



Study of vegetation and maturity index of Igatpuri forest of Nasik District, Maharashtra, India

D U Ahire

Department of Botany, SPH College Nampur, Nasik, Maharashtra, India

Abstract

This paper is present maturity index and provides information about the maturity of the forest community and species dominant with in the community. It can be observed that the degree of maturity of maturity is very high and less forest. Phytosociology is the branch of vegetation science that deals with current plant assemblages at a resolution of vegetation stands. Its principal goals are the delimitation and characterization of vegetation types based on the complete floristic composition of vegetation plots. These are placed to minimize within plot heterogeneity and maximize between-plot variability, typical sizes are 4-25 m² in herbaceous and 50-400 m² in woody vegetation. Plot records (relevés) consists of head data (locality, environment, structure) and a complete species list with cover values. Using means of unsupervised, semi-supervised and supervised classification Phytosociological classification (syntaxonomy) aims at a single, hierarchical, multi-purpose classification system based on floristic similarity.

Keywords: vegetation, maturity index, Igatpuri forest

Introduction

The vegetation is deals with the qualitative study of the structure of the vegetation with an emphasis on quantitative relationship of a few species which are judged to be dominant on the belief that these largely control the community and there by the occurrence of a large number of rare species. As far as the author is aware a detailed accounts on the flora of Vyara Forests Shah, G. L. & Patel, A. I. (1970) [6]. Flora of Gujarat State Shah, G. L. (1978) [7], flora of Saurashtra Shah, G. L. (1978) [7], Flora of Dangs Forest Shah, G. L. & Yadav, S. S. (1979) [8, 10], floristic diversity Yadav, D. K. & Singh, L. (2010), the phytosociology of Chhotaudepur forests (Shah, Yadav and Parabia, (1979) [8, 10], Panchamahals (shah and Bhatt (1980) [9, 11] and Dang forests Yadav (1979) [8, 10, 13]. A similar investigation is carried in Igatpuri forest with view to study the communities in different localities and to analyse them.

Maturity Index of Igatpuri Forest

Pichi - Sermolli (1948) [4] suggested an index for the establishment of maturity in plant communities based on the present of all species in the stands of a community. The principle is the long accepted notion that higher the frequency percent of each species and the smaller the number of sporadic species, the more mature is the community. The index of maturity of each stand is compared with other stands to establish the general maturity of the community.

Area of Study

The Nasik district is located between latitudes 19°35' and 20°50' and longitudes 73°55' and extends an over an area of 15.582 sq. km. Nasik district is bounded on the north-west

by the Dang and Surat districts of Gujarat, on the north by Dhulia district, and on the east by Jalgaon District and towards the south-west the Thane District.

The Nasik district is divided into fifteen talukas viz.... Satana, Malegaon, Surgana, Kalwan, Deola, Peth, Dindori, Chandwad, Nandgaon, Nasik, Tryambakehswar, Niphad, Yeola, Igatpuri and Sinnar. The forests of district are divided into fifteen ranges which are grouped under East Nasik Forest Division and West Nasik Forest Division for sake of convenience. The study area comes under West Nasik Forest Division. The forests of the district cover an area of 3,446.28 sq.km. of which 3,338.85 sp.km. area in the charge of Forest Department, whereas 107.43 sq.km. are governed by the Revenue Department of Maharashtra State. The area under control of the former consist of reserved forests 2,920.08 sq.km. The total areas studied 17244.651 hector Igatpuri forest. The western part of Nasik district is rugged as it includes the Western Ghats. The peaks like Kalsubai [1846 M. above m.s.l. (19°36', 74°42')] and Tryambakeshwar [1294 M. above m.s.l. (19°56', 73°31')] are well known. The Ghats extend east wards and there are located few peaks, Nothern part, a cluster of high hills are found. Igatpuri is the part of Nasik district. It lies between 20N Latitude and 74E Longitude. Igatpuri in the extreme south-west, bounded on the north by Nasik division, on the east by Nasik division. Sinnar and Akola sub-division of Ahmednagar, on the south by Akola and the Shahapur sub-division and on the west by Shahapur. Its area is about 375 square miles, especially on the North West and south, is hilly. The line of natural drainage divide it into two parts, a small section on the north and north-west the slopes west to the Vaitarana and larger section in the south that drains east into the Darana.

