

Floristic Diversity of Mangroves of Karnataka, India

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Abstract:

The 320 km long coastline of Karnataka is shared by three coastal districts, namely Dakshina Kannada, Udupi and Uttara Kannada along which mangrove vegetation occurs as scattered estuarine patches. In fact, there are 15 west flowing rivers present here which form a total of 12 estuaries and estuarine complexes supporting mainly fringing type of mangrove vegetation. A total of 35 species of higher plants are found to be associated with the mangrove vegetation of Karnataka which includes 34 angiosperms and 01 pteridophyte. They belong to 28 genera and 19 families. Among them, 15 species are generally considered as eumangroves and 20 are mangrove associates. A list of all these plant species is provided along with their estuary-wise distribution is presented in this paper.

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Introduction:

Mangrove forests occurring along the coastlines of about 120 tropical and subtropical countries have been recognized among the most productive and also the most threatened ecosystems of the world. Though their biological and ecological significances have been long realized, their value as a protective green wall to the coastal areas against the destructive force of natural disasters like tsunami and cyclone has been recorded recently, after the 1999 super cyclone of Orissa and the 2004 tsunami. Owing to this, there has been a considerable resurgence of interest in conservation and restoration of mangrove forests worldwide in the last decade. Adequate baseline data on extent and biodiversity components of existing mangrove areas, their bio-ecological status and socio-economic significance forms inevitable pre-requisites to place mangrove management efforts on a firm scientific footing.

Mangrove vegetations are reported from the 320 km long coastal stretch of Karnataka State of the West Coast of India. However, no recent comprehensive report about their area, biodiversity and status is available. Earlier reports regarding the floristic diversity of the mangroves of Karnataka are also scattered and highly variable. Therefore, an effort has been made to study the mangrove floristic diversity and their estuary-wise distribution in Karnataka.

Study area and Methodology:

The 320 km long coastline of Karnataka is shared by three coastal districts, namely Dakshina Kannada, Udupi and Uttara Kannada (Fig. 1). This area is situated between latitudes 12°28' – 15°31' N and longitudes 74°32' – 75° 4' E. 15 west flowing rivers present here form a total of 12 estuaries and estuarine complexes which support mainly fringing type of mangrove vegetation. The list of these estuaries are given in table 1.

Information regarding plant species occurring in the mangrove vegetation is collected by repeated field trips to the estuary locations during different seasons of the year. Plant specimens were gathered preferably in flowering and fruiting condition for botanical identification using standard regional floras (Cooke 1903, Gamble 1967, Saldanha 1984). Data collected through field trips is also cross verified with earlier reported literature on mangroves of Karnataka (Rao & Suresh 2001, Achary *et al* 2002, Mandal & Naskar 2008, Nayak & Bhandary 2010, Kumar & Kumar 2012, Chandran *et al* 2012).

Results and Discussion:

Mangrove Area of Karnataka:

The total mangrove coverage of the world is estimated to be about 1.8 million sq. km. of which about 41.4% exists in South and Southeast Asia (Kathiresan & Qasim, 2005). According to the most latest report of Forest Survey of India, the total mangrove forest extent of the nation is 4662.56 sq. km (Anonymous, 2011). However, the share of Karnataka State in this is estimated to be only 3 sq. km. Earlier estimates of mangrove forests of the state ranged from 12.5 sq. km. to 127 sq. km.

The latest FSI estimate of 3 sq. km. appears to be far from reality and the mangroves of the state may have been underestimated in the national level macro-scale surveys based on remote sensing. The major reason may be that the fringing mangroves (Fig. 2) of the state are presently in a highly fragmented condition and are not recognized completely in the macro-scale surveys. The fact that a recent detailed micro-scale survey of only 4 estuaries of Honavar Forest Division alone has revealed the occurrence of 3.91 sq. km. of mangrove forests, in as many as 1549 small patches, in this area bears evidence to this view (Chandran *et al* 2012). Majority of these patches are less than one ha in area and the largest patch measured only about 8 ha. Therefore, a similar detailed survey of all the estuaries is

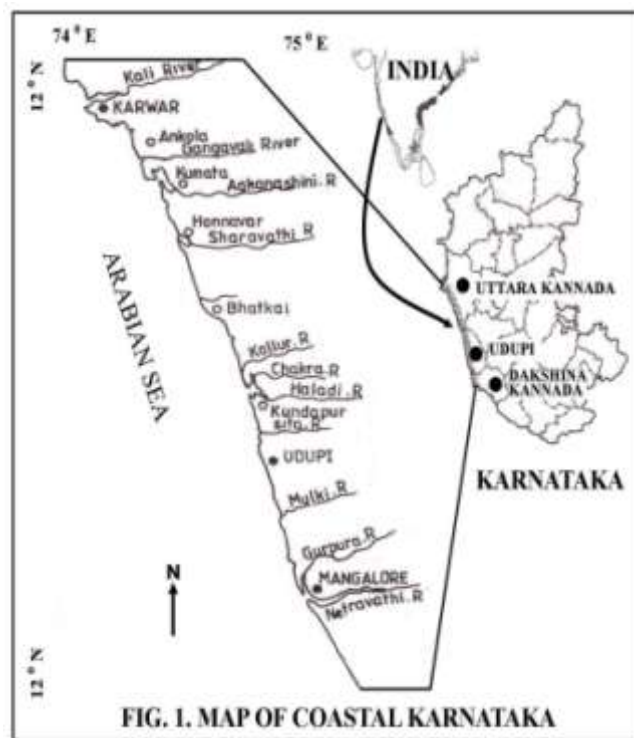


FIG. 1. MAP OF COASTAL KARNATAKA



required to obtain a clear and complete picture of the actual mangrove cover of the state.

