry

3.1. Medicinal application

Junqueira and Simão-Bianchini (2006) wrote that van Oostroom (1934) thought that *Evolvulus alsinoides* was taken to the Old World for medicinal uses. Simão-Bianchini (pers. commun., March 2007) subsequently told me that she attributes that statement to a mistranslation of the original English into Portuguese. While Oostroom implied medical introduction to be the case without actually saying it, he noted uses for *Evolvulus alsinoides* only in “British India” and Africa. He also added that *Evolvulus nummularius* was used in Madagascar. Most students of the medicinal uses of the plants have not mentioned the alien status of *Evolvulus alsinoides* or *Clitoria ternatea* in Asia but consider them along with native species. Indeed, Gopalakrishna Pillai (1976) concluded that the “true” *shankhapushpi* mentioned in the ancient Sanskrit texts was *Clitoria ternatea*. Apparently he did not know that the species arrived in India during historic times.

The oldest reports found of use of *Evolvulus alsinoides* are from India and surrounding regions. Burman (1737) said that the herb was used to treat dysentery. Watt (1889) summarized those records noting that Mohammedan physicians used the plant to strengthen the brain and memory, and to treat fever and as a general tonic. He says that Ainslie (1813) prescribed the herb for bowel problems, and that Dymock (1885) noted that in the Vedic period (2nd and 1st millennia to the 6th century BCE) what he called *Evolvulus alsinoides* was used to promote conception. Monier-Williams (1899) makes no reference to that use. Colonists thought that the roots were good for treating fevers in children, and might also be made into cigarettes and smoked to relieve chronic bronchitis and asthma. The entire plant was considered astringent and useful for treating hemorrhages.

To the best of our knowledge, *Evolvulus alsinoides* was not introduced into the Old World until after the Europeans arrived

Table 2
Some American plants introduced into Asia

	Species	Early Old World records	Early American records	Nativity source
Anacardiaceae	<i>Anacardium occidentale</i> L.	de Orta (1563), Rheede (1678–1703), Burman (1737)	Clusius (1605), Piso (1648, 1658), Merian (1705), Catesby (1731–1732)	Mitchell and Mori (1987)
Annonaceae	<i>Annona squamosa</i> L.	Burman (1737)	Clusius (1592 ex Ubrizsy and Heniger, 1983), Sloane (1696, 1705–1725)	Kubitzki (1993)
Araceae	<i>Pistia stratoites</i> L.	Rheede (1678–1703), Burman (1737)	Bauhin (1623), Bauhin (1650–1651), Morison (1680), Sloane (1696, 1705–1725)	Dray et al. (1993)
Caricaceae	<i>Carica papaya</i> L.	Rheede (1678–1703), Burman (1737)	Bauhin (1623), Plukenet (1696)	Badillo (1971)
Convolvulaceae	<i>Aniseia martinicensis</i> (Jacquin) Choisy	<i>ben-tiru-tali</i> (ven, white, <i>thiru</i> , sir, <i>thali</i> , plants with mucilage, Tamil, Rheede (1678–1703); <i>thiruthali</i> name of <i>Ipomoea marginata</i> (Desrousseaux) Verdcourt, Nicolson et al. (1988)	? <i>Convolvulus martinicensis</i> Jacquin (1763)	Austin (1999)
Convolvulaceae	<i>Evolvulus alsinoides</i> (L.) L.	<i>Alsine hirta minor, folia alternis</i> ... Burman (1737), <i>vistnu-clandi</i> (<i>vishnu</i> , Lord Vishnu, <i>kranti</i> , halo, Sanskrit), Plukenet (1696)	<i>Convolvulus alsinodes</i> Linnaeus (1753)	van Oostroom (1934)
Convolvulaceae	<i>Ipomoea alba</i> L.	<i>munda-valli</i> [<i>moodavalli</i> in Malayalam script] (<i>munda</i> , small, <i>valli</i> , climber, Tamil, Rheede (1678–1703)	<i>flor de la Y</i> Oviedo (1526), Sloane (1696, 1705–1725)	McDonald (1993)
Convolvulaceae	<i>Ipomoea batatas</i> (L.) Lamarck	<i>kapa-kelengu</i> (<i>kappa</i> , ship or from abroad, <i>kezhengu</i> , tuber, Malayalam, Rheede (1678–1703); Nicolson et al. (1988)	<i>aji</i> and <i>batatas</i> Oviedo (1526), Clusius (1576, 1601, 1605), Bauhin (1623), Morison (1680)	Austin (1978)
Convolvulaceae	<i>Ipomoea nil</i> (L.) Roth	<i>Convolvulus peregrinus vel flos noctis, Nil Arabum</i> Gesner (1561), Gerard (1597)	<i>Convolvulus caeruleus hederaceo anguloso folio</i> Bauhin (1623), Dillenius (1732)	Austin (2000), Austin et al. (2001)
Convolvulaceae	<i>Ipomoea quamoclit</i> L.	<i>Quamoclit foliis tenuiter incisus</i> ... Burman (1737), <i>tsjuria-cranti</i> (<i>suriya</i> , sun, <i>kranti</i> , halo, Sanskrit, Rheede (1678–1703), Nicolson et al. (1988)	<i>Quamoclit sive Jasminum Amerianum</i> Columna (1606), Clusius (1611), Bauhin (1623)	O'Donell (1959), Biju (2003)
Malvaceae	<i>Gossypium hirsutum</i> L.	Burman (1737)	Harriot (1588 [1590]), Clusius (1590 fide Ubrizsy and Heniger, 1983)	Fryxell (1979, 1992)
Myrtaceae	<i>Eugenia uniflora</i> L.	Burman (1737), Linnaeus (1747)	Tilli (1723), Micheli (1729)	McVaugh (1956, 1968), Mabblerley (1997)
Myrtaceae	<i>Psidium guajava</i> L.	Burman (1737)	Clusius (1605), Plukenet (1696), Commelin (1697)	McVaugh (1968), Mabblerley (1997)
Solanaceae	<i>Capsicum annum</i> L.	Rheede (1678–1703), Burman (1737), Linnaeus (1747)	Clusius (1611), Bauhin (1623)	Heiser and Pickersgill (1969)
Solanaceae	<i>Datura metel</i> L.	Rheede (1678–1703), Burman (1737), Linnaeus (1747)	Bauhin (1623)	Avery et al. (1959)

