iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 5 **Issue:** XI **Month of publication:** November 2017

DOI:

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor:6.887
Volume 5 Issue XI November 2017- Available at www.ijraset.com

Diversity and Distribution of Leguminosae Tree Plants in Kinwat and Mahur Forest Ranges of Nanded District

M. S. Wankhade[1]
[1]*Sunderrao Solanke Mahavidyalaya, Majalgaon. Dist-Beed (MS), India.*

Abstract : Leguminosae one of the most dominant and the important family, found under extremely varied soil and climate condition. It is cosmopolitan in distribution and most abundant in tropics, subtropics, temperate and worm climate. It is commonly known as the legume, pea, or bean family, are a large and economically important family of flowering plants. Kinwat and Mahur taluka of Nanded districts has old heritage of medicinal plants and herbal medicine. Forest is rich in biodiversity and consists of rare medicinal plants. Biogeographical condition such as altitude, soil type and average rain fall make the vegetation diversity in this area. In present study total 45 quadrate were taken from the study area out of this 27 quadrate were from the Kinwat taluka and 18 Quadrate from the Mahoor taluka. Quadrate analysis of the study area showed the presence of 27 leguminosae tree plant distributed in the 45 different quadrate. Out of this 27 leguminosae plants, 9 were belonging to the Papilionaceae, 6 were belonging to the caesalpincae and 12 were belonging to the family mimosaceae.
Keywords- Leguminosae family, Diversity and Distribution

I. INTRODUCTION

Forest composition, structure and dynamics serve as a research base for diverse aspects of ecology. Forest surveys of permanent plots can provide information that is crucial for conservation and management of forest (Ayyappan and Parthasarathy, 1999).Forest ecosystem dynamics and conservation depends on the understanding of species composition and diversity (Zaman, *et.al.*,2011). This composition and diversity of species can be studied by the quantitative characteristics which include frequency percentage, density and abundance (Poore, 1955).The Frequency percentage, density and abundance are important ecological characteristics for a species. Frequency refers to the degree of dispersion of individual species in an area and is usually expressed as number of sampling unit in which particular species occurs (Patel, *et.al.*,2014). More frequency of a species shows the more occurrences of species. More frequency of a species in a particular area indicates that the species is more successful to survive than the other species. It also indicate that the particular region favorable for the species to its distribution. Frequency does not give correct idea of the distribution of species, unless it is correlated with other characters such as density and abundance. Density is the study of number of species per unit area. Density gives an idea of degree of competition. The Abundance indicates number of individuals or different species per sampling units of occurrence. Both this density and abundance gives the idea of the species in quantitative terms. Study area includes the forest ranges from Kinwat and Mahur taluka of Nanded district. Over all forest cover of Nanded is 91,748 hectors forest area which is 11.92 % of the total area. Forest cover in Kinwat is 57,800 hectares which is 39.34% of total forest cover of the taluka (Patil,*et.al.*, 2010) while Mahur taluka has 14397.39 hectares forest cover (Vijigiri and Bembrekar, 2015). Geographical position of the Kinwat is 19^0 25 to 19^0 55 N latitude and 77^0 51 to 78^0 19 E longitude. Geographically position of the Mahur is 19^0 49 to19^0 83 N latitude and 77^0 91 to 77^0 55 E longitude.

II. MATERIALS AND METHODS

Occurrence and distribution pattern of the leguminosae tree species was studied with the help of quadrate method. At random 45 quadrates were analyzed from the forest of the study area. Quadrate size was 100 m. × 100 m. While taking the quadrate different region of the study area were in consideration like core region forest, buffer region forest, road side forest etc. Leguminosae plants from study area were identified with the help of available literature (Anonymous, 1948; Kirtikar and Basu, 1975; Nadkarni and Nadkarni, 1976; Naik, 1998; Yadav and Sardesai, 2000). Frequency percentage, Density, Abundance were calculated with following formula (Misra, 1968; Sharma, 2005).

