



**MUÑOZ-ARNANZ, JUAN**

Researcher



# ATMOSPHERIC HCH CONCENTRATIONS (2008-2019) FROM THE SPANISH MONITORING PROGRAM ON POPs

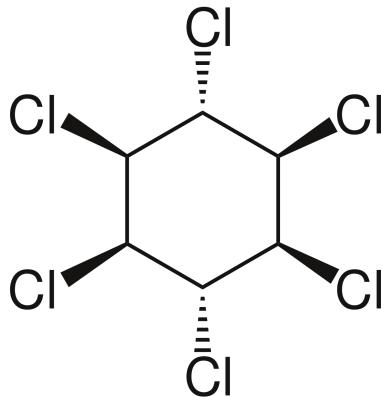
**J. Muñoz-Arnanz, P. Colomer-Vidal, M. Ros, A. Vicente, C. Salcedo, A. Bartalini, B. Jiménez**

# Stockholm Convention



## Object

Persistent  
Organic  
Pollutants  
(POPs)



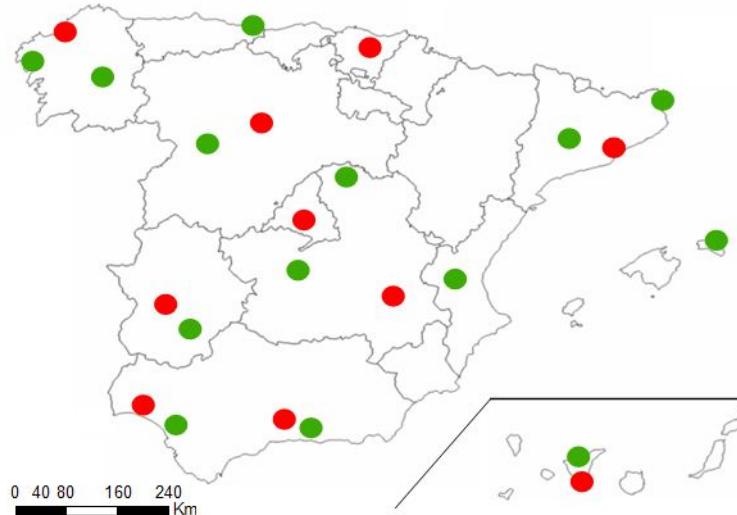
## Objective

“to protect human  
health and the  
environment from  
POPs”

## Measures

- ✓ Prohibit and/or eliminate the production and use of intentionally produced POPs.
- ✓ Reduce or eliminate releases from unintentionally produced POPs.
- ✓ Ensure that stockpiles and wastes consisting of, containing or contaminated with POPs are managed safely
- ✓ Others: Implementation plans (Article 7), research, development and **monitoring** (Article 11), reporting (Article 15), effectiveness evaluation (Article 16).

