



# ICA2018

## 11th International Congress on Aerobiology

3-7 September 2018, Parma, Italy



SERVIZIO SANITARIO REGIONALE  
EMILIA-ROMAGNA  
Azienda Ospedaliero - Universitaria di Parma



UNIVERSITÀ  
DI PARMA

## **POLLEN AND PLANTS OF AMBROSIA IN PROVINCE OF PARMA (NORTHERN ITALY, SOUTHERN PO VALLEY): SURVEILLANCE FOR TARGETED PREVENTIVE MEASURES**

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a) *Ambrosia* is very important for allergy worldwide;

b) in Italy, the most infested region is Lombardy where, in some areas, it is the major cause of hay fever. Lombardy is counterminous to Parma territory.

c) until 2007, in Parma territory, *Ambrosia*. seemed to be very rare, despite an observed increase of pollen concentration and asthma among ragweed sensitized patients.

Considering that without knowledge there is no control, the aims of this study were to:

- 1) calculate ragweed pollen season and trends;
- 2) assess the relationships between pollen season characteristics and selected meteorological data;
- 3) map plants in the territory;
- 4) evaluate the presence of beetle *Ophraella communa*, known as an eater of *Ambrosia* leaves.

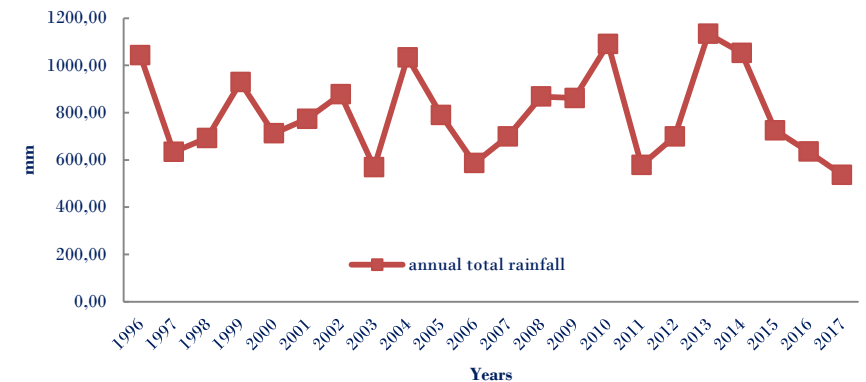
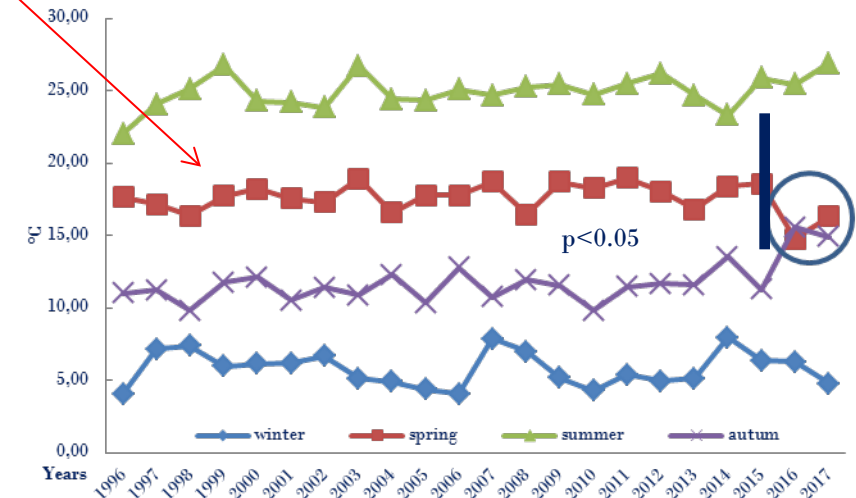
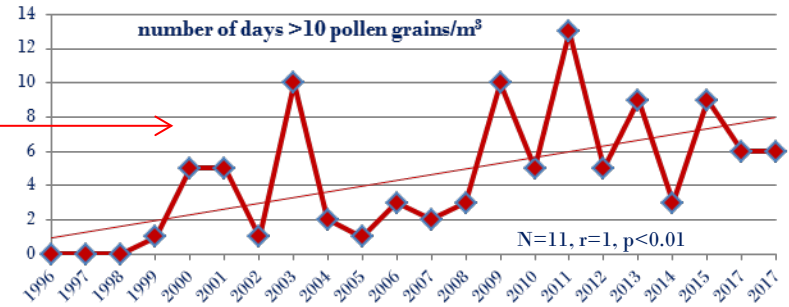