Fig. 2. Fringing mangrove forest along Kali Estuary, Karwar, Karnataka

Floristic Diversity and Estuary-wise distribution:

A total of 35 species of higher plants found to be occurring in the mangrove vegetation of Karnataka which includes 34 angiosperms and 01 pteridophyte. They belong to 28 genera and 19 families. Among them, 15 species are generally considered as eumangroves and 20 are mangrove associates. A list of all these plant species is provided in table 1. According to Kathiresan and Qasaim(2005), the Indian mangroves consist of 71 plant species of which 38 are found in west coast and 65 species in east coast.

When estuary-wise distribution of floristic diversity is analysed, maximum diversity of 31 species was found in the Kali - Mavinahole estuarine complex of Uttara Kannada District and lowest (13 species each) was recorded from Mulki-Pavanje and Shiroor estuaries of Udupi District. Owing to its maximum mangrove floristic diversity, Kali estuary may be considered for declaring and protecting as an mangrove germplasm conservation area of Karnataka.

Rhizophora mucronata, *Sonneratia alba*, *Excoecaria agallocha*, *Avecinia officinalis* and *Acanthus ilicifolius* appears to be the widely distributed species of eumangroves because of their occurrence in almost all estuaries. On the contrary, *R. apiculata*, *Lumnitzera racemosa* and *Bruguiera cylindrica* (Fig. 3) are the rare species which are restricted to only a few mangrove locations. The occurrence of 3 eumangrove species namely *Ceriops decandra*, *Heritiera littoralis* and *Sonneratia apetala* which have been reported earlier by different workers as present in the mangroves of Karnataka is highly doubtful as they have not been recorded in the present study or any of the other recent studies. *C. decandra* was

recorded from Shiroor estuary by Rao & Suresh (2005), *S. apetala* from Kundapur – Malpe area (Mandal & Naskar 2008) and *H. littoralis* was reported by Talbot almost a century ago from Kali river (Cooke 1903).

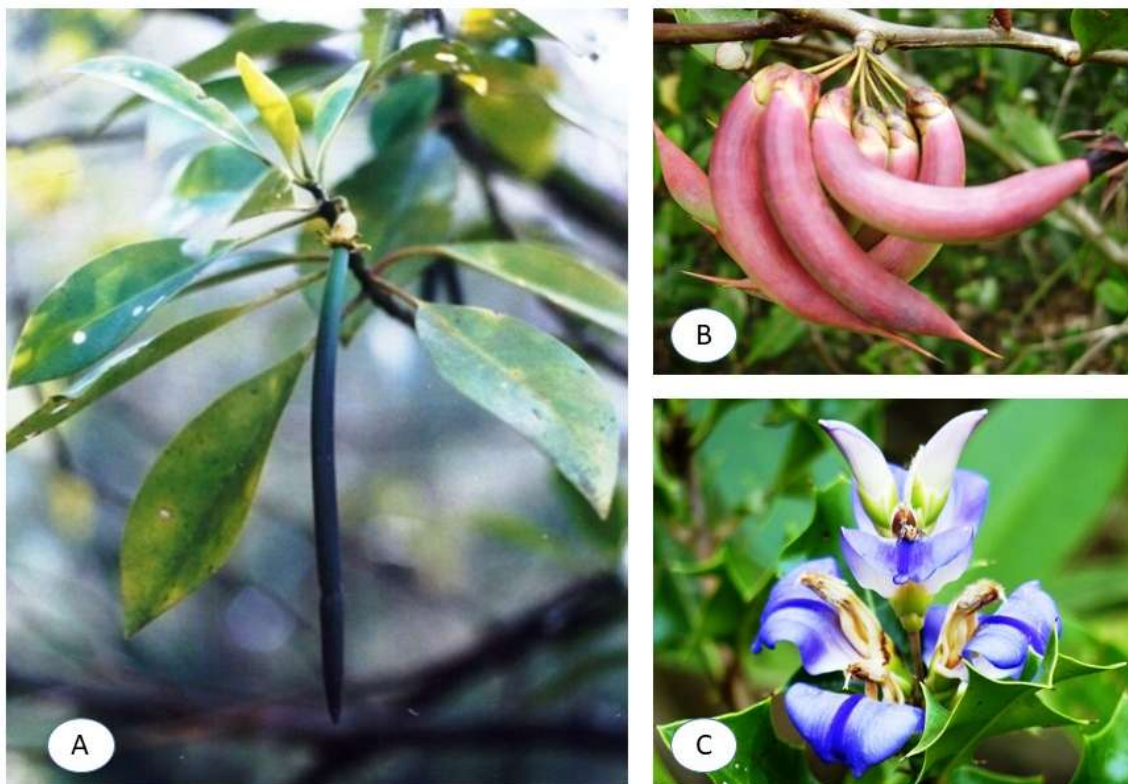


Fig. 3. Mangrove species of Karnataka - A. *Bruguiera cylindrica*, B. *Aegiceras corniculatum*, and C. *Acanthus ilicifolius*

