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Project 2017-1-IT02-KA201-036968 - IO3



## **River ecosystem characteristics: plant biodiversity**

### **WORKSHEET 1**

1.1 *Do you know some rambla? Can you describe the characteristic landscape of the rambblas?*

1.2 *What type of plants and animals do live in the rambblas?*

1.3. *Do you know the term 'biodiversit'? What does it mean?*

1.4. *Do you think that around a rambla or another water course the plant species varies going along the channel? And going across the channel?*



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## **River ecosystem characteristics: plant biodiversity WORKSHEET 2**

Generate a hypothesis of question to be solved with the research

*2.1. Discuss in the group the possible hypotheses and questions about the work you want to carry out in this unit*

*2.2 Write the hypothesis*



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## River ecosystem characteristics: plant biodiversity WORKSHEET 3

3.1. *Where will we measure vegetation biodiversity?*

3.2 *How will we measure plant biodiversity?*

3.3. *How the plants are classified by functional groups and how could it be measured the vertical structure of the vegetation?*

3.4. *What material do we need to collect vegetation samples in the field? Write a list*

3.5 *What the method is to collect and conserve the specimens?*

3.6. *How can you identify the specimens?*



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3.7. *How can you write an information sheet about the plant species?*



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## **River ecosystem characteristics: plant biodiversity WORKSHEET 4**

With all the information obtained in the previous activities do elaborate information sheets of the plans find in the field excursion.

Later with the data collected proceed to calculate the biodiversity in the sampling points. Finally, do determine vertical structure of the vegetation of the zone.



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## **River ecosystem characteristics: plant biodiversity WORKSHEET 5**

5.1. Write a report with the conclusions of the experimental part in relation to the plant biodiversity in our study area. It should include:

- a. The plant species in the study area
- b. Conclusions about the study on vegetation biodiversity
- c. Vertical structure of the vegetation (relative abundance of trees, shrubs, subshrubs and herbs)
- d. Valuation of the importance of the plant species in the area

5.2 Plan the slides to be included in the presentation of the research

5.3. Do elaborate the presentation



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### **WORKSHEET 6**

6.1 Agree which part is going to be presented by each member of the group and write the text corresponding to each of the oartes of your presentation

- a. Introduction. Setting the problem and establishing the hypoteheses or questions of research
- b. Material and methods
- c. Results and discussion
- d. References

6.2. Essay the presentation one or several times until getting to do the presentation on the recommended time, in an agile way and using a clear and rigurous language



## ANNEX I

### INFORMATION FOR THE STUDENT

#### WEBS FOR CONSULTATION:

- <https://www.murcia.es/medio-ambiente/medio-ambiente/estado/e-naturales.asp>
- [http://www.regmurcia.com/servlet/s.SI?sit=c,365,m,3027&r=ReP-27796-DETALLE\\_REPORTAJESPADRE](http://www.regmurcia.com/servlet/s.SI?sit=c,365,m,3027&r=ReP-27796-DETALLE_REPORTAJESPADRE)
- <https://www.asociacionanse.org/proyectos/voluntariado-en-rios/flora>
- <http://iderm.imida.es/Acequias/>
- <https://www.murcia.es/web/urbanismo/huerta1>
- <https://naturaleza.paradis-sphynx.com/plantas/diferencias-arboles-arbustos-matas-hierbas.htm>
- [http://www.murcianatural.carm.es/web/guest/flora/-/journal\\_content/56\\_INSTANCE\\_vIC8/14/83126](http://www.murcianatural.carm.es/web/guest/flora/-/journal_content/56_INSTANCE_vIC8/14/83126)

#### CONSULTATION REFERENCES

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- Bonnier, G. y Layens. *Claves para la determinación de plantas vasculares*. G. D. Omega, 1997.
- Rose, F. *Clave de plantas silvestres*. Omega, 1987.
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- O'Callaghan, M. *Biology plus*. The educational Company of Ireland, 2013.
- Romero, M. A. *La erosión en la región de Murcia*. EDITUM, 2002.
- *Decreto nº 50/2003, de 30 de mayo por el que se crea el Catálogo Regional de Flora Silvestre Protegida de la Región de Murcia*. BORM de 10 de junio de 2003.



