



Alien plants revealed from Stewart's handbook for officers and residents in Punjab: nativity, economy and bio-culture

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ARTICLE INFO	ABSTRACT
<p>Original Research Article Received on Feb 23, 2021 Revised on March 25, 2021 Accepted on April 20, 2021 Published on May 12, 2021</p> <p>Article Author Patil, D. A.</p> <p>Corresponding Author Email dapatil_10aug@yahoo.com</p>	<p>Convention for Biological Diversity (IUCN, 1992) visualize 'biological invasion of alien species as the second worst threat after habitat destruction'. The present author studied Stewart's Handbook (1869) on Punjab plants. The study is aimed at evaluating diversity of alien plant species and their implications on human life in different compartments. This attempt divulged 167 total plant species belonging 138 genera and 38 families. Of these, 110 species were exclusively found under cultivation in the erstwhile Punjab Province, whereas 52 species appeared naturalized and established in the region. Few species are both cultivated and wild in the region. They belong to different regions of the Old and New Worlds. Maximum number of aliens hail from various parts of Europe (45), America (41), Asia (Excl. India) (34) and Africa (33). The Mediterranean region (17) also contributed well. The figures in parenthesis denote number of alien species. Many others countries and geographical regions are represented by few species only. The results obtained are interpreted for their role in economy and bio-culture of the erstwhile Punjab Province which continue in the present Indian landmass.</p>
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Of late, understanding the aliens in view of their diversity and bearings on mankind and environment has gained tremendous importance. Several plant species have been introduced intentionally by mankind and even unintentionally. The former ones are introduced for social or personal gain. The latter ones invade natural communities and sometimes become invisible and as such are the second most serious threat to biodiversity habitat destruction (Pimentel, 2000). Many different terms e.g. alien, exotic, non-indigenous, non-native, foreign, etc. are used to denote species occurring in ecosystems to which they are not indigenous. However, IUCN, the (World Conservation Union, 2002) used the term

'alien', encompassing all the terms (Shine *et al.*, 2000). The CBD, Convention on Biological Diversity (CBD, 1992) defines alien species as 'a species occurring outside its normal distribution'. A large number of alien plant species have invaded in India (Maheshwari, 1960 and 1979, Nayar, 1977 and Reddy, 2008). Their reasons of invasion on Indian landmass are various e.g. human migration, foreign rulers, trade through terrestrial and sea routes or even natural phenomenon of plant dispersal through different diaspores. These alien taxa eventually became integral part of agriculture (Singh and Nigam, 2017), medicine (Patil, 2019b and Singh, 2016) and bio-culture (Patil, 2018a, b and 2017b).

The present author inventorised some ancient botanical treatises and manuals (Patil, 2019c and 2020). These are repositories of alien plant species and have been revealed thereby shedding more light on their history and introduction. The present treatise similarly thought a treasure-trove of such foreign plant species. The close examination of it unearthed a large number of aliens which are being communicated in this account.

Methodology

A hand-book for officers and residents in the Punjab by (Stewart, 1869) is an inventory on plant species as occurred in the erstwhile Punjab province of India which also included a part now in Pakistan, Kashmir, Ladakh, Garhwal and Kumaon of present India. It has not been investigated yet on any facet of plant science, human life and plant invasion. It was, therefore, thought worthwhile to divulge particularly alien plant species and its bearing on Indian agriculture, economy and environment in past and even today. The contents have been analyzed from the standpoint of recent valid plant names, their common names, habital categories, wild and cultivated status. This data and nativity of each species is deciphered consulting relevant taxonomic literature as given for each species in table- 1. The information accrued on its close examination are discussed pertinently. The plant species are arranged alphabetically (table- 1).

Results and Discussion

There is a global concern for evaluating the status of aliens and conservation of biodiversity. Although biodiversity studies have continued, there are few accounts containing alien species and which deserve decipherment about nativity. The present author, as mentioned earlier, engaged to assess their status in Indian Territory. The erstwhile Punjab Province represents northern part of India. Assessment of its biodiversity from the point of plant invasion yielded interesting results because of elevation, edaphic factors, rainfall and temperature. Moreover, northern part of India has mainly terrestrial routes for communication with other countries or geographical regions. The hand-book on plants of Punjab Province contains authentic record by a systematic.

Its close scrutiny on the ground of plant invasion or introduction resulted in occurrence of as many as 167 angiospermic species belonging to 138 genera and 63 families. The dicotyledons are represented by 144 species under 125 genera and 53 families. The monocotyledons occurring in those days belong to 23 species under 13 genera and 10 families. These aliens exhibit different habital groups *viz.*, herbs (106), climbers and trees (21 each) and shrubs (20). The figures in parenthesis denote number of species. Their analysis reveals exclusively 110 cultivated species, whereas exclusively wild and naturalized species are 52. Few species are both wild as well as found under cultivation (table- 1).

These alien species are hailed from different continents, countries and geographical regions of both Old and New Worlds. The largest number of aliens belong to Europe (45 species) which is then followed by America (41 species), Asia (Excl. India) (34 species) and Africa (33 species). The Mediterranean region contribute for a fair number of aliens (17 species), China (07 species), Mexico (05 species) and West Indies (04 species), Arab and Eurasia (03 species each). East Indies, Palestine and Middle East are represented by two species each. The other countries or geographical areas *viz.*, Ethiopia, Abyssinia, Java, Hawaii and Fiji, Nepal, Madagascar, Japan, temperate region, Syria, Australia, Brazil, Italy, Near East, Costa Rica, Ecuador, Caucasus, Andes, Persia, Fertile Crescent, Malay Archipelago, tropical and subtropical regions of both Hemispheres, subtropics and warm temperate zone are represented by a single alien species each.