Specimen data from Jarvis (2007) and Jarvis and Cafferty (2007).

(van Oostroom, 1934). Therefore, Ainslie (1813) and Dymock (1885) were wrong about the identification of the plants pre-Europeans called *vishnukranti* as *Evolvulus alsinoides*, and this led Watt (1889) astray. In spite of that error, there was some plant in India during pre-European time that was called *vishnukranti*. That original may have been *Indigofera tinctoria* (indigo), but it is usually called *anil* or *nil* (blue) in Sanskrit and numerous related modern languages. The possibility linked with Hindu deities is the lotus. Regardless of the original species meant, by the 1800s *vishnukranti* had been almost universally applied to *Evolvulus alsinoides*. That dominance prevails today in India.

The most common maladies against which these plants are now considered as a remedy in Ayurveda and by non-professional villagers in India are various mental problems. Among these illnesses are epilepsy, insanity, nervous debility, and loss of memory (Anis et al., 2000; Auddy et al., 2003; Allimuthu and Venilla, 2005). *Evolvulus alsinoides* is deemed a memory enhancer and anti-amnesic (Misra, 1998; Siripurapu et al., 2005). Even in Africa the herb is used to treat low spirits and depression (Bussmann et al., 2006).

There are a variety of other medical applications, including as an adaptogenic, antiphlogistic, antipyretic, antiseptic, aphrodisiac, febrifuge, stomachic, tonic, vermifuge, and against asthma, bronchitis, scrofula, styesepsis, syphilis, or in “controlling night emissions,” and to promote wound healing (Getahun, 1976; Kapoor and Kapoor, 1980; Anis et al., 2000; Van Valkenburg and Bunyapraphatsara, 2001; Manandhar, 2002; Biswas and Mukhurjee, 2003; Allimuthu and Venilla, 2005; Siripurapu et al., 2005; Sandhya et al., 2006). *Evolvulus alsinoides* is so important to the Santals of West Bengal that pulling out plants before seed dispersal is taboo (Jain, 2000).

Uses were found from only three countries in Southeastern Asia. In the Philippines *Evolvulus alsinoides* is used for bowel problem (Quisumbing, 1978). Although the plants have names in Vietnamese and Thai, they are not commonly used there. There is one report that the medicine reduces fever and promotes hair growth in Vietnam (Võ, 2003). Nigerians also treat asthma and bronchitis with the species, and people in Ghana use the herb in love potions and religious rites (Van Valkenburg and Bunyapraphatsara, 2001).