From 1996 to 2017, start, end, duration, peak date, peak values, SPI and temperature, relative humidity, rainfall, were analyzed.

The *Ambrosia* plants sites were mapped and the presence of *O. communa* was assessed during naturalistic activities.

# RESULTS

- 1) the number of days >10 pollen grains/m<sup>3</sup>
- 2) the spring average air temperature until 2015 increased significantly.



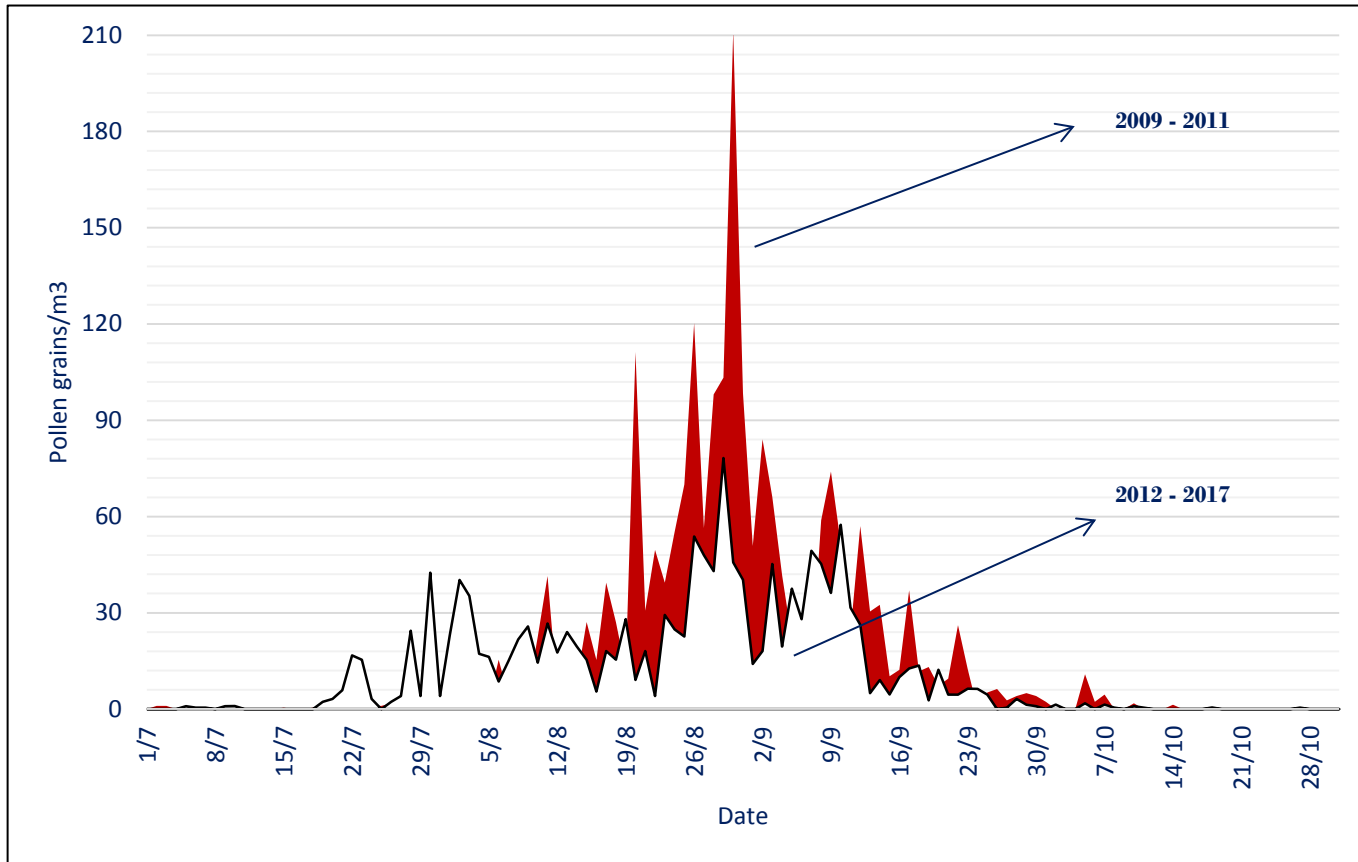
1996 - 2017	Median	Mean	SD	R <sup>2</sup>	Slope	SE	p	N
Start date (DOY)	219	214.9	20.5	0.00	0.08	0.82	0.92	22
Peak date (DOY)	242	240.9	7.8	0.01	0.11	0.31	0.73	
End date (DOY)	262	265.6	14.1	0.07	-0.61	0.54	0.28	
Duration (DOY)	43	50.9	19.4	0.04	-0.64	0.76	0.41	
Peak value (Pollen/m <sup>3</sup> )	36	42.2	30.6	0.16	2.10	1.11	0.08	
SPI	259	300.2	214.9	0.43	23.69	6.49	<b>0.00</b>	

