

Garcia da Orta's Coloquios dos Simples e Drogas: Plant invasion and implications

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Abstract: Garcia da Orta's 'Coloquios dos Simples e Drogas e Cousas Mediciniais da India' is acclaimed to be the first scientific work on medicinal plants of India. It was compiled in Goa, a land rich in trade and crossroads of people, religions and cultures. It has historical bearings on various facts of human life and has many dimensions to understanding knowledge systems. It has yet remained unstudied from the point of plant invasion in erstwhile India. The present author exhumed and shed light on total 27 exotic plant species belonging to 25 genera and 24 families. These taxa have been introduced in India from various parts of the world. However, American and Asian (Excluding India) exotic floral elements predominate relatively. The paper discusses impact of this historical *vis-a-vis* botanical annal in various compartments of human life in India and outside. The role played by its author in dissemination of Indian medicolegal then unknown to outside is also explained.

Keywords: Garcia da Orta's Coloquios dos Simples, Plant invasion, India.

INTRODUCTION

The reasons for plant transfers are various. It is essential to understand properties of plants while attempting to explain their utilization and spread. Plant transfers *vis-a-vis* plant invasion may be due to climate change, interest in economic plants, demographic pressure, human choice for specific products, choice for taste, colour and productivity, crop innovation, easily transportable artifacts (*e.g.* seeds), trade, invasive nature of species, etc. When and why people welcome alien plants is the main enquiry while studying plant transfers. We have to find out answers for this enquiry through past evidence, history, human migration, history of rulers and trade. All these can be traced if we look back at the botanical epics *e.g.* flora or manuals written in past or ancient period. The present author, therefore, judged to study 'Garcia da Orta's Coloquios dos Simples e Drogas e Cousas Mediciniais da India' which means 'Conversations on the Simples, Drugs and Medicinal Substances of India. It is the first treatise on tropical medicine in the form of dialogue in Latin and later in Portuguese, published in 1563. It has been studied and appreciated by earlier workers and commentators (Mathew, 1997; Walker, 2010; Silva, 2011; Teresa, 2013). The present author is engaged in searching plant invasion in India (Patil, 2017, 2018, 2019a,b; Patil & Patil, 2019). The present is an attempt to examine alien floral elements recorded in past particularly embodied in a historical document developed and written by Garcia da Orta mentioned earlier with an objective to investigate status and reasons for plant invasion in the then India.

METHODOLOGY

Garcia da Orta's 'Colloquios dos Simples Drogas....' has been studied by earlier authors. However, it remained, to date, uninvestigated from the viewpoint of plant invasion in the ancient period in India. Information is borrowed from Markham's (1913) Coloquios dos Simples and Drogas of India and also other secondary sources. It was also thought worthwhile to focus its bearings on various facets of human life in India and outside. The treatise is searched out for exotic plant species and their nativity based on recent evidences provided in table 1. The role played by the original author and his manuscript is explained relevantly.

RESULTS

My peep into floral elements included in his treatise could bring forth a total 27 alien species pertaining to 25 genera and 24 families of angiosperms. These taxa have been debated emphasizing their medicinal importance. They originally belong to various parts of the world and have been brought by invaders in different periods. It is interesting to note that maximum aliens are introduced in past from various parts of America (05 species) and Asia (Excluding India) (05 species). It is then followed numerically by China and various parts of Africa (03 species each), whereas the other countries or regions *viz.*, Malay Islands, Japan, Europe, Arabian Gulf, Persia, Afghanistan, Bali, East Indies, Siberia,

Table 1. Enumeration of exotic species.