# Spanish Monitoring Program on POPs (SMP-POPs)



10 urban sites

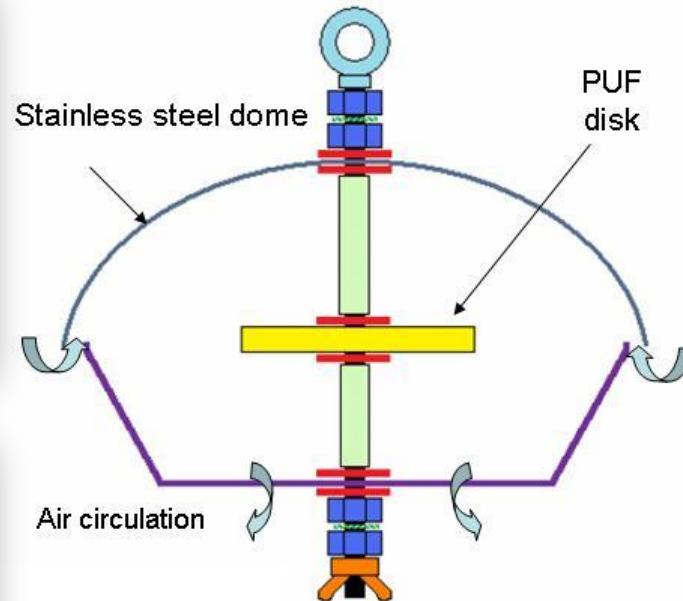


Data since 2008

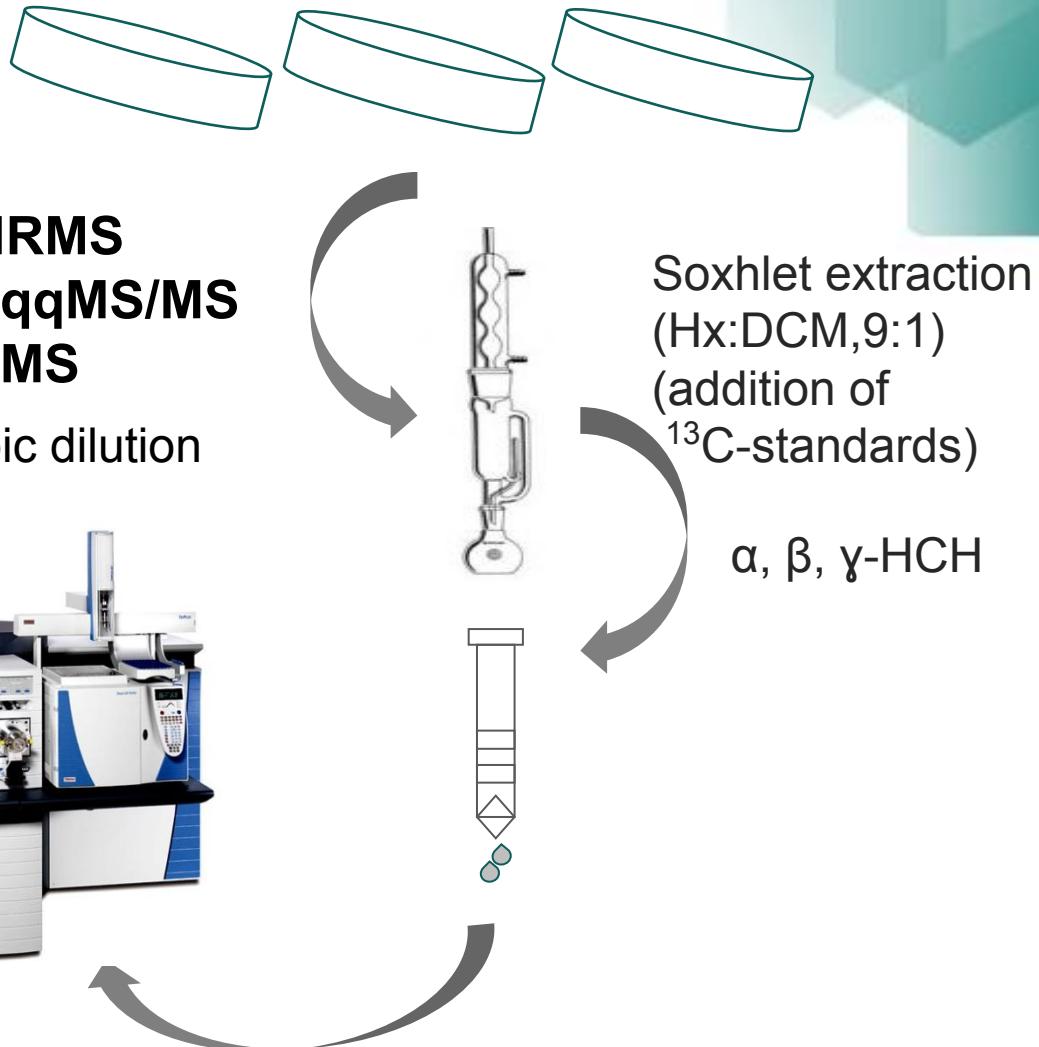


14 background sites

# Spanish Monitoring Program on POPs (SMP-POPs)



**GC-HRMS**  
**GC-qqqMS/MS**  
**GC-qMS**  
Isotopic dilution



# SPANISH MONITORING PROGRAM on POPs (SMP-POPs)



1-Barcelona



2- Azpeitia



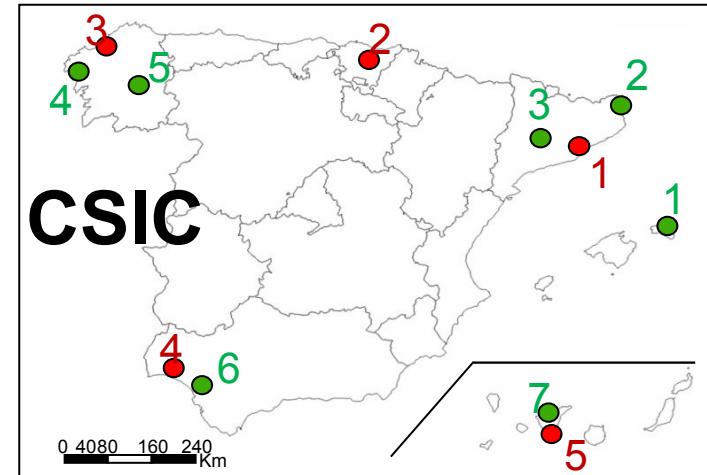
3- La Coruña



4- Huelva



5- Sta. Cruz  
de Tenerife



1- Menorca



2- Cabo de  
Creus



3- Els  
Torms



4- Noia



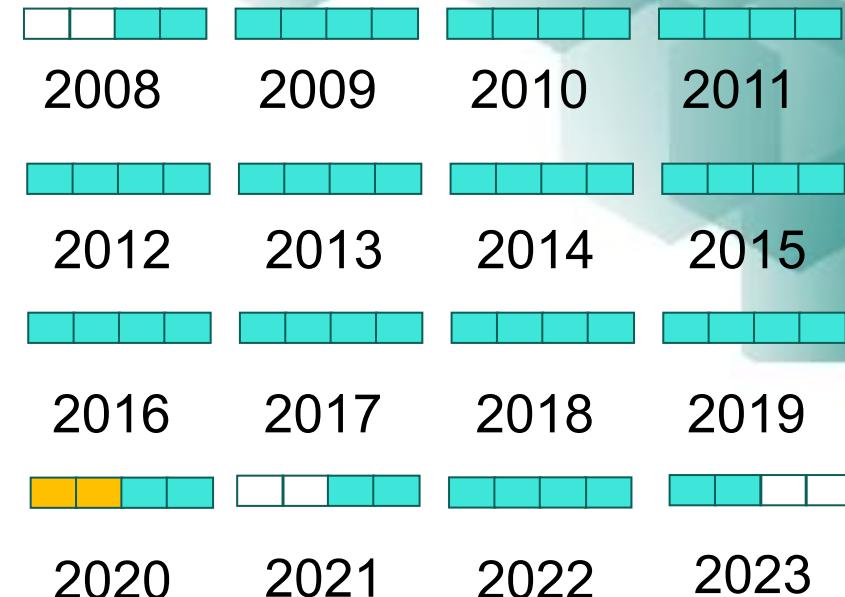
5- O'Saviñao



6- Doñana



7- Izaña (Teide)



**55 campaigns**

>1300 samples

>1300 blanks

Data on

**69 analytes**

# SPANISH MONITORING PROGRAM on POPs (SMP-POPs)



1-Barcelona



2- Azpeitia



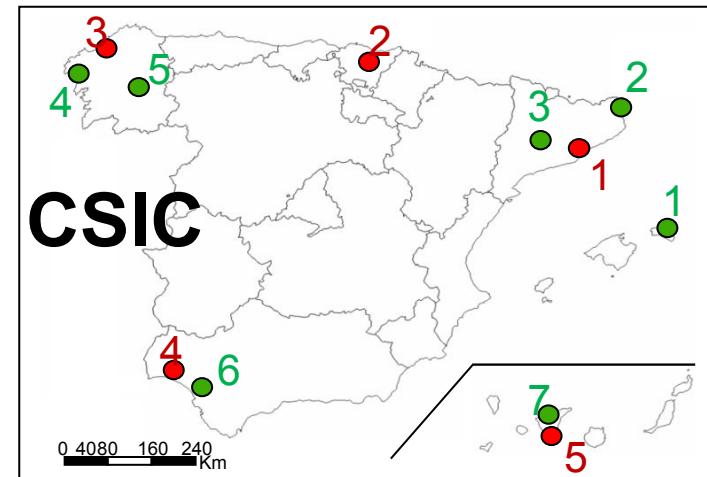
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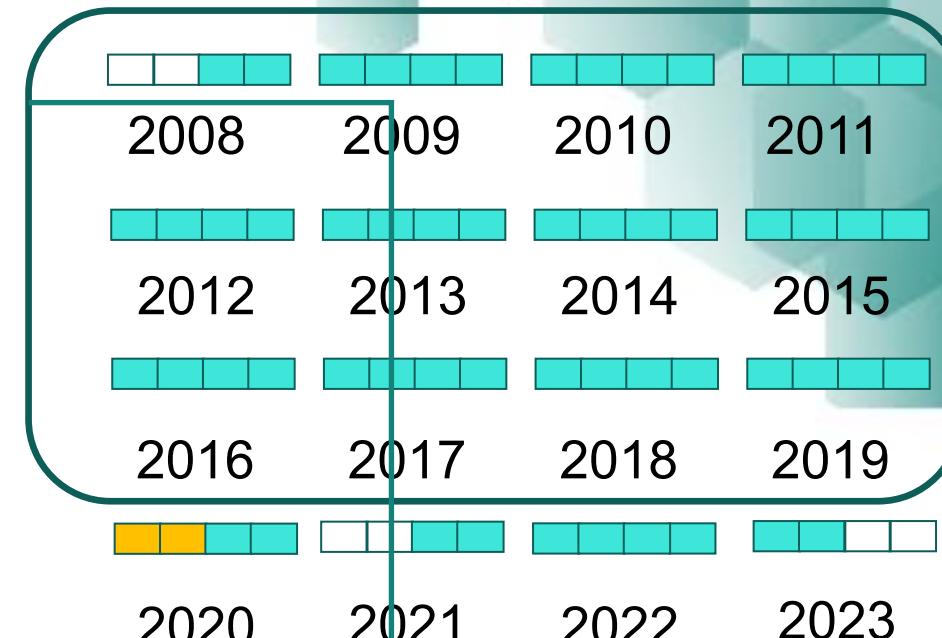
5- O'Saviñao



6- Doñana



7- Izaña (Teide)



