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Traditional Medicinal Knowledge in Goa, India

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Introduction

Goa is the smallest Indian state, and Panaji is the capital city, an urban settlement located in the island of Tiswadi, on the banks of the Mandovi River. An extensive wall (21 Km) was constructed in 1565, by the Portuguese settlers, encircling the first capital city, Old Goa, built further east on the island that also protected agricultural land, about 80 % of the fortification (RODRIGUES DOS SANTOS, MENDIRATTA, 2011). Goa was colonised after the discovery of the maritime route to the land of spices, in 1498, by Vasco da Gama, and became the cosmopolitan centre of a vast overseas territory where the viceroy had his official residence and ruled over a number of ports and fortresses, extended from the Cape of Good Hope to the straits of Malacca, and Macao (EVERAERT ET AL., 2001).

It was exactly in remote Malacca that the author of one of the couple of 16th and 17th century manuscripts examined was born, Manuel Godinho Erédia (1558?-1623), a Portuguese cartographer and botanist that lived in India (Goa and Kochi) from his 13th birthday to the year 1601 (EVERAERT ET AL., 2001). Erédia wrote and illustrated a manuscript of trees and other plant species, gardened and consumed in the East Indies, in 1612, while already back to Malacca. This manuscript complemented the most famous codex written on the issue of simples and drugs of the India, edited by the German Joahannes de Emdem in 1563, and authored by a Jewish-Portuguese doctor who lived for over 30 years in Goa, Garcia d' Orta (1500?-1568). This Renaissance scientist had a spice farm where he paid for his own medicinal plant species to be grown, in an island of the Bombay archipelago, now Mumbai, north of Goa (ORTA, 1563).

Material and Methods

Current research was initiated in Kochi, in 2013. The main objective was to explore the level of reliance on traditional medicinal plants. Therefore, the Portuguese Tropical Institute (IICT) team used its own bibliographical resources in order to provide a catalogue of the spices, medicinal plants and fruits the Europeans required from India, in general, and Kochi and Goa, in particular, in the early years of the Portuguese maritime expansion. Other archival resources were added, such as the ones from the Lisbon Academy of Sciences. Regarding this contribution about the Renaissance medicinal knowledge of Goa, the catalogue contains 134 different plant species. Only two dozens were reproduced in Table 1, selected for being in use in our days in this city.

Primary sources gathered on the issue of current medicinal applications of vegetable species in Goa were collected in a survey conducted by the IICT, in early 2014. The in-depth interviews included three types of informants: 1) the urban gardeners (26); 2) the spice, herb and fruit traders (22); 3) the Ayurvedic medicines healers (2). The sample totalled fifty (50) interviews, conducted in seven different locations, in touristic urban sites such as Candolim (42%), in the capital city (34%), in spice farms (2%), and spice markets (12%). The plant species catalogue contains 150.