S.N.	Botanical Name (Family)	Common Name	Habit	Wild (W) / Cultivated (C)	Nativity [References]
1.	<i>Aloe succotrino</i> Lam. (Liliaceae)	Aloes	Herb	C	South Africa [Foden & Potter, 2009]
2.	<i>Alpinia galanga</i> (L.) Willd. (Zingiberaceae)	Galanga	Herb	C	Malay Islands [Roxburgh, 1814]
3.	<i>Anacardium occidentale</i> L. (Anacardiaceae)	Cashew	Tree	C	Tropical America [Yadav & Sardesai, 2002; Patil, 1995]
4.	<i>Ananas comosus</i> (L.) Merr. (Bromeliaceae)	Pine Apple	Herb	C	Tropical America [Yadav & Sardesai, 2002]
5.	<i>Canabis sativa</i> L. (Cannabinaceae)	Bangue	Herb	W	Central Asia [Chandra Sekar, 2012] Asia (Excluding India) [Kaul, 1986]
6.	<i>Cinnamomum camphora</i> (L.) Nees & Eberm. (Lauraceae)	Camphor	Tree	C	China & Japan [Benthall, 1946]
7.	<i>Citrullus lanatus</i> (Thumb.) Mats & Nakai (Cucurbitaceae)	Mungo e Melum de India	Climber	C	Tropical Africa [Shetty & Singh, 1987]
8.	<i>Citrus aurantifolia</i> (Christem & Panz.) Swingle (Rutaceae)	Lime	Tree	C	Malaysia [Yadav & Sardesai, 2002]
9.	<i>Citrus medica</i> L. (Rutaceae)	Citron	Tree	C	China [Roxburgh, 1814]
10.	<i>Citrus sinensis</i> (L.) Osb. (Rutaceae)	Sweet Orange	Tree	C	Asia (Excl. India) [Stewart, 1972]
11.	<i>Datura metel</i> L. (Solanaceae)	Datura	Shrub	W	Tropical America [Chandra Sekar, 2012]
12.	<i>Commiphora myrrha</i> (Nees) Engl. (Burseraceae)	Myrrh	Tree	C	Ethiopia, Kenya, Oman, Saudi Arabia & Somalia [Orwa <i>et al.</i> , 2009; Gillett, 1991].
13.	<i>Dryobalanops aromatica</i> Gaertn. (Dipterocarpaceae)	Camphor, Bornea Camphor	Tree	C	Borneo, Labuan, Sumatra & Jahore [Lake & Kalsall, 1894]
14.	<i>Ferula asafoetida</i> Linn. (Apiaceae)	Altight	Herb	C	Central Asia, Europe & North Africa [Patil & Dhale, 2013] Persia [Roxburgh, 1814]
15.	<i>Garcinia mangostana</i> L. (Clusiaceae)	Mangostaes	Tree	C	South-East Asia [Martin <i>et al.</i> , 1987]
16.	<i>Glycyrrhiza glabra</i> L. (Papilionaceae)	Licorice, Liquorice	Herb	C	Arabia, Persian Gulf, Afghanistan, Turkesthan, Asia Minor & Siberia [Sawant <i>et al.</i> , 2016]
17.	<i>Guaiacum officinale</i> L. (Zygophyllaceae)	Palode la China	Tree	C	South America & West Indies [Singh & Karthikeyan, 2000]
18.	<i>Melia azedarach</i> L. (Meliaceae)	Nimbo	Tree	C	Asia (Excluding India) [Ara <i>et al.</i> , 1995]
19.	<i>Myristica fragrans</i> Houtt. (Myristicaceae)	Maca e Noz.	Tree	C	Moluccas [Singh <i>et al.</i> , 2001]
20.	<i>Nephelium chinensis</i> (Lour.) Almeida (Sapindaceae)	--	Trees	C	China [Singh & Karthikayan, 2000]
21.	<i>Papaver somniferum</i> L. (Papaveraceae)	Amfiam, Opio	Herb	C	Mediterranean countries & Middle East [Shetty & Singh, 1987]
22.	<i>Pipeer betle</i> L. (Piperaceae)	Betre	Climber	C	Bali & East Indies [Graf, 1980]
23.	<i>Punica granatum</i> L. (Punicaceae)	--	Tree	C	Afghanistan & Persia [Shetty & Singh, 1987]
24.	<i>Ravensara aromatica</i> Sonn. (Lauraceae)	Canela	Tree	W/C	Madagascar [Ramanoelina <i>et al.</i> , 2006]
25.	<i>Rosa damascena</i> Mill. (Rosaceae)	Damask Rose	Shrub	C	Eurasia & West Asia [Patil, 2003, 1995]

26.	<i>Syzygium aromaticum</i> (L.) Merr. & L.M. Perr. (Myrtaceae)	Cravo-da-India	Tree	C	Moluccas [Roxburgh, 1814]
27.	<i>Tamarindus indicus</i> L. (Caesalpinaceae)	Tamarindo	Tree	W/C	Tropical America [Shetty & Singh, 1987; Patil, 1990]

Moluccas, Middle East, Mediterranean region, Madagascar, Ethiopia, Kenya and Somalia by just a single species each. These figures are obviously indicative of direct and indirect human contacts of India with these countries or regions. These plants have been particularly noted from Goa, a state accessible by sea-route apart from roads. Although these plant species are foreign to Goa or India, they were appropriated by the then Indians and developed medicolore in due course. This knowledge of medicinal plants was documented by Garcia da Orta during his stay in Goa in his monumental treatise. This treatise has been consulted as a literary source on medicine. It helped to diffuse knowledge of Indian traditions to other countries in Europe, Africa and America. Interestingly, out of total 27 exotic species, 25 species are cultivated in India or outside. Apart from their miscellaneous uses, they were appropriated for medicinal purposes by trial and error by the Indians. The plant species although exotic, were integrated with bioculture of India and turned into sources of medicinal knowledge. It is notable that majority of them are perennial sources of drugs being trees (16 species) and shrubs (02 species), herbs (07 species) and two climbers are also represented.