46 campaigns

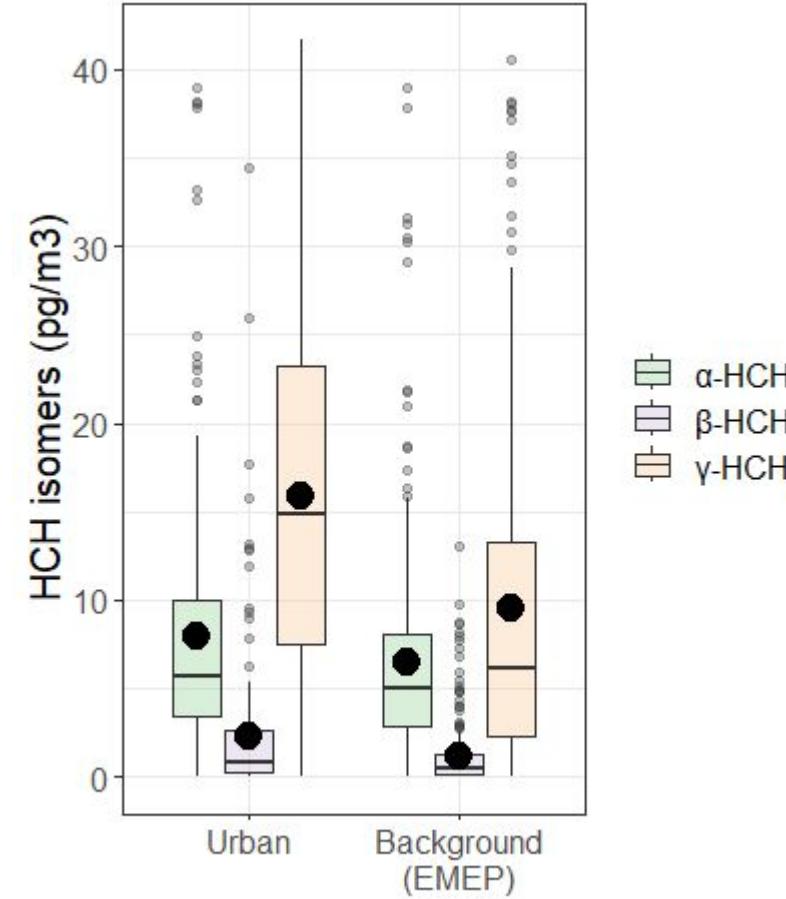
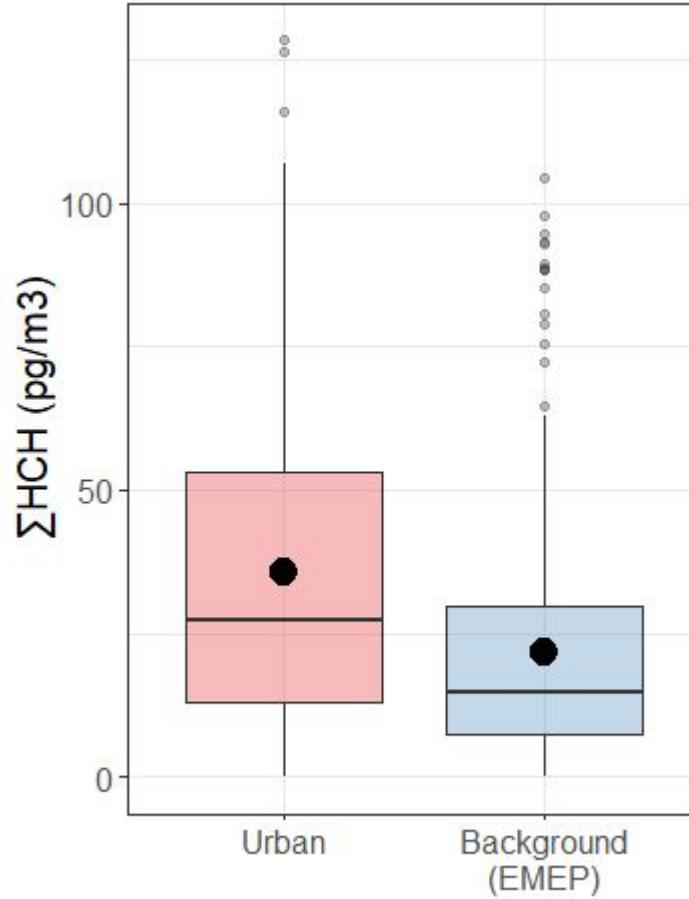
513 samples

