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S2.4. An assessment of Allis shad larvae and juvenile tolerance to oxythermic stress

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Allis shad (*Alosa alosa*) populations showed important decline among last decades, and it is assumed that the species' distribution area has restricted. In some watersheds, the status of the species is preoccupating, however this remains poorly explained. In the Gironde-Garonne-Dordogne system (SW France), its decline leads to the adoption of a fishery moratorium in 2008. Despite this measure, local populations don't show signs of a recovering. One hypothesis consists in the unefficiency of the recruitment process: indeed, young-of-the-year Allis shad are exposed to many pressures during their downstream migration, such as hypoxia (low water oxygen concentration). In the Gironde estuary, hypoxic events are frequent in summertime, and can consist in episodes of several days with water O₂ saturations under 30%. In addition, hypoxic events are thought to be even more severe and frequent in the future, according to most of climate change scenarios. Such low O₂ availability could threaten young Allis shad, and as a consequence, this could condition their migration success.

To our knowledge, if authors have suggested that 3-months old Allis shad show lower resistance to hypoxia at higher temperature, the abilities of younger developmental stages (larval and migrating stages) have never been studied. Here we meant to describe tolerance range of 10, 30, 60 and 90-days old Allis shad to oxythermic stress, by conducting behavioural analysis at individual scale in decreasing water oxygen saturation conditions (from 100 to 30%), at temperatures 18, 22, or 26°C.

By this study, we aimed to bring useful information on the importance of oxythermic conditions for Allis shad in both larvae reintroduction purposes and juvenile migration success.

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