DISCUSSION

The richness of biodiversity on Indian subcontinent is doubtless. The Indian spices were integrated with biblical texts in Europe in the earlier period of Christianity and also enjoyed in the Middle East. The Portugues colonisers looked for spices to preserve their food articles, fruits and grains. They also made fares in African and Brazilian ports whenever they visited Goa (Rodrigues, 1997). Their journeys were favoured by the trade winds and made familiar with sea route to Indian coasts and seasons in the region. They also brought with them the American fruits, useful plants, staples and propagules and introduced into Indian landmass. Goa was colonised after the discovery of maritime route to the land of spices by Vasco da Gama in 1498. A Jewish-Portuguese doctor Garcia da Orta lived for about 30 years in Goa, who wrote the influential manuscript on 'Simples and Drugs of the India', entitled as 'Coloquios dos Simples e Drogas e Cousas medicinais da India' (Orta, 1563). He served as a physician to the government of Goa. He developed a garden with many medicinal plants at Goa and Bombay. He had a great love for plants and enlightened scientific knowledge of medicinal plants and also Indian medicolore.

Knowledge of alien flora is essential for scientific management and policy-making on biological invasions of a nation or even at a global level. Khuroo *et al.* (2012) provided an inventory for alien plants in India and revealed 1599 species belonging to 842 genera and 161 families which constitutes 8.5% of the total Indian vascular flora. India's Third National Report submitted to the Convention on Biological Diversity (CBD) mentioned 40% of Indian flora as alien to the country (CBD, 2005). The further researches are on-going and adding the aliens numerically. However, their history of invasion, routes of invasion and related bioculture are not paid satisfactory attention. The present author, therefore, tapped invasion of such taxa especially encoded in the landmark botanical epic by Garcia da Orta. He included six dozen drugs arranging alphabetically based on his own observations and on testimonies provided by reliable informants.

Tamarind (*Tamarindus indica* L.) is although exotic and introduced species in India (Shetty & Singh, 1987; Patil, 1990), its specific name and common Arabian and Persian name 'Tamar-e-Hind' (Indian date) are coined after the name of India (Hind). The common name is coined by the traders as Tamarind and was sent out from the west coasts to Cairo from where it was taken to Alexandria and then Venice for use in Europe. Likewise, Bhang (*Cannabis sativa* L.) is an exotic plant in India (Kaul, 1986), but its medicolore developed on Indian land was furnished to Europe by Orta. He explained the Europeans about the first account of treatment of a case of cholera. He also made familiar with the etiquette of chewing betel nut in India (Markham, 1913). Even his knowledge about plant-derived drugs is 'copied wholesale' by Portuguese Jew, Christovas da Costa, and published in Spanish work in 1578 (Mathew, 1997). There was a custom to exchange gifts from the Portuguese and the king of Agra. Portuguese commonly sent typical Hindu-influenced medicines *e.g.* 'balsama apoletico' to treat head-ache and sandalwood paste to check fevers. They asked to send potent distilled beverage *e.g.* 'aguardente' and cashew 'feni' as tribute (HAG, 1346, 1429). The gum resin purchased in Calicut or Cochin were sold as a medicinal ingredient in Malacca or Macau (Friar, 1772), Opium (*Papaver somniferum* L.) bought in Malabar and Gujarat and sent to the Atlantic Colonies and it was not a controlled substance as in the modern practice. Records of sending camphor (*Cinnamomum camphora* (L.) J.Presl) and assafoetida (*Ferula asafoetida* H.Karst.) from Goa to Timor are available (*cf.* Walker 2010). Some more evidences are on record for the dissemination of Indian medicinal substances and healing techniques throughout the Portuguese maritime colonial network.

CONCLUSIONS

In a nutshell, Goa was the main commercial hub of the East in the 16th Century. It was/is a land rich in trade and a crossroad of peoples, languages, religions and culture. Garcia da Orta worked on this fertile land and never returned to Europe. His work has bearings, acclaimed to be pioneer scientific contribution on medicinal plants, on different facets of human welfare. His work sheds light on a part of the world then unknown to the Western countries. His treatise enabled market regulation and stability of distribution routes in India and abroad. He incorporated traditional Indian knowledge into the mainstream outside India. He followed a format of a dialogue between two individuals which has significance in explaining the medicinal recipes in Africa and South America. Even the merchants of Portuguese colonies sold Indian remedies in different regions of China, Vietnam and East Indies (Walker 2010). Ancient treatises, however, should be scrutinized in the light of present information on modern line to project factual environmental circumstances.

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