



RESEARCH ARTICLE

Hortus Indicus Malabaricus: An Enquiry into Alien Plants: II

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ABSTRACT

Rheede's Magnum Opus (1678-1693) – Horti Indici Malabarici – reflects the indigenous medical knowledge of the people of Malabar region (India) in the 17th century. It invited attention of researchers from different walks of life. It dovetailed the science of medicine and culture of indigenous people of India. The present author extended investigation on it from the standpoint of plant invasion prior to this period. This account sheds light on additional 32 alien plant species pertaining to 32 genera and 23 angiospermic families. As many as 20 biogeographical regions have been divulged for their floral contribution to India. The American and African continents share maximum contribution. Nearly all parts of the Old and New Worlds showed contacts with the then India. The author is inclined to state that such ancient botanical annals should be re-investigated on various grounds to disclose past biological invasion which help manage our present biodiversity.

Keywords: Hortus Indicus Malabarius, Aliens, Plant Invasion.

INTRODUCTION

The land of Malabar (India) was discovered by the Europeans in their quest for lucrative plant wealth as source of spices, sugar, medicine, cotton, oils, etc. The Portuguese discovered the sea route to India. Pedro de Covila was the first Portuguese to set foot on Indian landmass. Although so, it was Van Rheedee, a Dutch soldier and a keen naturalist made a milestone history of Indian Botany. He was the Dutch Governor of Cochin (1663) and then Commander of Malabar in 1669. He botanised in this region consulting native people, the results of which were embodied in his 'Hortus Malabaricus Indicus (Rheedee, 1678-1693)' (cf. Manilal, 2012). It is written originally in Latin but translated carefully by Manilal in English (Manilal, 2003) and the subject is dilated later by him also (Manilal, 2012). The present author made a further headway to divulge plant invasion from their botanical annals (Patil, 2020). This treatise being a botanical annal for Indian region and bears a testimony to biological evidences of past such as plant or biological invasion. It, therefore, needs encoding the hidden secrets embedded in it. It is scrutinized critically based on additional or new literary sources ascertaining exotic status of some more taxa. The results are being communicated in this communication.

METHODOLOGY

Floral elements as mentioned in monumental work by Prof. Manilal viz., (i) Hortus Malabaricus (2003) (English translation) and (ii) Hortus Malabaricus and The Socio-cultural Heritage of India has been borrowed for the present communication. These treatises have not ascertained exotic status of the plant taxa included in them. The present author made a headway on this line earlier (Patil, 2020). Some more exotic plant species appeared worth to report from the same literary sources, they are being highlighted presently. They are enumerated in Table-1 alphabetically along with name of family, volume number of the said treatise, besides status regarding wild/cultivated, habit and biogeographical affiliations (nativity) citing relevant references for each alien species.

RESULTS AND DISCUSSION

Location of India at the junction of three major biogeographic realms viz., Eurasian, Afro-tropical and Indo-Malayan is characteristic. India is the 7th largest country with a land frontier of nearly 15200 km and a coastline of 7516 km. It is also one of the 12 centres of origin and diversity of plant species in the world. Moreover, its ancient contacts and trade need no special mention as also the European invasion for spices, sugars, oils, cotton, etc. The outsiders not only endeavoured to find out useful plant

species and products but also botanised the Indian territory (cf. Roxburgh, 1832; Rheedee, 1678-1693; Hooker, 1872-1897, etc.). Their monumental, laborious and hard works left some foot prints in the history of India. One such botanical annals is Rheed's 'Horti Indici Malabarici' (1678-1693). It has been restudied by Prof. Manilal intensively (Manilal, 2003, 2013). His work is acclaimed to be a milestone in plant science (Sashtry, 1975; Mohan Ram, 2005; Dharmapalan, 2012; Jain and Singh, 2014). The present author studied it from the viewpoint of plant invasion in the then India (Patil, 2020). Some more plant species need focus on the same line and presented in this communication.

The present scrutiny of exotic plant species embodied in Hortus Melabaricus Indicus projected total 32 angiospermic species belonging to total 23 families. Of these, 05 species belong 05 genera and 04 monocotyledonous families. The rest others 27 species belong to 27 genera and 19 families of the dicotyledonous ones. These are either wild (16 species), cultivated (04 species) and both wild and cultivated as well (02 species). Majority of these are herbaceous ones (15 species) which are then represented as: trees (09 species), shrubs (05 species) and climbers (03 species). While estimating the contribution of source flora to the alien species in the then Malabar region of India in thus: Africa and Asia (Excl. India) (06 each), America and tropics (04 each), Malesia and Australia (02 each). Other's regions or countries shared for a single alien plant species each are: Madagascar, China, Mediterranean region, Molucca Island, Java, South Sea Islands, Europe, Persia, Bali, East Indies, Temperate regions, Malaya, Malay Archipelago and Society Island. It is to be noted that Malabar region as considered by Rheed accommodated total 143 alien species belonging to 112 genera and 71 families of angiosperms inclusive of author's earlier report, Patil, 2020). Maximum aliens have been contributed (inclusive of earlier report by the present author) by American continent (52 species), African continent (32 species) and Asia (Excl. India) (18 species). Other regions of the Old World have lesser contribution to the alien flora of Malabar region (India). Wild as well as cultivated species have nearly similar share in alien flora of this Indian landmass. Analysis of invasive aliens also share the similar dominance from American and African continents. The cultivated species indicated that these have been introduced for food, medicine, fodder, energy and ornamental purposes (Patil, 2020; Khuro *et al.*, 2012). Many wild and cultigens have been appropriated for religious purposes (Khare, *et al.*, 2020).

