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Abstract

The present investigation was planned with an objective to ascertain status of mangrove and mangrove associates diversity of Purna estuary and surroundings of South Gujarat sea coast. Our result indicated that the majority of the area of the Purna estuary is dominated with *Avicennia marina* and *Sonneratia apetala* followed by *Acanthus ilicifolius* and *Bruguiera cylindrica*. The other species of mangroves like *Ceriops tagal* and *Rhizophora mucronata* are found to be very rare. The estuary is having the significant area of mangrove associates species viz., *Oryza coarctata* Roxb., *Aleuropes lagopoides* (L.) Pellegrin, *Derris trifoliata* Lour., *Salvadora persica* L. *Sesuvium portulacastrum* L. *Suaeda fruticosa* Frost., etc. However, because of increasing area under aquaculture and anthropogenic activities pose the serious concern about the health of mangrove area of Purna estuary. The serious action plan is required to be set up in order to achieve sustainable growth of mangrove and its associates health in South Gujarat. The Purna estuary is also a very potential area of *Oryza coarctata* Roxb. This serves as the unconventional source of fodder for the population residing surroundings of Purna estuary. Therefore, there is urgent need to protect the area of *Oryza coarctata* Roxb., under the alarming increasing area of aquaculture activities. Here we have discussed and presented the brief account of the fertile estuary of the South Gujarat under the light of climate change and extensive industrialization.

Introduction

The Gujarat state being the largest sea coast harboring state has the second largest mangrove cover in the India. Gujarat is situated in the west coast of India which is surrounded by Arabian Sea. In maritime states of India; Gujarat has largest coastal area around 28,000 km² or longest coast line around 1650 km supports variety of marine flora and fauna. The mangrove cover of the Gujarat is distributed over four regions viz., Kutch, Gulf of Kutch, Saurashtra and South Gujarat. Among these, significant mangrove diversity was reported from the Purna estuary and surroundings of south Gujarat sea coast. Previously the status of the mangrove diversity was reported by the Bhatt et. al., (2009), Pandey and Pandey (2009), Naik and Dhabe (2018). However, in order to know the recent status of mangrove and mangrove associate diversity, present investigation was planned with an objective to ascertain status of mangrove and mangrove associates diversity of Purna estuary and surroundings of South Gujarat sea coast.

Methodology

The inventory of the Purna estuary and surroundings has been investigated for the periods of 2021- 2024 and reported the status of mangroves and associates. The coastal wetland of Purna River is located on the southern part of Gujarat state on the western coast of India. It extends between the longitude 72° 44' E to 72° 55' E and latitude 20° 53'N to 21° 01'N. The mangrove vegetation study was carried out from selected sites during low tide. Quantification of mangrove vegetation from three sites through belt transect survey method. In each site total of five transect of 10 X 5 m. was laid. Quantification of the frequency and density was carried out by method prescribed by Sutherland (1996). Plant samples (leaves, flowers, stem, seeds and roots) were collected from selected sites for authentication and preparation of digital herbarium. Authentication and identification of collected plant samples was done with the help of reference book Pandey CN and Pandey R (2010).