It appears worth to remember about the 'Silk Road' running towards northern side of India. It was a network of trade routes connecting China and the Far East with the Middle East and Europe. The Han Dynasty in China opened trade with the West 130 BC and the Silk Road routes remained in use until 1453 AD. This road has been used for international trade. This route had a lasting impact on commerce; culture and history that resonates even today (*cf.* Silk Rod). Apart from this terrestrial connection of India with other countries, there were also maritime trade routes from India to other continents in ancient time (*cf.* Tsiagalakis, 2018).

Table 1. Status of Punjab Plants

(1) S. N.	(2) Botanical Name and Family	(3) Common Name	(4) Habit	(5) Wild(W)/ Cultivated(C)	(6) Nativity and Reference
1.	<i>Abelmoschus esculentus</i> L. Malvaceae	Bhinda Tori, Ramturai	Shrub	C	Asia (Excl. India) & Africa Naqshi <i>et al.</i> , 1988.
2.	<i>Acacia nilotica</i> (L.) Willd. ex Del. (Syn. <i>A. arabica</i> Willd.) Mimosaceae	Kikkar, Babul	Tree	W	North Africa & Arab Rajagopal & Panigrahi, 1965; Purseglove, 1968.
3.	<i>Adansonia digitata</i> L. Bombacaceae	Imli Khorusani	Tree	C	Tropical Africa, Patil, 2003, 1995; Yadav & Sardesai, 2002.
4.	<i>Agave americana</i> L. Agavaceae	Wilayati Kantala	Shrub	C	Tropical America, Yadav & Sardesai, 2002; Patil, 2003; Bailey, 1949. Mexico, Gaikwad & Garad, 2015; Backer & Bink, 1968.
5.	<i>Agave cantala</i> Roxb. Agavaceae	Kantala, Kitki	Shrub	C	Central America, Sharma <i>et al.</i> , 1996; Gaikwd & Garad, 2015.
6.	<i>Albizia lebbek</i> (Linn.) Bth. Mimosaceae	Siris	Tree	C	Pantropical & Tropical Africa Bhandari, 1978.
7.	<i>Alcea rosa</i> L. (Syn. <i>Althea rosea</i> Cav.) Malvaceae	Gul Khaira, Khatmi	Shrub	C	China, Bailey, 1949; Bose & Pandey, 1970; Roxburgh, 1795-1820.
8.	<i>Allium ascolonicum</i> L. Liliaceae	(Shallot) Gandhan	Herb	C	Palestine Shah, 2014.
9.	<i>Allium cepa</i> L. Liliaceae	Gatta, Piaz Tsung	Herb	C	West Asia, Gaikwd & Garad, 2015; Patil, 2003; Yadav & Sardesai, 2002. Western Temperate Asia De Candolle, 1886; Bailey, 1928.
10.	<i>Allium sativum</i> L. Liliaceae	Lahsan	Herb	C	Europe, Gaikwad & Garad, 2015; Yadav & Sardesai, 2002; Patil, 2003; Bailey, 1949.
11.	<i>Aloe vera</i> (L.) Burm. f. [Syn. <i>A. perfoliata</i> L.; <i>A. indica</i> Royle.] Liliaceae	Ghikwar, Kwar Gandal, Masti	Herb	C	Tropical Asia John, 1891.
12.	<i>Amaranthus spinosus</i> L., Amaranthaceae	Chaulai	Herb	W	Tropical America, Singh <i>et al.</i> , 1991; Patil, 1995, 2017; Chandra Sekar, 2012.
13.	<i>Amygdalus persica</i> L. Rosaceae	Aru, Chinnau, Drui, Bem Beihmi	Tree	C	North China Tao Shu, 2003.
14.	<i>Anagallis arvensis</i> L. Primulaceae	Dhabbar	Herb	W	Europe & Meterranean Region Rajagopal & Panigrahi, 1965; Kaul, 1986., Europe, Chandra Sekar, 2012.
15.	<i>Anethum graveolens</i> L. (Syn. <i>A. sowa</i> Roxb. ex Flem.) Apiaceae (Umbelliferae)	(Dill) Soya	Herb	C	Europe Patil & Dhale, 2013.
16.	<i>Apium graveolens</i> L. Apiaceae (Umbelliferae)	(Celery) Ajmod	Herb	C	Europe Debnath & Debnath, 2017.

