

C.S.I. Pollen

Citizen Scientist Investigation on pollen diversity forage available to honey bees



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PLANT RESEARCH INTERNATIONAL
WAGENINGEN UR

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Promotion in beekeeping journals

FANCY YOURSELF AS A SCIENTIST?

CSI Pollen

Norman L Carreck, NDB
(International Bee Research Association)

mijn bijen

C.S.I. POLLEN: PREOCUPĂRI PRIVIND INVESTIGAREA POLENULUI DISPONIBIL, ALBINELOR, MELIFERE
de Ing. Vasileza KOK
Laboratorul de Flori Utilizate și Protecție - I.C.-G.A. București

Apicultorii pasionați de țara noastră și interesați de diversitatea și logica lucrurilor de țară pot participa în mod voluntar la activitatea de studiu a diversității plantelor melifere din jurul apiculturii apicole.

STUDIUL POLENULUI DIN COLECȚIILE DE POLEN

Ny mulighet for å være med på biforskningsprosjekt: C.S.I. Pollen

C.S.I. Pollen – Großräumige Untersuchung der Pollendiversität

Centra de Cercetare de Albină din România

România apicolă

Workshop in Graz

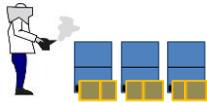


Workplan

- 2 levels of investigation:
 - 1. Citizen scientists investigation
 - 2. Palynological analysis

Communication with citizen scientists

Collect pollen



Estimate about 20 g sample for analysis



Determine number of different pollen colours



Report results to national coordinators using www



Communication with citizen scientists

- Picture manual



Expected (first level) results

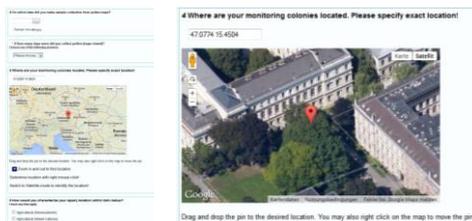
- Spatial and temporal characterization of pollen availability
 - Identification of pollen diversity in **habitats**
 - geographically
 - by habitat type (city, village, agriculture, forest,...)
 - Identification of pollen diversity in **season**
- Differences between colonies at same locations?
- Correlation with geographical data
 - land use
 - sea level

Communication with citizen scientists

- Picture manual
- Online tool (Limesurvey)
 - Language versions
 - Invitation to submit data 2 days before sampling date
 - Reminder to submit data ca. 8 days after invitation

Communication with citizen scientists

- Picture manual
- Online tool (Limesurvey)
 - <https://survey.uni-graz.at/index.php?sid=76226&lang=en>



Status of first level study

- 2014: 8 / 9 samplings accomplished
 - 21 European countries
 - Documents in 15 different languages
- 2015: 9-10 samplings planned
- 2015: Increase participation
 - Beekeepers
 - Countries

- o 3.-6. April
- o 24.-27. April
- o 15.-18. May
- o 5.-8. June
- o 26.-29. June
- o 17.-20. July
- o 7.-10. August
- o 28.-31 August
- o 18.-21. September

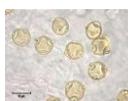
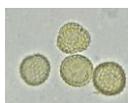
Second level study



Number of different colours



Number of pollenspecies
(palynological analysis)



Expected (second level) results

- Second level:
 - Selected citizen scientists are asked to provide pollen samples for **palynological analysis**.
- **Palynological analysis**
 - Validation of first level results
 - If needed: correction of first level results
 - Overestimation / Underestimation

Pollen samples (2nd level)



Pollen samples (2nd level)

- Microscopic evaluation of 500 pollen grains per sample (colony)
- Method of Barth et al., 2010



Pollen samples (2nd level)

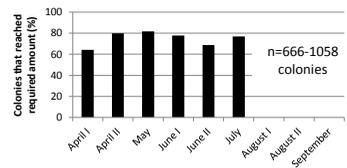


April sampling, [%]