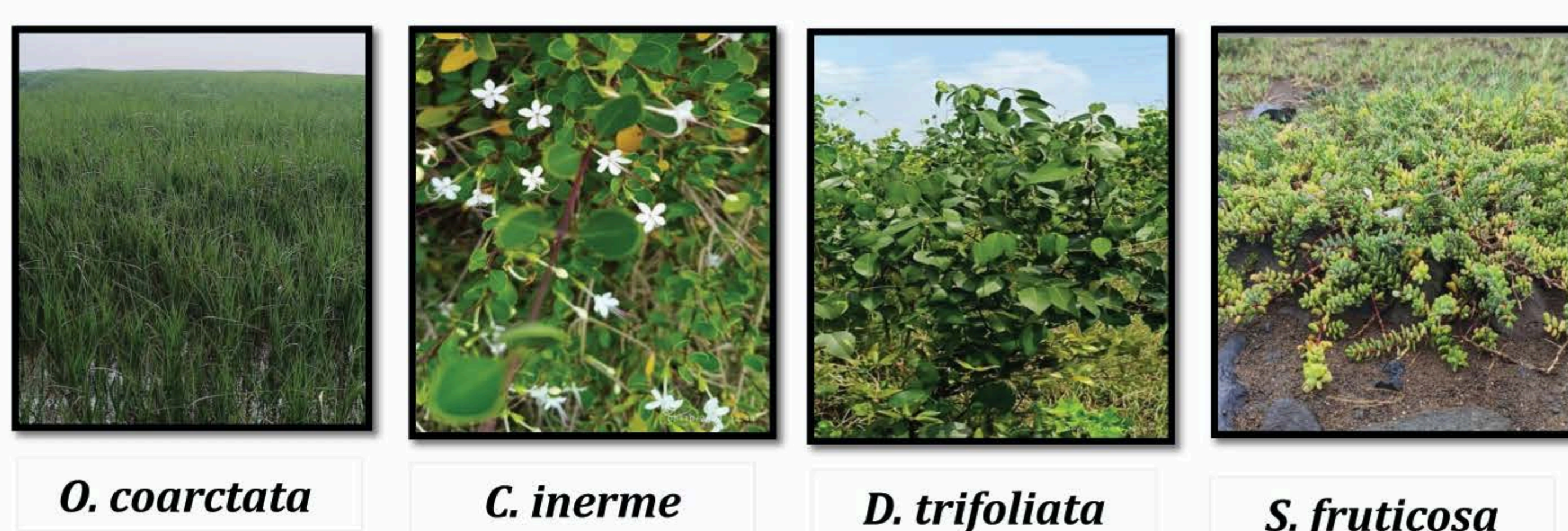


Plate 1. Purna estuary and its surroundings of South Gujarat sea coast.

Results

- In the present study, total of six mangroves species (Table 1) and twelve mangrove associate species (Table 2) have been reported. Site wise density analysis reveals *A. marina* with highest density, followed by *S. apetala* and *A. ilicifolius*. *R. mucronata* have least density. With respect to frequency classes, *A. marina*, *S. apetala* and *A. ilicifolius* have reported highest frequency at all sites. Whereas, *B. cylindrical* and *C. tagal* have lowest minimum frequency as depicted in Graph 1.
- Out of six species of mangroves reported, three species belongs to family *Rhizophoraceae*, whereas family *Avicenniaceae*, *Lythraceae* and *Acanthaceae* have one species each.
- A. marina*, *S. apetala* and *A. ilicifolius* and *B. cylindrical* occurs at all three sites, whereas *C. tagal* was found at two sites. *R. mucronata* was found least at only one site.
- Out of the twelve mangrove associates reported, family *Fabaceae* has three species followed by family *Poaceae* with two species. *O. coarctata*, *S. portulacastrum*, *A. lagopoides*, *D. trifoliata* and *S. persica* occurs at all the three sites. *C. inerme* was found at two sites, rest of the species were found at only one site.