17.	<i>Argemone mexicana</i> L. Papaveraceae	Kateli, Bhat Kateya	Herb	W	Central America, Mexico & West Indies, Reddy, 2008., Tropical America, Shetty & Singh, 1987.
18.	<i>Asphodelus tenuifolius</i> Cav. (Syn. <i>A. fistulosus</i> L.), Liliaceae	Piazi, Bokat	Herb	W	Tropical America Reddy, 2008; Patil, 2017; Chandra Sekar, 2012.
19.	<i>Atriplex hortensis</i> L. Chenopodiaceae	Korake, Surakka	Herb	W	South Europe John, 1891.
20.	<i>Avena sativa</i> L. Poaceae (Graminae)	Gozang, Kasamm Ganer	Herb	W/C	Mediterranean Region/Ethopia/Abyssinia Patil, 2019a.
21.	<i>Averrhoa carambola</i> L. Averrhoaceae	Kamrakh	Tree	C	Tropical America Gaikwad & Garad, 2015.
22.	<i>Benincasa hispida</i> (Thunb.) Cogn. (Syn. <i>B. cerifera</i> Savi.) Cucurbitaceae	Petha, Chal Kumra, Gol Kaddu	Climber	C	Java Patil, 1995; Cooke, 1958.
23.	<i>Beta vulgaris</i> L. Chenopodiaceae	Palak	Herb	C	Europe Bailey, 1949.
24.	<i>Boerhavia diffusa</i> L. Nyctaginaceae	Nakbet Arsat	Herb	W	Tropical Africa Panda <i>et al.</i> , 2018.
25.	<i>Brassica campestris</i> L. Brassicaceae (Cruciferae)	Sarson	Herb	C	Europe Naqshi & Javeid, 1987.
26.	<i>Brassica juncea</i> (L.) Czern. & Coss. Brassicaceae (Cruciferae)	Rai, Turia	Herb	C	Eastern Europe & China Spect & Diederichson, 2001. Middle East Neighbouring Region Prakash, 1980.
27.	<i>Brassica napus</i> L. Brassicaceae (Cruciferae)	Sarri, Sarru, Kat Kranar	Herb	C	Europe Naqshi & Javeid, 1987; John, 1991.
28.	<i>Brassica oleracea</i> L. var. <i>capitata</i> L. (Syn. <i>B. oleracea</i> L.) Brassicaceae (Cruciferae)	Gobi, Kobi	Herb	C	Europe Dar <i>et al.</i> , 2002.
29.	<i>Brassica rapa</i> L. Brassicaceae (Cruciferae)	Shalgam, Thipar, Gugchi, Gumbar	Herb	C	Central & South Europe Purseglove, 1968. Eurasia Gulden <i>et al.</i> , 2008.
30.	<i>Bupleurum martinatum</i> Wall., Apiaceae (Umbelliferae)	Kali Zewar Zira	Herb	C	
31.	<i>Calendula officinalis</i> L. Asteraceae (Compositae)	Zergul	Herb	C	South Europe Bailey, 1949; Stewart, 1972; Gaikwad & Garad, 2015., Europe, John, 1891.
32.	<i>Calotropis procera</i> (Ait.) R. Br. Asclepiadaceae	AK, Pashkand, Spalmak	Shrub	W	Tropical Africa Reddy, 2008; Patil, 2017; Chandra Sekar, 2012.
33.	<i>Cannabis sativa</i> L. Cannabinaceae	Bangri, Bhangi, Bhang	Herb	W	Central Asia, Chandra Sekar, 2012. Asia (Excl. India) Kaul, 1986.
34.	<i>Capsicum annuum</i> L. Solanaceae	Lal Mirch, Marcha, Matitsa	Herb	C	Tropical America Singh <i>et al.</i> , 2001; Patil, 2003.

35.	<i>Cardiospermum halicacabum</i> L. Sapindaceae	Wangrul Habb-UI- Kulkul	Climber	W	South America Patil, 2003, 1990.
36.	<i>Carica papaya</i> L. Caricaceae	Arand Kharbuza, And- Kharbuza	Tree	C	Tropical America Singh <i>et al.</i> , 2001; Patil, 2003. West Indies & Central America Shetty & Singh, 1987.
37.	<i>Carthamus tinctorius</i> Roxb., Asteraceae (Compositae)	Kasam, Kartum	Herb	C	South-West Asia Singh <i>et al.</i> , 2001; Patil, 2003; Cooke, 1958.
38.	<i>Carum carvi</i> L. Apiaceae (Umbelliferae)	(Carraway) Gunyun, Umbu, Zira	Herb	C	Western Asia, Europe & North Asia Caraway-Wikipedia. North & Central Europe Patil & Dhale, 2013.
39.	<i>Cassia occidentalis</i> L. Caesalpiniaceae	Kasaunda	Shrub	W	South America Patil, 2017a; Chandra Sekar, 2012.
40.	<i>Cassia tora</i> L. Caesalpiniaceae	Hiru Chakaunda	Herb	W	South America, Reddy, 2008; Patil, 2017a; Chandra Sekar, 2012.
41.	<i>Catharanthus roseus</i> (L.) G. Don (Syn. <i>Vinca rosea</i> L.)	Rattan jot	Herb	C	West Indies & Madagascar Maheshwari & Paul, 1975. West Indies, Singh <i>et al.</i> , 2001; Patil, 2003., Tropical America Singh <i>et al.</i> , 1991.
42.	<i>Celosia argentea</i> L. Amaranthaceae	Sarwali	Herb	W	Tropical Africa Reddy, 2008; Chandra Sekar, 2012.
43.	<i>Chenopodium album</i> L. Chenopodiaceae	Bathua, Lunak, Jausag	Herb	W	Europe Kaul, 1986.
44.	<i>Chenopodium murale</i> L. Chenopodiaceae	Batu, Kurund, Kharatua	Herb	W	Tropical America Chandra Sekar, 2012; Patil, 2017a. Africa & Europe, Stewart, 1972.
45.	<i>Chrysanthemum indicum</i> L., Asteraceae (Compositae)	Gendi, Bagaur, Kalzang	Herb	C	China, Eastern Asia John & Blanco, 2016.
46.	<i>Cicer arietinum</i> L. Papilionaceae	Channa, Chola	Herb	C	Mediterranean Region Shetty & Singh, 1987. South Europe, Patil, 1990.
47.	<i>Cichorium intybus</i> L. Asteraceae (Compositae)	Hand, Gul, Suchal, Kasni	Herb	W	Europe Kaul, 1986.
48.	<i>Citrullus vulgaris</i> Schrad. Cucurbitaceae	Mathira, Tarbuz Hindwana	Climber	C	Africa Stewart, 1972.
49.	<i>Citrus medica</i> L. Rutaceae(Aurantiaceae)	Bajauri	Tree	C	China Roxburgh, 1814.
50.	<i>Cleome gynandra</i> L. [Syn. <i>Gynandropsis pentaphylla</i> (L.) DC.] Capparidaceae	Hulhul, Bugra, Gandhuli	Herb	W	Tropical America Chandra Sekar, 2012.
51.	<i>Clitoria ternatea</i> L. Papilionaceae	Dhanattar	Climber	W/C	Tropical America Purseglove, 1968.
52.	<i>Colocasia esculenta</i> (L.) Schott. [Syn. <i>Arum colocasia</i> L.];	Rab Alu, Kasauri, Gagli	Herb	C	Hawaii & Fiji Graf, 1980.

