



ORIGINAL RESEARCH PAPER

Botany

STUDY OF PSAMMOPHYTIC DIVERSITY ON MAHIM BEACH FROM PALGHARTALUKA, PALGHAR DISTRICT, MAHARASHTRA STATE, INDIA

KEY WORDS: Ecological study, Psammophyte Vegetation, Mahim beach, Sand dunes, PalgharTaluka, Palghar District, Maharashtra.

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ABSTRACT

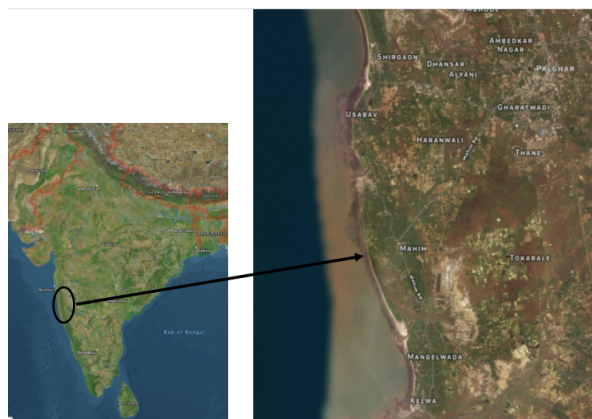
Psammophyte are plants that are able to thrive on sandy soil. The ability of the plants to sustain themselves on sand dunes has helped them flourish even at such harsh conditions. Mahim beach lies within the altitude of 19° 38'45.80 N and longitude of 72° 42'46.74 E. Study on Mahim coast was done with a view of exploring and documenting diversity in growing sand dunes flora. Psammophyte growing on sand dunes are very sensitive ecosystems and can get disturbed even on minor intrusion. A total of 55 species belonging to 52 genera of 21 families were found growing with exploration still in progress.

1. Introduction

Plants are the vital group in any food chain where they acts as the source of energy and flow take place from consumers to consumers. They due to their versatility in adaptations are able to modify their body as per their surrounding needs (Poojari and Tosh 2017b). Plants are segregated into different categories based on the type of soil and substratum in which they grows. It consists of groups like Hydrophytes, Heliophytes, Mesophytes, Oxylophytes, Halophytes, Psychrophytes, Lithophytes, Psammophytes and Chasmpophytes (Warming et al., 1909). Plants that grow on sandy soil and xeric condition where water is very less retained are termed as Psammophyte. They provides natural protection to the sea coast from high waves and salt water intrusion (Corre 1991). Coastal dunes are landforms that develop in coastal situations where an ample supply of loose, sand-sized sediment is available to be transported inland by the ambient winds(Martinez et.al 2004). Psammophyte develops a very sensitive ecosystem that requires protection from habitat destruction (Muthukumar and Samuel 2011). Psammophytic plants due to their unique rooting nature binds the soil and helps the coastal area from erosion (Desai 2000). Sand dunes reflects variation in terms of floral diversity that serves both ecological and economical service to the coastal community (Maun and Baye1989; and Martinez et.al 1997). Communities living in coastal areas make use of the coastal vegetation for numerous purposes like fodder, food, medicine etc (Chaudhari et.al 2017).

2. Materials and Methods

Mahim beach lies within an altitude of 19 ° 38'45.80 N and longitude of 72° 42'46.74 E. The coastal border is



Map showing enlarged view of study area (Mahim beach)

about 12km in distance with average annual temperature of 26.5 °C and rises to 29.8 °C in the month of May. In the month of January the temperature slightly fall down to 22.8 °C and the area experiences rainfall from the month of June with average rainfall

of 816mm. Observation and study in different seasons has helped in collecting and compiling different Psammophytic flora. In each and every visit, specimens were collected, they were properly processed as per the Botanical Collector's Manual (Santapau H 1955), identified using Flora (Cooke T 1901-1908); (Blatter E and McCann C 1935); (Singh N.P et al.2000, 2001); (Yadav S.R and Sardesai M.M 2002); (Potdar G.G et al.2012) (Poojari and Tosh 2017a) and finally herbarium were prepared.

