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ROLE OF TEMPLES AND OTHER HOLY PLACES IN PLANT CONSERVATION OF ODISHA, INDIA

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Abstract

An ethnobotanical survey of plants associated with temple rituals and nurtured in the temple yards or gardens in the Jajpur district of Odisha was been carried out during 2009-11. A total of 84 plant species of both trees, shrubs, herbs or climbers have been collected and identified from different temple premises and adjoining areas. Twelve (12) species are found to be exclusively planted and carefully nurtured for their particular utility. Moreover, some plants are considered sacred and planted as well as worshipped on specific occasions. Those plants are available rarely in wild but protected and saved from extinction being associated with religious places in this district.

Keywords: *Conservation practices, Jajpur district, religious rituals, sacred plants, temple gardens.*

Introduction

The pre-historic man worshipped different elements of nature for fear of their potential to inflict calamities or curse as well as for reverence for the benefits he received from them. His sense of gratitude went to the extent of bestowing godhood of such forces of nature as the sun, rain, river, forest, mountain, animal and plants etc. Gradually, temples and other religious institutions were created and elaborate rituals as well as functions were performed there to appease the presiding deities. He offered them specific materials of his choice including leaf, flower, fruit, seeds etc. and also used different plant products in those religious activities. To meet such requirements, plants used frequently were nurtured in the temple gardens and surrounding areas and well protected for their necessities. Also, as a part of this process he began identifying some plants with particular divine personalities of his pantheon and started worshipping them. In fact, this plant worship in India is one of the earliest form of religious cult [1], prevailing till date. Such religious practices play a significant role in conserving a particular plant in a locality.

Scientific investigation on human faith, belief and the conservatory role of holy places in India are sporadic [2-9], which are mostly confined to some protected natural forest patches in tribal dominated areas called sacred grooves, holy hills or Deogudis. But there is hardly any

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report on manmade temple gardens from this country as well as from Odisha. Hence, this project was undertaken to explore and enlist the flora of temple yards, gardens as well as plants associated with temple rituals in Jajpur district of Odisha with the purpose to evaluate the role of holy places in conservation of some particular plant species, if any and the biodiversity in general of that locality.

Land and culture

Jajpur (85°40' E – 86°44' E.L., 20°30'N – 21°10N.L), situated on the bank of holy river 'Baitarani', has a separate identity in the temple culture from ancient days (Fig. 1).

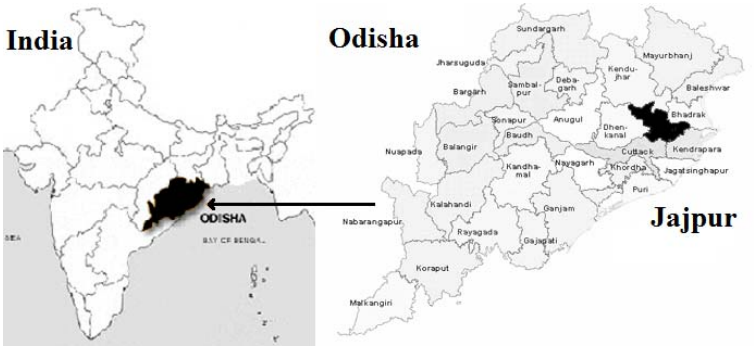

Fig. 1. Map of the study area

It was the capital of Odisha from 736 AD to 1110 AD during the 'Bhauma' and 'Somavamsi' Keshari dynasty rulers [10] and was also a centre of culture. It also happened to be the place of synthesis of different religions like "Buddhism", "Jainism", "Shaktism", "Saivism" and "Vaishnavism" which spread here in different periods of history, due to the affiliation of rulers to a particular faith. Obviously a large number of temples and other religious places of worship were built by the contemporary kings to spread their adopted faith and religion in this locality. Moreover Jajpur has the unique distinction of becoming the ancient and prominent "Shaktipitha" of the state due to the presence of Goddess "Viraja", for which it is called "Virajakhetra". It has also a number of Buddist relics of the "Bhaumakara" period (9^{th} – 10^{th} Century AD). The famous among them are Ratnagiri, Udayagiri, Langudi and Radhanagar sites with Mahastupas and monastic complexes [11].

