



Look for urban lichens and get to know the air quality of your city

*Physcia aipolia*



- Funded by the Spanish Foundation For Science and Technology - Ministry of Science, Innovation and Universities



- 2018 Call
- 50,000 € funding
- Coordinated by: Royal Botanic Garden - CSIC, GBIF.ES, CREAM & ICM - CSIC
- <http://liquencity.org/>

# Main goal

Make citizens aware about the effects of the dangers of air pollution on health, through their participation in the monitoring of highly sensitive living organisms, which live with us in large cities

# Secondary goals

1. Create **knowledge** about the value and the importance of lichens and their role in the environment as indicators of air pollution.
2. **Map air pollution in cities of Madrid and Barcelona**
3. **Involve citizens in public decision making.**
4. **Test the value of public participation in science.**



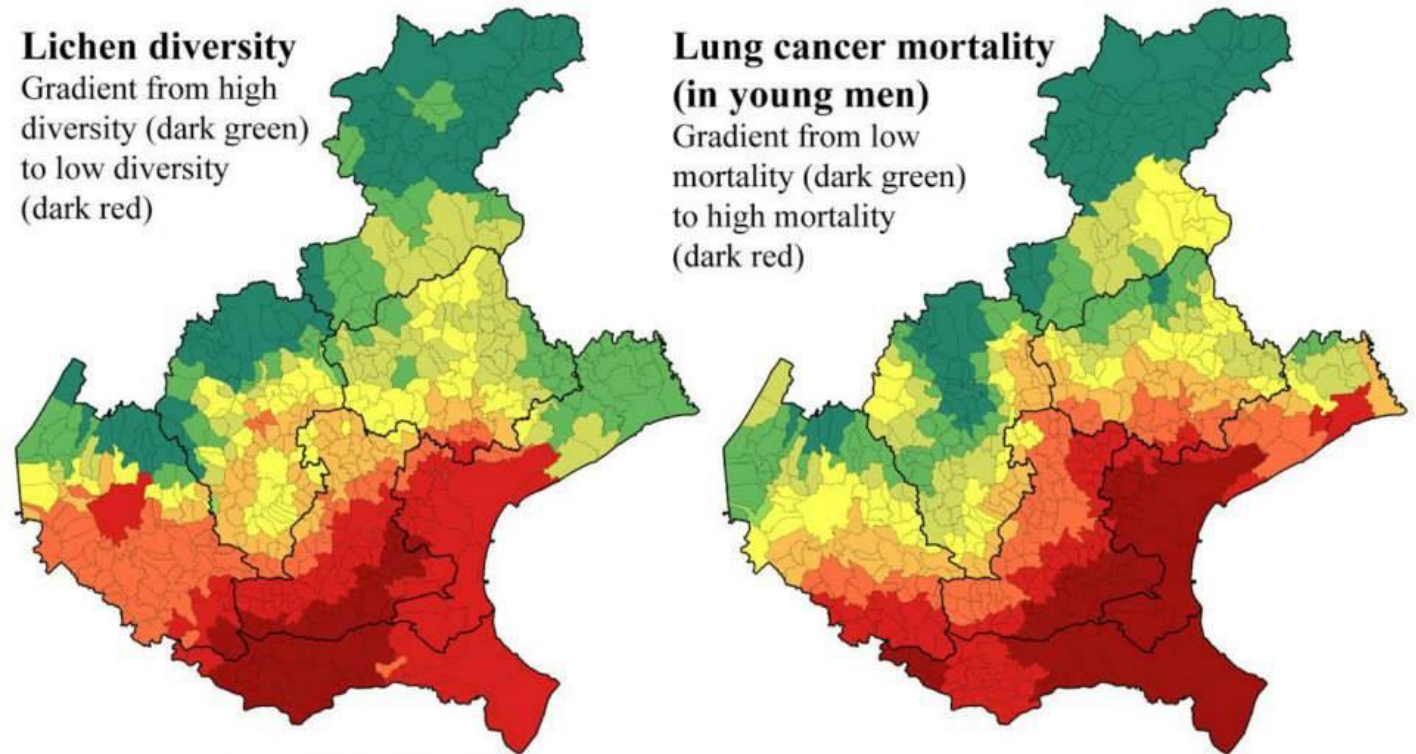
*Xanthoria parietina*

# Background

## Lichens, air pollution and lung cancer

Previous studies support that lung cancer is highly correlated with diversity and abundance of lichens.