	<i>Colocasia antiquorum</i> Schett)]				
53.	<i>Convolvulus arvensis</i> L. Convolvulaceae	Hiranpadi	Climber	W	Europe, Chandra Sekar, 2012; Kaul, 1986; Patil, 2017. Temperate Region Backer & Brink, 1963.
54.	<i>Corchorus olitorius</i> L. Tiliaceae	Banpat	Herb	W	Tropical Africa Patil, 2017a; Chandra Saker, 2012.
55.	<i>Coriandrum sativum</i> L. Apiaceae (Umbelliferae)	Dhania	Herb	C	Mediterranean Region Shetty & Singh, 1987.
56.	<i>Crotalaria medicaginea</i> Lam. Papilionaceae	Gulabi	Herb	W	Austra-Asian Naik, 1998; Patil, 1990.
57.	<i>Cucumis melo</i> L. Cucurbitaceae	Kharbaza, Saghun, Sarda, Paliz	Climber	C	Asia (Excl. India) Stewart, 1972. Africa, Singh & Nigam, 2017.
58.	<i>Cucurbita maxima</i> Duch. ex Lam. Cucurbitaceae	Al, Daghan, Kaddu safed	Climber	C	South America Dar <i>et al.</i> , 2002. Central America Singh & Nigam, 2017.
59.	<i>Cuminum cyminum</i> L. Apiaceae (Umbellifere)	Zira Zira Safed	Herb	C	Mediterranean Region Shetty & Singh, 1987. South Europe, Yadav & Sardesai, 2002.
60.	<i>Cuscuta macrontha</i> G. Don, Convolvulaceae	Amil, Nila Thari	Climber	W	Nipaul (Nepal) George, 1838.
61.	<i>Cuscuta planiflora</i> Tenore, Convolvulaceae		Climber	W	Europe & Asia (Excl. India) Stewart, 1972.
62.	<i>Cuscuta reflexa</i> Roxb. Convolvulaceae	Andal, Midasat, Baunde, Mingri, Nila Tari	Climber	W	Mediterranean Region Singh <i>et al.</i> , 2001; Chandra Sekar, 2012.
63.	<i>Cyamopsis tetragonolobu</i> (L.) Taub. DC., [Syn. C. <i>psoraloides</i> (Lam.)]	Kauri, Phaliguar	Herb	C	Africa Patil, 2019a.
64.	<i>Cydonia vulgaris</i> Pers. Rosaceae	Bam, Bihi. Tsuntu,	Tree	C	South-West Europe & Minor Asia Patel <i>et al.</i> , 2016.
65.	<i>Cynodon dactylon</i> (L.) Pers. Poaceae (Graminae)	Borawa, Dub Khabbal	Herb	W	Tropical Africa, Debnath & Debnath, 2017; Panda <i>et al.</i> , 2018; Wagh & Jain, 2015; Srivastava <i>et al.</i> , 2014.
66.	<i>Cyperus rotundus</i> L. ssp. <i>tuberosus</i> (Syn. <i>Cyperus tuberosus</i> Rottb.) Cyperaceae	Kaseru	Herb	C	
67.	<i>Datura stramonium</i> L. Solanaceae	Tattur, Dattur, Dhatura	Shrub	W	Tropical America Chandra Sekar, 2012.
68.	<i>Daucus carota</i> L. Apiaceae (Umbelliferae)	Mor Muj, Bal Muj, Kach, Gajar	Herb	C	Europe & North Africa Shetty & Singh, 1987, Europe, Yadav & Sardesai, 2002; Patil, 2003.
69.	<i>Digera muricata</i> (L.) Mart.	Tartera, Tandela,	Herb	W	South-West Asia Reddy, 2008; Patil, 2017; Chandra

	(Syn. <i>D. arvensis</i> Forsk.) Amaranthaceae	Leswa			Sekar, 2012; Afro-Asian, Naik, 1998.
70.	<i>Dioscorea sativa</i> Willd. Dioscoreaceae	Ratalu	Climber	C	East & West Indies, Japan. John, 1810.
71.	<i>Dodonea viscosa</i> (L.) Jacq. [Syn. <i>D. burmanniana</i> DC.] Sapindaceae	Sanattha, Ban, Aliar Mendu, Mendru,	Shrub	C	Africa Singh <i>et al.</i> , 2000.
72.	<i>Dolichos lablab</i> L. Papilionaceae	Kaka Lobia	Climber	C	Tropical Africa Debnath & Debnath, 2017.
73.	<i>Eclipta prostrata</i> (L.) Linn. (Syn. <i>E. erecta</i> L.) Asteraceae (Compositae)	Bukan, Bhangra, Basar, Babri Mukand	Herb	W	South & Tropical America Patil, 2017; Reddy, 2008; Chandra Sekar, 2012.
74.	<i>Eleusine coracana</i> Gaertn. Poaceae (Graminae)	Mandwa Mandal	Herb	C	Africa Singh & Nigam, 2017.
75.	<i>Eruca sativa</i> Mill. Brassicaceae (Cruciferae)	Tara, Usan, Kala Sarson	Herb	C	Mediterranean Region Negi & Hajra, 2007. South America, Kohli <i>et al.</i> , 2012.
76.	<i>Erysimum hieraciifolium</i> L. (Syn. <i>E. strictum</i> P. Gaert.) Brassicaceae (Cruciferae)	Nepal Weal Flower	Herb	C	Eurasia Vit & Agata, 2007.
77.	<i>Ferula assafoetida</i> L. Apiaceae (Umbelliferae)	Anguza, Hing, Yang	Herb	W	Central Asia, Europe & North Africa Patil & Dhale, 2013.
78.	<i>Ficus carica</i> Roxb. ex Horn. Urticaceae (Moraceae)	Phagwaro, Phagu, Jamir, Anjir	Tree	C	Mediterranean Region Gaikwad & Garad, 2015; Matthew, 1969. Syria & Palestine, Naik, 1998.
79.	<i>Foeniculum vulgare</i> Gaertn., Apiaceae (Umbelliferae)	Saunf	Herb	C	Mediterranean Region, Purselove, 1968., South Europe, Shetty & Singh, 1987; Gaikwad & Garad, 2015.
80.	<i>Gossypium herbaceum</i> L. Malvaceae	Kappas, Kapa	Herb	C	Arabia & Asia Minor Bailey, 1949. Africa & Asia, Purselove, 1968.
81.	<i>Hedera helix</i> L. Araliaceae	(Ivu) Banakhor, Churial, Rarar	Climber	C	Europe Stewart, 1972.
82.	<i>Hibiscus cannabinus</i> L. Malvaceae	Shan, San, Patsan	Herb	C	Tropical & Subtropical Africa Backer & Brink, 1963; Purselove, 1968., Africa Patil, 2003; Shetty & Singh, 1987.
83.	<i>Hibiscus mutabilis</i> L. Malvaceae	Gul-o-ajaib	Herb	C	West Indies Stewart, 1869, China, Debnath & Debnath, 2017; Negi & Hajra, 2007.
84.	<i>Hydrilla verticillata</i> Royle Hydrocharitaceae	Jhanih, Jala	Herb	W	North Australia Kohli <i>et al.</i> , 2012.
85.	<i>Hyoscyamus niger</i> L. Solanaceae	Dandura, Denturu,		W	Africa & Europe Kaul, 1986.