Evolvulus alsinoides is used in the New World, but there are far fewer records than in the Old. In Yucatán, the common name *sia-siu* (enchantment herb) strongly implies that the herbs had and still have an ancient and religious significance to the Mayan people of Mesoamerica (Table 1). Probably, the Caribbean name *ilusión haitiana* (Haitian dream) makes the same allusion. The fact that other countries which are occupied by the descendants of the Maya have common names for the plants further hints at a long history (Austin, 2004). For example in Guatemala, the name *quebra-cajete* is an allusion to medical treatment of bowel problems. There is an unpublished reference from 1943 cited by Morton (1981) suggesting that the plants were used to treat gonorrhea in Yucatán, but no recent reports.

Other major applications are for gastric distress, duodenal ulcers, and fever, especially in children. The Maya name *x-havay* suggests that plants were used to treat leprosy and other contagious skin diseases. In Cuba, a decoction of the whole plant has

been applied against fevers and chronic diseases of the intestines (Roig, 1945). Everyone considers *Evolvulus alsinoides* a bitter tonic and antipyretic.

The genus is not well known for medicinal application, although the species contain several bioactive compounds (e.g., Schimming et al., 1998). The North American endemic *Evolvulus nuttallianus* was used by at least the Kayenta Navajo (Moerman, 1998). In addition, *Evolvulus convolvuloides* and *Evolvulus sericeus* are still used in Latin America. Villagers in Salango, Pacific coastal Ecuador, told me in 1999 that they make a medicinal tea from *Evolvulus convolvuloides* although I have not found it recorded anywhere in the literature. Known as *havay ak* (leprosy vine, Maya), *Evolvulus sericeus* is used in Yucatán to treat all kinds of burns (Tapia and Contreras, in press). *Evolvulus arbuscula* grows in the Bahamas, Cuba, Haiti, Jamaica and Little Cayman, and is used by people in all those places (Roig, 1945; Morton, 1981). A decoction of the entire plant is a popular remedy for catarrh and neurasthenia in Cuba. Jamaicans make a tea considered a treatment for heart problems, flatulence, and belly-ache. The related Bahamian *Evolvulus squamosus* is used in much the same manner, especially against fever or jaundice.

3.2. Chemistry and laboratory experiments

Many of the American and Indian common names are reminiscent of the reputation *Evolvulus alsinoides* has in Asia as a “brain tonic.” Plants are replete with active chemicals that have known medical activity. Cultured tissues of *Evolvulus alsinoides* reputedly accumulate ergot alkaloids, which are amides of D-lysergic acid that are biosynthetically derived from the amino acid tryptophan (Nambiar and Mehta, 1981; Nair et al., 1987). These reports are dubious, largely because of the technique used (Eich, pers. commun., April 2007), but also since some of the same species reported by Amor-Prats and Harborne (1993) did not have those chemicals.

Moreover, studies of *Evolvulus alsinoides* by Eich failed to find ergoline alkaloids in the species. The German study did, however, find tropane alkaloids (tropan-3a-ol, formerly called tropine), tropan-3b-ol (=pseudotropine), tropan-3-one (=tropinone), merresectine C (an ester of 3a-tropanol), and different other similar esters of tropanol and nortropanol, respectively, and several pyrrolidine alkaloids (hygrine, norhygrine, 5-(2'-oxopropyl)-hygrine, 5-(2'-hydroxypropyl)-hygrine, 5-(2'-hydroxypropyl)-hygroline, 2',3-N-methylpyrrolidinylhygrine, 2',4-N-methylpyrrolidinylhygrine, cuscohygrine) (Eich, pers. commun., September 2003). The alkaloids betaine and evolvin[e] have also been reported in the plants (Guruswamy et al., 1956; Varadan et al., 1958; Krishnamurthy, 1959; Aulakh et al., 1988).

In addition, *Evolvulus alsinoides* contains flavonols, flavonoids, saponins, the alkanes pentatriacontane and triacontane, the phytosterol β -sitosterol, phenolics, and tannins (Guruswamy et al., 1956; Mehta and Shah, 1958; Krishnamurthy, 1959; Kapoor et al., 1981; Aulakh et al., 1988; Van Valkenburg and Bunyapraphatsara, 2001).

Ayurvedic medicine regards *Evolvulus alsinoides* highly for impairment of the central nervous system. Laboratory stud-

ies by Aulakh et al. (1988) and Purohit et al. (1996) revealed the herb as anticatonic and a central nervous system depressant with an LD50 of 450 mg/kg (Agarwal and Day, 1977). By contrast, Andrade et al. (2000) found no significant benefit to promote learning or correct amnesia when *Evolvulus alsinoides* was tested. Still, dozens of studies have been made of the compound herbal preparation called BR-16A and marketed as Mentat (e.g., Tripathi et al., 2000). This drug contains 20 or more plants species, including *Evolvulus alsinoides*, and has shown positive results like those reported by Aulakh et al. (1988) and Purohit et al. (1996). Reasons for the different interpretations remain unknown, but Andrade et al. (2000) suggested that they may have been due to their using an aqueous as contrasted with alcoholic extracts by others. More may be involved as the Ayurvedic preparations are typically aqueous.