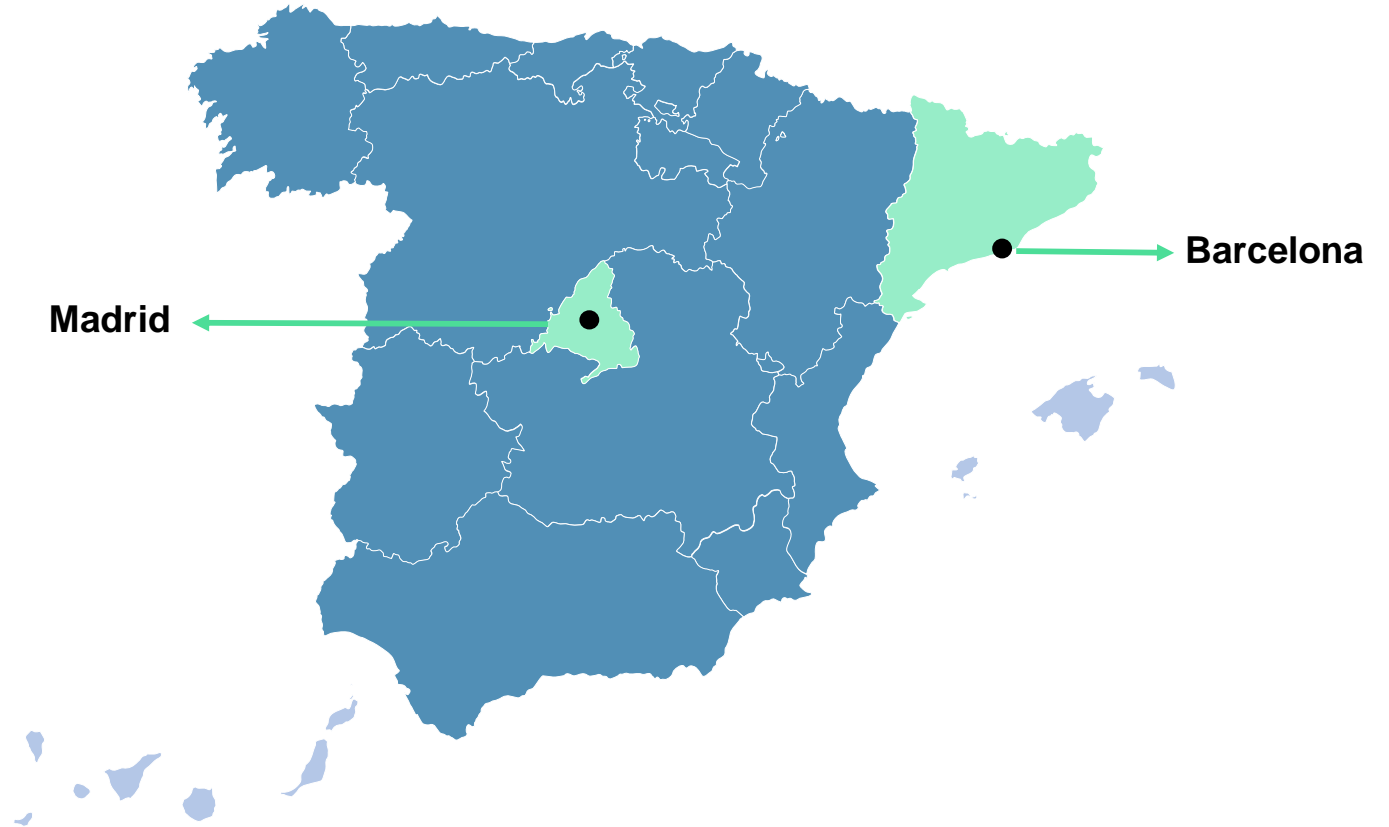
According to the latest study of the Global Burden of Disease (GBD), there are at least 15,000 deaths per year in Spain due to air pollution.



From the scientific article “**Lichens, air pollution and lung cancer**”, published in Nature 387 (1997) by Cesare Cislighi and Pier Luigi Nimis (redrawn by R. Lucking from original maps).

