

Airborne Pollen Grains of Wasteland Weeds in Hubli - Dharwad

The detailed studied on pollen spectrum in the atmosphere of a particular place is very important in the field of medicine as air borne pollens are one of the causative organisms to implicate several allergic symptoms like asthma, hayfever and several respiratory and skin disorders. Aerobiological studies conducted over various parts of the world revealed considerable pollen diversity and total number of airborne pollens show temporal and spatial variations depending upon the area selected (Mezei *et al.*, 1997). The vegetation, climate of that region and the variations in various parts of the world revealed considerable pollen diversity and total number of airborne pollens show temporal and spatial variations depending upon the area selected (Mezei *et al.*, 1997). The vegetation, climate of that region and the variations in various meteorological parameters (Munshi, 1997) etc., play a major role in pollen diversity. Data available in the aerobiological studies in Karnataka is very much limited (Anand and Agashe, 1984, Agashe and Abraham, 1988). Therefore, the detailed aerobiological studies were taken up for the first time in northern Karnataka region. The present paper reports on the results occurred of the airborne pollen in the rural and urban area of Hubli-Dharwad from December, 1999 to November, 2000.

The atmospheric pollens were trapped by a locally made fabricated vertical cylinder pollen trap, a wind impaction air sampler. This is used on account of its simple construction and high efficiency as proved by Gregory (1951) and Hirst (1959), further modified by Ramalingam (1968). The spore trapping surface is an adhesive coated cellophane tape wrapped around a glass rod of 0.53 cm diameter, suspended under a metallic sheet. Such type of devices were installed two in each locations at a height of about 40 meters both in rural and urban area from the

ground level. The cellophane tapes exposed for 24 hours. were mounted in glycerine jelly on microslide and observed under microscope. The trapped pollen grains were identified with the help of reference slides (Woodhouse, 1935). To study the detailed morphology of pollen grains acetolysis method was employed (Erdtman, 1952). Phenology, pollen size, flowering period and exine ornamentation were considered. Pollen morphology was analyzed following Nairs, terminology (Nair, 1964).

The size of pollen grains varied from 7.85 (*Eupatorium odoratum*) to 179.92 (*Stachytarpheta indica*). Variety of exine ornamentation such as Psilate, Spinate, Reticulate etc., was observed. A total of 40 pollen types of various weeds representing 19 Angiosperm families from rural area and 28 pollen types representing 14 families from urban area were recorded. In addition to this, '6' pollen types up to family level the species of which could not be identified have also been recorded. The detailed monthly airborne pollen percentage of pollen types and the per cent frequency of these pollen types in the atmosphere were studied. However, half yearly pollen percentage and pollen frequency of some important selected dominating species are presented in rural and urban areas (Table 1).

In the first half of the year, the incidence of airborne pollen percentage and pollen frequency of *Lantana camara*, *Isilema laxum*, *Chloris barbata* and *Dicanthium annulatum* were more. Pollen grains of *Parthenium hysterophorus*, however exhibited moderate occurrence in the atmosphere. The pollen grains of most of the species except *Eupatorium* were more in the rural area compared to urban. This might be due to more vegetation in rural area compared to urban as most of the wasteland in urban area are utilized for construction of buildings. In second half of the year except *Parthenium hysterophorus* pollen

Table 1. Incidence of airborne pollen per cent, percent frequency and pollen size in rural and urban areas of Hubli-Dharwad

Sl. No	Weed species	(December 1999 May 2000)				(June 2000- November, 2000)				Pollen size (u)
		Pollen (%)		Pollene frequency		Pollen (%)		Pollene frequency		
		Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	
1	<i>Parthenium hysterophrus</i>	5.75	2.67	32.17	18.51	6.25	10.17	22.83	30.00	17.14
2	<i>Lantana camara</i>	12.83	9.50	50.50	42.67	5.80	5.80	33.33	23.33	39.98
3	<i>Eupatorium odoratum</i>	5.90	14.83	24.67	13.42	4.33	4.80	19.58	18.50	7.85
4	<i>Alternanthera pungens</i>	1.83	7.38	13.00	12.00	1.17	0.43	8.00	1.50	8.56
5	<i>Abitulon Indicum</i>	0.05	0.00	1.00	0.00	0.00	0.00	0.00	0.00	141.37
6	<i>Mimosa pudica</i>	0.67	0.66	3.16	1.58	3.00	5.75	9.75	7.25	15.70
7	<i>Cassia hirsuta</i>	0.58	1.83	4.80	11.33	5.30	0.00	19.00	0.00	42.84
8	<i>Cassia sericea</i>	0.83	1.20	5.80	5.00	1.80	7.50	13.67	25.00	36.24
9	<i>Iseilema laxum</i>	13.92	11.10	51.00	37.42	3.22	1.33	12.67	4.83	31.71
10	<i>Chloris barbata</i>	10.83	8.16	54.67	37.18	8.50	8.50	47.17	30.67	35.70
11	<i>Dicanthium annulatum</i>	20.75	13.00	53.83	43.00	12.00	7.50	29.00	26.50	33.53
12	<i>Cynodon dactylon</i>	4.00	0.16	9.42	0.005	5.83	4.17	32.25	20.17	33.00
13	<i>Rugia repens</i>	0.67	0.00	3.83	0.00	0.22	0.83	2.17	4.50	49.13
14	<i>Tridax procumbens</i>	0.00	0.00	0.00	0.00	3.83	1.72	8.92	1.13	64.26
15	<i>Oxalis corniculata</i>	0.00	0.00	0.00	0.00	1.50	2.16	12.58	14.75	31.39
16	<i>Plumbaoa zeylanica</i>	0.00	0.00	0.00	0.00	0.30	0.08	1.83	0.50	67.11
17	<i>Croton bonplandianum</i>	0.00	0.00	0.00	0.00	0.16	2.30	0.50	4.16	47.12
18	<i>Justicia simplex</i>	0.00	0.78	0.00	5.08	0.33	0.16	1.00	1.08	28.56
19	<i>Oscimum canum</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.73
20	<i>Ergosns sp</i>	1.43	0.67	6.92	2.83	1.00	0.00	1.58	0.00	32.41
21	<i>Ipomaea sp.</i>	0.32	0.22	2.00	2.34	0.50	0.16	1.00	1.16	74.25
22	<i>Stachyterpeta</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	179.92

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grains of most of the other species exhibited moderate occurrence. This is because of peak flowering period of *Parthenium hysterophorus* during the months of July and August.

In general, a detailed month wise pollen count indicated, high pollen count during the month of August and January in rural area. The pollen grains of *Lantana camara*, *Ischilema laxum*, *Chloris barbata* and the pollens of family Poaceae were the main contributors during January, whereas the pollen grains of *Parthenium hysterophorus*, *Dicanthium annulatum* and *Chloris barbata* were the principle contributors during August. Similarly, in urban area, the high peak was observed during January and the dominant species were *Chloris barbata*, *Lantana camara*,

Dicanthium annulatum and grass pollen. The comparison of pollen percentage between rural and urban area indicated in general, the high per cent during January, followed by December in both the areas. However, during August, the per cent population was increased in Rural Area. This is due to the high number of *Dicanthium annulatum* and the unidentified species.

As the airborne pollen grains are likely to cause allergy in human beings, it is necessary to consider dominant airborne pollen grains and the impact of such pollen grains on human health. Hence, the results obtained from the present study can be used further for allergy tests to find out the extent of allergenicity of air borne pollen types on human beings.

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(Received : December, 2004)

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