Other laboratory experiments suggest that extracts from *Evolvulus alsinoides* are antibacterial, antifungal, and antiulcer (Shah and Bole, 1960–1961; Kapoor et al., 1981; Aulakh et al., 1988; Dey and Das, 1988; Purohit et al., 1995, 1996; Andrade et al., 2000; Kamanzi Atindehou et al., 2002; Rajakaruna et al., 2002; Tharan et al., 2003). Although Thenmozhi et al. (1989) reported extracts of *Evolvulus alsinoides* as not being anti-inflammatory, more recent study by Ganju et al. (2003) found that it was. Others note that there is a change in blood pressure and heart rate and force when *Evolvulus alsinoides* is made into a drug and used on laboratory rats (Baveja and Singla, 1969; Aulakh et al., 1988).

4. Discussion

The records between 1670 and the 1730s mention *Evolvulus alsinoides* only in the Old World, specifically southern India. Most of those publications cite only Rheedee (1678–1703) and do not contribute additional data. Although the reports of the species in the Americas begin in 1737, that is not confirmation that the species was not there before that date. The same discovery sequence was true for *Aniseia martinicensis*, *Ipomoea alba*, and *Ipomoea nil*, and these are verifiably American species (Table 2).

As with *Aniseia martinicensis*, *Ipomoea batatas*, *Ipomoea alba*, *Ipomoea nil*, and *Ipomoea quamoclit* the closest relatives of *Evolvulus alsinoides* confirm that the species was originally confined to the New World. When the plant was introduced into the Old World has not been resolved, but it probably arrived with European explorers in the 1500s and 1600s, as did so many other American plants (Table 2). The widespread use of common names for these herbs in India and nearby countries, plus the reports from the late 1600s onwards demonstrate that the herbs were adopted early into Old World pharmacopoeias.

Sanskrit names have been applied to the species (Tables 1 and 2) and Monier-Williams (1899) has argued that these names date to 2000–200 BCE years old (cf. Decker-Walters, 1999). However, it appears clear that the current use of the words *shankhapushpi* and *vishnukranti* resulted from the transfer of pre-European names to plants introduced from the New World. Association of Sanskrit and related-language words that allude to Hindu deities makes it probable that the

new plant was “substituted” for an old one. Since *Evolvulus alsinoides* and some other introductions manifest colors important in Hindu beliefs as being associated with deities, it is likely that this hastened their adoption. The “model” for comparing these new plants is incompletely unresolved but the following hypothesis is offered.

Originally all of these names were used exclusively for the supremely important lotus (*Nelumbo* and *Nymphaea* were not always distinguished). McDonald (2004) has given part of the complexities of the significance of the lotus to Hinduism, and is preparing a book on the topic. Original references to white and blue were to the different colors of the lotus flower that has white and blue/pink petals. The names *shankhapushpi* and *sivakranti* both allude to the white of the flower; *vishnukranti* refers to blue. In both Hindu folklore and iconography it is the lotus depicted as the “halo” over Vishnu and Shiva, and several other gods are often illustrated as sitting on or otherwise associated with the plant (cf. illustrations in McDonald, 2004).

It is currently thought that the earliest civilizations in Pakistan and India were in the Indus River region of the northwest. Sanskrit was spoken by Aryan (comprising the worshippers of the gods of the Brahmins) people moving into northwestern India before 1000 BCE. From archaeological studies we know that these people eventually moved to the east and south down the peninsula to blend with and sometimes replace previous inhabitants, giving rise to modern groups (Kenoyer, 1991; Possehl, 1997). As these people moved east and south, mingling with other cultures, there was mixing of ideas and beliefs that gave rise to the complexities of modern Hinduism (ReligionFacts, 2004–2007; Encyclopedia Britannica Online, 2007). Moreover, the people encountered new plants as they moved and applied some old names to these new organisms.

