

## Supplementary material

Supplemental Table. List of pollen taxa identified in the samples collected by active (i.e. Hirst-type) and passive (i.e. Sigma-2) aerobiological sampling in San Michele all'Adige (Italy) during 12 one-week sampling periods in 2018 (see Table 1), mean daily concentrations ( $P^*m^{-3}$ ) and sedimentation rates ( $N^*cm^{-2}*d^{-1}$ ), and corresponding frequencies. For each pollen taxon are reported: the mean pollen size and the size class; the one or more species considered as reference (i.e. the species most likely present in the local vegetation), when the pollen taxon identified in the aerobiological samples was a genus or a family; the pollen size (i.e. the polar and equatorial axis) of the reference species, and the link to the web site used as source of information on the reference pollen size ((a): <https://www.pollenwarndienst.at/AT/en/aerobiology/pollen-atlas.html> (last accessed on 14.07.2020); (b): <https://pollen.tstebler.ch/MediaWiki/index.php?title=Artenliste#C> (last accessed on 14.07.2020)). When more than one species was considered as a reference for a genus or a family (see e.g. the pollen taxon *Acer*), the mean polar and equatorial axis of all the species was calculated. For some reference species (see e.g. the pollen taxa *Abies* and Caryophyllaceae) only one size for each reference species was reported because of the peculiar grain morphology. In some cases (see e.g. the pollen taxon Apiaceae) no information on pollen size is reported because of the large variability of pollen grain features at species level.

<sup>1</sup> The mean pollen size was calculated as the average of the polar and equatorial axes lengths of the reference species.

\* Reference pollen species collected from fully flowering plants, and analyzed by SEM/EDX to determine their specific morpho-chemical fingerprint.

Pollen taxon	Active sampling		Passive sampling		Mean pollen size <sup>1</sup> , $\mu m$	Size class, $\mu m$	Reference species information			
	$P^*m^{-3}*d^{-1}$	%	$P^*cm^{-2}*d^{-1}$	%			Species	Polar axis, $\mu m$	Equatorial axis, $\mu m$	Info source
<i>Abies</i>	0.9	0.0	0.4	0.1	124.8	>80	<i>Abies alba</i>	124.8		a
<i>Acer</i>	0.5	0.0	0.0	0.0	31.5	20-40	<i>Acer campestre</i> ; <i>A. negundo</i> ; <i>A. pseudoplatanus</i> ; <i>A. saccharinum</i>	29.2	33.8	a
<i>Aesculus</i>	0.1	0.0	0.0	0.0	23.2	20-40	<i>Aesculus hippocastanum</i>	25.4	21.0	a
<i>Ailanthus altissima</i>	0.3	0.0	0.0	0.0	26.4	20-40	<i>Ailanthus altissima</i>	25.0	27.7	a
<i>Alnus</i>	30.2	0.6	2.3	0.5	23.8	20-40	<i>Alnus glutinosa</i> *	22.1	25.5	a
Amaranthaceae	17.0	0.3	3.6	0.8	26.9	20-40	<i>Chenopodium album</i>	26.9		
<i>Ambrosia</i>	1.7	0.0	0.0	0.0	18.1	10-20	<i>Ambrosia artemisiifolia</i>	17.4	18.8	a
Apiaceae	0.6	0.0	0.0	0.0			n.a.			
Arecaceae	0.2	0.0	0.0	0.0	21.6	20-40	<i>Trachycarpus fortunei</i>	22.8	20.4	a
<i>Artemisia</i>	36.3	0.7	2.8	0.6	21.5	20-40	<i>Artemisia vulgaris</i> *	20.5	22.5	a

<i>Betula</i>	182.7	3.6	10.8	2.5	23.3	20-40	<i>Betula pendula</i>	22.6	24.0	a
Boraginaceae	0.1	0.0	0.0	0.0				n.a.		
Brassicaceae	0.7	0.0	0.4	0.1	23.4	20-40	<i>Brassica napus</i>	22.8	24.0	a
<i>Buxus</i>	0.1	0.0	0.0	0.0	30.6	20-40	<i>Buxus sempervirens</i>	28.9	32.3	a
Campanulaceae	0.1	0.0	0.0	0.0				n.a.		
Cannabaceae	72.5	1.4	5.2	1.2	20.0	20-40	<i>Humulus lupulus</i>	18.9	21.1	a
<i>Carpinus betulus</i>	6.8	0.1	1.0	0.2	34.7	20-40	<i>Carpinus betulus</i>	33.8	35.5	a
Caryophyllaceae	0.0	0.0	0.1	0.0	41.6	40-80	<i>Saponaria officinalis; Silene dioica</i>	49.2; 34.0		a
<i>Castanea</i>	67.4	1.3	2.5	0.6	16.2	10-20	<i>Castanea sativa</i>	18.8	13.6	a
<i>Cedrus</i>	1.4	0.0	0.1	0.0	75.2	40-80	<i>Cedrus sp.</i>	75.2		a
Compositae	6.5	0.1	0.7	0.2				n.a.		
<i>Cornus</i>	0.0	0.0	0.1	0.0	37	20-40	<i>Cornus mas; C. sanguinea</i>	24.0; 58.0		b
<i>Corylus</i>	100.7	2.0	8.4	1.9	28.1	20-40	<i>Corylus avellana*</i>	27.3	28.9	a
Cupressaceae	155.3	3.0	16.8	3.9	27.3	20-40	<i>Cupressus sempervirens</i>	27.3		a
Cyperaceae	5.6	0.1	0.7	0.2	34.35	20-40	<i>Carex sp.</i>	39.7	29.0	a
Ericaceae	0.1	0.0	0.0	0.0	32.9	20-40	<i>Erica carnea</i>	32.9		a
Euphorbiaceae	0.4	0.0	0.1	0.0	19.25	10-20	<i>Mercurialis annua</i>	19.3	19.2	a
<i>Fagus sylvatica</i>	28.6	0.6	4.2	1.0	46.2	40-80	<i>Fagus sylvatica</i>	44.6	47.8	a
<i>Fraxinus excelsior</i>	44.3	0.9	3.7	0.9	24.6	20-40	<i>Fraxinus excelsior</i>	22.5	26.7	a
<i>Fraxinus ornus</i>	234.5	4.6	24.2	5.6	21.4	20-40	<i>Fraxinus ornus</i>	20.1	22.6	a
<i>Ginkgo biloba</i>	1.3	0.0	0.4	0.1	27.4	20-40	<i>Ginkgo biloba</i>	28.7	26.1	a
<i>Hedera</i>	0.4	0.0	0.0	0.0	28.5	20-40	<i>Hedera helix</i>	28.5	28.5	a
<i>Juglans</i>	7.2	0.1	1.3	0.3	39.3	20-40	<i>Juglans regia</i>	39.3		a
Juncaceae	0.9	0.0	0.1	0.0	46.6	40-80	<i>Luzula lutea</i>	46.6		a

