

CLINICAL TESTS OF SOME COMMON POLLEN GRAINS

RESULTS :

Out of 22 airborne pollen types tested for allergenicity using whole pollen extract on adult respiratory allergic patients of Jalpaiguri, West Bengal, 19 induced a positive response through skin prick test (Table 13).

The pollen extract of *Melastoma malabathrica*, *Camellia sinensis*, *Cymbopogon pendulus* did not produce any positive response (Table 13). The tests were performed on the patients with the relevant case history. The results were analysed according to Stytiš *et al.* (1982).

After the clinical study the whole extracts of eight pollen types were fractionated in the range of 0–30%, 30–60% and 60–90% saturation of $(\text{NH}_4)_2\text{SO}_4$ and three fractions (designated as Fr I, Fr II, Fr III) of each pollen types was taken for skin-prick test. When skin-prick tests performed with these $(\text{NH}_4)_2\text{SO}_4$ cut fractions (Fr I, Fr II and Fr III) of the eight pollen types on respective pollen-sensitive patients, Fraction two (Fr II), i.e. 30–60% $(\text{NH}_4)_2\text{SO}_4$ cut fraction of all eight pollen types was found to be allergenicallly potent (Table 14). The higher positivity was noted in *Cocos nucifera* (85.71%) which was immediately followed in the degree of prevalence by *Cassia siamea* (82.35%), *Acacia auriculiformis* (80.00%), *Eucalyptus globulosus* (76.19%), *Borassus flabellifer* (75.00%), *Areca catechu* (75.00%), *Saccharum spontaneum* (73.33%) and *Bassia latifolia*. So it was observed that 30–60% $(\text{NH}_4)_2\text{SO}_4$ cut fraction i.e. Fr-II, elicited maximum percentage of positive response (Table 14).

DISCUSSION :

From the detailed result of skin sensitivity test (Table 13) using 22 whole pollen extracts on adult respiratory allergic patients it was observed that 19 taxa induced at least 1⁺ reaction in allergic-patients. The highly potent allergic pollen showing 2⁺ to 3⁺ positivity were *Acacia auriculiformis*, *Areca catechu*, *Azadirachta indica*, *Cassia siamea*, *Cyperus rotundus*, *Cocos nucifera*, *Lantana camara*, *Borassus flabellifer* and *Saccharum spontaneum*. Among the tested pollen *Saccharum spontaneum* was the most potent allergen which showed 48.08% positive response with 43.40% + I reaction, 3.83% + II reaction and 0.85% + III reaction. The next highly potent allergen was *Azadirachta indica* showing 45.41% skin positivity with 40% +I reaction, 4.17% +II reaction, 1.25% +III reaction. The next high

hypersensitivity was found in the allergenic extract of *Areca catechu* showing 40.29% positive response among 206 patients with 34.9% +I reaction and 3.88% + II response and 1.45% +III response. 35% skin positivity was produced by the antigenic extract of *Cocos nucifera* among 256 tested patients. It showed 33.59% + I response, 1.17% + II response and 0.79% +III reactions. *Borassus flabellifer* (34.34% positivity), *Cassia siamea* (30.70%) and *Eucalyptus globulosus* (30.48% positivity) were the other potent allergenic plants of the investigated area. This was followed by *Cyperus rotundus* (out of 126 patients 36 patients showed 28.57% positive response), *Bassia latifolia* (26 patients out of 114 induced 22.80% positivity), *Carica papaya* (out of 212 patients 40 possessed 18.87% positivity), *Acacia auriculiformis* (out of 85 patients 16 induced 18.82% positivity), *Peltophorum pterocarpum* (41 patients out of 242 showed 16.94% skin positivity), *Bombax ceiba* (37 patients out of 231 showed 16.01% positivity), *Oryza sativa* (20 patients out of 126 showed 15.87% positivity), *Chenopodium album* (33 patients out of 232 showed 14.22% positive response), *Lantana camara* (29 patients out of 209 induced 13.87% skin positivity). Some other pollen types also induced skin positivity showing low intensity. These include *Trema orientalis* (10 patients out of 128 induced 8.33% positivity), *Amaranthus viridis* (out of 112 patients 6 patients showed 5.36% positivity), *Justicia diffusa* (6 patients out of 184 showed 3.26% positive response).

The three pollen types namely *Melastoma malabathrica*, *Camellia sinensis* and *Cymbopogon pendulus* were found to be non-allergenic as they did not show any skin positivity using whole pollen extract. The result were analysed according to Stytis *et al.* (1982).