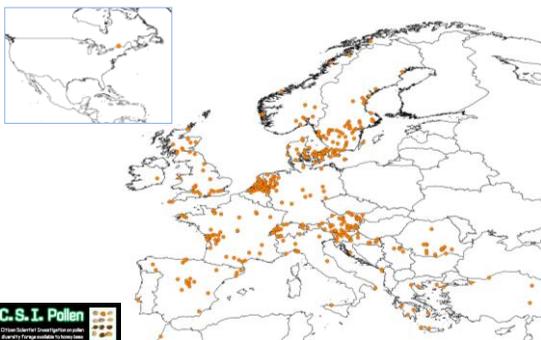
	Colony 1	Colony 2	Colony 3
Acer sp.	71	57	57,2
Aesculus hippocastanum	1,8	1,8	5,6
Allium sp.			0,4
Apiaceae	1,2	2,4	2
Asteraceae	1,2	0,4	
Brassicaceae	1,2		0,4
Cirsium sp., Carduus sp., Silybum sp.*	0,4	0,2	
Fagus sylvatica	1,6	9	3,8
Geranium sp.			0,2
Ilex aquifolium			1,8
Juglans sp.		0,2	
Lamium-Form7 (3 Kst.)		0,4	0,4
Lonicera sp.	1,4	0,2	0,6
Malus sp., Pyrus sp., Crataegus sp.*		0,6	5
Picea abies	0,2		
Picea abies, Abies alba		0,4	0,2
Pinus sp.	0,2		
Quercus sp.		2	2,6
Ranunculus sp.	7,8	4,2	3,8
Salix sp.	1,8	8,4	3,8
Syringa vulgaris	5	9,4	4,6
Taraxacum-Form3	6,4	3,2	6
Tragopogon sp.	0,6		1,4
Trifolium pratense-Form4		0,2	0,2

Preliminary results: Participation

- Up till sampling #6 (July)
 - 447 individual C.S. participated at least once
 - On average, 328 participants participated with at least 1 colony in sampling

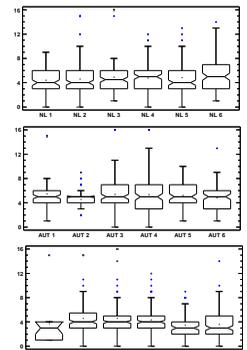


Apiary location of C.S.I. agents (2014: prelim.)

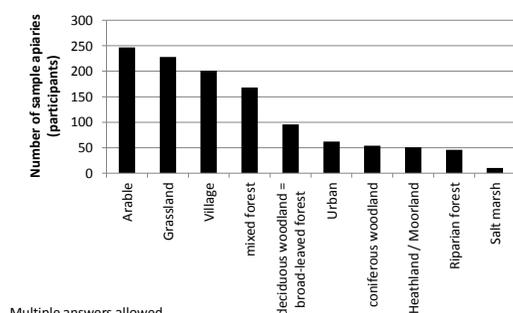


Preliminary results

- Abundant colours only!
- First 6 samplings
- n (colonies):
 - NL: 91-130
 - AUT: 99-126
 - SWE: 21-179
- P<0,05 (Moods median) in AUT and SWE



Beekeepers description of habitat within 2 km



Multiple answers allowed

Habitat type and seasonal variation

(2014: prelim.)

Habitat type	Kruskal-Wallis /w Dunn's multiple comparisons
Arable	p<0.05
Urban	n.s.
Village	n.s.
Grassland	n.s.
Heathland / Moorland	p<0.05
Salt marsh	n.s.
deciduous woodland = broad-leaved forest	n.s.
coniferous woodland	n.s.
mixed forest	p<0.05
Riparian forest	p<0.05

Outcome for citizen scientists

- Establishment of a citizen scientist group that is equipped and trained to collect and store pollen for various research purposes
- Gain knowledge on pollen diversity and fluctuation
 - between colonies
 - during season

Anecdotes

- Waldorf school participates (Germany)
- „Nice evening activity with the kids instead of a game of Trivial Pursuit“ (Austria)
- Samples eaten by dog (Austria)
- Samples sold by wife (France)



Have a look at some related posters!

- **Božič & Podrižnik:** Monitoring of melliferous plants biodiversity using pollen loads samples from commercial bee hives
- **González-Porto, Molina-Abril, Pardo-Martín:** Diversity of pollen sources: Preliminary data from **C.S.I. Pollen** in Spain
- **Tamic, Aupinel, Odoux, Chabirand, Loublier:** Optimization of a method of pollen counting adapted to honeybee diet
- **Ion, Odoux, Bretagnolle:** Melliferous potential assessment of species: a useful tool to enhance the low diversified bee-food in agricultural habitats