# Where are we carrying out this project?

Madrid and Barcelona



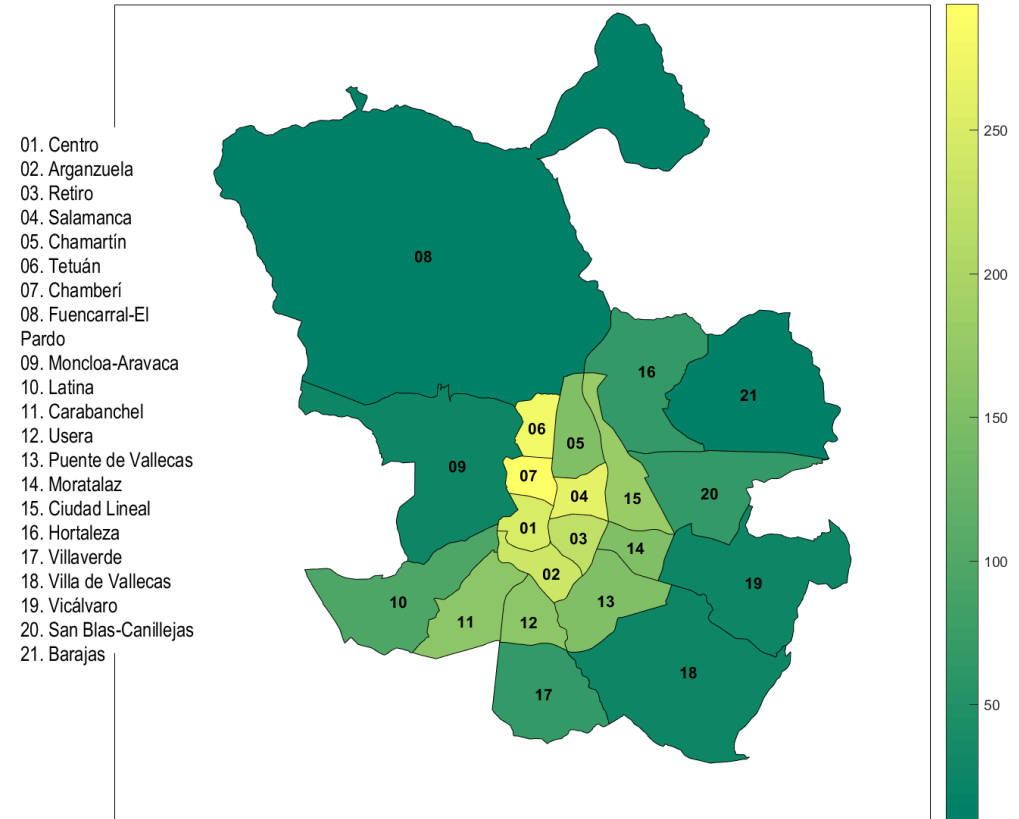
# Where are we carrying out this project?

## Madrid

21 districts, 131 neighbourhoods



Densidad poblacional (Ene 2016, hab./Ha.)



[www-2.munimadrid.es/CSE6/control/seleccionDatos?numSerie=14010100010](http://www-2.munimadrid.es/CSE6/control/seleccionDatos?numSerie=14010100010)



# Where are we carrying out this project?

## Barcelona

10 districts, 73 neighbourhoods



# Who is involved?



## SCHOOLS



Students and teachers who observe and quantify the presence of lichens in Madrid and Barcelona



## LICHENOLOGISTS



Experts reviewed and identified the observations of all the participants



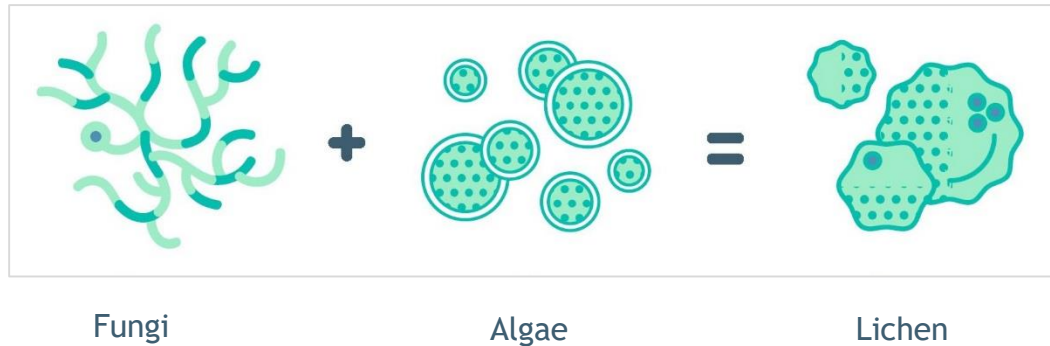
## SOCIETY



Naturalists, environmental volunteers and other social groups

# What tools are we using?

## Epiphytic lichens



Lichens are among the most valuable bioindicators of air pollution. These organisms are very sensitive to atmospheric pollution and are used to assess the pollution of an area.



*Xanthoria parietina*, *Physcia adscendens* y *Teloschistes chrysophthalmos*  
Photo: Laura Force

# What tools are we using?

**Natusfera:** <http://natusfera.gbif.es>

Web platform and mobile app to empower citizens to record, organize and share biodiversity observations. It is free and open source. Based on iNaturalist.