Significant SPI increase was observed

## Correlation analysis showed some *Ambrosia* season characteristics significantly related

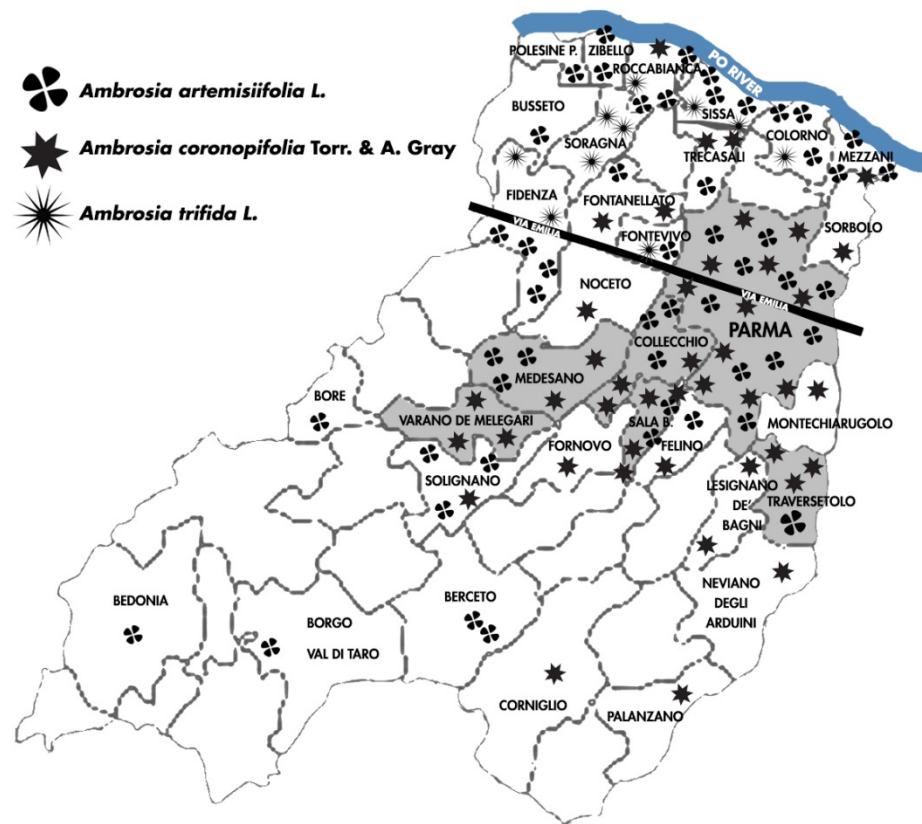
Seasonal and meteorological data	Start	End	Duration	Peak value	SPI	Day of Peak	Winter mean temperature
Start	-	ns	<b>-0.589**</b>	ns	ns	ns	ns
End	ns	-	<b>0.506*</b>	<b>-0.463*</b>	<b>-0.541*</b>	ns	ns
Duration	<b>-0.589**</b>	<b>0.506*</b>	-	<b>-0.447*</b>	<b>-0.552*</b>	ns	ns
Peak value	ns	<b>-0.463*</b>	<b>-0.447*</b>	-	<b>0.820***</b>	ns	ns
SPI	ns	<b>-0.541*</b>	<b>-0.552*</b>	<b>0.820***</b>	-	ns	ns
Day of peak	ns	ns	ns	ns	ns	-	ns
Winter mean temperature	ns	ns	ns	ns	ns	ns	-
Spring mean temperature	ns	ns	ns	ns	<b>0.582**</b>	ns	ns
Summer mean temperature	ns	ns	ns	ns	<b>0.490*</b>	ns	ns
Autumn mean temperature	ns	ns	ns	ns	ns	ns	ns
Relative humidity	ns	ns	ns	ns	ns	<b>0.538*</b>	<b>-0.499*</b>