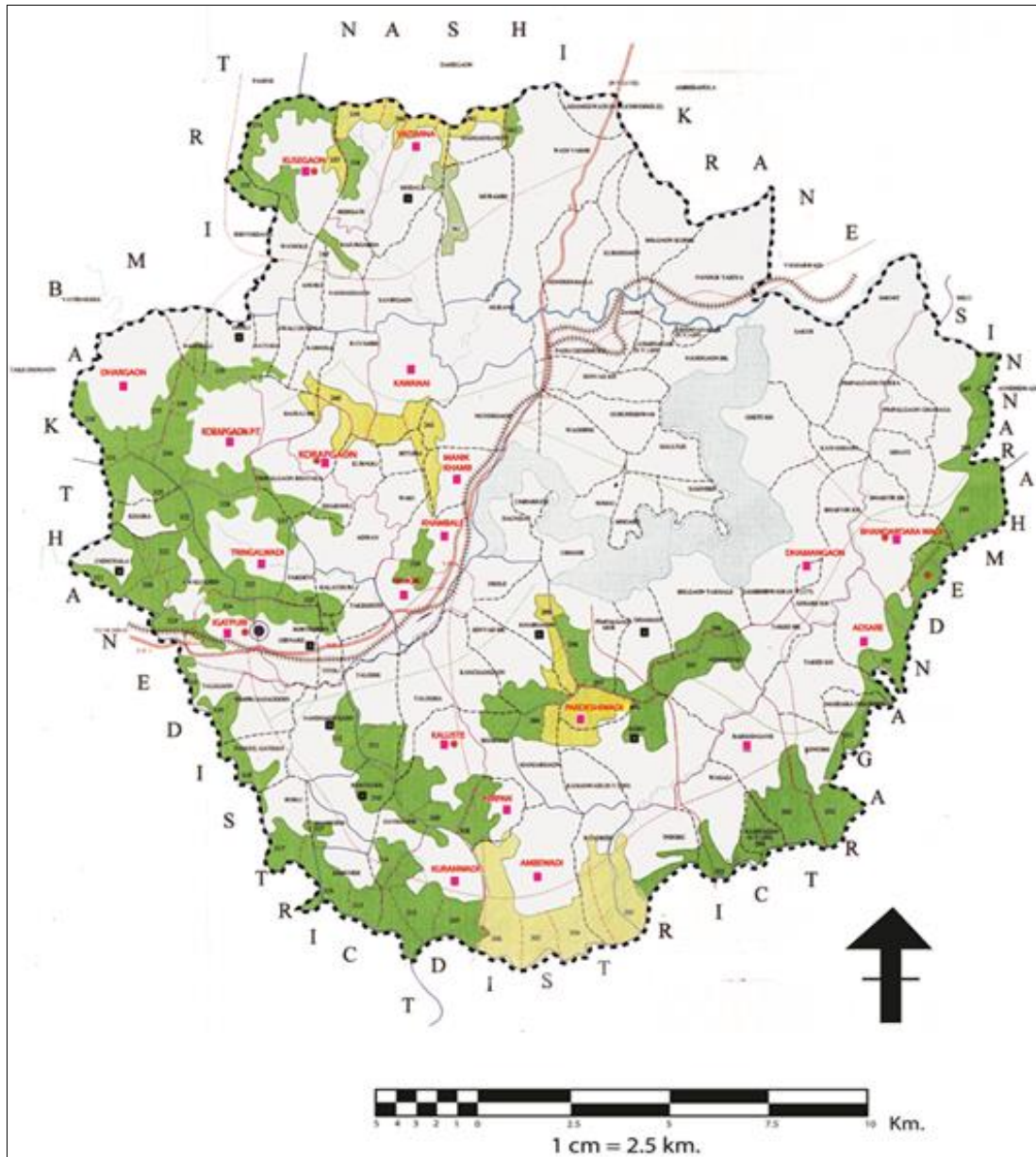


Fig 1: Map Showing Forest Area and Localities of Plant Collection

Methodology

For the vegetation studied eleven areas localities were selected randomly throughout forest. Quadrates of 10 X 10 meter were laid down in different directions in each places in different forests, so that quadrates represent the distribution pattern of almost all species areas. Altogether 11 plots were laid for trees and shrubs in the entire area studied. Thus the sampling was done for a total area of 1100 Sq. meter in the forests representing all ranges. All species covered by the quadrates were recorded and collected. Further, the quadrates were laid down at random but profitably in the localities showing diversity and denseness of the vegetation. The selection of quadrates for study was also motivated to include as many species as possible in quadrates. Frequency (%), density and abundance were calculated by the formulae given by Raunkiaer (1934) [5]. It is commonly found that during succession there is a gradual change in the variety of species leading to the climax of the community. Finally towards maturity index or relatively stable state a few species assume dominance (Ambasth; 1978) [1]. It is often found that with increase in dominance the diversity decreases (Goodman; 1975) [3]. The degree of stabilization of maturity of a plant community which undergoes a series of different communities developing successively in an area leading to a climax community was determined by maturity index as suggested by Pichi-Sermolli (1948) [4]. Maturity index based on the

frequency percentage of all species in the stands of a community. The principal is the long accepted notion that the higher the frequency percentage of each species and the smaller the number of sporadic species, the more mature is the community. The maturity index is obtained by adding the frequency percentage of all species in a stand and dividing this sum by total number of species in the stand.