513 blanks

Data on

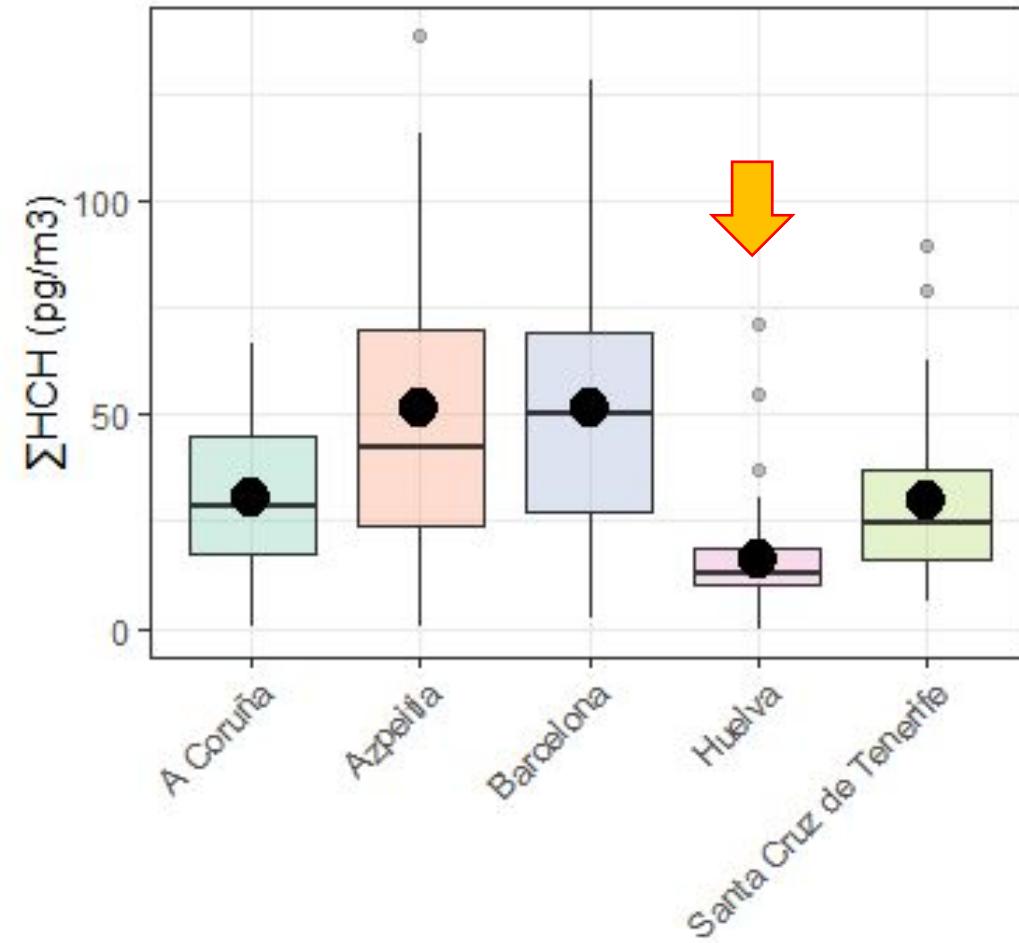
$\alpha$ ,  $\beta$ ,  $\gamma$ -HCH

# Urban vs. background

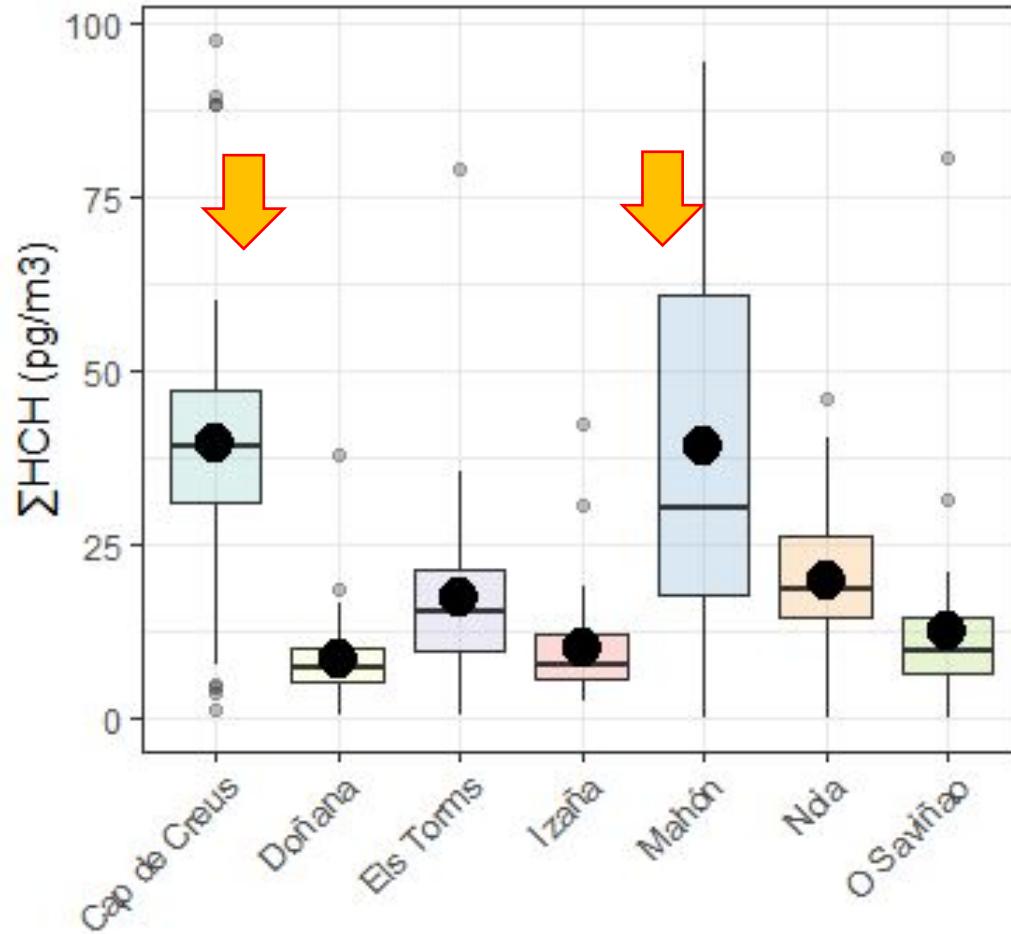


Statistically higher concentrations  
in urban than background locations

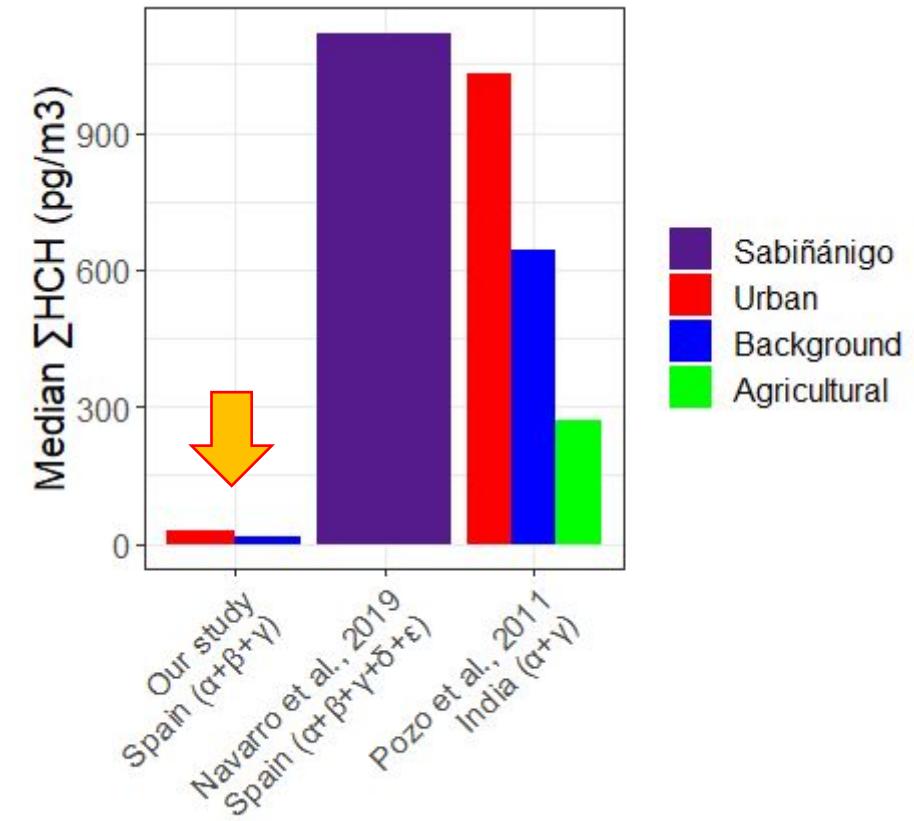
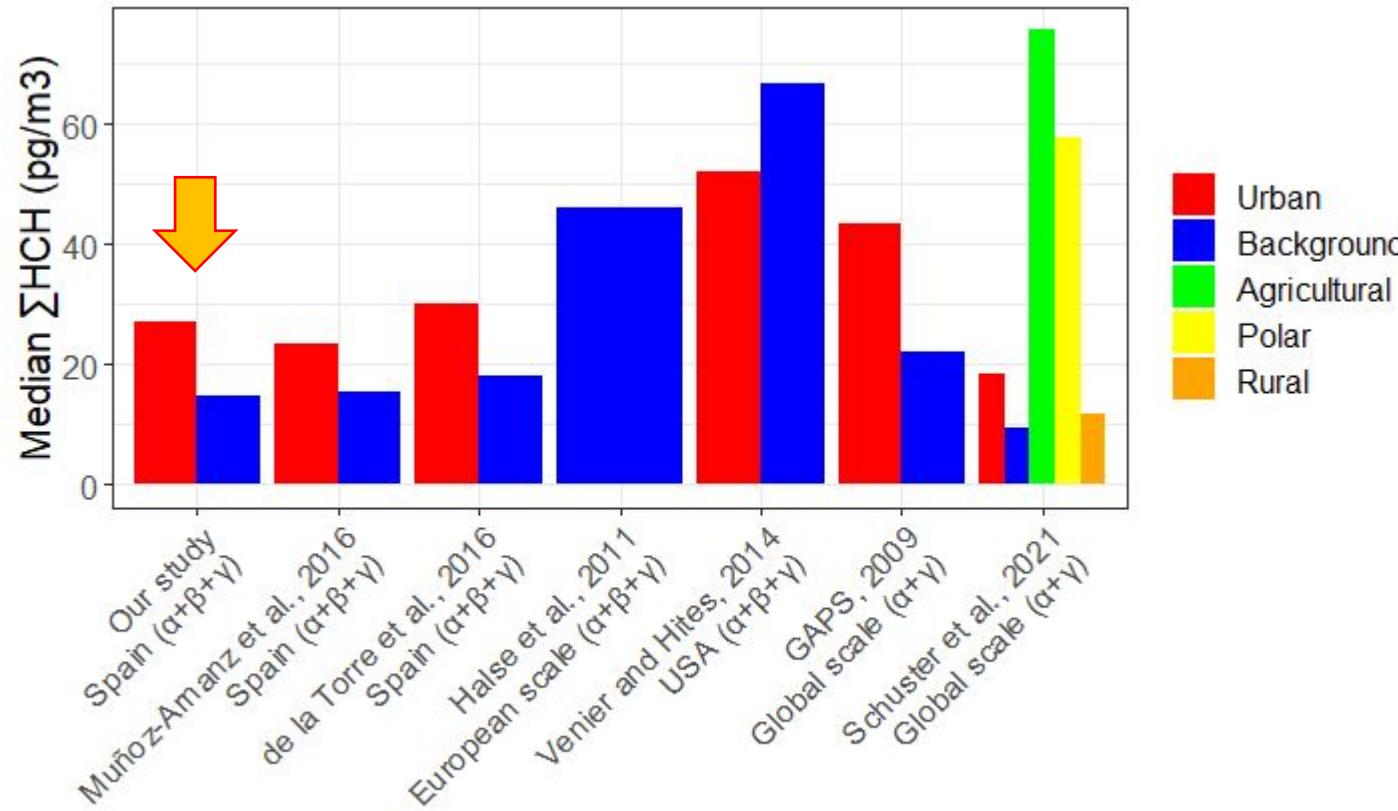
# Urban locations



