



# Preliminary study of the population structure and allometry of the introduced shrimp *Palaemon macrodactylus* in the Salado River, Argentina



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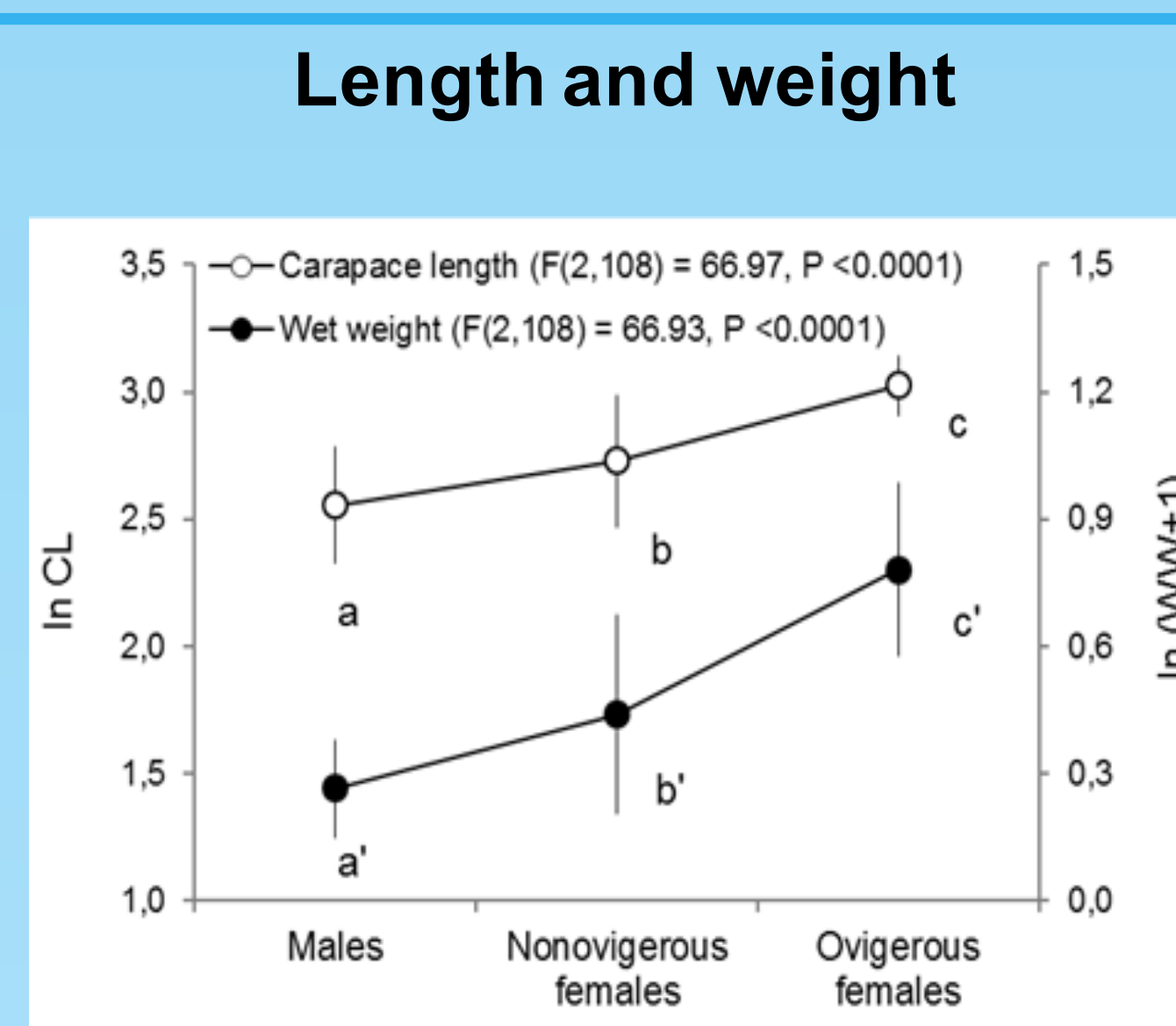