Table 1. Estuary-wise distribution of Eumangrove and Mangrove associate plants in Karnataka

		Name of the Estuaries											
Sl. No.	Botanical Name (Family)	Netravathi-Gurupur	Mulki-Pavanje	Udyavar	Suvarna-Sita-Kodi	Chakra-Haladi	Baindur	Shiroor	Venkatapur	Sharavathi	Aghanashini	Gangavali	Kalinadi-Mavinahole

01	<i>Acanthus ilicifolius</i> L. (Acanthaceae)	+	+	+	+	+	+	+	+	+	+	+	+
02	<i>Acrostichumaureum</i> L. Pteridaceae)	+	+	+	+	+	-	+	+	+	+	+	+
03	<i>Aegicerascorniculatum</i> (L.) Blanco(Myrsinaceae)	-	+	+	+	+	+	-	+	+	+	+	+
04	<i>Avicennia alba</i> Bl. (Avicenniaceae)	+	+	+	+	+	+	+	-	-	-	-	+
05	<i>Avicennia marina</i> (Forsk.) Vierh. (Avicenniaceae)	-	-	-	-	+	-	+	+	+	+	+	+
06	<i>Avicennia officinalis</i> L.	+	+	+	+	+	+	+	+	+	+	+	+
07	<i>Bruguieracylindrica</i> (L.) Bl. (Rhizophoraceae)	-	-	-	+	-	+	-	-	-	-	-	+
08	<i>Bruguieragymnorhiza</i>	-	+	+	+	+	+	+	+	-	-	+	+
09	<i>Excoecariaagallocha</i>	+	+	+	+	+	+	+	+	+	+	+	+
10	<i>Kandeliacandel</i>	+	+	+	+	+	-	-	+	+	+	+	+
11	<i>Lummitzeraracemosa</i>	-	-	-	-	+	+	+	-	-	-	-	+
12	<i>Rhizophora apiculata</i>	-	-	-	-	+	+	-	+	-	+	+	+
13	<i>Rhizophora mucronata</i>	+	+	+	+	+	+	+	+	+	+	+	+
14	<i>Sonneratia alba</i>	+	+	+	+	+	+	+	-	+	+	+	+
15	<i>Sonneratiacaseolaris</i>	+	+	-	+	+	+	-	+	+	+	-	+
16	<i>Barringtonia racemosa</i>	-	-	-	-	-	-	-	-	+	-	-	+
17	<i>Caesalpineabonducella</i>	-	-	-	-	-	-	-	-	-	-	+	+
18	<i>Caesalpinea crista</i>	-	-	-	-	+	-	-	+	+	+	+	+
19	<i>Calophylluminophyllum</i>	-	-	-	-	-	-	-	+	+	+	-	+
20	<i>Cerberaodollum</i>	+	-	-	-	-	-	-	+	+	+	-	-
21	<i>Clerodendruminerve</i>	+	+	+	+	+	+	+	-	+	+	+	+
22	<i>Cyperus malaccensis</i>	+	-	+	+	+	+	+	-	+	+	+	+
23	<i>Dalbergia spinosa</i>	-	-	-	-	+	-	-	+	-	-	-	+
24	<i>Derris scandens</i>	-	+	+	-	-	-	-	+	+	-	+	+
25	<i>Derris trifoliata</i>	+	-	-	-	+	-	+	+	+	+	+	+
26	<i>Dolichondronspathacea</i>	-	-	-	-	-	-	-	-	+	+	-	+
27	<i>Erythrina indica</i>	-	-	-	-	-	-	-	+	+	+	+	-
28	<i>Ipomoea pes-caprae</i>	-	-	-	-	+	+	-	-	-	-	-	+
29	<i>Pandanus fascicularis</i>	+	-	-	-	+	-	-	+	+	+	-	-
30	<i>Pongamia pinnata</i>	-	-	-	-	-	-	-	+	+	+	+	+
31	<i>Porteresiacoarctata</i>	-	-	-	-	+	-	-	+	+	+	+	-
32	<i>Premnaserratifolia</i>	-	+	+	+	-	-	-	+	+	+	+	+
33	<i>Salvadora persica</i>	-	-	-	-	-	-	-	-	-	+	-	+
34	<i>Sesuviumportulacastrum</i>	-	-	-	-	+	-	-	-	-	-	-	+
35	<i>Thespesia populnea</i>	+	-	-	-	-	-	-	-	+	-	-	+
	Total	15	13	14	15	23	15	13	22	25	24	21	31

+ = Present, - = Not Present

Sl. No. 1 to 15 represent the Eumangrove species and 15-35 represent the mangrove associates.

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