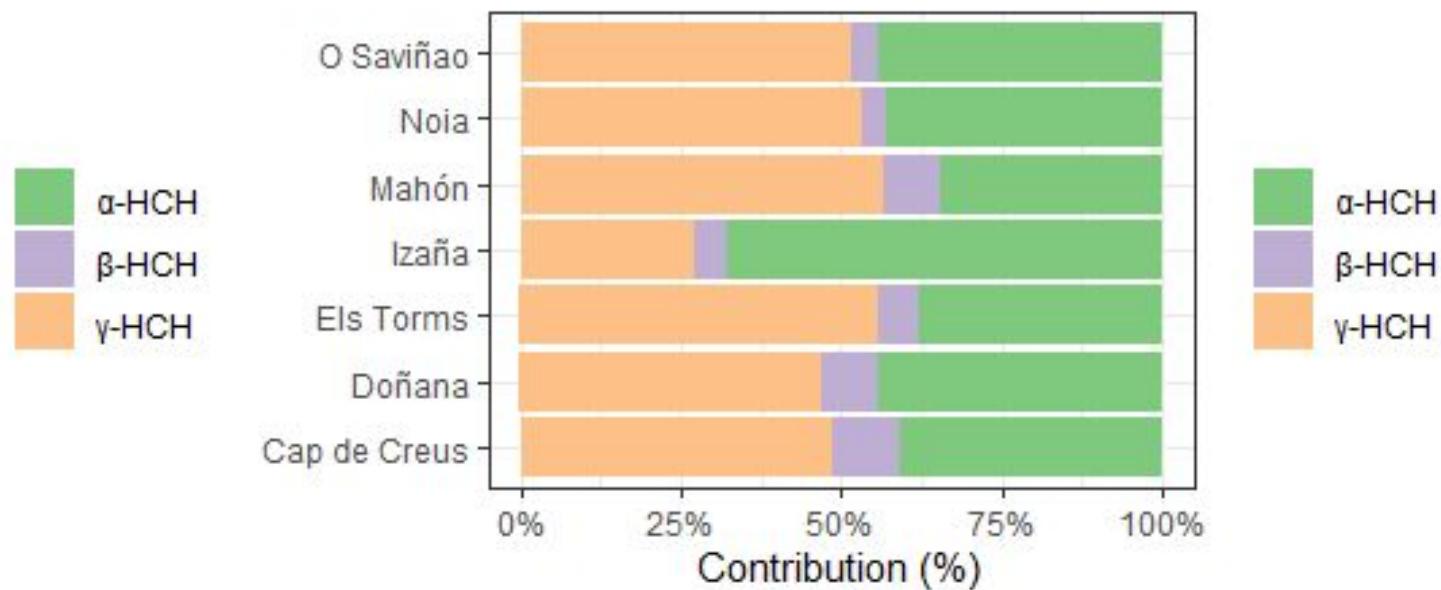
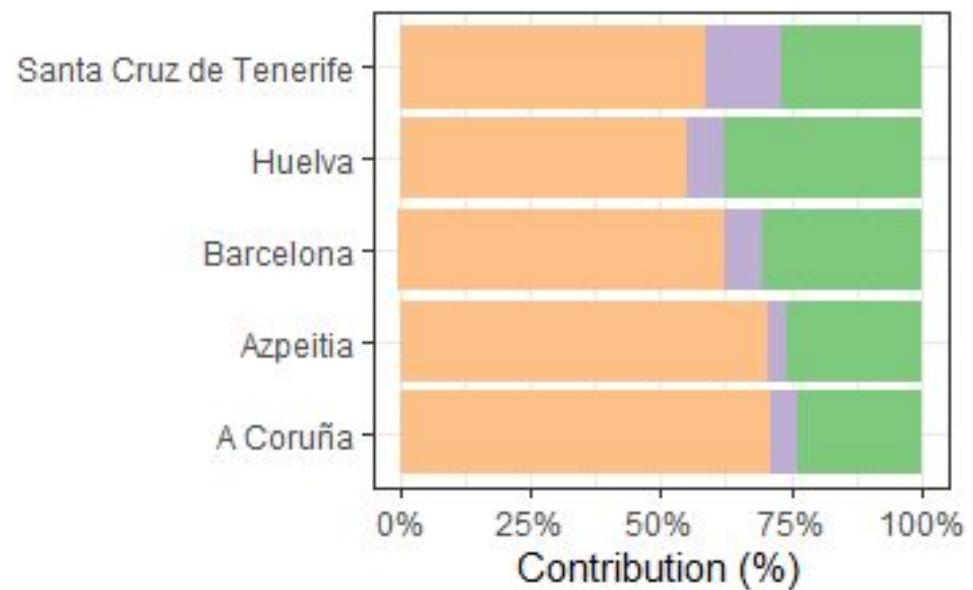
# Background locations



