

Ministerio de Producción, Ciencia y Tecnología

Effect of adding photoprotective compounds in the diet of *Palaemon macrodactylus* and its role under ultraviolet radiation

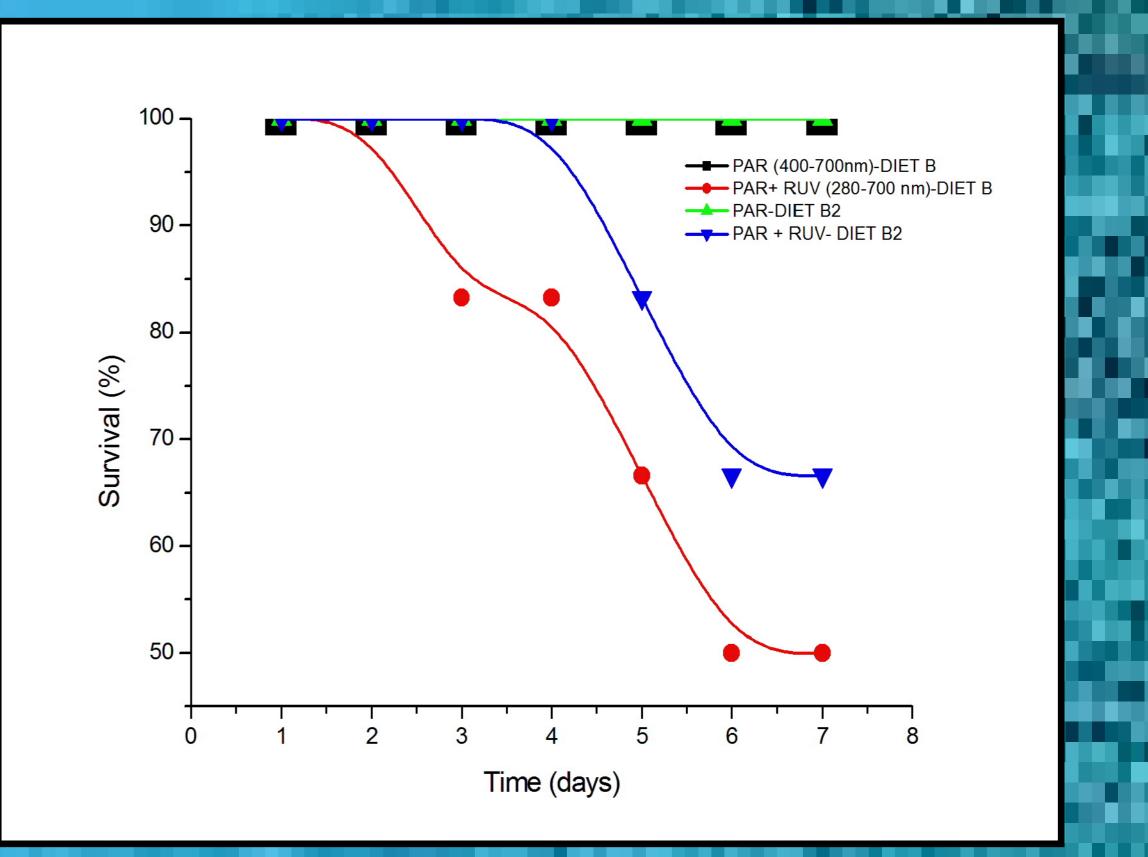
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INTRODUCTION

During the past two decades, it has shown an increase in ultraviolet radiation (UVR) and particularly the UVB (280-315nm) above Earth's surface. There is some evidence that UV-B radiation (280-315 nm) and the shorter wavelengths of UV-A (315-400 nm) can significantly affect the biota in waters up to 20 m deep and have adverse effects on aquatic organisms such as damage in the genetic material and high mortality. It has been shown that many species of seaweeds synthesize and accumulate high concentrations of photoprotective compounds and may constitute an interesting alternative as a supplement in aquaculture feeds. In the present work the effects of UVR were studied in the model animal *Palaemon macrodactylus* which is a successful invader, known as the Oriental Shrimp, native to estuaries and coastal waters of the Northwest Pacific. In the south western Atlantic, the species was found in Mar del Plata harbour, Argentina, probably introduced from the Pacific with discharged ballast water.