As a seat of ancient culture and civilization, it was like the temple cities of Bhubaneswar and Puri once studded with stone temples. But the place has lost its importance and glory with the shifting of the capital. Later many temples were destroyed during the Moghul period [12]. Despite this, now there are more than one hundred temples and other holy places surviving and functioning in this district facing the ravages of nature as well as mankind for centuries (Table 1). In order to fulfill their regular requirements, commonly a flower garden and occasionally an orchard is developed and maintained by most of these temples.

Table 1. Names of some ancient temple sites visited**.**

No.	Name of temples and holy places	Location
01.	Viraja temple, Hemeswar temple, Akhandalesvar temple, Mangala temple, Bhimeswar temple, Visvesvara temple, Hatakeswar temple, Saptmatruka temple, Ganesh temple, Dasasvamedha ghat, Jagannath temple, Mukteswar temple, Garuda temple, Varahanath temple, Hamseswar temple	Jajpur
02.	Jagannath temple, Gopinath temple	Sukinda
03.	Buddhist site at Ratnagiri, Udayagiri, Langudi, Mahavinayak temple, Chandikhol	Ratnagiri
04.	Baruneswar temple	Mainda

05.	Someswar temple	Bachiari
06.	Khilateswara temple	Ali Nagar
07.	Trilochaneswar Temple, Kapileswar Temple	Trilochanapada
08.	Tadakeswara temple, Hanuman temple	Khandara
09.	Vilveswara temple	Beleswar
10.	Siddheswara temple, Kuturi-Katiri temple, Gopinath temple	Siddheswar
11.	Buddhist monastery	Tarang sagarpur
12.	Kaleswar temple	Deulabeda

Methodology

Field survey was conducted consecutively for two years (2009-2011) covering the major seasons and at definite intervals to collect and identify the plants present in and around the temple premises. For the convenience of study, the entire district was divided into three zones namely Zone-A (Jajpur), Zone-B (Badachana-Dharmasala) and Zone – C (Sukinda), situated around 70kms from each other, where there are congregation of a number of temples and other prominent holy places. Local knowledgeable people attached to temples including priests, temple gardeners if any and traditional temple florists colloquially called 'Mali' were interviewed following the participant observation method [13]. Collection and recording of data like types of plant present in temple premises and adjoining locality, specific plant part or product utilized in temples and type of use etc. were done during the field study. Voucher specimens were collected and their identification was authenticated following the prescribed procedure [14, 15]. Scrutiny of existing literature i.e. scientific work done previously, if any, regarding this aspect was carried out and ultimate analysis as well as interpretation of data was made to reach at some definite conclusion.

Results

A total of 84 plant species belonging to 75 genera and 44 families have been collected and identified from different temple premises and adjoining areas present in all the three zones of Jajpur district of Orissa. The plants collected are categorized in to seven different groups basing on their specific requirements and usages in temples. The data are also presented in a consolidated tabular form (Table 2) highlighting their local name, botanical name and family, locality or zone from where they were collected and the category of their use for specific purpose etc. for convenience of study.