©IJRASET (UGC Approved Journal): All Rights are Reserved

$$\text{Frequency \%} = \frac{\text{Total number of quadrate in which species occurred}}{\text{Total number of quadrate studied}} \times 100$$

$$\text{Density} = \frac{\text{Total number of individuals of the species}}{\text{Total number of quadrate studied}}$$

$$\text{Abundance} = \frac{\text{Total number of individuals of the species}}{\text{Total number of quadrate in which the species has occurred}}$$

III. RESULTS

Total 45 quadrate were taken from the study area out of this 27 quadrate were from the Kinwat taluka and 18 Quadrate from the Mahur taluka. Quadrates were taken from the area where the plant biodiversity is more. GPS location of the quadrate and the diversity of leguminosae plants in each quadrate were recorded for the further analysis. Quadrate analysis of the study area showed the presence of 27 leguminosae tree plant distributed in the 45 different quadrate. Out of this 27 leguminosae plants, 9 were belonging to the Papilionaceae, 6 were belonging to the caesalpinaceae and 12 were belonging to the family mimosaceae. Plants belonging to the papilioniaceae family were *Butea monosperma* (Lam.) Taub., *Dalbergia lanceolaria* subsp. *Paniculata* (Roxb.) Thoth., *Dalbergia sissoo* DC., *Desmodium oojeinense* (Roxb.) H. Ohashi, *Erythrina suberosa* Roxb, *Gliricidia sepium* (Jacq.) Walp., *Pongamia pinnata* (L.) Pierre, *Pterocarpus marssupium* Roxb. And *Peltophorum pterocarpum* (DC.) K.Heyne. Caesalpiniaceace family comprised the following *Bauhinia recemosa* Lam., *Caesalpinia pulcherrima* (L.) Sw., *Cassia fistula* L., *Senna siamea* (Lam.) H.S.Irwin& Barnaby, *Delonix regia* (Hook.) Raf. And *Tamarindus indica* L. Plants belonging to the family mimosaceae were *Acacia farnesiana* (L.) Willd., *Acacia catechu* (L.f.) Willd., *Acacia leucophloea* (Roxb.) Willd. *Acacia chundra* (Rottler) Willd., *Acacia nilotica* (L.) Delile, *Albizia leback* (L.) Benth.,*Albizia procera* (Roxb.) Benth. *Albizia julibrissin* Durazz., *Albizia saman* (Jacq.) Merr *Leucaena latisiliqua* (L.) Gillis & Stearn, *Pithecellobium dulce* (Roxb.) Benth and *Prosopis juliflora* (Sw.) DC. Phytosociologial characteristics of leguminosae tree plants were studied by using the parameter of the individual species such as frequency percentage, density and abundance in the study area. This data was analyzed using the different formula. Highest frequency percentage was found in *Butea monosperma* (Lam.) Taub (88.89) followed by *Cassia fistula* L. (71.11) and *Bauhinia recemosa* Lam. (55.56). Lowest frequency percentage was found in *Acacia chundra* (Rottler) Willd. (4.44), *Acacia catechu* (L.f.) Willd. (6.67) and *Albezia julibrissin* Durazz. (6.67).Maximum density was found in *Butea monosperma* (Lam.) Taub. (10.66), followed by *Cassia fistula* L. (6.91) and *Gliricidia sepium* (Jacq.) Walp. (3.71). Lowest density was found in *Acacia chundra* (Rottler) Willd. (0.067), *Acacia catechu* (L.f.) Wild. (0.13) and *Albezia julibrissin* Durazz. (0.178); Maximum abundance was found in *Gliricidia sepium* (Jacq.) Walp.(16.7), *Butea monosperma* (Lam.) Taub. (12) and *Cassia fistula* L. (9.72)and lowest abundance was found in *Acacia chundra* (Rottler) Wild.(1.5) and *Pterocarpus marssupium* Roxb (2) and *Acacia catechu* (L.f.) Wild.(2).

Table No. 1- Frequency percentage, Density, Abundance of the leguminosae tree plants.

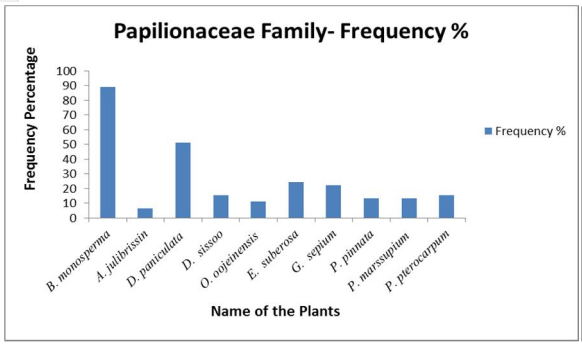
SN	Name of the plants	Total no. of individual of species	Total no of quadrate of occurrence	Total no. of quadrate studied	Frequency %	Density	Abundance
1	*Butea monosperma*	480	40	45	88.89	10.66	12
2	*Albezia julibrissin*	08	03	45	6.67	0.178	2.67
3	*Dalbergia lanceolaria subsp. paniculata*	95	23	45	51.11	2.11	4.13
4	*Dalbergia sissoo*	23	07	45	15.56	0.51	3.286
5	*Desmodium oojeinense*	15	05	45	11.12	0.33	3
6	*Erythrina*	34	11	45	24.45	0.76	3.09