RESULTS

The aim of this study was to determine the bioaccumulation of photoprotective compounds (PPC) from diets added with red seaweeds meal of the family Halymeneaceae on juvenile *P. macrodactylus* and its possible protective role under conditions of stress by UVR.

MATERIALS AND METHODS

Fig 1: Palaemon macrodactylus survival after 7 days of exposition at the different treatments.

Table 1: Initial mean weight (IMW), final mean weight (FMW) and percentage increase in weight (PIW) of *Palaemon macrodactylus* after 7 days of exposition.

TREATMENTS								
	a-PAR (400-	b- PAR + UVR	c- PAR –DIET	d- PAR+RUV-				
	700nm)-DIET B	(280-700 nm)	B2	DIET B2				
		DIET B						



RED SEAWEED HALYMENEACEAE IN MAR DEL PLATA HARBOUR

Ingredients

Fish meal

Soybean meal

Corn starch

Wheat brand

Fish oil

Fish soluble

Soybean lecithin

Cholesterol

Vitamins

Squid protein



SEAWEED MEAL

DIET B2: 2% DIET ADDED WITH RED SEAWEED MEAL HALYMENEACEAE



40 C DRYING

48

17

20

8.5

2

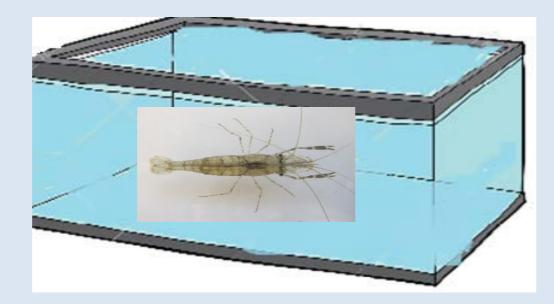
2

0.5

0.5

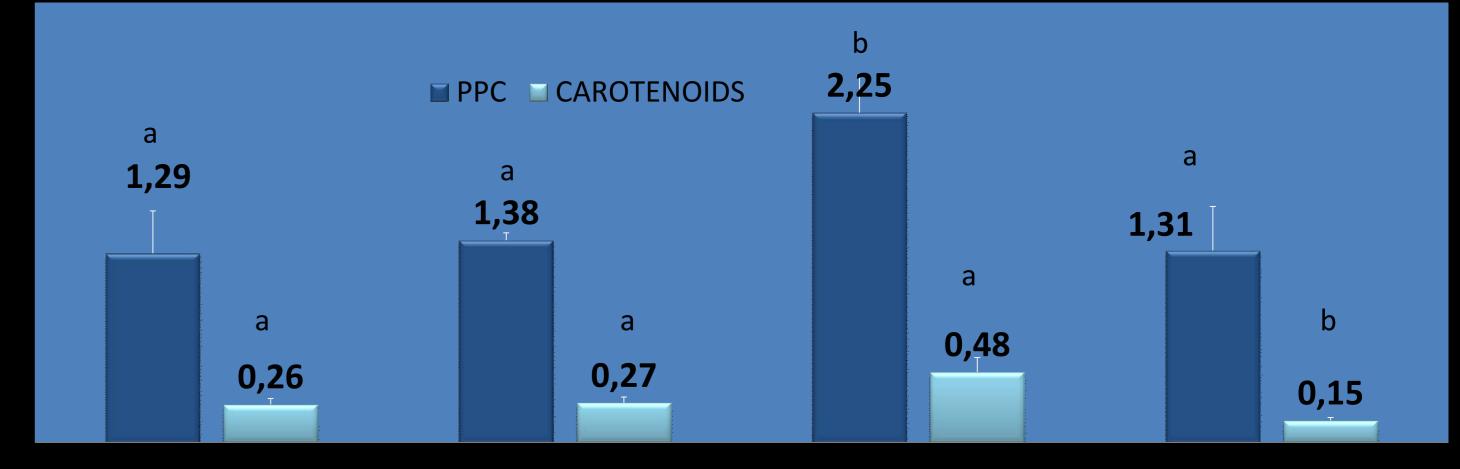
0.5

BASAL DIET + 2G RED SEAWEED MEAL