Table 2. Plants associated with temples in Jajpur district of Odisha

No.	Botanical Name, Family and Local Name	Locality/ Zone			Category of uses						
		A	B	C	1	2	3	4	5	6	7
1	*Acacia catechu* (L.f.) Willd. (Mimosaceae) 'Khaira'			+						+	
2	*Adhatoda vasica* Nees. (Acanthaceae) 'Basanga'	+	+			+					
3	*Aegle marmelos* (L.) Corr. (Rutaceae) 'Bela'	+	+	+	+				+		+
4	*Aeschynomene aspera* L. (Fabaceae) 'Sola'	+								+	
5	*Aganosma caryophyllata* Roxb. (Apocynaceae) 'Malati'	+	+	+		+					
6	*Ananas comosus* (L.) Merr. (Bromeliaceae) 'Sapuri'	+	+	+			+				
7	*Annona squamosa* L. (Annonaceae) 'Sitaphala'	+	+	+			+				
8	*Anogeissus acuminata* Roxb. (Combretaceae) 'Phasi'			+					+		
9	*Anthocephalus cadamba* Roxb. (Rubiaceae) 'Kadamba'	+	+			+					
10	*Areca catechu* L. (Arecaceae) 'Gua'	+					+				
11	*Artabotrys hexapetalus* L.f. (Annonaceae) 'Chinichampa'	+	+			+					
12	*Artocarpus heterophyllus* L. (Moraceae) 'Panasa'	+	+	+	+						
13	*Asparagus racemosus* Willd. (Liliaceae) 'Satabari'	+	+				+				
14	*Averrhoa carambola* L. (Geraniaceae) 'Karamanga'	+	+				+				
15	*Azadirachta indica* A.Juss. (Meliaceae) 'Nima'	+	+	+						+	+
16	*Bauhinia variegata* L. (Caesalpiniaceae) 'Kanchana'		+	+		+					
17	*Borassus flabellifer* L. (Arecaceae) 'Tala'	+	+							+	
18	*Butea monosperma* Lam. (Fabaceae) 'Palasa'		+	+	+					+	
19	*Calophyllum inophyllum* L. (Clusiaceae) 'Polanga'	+						+			

