

# Data collection and analysis of paleonetworks

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## Data collection

the first step was to collect data from the paleodiversity database, from there we gathered occurrences using the following code. Which collected all occurrences from the Rhaetian to the Sinemurian, within the bounding box of latitudes 34 to 85 degrees north and longitudes 28.85 west to 41.078 east.

```
All <- read_csv("https://paleobiodb.org/data1.2/occs/list.csv?datainfo&rowcount&interval=rhaetian,sinemurian",
  skip = 22)
```

## Data cleaning

### Environment

we filtered the data to include only occurrences that occurred in the environments

### Taxonomy

Occurrences were excluded if they were part of the Phyla Problematica, Ginkgophyta, Cycadeoideophyta, Cycadophyta, Equisetophyta, Pinophyta, Peltaspermatophyta, Tracheophyta or if they belonged to the class Insecta or Mammalia, or belonging to the orders Pterosauria.

## Data exploration

The final dataset had 7,368 occurrences, belonging to 12 Phyla (Table 1) and 2,058 species.

## Subsetting dataset by Age

### Rhaetian

The Rhaetian dataset had 3,041 occurrences, belonging to 11 Phyla (Table 1) and 748 species.

### Hettangian

In order to subset by age we have to take into account an occurrence to be present in an age if any of its

The Hettangian dataset had 1,851 occurrences, belonging to 9 Phyla (Table 1) and 787 species.

### Sinemurian

The Sinemurian dataset had 4,075 occurrences, belonging to 11 Phyla (Table 1) and 1,300 species.

Table 1: Number of occurrences for each Phylum present in descending order

phylum	n
Mollusca	3,619
Brachiopoda	1,578
Chordata	891
Cnidaria	492
Arthropoda	457
Echinodermata	169
Porifera	75
Chlorophyta	49
Annelida	22
Cyanobacteria	11
Bryozoa	4
Nematoda	1

## Appendix

### Species by order of number of occurrences

Table 2: Number of occurrences for the 20 most abundant Species present in descending order

Binomial	n
<i>Gryphaea arcuata</i>	102
<i>Rhaetavicula contorta</i>	86
<i>Placunopsis alpina</i>	72
<i>Atreta intusstriata</i>	70
<i>Rhaetina gregaria</i>	64
<i>Plagiostoma</i> sp.	57
<i>Chlamys</i> sp.	53
<i>Rhaetina pyriformis</i>	52
<i>Fissirhynchia fissicostata</i>	50
<i>Entolium</i> sp.	41
<i>Misikella posthernsteini</i>	41
<i>Protocardia rhaetica</i>	40
<i>Bakevella</i> ( <i>Bakevelloides</i> ) <i>praecursor</i>	38
<i>Gervillia inflata</i>	37
<i>Plagiostoma punctatum</i>	37
<i>Zeilleria mutabilis</i>	37
<i>Cassianella inaequiradiata</i>	35
<i>Myophoriopsis isoceles</i>	35
<i>Oxycolpella oxycolpos</i>	35
<i>Palaeocardita austriaca</i>	35