# **CONTAMINATION AND HABITAT FRAGMENTATION AS DRIVERS OF POPULATION DISTRIBUTION OF STRESSED LANDSCAPES**

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## INTRODUCTION

In aquatic ecosystems, the spatial connectivity is considered a fundamental ecosystem organizing principle. Disturbances in the landscape might affect the biological dispersal, as a consequence of the habitat fragmentation driven by connectivity loss and chemical fragmentation caused by contamination.

### **OBJECTIVES**

To evaluate the individual and combined effects of habitat connectivity restriction and contamination on the organism's ability to explore a heterogeneous landscape, and the possible threat to the population dynamics to forage.

The capacity to explore a landscape was evaluated by foraging as one of the most important trigger for organisms exploring an environment.

# MATERIALS AND METHODS

#### Exposure assay system







Length: 24 cm Width: 24 cm Height: 8 cm Volume: 700 mL

**Rotatory door** Gate Length: 5 cm Height: 6.5 cm Diameter: 3.5 cm Width: 5 cm Diameter hole: 2.1 cm Height: 8 cm



Diameter: 2.45 cm

Length: 22.2 cm

HeMHAS - Heterogeneous Multi-Habitat

Assay System (version #2)

Multi-stressor approach







#### Heterogeneous connectivity configuration and contamination exposure







Contamination

Connectivity restriction

Zebrafish (Danio rerio)

High fragmentation

> Fragmentation levels defined by the passages connecting compartments Contaminated compartments are colored in red

# RESULTS













Fragmentation

According to model selection, the evidence ratios (ER) that support the effects of both stressors, high level of contamination (25 µg L-1) and high restriction connectivity, were (respectively):

ER = 111.8 and >1000







# CONCLUSIONS

This study evidenced that the effects of a highly restricted connectivity among habitats and contamination by copper:

- Reduced the foraging success of the zebrafish to reach food,
- Increased the foraging effort, and
- Increased the time spent by the fish exploring the landscape.

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BrEStress project