20	*Calotropis procera* (Ait.) R.Br. (Asclepiadaceae) Arakha'	+	+			+		+			
21	*Catharanthus roseus* L. (Apocynaceae) 'Sadabihari'	+	+	+		+					
22	*Cestrum nocturnum* L. (Solanaceae) 'Hena'	+	+	+		+					
23	*Cinnamomum tamala* Nees. (Lauraceae) 'Tejapatra'	+								+	
24	*Clitoria ternatea* L. (Fabaceae) 'Aparajita'	+	+	+		+					
25	*Cocos nucifera* L. (Arecaceae) 'Nadia'	+					+				
26	*Couroupita guianensis* Aubl. (Lecythidaceae) 'Nageswar'			+		+					
27	*Crateva magna* (Lour.) DC. (Capparidaceae) 'Baruna'	+	+		+						+
28	*Cynodon dactylon* L. (Poaceae) 'Duba'	+	+	+	+						
29	*Datura metel* L. (Solanaceae) 'Dudura'	+	+	+		+					
30	*Delonix regia* Raf. (Caesalpinaceae) 'Krushna Chuda'	+	+	+		+					
31	*Desmostachya bipinnata* L. (Poaceae) 'Kusa'	+			+						
32	*Dillenia indica* L. (Dilleniaceae) 'Oau'	+	+				+				
33	*Diospyros sylvatica* Roxb. (Ebenaceae) 'Kanchia'	+	+						+		
34	*Emblica officinalis* Gaertn. (Euphorbiaceae) 'Aonla'	+	+	+	+						+
35	*Ficus benghalensis* L. (Moraceae) 'Bara'	+	+	+	+				+		+
36	*F.hispida* L.f. (Moraceae) 'Dimiri'	+						+			
37	*F.microcarpa* L.f. (Moraceae) 'Jida'		+					+			
38	*F.religiosa* L. (Moraceae) 'Aswastha'	+	+	+	+				+		+
39	*Hibiscus mutabilis* L. (Malvaceae) 'Sthalapadma'	+	+			+					
40	*H.rosa-sinensis* L. (Malvaceae) 'Mandara'	+	+	+		+					
41	*Holoptelia integrifolia* Roxb. (Ulmaceae) 'Dhau'		+						+		
42	*Ipomoea alba* L. (Convolvulaceae) 'Kunjalata'		+			+					
43	*Jasminum auriculatum* Vahl. (Oleaceae) 'Juhi'	+	+	+		+					
44	*J.pubescens* Willd. (Oleaceae) 'Kunda'	+	+			+					
45	*J.sambac* L. (Oleaceae) 'Malli'	+	+	+		+					
46	*Leucas aspera* Willd. (Lamiaceae) 'Gayasa'	+	+			+					
47	*Mammea suriga* Kosterm. (Clusiaceae) 'Churiana'		+			+					
48	*Mangifera indica* L. (Anacardiaceae) 'Amba'	+	+	+	+		+	+	+	+	
49	*Mesua ferrea* L. (Clusiaceae) 'Nagakedara'	+	+			+					
50	*Michelia champaca* L. (Magnoliaceae) 'Champa'	+	+	+		+					
51	*Mimusops elengi* L. (Sapotaceae) 'Baula'	+	+	+		+					
52	*Mirabilis jalapa* L. (Nyctaginaceae) 'Rangani'	+				+					
53	*Mitragyna parvifolia* Roxb. (Rubiaceae) 'Kelikadamba'	+	+			+					
54	*Murraya exotica* L. (Rutaceae) 'Kamini'	+	+			+					
55	*M.koenigii* L. (Rutaceae) 'Bhursanga'	+	+	+						+	
56	*Musa sapientum* L. (Musaceae) 'Kadali'	+	+		+		+			+	
57	*Nelumbo nucifera* Gaertn. (Nymphaeaceae) 'Padma'	+	+			+					
58	*Nerium indicum* Mill. (Apocynaceae) 'Karabira'	+	+	+		+					
59	*Nyctanthes arbortristis* L. (Oleaceae) 'Gangasiuli'	+	+			+					
60	*Nymphaea stellata* Willd. (Nymphaeaceae) 'Kain'	+				+					
61	*Ocimum basilicum* L. (Lamiaceae) 'Durlava'	+	+		+						
62	*O.sanctum* L. (Lamiaceae) 'Tulsi'	+	+	+	+						+
63	*Pandanus fascicularis* Lam. (Pandanaceae) 'Kia'	+				+					
64	*Plumeria rubra* L. (Apocynaceae) 'Kathachampa'	+	+	+		+					
65	*Polyalthia longifolia* Thw. (Annonaceae) 'Debadaru'	+	+		+					+	+
66	*Polyanthes tuberosa* L. (Amaryllidaceae) 'Rajni Ganda'	+				+					
67	*Prosopis cineraria* L. (Mimosaceae) 'Sami'	+	+								+
68	*Pterocarpus santalinus* L. (Fabaceae) 'Rakta Chandana'		+							+	
69	*Pterospermum acerifolium* L. (Sterculiaceae) ''Muchukunda'	+	+			+					
70	*Quisqualis indica* L. (Combretaceae) 'Madhumalati'	+	+	+		+					
71	*Ricinus communis* L. (Euphorbiaceae) 'Jada'	+	+					+			
72	*Santalum album* L. (Santalaceae) 'Chandan'		+	+						+	
73	*Saraca asoca* Roxb. (Caesalpiniaceae) 'Asoka'	+	+		+						
74	*Sesbania grandiflora* L. (Fabaceae) 'Agasti'	+	+		+						
75	*Shorea robusta* Gaertn.f. (Dipterocarpaceae) 'Sala'			+					+		+
76	*Streblus asper* Lour. (Moraceae) 'Sahada'	+	+		+				+		
77	*Strychnos nuxvomica* L. (Loganiaceae) 'Kochila'		+	+					+		+
78	*Syzygium cumini* L. (Myrtaceae) 'Jamu'	+	+				+				
79	*Tabernaemontana coronaria* Willd. (Apocynaceae) 'Tagara'	+	+	+		+					
80	*Terminalia bellirica* Roxb. (Combretaceae) 'Bahada		+	+			+				
81	*T. chebula* Retz. (Combretaceae) 'Harida'		+	+			+				
82	*Thevetia nerifolia* Pers. (Apocynaceae) 'Kaniara'	+	+	+		+					
83	*Vallaris solanacea* Roth. (Apocynaceae) 'Padabali'		+			+					
84	*Ziziphus mauritiana* Lam. (Rhamnaceae) 'Barkoli'	+	+	+	+						

A – Jajpur zone, **B** – Barchana - Dharmasala Zone , **C** – Sukinda zone,

Category: 1 - Plants used in rituals, **2** – Ornamental plants, **3** – Fruit trees, **4** – Plants for sacred fire, pitcher and fuel, **5** – As platform for Gods, **6** – Miscellaneous use, **7** – Sacred and Totem plants.