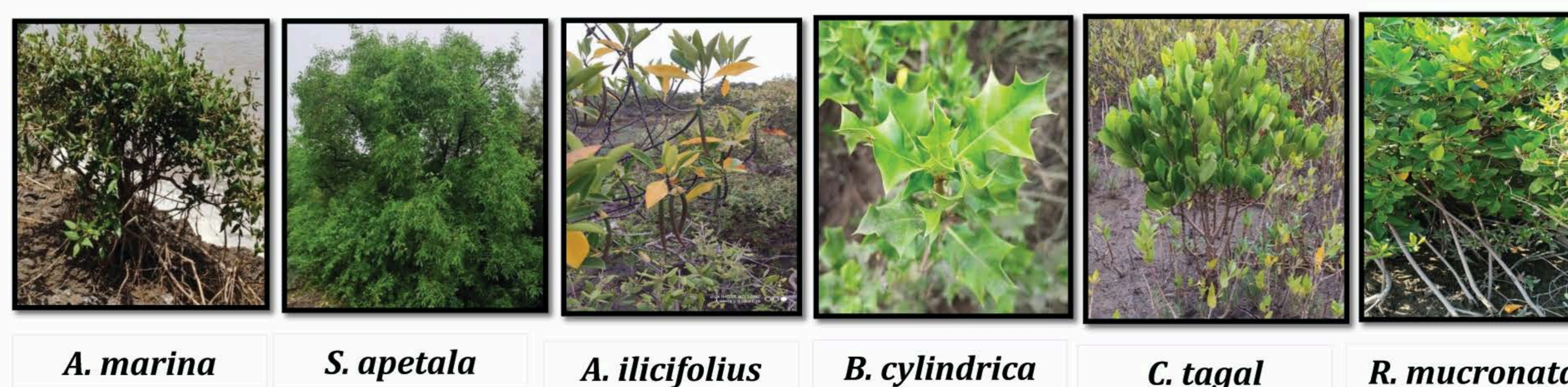
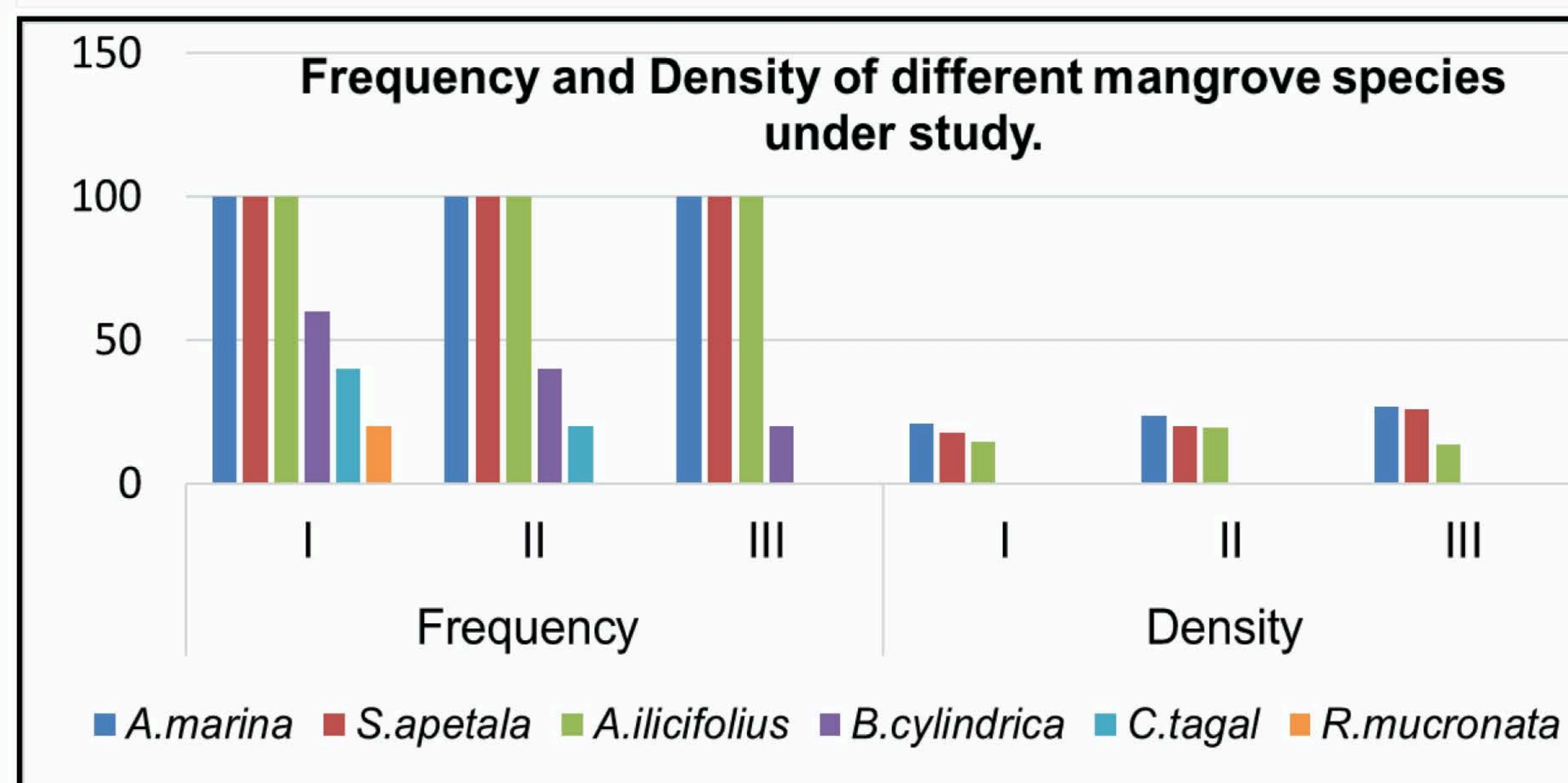


Table 1. List of true mangrove species reported in the present study			
Sr. No.	Botanical name	Family	Local Name
1	<i>Avicennia marina</i> (Forsk.) Vierh	Avicenniaceae	Tavar
2	<i>Sonneratia apetala</i> Buch. Ham.	Lythraceae	Moti Tavar
3	<i>Acanthus ilicifolius</i> L.	Acanthaceae	Kantaliyo
4	<i>Bruguiera cylindrica</i> (L.) Bl.	Rhizophoraceae	-
5	<i>Ceriops tagal</i> (Perr.) C.B. Robinson	Rhizophoraceae	-
6	<i>Rhizophora mucronata</i> Lam.	Rhizophoraceae	Tadtadiya

