INCIDENCE OF AIRBORNE POLLEN IN NAGBHID (MS), WITH REFERENCE TO METEREOLOGICAL PARAMETERS*

BY

AN Shende♣
DKM Mahavidyalaya, Kurkheda

AN Korpenwar♣
RMG Arts and Science College, Nagbhid

RR Dahegaonkar♣
Dr.Ambedkar College of Art, Comm. & Sci, Chandrapur

Abstract: - The influence of meteorological parameters like temperature, humidity, rainfall and wind on pollen catch from Nagbhid(MS) has been studied for a period of twelve month i.e. from May, 2016 to April, 2017. Aerial pollen grains of site counted on a monthly basis, showed three principal seasons. Viz. August- November, March to July and December to February. Climatic factors given above have been reported to be of paramount importance in the occurrence and distribution of atmospheric pollen.
Keywords: - Airborne pollen, meteorological parameters, Nagbhid, pollen grains.

Received 28 July 2021, Accepted 18 August 2021, Published 30 August 2021
♣ Correspondence Author: AN Shende

INTRODUCTION: -

The presence of pollen grains in the air called them airborne pollen grains, whether it is transported by insect or carried out by wind from one place to another (William R. S., 2002). Many workers have reported a relationship between the incidence of bioparticlesand prevailing climatic conditions (Hirst, 1953; Ramalingam, 1971; Davies, 1973; Spiekesma, 1980). In order to identity the offending pollen agents,it is necessary to monitor the pollen particles in free air, these prevalence and emission patterns through systematic air sampling.The situation thus call for serious efforts at routine atmospheric monitoring so that necessary measures can be taken to alleviate the human affliction. Efforts at trapping the airborne pollen were began a decade ago (Subha Reddi, 1970).But the information at hand is still far from complete. In this paper we present data describing the composition of the airborne pollen, relative prevalence of the constituents and their seasonal emission pattern over a period of twelve months from May, 2016 to June, 2017 together, in this present investigation the influence of meteorological factors on the monthly prevalence of airborne pollen of Nagbhid(MS) has been studied.

MATERIAL & METHODS: -

Nagbhid is a tehsil place which is located between 19.30'N & 20.45'N latitude and 78.46'E longitudeof Chandrapur district of Maharashtra. Atmospheric pollen trapping was done by Gravity slide method (Agrawal *et al*,. 1973)from May, 2016 to April, 2017. Two slides smeared with safranin stained glycerine jelly were exposed every 24 hours on the roof of Poultry farm, Nagbhid at the height of 12 m from ground level. The total area of exposed surface of the slide was scanned by using binocular research microscope and microphotographs were captured by using micro-camera which directly attached to the microscope. Identification of the trapped pollen was done by using reference pollen slides from the plants growing in and around Nagbhid in that particular period. The average monthly meteorological data of Nagbhid for the year of 2016-17 were obtained from meteorological department Nagpur.

RESULT AND DISCUSSION: -

The monthly average meteorological parameters such as temperature, relative humidity and rainfall are given in Table 1. Aerial pollen grains of Nagbhid, counted on a monthly basis, showed three principal seasons, August to November, March to July and December to February (Table 2). The first principal season of atmospheric pollen started in August and continued upto November, the pollen count being 36.19% of the annual average in 2016-17. The maximum was in October(10.37%) followed by September (9.31%), August (8.78%) and November (7.73%) had the lowest count. This season was dominated by grass pollen, weed pollen being second in order. During this period both the grasses and weeds were in full bloom. The rainy season comes to an end inSeptember. October in Nagbhid is characterized by a rise in temperature before the inception of winter. Higher temperature condition coupled with lack of rains in clearly noticed from the pollen count which is at its highest in October. November, with lowest record in these four months, indicates the end of the flowering periods of the seasonal vegetation.

Table 1. Average monthly meteorological parameters from May, 2017 to April, 2017

Month	Maximum Temp. (^{0}C)	Minimum Temp (^{0}C)	Relative humidity at 8.30 hrs.	17.30 hrs.	Total Rainfall (mm)
May	36.5	26.5	68	63	114.5
June	34.8	26.7	76	72	220.7
July	32.6	26.1	81	79	268.5
August	32.2	26.0	83	81	246.4
September	32.0	25.4	81	80	295.6
October	31.6	24.8	75	76	185.5
November	30.0	20.0	66	62	15.6
December	26.8	14.1	68	58	1.5
January	26.5	10.8	69	55	10.8
February	30.4	15.2	67	48	11.7

March	34.8	22.7	66	43	20.5
April	39.8	25.5	68	55	50.0

Table 2. Incidence of pollen based on habit of plants from May, 2017 to April, 2017

Month	Grasses	Weeds	Tress	Unidentified	Total	Percentage of annual
May	125	387	253	70	835	9.08
June	155	410	258	103	926	10.07
July	230	348	223	92	893	9.71
August	304	311	135	57	807	8.78
September	430	306	78	42	856	9.31
October	561	268	38	86	953	10.37
November	455	180	17	59	711	7.73
December	349	119	24	71	563	6.12
January	280	134	97	36	547	5.95
February	207	204	143	67	621	6.75
March	144	317	210	52	723	7.86
April	116	363	232	49	760	8.27

November, December and January are the cooler months of Nagbhid with low rainfall, with have recorded the lowest pollen count i.e. 18.82%. March to July recorded 44.99% of the average annual pollen. March-April-May are the summer months with the late spring in March. Most of the tree flower during this period. Therefore, the pollen count was high throughout this period. The flowering of earlyspring grasses and weeds also start in March. Thus having contribution from almost all the plants, this period showed the maxima of aerial pollen, both for the season and for entire period. Parameters like temperature, relative humidity and rainfall are of paramount importance in the occurrence and distribution of pollen in the atmosphere.

ACKNOWLEDGEMENTS:

Our sincere thanks research center, Dr. Ambedkar College of Arts, Comm.& Science, Chandrapur for laboratory support and also thankful to meteorological department, Nagpur.

REFERENCES:

- William, R. Solomon. (2002) Airborne pollen: A brief life, *Journal of Allergy& Clinical Immunology* 109(6): p- 895-900.
- Agarwal, M. K., et. al. (1973) Aerobiology and allergens methods of research in allergy and related disciplines. *Technical Bulletin* I, Archana Pub., Delhi.

- Chanda, S. and Mandal, S. (1977) The effects of organic environmental pollution in West Bengal. *Proc. International Symposium on Environmental Pollution and Toxicology,* Hissar.
- Davies, R. R. (1973) Climate and topography in relation to aero-allergens at Davos and London. *Acta Allergol.* 24, 396.
- Hirst, L. M. (1953) Changes in atmospheric spores content: diurnal periodicity and the effect of weather. *Trans. Brit. Mycol. Soc.* 36,375-393.
- Ramalingam, A. (1971) Airspora of Mysore. *Proc. Ind. Acad. Sci.* 78B, 227-240.
- Spieksma, F. T. (1980) Daily Hay fever forecast. Proc. 1st *Int. Conf. Aerobiology,* 1978, P 307.