Group 1. Plants used in specific temple rituals

A total of 18 plant species belonging to 16 genera and 12 families were collected and identified whose parts like leaves, flowers, branch or whole plant are offered to the deities during different rituals and functions in the temples performed throughout the year. These are either planted or available in temple premises and surrounding zone or collected from adjoining locality.

Group 2. Ornamental plants

A total of 38 plant species belonging to 35 genera and 23 families were collected and identified whose flower or leaves are offered daily to the deities, are commonly planted and available in temple gardens and in protected surrounding locality. Mostly the flowers of those trees or shrubs are a daily requirement for which they are exclusively planted and nurtured. More over they are planted to beautify the temple premises.

Group 3. Fruit trees

A total of 12 plant species belonging to 11 genera and 10 families are mostly tropical fruits used as offering in temple ceremonies. Those are also used as ingredients in temple dishes. A few seasonal ones like Annanas, Anona or Mango offered to deities during their availability in different seasons of the year.

Group 4. Plants for Sacred fire, Sacred pitcher and Fuel

Burning the sacred fire (Havan or Homa) with cow milk fat (Ghee) is a part of many temple rituals in which wood of particular plants are made to burn with chanting of verses. So also, it is a binding to put a sacred pitcher, (Purna Kumbha or Kalasa filled with holy water) before performing any ritual in temples. A twig of mango or some other but specific plant and a coconut is also a part of the sacred pitcher. Similarly the vegetable oil extracted from the seeds of some indigenous plants like *Calophyllum inophyllum* or *Ricinus communis* are used to fuel the temple lamps. It is because; the use of kerosene oil or electricity is prohibited in the sanctum of many temples. A total of six (06) plant species belonging to 5 genera and 5 families, whose part or extracts are used for these purposes for which, they are common in temple gardens or premises in different temples of Jajpur.

Group 5. Plant base as platform or dais

In rural areas and particularly in tribal villages of Sukinda, the village goddess or deities are placed at the base of some specific trees. A total of 10 plant species belonging to 09 genera and 08 families are used for this purpose.

Group 6. Miscellaneous uses

12 plant species belonging to 12 genera and 10 families are collected and identified which are used in temples for different purposes. When some are used as part of temple dishes on specific occasion, others are used as utensil, for decoration or in temple writing. They are *Acacia catechu* (Latex in ritual), *Azadirachta indica* (flower in temple dish, wood in construction of deity), *Aeschynomene aspera* (in preparation of various craft items), *Borassus flabellifer* (Palm leaf writing), *Butea monosperma* (stem or flower in rituals), *Cinamomum tamala* and *Murraya koenigii* (in preparation of temple dishes), *Mangifera indica* and *Polyalthia longifolia* (Leaves in decoration), *Musa sapientum* (plant for decoration and leaf as utensil), *Pterocarpus santalinus* and *Santalum album* (Wood paste in rituals).

Group 7. Sacred and Totem plants

Eleven plant species belonging to ten genera and ten families are identified which are either present in temple premises or in the vicinity of temples. As per belief, these plants are

considered sacred or possess some super natural power. Plants like *Aegle marmelos*, *Crateva magna*, *Ficus religiosa* or *Ocimum sanctum* are considered to be the abode of different Gods or Goddesses as per Hindu mythology and belief. These are planted in temple premises, worshiped in certain occasions and protected.

Scrutiny and analysis of data reveals that, out of 84 plant species belonging to 44 families, *Apocynaceae* has maximum representation of 07 species followed by members of family *Moraceae* (06 sp.), *Fabaceae* (05 sp.), *Combretaceae* and *Oleaceae* (4 species each), *Anonaceae*, *Arecaceae*, *Caesalpiniaceae*, *Clussiaceae*, *Lamiaceae* and *Rutaceae* (3 sp. each), *Euphorbiaceae*, *Mimosaceae*, *Malvaceae*, *Nymphaeaceae*, *Poaceae*, *Rubiaceae* and *Solanaceae* (2 sp. each), while the remaining 26 families are represented by 01 species each. Figure 2 depicts percentage contribution of species used for various purposes. From the figure it is evident that more number of species are used for Ornamental and less species for sacred fire, pitcher and fuel purposes. Figure 3 indicates that 39% of plant species are collected and identified from *zone A* (Jajpur and surrounding locality) and *zone B* (Badchana – Dharmasala area) while 22% species were from *zone C* (Sukinda locality). Moreover, the similarity in species composition between zone A and B was found to be more similar to that of zone C (Table 3). Another significant feature marked was that 29 species were found common to the three zones while 21 species were detected from only one zone in course of investigation.