## ANNEX II

### ESTIMATION OF PLANT BIODIVERSITY. SIMPSON'S INDEX

To build with wood strips or fine rods a quadrat of 1x1 m to take data on different points of the area. To randomly select the points it can be launched a little ball and later center the quadrat on the point the ball fell

Other option is to locate the quadrat on concrete places to compare the biodiversity between them following a previous hypothesis

In any case, it is convenient to locate the sampling points in a map of the area

Once the quadrat is on place, they are counted the number of individuals/cover of each species that appear within the quadrat and the following table is filled

Sample number:	
Species	Individuals/cover

Simpson's biodiversity index.

$$D = \frac{\sum n(n-1)}{N(N-1)}$$

$n$  = number of individuals/cover per species  
 $N$  = total number of individuals/cover in the community

The values of D range from 0 to 1, 0 is an infinite biodiversity while 1 is a one species community. As lower is D higher is biodiversity.

After calculating biodiversity per sampling point, the total average and conclusions will be reached in relation with the soil conditions in relation to the water course.

## ANNEX III

### COLLECTING AND CONSERVING PLANTS FOR A COLLECTION

1. Corrugated cardboard
2. Newspapers
3. Dryer
4. Pruning shears
5. Knife
6. Plastic bags
7. Notebook
8. Pencil (no bolpen, useless with rain)

Collect only specimens to be used

Collected plants should have leaves, stem, flowers and/or fruits in good state as this structures are used for the identification.

Specimens to be collected should have about 30 cm. Very large plants may be divided in three parts fitting that size, On the contrary, if specimens are little several ones should be collected.

Each specimen will be labelled and numbered. The number has to coincide with notes on the field notebook. In the case of ferns and orchids soil should be removed from the roots.

If the specimens were not pressed in the moment use large plastic bags, caring to conserve the bag closed to maintain a high humidity inside avoiding wilting,

Data for the specimen

- Number of the plant.
- Common name of the species.
- Name of the collector.
- Locality where it was collected.
- Notes about the site (climate, altitude), ecology of the plants, color of the flower, fruit, type of leaves and stem, type of soil, type of vegetation (forest, pasture, shrubland, etc.)

## Pressing

The objective of pressing is eliminate the water of the plants, to conserve them without losing their principal characteristics and their aspect as similar as possible to the natural one. A press can be very easily made at low cost. It is noly necessary tow thin wood strips 5 cm wide and two gratings, Join them to build two grills of about 43 x 30 cm. Pressure is provided by two straps.

Other pressing technique consist of put the plants between absorbing paper or newspapers and put weight over (as a book pile) for several days.

## Pressing technique

Collected plants will be put bewteen newspaper sheets. This point is very important, as the pressing of the specimens will give good mounting quality; avoid to damage elements important for the identification. Remind that when pressing it is necessary to respect the direction of all the parts of the specimen (stems, leaves, flowers, fruits). Also they will be accomodated most of the leaves with the upper face upside and some with the lower face visible.

Newspaper sheets will be joined with the collection data. Putting the samples in the press it will be advisable this sequence

1. Corrugated card
2. Newspaper sheets
3. Specimen
4. Newspaper sheets
5. Corrugated cardboard



## ANNEX IV

### BOTANY FILES

Scientific name:	
Common name:	
Family:	
Plant description:(1)	
Plant location, description of the environment: (2)	
Known uses (medicinal, cooking, agrarian):	

General image	Leaf image	Flower image	Fruit image

Explanation of concepts to complete the file:

(1) In the description of the plant it is important to know if it is a herb, a subshrub, shrub, tree, palm or liana. How its leaves are? Simple, etc. How its flowers are? Color, form, disposition in the plant

(2) Description of the place where it is usual to see the plant. It is interesting to know if the plant is living by the sea, coast or in a forest and which kind of forest, in *rambla*, rivers, between rocks. On limestone soils, acid soils, rich in humus, on north facing or south facing slopes.