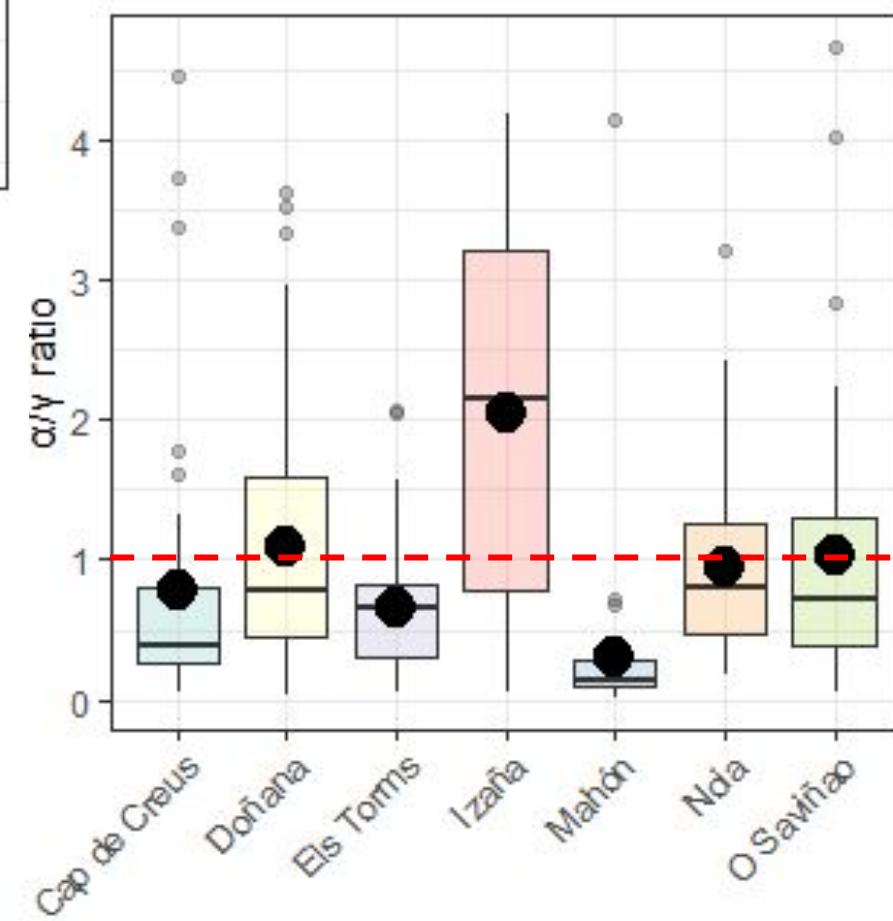
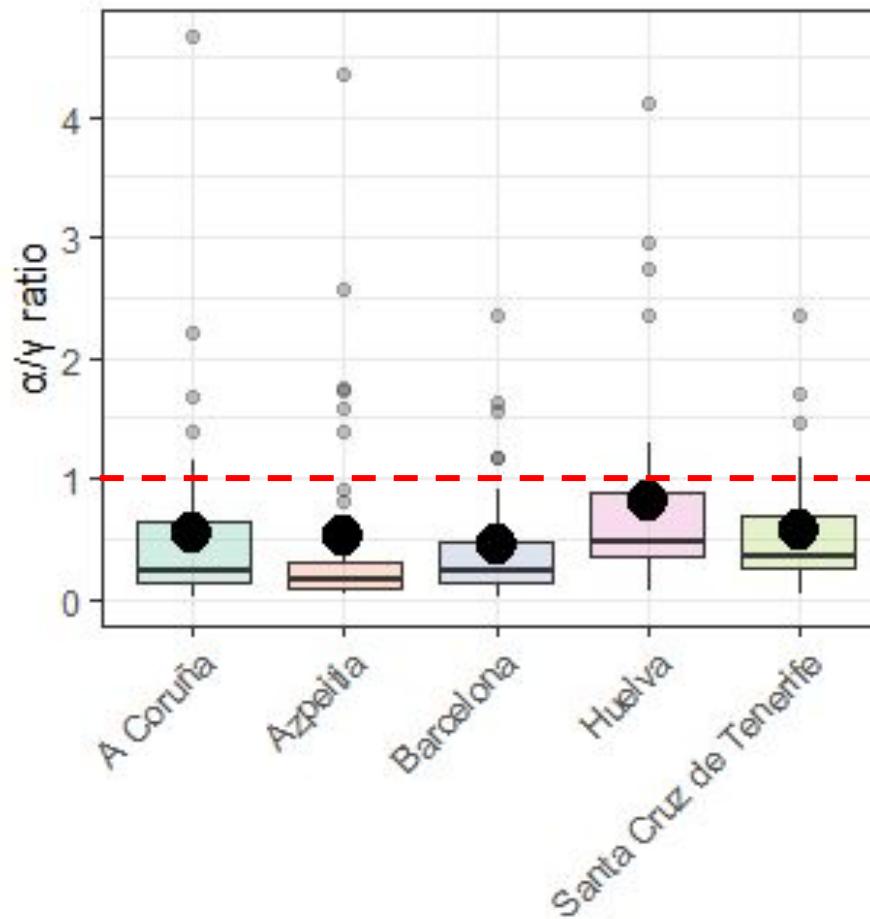
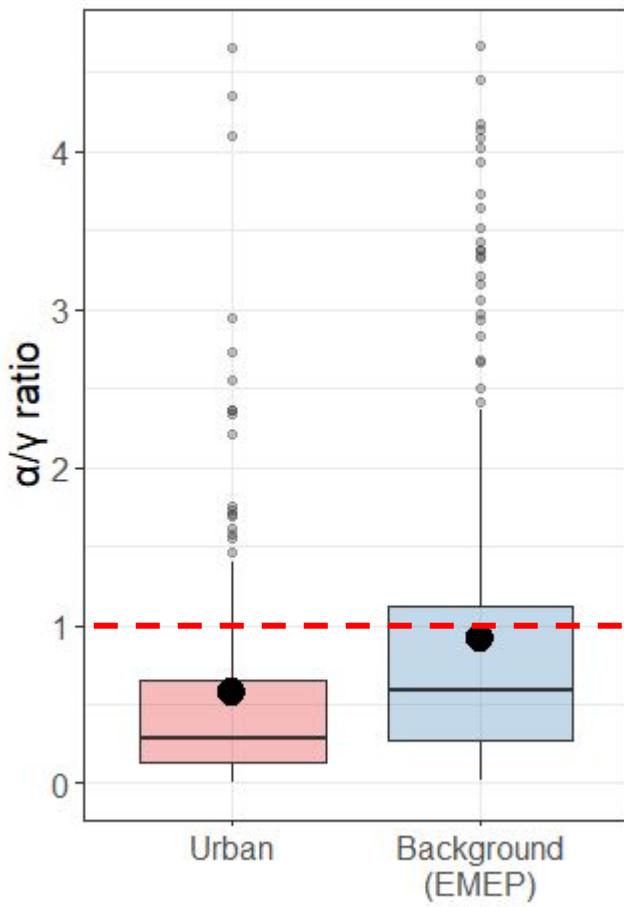
# Concentrations in “context”



