

# Changes of functional attributes in benthic communities of a Mediterranean pond system along a salinity gradient

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## INTRODUCTION

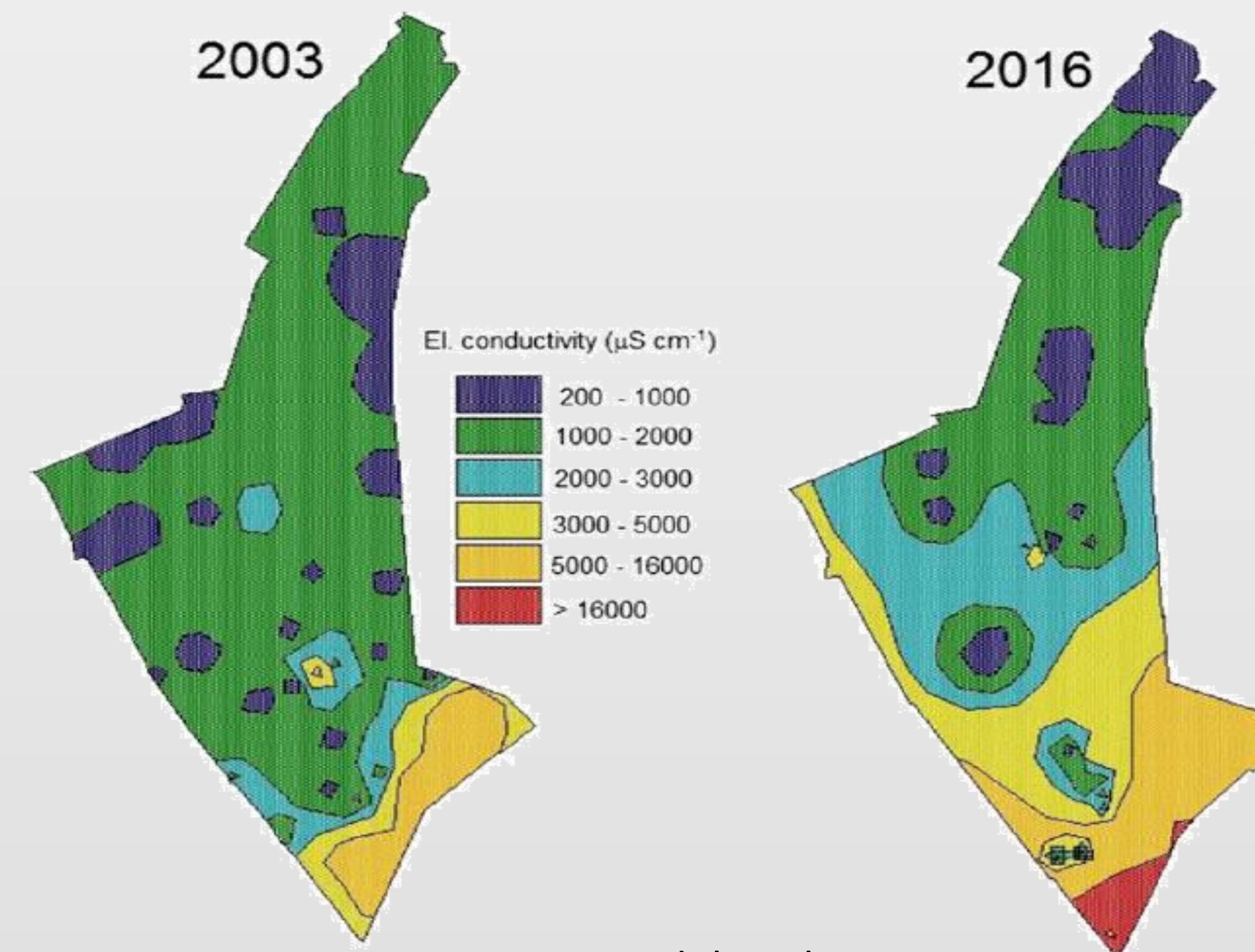
The aim of the study is to investigate the response of macrofauna communities along a salinity gradient in a coastal permanent pond system in a pond system inside a deltaic forest (Bosco della Mesola, Northern Italy). Moreover, variations of biological traits along a salinity gradient are described. "Bosco della Mesola" is a full Nature Reserve in province of Ferrara that covers 1,058 hectares. It represents the remain of a woodland complex and it has a high level of flora and fauna diversity (Piccoli et al., 1983; Fano et al., 2001; Piccoli e Pellizzari 2001). The Nature Reserve "Bosco della Mesola" is characterized by many ponds that were formed from the ancient dunes and which permits the stagnation of the waters. In the This ecosystem has suffered an increase in salinization and this process seems to be an unstoppable one. That is why we decided to see how the bethic macroinvertebrates community changes from the point of view of the biological traits.