Lamiaceae	0.0	0.0	0.0	0.0						
<i>Larix</i>	5.0	0.1	0.8	0.2	79.3	40-80	<i>Larix decidua</i>	79.3		a
Leguminosae	1.8	0.0	0.3	0.1				n.a.		
Lythraceae	0.0	0.0	0.0	0.0	30.0	20-40	<i>Lagerstroemia indica</i>	30.0		b
Moraceae	43.6	0.8	3.5	0.8	16.45	10-20	<i>Morus alba</i> ; <i>Broussonetia papyrifera</i>	15.95	16.95	a
<i>Olea</i>	15.4	0.3	1.9	0.4	20.8	20-40	<i>Olea europaea</i>	20.1	21.5	a
Oleaceae	9.1	0.2	0.9	0.2				n.a.		
<i>Ostrya carpinifolia</i>	2634.0	51.3	206.0	47.7	25.9	20-40	<i>Ostrya carpinifolia</i> *	24.3	27.5	a
<i>Parthenocissus</i>	0.0	0.0	0.2	0.0	34.55	20-40	<i>Parthenocissus sp.</i>	35.7	33.4	a
<i>Picea</i>	27.3	0.5	5.0	1.2	107.7	>80	<i>Picea abies</i>	107.7		a
Pinaceae	1.4	0.0	0.1	0.0				n.a.		
<i>Pinus</i>	161.1	3.1	23.2	5.4	71.45	40-80	<i>Pinus nigra</i> *; <i>P. sylvestris</i>	75.5; 67.4		a
<i>Pistacia</i>	2.2	0.0	0.3	0.1	31.9	20-40	<i>Pistacia lentiscus</i>	30.4	33.4	a
<i>Plantago</i>	32.5	0.6	3.7	0.9	26.2	20-40	<i>Plantago lanceolata</i> ; <i>P. media</i>	25.4; 26.9		a
<i>Platanus</i>	26.1	0.5	1.8	0.4	21.3	20-40	<i>Platanus sp.</i>	19.5	23.1	a
Poaceae	166.0	3.2	32.5	7.5	33.8	20-40	<i>Alopecurus pratensis</i> ; <i>Cynodon dactylon</i> ; <i>Dactylis glomerata</i> ; <i>Festuca pratensis</i> ; <i>Phleum pratense</i>	29; 33; 36; 36; 35		b
Polygonaceae	23.3	0.5	1.1	0.2	22.4	20-40	<i>Rumex acetosa</i>	22.4		a
<i>Populus</i>	36.9	0.7	3.3	0.8	30	20-40	<i>Populus sp.</i>	30		a
<i>Quercus</i>	138.3	2.7	13.7	3.2	27.3	20-40	<i>Quercus ilex</i> *; <i>Q. pubescens</i>	25.25	29.35	a
Ranunculaceae	0.0	0.0	0.0	0.0				n.a.		
Rosaceae	2.5	0.0	1.1	0.3				n.a.		
Rubiaceae	0.9	0.0	0.0	0.0	16.6	10-20	<i>Galium anisophyllum</i>	15.3	17.9	a
<i>Salix</i>	26.7	0.5	1.4	0.3	19.6	10-20	<i>Salix sp.</i>	18.8	20.4	a
<i>Sambucus</i>	18.5	0.4	6.1	1.4	17.9	10-20	<i>Sambucus nigra</i>	17.1	18.7	a

<i>Tilia</i>	2.9	0.1	0.3	0.1	27.9	20-40	<i>Tilia cordata</i>	23.9	31.9	a
<i>Ulmus</i>	5.4	0.1	0.6	0.1	26.1	20-40	<i>Ulmus minor*</i>	24.9	27.3	a
Urticaceae	669.4	13.0	26.2	6.1	13.1	10-20	<i>Urtica dioica; Parietaria officinalis</i>	12.7	13.4	a
<i>Vitis</i>	48.9	1.0	3.4	0.8	23.3	20-40	<i>Vitis sp.</i>	22.8	23.7	a
<i>Xanthium</i>	0.0	0.0	0.0	0.0	23.3	20-40	<i>Xanthium italicum</i>	23.1	23.5	a
<i>Zea mays</i>	0.0	0.0	0.2	0.0	99	>80	<i>Zea mays</i>	99		a
not identified	34.6	0.7	4.6	1.1				n.a.		

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