86.	<i>Ipomoea batatas</i> (L.) Lam.(Syn. <i>Batatas edulis</i> Chois.; <i>Canvolvulus batatas</i> L.) Convolvulaceae	Damtura Shakarkand	Climber	C	America Sigh <i>et al.</i> , 2001; Singh <i>et al.</i> , 1991.
87.	<i>Jasminum sambac</i> (L.) Ait., Oleaceae	Mugra	Shrub	C	Tropical Asia John, 1891.
88.	<i>Jatropha curcas</i> L. Euphorbiaceae	Rattanjot Japhrota Jablota	Shrub	W	Tropical America Rajagopal & Panigrahi, 1965; Gaikwad & Garad, 2015; Patil, 2003.
89.	<i>Lactuca sativa</i> L. Asteraceae (Compositae)	(Lettuce) Kahu	Herb	C	Southern & West Asia Khare, 2008
90.	<i>Lagenaria siceraria</i> (Mol.) Standl. (Syn. <i>L.vulgaris</i> Ser.) Cucurbitaceae	Kaddu Kabuli Kaddu Lauki Tumba	Climber	C	Africa Singh & Nigam, 2017.
91.	<i>Lathyrus sativus</i> L. Papilionaceae	Kisari, Mattar, Chural	Herb	C	Southern Europe & West Asia Helback, 1965.
92.	<i>Lawsonia inermis</i> L. Lythraceae	Nakrize, Mehndi, Hina	Shrub	C	Middle East Gaikwad & Garad, 2015. Arabia & Persia, Shetty & Singh, 1987.
93.	<i>Lens culinaris</i> Medik. (<i>Ervum lens</i> L.) Papilionaceae	Masur	Harb	C	Central Europe, Mediterranean Region & West Asia Patil, 1995.
94.	<i>Lepidium sativum</i> L. Brassicaceae (Cruciferae)	Shargunde Sorma	Herb	C	West Asia, Beiley, 1949, Asia (Excl. India), Stewart, 1972. South-West Asia & North Africa Backer & Brink, 1963.
95.	<i>Linum usitatissimum</i> L. Linaceae	Alsi, Alish	Herb	C	Mediterranean Region De Candolle, 1886. Europe, Dar <i>et al.</i> , 2002; John, 1891.
96.	<i>Lycopersicon lycopersicum</i> (L.) Karsten (Syn. <i>Solanum lycopersicum</i> L.) Solanaceae	Vilayati Benson	Herb	C	America Stewart, 1972.
97.	<i>Macrotyloma uniflorum</i> (Lam.) Verdc. (Syn. <i>Dolichos uniflorus</i> Lam.) Papilionaceae	Kulat, Kuli, Kalatt	Climber	C	South-East Asia Patil, 2019a.
98.	<i>Martynia annua</i> L. (Syn. <i>M.diandra</i> Glox.) Martyniaceae (Sesameae)	Bichu Hathajoxi	Shrub	W	Tropical America, Reddy. 2008; Chandra Sekar, 2012; Patil, 2003; Naik, 1998., Mexico & Brazil Rajagopal & Panigrahi, 1965; Singh <i>et al.</i> , 1991.
99.	<i>Mathiola incana</i> R. Br. [Syn. <i>M.annua</i> (L.) Sweet] Brassicaceae (Cruciferae)	Tadri Safed Tila	Herb	C	Europe Stewart, 1972.

