

Regional Distribution of Allergic Tree Pollen in Japan

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Short Communication

In Japan patients with Japanese Cedar (JC) pollinosis have increased nation widely since the latter of 1970's. Japanese Governments has begun to take preventive measures against JC pollinosis and airborne pollen monitoring has been begun to investigate as a causative agent since 1986. We have estimated the longitudinal investigation result for effective prevention and treatment against pollinosis in Japan.

Method

We have monitored airborne pollen all year around since July 1986 by gravitational pollen sampler, Durham's sampler, at 15 locations for long time in Japan Island. Pollen samples were sent to our hospital and we stained by Calberla solution and counted pollen number per cm² through microscope [1,2]. And then we classified pollen grains as the allergic causative agent. We estimated regional distribution of main allergic pollen in Japan.

Result and Discussion

We have collaborated these facilities for monitoring as shown Figure 1, Sapporo (Wagatsuma children Clinic), Sendai (Tohoku University), Niigata (Fujisaki Clinic), Toyama (Toyama University), Takasaki (Sato Clinic), Sagami (NHO Sagami Hospital), Hamamatsu (Tokai Pollinosis Institute), Tsu (NHO Mie Hospital), Wakayama (Kenko Planning Institute.), Fukuoka (Kyushu University), Kumamoto (Kumamoto University), Miyazaki (Miyazaki University) and Yakushima (Kagoshima University, The Forestry Agency).

Table 1 shows each pollination season approximately of main

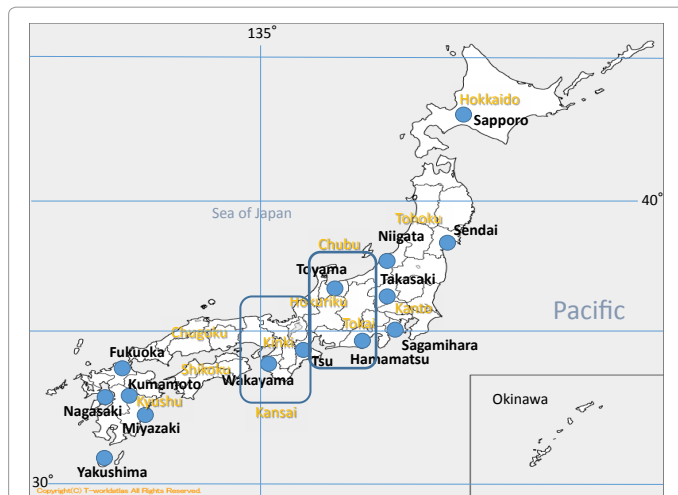


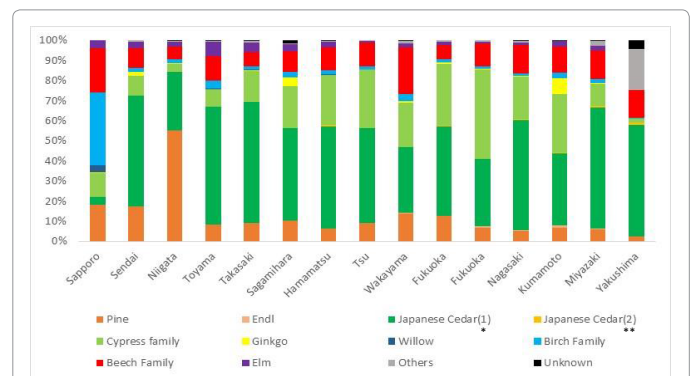
Figure 1: The locations of airborne pollen monitoring by Durham's Sampler.

important pollen from start to end of pollen grains dispersing term all Japan Island.

English name	J	F	M	A	M	J	J	A	S	O	N	D
Pine			*	***	***	*						
Endl					*	**						
Himalayan Cedar											***	
Japanese Cedar		***	***	**							*	*
Cypress Family			*	***	*							
Ginkgo				**								
Willow			*	*	*							
Birch Family		***	***	***	***							
Beech Family			*	***	***	*						
Elm				**	**				**			

*Shows 10 days and the main dispersing length.

Table 1: Tree pollen pollination season in Japan.



* Japanese Cedar in spring,

** Japanese Cedar in autumn.

Figure 2: The prevalence of important pollen count at each location.