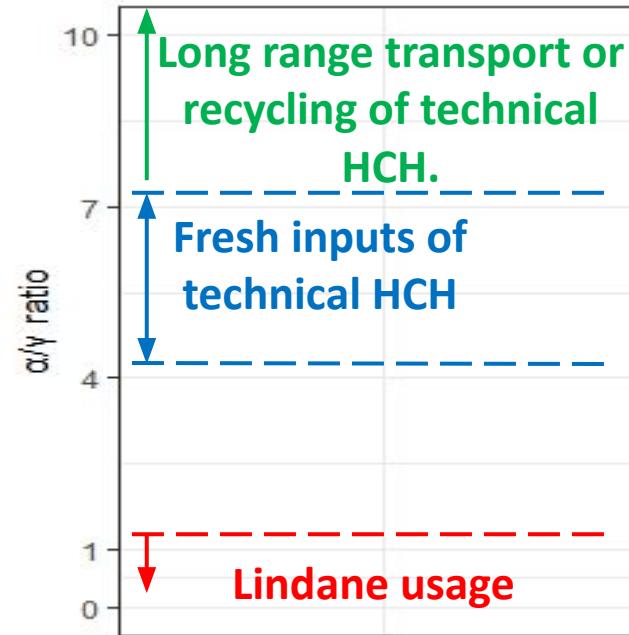
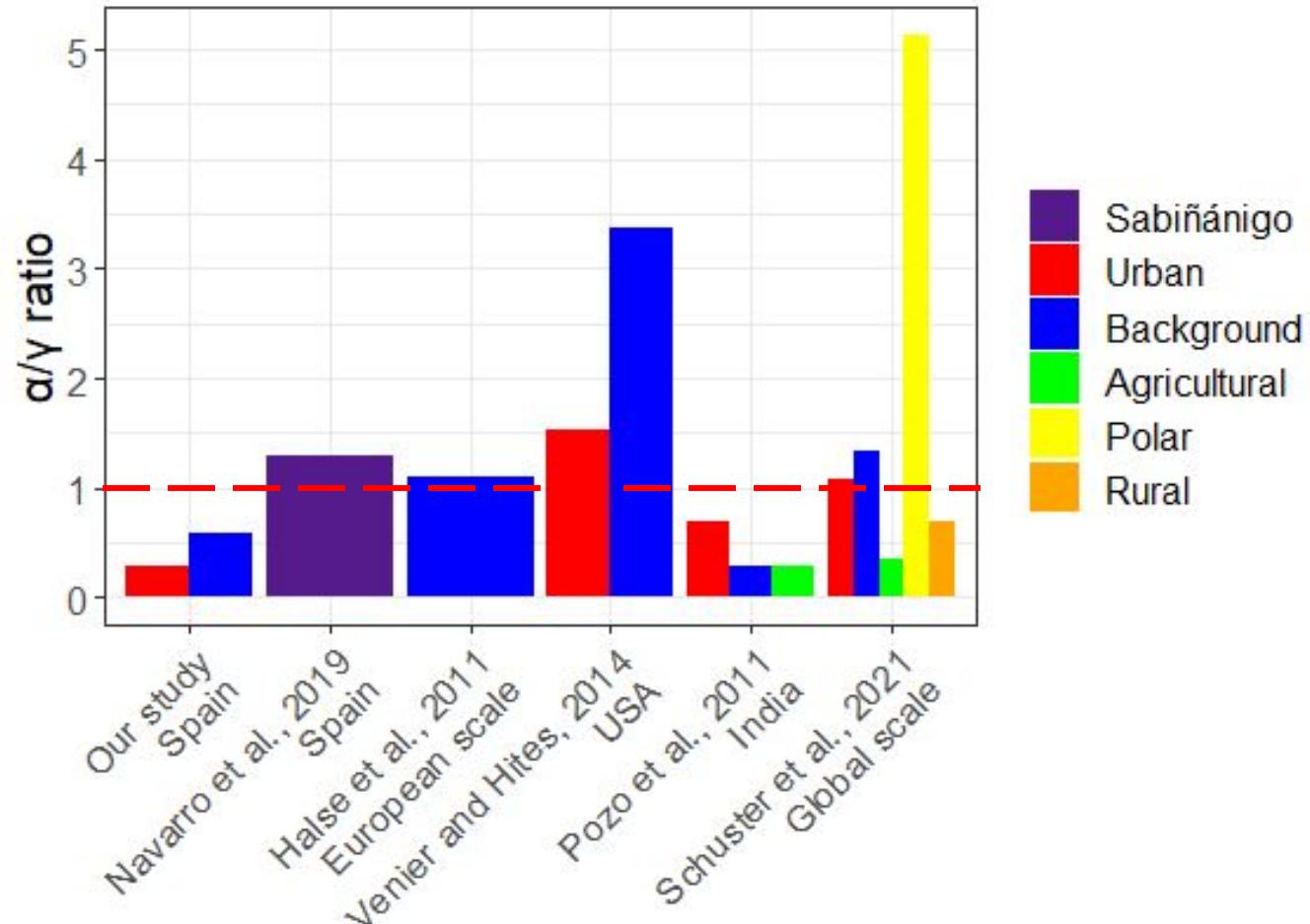
# Isomeric contribution



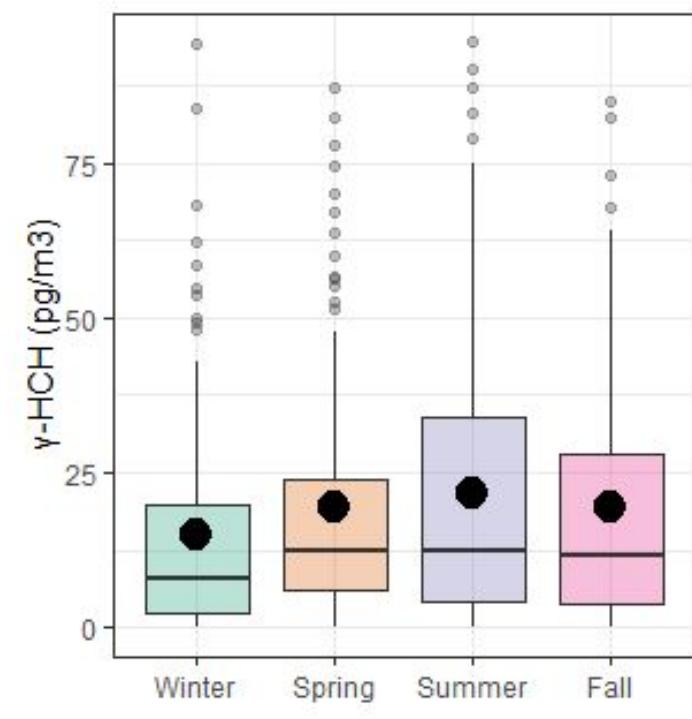
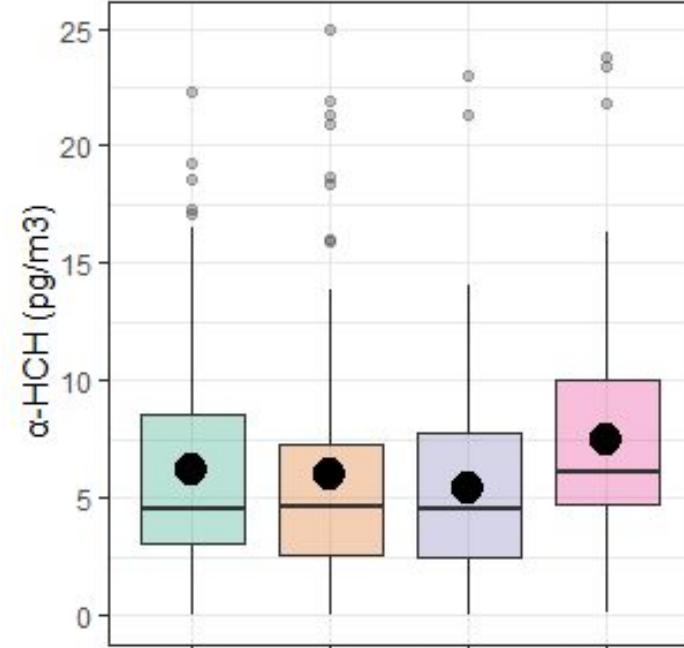
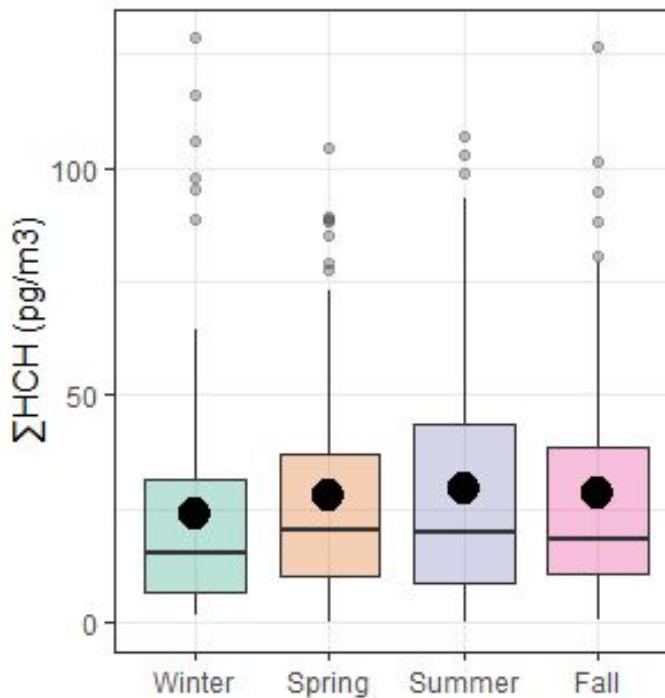
# $\alpha/\gamma$ ratio