Table 1: Enumeration of Psammophytic plants from Mahim beach

Sr. no	Botanical Name	Family	Habit	Phenology
1	<i>Acacia arabica</i> Lam.	Fabaceae	Tree	Throughout the year
2	<i>Achyranthus aspera</i> Linn.	Amarantaceae	Herb	November-January
3	<i>Aerva lanata</i> Juss.	Amarantaceae	Herb	December-February
4	<i>Ageratum conyzoides</i> Linn.	Asteraceae	Herb	October-March
5	<i>Aleuropus lagopoides</i> Linn.	Poaceae	Herb	April-October
6	<i>Alternanthera triandra</i> Lam.	Amarantaceae	Herb	July-December
7	<i>Alysicarpus vaginalis</i> DC.	Fabaceae	Herb	July-October
8	<i>Anisomeles indica</i> Linn.	Labiatae	Shrub	October-February
9	<i>Boerhaavia diffusa</i> Linn.	Nyctaginaceae	Herb	November-December
10	<i>Calotropis gigantea</i> R.Br	Asclepiadaceae	Shrub	February-July
11	<i>Capparis zeylanica</i> Linn.	Capparidaceae	Shrub	November-April
12	<i>Casuarina equisetifolia</i> Linn.	Casuarinaceae	Tree	February-March
13	<i>Clerodendron inerme</i> Goerth.	Verbenaceae	Shrub	November-February
14	<i>Cressa cretica</i> Linn.	Convolvulaceae	Herb	November-March
15	<i>Crotalaria medicaginea</i> Lamk.	Fabaceae	Herb	September-December
16	<i>Daemia extensa</i> R.BR.	Asclepiadaceae	Twiner	August-January
17	<i>Desmodium scorpiurus</i> Sw.	Fabaceae	Herb	October-March
18	<i>Elusine aegytiaca</i> Desf.	Poaceae	Herb	September-November
19	<i>Eragrostis ciliaris</i> Linn.	Poaceae	Herb	Throughout the year
20	<i>Eupatorium odoratum</i> Linn.	Asteraceae	Shrub	November-May

21	<i>Evolvulus alsinoides</i> Linn.	Convolvulaceae	Herb	July- November
22	<i>Evolvulus nummularius</i> Linn.	Convolvulaceae	Herb	July- December
23	<i>Ficus hispida</i> Linn.	Urticaceae	Tree	April-July
24	<i>Heliotropium marifolium</i> Retz.	Boraginaceae	Herb	October- August
25	<i>Hemidesmus indicus</i> Linn.	Asclepiadaceae	Twiner	July-May
26	<i>Hyptis suaveolens</i> Poit	Labiatae	Herb	November- January
27	<i>Indigofera cordifolia</i> Heyne.	Fabaceae	Herb	July- December
28	<i>Indigofera enneaphylla</i> Linn.	Fabaceae	Herb	October- December
29	<i>Ipomoea biloba</i> Forsk.	Convolvulaceae	Herb	September- November
30	<i>Ipomoea pes-tigridis</i> Linn.	Convolvulaceae	Twiner	September- November
31	<i>Ipomoea triloba</i> Linn.	Convolvulaceae	Twiner	May-August
32	<i>Justicia simplex</i> D.Don.	Acanthaceae	Herb	September- December
33	<i>Lantana camara</i> Linn.	Verbenaceae	Shrub	Throughout the year
34	<i>Launaea sarmentosa</i> Willd.	Asteraceae	Herb	July-January
35	<i>Leonotis nepetiifolia</i> Linn.	Labiatae	Herb	October- February
36	<i>Leucas stricta</i> Benth.	Labiatae	Herb	August - January
37	<i>Ocimum americanum</i> Linn.	Labiatae	Herb	September- February
38	<i>Oplismenus burmanni</i> Beauv.	Poaceae	Herb	September- October
39	<i>Pedaliium murex</i> Linn.	Pedaliaceae	Herb	September- January
40	<i>Peristrophe bicalyculata</i> Nees.	Amarantaceae	Herb	October- December
41	<i>Plumbago zeylanica</i> Linn.	Plumbaginacea e	Herb	August- November
42	<i>Prosopis juliflora</i> Swartz.	Fabaceae	Shrub	February- May
43	<i>Psilostachys sericea</i> Hook.	Amarantaceae	Herb	October- January
44	<i>Salvadora persica</i> Linn.	Salvadoraceae	Shrub	November- February
45	<i>Sesuvium portulacastrum</i> Linn.	Ficoideae	Herb	November- December
46	<i>Setaria pumila</i> Poir.	Poaceae	Herb	June- October
47	<i>Sida corifolia</i> Linn.	Malvaceae	Herb	October- November
48	<i>Spermacoce hispida</i> Linn.	Rubiaceae	Herb	September- October
49	<i>Spinifex squarrosus</i> Linn.	Poaceae	Herb	October- November
50	<i>Tephrosia strigosa</i> Dalz.	Fabaceae	Herb	July-May
51	<i>Trichodesma indicum</i> R.BR.	Boraginaceae	Shrub	August- November
52	<i>Tridax procumbens</i> Linn.	Asteraceae	Herb	Throughout the year
53	<i>Urginea indica</i> Kunth.	Liliaceae	Herb	April-May
54	<i>Xanthium strumarium</i> Linn.	Asteraceae	Herb	October- February
55	<i>Zornia diphylla</i> Linn.	Fabaceae	Herb	August- October

