

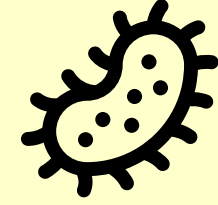
NEW DATA ON MOLECULAR DETECTION OF ENDOSYMBIOTIC BACTERIA OF THE GENUS *CARDINIUM* IN NON-MARINE EUROPEAN OSTRACODS OF THE SUBFAMILY CANDONINAE

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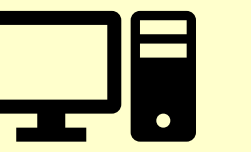
INTRODUCTION



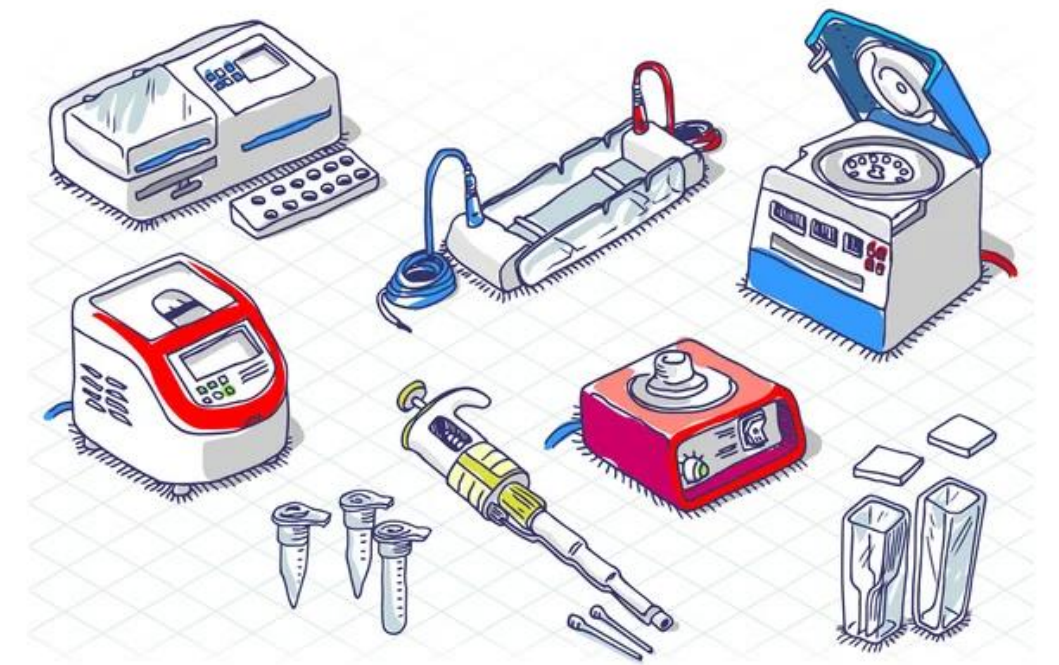
Cardinium is a gram-negative bacterium from the *Bacteroidetes* group. This maternally inherited endosymbiont may be involved in various reproductive modifications in its arthropod hosts, such as cytoplasmic incompatibility, parthenogenesis or feminization.

While previous studies have screened for the presence of this bacterium in non-marine ostracods, none have comprehensively examined representatives from the Candoninae subfamily to date.

MATERIAL AND METHODS

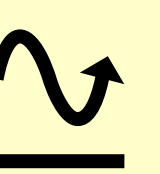


Our preliminary analysis was performed on 140 specimens of 23 Candoninae species, representing nine genera, collected from diverse aquatic environments across Europe, including lakes, ponds, streams, caves and wells. Detection of the endosymbiont was achieved through amplification of the 16S rRNA gene fragment of *Cardinium* with CARFM/CARRM primer pair. A negative control was included in each amplification.



