

**Keywords**Sturgeon, Stress, Temperature,  
Growth**CORRESPONDING AUTHOR****Lucia Aidos**

marialucia.matelaaidos@unimi.it

**JOURNAL HOME PAGE**[riviste.unimi.it/index.php/haf](http://riviste.unimi.it/index.php/haf)UNIVERSITÀ DEGLI STUDI DI MILANO  
DIPARTIMENTO DI SCIENZE VETERINARIE  
PER LA SALUTE, LA PRODUZIONE ANIMALE  
E LA SICUREZZA ALIMENTARE

## Rearing temperature effect on the skeletal muscle fibers of *Acipenser baerii* yolk-sac larvae

Lucia Aidos<sup>1\*</sup>, Alessia Di Giancamillo<sup>1</sup>, Marco Lanfranchi<sup>3</sup>,Daniela Bertotto<sup>2</sup>, Giuseppe Radaelli<sup>2</sup> and Cinzia Domeneghini<sup>1</sup><sup>1</sup>University of Milan, Department of Health, Animal Science and Food Safety, Italy<sup>2</sup>University of Padua, Department of Comparative Biomedicine and Food Science, Italy<sup>3</sup>Società Naviglio Agricola SS, Goito, Italy

### Abstract

Siberian sturgeon farming is important because it provides an alternative source of caviar and meat, but also for the conservation of the endangered natural stocks. Farmed fish is continuously subjected to stress factors, of which, water temperature is considered a major one (Schram *et al.*, 2006). It has been demonstrated that physiological stress may have serious negative consequences on growth (Wendelaar Bonga, 1997) and that fish larvae appear less tolerant than adults to temperature variations (Stefanovich *et al.*, 2016).

The present study aims at investigating the stress response and development in precocious stages of siberian sturgeon when subjected to different rearing temperatures, by analysing ontogeny, growth and stress response of yolk-sac larvae.

This study was approved by the Ethic Committee of the University of Milan (OPBA\_20\_2016). Fertilized Siberian sturgeon eggs were reared at 16°C, 19°C and 22°C until complete yolk-sac absorption. Sampling timepoints were: hatching, schooling and complete yolk-sac absorption stage. Water parameters and larvae development data were registered. Histological, histochemical and immunohistochemical analyses were performed in order to assess ontogeny and stress biomarkers and whole body cortisol was measured by a specific microtitre radioimmunoassay (RIA). Statistical analysis was performed with SAS software (v. 9.3, Cary Inc., NC).

Larvae subjected to the highest water temperature showed a faster yolk-sac absorption and larvae body weight significantly increased from hatching onwards. Structural normal development considering the three different temperatures investigated from hatching until the end of the trial was observed. Significant differences were found between temperatures regarding body weight and cortisol levels ( $P < 0.01$ ). A stronger expression of stress markers was noticed in larvae subjected to the lower temperature. Even if this study indicates that lower rearing temperatures would appear more suitable for Siberian sturgeon rearing, further studies would be necessary to evaluate the temperature effect on a mid-long term basis.

## References

Schram E., Van der Heul J.W., Kamstra A. and Verdegen MCJ. 2006. Stocking density dependent growth of Dover sole (*Solea solea*). *Aquaculture*, 252:339-47.

Stefanovich DI, Manzon LA, McDougall CS, Boreham DR, Somers CM, Wilson JY, Manzon RG. 2016. Thermal stress and the heat shock response in embryonic and young adult of the year juvenile lake whitefish. *Comp. Biochem. Physiol. Part A* 193: 1-10.

Wendelaar Bonga, S.1997. The stress response in fish. *Physiol.Rev.* 77:591–625.