{rokbox title=|A full image of the flume used in the study and its set–up :: Image: Authors (COB-IEO)|
thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-response-chemical-stimuli-juvenile-fish-gouraguine-et-al-2016-thumb.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-response-chemical-stimuli-juvenile-fish-gouraguine-et-al-2016.jpg{/rokbox}

Adam Gouraguine, Carlos Díaz-Gil, **Olga Reñones**, David Simón Otegui, Miquel Palmer, Hilmar Hinz, Ignacio A. Catalán, David J. Smith,
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Behavioural response to detection of chemical stimuli of predation, feeding and schooling in a temperate juvenile fish
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Abstract: In order to recruit into adult populations juvenile fish must be able to find food, successfully compete with other organisms and avoid predation within a habitat, in other words they must be able to locate favourable and avoid detrimental conditions. Bio-chemical research into fish detection and discrimination between chemical cues is extensive, however whether olfactory mechanisms are critical in habitat selection and avoidance of detrimental conditions within the marine environment remains under-researched. Despite being one of the scientifically most explored seas, studies on the use of olfactory system in the selection of water masses of the Mediterranean fish species are absent. Using a chemical choice flume, the chemically mediated behaviour choices to distinct chemical cues (algae, seagrass, predator and conspecifics) of Symphodus ocellatus, a common Mediterranean fish, were investigated. In addition to the conventional analysis, which relies on the amount of the time spent in the specific water mass as the main indicator of preference, the behavioural response triggered by the detection of a particular cue was also examined, by analysing the mean and variance of speed of the individual fish movements, a complimentary approach previously not considered in the flume experiments. Bayesian statistical method was used to calculate both, proportion of time spent in the specific water mass, as well as to analyse the behavioural response of each individual within the specific water mass. In terms of the time spent, the flume trials conducted resulted in no significant fish selection preference or avoidance for any of the water masses tested, however varied speeds and number of burst speed movements were observed in a number of trials. When no olfactory stimulus was present, no change in behaviour was triggered. Thus, juvenile S. ocellatus undoubtedly has a capacity of change in behaviour to a complex array of olfactory stimuli, nevertheless the response in the flume experiment was more complex than just the differences in time of the occupancy between the water masses. As a result, the analyses of speed could in future prove to be an important complementary tool for

studying behavioural responses of fish using this methodology. The findings are coupled with the development of the rigorous novel protocol for behavioural analyses using exclusively publicly available apparatus and software, all described within the manuscript.

Keywords: Behavioural response, Chemosensory cues, Choice flume, Juvenile fish, Swimming speed, Bayesian statistics