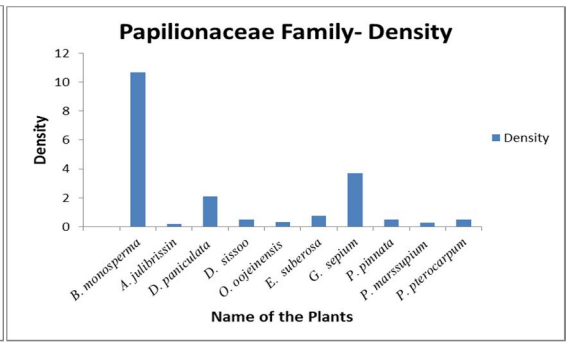
©IJRASET (UGC Approved Journal): All Rights are Reserved

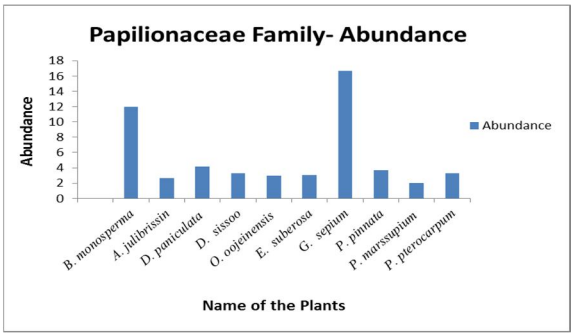
	suberosa						
7	*Gliricidia sepium*	167	10	45	22.22	3.71	16.7
8	*Pongamia pinnata*	22	06	45	13.33	0.489	3.67
9	*Pterocarpus marssupium*	12	06	45	13.33	0.267	2
10	*Peltophorum pterocarpum*	23	07	45	15.56	0.51	3.286
11	*Bauhinia recemosa*	96	25	45	55.56	2.13	3.84
12	*Caesalpinia pulcherrima*	29	06	45	13.33	0.64	4.83
13	*Cassia fistula*	311	32	45	71.11	6.91	9.72
14	*Cassia siamea*	40	07	45	15.56	0.89	5.71
15	*Delonix regia*	23	08	45	17.78	0.51	2.875
16	*Tamarindus indica*	42	06	45	13.33	0.93	7
17	*Acacia farnesiana*	22	07	45	15.56	0.489	3.14
18	*Acacia catechu*	06	03	45	6.67	0.13	2
19	*Acacia leucophloea*	34	09	45	20	0.756	3.78
20	*Acacia chundra*	03	02	45	4.44	0.067	1.5
21	*Acacia nilotica*	124	13	45	28.89	2.756	9.54
22	*Albizia leback*	25	09	45	20	0.56	2.78
23	*Albizia procera*	19	08	45	17.78	0.43	2.375
24	*Leucaenalatis iliqua*	25	07	45	15.56	0.56	3.57
25	*Pithecellobiu mdulce*	29	07	45	15.56	0.64	4.14
26	*Prosopis juliflora*	74	09	45	20	1.64	8.22
27	*Samanea saman*	39	12	45	26.67	0.87	3.25

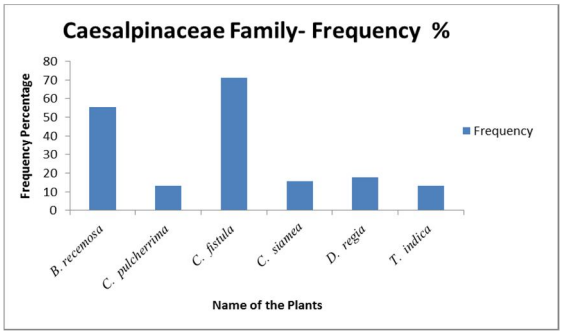
Fig. No. 1- Frequency percentage, Density and Abundance of plants belonging to Papilionaceae, Caesalpiniaceace and Mimosaceae family.

