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# Evaluation of human exposure to microplastics and nanoplastics related to the consumption of the striped venus clam *Chamelea gallina* caught in the Central Adriatic Sea (PLASTICVONG project)

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## Abstract

The striped venus clam, *Chamelea gallina*, is one of the most consumed bivalves in Italy, caught from the natural banks present in the coastal waters. Being a bivalve mollusc, it feeds by filtering the surrounding waters and can bioaccumulate any xenobiotics present in the same area, including the plastic additives, micro (MPs) and nanoplastics (NPs). The flesh of *C. gallina* is consumed entirely by humans without any type of evisceration. For this reason, the European Food Safety Authority indicated bivalve molluscs as food to be further evaluated for a possible risk generated by the human consumption of bivalve-associated MPs and NPs. In the absence of an official method, MPs and NPs are generally detected by

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choosing a detection technique available in the literature, which presents technical advantages and disadvantages, and are seldom detected in the same matrix using different types of techniques, aiming to better understand the extent of this pollutant presence. Moreover, no molecular data are available for *C. gallina* exposed to MPs and NPs at environmentally realistic doses. Hence, the PLASTICVONG project has undertaken the detection and characterization of MPs and NPs and additives (e.g. bisphenol A - BPA) in the soft tissues of *C. gallina* caught from Marche, Abruzzo and Molise regions (Italy) by means of stereomicroscopy, Raman microspectroscopy, mass spectrometry, Pyr-GC/MS. Accordingly, PLASTICVONG will estimate the exposure to MPs and NPs related to the human consumption of *C. gallina* caught in the Central Adriatic Sea. Also, the transcriptional and metabolic changes induced by experimental exposure of clams to MPs, NPs and BPA, possibly linking them to genome methylation profiles, will be evaluated. This study is financially supported by Italian Ministry of Health, through "ricerca corrente 2022" research programme fund.

**Keywords:** Chamelea gallina, Microplastics, Nanoplastics, Additives, molecular data, human exposure