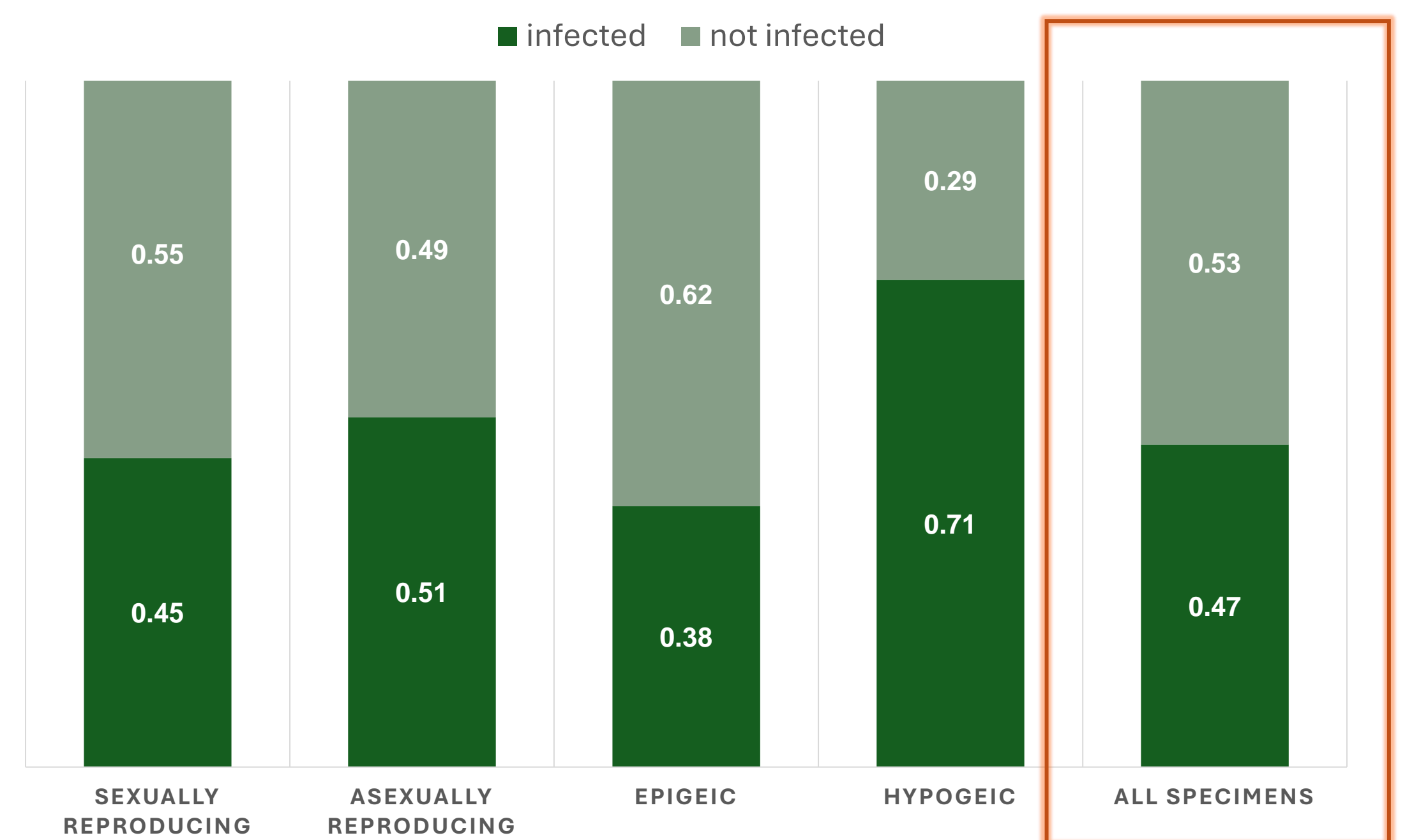
To verify whether there were statistically significant differences in prevalence of *Cardinium* in sex/asex and epigeic/hypogeic species a Student's t-test was conducted.