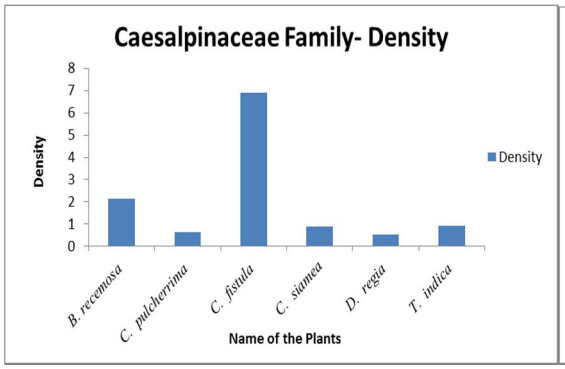
©IJRASET (UGC Approved Journal): All Rights are Reserved

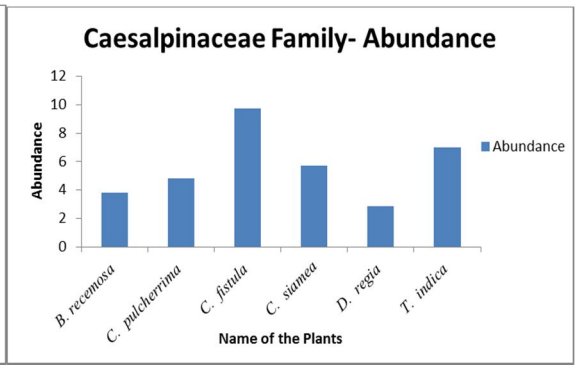


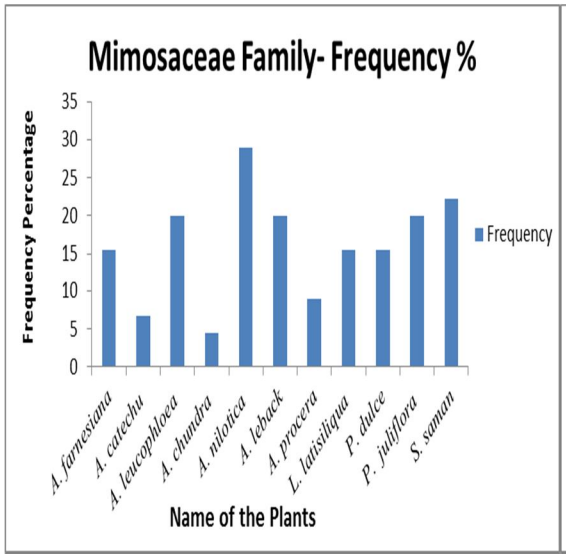


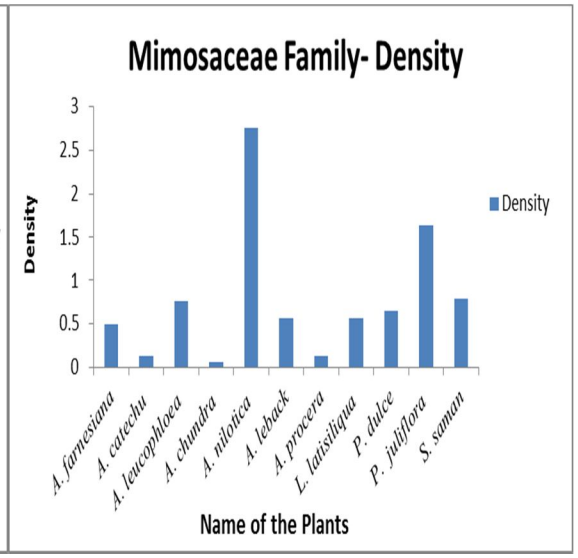




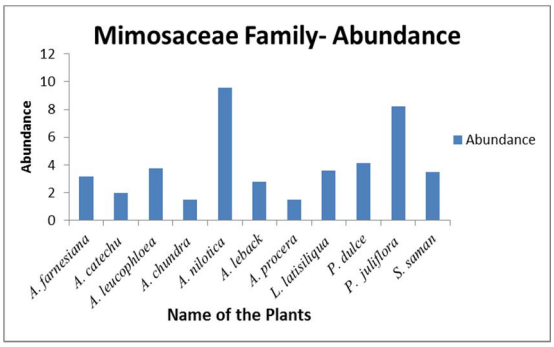








©IJRASET (UGC Approved Journal): All Rights are Reserved



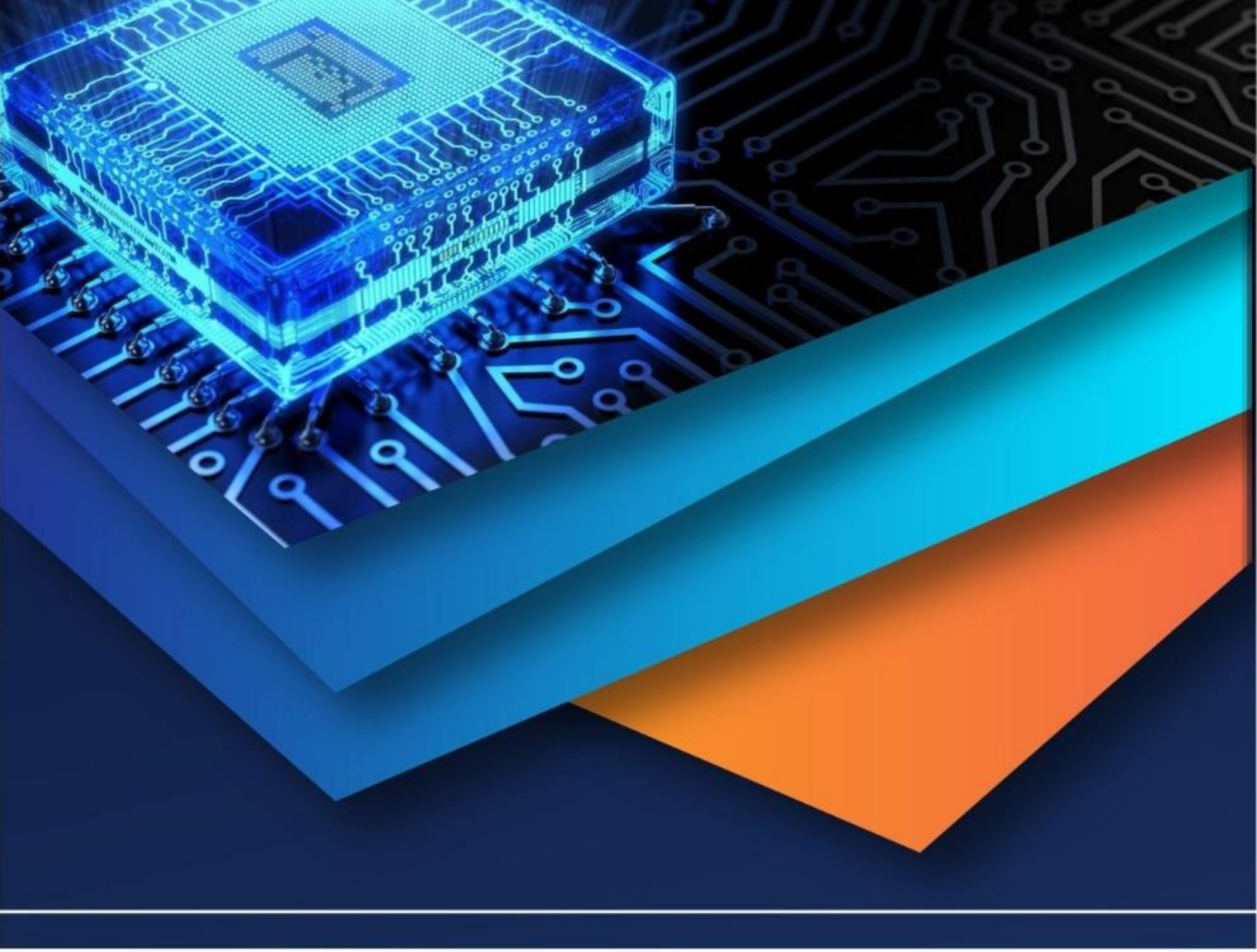
IV. CONCLUSION

Forest was studied phytosociological to get the complete description and classification of vegetation. It also gives the detailed information about the floristic composition structure and development. Present study of phytosociologial characteristic analysis by quadrate method provided the important information about the tree species diversity and distribution in the study area. Population diversity and composition can be studied with the help of percentage frequency, density and abundance. This study showed that the maximum tree diversity was found in the family Mimosaceae (11) and less in the Caesalpinaceae (06) family in the Kinwat and Mahur forest ranges.

