

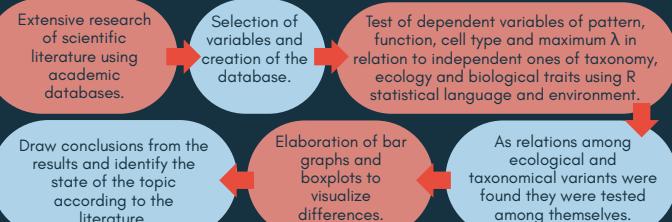
# COLORATION PATTERNS IN CEPHALOPODS: A BIBLIOGRAPHIC AND COMPARATIVE ANALYSIS

Cephalopods are marine invertebrates known for their remarkable ability to change color and create diverse patterns. While the physical and cellular mechanisms of this color change are well studied, its ecological and communicative functions remain partly unknown. This research aims to review existing studies and analyze how habitat, depth, and other ecological or taxonomic factors influence their coloration, with the goal of identifying common adaptive patterns across groups and environments.

## AIMS

- Review existing scientific literature
- Create our own database
- Analyze how taxonomy and ecology influence coloration and patterns
- Detect whether there are common adaptive patterns in the coloration of cephalopods
- Detect gaps in knowledge and identify possible future lines of research.

## METHODS



## RESULTS

The following variants were found to be significantly associated with ecological and taxonomical factors:



### depth:

mimeticism  
camouflage  
leucophores  
chromatic pulse

epipelagic

flicker  
light emission, photophores  
and bioluminescence

mesopelagic

light emission, photophores  
and bioluminescence

bathypelagic

### taxonomy (order):

nautilida  
oegopsida  
• Light emission  
• Photophores  
vampyromorpha  
• Light emission  
• Photophores

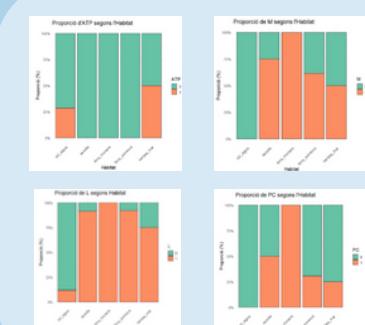
### sepiida

- Mimeticism
- Reflectivity
- Leucophores

idiosepiida  
• Color and transparency  
• Mimeticism  
• Leucophores

octopoda  
• Mimeticism  
• Leucophores

myopsida  
• color and transparency  
• Reflectivity



### habitat:



### maximum $\lambda$

Clear trend where species that perceive shorter wavelengths have a deeper distribution than those that perceive longer ones.

## CONCLUSIONS

- The results obtained in this study reflect the recurring challenge in evolutionary ecology to determine the relative **weight of taxonomic and ecological factors** when explaining **morphological and behavioral patterns**.
- Taxonomic and ecological variables (especially depth and habitat) exert a significant influence on many coloration patterns. Mantle size, sociability or daily activity pattern have not shown a clear relationship with coloration types, possibly due to the lack of data or the complexity of the behaviors involved.
- There are still **significant knowledge gaps**, especially in deep-sea species and in aspects such as **sociability, daily activity patterns and light perception**, which limit the overall understanding of coloration patterns.
- There is also a **need to unify scientific terminology**, as the lack of consensus in describing behaviors and coloration patterns makes it difficult to compare studies and advance knowledge in this field.