The present study was aimed to detect sensitization of individuals to common pollen of Jalpaiguri town. The most potent allergy producing plants are large trees commonly found as wild or cultivated in wide areas. *Acacia auriculiformis*, *Eucalyptus globulosus*, *Cassia siamea*, *Bombax ceiba*, *Peltophorum pterocarpum*, *Trema orientalis*, etc. are planted on roadside and railway stations as avenue or ornamental fruit producing trees. *Areca catechu*, *Azadirachta indica*, *Cocos nucifera*, *Carica papaya*, *Borassus flabellifer*, *Bassia latifolia* found in jungles and rural as well as urban surroundings which are cultivated for their commercial use. *Lantana camara* is a common hedge plant in urban areas. *Saccharum spontaneum* is a common grass growing gregariously along the river beds and wet land surroundings. *Cyperus rotundus*, *Chenopodium album*, *Justicia diffusa* are some common weeds of Jalpaiguri

town. In a two year continuous aerobiological survey of Jalpaiguri town it was found that the pollen grains of those plants were commonly airborne during pollination months. This was also evidenced by the works of some previous workers (Chakraborty *et.al.* 1996, 1998a & b; Banik and Chanda, 1992; Boral and Bhattacharya, 1999, 2000; Choudhury *et.al.* 1999; Boral *et.al.* 1999, 2004) in other parts of West Bengal. The present study reveals a somewhat different picture in respect to incidence and intensities of the reaction.

Table 13 : Result of Skin-Prick-Tests using different whole Pollen extracts on adult respiratory allergic patients.

Sl. No.	Pollen allergen extract	No. of Patients tested.	No. of patients showing			% of positive response
			+1 level	+2 level	+3 level	
1.	<i>Acacia auriculoformis</i>	85	12	2	2	18.82
2.	<i>Amaranthus viridis</i>	112	6	0	0	5.36
3.	<i>Areca catechu</i>	206	72	8	3	40.29
4.	<i>Azadirachta indica</i>	240	96	10	3	45.41
5.	<i>Eucalyptus globulosus</i>	187	52	5	0	30.48
6.	<i>Bombax ceiba</i>	231	35	2	0	16.01
7.	<i>Cassia siamea</i>	195	56	3	1	30.76
8.	<i>Cyperus rotundus</i>	126	32	3	1	28.57
9.	<i>Cocos nucifera</i>	256	86	3	2	35.54
10.	<i>Carica papaya</i>	212	38	2	0	18.87
11.	<i>Chenopodium album</i>	232	31	2	0	14.22
12.	<i>Lantana camara</i>	209	26	2	1	13.87
13.	<i>Bassia latifolia</i>	114	23	3	0	22.80
14.	<i>Oryza sativa</i>	126	18	2	0	15.87
15.	<i>Peltophorum pterocarpum</i>	242	40	1	0	16.94
16.	<i>Borassus flabellifer</i>	198	64	3	1	34.34
17.	<i>Saccharum spontaneum</i>	235	102	9	2	48.08
18.	<i>Trema orientalis</i>	120	10	0	0	8.33
19.	<i>Justicia diffusa</i>	184	6	0	0	3.26
20.	<i>Melastoma malabathrica</i>	25	0	0	0	0
21.	<i>Camellia sinensis</i>	25	0	0	0	0
22.	<i>Cymbopogon pendulus</i>	25	0	0	0	0

Table 14 : Results of Skin-test using fractions of some selected Pollen antigens.

Pollen types	(NH ₄) ₂ SO ₄ cut fractions	Total No. of Patients tested	% of positive response
1. <i>Acacia auriculoformis</i>	Fr I (0-30%)	25	12.00
	Fr II (30-60%)	25	80.00
	Fr III (60-90%)	25	48.00
2. <i>Eucalyptus globulosus</i>	Fr I (0-30%)	21	19.04
	Fr II (30-60%)	21	76.19
	Fr III (60-90%)	21	33.33
3. <i>Bussia latifolia</i>	Fr I (0-30%)	30	16.66
	Fr II (30-60%)	30	60.00
	Fr III (60-90%)	30	36.66
4. <i>Cassia siamea</i>	Fr I (0-30%)	34	11.76
	Fr II (30-60%)	34	82.35
	Fr III (60-90%)	34	35.29
5. <i>Borassus flabellifer</i>	Fr I (0-30%)	28	14.28
	Fr II (30-60%)	28	75.00
	Fr III (60-90%)	28	28.57
6. <i>Cocos nucifera</i>	Fr I (0-30%)	21	19.04
	Fr II (30-60%)	21	85.71
	Fr III (60-90%)	21	33.33
7. <i>Areca catechu</i>	Fr I (0-30%)	24	12.5
	Fr II (30-60%)	24	75.0
	Fr III (60-90%)	24	33.33
8. <i>Saccharum spontaneum</i>	Fr I (0-30%)	15	13.33
	Fr II (30-60%)	15	73.33
	Fr III (60-90%)	15	46.66