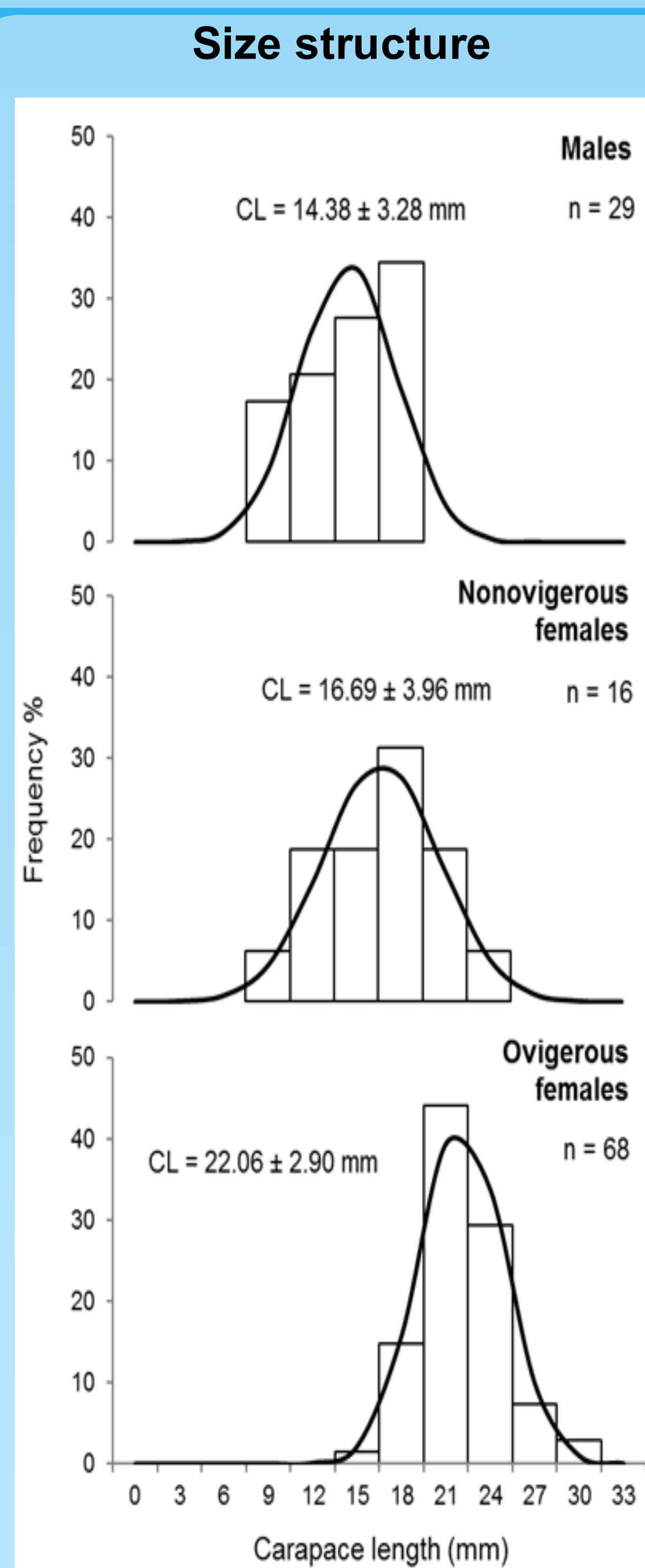
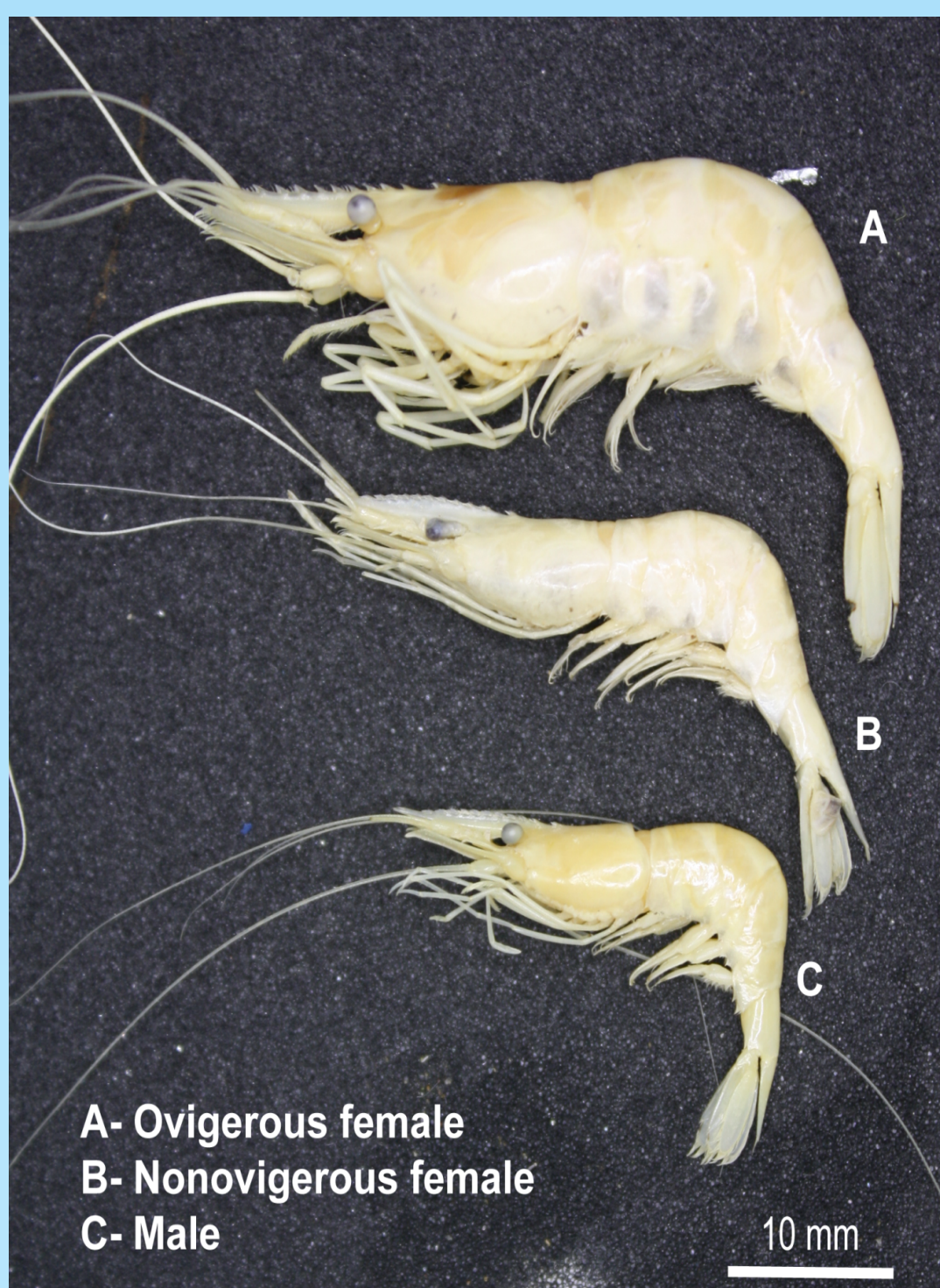
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The invasive oriental shrimp *Palaemon macrodactylus* was first reported in Argentina in 2006. Since then, it has expanded its distributional range along the south Atlantic coast. The knowledge of their ecology and biology, however, is still incomplete. We examined the size structure, the allometry, and the size at sexual maturity of *P. macrodactylus* from the Salado River, Argentina.

