Historical changes and phenotypic variation in *Daphnia longispina* species complex in Lago Maggiore

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Introduction

- Daphnia longispina complex
- key taxa in pelagic communities in European lakes
- concerned species: D. galeata, D. longispina, D. cucullata
- Lago Maggiore (LM) one of the longest studied European lakes

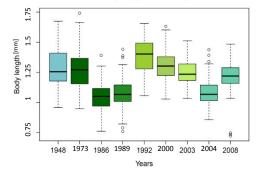
	A REPORT OF	COLUMN TWO IS		THE REAL PLANTS AND	
2012	>	2010	decrease of PCBs (persistent ogranic pollutant)	Suisse	
2008		1996	fishing ban for commercial fisheries to 2005	en e	
2004			severe DDT (insecticide) pollution events		
2003		1995	max. concentration of chl-a		
2000		1989	high abundance of predatory crustacean	Province General Provinger	
1997			Bythotrephes longimanus until 2002	Verbano-Cusio-Ossola	
1996		1985	increase of fish predation pressure	The Province	
1992		1980	peak of eutrophication	Varise	
1989		1979	increase in cladoceran abundance	Ghiffa – sampling station	
1986		1977	total phosphorus maximum	AAN a.	
1973		1962	eutrophic lake until 1980	The West	
1952		1950	high abundance of fish		
1949			successful introduction of predatory fish Coregonus	Province Last Cover	
1948		1949	macrophthalmus (Salmonidae)	de Novare	
Samples: waiting for analysis eutrophic state included in analysis eutrophic state					
			ncluded in analysis	Red Land Land Land Land Land Land	

Hypothesis

 over the period of eutrophication and re-oligotrophication, Daphnia in LM underwent similar changes as in Lake
Constance, from longispina-dominated to galeata-dominated
community with widespread hybridization

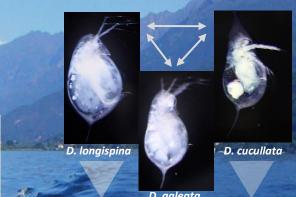


Body length variability



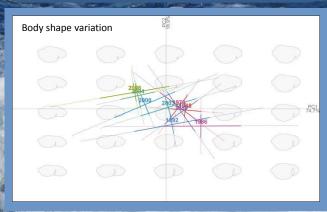
Total phosphorus concentration [µgL⁻¹]:

6.5
22
19
15
12
11
11
11
10



Aims

- characterize taxonomic changes in the *D.longispina* species complex in LM over the 20th century (based on phenotypes)
- evaluate the impact of environmental changes on Daphnia body shapes



Material and methods

- Daphnia samples collected throughout the 20th century (usually early and late summer)
- geometric morphometrics: elliptic Fourier analysis

First results and future plans

- temporal changes in *Daphnia* body shapes (from roundheaded specimens to thinner, with *D.galeata*-like heads): indication of taxonomic shift?
- effects of size-selective predation: short body lengths in the 1980s as a result of increased fish predation pressure; enlargement in the 1990s due to Bythotrephes?
- analyses will continue with additional years

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