## MATERIALS AND MATHODS

The macrozoobenthos community was sampled using Surber net (500 μ net, 0.40 m gap that we dragged for 1 m). We sampled 17 ponds in March 2017, thus having a gradient of salinity inside "Bosco della Mesola". The sediment was stored in plastic bottles and in the laboratory we sorted the animals and we preserved them in 4% formaldehyde solution until identification has been made.

Functional diversity was investigated by means of seven functional traits (feeding, mobility, adult life habitat, body size, life span, reproductive frequency and habitat choice). Statistical analysis was performed to identify the main environmental factor controlling taxonomic and functional diversity, and to test differences in functional traits

## RESULTS AND CONCLUSIONS

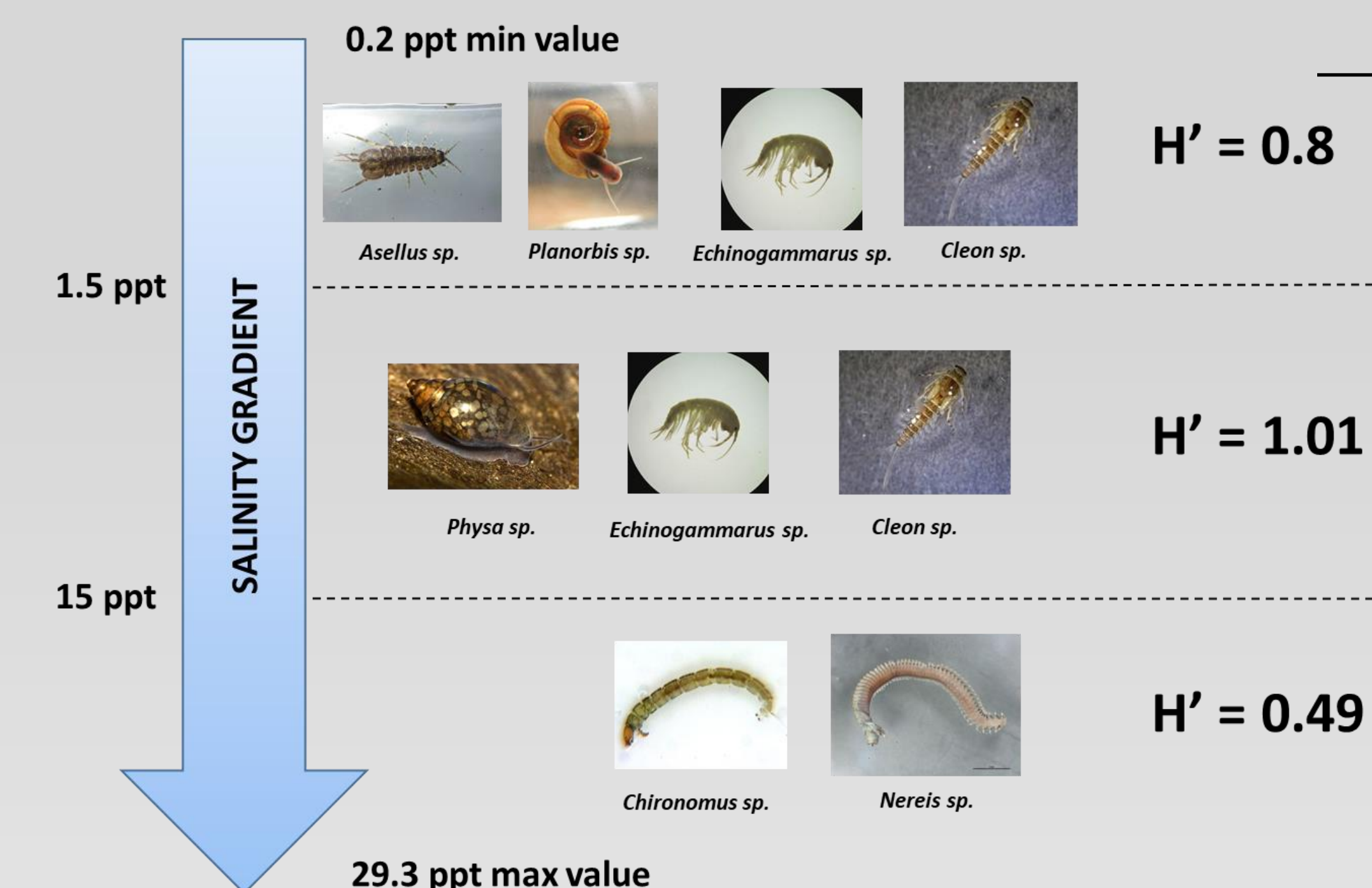


Gerdol et al., 2018

The results emphasize a close relationship between the biological traits and the habitat saline concentration. The ponds with higher salinity levels show communities with lower taxonomic diversity and simplified functional attributes.

Attribute	$\chi^2$ (df=2)	P value	Freshwater	Brackish water	Saline water
<b>FEEDING</b>					
<i>Predator</i>	6,91	<b>0,0317</b>	b	b	c
<i>Grazer</i>	0,49	0,7833	b	b	b
<i>Shredder</i>	173,97	<b>&lt;0.001</b>	a	c	c
<i>Scaper</i>	8,7	<b>0,0129</b>	a	b	b