Name transference or reversal is a comparatively common phenomenon in numerous cultures (Witowski and Brown, 1983). For example, there is evidence of the moving of names from some native Indian species to introduced *Ipomoea nil* during historic times (Austin, 2000). Other examples exist in many parts of the world, but a famous case among indigenous Americans is the opossum (*Didelphis marsupialis*). Before Europeans arrived, the Iroquoian-speaking Cherokee call the opossum *sikwa*. When the new people introduced swine (*Sus scrofa*), the opossum became *sikwa utse'tsti* (grinning pig), and the hog became *sikwa* (Austin, 2004). Similarly, the Muskogean-speaking Mikasuki knew the opossum as *soki*. Like the Cherokee their words shifted and the pigs are now *soki*; opossums became *sokihatki* (white pig). English has many plant names that show similar transference, such as “apple,” “cactus,” “corn,” and “daisy.”

Modern application of names changes from Pakistan and northwestern India to the southern part of the Indian peninsula and Sri Lanka. In the northwest, *shankhapushpi* is now applied to the native *Convolvulus prostratus*. On the western part of the Indian peninsula, the name is applied most often to *Canscora decussata*, although it also refers to *Evolvulus alsinoides*. In Sri Lanka *shankhapushpi* is not used and *vishnukranti* refers exclusively to *Evolvulus alsinoides*. Perhaps the people of India were as flexible as Yoruba from Africa when they were exposed to a novel flora in the New World and could no longer obtain the

plants needed for both religious and medicinal purposes—they simply substituted a similar American species and kept the old name (Voeks, 1997).

While *shankhapushpi* was likely originally an early name for lotus, the white color of *Convolvulus prostratus* flowers and its medicinal utility caused people to associate it with Shiva and Lakshmi and they began calling it *shankhapushpi*. Because the lotus has blue in its flowers and other parts, it too was probably the one first called *vishnukranti*, although it often has other names among modern people. Other blue-flowered plants also reminded devout Hindus of Vishnu, and they began applying *vishnukranti* to them too. As time passed, the number and origin of plants with these names was forgotten, or never known, and many people now typically think of only *Convolvulus* and *Evolvulus* when they use either of these Sanskrit-based names. Others think only of *Canscora* or *Clitoria*.

Although *Evolvulus alsinoides* is still used in the New World, its mention in the literature and among indigenous people is much less prominent than in the Indian region. Few historical records of actual usage have been located, but some of the common names point to ancient important use in the Americas. It appears that the species has been overshadowed and/or mostly forgotten by indigenous Americans following the devastation that ensued when European diseases and domination followed colonization.

The conclusions on whether *Evolvulus alsinoides* is actually effective against specific maladies are uneven. Some of the laboratory experiments strongly support certain folk uses, while others do not. A few of the laboratory studies and chemical reports are faulty while others were not comparing the chemicals by using extracts like those made by villagers. Still, the general trend appears to be that many of the Ayurvedic uses are valid. The array of chemicals in *Evolvulus alsinoides* has multiple impacts on human physiology that generally support folk uses.

Cultures change with time and as people adapt to new areas and their floras. Although some names have retained static use for the same plants for thousands of years, others do not. Both *shankhapushpi* and *vishnukranti*, originating in Sanskrit, are among those names whose applications have drastically changed with time.

Scholars should be careful with their identifications, but they often are not. People translating ancient documents often refer to a plant mentioned with a binomial without checking to see if the characteristics match the species. Then, people copy from one another, thus passing ignorance to users of their labor. Biologists and chemists tend to apply Greek names to binomials created by Linnaeus in the 1700s, often never checking to see if those are the current names, or if the species ever existed on the continent being studied. Among those mentioning this problem are Dawkins (1936), but the process continues.

Different taxonomic philosophies and uncritical and/or focused perspectives from indigenous people and scholars have added to the complexity of unraveling historical applications of these names and their chemistry. Both aspects have led some to decry common names as completely useless and untrustworthy. My contention is that such an approach is unproductive.

Instead, careful examination of the historical record and cultural views often provides a more lucid picture of what may have occurred. Moreover, such scrutiny instills greater appreciation for the thoughts, processes, and amazing inventiveness of humans.

5. Conclusions

For thousands of years there have been plants in India and vicinity called *shankhapushpi* and *vishnukranti*. While many studies have attempted to resolve the impact of these medicines on human maladies, particularly mental problems, conclusions have been limited because of the complex history of these and other common names. More importantly, because the common names are applied to several plants in distinct families, simple use of common names without proper clarification and validation of the species has led to claims that may not be valid. At this stage of knowledge of both *shankhapushpi* and *vishnukranti*, there is no way to fully understand what is known. Any or none of the several species called by these names may have active compounds, either singly or in mixtures, that are effective against the various problems for which they have been used. However, it appears that *Evolvulus alsinoides*, one of the plants called by these two ancient names, has some phytochemicals that are effective against the maladies for which people use them. How effective and which chemicals are involved requires further study.

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