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Research Article

A STUDY ON SPECIES DIVERSITY OF THE FAMILY COMPOSITAE ON COASTAL REGION FROM ARTHUNKAL TO PALLITHODE, KERALA

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ABSTRACT
Coastal regions are protected areas under environment protection act in which activities are regulated under law. Coastal zone possess specific vegetation because of unique climatic conditions. The present study assesses diversity of members of Compositae among coastal region from Arthunkal to Pallithode, Kerala. Compositae was represented by 7 species, *Chromolaena odorata* (L.) R.M.King & H.Rob. *Eclipta alba* Hassk., *Grangea maderaspatana* Poir., *Launaea sarmentosa* (Willd.) Sch.Bip. ex Kuntze, *Mikania cordata* (Burm.f.) B.L.Rob., *Sphagneticola trilobata* (L.) Pruski. and *Tridax procumbens* (L.) L. *L.sarmentosa* and *S.trilobata* are found growing on the entire stretch of beach studied. Invasive status of *S. trilobata* was also discussed.

Keywords*: Coastal flora, Compositae, Sphagneticola*

INTRODUCTION
The Kerala coastal zone is famous for its natural beauty with beaches, estuaries, lagoons and backwaters which has high tourism potential. Another characteristic feature of the coastal zone is the high population density dominated by fishermen and coir workers (Radhakrishnan *et al.*, 2016). Kerala has a well-prepared Coastal Zone Management Plan and CRZ. The Kerala coast was very much affected by the 2004 Indian Ocean Tsunami.

Coastal plants have adapted to live in an environment where they are exposed to salt spray, sand blasts, strong winds, high temperatures and flooding. Beach vegetation is probably the best known of all the plant communities found on sandy shores. Plant species exhibit adaptation to disturbances such as sand burial, salinity and temperature (Bhagya and Sridhar, 2008). Coastal flora has gained global attention for their protection, conservation and rehabilitation. Most coastlines are naturally dynamic due to wind, waves and currents are natural forces that easily move the unconsolidated sand and soils in the coastal area, resulting in rapid changes in the position of the shoreline. In order to protect this important area, several laws have been implemented. Documentation of plants in this threatened area is of immense importance and through light to the need of conservation as well as management of the coastline. Many earlier attempt to investigate the beach flora was reported (Sridhar and Bhagya (2007); Pattanaik *et al.*, (2008); Padmavathy *et al*., (2008); Bhagya and Sridhar (2009) ; Muthukumar and Samuel (2011); Arulmoorthy and Sreenivasan (2013); Ramarajan and Murugesan (2014) and Aparna and Raja Sekhar (2015). Rodrigues *et al*., (2011) reported an evaluation of flora from coastal sand dunes of India for the purpose of conservation and management. Radhakrishnan *et al*., (2016) conducted an ethno botanical survey in the coastal areas of Thiruvananthapuram district, Kerala and reported 14 edible species, 176 medicinal herbs and 14 fodder yielding plants species. Aim of this paper is to document the diversity of members of the Family Compositae in the selected coastal area Arthunkal to Pallithode, Kerala.

MATERIALS AND METHODS
The present study area is 13.6 kilometers zone of Kerala Coast from Arthunkal to Pallithode. The area is divided into 4 zones. 1. Arthunkal to Thaickal, 2. Thaickal to Andhakaranazhy, 3. Andhakaranazhy to Thuravoor and 4.Thuravoor to Pallithode. The study manually recorded the plant wealth comprising

Compositae. Plants are identified with the help of regional floras like "The Flora of Presidency of Madras (Gamble, 1935)", "Flora of Alappuzha District Kerala, India" by Sunil and Sivadasan,(2009) and thorough consultation with experts. Distribution of plants with respect to the zones was arbitrarily set for the convenience of the study.

RESULT AND DISCUSSION

Compositae in the present study represented with 7 species includeb*Chromolaena odorata* (L.) R.M.King & H.Rob., *Eclipta alba* Hassk., *Grangea maderaspatana* Poir., *Launaea sarmentosa* (Willd.) Sch.Bip. ex Kuntze, *Mikania cordata* (Burm.f.) B.L.Rob., *Sphagneticola trilobata* (L.) Pruski. and *Tridax procumbens* (L.) L.

