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# Book of Abstracts

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## P-00496 Microplastics in the bloodstream of dogs and cats: evidence of systemic exposure and implications for One Health

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**Introduction**
Microplastics (MPs) are increasingly recognized as pervasive contaminants occurring across aquatic, terrestrial, and atmospheric environments. Their small size, persistence, and physicochemical properties promote extensive environmental dispersion and bioavailability, raising growing concerns regarding their potential impacts on both animal and human health. Although MPs have been extensively documented in aquatic organisms and wildlife [1, 2], information concerning their occurrence in companion animals remains limited [3]. In the present study, we provide the first evidence of MPs in the blood of living dogs and cats through both quantitative and qualitative characterization.

**Materials and Methods**
A total of 20 whole blood samples from companion animals (14 dogs and 6 cats) were analyzed, and MPs were extracted according to [4].

**Results**
MPs were detected in 100% of samples, demonstrating systemic exposure in both species. No statistically significant differences were observed between dogs and cats in terms of MP abundance, morphology, size, or colour distribution, suggesting comparable exposure patterns and environmental sources. Whole blood analysis revealed a particle abundance ranging from 2 to 13 MPs per individual, with a median value of 6 MPs. Morphological characterization showed a clear predominance of filaments over fragments in all samples analyzed. Size distribution analysis indicated that most particles were smaller than 100 µm, supporting the hypothesis that smaller MPs may more easily translocate into the bloodstream. Colour distribution analysis demonstrated a prevalence of black particles (65.4%), followed by blue (16.5%), red (14.2%) and white/transparent particles (3.9%). Overall, a total of 127 MPs were identified. To further evaluate the suitability of blood-based matrices for biomonitoring studies, serum samples were also analyzed. MPs were consistently detected in serum, although at lower concentrations than in whole blood, showing a more homogeneous size distribution (<120 µm) while preserving similar qualitative features, including predominantly filamentous and dark-coloured particles.

**Discussion and Conclusion**
Our findings suggest that MPs circulate not only within cellular blood components and coagulation-associated elements but also in the freely circulating fraction, supporting their systemic bioavailability and potential transport to peripheral tissues. Taken together, these results confirm chronic exposure of companion animals to MPs and support the use of blood as a reliable matrix for MP detection and characterization. Given their close coexistence with humans and shared environmental exposure, companion animals may serve as valuable sentinels of environmental contamination within a One Health perspective. Future studies involving larger cohorts are needed to investigate possible associations between MP burden and health status, as well as the influence of factors such as age, sex, breed, lifestyle, and environmental exposure.

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