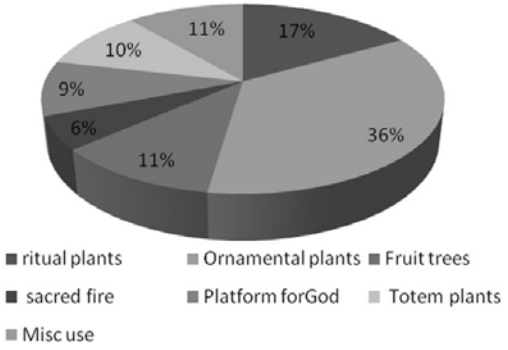

Fig. 2. Contribution of plant species for different purposes

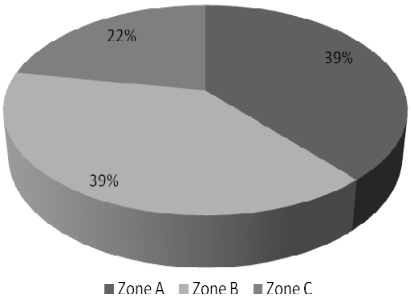

Fig.3. Distribution of species at different sites

Table 3. Comparison of different species at different sites by Jacquards coefficient of comparison.

Samples	Zone A	Zone B	Zone C
Zone A	1.0	0.71	0.37
Zone B		1.0	0.48
Zone C			1.0

Discussion

The worship of nature including the plants and animals is a common religious practice among a number of societies from early period. The 'Feng Chan' ritual of China's ancient emperors for the protection of mountain forests [16], the sacred forest of Indus, worship and maintenance of sacred grooves in many tribal as well as rural societies and hundreds of plants used in religious rituals in India and other Asiatic countries are some examples of nature worship, known from ancient documents as well as from recent studies [2,6,8,17-24]. Moreover, some plants are either considered to be sacred or believed to posses some

supernatural power. Those species are worshipped and protected in different parts of the world. Prominent among such trees are *Aegle marmelos* (Bel tree), *Ficus religiosa* (Peepal tree) and *Ocimum sanctum* (Sacred Basil) in India; Mapple tree in Canada; Red wood tree in America and *Ficus religiosa* as well as *Ginkgo biloba* in China and Bhutan respectively [6]. Thus it is obvious that, religious beliefs in definite forms of totemism and fetishism have played a key role in protecting the surrounding environment, flora, fauna and their diverse elements [25, 26].

That a similar role is played by the temples and other religious places of Jajpur is evident from the present study where many of the collected and identified species are occasionally seen in the wild state. Noteworthy among them are 12 species namely *Artobotrys hexapetalous, Averrhoa carambola, Calophyllum inophyllum, Createva magna, Mesua ferrea, Mimusops elengi, Mitrogyna parvifolia, Ocimum basilicum, Plumeria rubra, Prosopis cineraria, Pterospermum acerifolium* and *Sesbania grandiflora* which are exclusively planted and carefully nurtured in temple premises, yards or in surrounding localities for their specific utility in temples. *Aeschynomene aspera*, which is considered as a weed in swallow water bodies, become an essential plant for it's multiple usages in temples i.e. for preparation of many traditional craft items necessary in temple rituals. Thereby it also provides livelihood to a sizeable section of temple florists and craftsmen called "Malli" or "Rana" in this district. Due to such multifarious use of plants in temples, they have been cultivated and protected from the vagaries of nature and other harmful agents including human beings.

Conclusions

The religious overtones and moral binding with regard to protection of religious places and their surrounding vegetation are fast receding in this locality. It is possibly due to the rapid change in socio-economic as well as socio-cultural status of the society wrought by industrialization and invasion of western culture. It is really time that some serious thought and appropriate step was given to this problem before these flora, which are already rare and occasionally seen in a state of wilderness, totally disappear from this district within few decades.

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