RESULTS



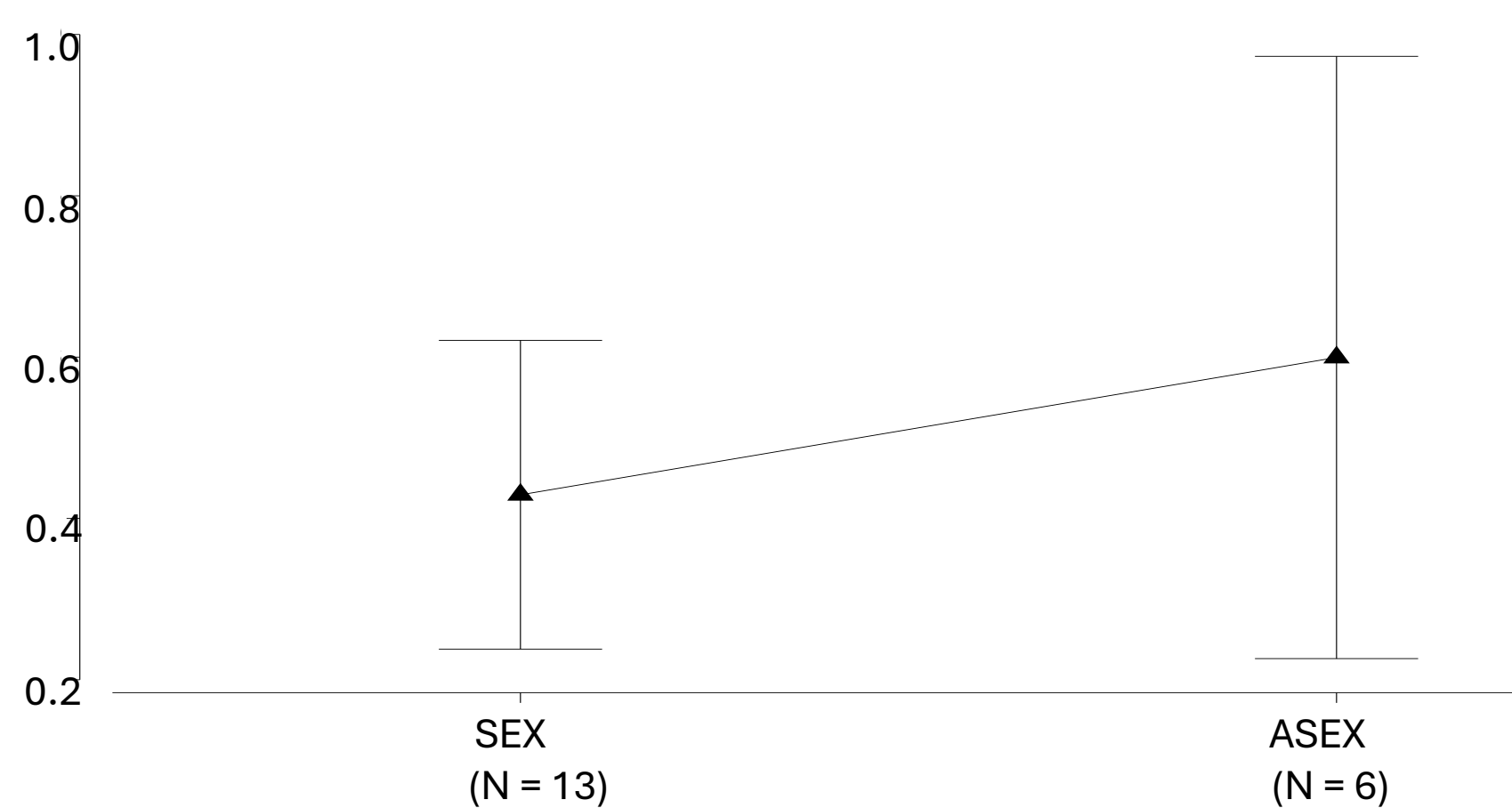
Species	sex/asex	epigeic/hypogeic	N infected/N screened specimens
<i>Candona candida</i>	asex	epigeic	2/12
<i>Candona weltneri obtusa</i>	sex	epigeic	1/6
<i>Candonopsis kingsleii</i>	sex	epigeic	4/7
<i>Candonopsis</i> sp. nov.	sex	hypogeic	1/3
<i>Cryptocandona cf. reducta</i>	asex	epigeic	1/4
<i>Cryptocandona vavrai</i>	asex	epigeic, hypogeic	e: 2/3; h: 3/6
<i>Fabaeformiscandona cf. breuili</i>	asex	hypogeic	5/5
<i>Fabaeformiscandona fabaeformis</i>	sex	epigeic	1/3
<i>Fabaeformiscandona fragilis</i>	sex	epigeic	6/8
<i>Fabaeformiscandona protzi</i>	sex	epigeic	0/9
<i>Fabaeformiscandona subacuta</i>	sex	epigeic	2/2
<i>Mixtacandona</i> sp. ex gr. <i>laisi-chappuisi</i>	sex	hypogeic	10/13
<i>Neglecandona altooides</i>	sex	epigeic	5/7
<i>Neglecandona lindneri</i>	sex	epigeic	5/5
<i>Neglecandona neglecta</i>	sex	epigeic	3/10
<i>Pseudocandona albicans</i>	asex	epigeic, hypogeic	e: 1/3; h: 4/5
<i>Pseudocandona compressa</i>	sex	epigeic	5/10
<i>Pseudocandona hartwigi</i>	sex	epigeic	1/7
<i>Pseudocandona insculpta</i>	sex	epigeic	0/4
<i>Pseudocandona marchica</i>	sex	epigeic	0/2
<i>Schellencandona cf. belgica</i>	sex	hypogeic	1/1
<i>Typhlocypris eremita</i>	asex	hypogeic	3/3
<i>Typhlocypris sywulai</i>	sex	hypogeic	0/2

PREVALENCE OF *CARDINIUM* IN ALL SPECIMENS (4 CATEGORIES)