REFERENCE

[1] Anonymous (1948). ***Wealth of India. A dictionary of Indian raw material and Industrial Products; Raw Material, Vol –III,*** Publication and Information Directorate. C.S.I.R. New Delhi. 12
[2] Anonymous (1948). ***Wealth of India. A dictionary of Indian raw material and Industrial Products; Raw Material, Vol –I,*** Publication and Information Directorate. C.S.I.R. New Delhi. 130.
[3] Anonymous (1948). ***Wealth of India. A dictionary of Indian raw material and Industrial Products; Raw Material, Vol –VII,*** Publication and Information Directorate. C.S.I.R. New Delhi. 130.
[4] Ayyappan, N., Parthasarathy, N. (1999). Biodiversity inventory of trees in a large-scale permanent plot of tropical evergreen forest at Varagalaiar, Anamalais, Western Ghats, India. ***Biodiversity and Conservation.*** Vol. 8, 1533–1554.
[5] Kirtikar, K. R., Basu, B.D. (1975). ***Indian Medicinal Plants. Vol. - I.*** International Book Distributors. Dehradun.
[6] Kirtikar, K. R., Basu, B.D. (1975). ***Indian Medicinal Plants. Vol. - II.*** International Book Distributors. Dehradun.
[7] Kirtikar, K. R., Basu, B.D. (1975). ***Indian Medicinal Plants. Vol. - III.*** International Book Distributors. Dehradun.
[8] Misra, R. (1968). ***Ecology Work Book.*** – Oxford & IBH Publishing Co., New Delhi.
[9] Nadkarni, K M., Nadkarni, A. K. (1976). ***Indian Materia Medica-2,*** 3rd ed. Popular Prakasan, Bombay, 61.
[10] Naik, V. N. (1998a). ***Flora of Marathwada.*** Vol. I. AmrutPrakashan, Aurangabad.
[11] Naik, V. N. (1998a). ***Flora of Marathwada***. Vol. II. AmrutPrakashan, Aurangabad.
[12] Patel, Y., Patel, N., Pandya, H. (2014). Study on ecological assessment parameters for Attarsumba range, Gandhinagar forest division, Gujarat, India. ***International journal of science, engineering and technology.*** 1509-1513.
[13] Poore, M. E. (1955). The Use of Phytosociological Methods in Ecological Investigations: I. The Braun-Blanquet System. ***The Journal of Ecology.*** Vol. 43(1), 226-244.
[14] Sharma, P.D. (2005). ***Ecology and Environment.*** Rastogi Publications, Meerut.
[15] Vijigiri, D., Bembrekar, S. K. (2015). Traditional knowledge of wild edible plants used in the Mahurtaluka of Nanded District, Maharashtra, India. ***Research Directions.*** Vol. 2(9), 1-5.
[16] Yadav, S. R.,Sardesai M. M. (2002). ***Flora of Kolhapur District.*** Pub. Shivajiuni. Kolhapur.178-179.
[17] Zaman, S., Siddiquee, S. U., Katoh, M. (2011). Species composition and forest structure in tropical moist deciduous forest of Bangladesh-a case study in Thakurgaon. ***Arab J Geosci,*** Vol. 4, 1315–1321.
[18] Wankhade, M. S., Mulani, R. M. (2015). Preliminary phytochemical screening and chromatographic fingerprint analysis of Acacia leucopholeaRoxb. methanolic leaf and bark extract by HPTLC technique. ***Indo American Journal of Pharmaceutical Research.*** Vol. 4(1). 184-191.
[19] Wankhade, M. S., Mulani, R. M. (2015). Chromatography finger print profiling and phytochemical investigation on leaf and bark methanolic extract of *Ougeinia oojeinensis* (Roxb.) Hochr. ***International Journal of Current Research.***Vol. 7(2), 12665-12673.
[20] Wankhade, M. S., Mulani, R. M. (2015). Chromatographic screening and phytochemical investigation on leaves and bark methanolic extract of *Albizia procera* (Roxb.) Benth. ***International journal of Innovative pharmacetetical Sciences and Research.*** Vol. 3(12). 1662-1674.
[21] Wankhade M.S and Mulani R. M. (2016). Digitization of Leguminosae Tree Plants From Kinwat and Mahur Forest Ranges of Nanded District in Maharashtra. ***Int. J. Recent Sci. Res.*** 7(4), 9850-9852
[22] Wankhade, M. S., Mulani, R. M. (2016). Larvicidal activity and phytochemical investigation of *Albizia julibrissin* Durazz. methanolic leaf and bark extract against *Aedes aegypti* Linn. larvae. ***International Journal of Pharmacy and Pharmaceutical Research.*** Vol. 6 (3): 172-179.

©IJRASET (UGC Approved Journal): All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)