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Eduardo De Mercado, Ana María Larrán, Julia Pinedo, Cristina Tomás-Almenar



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**Skin mucous: A new approach to assess stress in rainbow trout**

Eduardo De Mercado, Ana María Larrán, Julia Pinedo, \*Cristina Tomás-Almenar

Subdirection of Research and Technology. Agro-Technological Institute of Castilla y León. Consejería de Agricultura y Ganadería. Finca de Zamadueñas. Ctra. Burgos km. 119, 47171, Valladolid, Spain

\* Author for corresponding: tomalmcr@itacyl.es; +34 921 41 27 16

de Mercado, Eduardo: ita-merpened@itacyl.es

Larrán, Ana María: ita-largaran@itacyl.es

Pinedo, Julia: julia.pinedo.gil@gmail.com

**Abstract**

Animal welfare is an increasingly important issue, which is reflected in the current policies established by many countries. It is just a question of time that different indicators are required to evaluate the health and welfare status of the animals. In this study, we explored the possibility to analyze different stress indicators as lactate, cortisol, and oxidative stress markers (reactive oxygen species and antioxidant power) in skin mucous as a non-invasive method for detecting alterations in fish welfare state *'in vivo'*. For that, fish were subjected to a brief acute stress by hypoxia and a total of 14 samples of skin mucous were taken at different times (basal level, after stress, 1 h, 2 h, 3 h, 5 h, 7 h, 24 h, 48 h, 72 h, 96 h, 120 h, 144 h and 168 h post-stress). For each time, cortisol, lactate and oxidative stress markers were determined in skin mucous. According to other studies our results show the presence of cortisol in skin mucous, and by first time is revealed the presence of other stress markers as lactate and oxidative stress. In addition, the concentration of these substances over time showed a clear response against hypoxia as acute stressful factor. Further research is required to evaluate and validate the stress response in skin mucous, but this study shows the ability of the use of skin mucous as a stress sensor, and open new possibilities for setting up non-invasive, quick and simple methods for detecting alterations in the fish welfare state *'in vivo'* that lastly could adversely affect the fish's health and the output efficiency.

**Keywords:** skin mucous; hypoxia; cortisol; lactate; oxidative stress

**1. Introduction**

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