Plate 01: Habitat showing variation in Psammophytic plants from study area (Mahim Beach)

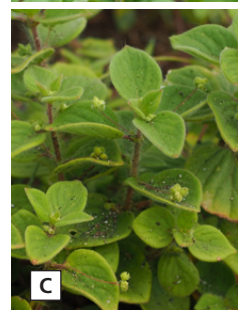
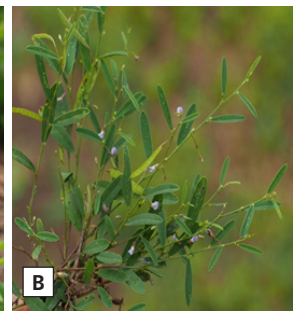


Plate 02: A: *Oplismenus burmanni* Beauv. B: *Tephrosia strigosa* Dalz. C: *Psilostachys sericea* Hook. D: *Setaria pumila* Poir. E: *Pedaliium murex* Linn. F: *Heliotropium marifolium* Retz.



Plate 03: G: *Plumbago zeylanica* Linn.
 H: *Trichodesma indicum* R.BR.
 I: *Elusine aegyptiaca* Desf.
 J: *Indigofera cordifolia* Heyne.
 K: *Eragrostis ciliaris* Linn. L: *Sida corifolia* Linn.