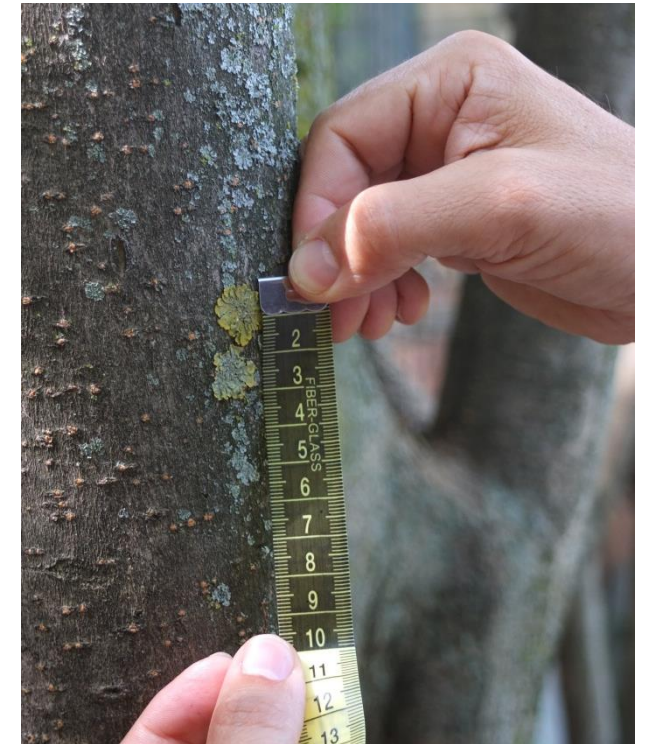
# What tools are we using?



Lens for mobiles

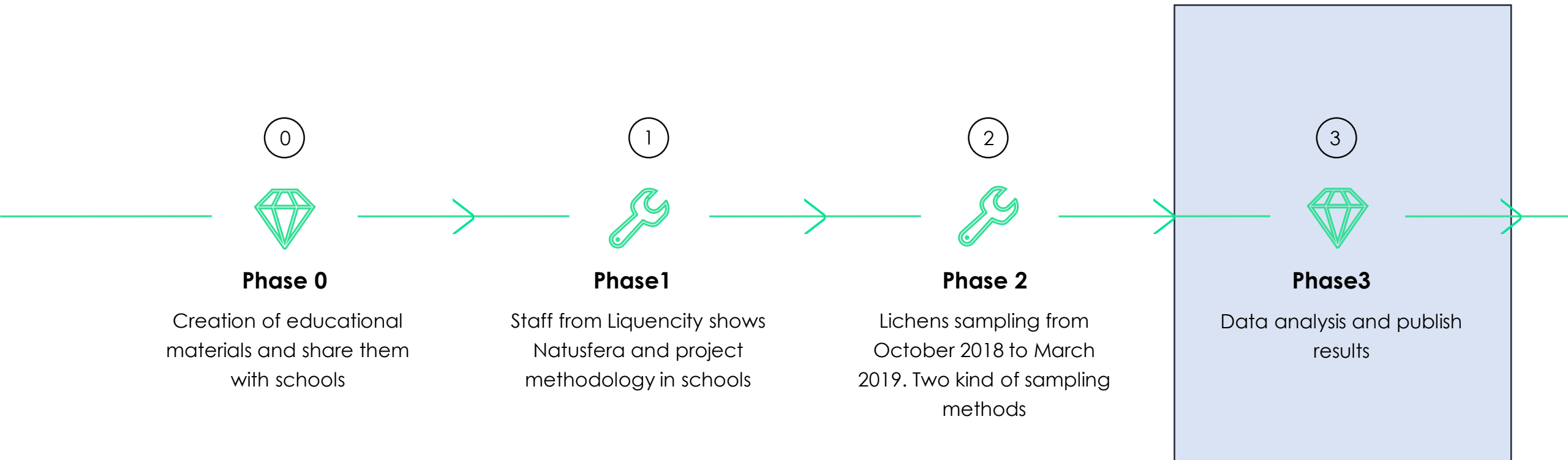


Identification cards



Measuring tape

## PHASES OF LIQUENCITY



## Some results so far

	Madrid	Barcelona
Observations	<b>3,649</b>	<b>1,086</b>
Participants	1,091	820
Field Activities	50	31
Schools	29	23
Species	25	20

**~5,000**  
observations

High impact in media: 83 publications <http://liquencity.org/contacto-y-oficina-de-prensa/>

# Next steps



Identify, clean, standardise and organise these data.



Analyse these data helped by statistics.