100.	<i>Melia azaderch</i> L. Meliaceae	Kachen Jek., Drek. Bakain	Tree	C	Asia (Excl. India) Ara <i>et al.</i> , 1995.
101.	<i>Mentha arvensis</i> L. (Syn. <i>M.sativa</i> L.) Lamiaceae (Labiatae)	Pudina	Herb	C	Africa & Europe Reshi, 1984.
102.	<i>Mentha spicata</i> L. (Syn. <i>M.viridis</i> L.) Lamiaceae (Labiatae)	Speormint Pahari Pudina	Herb	C	Europe & North America Stewart, 1992.
103.	<i>Mirabilis jalapa</i> L. Nyctaginaceae	Gul Abbas	Herb	C	South America, Singh <i>et al.</i> , 1991; Stewart, 1972, Tropical America, Bailey, 1949, Mexico, Singh <i>et al.</i> , 2001; Gaikwad & Garad, 2015.
104.	<i>Morus alba</i> L. Moraceae	Tuti Tut	Tree	C	Asia (Excl. India) Dar <i>et al.</i> , 2002.
105.	<i>Myrtus communis</i> L. Myrtaceae	Vilayti Mehndi, Murad	--	C	Mediterranean Region Zikah & Goldschmit, 2014.
106.	<i>Nerium indicum</i> Mill. (Syn. <i>N.odorum</i> Soland & <i>N.Oleander</i> L.) Apocynaceae	Kanira, Ganhira, Gandere, Kaner	Shrub	C	China, Cochin China Voight, 1845. Mediterranean Region Purseglove, 1968; Singh <i>et al.</i> , 1991.
107.	<i>Nicotiana rustica</i> L. Solanaceae	Chilassi Tamaku, Kakkar, Tamaku, Kadahari.	Herb	C	South America Stewart, 1972.
108.	<i>Nicotiana tabacum</i> L. Solanaceae	Tamaku	Herb	C	Tropical America Gaikwad & Garad, 2015; Patil, 2003; Bailey, 1949; Purseglove, 1968.
109.	<i>Opuntia dillenil</i> W. & A. (Syn. <i>Cactus indicus</i> Rox.) Cactaceae	Gsangi Sho, Chil Kanghi Kabuli Tsui, Mitha		C	America Stewart, 1869; Graham, 1839.
110.	<i>Oxalis corniculata</i> L. Oxalidaceae	Surchi Khatta Chukha	Herb	W	Europe, Reddy, 2008; Patil, 2017, Asia (Excl. India) & Europe, Kaul, 1986, North America, Bailey, 1949.
111.	<i>Papaver somniferum</i> L. Papaveraceae	Khash Khash	Herb	C	Europe Stewart, 1972.
112.	<i>Parkinsonia aculeata</i> L. Caesalpiniaceae	Vilayati Kikkar	Tree	W	Tropical America, Gaikwad & Garad, 2015; Shetty & Singh, 1987; Ugemuge, 1986.
113.	<i>Petroselinum crispum</i> Mill. (Syn. <i>P.sativum</i> Hoff. ex. Gaudin) Apiaceae (Umbelliferae)	(Parsky) Piter Saleri	Herb	C	Eastern Mediterranean Region Agyare <i>et al.</i> , 2017
114.	<i>Phoenix dactylifera</i> L. Arecaceae (Palmae)	Khajur	Tree	C	Arabia & North Africa Graf, 1980.
115.	<i>Phyla nodiflora</i> (L.) Greene (Syn. <i>Lippia nodiflora</i> Rich.) Verbenaceae	Monka, Bukan Jalnim	Herb	W	South America Stewart, 1972.

116.	<i>Pimpinella anisum</i> L. Apiaceae (Umbelliferae)	Anisun	Herb	C	Mediterranean region Patil & Dhale, 2013.
117.	<i>Pisum sativum</i> L. Papilionaceae	Sen, Mattar Khandu	Herb	C	West Asia Shetty & Singh, 1987.
118.	<i>Plumbago zeylanica</i> L. Plumbaginaceae	Lal Chitra	Shrub	W	Africa, Rajagopal & Panigrahi, 1965. Tropics of Asia, Africa, Australia & Hawaii, Bailey, 1929.
119.	<i>Polianthes tuberosa</i> L. Agavaceae	Gul Shab Bo	Herb	C	Mexico, Patil, 2003; Sharma <i>et al.</i> , 1996; Bailey, 1949.
120.	<i>Portulaca oleracea</i> L. Portulacaceae	Lonak	Herb	W	Tropical South America, Reddy, 2008; Patil, 2017a; Chandra Sekar, 2012. Africa & South America, Kaul, 1986.
121.	<i>Portulaca oleracea</i> L. subsp. <i>sativa</i> (Haw. Celak) Syn. <i>P. sativa</i> L. Portulacaceae	Khurfae	Herb	C	Italy Pignatti, 1982.
122.	<i>Portulaca quadrifida</i> L. Portulacaceae	Lunak Hakesha	Herb	W	Tropical South America, Reddy, 2008; Patil, 2017a; Chandra Sekar, 2012.
123.	<i>Potamogeton crispus</i> L. Potamogetonaceae (Fluviales)	Sawal Chusbal	Herb	W	Europe & South America Naqshi & Javeid, 1973.
124.	<i>Prunus armeniacea</i> L. Rosaceae	(Apricot) Hari, Chir Harian, Gurdalu, Jaldaru Chuli	Tree	C	Asia (Excl. India) Dar <i>et al.</i> , 2002.
125.	<i>Prunus crasus</i> L. (Syn. <i>Cerasus vulgaris</i> Mill.) Rosaceae	Gilas Alu Balu	Tree	C	Eastern Europe, Western Asia & Parts of North America Loescher, 2003.
126.	<i>Prunus domestica</i> L. Rosaceae	Plum-Olchi Aor Alucha	Tree	C	Asia (Excl. India) Dar <i>et al.</i> , 2002.
127.	<i>Prunus dulcis</i> (Mill. D.A. Webb (Syn. <i>Amygd alus communis</i> L.; <i>Prunus amygdalus</i> Batseh.) Rosaceae	Baddam	Tree	C	Near East Patil, 2019a; Mori <i>et al.</i> , 2011.
128.	<i>Psidium guajava</i> L. Myrtaceae	Amrut Amrud	Tree	C	Tropical America, Singh <i>et al.</i> , 2001; Patil, 2003. Mexico, Shetty & Singh, 1987.
129.	<i>Punica granatum</i> L. Punicaceae	Daru, Daruni, Anor, Anar	Tree	C	South Asia, Gaikwd & Garad, 2015. Afghanistan, Baluchistan & Persia Patil, 2003; Shetty & Singh, 1987.
130.	<i>Raphanus sativus</i> L. Brassicaceae (Cruciferae)	Muli Sengra	Herb	C	Western Asia, Purseglove, 1968. Europe & Temperate Asia, Singh <i>et al.</i> , 1991; Patil, 1995, China, Japan & West Asia, Voight, 1845.
131.	<i>Rhodiola rosea</i> L. (Syn. <i>Sedum rhodiola</i> DC.) Crassulaceae	Shrolo	Shrub	W/C	Northern Europe, Vit & Agata, 2007.
132.	<i>Ribes leptostachyum</i> Benth., Grossulariaceae	Yellow cumant	Shrub	W	Costa Rica & Ecuador Alina, 2002.
133.	<i>Ribes rubrum</i> L. Grossulariaceae	(Red Current)	Shrub	W/C	Europe John & Blanca, 2016.