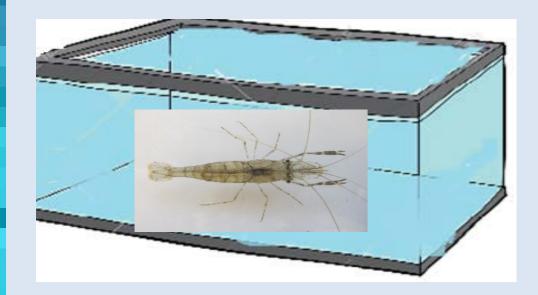


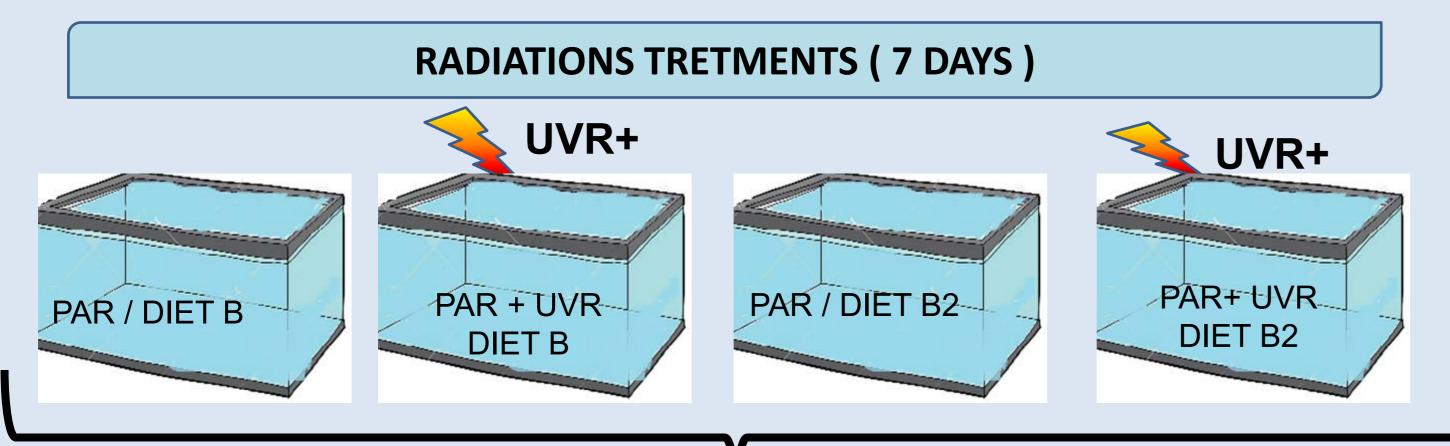
	IMW	0,18±0,07	0,18± 0,05	0,18±0,07	0,15±0,04
1	FMW	0,16±0,04	0,18 ±0,04	0,22± 0,08	0,156±0,04
	PIW				
		12,5	0	22	4

Concentrations of PPC and carotenoids



a-Control (PAR 400-700 b- PAR+ RUV (280-700nm)- c- PAR (440-700 nm)- DIET d- PAR+ RUV (280-700nm) nm)-DIET B DIET B B2 - DIET B2





Survival

Percentage of weight gain (PWG) Concentrations of photoprotective compounds PPC and carotenoids Fig 2: Concentration of photoprotective compounds and carotenoids in tegument after 7 days of exposition: Carotenoids 464 nm (OD g tissue⁻¹), Photoprotective compounds 321nm (OD g tissue¹). The superscripts (a,b) indicate differences between treatments (ANOVA p ≤0.05).

CONCLUSIONS

These results suggest that a diet added with red seaweeds rich in photoprotective compounds constitutes and interesting alternative, not only for its contribution to a better physiological state of animals under stress conditions by UVR, but also for the particularity of being invasive species with potential commercial use.