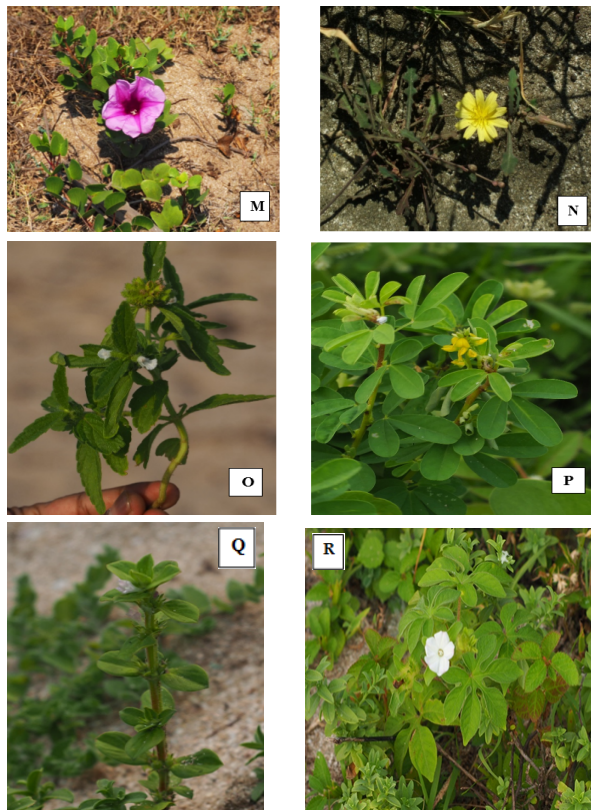
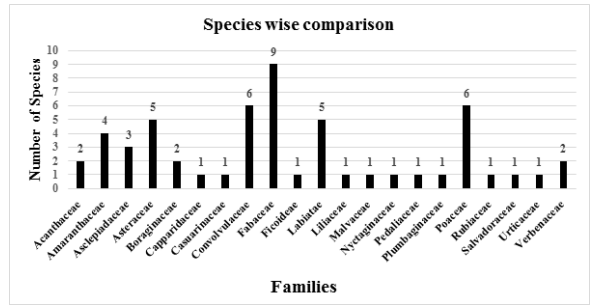
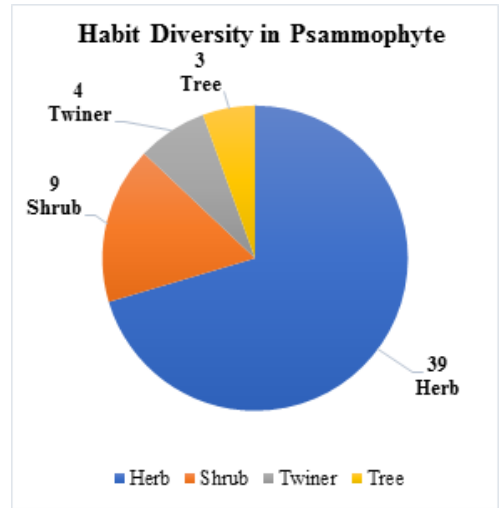


Plate 04: M: *Ipomoea biloba* Forsk. N: *Launaea sarmentosa* Willd.
 O: *Leucas stricta* Benth. P: *Crotalaria medicaginea* Lamk. Q: *Spermacoce hispida* Linn. R: *Ipomoea pes-tigris* Linn

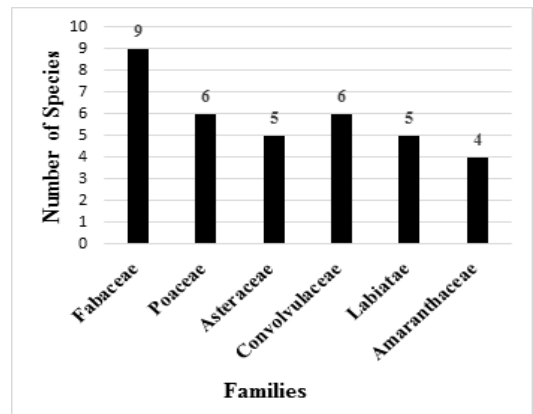
Graph 01: Distribution and comparison of species into families.



Graph 02: Habit wise comparison among species.



Graph 03: Dominant Families in Psammophyte



3. Result and Conclusion

Exploration in different season has eventually resulted in documenting 55 species of wild flora belonging to 52 genera of 21 families that flourishes on sandy soil. Enumeration of psammophytic flora is presented in Table no 01. Graph 01 shows distribution of species in different families with comparison. Graph 02 shows habit wise comparison among 55 species and Graph 03 reflects the dominant families and species found growing on Mahim beach. The Fabaceae family was most common and dominant with 9 species followed by Poaceae 6, Convolvulaceae 6, Asteraceae 5, Labiatae 5 and Amaranthaceae 4. Plant species like *Alternanthera triandra* Lam., *Aleuropus lagopoides* Linn., *Evolvulus nummularius* Linn., *Launaea sarmentosa* Willd., *Elusine aegyptiaca* Desf., and *Ipomoea biloba* Forsk., are growing prostrate and develops roots at node that helps to bind the sandy soil hence it acts as a good sand binder and conserves soil. Due to a number of tourist activities in Kelwe beach and indiscriminate clearing in the impression of aesthetics many patches of Psammophytic floral

cover are wiped out which has posed a threat to the growing Psammophytic flora. Psammophyte are very sensitive ecological group and intrusion leads to destruction of valuable floral diversity. Mahim beach lies next to the most popular and tourist attractive Kelwe beach and there is every possibilities of flora getting uprooted. Plants that are in abundance may soon be counted as endangered and rare. Strategies of conservation will only prove as a boon to protect psammophytes growing on Mahim beach. Our work is an attempt to document flora of importance from Mahim beach.