		Jak, Kash, Hadar, Dak, Rade			
134.	<i>Ribes uva-crispa</i> L. (Syn. <i>Ribes grossularia</i> L.) Grossulariaceae	Amlanch, Kansi, Teila Pilsam,	Shrub	W	Europe, Caucasus & Northern Africa Doronina & Terekhina (2003-2009).
135.	<i>Ricinus communis</i> L. Euphorbiaceae	Aneru Harnauli Arand	Tree	C	Africa, Singh <i>et al.</i> , 1991; Bailey, 1949; Stewart, 1972; Purseglove, 1968, Tropical Africa, Yadav & Sardesai, 2002.
136.	<i>Rosa damascena</i> Mill. Rosaceae	Gulab	Shrub	C	Middle East, Gaikwad & Garad, 2015. East Asia, Patil, 2003.
137.	<i>Rumex vesicarius</i> L. Polygonaceae	Triwakka, Khatbiri, Saluni	Herb	W/C	South Europe, Africa & South-East Asia Naik, 1998.
138.	<i>Sida cordifolia</i> Linn. Malvaceae	Kharent	Herb	W	Tropical & Subtropical Regions of Both Hemispheres, Bhandari, 1978.
139.	<i>Solanum melongena</i> L. Solanaceae	Bensan	Shrub	C	East Indies, Singh <i>et al.</i> , 2001. America, Gaikwad & Gard, 2015.
140.	<i>Solanum nigrum</i> SW. Solanaceae	Kambei, Kachmach, Riaungi	Herb	W	Tropical America Debnath & Debnath, 2017.
141.	<i>Solanum tuberosum</i> L. Solanaceae	Alu	Climber	C	America, Singh <i>et al.</i> , 2001; Gaikwad & Garad, 2015, Andes, Purseglove, 1968. South America, Stewart, 1972.
142.	<i>Sonchus oleraceus</i> L. Asteraceae (Compositae)	Dodak	Herb	W	Mediterranean Region, Reddy, 2008; Chandra Sekar, 2012, Eurasia & Africa Naik, 1998; Rajagopal & Panigrahi, 1965, Europe, Patil, 1995.
143.	<i>Sorghum bicolor</i> Moench. (Syn. <i>S. vulgare</i> Pers.) Poaceae (Graminae)	Joar	Herb	C	Africa Stewart, 1972.
144.	<i>Sorghum halepense</i> Pers. Poaceae (Graminae)	Baru, Barwa Braham,	Herb	W	Europe Kaul, 1986.
145.	<i>Spinacea oleracea</i> L. Chenopodiaceae	(Spinach)	Herb	C	Persia, De Candolle, 1886, Persia & Arabia, Voight, 1845 Arabia, John, 1851.
146.	<i>Spondias pinnata</i> (L.f.) Kurz (Syn. <i>S. mangifera</i> Pers.) Anacardiaceae	Bahamb, Amlara	Tree	C	Tropical Asia Martin <i>et al.</i> , 1987.
147.	<i>Tagetes erecta</i> Willd. Asteraceae (Compositae)	(African Marigold) Tangla, Genda, Mentok	Herb	C	Mexico Bailey, 1949; Cooke, 1958; Naik, 1998; Patil, 2003.
148.	<i>Tagetes patula</i> L. Asteraceae (Compositae)	(A French Margigold) GendaTanga Mentok	Herb	C	Mexico Bailey, 1949; Cooke, 1958; Naik, 1998; Patil, 2003.
149.	<i>Tamarindus indica</i> L. Caesalpiniaceae	Imli	Tree	W	Tropical America Shetty & Singh, 1987; Patil, 1990.
150.	<i>Trachyspermum ammi</i> (Linn.) (Syn. <i>Ligusticum ajowan</i> L.; <i>Carumcopticum</i> Heim.) Apiaceae (Umbelliferae)	Ajwain	Herb	C	Africa Shetty & Singh, 1987. Egypt Bairwa <i>et al.</i> , 2012. South Europe, Yadav & Sardesai. 2002

