Would *Carpetania matritensis* and *Carpetania elisae* cohabite under a climate change scenario?

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Introduction

Carpetania matritensis and *C. elisae* are two cryptical species that lives in different areas and usually coexist with *Allolobophora trapezoides.* In this work, laboratory microcosms were set up to study the interspecific relationships between the two species and with *A. trapezoides*.

Questions

- ✓ If climatic conditions change, could *C. matritensis* from El Molar colonize the area where *C. elisae* lives?
- ✓ *A. trapezoides* could benefit from the possible improvement of the soil conditions thanks to the activity of *C. matritensis*?

Materials and Methods

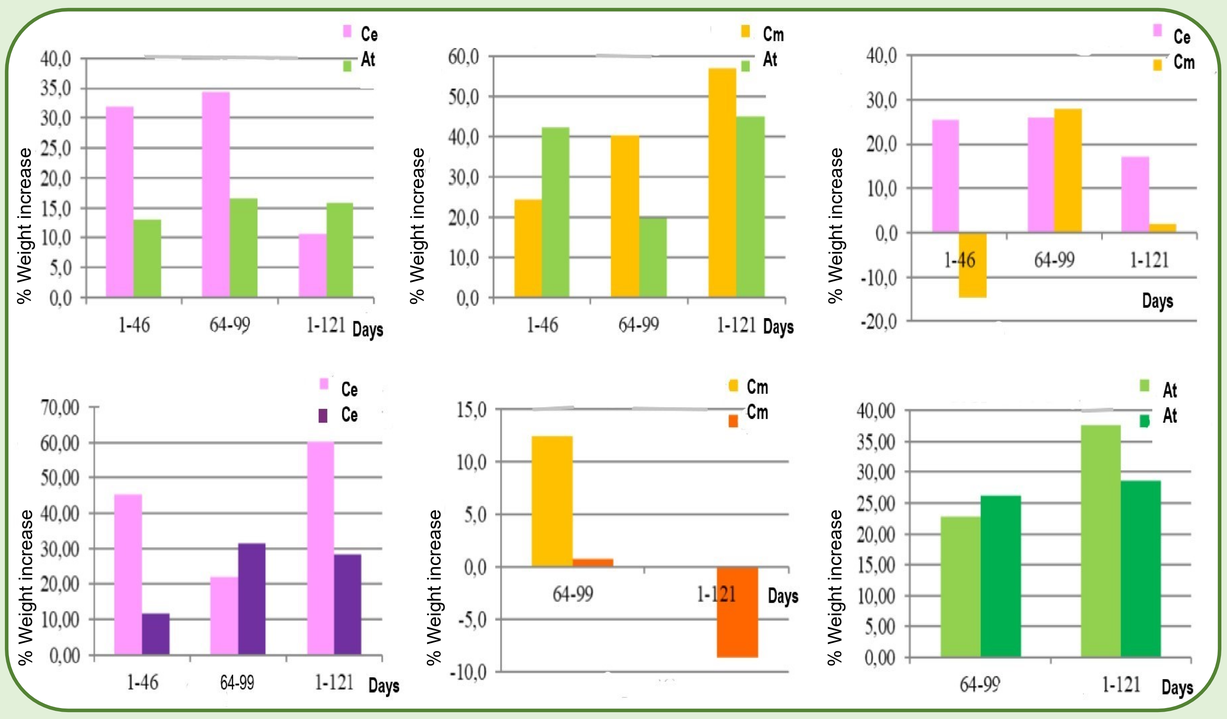
	Cm	Ce	At
Cm	Cm-Cm	Cm-Ce	Cm-At
Ce		Ce-Ce	Ce-At
At			At-At

Cm: *Carpetania matritensis (El Molar)*
Ce*: Carpetania elisae (El Tomillar)*
AT*: Aporrectodea trapezoides*

- ✓ Six replicates of each type of microcosm: N= 36
- ✓ 1200g dry soil of El Tomillar
- ✓ 900g tepes (superficial soil and plants)
- ✓ 20% Humidity
- ✓ Two earthworms in each replicate following the combination in the table.

- ✓ Each earthworm in the monospecific cultures was marked with different colored elastomers for individual differentiation and the two *Carpetania* species were labeled for differentiation.
- ✓ Throughout the 121 days of the experiment, the weight of the earthworms was controlled.
- ✓ The different species combinations are shown in the table.

Results



- ✓ *Carpetania elisae* (pink bars) increases its weight in all types of microcosms and is not affected by the presence of other species.
- ✓ *Carpetania matritensis* (yellow bars) only increases in weight when grown in the presence of *Aporrectodea trapezoides*, in all other types of microcosms it decreases in weight.
- ✓ *Aporrectodea trapezoides* (green bars) increases its weight in all cases, experiencing a higher increase in monospecific cultures.

Conclusions

- ✓ The two *Carpetania* species studied compete for the same resources, both are endogeic species.
- ✓ *C. elisae* is more adapted to the soil of El Tomillar than *C. matritensis* and therefore benefits.
- ✓ *C. matritensis* is favored when it coexists with *A. trapezoides,* this can be explained in two ways:

  a) there is no competition because they feed on different resources.

  b) A. trapezoides provides *C.matritensis* with the necessary resources for its growth, either in the form of its casts or by activating the microbiota it ingests from the soil.