INTRODUCTION:

There is a global trend for industry to move away from animal testing. Despite this regulation, there is no replacement of animal testing for developmental toxicity. Animal data are still considered the "gold standard," but new approach methodologies are being explored. Biobide's Teratotox assay uses zebrafish embryos to predict the developmental toxicity potential of chemicals based on potential induction of developmental defects in zebrafish embryos. Zebrafish present a high genetic homology with humans (over 75% in many protein functional domains) and important parallelisms in organogenesis and functional mechanisms. A blinded pilot study on 10 fragrance materials was conducted using this assay.

METHODS

Ten fragrance materials with curated results from available *in vivo* studies was selected for the pilot study. Zebrafish embryos were treated with five concentrations per test material. DMSO was used as vehicle. Embryos were treated twice: at the start of the experiment (4-5 hours post-fertilization) and at 2 days post-fertilization (DPF) and were incubated for 4 DPF. Embryo lethality and developmental toxicity were evaluated at 2 and 4 DPF.

RESULTS

Out of 10 materials tested, data for CAS #103-95-7 (Cyclamen aldehyde) has been described here. Effects observed: edemas, malformations affecting head and eyes, and very slow heartbeat. The NOAEL for 2 DOF was at 2 µM and for 4 DPF was at 3.71 µM.

The zebrafish model for developmental toxicity may help identify which materials to push forward in the testing pipeline.

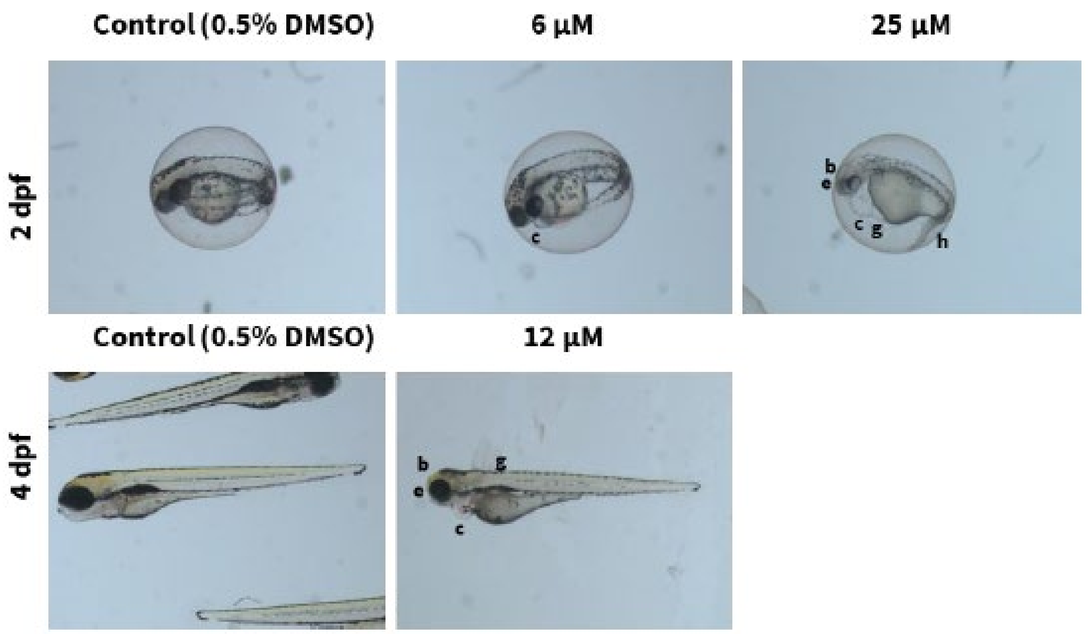

Figure 1. Representative images corresponding to treatment with CAS #103-95-7 (Cyclamen aldehyde). Observed effects are described as follows: Microcephaly (b), pericardial edema (c), microphthalmia (e),yolk sac edema (g), trunk alteration (h).

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Take a picture to check the data for pilot study on all 10 materials

RESULTS

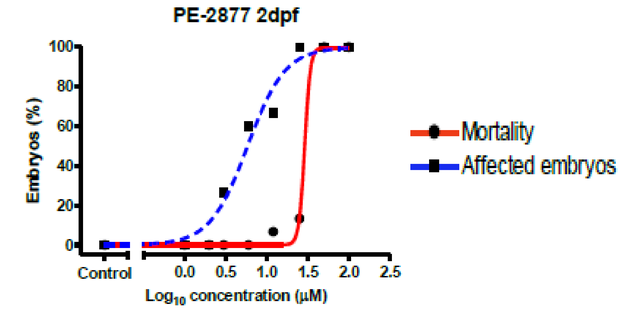

Figure 2. Representative images corresponding to treatment with CAS #103-95-7 (Cyclamen aldehyde). Mortality and affected embryos at 2 days post-fertilization (DPF)

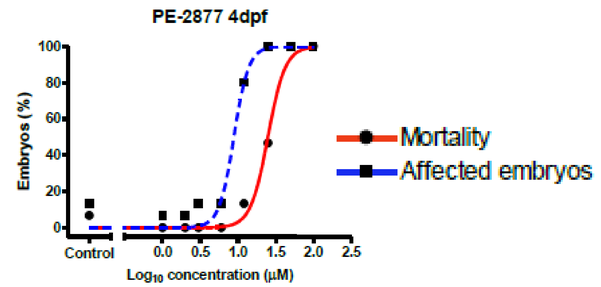

Figure 3. Representative images corresponding to treatment with CAS #103-95-7 (Cyclamen aldehyde). Mortality and affected embryos at 4 days post-fertilization (DPF)

CONCLUSION

A pilot studies in zebrafish model with fragrance materials that have historical *in vivo* animal studies was conducted. We think these assays may be promising in comparing the effects of structurally related materials and may help in prioritizing testing.

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