We predicted that females would be larger and heavier than males. Moreover, in view of the lower salinity conditions at the site studied compared to the fully marine area where this invasive shrimp was first reported in Argentina, we expected to find differences in size structure, allometry, and the size at sexual maturity between those two populations.

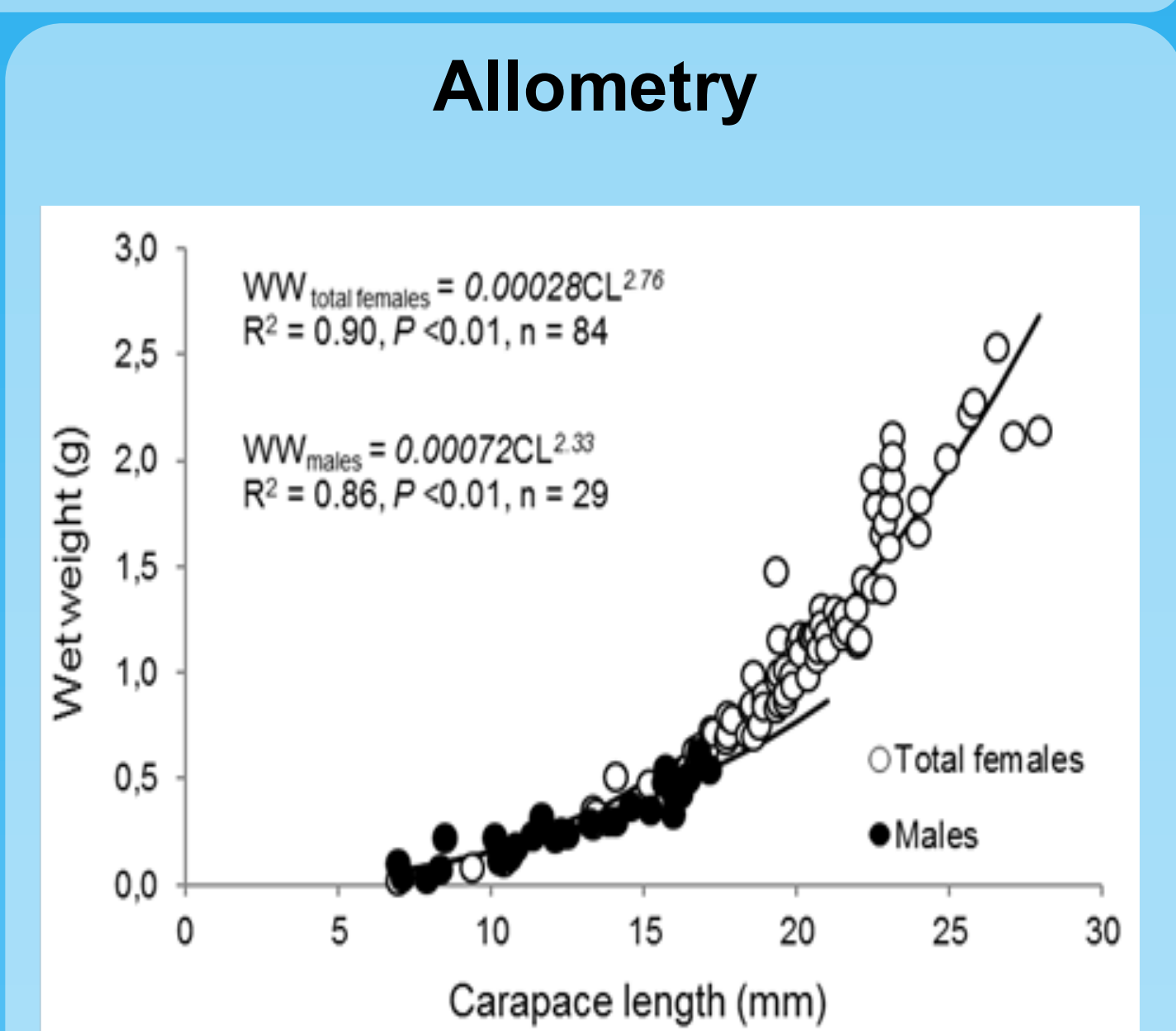


## *Palaemon macrodactylus*



Ovigerous females showed significantly larger mean carapace than nonovigerous females and males, and the carapace of males was significantly shorter than both female stages.

Ovigerous females showed significantly higher mean wet weight ( $1.23 \pm 0.48$  g) than nonovigerous females ( $0.59 \pm 0.37$  g) and males ( $0.31 \pm 0.15$  g), and nonovigerous females were heavier than males.