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Table-I: Exotic Species Gleaned from Rheeds' Hortus Malabaricus (H.M.)

Sr.No. (1)	Plant Species & Family (2)	No.Vol. of H.M. (3)	Habit (4)	Status Wild (W)/ Cultivated (C) (5)	Nativity & Reference (6)
1.	<i>Achyranthes aspera</i> L. Amaranthaceae	X	Herb	W	Tropics: Medakkar & Sharma, 2016b.
2.	<i>Aerva lanata</i> (L.) Juss. ex Schult. Amaranthaceae	X	Herb	W	Madagascar: Sheikh & Dixit, 2017.
3.	<i>Aeschomene indica</i> L. Papilionaceae	IX	Herb	W	Tropics: Medakkar & Sharma, 2016b.
4.	<i>Areca catechu</i> L. Arecaceae	I	Tree	C	Tropical Asia: Gaikwad & Garad, 2015.
5.	<i>Barleria prionitis</i> (L.) Gaertn. Acanthaceae	IX	Shrub	C	Tropics: Madakkar & Sharma, 2016b.
6.	<i>Bauhinia variegata</i> L. Caesalpiniaceae	I	Tree	C	China: Debnath & Debnath, 2017; Pullaiah & Ramamurthy, 2001.
7.	<i>Calophyllum inophyllum</i> L. Clusiaceae	IV	Tree	C	East Africa: Pullaiah & Rao, 2002.
8.	<i>Cassia fistula</i> L. Caesalpiniaceae	I	Tree	C	North America: Debnath & Debnath, 2017.
9.	<i>Cayratia trifolia</i> (L.) Domin Vitaceae	VII	Climber	W	Mediterranean Region: Sheikh & Dixit, 2017.
10.	<i>Coccinia grandis</i> Voight Cucurbitaceae	VIII	Climber	W,C	Africa: Medakkar & Sharma, 2016.
11.	<i>Codiaeum variegatum</i> (L.) Bl. Euphorbiaceae	--	Shrub	C	Molucca Island: Singh <i>et al.</i> , 2001 Malaysia: Gaikwad & Garad, 2015. Java to Australia & South Sea Islands: Bailey, 1949.
12.	<i>Erythrina variegata</i> L. Papilionaceae	VI	Tree	C	Malesia: Medakkar & Sharma, 2016b.
13.	<i>Euphorbia antiquorum</i> L. Euphorbiaceae	II	Shrub	C	Africa: Naik, 1988.
14.	<i>Evolvulus alsinoides</i> (L.) L. Convolvulaceae	XI	Herb	W	America: Daniel, 2008.
15.	<i>Gmelina arborea</i> Roxb. Verbenaceae	I	Tree	C	Malaya: Medakkar & Sharma, 2016b.

16.	<i>Hibiscus tiliaceus</i> L. Malvaceae	I	Tree	W	Society Islands: Almeida, 1996.
17.	<i>Hydrilla verticillata</i> (L.f.) Royle Hydrocharitaceae	II	Herb	W	North Australia: Kohli <i>et al.</i> , 2012.
18.	<i>Impatiens balsamina</i> L. Geraniaceae	IX	Herb	W,C	Tropical America: Chandra Sekar, 2012; Patil, 2017. Asia (Excl. India): Steward, 1972.
19.	<i>Melilotus indica</i> (L.) All. Papilionaceae	IX	Herb	W	South Europe & South-Western Asia: Shetty & Singh, 1987.
20.	<i>Murdannia nudiflora</i> (L.) Brenn. Commelinaceae	IX	Herb	W	Tropical Africa, Shaikh & Dixit, 2017.
21.	<i>Nymphaea nouchali</i> Burm.f. Nymphaeaceae	XI	Herb	W	South-East Asia: Shetty & Singh, 1987.
22.	<i>Ocimum basilicum</i> L. Lamiaceae	X	Herb	C	Persia: Pullaiah and Ramamurthy, 2001.
23.	<i>Phragmites karta</i> (Retz.) Trin. ex Steud. Poaceae	XII	Herb	W	Africa, Quereshi <i>et al.</i> , 2014.
24.	<i>Phyllanthus reticulatus</i> Poir. (Syn. <i>Kirgania reticulata</i> (Poir.) Baill. <i>Phyllanthus acidus</i> (L.) Skeels	III	Tree	C	Tropics: Medakkar & Sharma, 2016a.
25.	<i>Piper betle</i> L. Piperaceae	VII	Climber	C	Bali & East Indies Graf, 1980.
26.	<i>Plecranthus mollis</i> (Aiton) Spreng. Lamiaceae	X	Herb	W	Tropical America: Shaikh & Dixit, 2017.
27.	<i>Polygonum barbatum</i> L. Polygonaceae	X, XII	Herb	W	North Temperate Regions: Singh & Das, 2015.
28.	<i>Saccharum spontaneum</i> L. Poaceae	XII	Herb	W	Tropical West Asia: Reddy, 2008; Patil, 2017.
29.	<i>Syzygium malaccense</i> (L.) Mer. & Perry Myrtaceae	I	Tree	C	South-East Asia: Martin <i>et al.</i> , 1987.
30.	<i>Tabernaemontana divaricata</i> (L.) R.Br. ex Roem. & Schult.	II, VI	Shrub	C	Tropical Asia: Singh <i>et al.</i> 1991.
31.	<i>Urena lobata</i> L. Malvaceae	X	Herb	W	Tropical Africa: Reddy, 2008; Patil, 2017.
32.	<i>Vernonia anthelmintica</i> (L.) Willd. Asteraceae	II	Shrub	W	Malay Archipelago: Mitra & Mukharjee, 2012.