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City	duration	Pine	Endl	Japanese Cedar (1)*	Japanese Cedar (2)**	Cypress family	Ginkgo	Willow	Birch Family	Beech Family	Elm	Others	Unknown	Total
Sapporo	7	233.6 ± 363.5	0.0 ± 0.0	52.9 ± 73.6	0.1 ± 0.3	150.5 ± 134.0	6.1 ± 8.3	44.3 ± 62.8	463.6 ± 503.2	284.9 ± 414.2	48.9 ± 55.1	0.0 ± 0.0	0.0 ± 0.0	1284.9 ± 124.3
Sendai	28	721.2 ± 276.1	0.5 ± 1.1	2256.9 ± 1872.3	3.0 ± 5.8	390.8 ± 392.7	84.2 ± 71.1	6.9 ± 6.4	78.8 ± 59.1	399.8 ± 277.2	127.6 ± 170.2	27.3 ± 53.4	2.6 ± 6.0	4099.6 ± 516.7
Niigata	27	2878.7 ± 497.7	0.8 ± 2.1	1531.0 ± 1162.3	4.1 ± 5.8	208.4 ± 290.0	9.0 ± 7.4	8.1 ± 11.3	96.2 ± 62.5	337.4 ± 176.5	113.5 ± 110.8	34.7 ± 59.7	4.3 ± 7.7	5226.2 ± 702.4
Toyama	27	561.5 ± 189.2	1.3 ± 2.7	3890.0 ± 3005.8	15.0 ± 21.2	566.6 ± 664.1	15.0 ± 20.0	7.2 ± 9.6	283.2 ± 194.3	794.3 ± 357.1	484.8 ± 678.6	32.5 ± 50.3	6.0 ± 11.4	6657.4 ± 870.1
Takasaki	16	1017.2 ± 325.5	5.0 ± 9.1	6687.8 ± 4284.8	8.8 ± 11.4	1688.3 ± 1588.4	18.2 ± 11.2	68.5 ± 70.6	155.0 ± 94.9	819.7 ± 275.5	519.4 ± 362.5	84.1 ± 73.8	18.1 ± 22.0	11090.0 ± 1506.4
Sagamihara	28	1333.9 ± 605.6	0.0 ± 0.0	6066.6 ± 6348.4	20.0 ± 30.3	2717.9 ± 2991.7	580.9 ± 577.8	5.0 ± 9.1	369.6 ± 375.9	1334.4 ± 878.4	453.3 ± 535.8	64.9 ± 257.0	169.8 ± 349.5	13116.4 ± 1440.2
Hamamatsu	28	560.8 ± 238.2	7.7 ± 14.8	4421.7 ± 2715.3	80.7 ± 149.9	2146.9 ± 2092.9	5.5 ± 3.4	31.2 ± 48.4	171.1 ± 144.8	978.2 ± 527.1	259.1 ± 330.7	48.0 ± 74.8	6.7 ± 13.0	8717.6 ± 1064.7
Tsu	28	539.9 ± 363.6	2.5 ± 5.8	2841.5 ± 1978.6	16.0 ± 17.0	1736.0 ± 1532.8	13.5 ± 24.3	2.9 ± 8.2	92.8 ± 55.0	693.3 ± 446.6	55.3 ± 68.3	17.2 ± 28.4	2.2 ± 5.4	6013.6 ± 724.4
Wakayama	27	502.9 ± 168.3	3.0 ± 7.4	1171.6 ± 907.8	4.6 ± 5.6	791.3 ± 933.6	27.8 ± 21.5	2.3 ± 3.0	117.1 ± 85.4	837.2 ± 589.9	68.6 ± 58.1	42.7 ± 75.5	6.3 ± 19.8	3572.7 ± 348.0
Fukuoka	28	425.5 ± 221.1	4.5 ± 8.2	1498.1 ± 841.5	8.2 ± 13.9	1029.3 ± 1129.7	30.6 ± 21.9	3.6 ± 10.4	52.1 ± 27.4	239.0 ± 139.2	48.5 ± 48.6	19.2 ± 30.7	1.6 ± 3.4	3360.2 ± 394.3
Fukuoka	28	225.2 ± 108.1	27.3 ± 52.9	1094.3 ± 752.3	6.4 ± 8.2	1450.2 ± 1513.0	11.7 ± 12.0	0.9 ± 1.3	50.6 ± 31.2	369.4 ± 222.1	23.0 ± 16.4	21.5 ± 33.7	2.1 ± 4.9	3282.6 ± 392.3
Nagasaki	28	279.3 ± 359.7	17.8 ± 35.2	2924.9 ± 2247.9	22.5 ± 25.5	1130.6 ± 1258.0	19.5 ± 30.6	1.9 ± 3.1	47.6 ± 48.3	754.9 ± 868.5	76.7 ± 91.1	45.6 ± 71.7	6.6 ± 12.9	5328.0 ± 688.1
Kumamoto	28	276.5 ± 155.4	48.7 ± 88.1	1454.8 ± 864.7	7.6 ± 9.3	1186.7 ± 1068.2	318.7 ± 276.9	1.9 ± 3.5	110.5 ± 101.5	513.5 ± 315.5	113.9 ± 108.1	11.5 ± 19.1	3.5 ± 7.2	4047.8 ± 406.0
Miyazaki	28	178.9 ± 161.3	7.8 ± 15.2	1812.5 ± 1127.2	26.2 ± 58.8	337.3 ± 348.4	2.1 ± 3.1	1.9 ± 3.0	68.4 ± 76.9	416.1 ± 402.4	78.1 ± 117.6	69.1 ± 143.8	7.1 ± 10.9	3005.5 ± 406.7
Yakushima	16	28.3 ± 14.5	1.7 ± 2.4	647.4 ± 483.8	17.6 ± 25.0	20.1 ± 16.8	0.4 ± 1.1	2.4 ± 4.0	4.6 ± 2.9	157.4 ± 62.9	1.7 ± 1.5	240.1 ± 136.5	49.1 ± 24.1	1170.8 ± 145.2

Table 2: Main Tree Pollen Counts per cm² per year at each location in Japan

*Japanese cedar (1) pollen counts: in spring.
 **Japanese cedar (2) pollen counts: in autumn.

Table 2 and Figure 2 show each arithmetic mean pollen counts and the bar chart. Japanese Cedar pollen number was the most of all, more than 40%, next cypress family, about 20%. They were occupied of more than 60% of all and they increased with the remarkable annual fluctuation as the allergen of JC pollinosis [2]. Beech family pollen counting was also increasing and occupied about 10% of all pollen counts. There is cross-reactivity between beech and birch family which related with oral allergic syndrome [3].

Perspective and Conclusion

In future new occurrences of oral allergy syndrome due to increasing allergic tree pollen grains would be appeared. The continuous pollen research should be important for patients with pollinosis in Japan.

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