Vernacular name (Hindi or Konkaní)	Scientific name	Author	Nº	Identical medicinal applications
1. Begal quince (Bel)	*Aegle marmelos* (L.) Corrêa RUTACEAE	a)	2	Anti-diarrhoea
2. Bettel-leaf or vine (Paan)	*Piper betle* L. PIPERACEAE	a) b)	1	Strengthens the teeth
3. Bettel-nut, Areca (Bitel or Supari)	*Areca catechu* L. ARECACEAE	a) b)	2	Strengthens the teeth
4.Camphor	*Cinnamomum camphora* (L.) J. Presl. LAURACEAE	a)	1	Skin applications as anti-rheumatic and anti-septic
5.Cashew	*Anacardium occidentale* L. ANACARDIACEAE	b)	6	Blood circulation, anti-flu
6.Chebulic myrobalan (Haritaki)	*Terminalia chebula* Retz COMBRETACEAE	a)	3	Purge
7.Cinnamon (Dalchini)	*Cinnamomum zeylanicum* Blume LAURACEAE	a)	5	Analgesic
8.Clove	*Syzygium aromaticum* (L.) Merr. & L.M. Perry MYRTACEAE	a)	4	Analgesic
9.Coconut	*Cocos nucifera* L. ARECACEAE	a) b)	13	Skin applications as anti-septic
10. Ginger	*Zingiber officinale* Roscoe ZINGIBERACEAE	a) b)	11	Anti-flu
11.Indian Long Pepper (Pippali)	*Piper longum* L. PIPERACEAE	a) b)	1	Anti-flu
12.Indian Turmeric (Haldi)	*Curcuma longa* L. ZINGIBERACEAE	a)	9	Anti-septic
13.Jambolan (Karela beej, Jamun)	*Eugenia cumini* (L.) Druce MYRTACEAE	a) b)	4	anti-inflammatory
14.Lemon (Nimbu)	*Citrus medica* L., *C. limon* (L.) Osbeck RUTACEAE	a) b)	4	Syrup confection
15.Lime	*Citrus aurantiifolia* (Christm.) Swingle RUTACEAE	b)	3	Nutraceutical
16.Liquorice (Jyesthamadh, Mullathi)	*Glycyrrhiza glabra* L. FABACEAE	a)	3	Anti-flu
17.Mint, peppermint	*Mentha x piperita* L., *Mentha* sp. LAMIACEAE	a)	3	Digestive
18.Neem, Pride of India	*Melia azedarach* L. MELIACEAE	a)	5	Anti-septic, healing balm
19.Nutmeg, mace	*Myristica fragrans* Houtt. MYRISTICACEAE	a)	14	Anti-dysenteric, healing balm
20.Orange (Sweet)	*Citrus sinensis* (L.) Osbeck RUTACEAE	a)	5	Nutraceutical
21.Pineapple	*Ananas comosus* (L.) Merr. BROMELIACEAE	b)	9	Digestive
22.Pomegranate (Dalimb)	*Punica granatum* L. LYTHRACEAE	a) b)	5	Nutraceutical, throat problems
23.Sugar cane	*Sacharum* spp. POACEAE	a)	1	Used to sweeten in prescriptions
24.Watermelon (Carim)	*Citrullus lanatus* (Thunb.) Matsum. & Nakai CUCURBITACEAE	a)	8	Nutraceutical

Sources: Uses mentioned in the Renaissance manuscripts: a) Orta; b) Erédia. Survey, 2014

Table 1: Traditional medicinal knowledge in Goa, India

Results and Discussion

Cross-examination of the medicinal plants used today and during Renaissance proves that gardening and trade in Goa are old traditions rooted in religious practises and ancient cultural habits. Current preference for Krishna Tulsi *(Ocimum sanctum),* a Lamiaceae used in Hinduism for prayer and as domestic medicine (26 occurrences), provides evidence of the dominating Indian cultural identity, in a state with a strong Christian presence. In fact, over two thirds of the gardens display at least one tulsi bush, in a noble location in case of the Hindus, or a secondary place when the household is Christian, for the species is a sacred plant that blesses the house and the family. It is also a good anti-septic, anti-cough, and sedative species not mentioned in the Renaissance manuscripts. Spices such as pepper (*Piper nigrum*), clove, liquorice, nutmeg and all sorts of native fruits were the main goal of the analysis and fuelled the curiosity of the Europeans in the 16^{th} and 17^{th} centuries.

Biodiversity of the Indian subcontinent is unquestionable. The Indian spices, the soul of food, were already known in Europe in the beginning of Christianity, because they were mentioned in biblical texts and consumed in the Middle East. Portuguese colonisers arrived in 1498 and looked for spices to preserve rations. They were as pleased to taste and illustrate native fruits and vegetables, as they were needy to garden and cook the European ones. Additionally, Portuguese ships frequently made fares in several African and Brazilian ports, before and after the trip to Goa (RODRIGUES, 1997). They also travelled to the Far-East and brought sweet-oranges, spices and sandalwood (*Santalum album*). These long journeys were favoured by the trade winds, and many American and West African fruits, staples and medicinal plants were also transported to India, in early colonisation times. Therefore, another result of this research was that medicines like American Guaiacum (*Guaiacum officinale*), used to treat syphilis; fruits like guava (*Psidium guajava*) or cashew; and African pea of Angola (*Cajanus cajan*) became preferences in Goa as early as the 16^{th} century, as the manuscripts give notice.