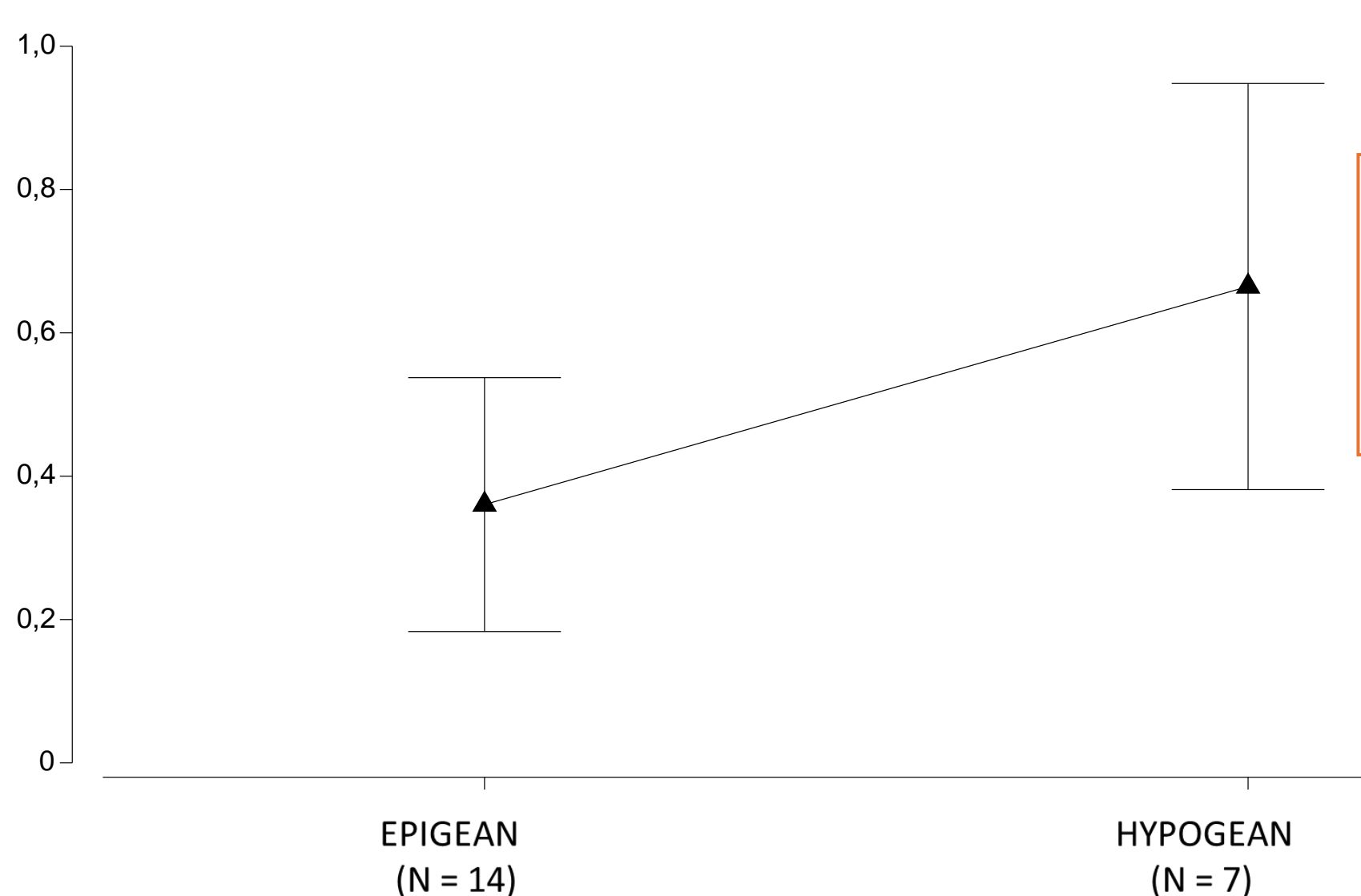


Among the 140 specimens analyzed, *Cardinium* was detected in 66 individuals (47%)

MEAN PREVALENCE OF *CARDINIUM* IN SEX VS. ASESEX AND EPIGEIC VS. HYPOGEIC SPECIES (ONLY SPECIES WITH ≥ 3 INDIVIDUALS SCREENED)



No significant statistical difference in the mean prevalence of *Cardinium* between sexually (42.9%) and asexually reproducing species (60.0%) (t-test = 1.049, P = 0.309).



A significant difference in *Cardinium* prevalence between epigeic (36.0%) and hypogeic species/populations (66.5%) (t-test = 2.143, P = 0.045).

N = number of species

CONCLUSIONS



This study is **the first** to demonstrate that ostracods inhabiting hypogeic environments are also infected with *Cardinium*.

Future studies should aim to confirm our results of prevalence by expanding the dataset to include more species from groundwater habitats and also more asexually reproducing species from the Candoninae subfamily.