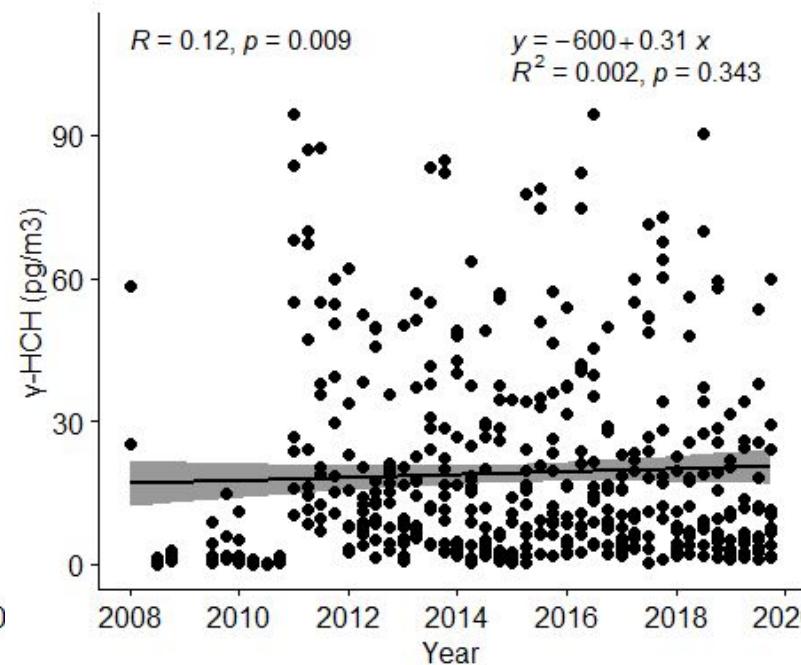
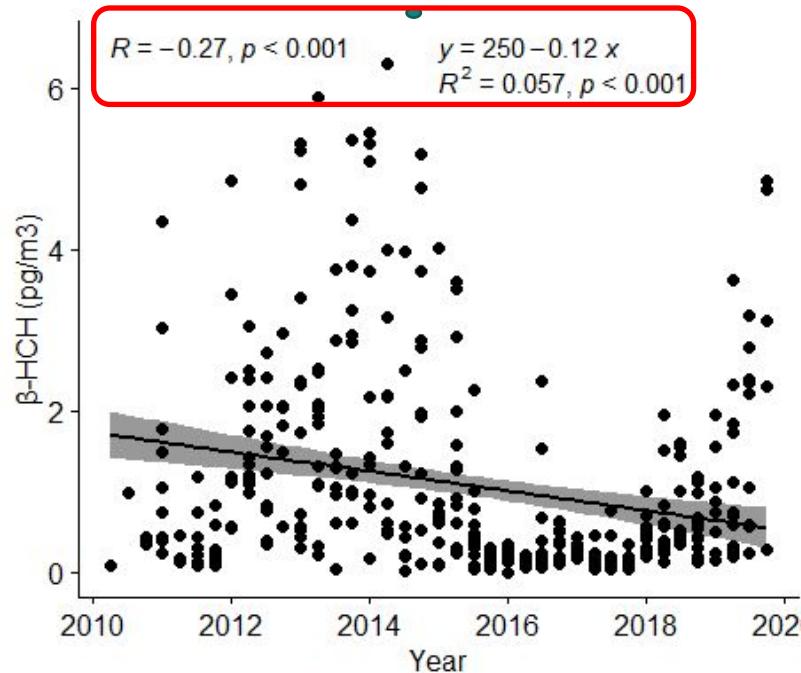
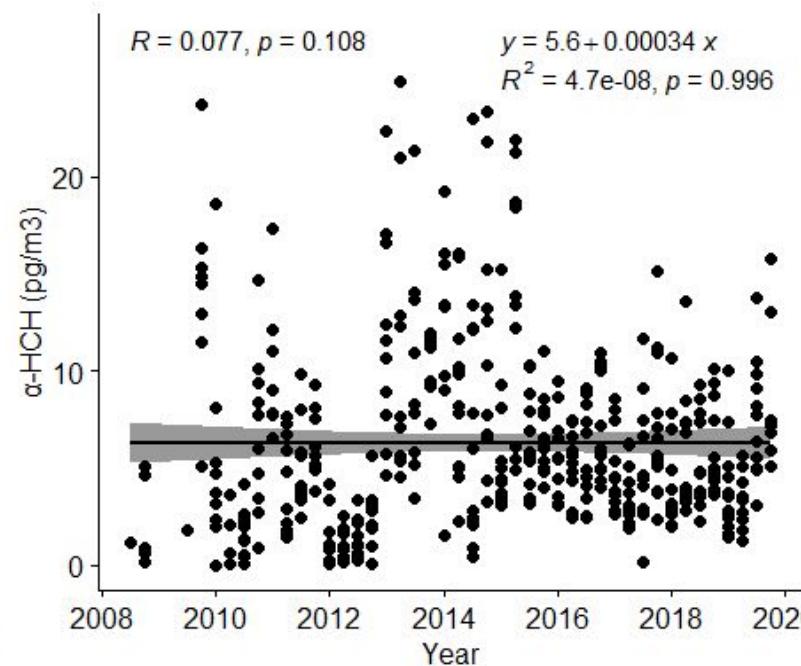
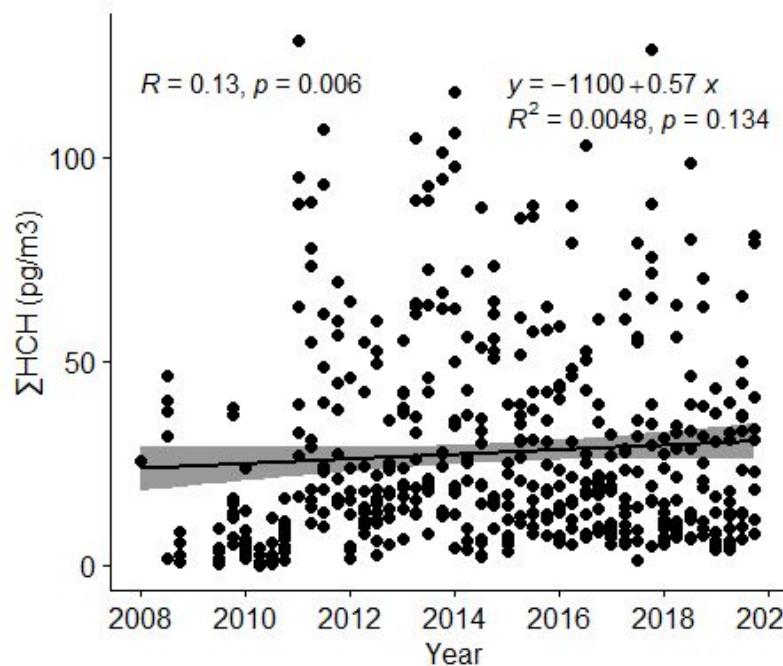
# $\alpha/\gamma$ ratio in “context”



# Seasonal variation



$\alpha\text{-HCH}$  in fall



## Temporal trends

# TAKE HOME MESSAGES

1

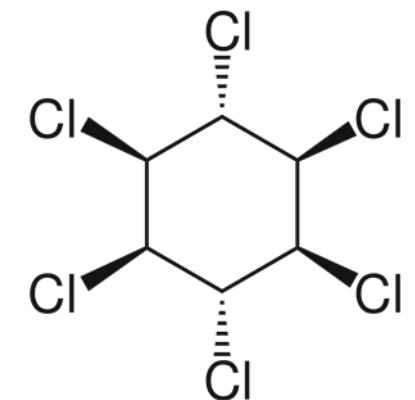
- Global concentrations comparable or lower to other national & international studies

2

- No clear seasonal behavior
- Stable levels over time 2008-2019 (slight decrease of  $\beta$ -isomer)

3

- Ongoing sources of  $\gamma$ -HCH (cities!)
- Need to continuous monitoring and research





# THANK YOU FOR YOUR ATTENTION

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