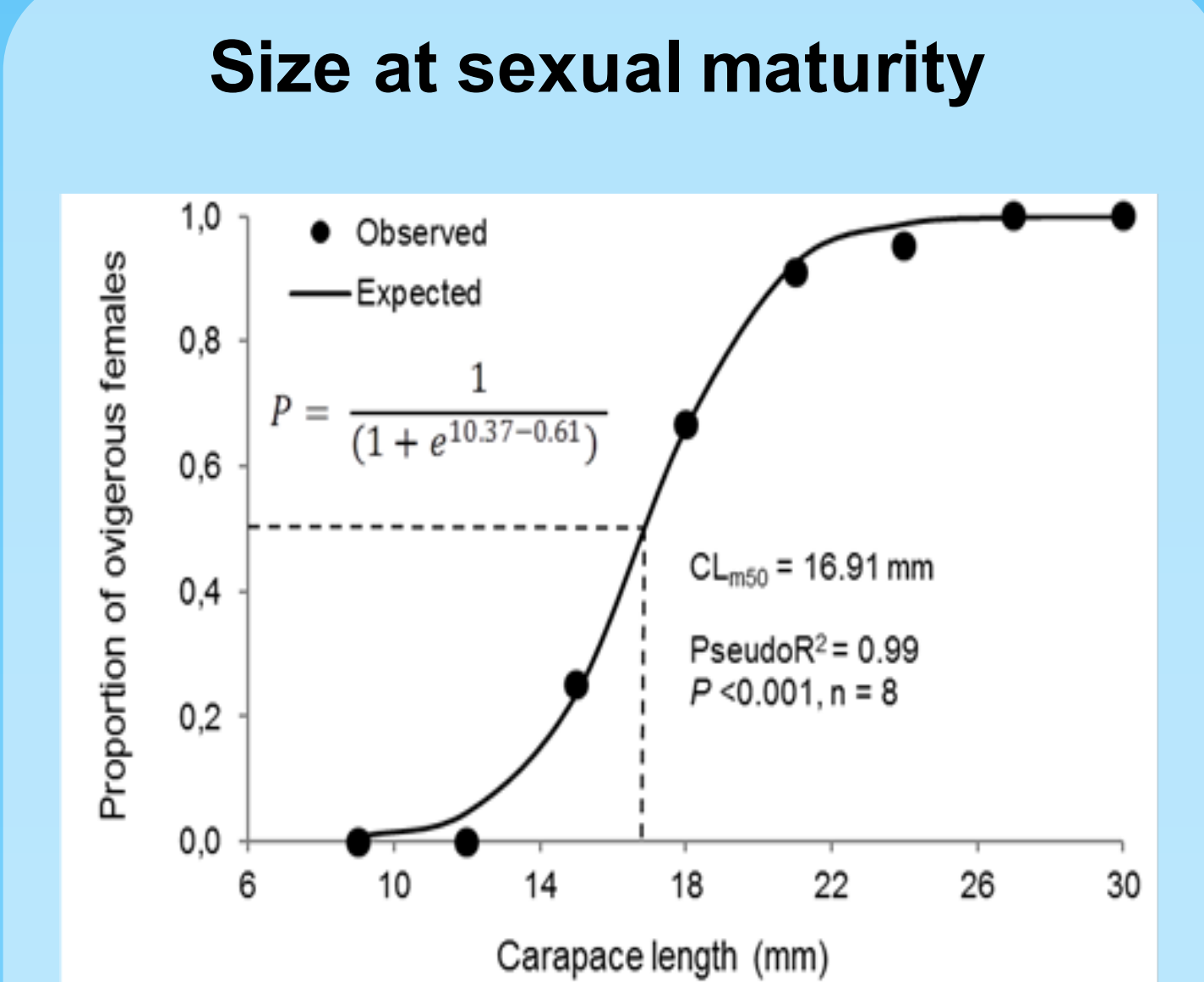
We observed significant differences in allometry between sex ( $F_{(2,109)} = 3.254$ ,  $P = 0.042$ ).

Allometric regressions indicated a negative allometry for males ( $b = 2.33$ ) and for total females ( $b = 2.76$ ).

## Spatial variation in size structure, weight, and size at sexual maturity

We noted that the individuals from the Salado River exhibited a larger size, a higher weight, and a larger size at sexual maturity than those individuals from other aquatic environments of higher salinity levels.

*Palaemon macrodactylus* has invaded both marine and estuarine environments and has been associated with brackish waters over a wide spatial distribution within estuaries principally as a result of its high osmoregulatory ability. **The findings presented here support the idea that this species would attain a larger size and higher weight in habitats characterized by lower salinity levels.**



The examination of the size-frequency distributions of total females revealed that the 82% of them had greater carapace than the size at sexual maturity.

Study site	Carapace length (mm)					Wet weight (mg)				Physicochemical parameters		
	Males	Nonovigerous females	Ovigerous females	Total females	CL <sub>m50</sub>	Males	Nonovigerous females	Ovigerous females	Total females	T (°C)	Salinity (PSU)	Turbidity (NTU)
Salado River (Argentina)	14.4 ± 3.3 (7.0-17.2)	16.7 ± 4 (6.9-22.0)	22.1 ± 2.9 (13.3-27.9)	21.0 ± 3.8 (6.9-27.9)	16.91	300 ± 160 (30-620)	560 ± 380 (20-1170)	1220 ± 500 (350-2530)	1094 ± 546 (20-2530)	17.8 ± 5.5 (10.0-31.8)	2.83 ± 1.46 (0.86-5.02)	209 ± 247 (10-1000)
Mar del Plata Harbor (Argentina)	nd (nd-7.5)	nd (4.5-nd)	nd (4.65-12.5)	nd (4.5-12.5)	6.79/5.91	nd	nd	nd	nd	15.0 ± 4.3 (9.3-20.9)	34.6 ± 3.6 (30.5-41.5)	nd
Matsushima Bay (Japan)	nd (nd-11.7)	nd	nd (8.5-nd)	nd (nd-16.7)	nd	nd	nd	nd	nd	15.9 ± 8.1 (0.8-29.4)	29.8 ± 3.0 (14.5-35.6)	nd
Gironde Estuary (France)	5.6 ± 1.0 (3.2-9.5)	nd	nd	7.0 ± 1.8 (3.4-13.1)	nd	179 ± 95 (29-629)	nd	nd	344 ± 271 (38-1583)	16 ± 5.7 (7.5-25.0)	15.5 ± 4.5 (10-22.5)	1400 (56-4000)