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References

- Blatter, E., and McCann, C., (1935): The Bombay Grasses. Imperial Council of Agricultural Research, Delhi.
- Chaudhari, Shivangli., Patil, Dakshata., and Tosh, Jayananda., (2017): Traditional Ethnomedicinal Plants used by the tribal in coastal area of Dahanu Taluka, Palghar district, Maharashtra State, India. International Journal of Scientific Research Vol 6, Issue 2, Page no.42-44, ISSN No. 2277-8179.
- Cooke, T., (1901-08): Flora of the Presidency of Bombay. Vol. I & II London.
- Corre, J.J., (1991): The Sand dunes and their vegetation along the Mediterranean coast of France. Their likely response to climate change. Landscape Ecology Vol 6, Issue 1-2, Page no.65-72, Kluwer Academic Publishers, Print ISSN: 0921-2973, Online ISSN: 1572-9761.
- Desai, K.N., (2000): Dune Vegetation: Need for a reappraisal. Coastin (A Coastal Policy Rese Newsletter) Vol.3, Page no. 6-8. hhgggdgdgh
- Martinez, M.L., and Psuty, P., Norbert., (2004): Coastal Dunes Ecology and Conservation, Ecological Studies Vol 171, Springer Publication, New York.
- Martinez, M.L, Moreno-Casasola P., and Vazquez, G., (1997): Effects of disturbance by sand movement and inundation by water on tropical dune vegetation dynamics. Canadian Journal of Botany, Vol.75, Page no.2005-2014.
- Maun, M.A., and Bayne, P.R., (1989): The ecology of Ammophila breviligulata Fern. On coastal dune ecosystem. CRC Critical Reviews in Aquatic Science, Vol.01, Page no.661-681.
- Muthukumar, K., and Samuel, A.S., (2011): Coastal sand dune flora in the Thoothukudi District, Tamil Nadu, Southern India. Journal of Threatened Taxa Vol 3, Issue 11, Page no. 2211-2216.
- Poojari, Harshal V., and Tosh, Jayananda., (2017a): Wild Beautiful Plants of Ornamental Potential of Palghar Taluka, Palghar District, Maharashtra State, India, International Journal of Scientific Research, Vol. 06, Issue no. 01, Page no. 32-35, ISSN No. 2277-8179.
- Poojari, Harshal V., and Tosh, Jayananda., (2017 b): "Enumeration of Chasmophytic Vegetation of Shirgaon Fort of Palghar Taluka, Palghar District, Maharashtra State India, in Management Guru: Journal of Management Research, Vol. 05, Issue no. 02, Page no. 22-29, ISSN No. 2319-2429.
- Potdar, G.G., Salunke, C.B., and Yadav, S.R., (2012): Grasses of Maharashtra. Shivaji University press, Kolhapur. ISSN: 978-81-8486-450-2.
- Santapau, H., (1955): Instructions for field collectors of the Botanical Survey of India. Ministry of Natural Resources and Scientific Research, New Delhi.
- Singh, N.P., and Karthikeyan, S., (2001): Flora of Maharashtra State (Dicotyledones) Vol. 2, Flora of India Series 2, Botanical Survey of India, Calcutta.
- Singh, N.P., Vohra, J.N., Hajra, P.K., and Singh, D.K., (2000): Flora of India, Vol. 5, Botanical Survey of India, Calcutta.
- Warming, Eug., Vahl, Martin., Groom, Percy., and Balfour, Bayley Issac., (1909): Oecology of Plants. Clarendon Press, Oxford, London.
- Yadav, S.R., and Sardesai, M.M., (2002). Flora of Kolhapur district. Shivaji University, Rajhans Printing Press, Kolhapur.