Present contribution further proposed to measure the impact of urban agriculture in several settlements of the state of Goa. Even with a small sample it is possible to conclude that gardening provides food, income, and health to the households, favouring urban sustainability whereas providing infiltration spaces, producing oxygen and nurseries that preserve the genetic identity of local plant species. As far as traditional medicinal knowledge is concerned, 21.6% of the spices, fruits and medicinal plants listed in the Renaissance catalogue maintain identical therapeutic applications. In spite of the known difference between concepts of traditional and modern medicine, it is imperative to observe that Ayurvedic practises dominate these days.

Obviously only the most consumed fruits, spices, vegetables and medicinal plants are displayed in this four-page text but we emphasize that most American and European fruits consumed today were already in use both in Orta and Erédia times. As to the results of the survey and the uses included in the catalogue of 150 plants identified during the scientific mission to Goa, ten are ranked on Table 2. The table excluded some species whose uses today are similar to Renaissance times, already included in the first table, where the number of occurrences in the 2014 survey has been placed. We emphasise that not all the species are gardened in Goa, as is the case with nutmeg that ranks fourth and equals the aloe grown in the urban plots.

Coconut palm ranks fifth, with thirteen occurrences, nine of them in the gardens. The fruit kernel is as important to cook in curry dishes as it is to eat raw or used as medicine. Another important result of the survey was that fifteen (57.7%) of the twenty six interviewed households possessed a well and used to water the spices, medicinal plants and fruit trees grown in their gardens. The beneficiaries of urban gardening are the households, in particular the less wealthy. Because Goa is a renowned Indian state for tourism, all the interviewed gardeners complemented the consumption of their produce with food bought with the family provider income, ranging from services provision, trade or transportation jobs. In Panjim, the capital city, urban agriculture is practised in old neighbourhoods (Fontainhas), in most instances related to centuries old Portuguese presence.

Common name	Medicinal application	Mode of preparation	Plant part used	Nº of gardeners	Total Informants
1.Sacred holy basil, Tulsi	Cough, colds, asthma	Infusion, concoction	Leaf, flower	18	26
2.Mango	Diabetes	Herbal mixture	Bark	6	19
3.Papaya	Digestive	Eaten raw	Fruit	5	15
4.Aloe	Skin rashes, burns, wounds	Extraction of the sap	Sap	13	14
5.Curry	Lowers blood pressure, diabetes	Chewed raw	Leaf	8	11
6.Banana	Chewed with others in narcotic mixtures	Wrapped in paan with bitel	Young leaf	2	11
7.Portuguese Peri-peri	Spice	-	-	2	10
8.Cardamon	Weight-loss, depression, digestive, memory loss	Infusion or concoction	Seed	0	9
9.Pepper	Purge	Infusion	Seed	0	7
10.Lemongrass	Cough and colds. Acne and depression.	Infusion. Oil drops in the skin or in water.	Leaf	6	7

Sources: Survey, 2014.

Table 2: Ranking of medicinal plants and spices consumed in Goa, India

Conclusions and Outlook

Urban gardens provide a wide range of medicines and supply nutritious food. In the state of Goa over a half of the in-depth interviews conducted in early 2014 targeted urban cultivation. Results show that fruit trees dominate (39.3%), followed by medicinal plants (33.9%), spices (17.9%) and vegetables (8.9%). Gardeners prefer organic fertilisation (57.7%) because Indian culture favours respect for nature, and cow manure is preferred (37.5%) and easy to get as the animals live on the streets. The survey further included interviews to traders and therapeutic practitioners, which permitted a cross-examination with the herbal medicines used in Renaissance times. Hope is to contribute for a more sustainable use of existing plant genetic resources.

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