<i>Deposit feeder</i>	183,33	<b>&lt;0.001</b>	c	a	a
<i>Filter feeder</i>	0,03	0,9837	b	b	b
<b>MOBILITY</b>					
<i>sessile</i>	0,03	0,9837	b	B	b
<i>swimmer</i>	167,95	<b>&lt;0.001</b>	a	c	c
<i>burrower</i>	185,53	<b>&lt;0.001</b>	c	a	a
<i>walker</i>	14,92	<b>&lt;0.001</b>	a	b	c
<b>ADULT LIFE HABITAT</b>					
<i>aquatic</i>	83,85	<b>&lt;0.001</b>	a	b	c
<i>aeric</i>	83,85	<b>&lt;0.001</b>	a	b	c
<b>BODY SIZE (g AFDW)</b>					
<i>small (&lt;0.01)</i>	2,51	0,2852	b	b	b
<i>medium (0.01-0.05)</i>	2,51	0,2852	b	b	b
<b>LIFE SPAN (years)</b>					
<i>short (&lt; 1)</i>	172,55	<b>&lt;0.001</b>	a	c	c
<i>medium (1-5)</i>	182,55	<b>&lt;0.001</b>	c	a	a
<i>long (&gt;5)</i>	5,68	0,0585	b	b	b
<b>REPRODUCTIVE FREQUENCY</b>					
<i>Iteroparous</i>	6,95	0,031	c	b	b
<i>Semelparous</i>	6,95	0,031	a	b	b
<b>HABITAT CHOICE</b>					
<i>generalist</i>	17,45	<b>&lt;0.001</b>	c	b	a
<i>specialist</i>	17,45	<b>&lt;0.001</b>	a	b	c

The three codes a, b and c were used to denote the location of the proportion values from the three dates: above, inside and below the upper and lower 99% confidence limits



Macrofauna communities switched from specialist to generalist taxa, and from predator, shredder and scaper species to deposit feeder-dominated communities.

The findings show that the environmental changes occurring in coastal systems are harming functional diversity of living communities.