Chromolaena odorata (L.) R.M.King & H.Rob.- Shrubs, glandular hairy. Leaves, ovate, apex acute, base cuneate, crenate, hispid. Heads in terminal corymbose cymes, white.

Eclipta prostrata (L.) Mant..- Diffuse or ascending herbs; stem and leaves sparsely strigose with bulbous based hairs. Leaves elliptic or oblong-lanceolate, base obtuse, margin faintly serrate-dentate, apex acute, both surfaces strigose, sessile or subsessile. Heads axilllary, solitary, heterogamous, rayed, white.

Grangea maderaspatana (L.) Poir.- Prostrate or decumbent herbs with pubescent and glandular stem. Leaves alternate, pinnatifid, subsessile. Heads yellow, subglobose, terminal or leaf opposed, solitary, non rayed.

Launaea sarmentosa (Willd.) Sch.Bip. ex kuntze- Glabrescent, creeping herb with milky sap, rooting at nodes. Leaves in rosettes, oblanceolate-sinuate, base attenuate, margins denticulate, apex obtuse or acute, fleshy. Heads cylindric, yellow, solitary or fascicled, homogamous, ligulate.

Mikania cordata (Burm.f.) B.L.Rob.- Climbers, Leaves opposite, triangular, ovate, base cordate, margin irregularly dentate, apex acuminate, membranous, glabrescent. Heads homogamous, nonrayed, numerous in axillary corymbs. Florets 4, white or pale yellow.

Sphagneticola trilobata (L.) Pruski.- Prostate or diffuse perennial herbs, rooting at nodes. Leaves opposite, obovate, 3 lobed, upper ones unlobed, base cuneate, margins coarsely dentate, apex acute, scabrid above and glabrous beneath, tri nerved, sessile. Heads axillary, solitary, heterogamous, yellow.

Tridax procumbens (L.) L- Procumbent herbs, rooting at lower nodes, stem pilose. Leaves, ovate, base cuneate, margin trilobed, apex acute, hirsute on both sides. Heads 1.5-2 cm across, heterogamous, radiate, yellowish-white, solitary, terminal, peduncle 10-20 cm long, hirsute and glandular.

Out of which *L. sarmentosa* and *S. trilobata* distributed throughout the stretch studied, while others were restricted in distribution (Table.1). Out of the species studied, except *L. sarmentosa*, all others are invasive. *C. odorata* and *E. prostrata* are natives of Tropical America, *G. maderaspatana* native to Tropical South America., *M. cordata* native to Southeast Asia and East Africa., *S. trilobata* native to Mexico, Central America, and the Caribbean., *T. procumbens* native to the Tropical Americas. Rodrigues *et al*., (2011) reported an evaluation of flora from coastal sand dunes of India for the purpose of conservation and management.

Among the invasive species observed in the coastal belt *S. trilobata* is considered under the category of Rapid Multiplication and Spread in different ecosystems (RMS), affecting ecosystem functions and services and Range Extension (RE) indicating continues spread. *C. odorata* is also categorised as RMS with Multiple Modes of Reproduction (MMR) and Multiple Modes of Dispersion (MMD) affecting ecosystem functions and services; Biodiversity loss; Economic loss and health hazard (human and wildlife) (Sandilyan *et al.,* 2018).

The study recommended formulation of a coastal vegetation conservation policy, implementation of existing laws, continuous monitoring and public awareness for the effective management of ecologically sensitive coastal habitat, controlling the spread of invasive alien species etc.

Table 1: Distribution of plant species belonging to Compositae observed during the study

Name of taxa	Locality			
	Arthunkal – Thaickal	Thaickal - Andhakaranazhi	Andhakaranazhi – Thuravoor	Thuravoor - Pallithode
Chromolaena odorata (L.) R.M.King & H.Rob.	+	-	-	-
Eclipta alba Hassk.	+	-	-	+
Grangea maderaspatana Poir.	+	+	-	-
Launaea sarmentosa (Willd.) Sch.Bip. ex kuntze	+	+	+	+
Mikania cordata (Burm.f.) B.L.Rob.	+	-	+	+
Tridax procumbens (L.) L	-	-	-	+
Sphagneticola trilobata (L.) Pruski.	+	+	+	+

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