Table 2. List of mangrove associates species reported in the present study				
Sr. No.	Botanical name	Family	Local Name	Occurrence
1.	<i>Oryza coarctata</i> Roxb.	Poaceae	Aal	+++
2.	<i>Sesuvium portulacastrum</i> L.	Aizoaceae	Khari bhaji	+++
3.	<i>Aleuropes lagopoides</i> (L.) Pellegrin	Poaceae	Jadi	+++
4.	<i>Clerodendron inerme</i> (L.) Gaertn.	Lamiaceae	Mehndi	++
5.	<i>Derris trifoliata</i> Lour.	Fabaceae	Karanj vel	+++
6.	<i>Derris scandens</i> (Roxb.) Benth.	Fabaceae	Alia karanj	+++
7.	<i>Suaeda fruticosa</i> Frost.	Amaranthaceae	Bethi Morad	++
8.	<i>Ipomoea pes-carpa</i> (L.) Sw.	Convolvulaceae	Mayada vel	+
9.	<i>Salvadora persica</i> L.	Salvadoraceae	Miswak	+++
10.	<i>Thespesia populnea</i> (L.) Sol. ex Corrêa	Malvaceae	Paras Piplo	+
11.	<i>Prosopis juliflora</i> (Sw.)DC.	Fabaceae	Gando baval	++
12.	<i>Arthrocnemum indicum</i> (Willd) Moq.	Chenopodiaceae	Bholado	+

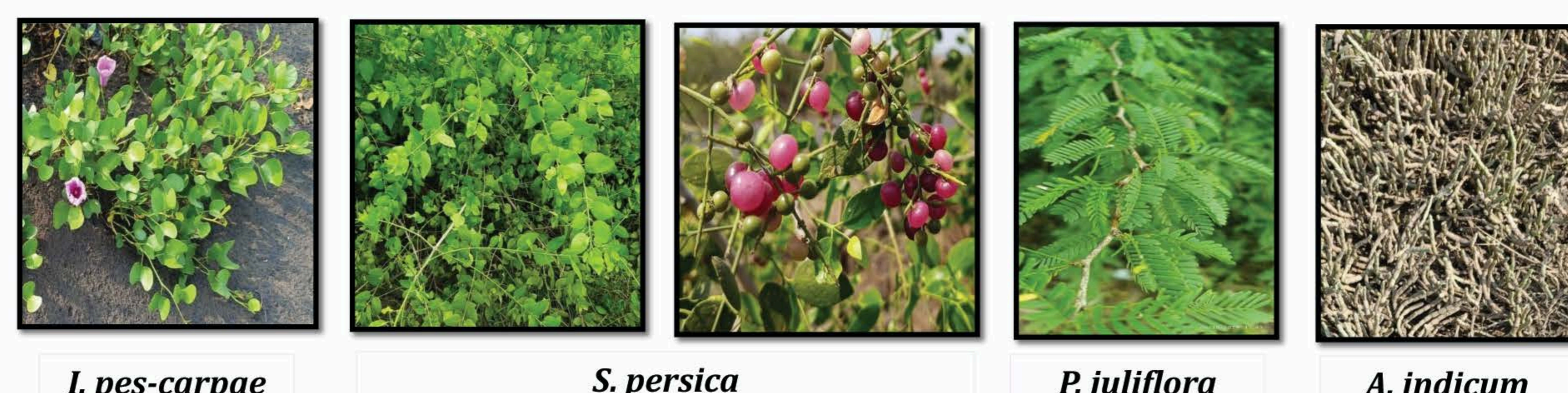


Plate 2. Island rich in *Oryza coarctata* Roxb

Wider impacts of the work

The present investigation provides a base line information to frame the mangrove and its associates conservation strategies in the Purna estuary. Moreover, the decline in mangrove diversity over a period of time pose a serious concern with respect to restoration of mangrove diversity and mangrove cover. The key species of mangrove associates are also important as far as ecosystem services are concern. Special concern also requires to protect the area under the *Oryza coarctata* Roxb. which serves as source of unconventional source of fodder to the house hold residing near to Purna estuary.

Conclusion

In present investigation, total six true mangrove species and Twelve mangrove associates species have been recorded. Among the true mangrove, *A. marina*, *S. apetala* and *A. ilicifolius* were found dominant. Though overall mangroves health in Purna estuary is normal but diversity is declining over the period of the time compares to previous reports. Among the mangrove associates, estuary is also possess a very potential area of *Oryza coarctata* Roxb. Special attention is required to maintain the diversity of mangroves in the estuary.

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