Table 1: Maturity Index of Igatpuri Forest

Sr. No.	Localities	Maturity Index (M.I.)
01	Stand No: 01	62.17
02	Stand No: 02	40.33
03	Stand No: 03	67.30
04	Stand No: 04	52.67
05	Stand No: 05	45.30
06	Stand No: 06	60.8
07	Stand No: 07	55.71
08	Stand No: 08	60.00
09	Stand No: 09	56.16
10	Stand No: 10	53.51
11	Stand No: 11	40.66
Total:		594.61
Average M.I.		54.05

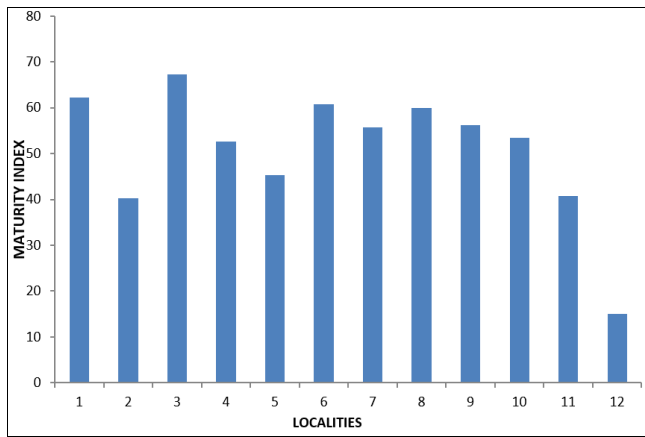


Fig 2: The Maturity Index Values of 11 Stands In Igatpuri & Igatpuri As A Whole

Observation

The maturity index values of Igatpuri forest shows that some forest are moderately mature (40 to 60) Stand No. 2, 4, 5, 7, 8, 10, 11 (Table No. 01). The vegetation at Stand No. 1, 3, 6 show the higher maturity index value 62.17, 67.30 & 60.8 (Table No. 01) they may be due to higher frequency percentage of species and less number of spodic species.

More or less all stands except 02 and 11 are mature stand as far as succession is concerned. The high maturity of stands 03 followed by 01 is due to the thick forest which disturbance of external factors is very less.

Discussion and Conclusion

Thus Phytosociological studies reveal a reliable picture of the vegetation and distribution of species and to some extent the factors operating on them in an area. The biotic interference in the forms of indiscriminate wood cutting for fuel and shifting cultivation operating for the past several years is one of the major factors that has affected the density of the forest and provided a congenial environment for some thorny species.

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References

1. Ahire DU. Studies on plant diversity of Igatpuri forest range of west Nasik division. Ph. D. thesis, NMU. Jalgaon, 2011.
2. Ambast RS. A text book of plant Ecology ed. 5th. Studies Friends Varansi, 1978.
3. Goodman D. The theory of diversity Stability relationship in ecology Quart.Rev. Biol,1975:50:237-266.
4. Pichi- Sermolli. An index for establishing the degree of maturity index in plant communities. J Ecol,1948:36:85-90.
5. Raunkiaer C. The life forms of plants and statistical plant Geography. The clarendon press Oxfoard, 1934, 632.
6. Shah GL, Patel AI. A Preliminary survey of the flora of Vyara Forests in South Gujarat, Bull. Surv. India,1970:12(1-4):18-28.
7. Shah GL. Flora of Gujarat State. 2 Vols. Sardar patel University, Gujarat, 1978.
8. Shah GL, Yadav SS. A contribution to the flora of Dangs Forest in Gujarat. Floristic composition, floristic elements and biological spectrum. Indian Journal of forestry,1979:21:13-19.

9. Shah GL, RG Bhatt. Phytosociological studies of the forest of Panchamahals district in eastern Gujarat, Indian J. for,1980:3(1):47-53.
10. Shah GL, Yadav SS, Parabia MH. Phytosociological studies on the vegetation of Chhotaudepur forest division, Eastern Gujarat. J. Indian forestry,1979:1:312-318.
11. Shah GL, Menon ARR. A contribution to the; Floristics, floristic composition, floral elements and biological spectrum of Saurashtra, Gujarat. Jour. Econ. Tax. Bot,1980:1:1-10.
12. Yadav DK, Singh L. Community structure and floristic diversity of tree stratum of deciduous forest of Achanakmar-Amankantak Biosphere Reserve. The Indian forester, 2010, 136(6).
13. Yadav SS. A contribution to the floristic and phytosociology of some plants of South Gujarat. Ph. D. thesis, Sardar Patel Univ. Gujarat, 1979.