Map air pollution in Madrid and Barcelona



Publish the results and compare past and future studies

**Gbif.Es**

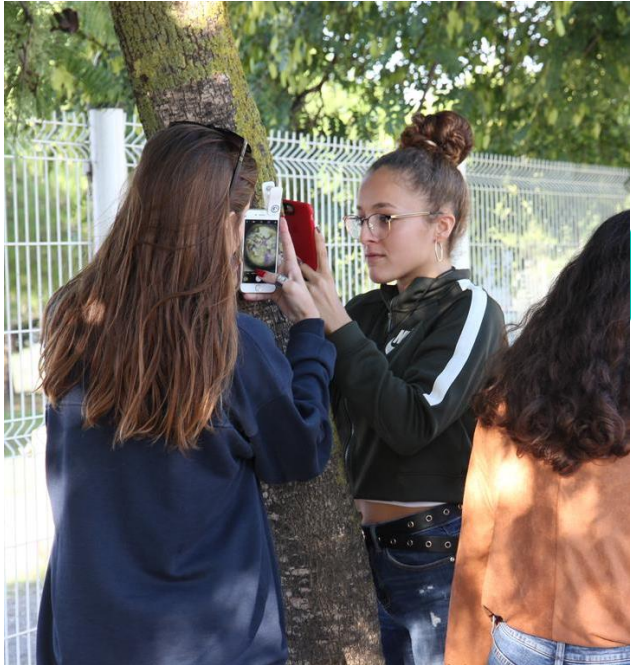


Share data through GBIF

If we know the lichens living (or not) with us we will know the pollution level of our neighbourhoods.  
We will map air pollution of our cities thanks to citizen participation.



# Activities in schools



# Activities in schools





# Pictures taken by students



Photo: Gisela Martín

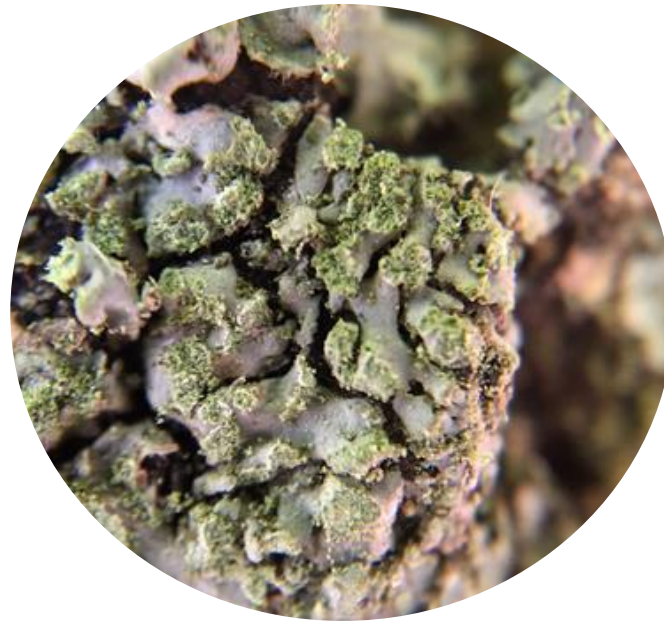


Photo: Ignacio Aguirre

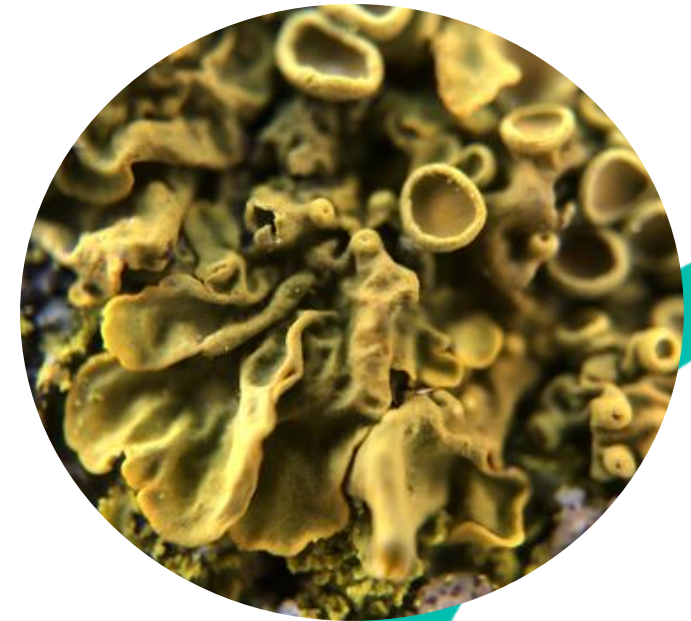


Photo: Colegio Santa Mónica

# Thank you!

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**Gbif.es**





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