POSTERS

IMPACT OF POLYETHYLENE MICROPLASTICS ON INTESTINE, OVARY AND BRAIN OF ZEBRAFISH

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Polyethylene terephthalate (PET) is a commonly used polymer mainly in food and beverage packaging. Mismanagement of PET waste leads to environmental accumulation and its subsequent fragmentation into microplastics (MPs), which pose a threat to aquatic organisms [1]. There is limited information in the literature regarding the effects of PET-MPs; therefore, this study investigates their impact using zebrafish, a model organism widely used in toxicological studies [2]. Adult zebrafish were exposed to 500 µgL-1 of PET-MPs mixed into feed for 10 (T10) and 20 (T20) days. The investigations were conducted on the intestine, ovary, and brain. The results showed that, at the intestinal level, inflammation increased, as evidenced by a rise in mucous cells observed through periodic acid–Schiff staining and by elevated il-1β expression in T20 group. At the ovarian level, altered follicular development was observed, with an increase in immature oocytes and a decrease in mature oocytes, particularly in the T20 group, consistent with the reduction in the gonadosomatic index observed in this group. An increase in poly(ADP-ribose) polymerase expression was also observed at T10, whereas at T20, although levels remained higher than in the control group, they decreased compared to T10. This trend was also observed in the molecular analysis of the genes involved in the maintenance and growth of ovarian tissue (gsdf, il-1 β, tox3, cyp191a, fn1). At the brain level, tissue damage was observed through hematoxylin–eosin staining that revealed hyperemia and ventriculomegaly at both T10 and T20. Alterations in redox homeostasis and in the expression of genes involved in proper nervous system function (gfap, ngn1, ascl1a) were also detected supporting the behavioral data, which revealed increased anxiety and aggressivity. Overall, these results provide preliminary evidence of the potential of PET-MPs to interfere with key physiological processes, supporting the continuation of this study.

References

1. Chen X Q et al. Bioresour Technol; 2025;429:132492.
2. Ferrandino I. Int J Mol Sci; 2024; 25:8608.