**Recently, 2012-2017 vs 2009-2011, a strong reduction (over 50%) of SPI and Peak value was observed.**



Comparison of the pollen means per day - 2009-2011 vs 2012-2017.

	Altitude above sea level	<i>A. artemisiifolia</i>	<i>A. cononopifolia</i>	<i>A. trifida</i>
Bedonia	500	1	-	-
Berceto	285-450	2	-	-
Bore	653	1	-	-
Borgo Val di Taro	660	1	-	-
Busseto	40	1	-	-
Collecchio	81-115	3 (1)	3 (1)	-
Colorno	32	2	-	1
Corniglio	385	-	1	-
Felino	220	1	1	-
Fidenza	53-100	4	-	2
Fontanellato	42	1	1	1
Fornovo di Taro	150	-	1	-
Lesignano de' Bagni	220	-	2	-
Medesano	95-126	3 (2)	2 (2)	-
Mezzani	26-30	3	1	-
Montechiarugolo	125	-	1	-
Neviano degli Arduini	517	-	1	-
Noceto	75	-	1	-
Palanzano	360	-	1	-
Parma	34-145	9 (1)	10 (1)	-
Polesine Parmense	33	1	-	-
Roccabianca	31-35	3	1	1
Sala Baganza	175-275	2 (1)	4 (1)	-
Sissa	30	3	-	2
Solignano	150-175	3	1	-
Soragna	42-48	-	-	3
Sorbolo	35	-	1	-
Traversetolo	135-150	1	3 (1)	-
Trecasali	38	1	2	-
Varano de' Melegari	165-220	-	3 (1)	-
Zibello	35	2	-	-
Total	/	41 (5)	37 (7)	10



- We have mapped some sources of *Ambrosia*, including downtown at the confluence between Parma and Baganza rivers.
- *A. trifida*, *A. coronopifolia* (*psilostachya*) and *A. artemisiifolia* are widespread throughout the province;
- *A. trifida* was observed only north of *Via Emilia*.
- *O. communis* was observed for the first time in 2014, in some areas, not on *A. trifida* leaves.

## CONCLUSIONS

The results showed a spread of ragweed plants over the territory.

The impact of *O. communa* on *Ambrosia* pollen production remains to be understood over a long period.

No law and no enforcement initiative by health authorities to become acquainted, prevent or reduce *Ambrosia* plants spread could determine consequences on public health by increase of the risk of allergy to ragweed and the consequent increase of sanitary costs.

Thanks for your attention