Ethology   Oral

Video multitracking to study the fish behaviour

DELCOURT Johann[1], YLIEFF Marc[1], BOLLIET Valérie[2], BARDONNET Agnès[2], DENOËL Mathieu[1], PONCIN Pascal[1]

[1] *Behavioural Biology Unit, University of Liège, Liège, Belgium;* [2] *UMR Ecobiop, INRA/UPPA, Pôle d'hydrobiologie de l'INRA, St Pée sur Nivelle, France*

With the development of digital imaging techniques over the last decade, there are now new opportunities to study complex behavioural patterns and rhythms in fish (from individual to collective group) and to track a very large number of individuals. These new technologies and methods provide valuable information to fundamental and applied science disciplines such as ethology, animal sociology, animal psychology, veterinary sciences, animal welfare sciences, statistical physics, pharmacology, as well as neuro- and ecotoxicology. Specifically in situations where a large number of individuals are involved, the use of video tracking data is essential, as manual analyses would be complicated, time-consuming and sometimes even impossible. Today, multitracking allows us to observe directly the behaviours of groups, and to determine the real interaction rules by sampling data collected in nature or in the laboratory, without any a posteriori rules as it was and is frequently the case in computer simulation of collective behaviours. With these technologies, the quantitative measures of collective behaviours is now easily accessible, and allow to define social behaviours with more accuracy than just qualitative criteria as is always the case for instance with the definition of shoaling and schooling behaviours.

Firstly will be introduced a review of fish video multitracking techniques. This review describes the possibilities of tracking individuals and groups at different scales, but also outlines the advantages and limitations of the different detection methods. The problem of occlusions, during which errors of individual identifications are very frequent, will be discuss. Secondly, our recent contribution in colour-based multitracking will be introduced, notably the new application of fluorescent VIE (Visible Implant Elastomer) tags in automatic tracking technology to study the behaviour of transparent animals like glass eels (*Anguilla anguilla*) in dim light or in darkness. The method makes it possible to measure the activity (notably distance and speed) of four individuals as a function of tidal and nycthemeral rhythms in the same flume (circular aquarium simulating the river or estuarine conditions) across a wide time scale (from seconds to weeks) in the context of migration in estuary.

Keywords : Video multitracking, Shoal and school, Collective behavior

XIV European Congress of Ichthyology
3-8 July 2012 - Liège (Belgium)

Program
and
Abstracts
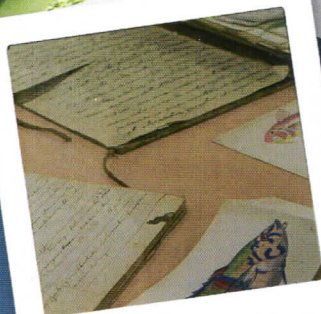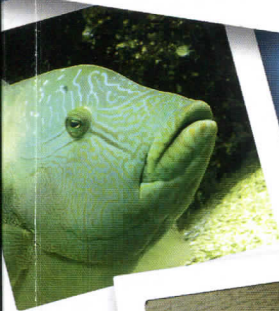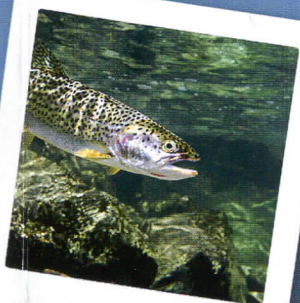
Genetics
Evolutionary morphology
Phylogeny and Systematic
Ecophysiology and Ecotoxicology
Ecology and Fish conservation
Behaviour

Université de Liège