151.	<i>Trapa nutans</i> L. (Syn. <i>T. bispinosa</i>) Trapaceae (Halorageae)	Gaunri Singhara	Climber	C	Europe Kak, 1990.
152.	<i>Tribulus lanuginosus</i> L. Zygophyllaceae	Khunda, Lotak, Bakhra, Gokhru	Herb	W	Tropical America Reddy, 2008; Patil, 2017a.
153.	<i>Tribulus terrestris</i> L. Zygophyllaceae	Khunda, Lotak, Bakhra, Gokhru	Herb	W	Tropical America Reddy, 2008; Patil, 2017. Africa & Asia (Excl. India) Kaul, 1986.
154.	<i>Trichosanthes anguina</i> L. Cucurbitaceae	Galar Tri, Pandol, Chichinda	Climber	C	Tropical Asia John, 1891.
155.	<i>Trigonella foenum- graecum</i> L. Papilionaceae	Methi	Herb	C	South Europe, Shetty & Singh, 1987; Patil, 1995. Asia (Excl. India) & Europe, Kaul, 1986.
156.	<i>Triticum aestivum</i> L. Poaceae (Graminae)	Kanak	Herb	C	Fertile Crescent Singh & Nigam, 2017.
157.	<i>Triticum durum</i> Desf. Poaceae (Graminae)	Pambhan Kanak Barkanak	Herb	C	Mediterranean Region/South-West Asia Singh & Nigam, 2017.
158.	<i>Vallisneria spiralis</i> L. Hydrocharitaceae		Herb	W	Europe Kak, 1990.
159.	<i>Verbascum thapsus</i> L. Scrophulariaceae	Ban Tamaku, Kadanda, Phunter Khargosh	Herb	W	Europe Kaul, 1986.
160.	<i>Vernonia anthelmintica</i> (L.) Willd., Asteraceae (Compositae)	Kalijiri	Herb	W	Malay Archipelago Mitra & Mukherjee, 2012
161.	<i>Vicia faba</i> L. (Syn. <i>V. fabavulgaris</i> Moench.) Papilionaceae	Kaiun, Bakla, Nakhthan	Herb	C	Asia (Excl. India) & Africa Dar <i>et al.</i> , 2012.
162.	<i>Vigna unguiculata</i> (L.) Walp. (Syn. <i>Dolichos sinensis</i> L.) Papilionaceae	Lobia	Climber	C	Central Africa Patil, 2019a.
163.	<i>Vitis vinifera</i> L. Vitaceae (Ampelidae)	Dakki, Dahla, Talur, Buri	Climber	C	Asia (Excl. India) & Europe Stewart, 1972. West Asia, Gaikwad & Garad, 2015.
164.	<i>Xanthium indicum</i> Koem (Syn. <i>X. strumarium</i> L.) Asteraceae (Compositae)	Tsur, Gudal, Chiru	Herb	W	Tropical South America, Reddy, 2008; Chandra Sekar, 2012; Patil, 2003, 1990, 2017; Srivastava, 1964.
165.	<i>Zaleya pentandra</i> (L.) Burm. f. (Syn. <i>Trianthema pentandra</i> L.) Aizoaceae	Biskharpa, Itsik, Narma	Herb	W	Africa Anum <i>et al.</i> , 2018.
166.	<i>Zea mays</i> L. Poaceae (Graminae)	Makki, Mak Bara Joar	Herb	C	Central America, Pursglove, 1972; Backer & Brink, 1968.
167.	<i>Ziziphus jujuba</i> Mill. Rhamnaceae	Berra	Tree	C	Subtropics & Warm Temperate Zone Mertin <i>et al.</i> , 1987.

By and large, we have not been able to add any name in the list of cultivated plants for a very long past. We depend largely on the plants domesticated or introduced by our ancients. India is not also exception to this fact. A large number of plants have been introduced intentionally for various purposes. The introduced cultigens (table- 1) were sources of economy in past and even continues in recent time. As many as 110 plant species are found under cultivation in the erstwhile Punjab province of India. These are principal sources of cereals, millets, pulses, edible oil-yielders, non-edible oil-yielders, spices, edible fruits, nuts, vegetables, fibre, dyes, medicine, aromatics, narcotics, ornamental, shade trees, useful for hedging, etc. Nearly all components of human needs on Indian Territory appear sufficed by these plant sources. The life and economy of the then Indians has been enriched. These plants are still a major potential source of Indian economy and undoubtedly major source of sustenance.

Vavilov (1926) proposed 'World Centers of Origin of Cultivated Plants'. The above resume of cultivated plants and their nativities indicate that India has received cultigens from most of the centres of cultivated plant as thought by (Vavilov, 1926). They belong to both old and new Worlds. Even a peep in bird's eye view into these alien sources suggest their origin from *viz.*, Chinese, Central Asiatic, Mediterranean, Abyssinian, South and Central American centres. The aliens have greatly contributed to the economy of India. Even plant species have been appropriated in bio-culture of Indian communities e.g. (i) *Cynodon dactylon* is an offering to Hindu god Ganapati (ii) Fruits and flowers of *Datura* are offered to Lord Mahadeva (iii) Flowers of *Rosa* to welcome guests and dignitaries and floral garlands in decoration during festivals and temples, etc. (Pawar and Patil, 2008).

Few naturalized exotic species also find place in local utilities e.g. (i) leaves of *Amarantus spinosus* as vegetable (ii) leaves of *Aloe vera* in medicine and cosmetics (iii) leaves of vegetable from *Chenopodium murale* and *Portulaca oleracea* (iv) tubers of *Cyprus rotundus* in hair washing (v) leaves of *Eclipta prostrata* in medicine and hair-dye etc. (Pawar and Patil, 2008; Patil and Patil, 2006). Although these aliens are generally thought as noxious weeds on wastelands, roads and cultivated fields, these have been lending support in native

economy and sustenance. Many such exotic taxa are recorded useful (Pawar and Patil, 2006; Patil *et al.*, 2012).

Conclusion

The alien plant species are mostly emphasized for their negative impact on surrounding environment. However, the present study, on the contrary, highlighted their positive role in local economy. It can be safely concluded that the aliens, whether cultivated or found in wild on Indian landmass have a great role in Indian economy and sustenance of various communities. Also, they have been accepted in Indian culture. They are integral part of agriculture, horticulture, medicine and bio-culture in India.

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