



Research Highlight

GLOBAL WARMING – THREATS FOR AQUA FARMING

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Global warming is a potential threat to the fundamental continuity of life on earth. Global warming has direct impact on marine life which leads to the high level of mortalities therefore, the need of the hour is to study the effects of global warming on marine life and how it can save marine life from global warming¹.

Aqua culture plays a vital role in providing sea food and commercial products worldwide as it is a lean source of protein. Aqua culture is becoming a popular business these days and freshwater prawn farming has become a precious sector. A giant freshwater prawn (*Macrobrachium rosenbergii*) which belongs to a family Palaemonidae is badly affected by global warming which restrains their yield². In 1991, the production of *Macrobrachium rosenbergii* was 26, 588 MT while in 2000 a drastic change in production was observed which was 118, 501 MT³.

Temperature plays a significant role in biological organization and integration of an organism. Increase in temperature up to a certain limit supports aquaculture by decreasing the time needed to produce

marketable sized animals as well as more generations in a year. However, exceeding threshold limit, temperature is lethal and can cause stress in the organism that consequently leads towards permanent cellular alterations⁴.

Temperature of this planet is amplifying day by day due to global warming therefore; biological response of different organisms should be assessed in case of changing environmental conditions. In aquatic life, gills are considered as fundamental structures, as they are involved in gaseous exchange and excretion of nitrogenous compounds⁴.

Hence, these structures can be efficiently used to study environmental changes on the test animals. Accordingly, a new research was carried out to study the cellular alteration of *M. rosenbergii* gills in response to thermal acclimation at three different temperatures (25, 30 and 35° C) and exposure to thermal extremes as well by using transmission electron microscopy⁵.

Tested prawns were exposed to a steady rate of increase or decrease (0.3°C/min) until critical thermal maxima and critical thermal

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minima were reached. Afterwards, research team dissected the gills and processed them for transmission electron microscopy, both at the end of acclimation period as well as at critical thermal limits⁶.

This study exhibited that cellular integrity gets changed in the gills, in response to thermal acclimation and exposure to thermal extremes. Conclusively, it is obvious that exposure to mounting temperatures (35°C and above) for longer duration because of global warming and climatic alterations can lead towards respiratory stress and breakdown of compensatory general adaptive syndrome (GAS) and eventually endanger *M. rosenbergii*. Last but not the least, it is recommended that there is a dire need of limiting green house gas emissions in order to protect the marine life. Well-managed protected areas can help conserve and protect ecologically and biologically significant marine habitats. This will also regulate human activities in these habitats and prevent environmental degradation⁷.

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