



HAL
open science

Energetic status, development and early behaviour of brown trout fry (*Salmo trutta*): study of maternal effects

Thomas Régnier, Valérie Bolliet, Jacques Labonne, Philippe Gaudin

► To cite this version:

Thomas Régnier, Valérie Bolliet, Jacques Labonne, Philippe Gaudin. Energetic status, development and early behaviour of brown trout fry (*Salmo trutta*): study of maternal effects. Nordic Workshop for PhD students on anadromous salmonids, Mar 2009, Southampton, United Kingdom. 55 p. hal-02751860

HAL Id: hal-02751860

<https://hal.inrae.fr/hal-02751860v1>

Submitted on 3 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

ENERGETIC STATUS, DEVELOPMENT AND EARLY BEHAVIOUR OF BROWN TROUT FRY (*SALMO TRUTTA*) : STUDY OF MATERNAL EFFECTS

Régnier T.⁽¹⁾, Bolliet V. ⁽¹⁾, Labonne J. ⁽¹⁾ & Gaudin P. ⁽¹⁾

(1) INRA, UMR ECOBIOP, Pôle d'hydrobiologie - Quartier Ibarron 64310 St-PEE-SUR-NIVELLE (FRANCE), tregnier@st-pee.inra.fr, bolliet@st-pee.inra.fr, labonne@st-pee.inra.fr, gaudin@st-pee.inra.fr

Key words: Metabolic rate, energetic status, *Salmo trutta*, emergence from gravel.

Abstract:

Energetic stores condition a number of traits linked to growth or reproduction, such as maternal investment, migration decision at the individual level. However, these stores are also linked to their rate of depletion i.e. metabolism which represents the costs of different function, as maintenance for a resting individual, synthetic processes for growth, feeding and activity. A growing body of literature, dealing with behavioural traits variability, tends to link them to physiological processes, including metabolism. For instance, metabolic rate has been linked to several personality traits such as aggressiveness and dominance in different species. So both energetic stores and metabolism, representing the Energetic status of an individual, appear of relevant interest for the understanding of life history-strategies. Yet emergence from gravel is thought to be one of the most critical phases for young salmonids due to high predation and starvation pressure combined with the acquisition of swimming behaviours and the acquisition of a feeding territory. Emergents have also to choose to reside on the emerging site or to disperse downstream. Until yolk depletion, the energetic status of an individual is only conditioned by maternal provisioning and the yolk absorption rate. Metabolic rate may be the missing link between energetic status and behavioural strategies at the onset of emergence.

To our knowledge, neither inter-individual variability of metabolic rate throughout embryonic and larval development nor the role of different metabolic rates on early behaviour has been investigated. The aim of this study is to compare the ontogeny of metabolic rate of different *Salmo trutta* families by means of flow through micro-respirometry. Routine metabolic rate (RMR) was monitored from fertilization to yolk sac resorption. Intra-family and also inter-family variations in RMR were investigated by means of Bayesian modelling in order to look for any maternal effect on metabolic rate ontogeny across embryonic development. The in fine purpose is to gather clues for the understanding of emergence patterns heading towards further researches.