Title	Acclimation cost of common environmental stress to copepod tigriopus japonicus
Author(s)	Kwok, KWH; Lee, JS; Leung, KMY
Citation	The 2015 International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME 2015), The University of Hong Kong, Hong Kong, 1-4 June 2015. In Programme and Abstracts, 2015, p. 83
Issued Date	2015
URL	http://hdl.handle.net/10722/216579
Rights	Creative Commons: Attribution 3.0 Hong Kong License

ACCLIMATION COST OF COMMON ENVIRONMENTAL STRESS TO COPEPOD *TIGRIOPUS JAPONICUS*

Kevin W.H. Kwok[1], Jae-Seong Lee[2] and Kenneth M.Y. Leung[3]

[1]Department of Applied Biology and Chemical Technology, The Hong Kong Polytechnic University, Hung Hom, Hong Kong SAR, China
[2]Department of Biological Science, College of Science, Sungkyunkwan University, Suwon 440-746, Republic of Korea
[3]The Swire Institute of Marine Science and School of Biological Sciences, The University of Hong Kong, Pokfulam, Hong Kong SAR, China

Arthropogenic stress and climate change pose major challenges to survivorship of organisms. Acclimation to these changes often incurred energy costs to organisms and led to decrease in fitness. This presentation will make use of two studies, using copepod *Tigriopus japonicus*, to examine whether development of resistance to two common stressors (copper and thermal stress) can be acquired and whether fitness cost is involved. *T. japonicus* inhabits shallow supratidal tidepools that subject to extreme environmental conditions and has good tolerances to a wide range of stresses. For copper, *T. japonicus* (F0) were acclimated to three concentrations (0, 10, and 100 μg Cu l-1) and offspring (F1 and F2) of each treatment were subsequently acclimated at these three concentrations, respectively. Cu resistance of the copepod was increased even after one generation of acclimation to 100 μg Cu l-1. Acquired Cu resistance had a fitness cost, as intrinsic population growth rate of this Cu resistant lineage was significantly lower than the control in clean seawater. For thermal stress, thermal tolerance of a temperate South Korea population (SK) and a sub-tropical Hong Kong population (HK) were compared. Copepods (F0; 27 pairs each) were raised in 3 temperatures: 15, 20 and 25℃ for 30 days and offspring (F1 and F2) of each treatment were subsequently acclimated at these three temperatures, respectively. As suspected, F0 SK copepods have lower thermal tolerance than F0 HK copepods as reflected by their mean lethal temperatures (LT; SK: 42.9℃, HK: 45.3℃). After acclimation to the 3 test temperatures, LT of both F0 populations shifted accordingly but similar difference remained. Interestingly, F1 individuals of both populations raised in the same temperature have less difference LTs than the F0 parents. Despite this, the reproductive output of F1 SK copepods under 25℃ were less than the HK group and the difference in output was larger than that observed their F0 parents. The overall results suggested that stress tolerance in *T. japonicus* is plastic but may involve some initial cost on the Darwinian fitness of the population.