

## 干露胁迫对日本囊对虾抗氧化酶活性的影响

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Effect of desiccation on antioxidant enzyme activities of kuruma shrimp (*Marsupenaeus japonicus*)

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## 摘要

研究了干露胁迫对日本囊对虾 (*Marsupenaeus japonicus*) 抗氧化酶活性的影响。结果显示, 与对照组相比, 4个实验组的对虾均于干露胁迫5 h后出现大量死亡, 而低温湿润组对虾成活率高于其他实验组; 随干露胁迫时间的增加, 4个实验组对虾肝胰腺中谷胱甘肽过氧化物酶 (GPx)、过氧化氢酶 (CAT) 和超氧化物歧化酶 (SOD) 活性呈现先升高后降低的趋势, 但低温干燥 (DG) 和常温湿润 (CS) 组 GPx 活性在胁迫早期有显著降低现象 ( $P < 0.05$ ); 谷胱甘肽-S转移酶 (GST) 和过氧化物酶 (POD) 活性显著降低 ( $P < 0.05$ ); 丙二醛 (MDA) 含量呈现先降低后升高的趋势。结果表明, 干露胁迫显著诱导日本囊对虾氧化应激反应, GPx、CAT、SOD 和 MDA 可作为其应答干露胁迫反应的监测指标。适量的低温湿润条件可提高对虾干法运输的成活率, 该条件下体质量约 10 g 的日本囊对虾在干露胁迫 10 h 内具有较高的成活率。

关键词: 日本囊对虾, 干露, 抗氧化酶, 成活

## Abstract:

We investigated the effect of desiccation on antioxidant enzyme activities of kuruma shrimp (*Marsupenaeus japonicus*). The results show that many shrimps died in the four treatment groups in 5 h after desiccation, and wet and low temperature improved the survival rate of shrimps significantly. Compared with the control, the activities of glutathione peroxidase (GPx), catalase (CAT) and superoxide dismutase (SOD) in hepatopancreas of the four treatment groups increased firstly and then decreased gradually, but GPx activities in the low temperature and dry (DG) and the normal temperature and wet (CS) groups decreased significantly at the beginning of the experiment ( $P < 0.05$ ). The activities of glutathione S-transferase (GST) and peroxidase (POD) decreased significantly ( $P < 0.05$ ). The contents of malondialdehyde (MDA) decreased firstly and then increased gradually. These results indicate that the response to oxidative stress of *M. japonicus* could be induced by desiccation. GPx, CAT, SOD and MDA were all sensitive to desiccation and could be regarded as monitor indices for desiccation in *M. japonicus*. It is beneficial to keep appropriate low and wet temperature during the transportation of *M. japonicus* without water, and the shrimps of average body weight of about 10 g would have a higher survival rate under such condition after 10-hour desiccation.

Key words: *Marsupenaeus japonicus*, desiccation, antioxidant enzyme, survival

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