UNIVERSITI TEKNOLOGI MARA

DETERMINATION OF MICROPLASTICS IN COMMERCIAL BIVALVES AND ESTIMATION OF EXPOSURE AMONG POPULATION IN PASIR PENAMBANG, KUALA SELANGOR

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In the name of Allah, The Most Gracious, The Most Merciful.

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ABSTRACT

Microplastics (MPs) pollution has gained global attention because of the severe harm to the surrounding environment, especially to the marine life and even human. Microplastics present everywhere in human daily life, whether in the water, the food or the air that can cause a serious health hazard to human especially through ingestion of food that are polluted with microplastics. Thus, this study aims to determine the characteristic and abundance of microplastics in different types of commercial bivalves and to assess the potential risk exposure through ingestion of microplastics to humans. Different types of the most commercially popular bivalves which are blood cockle, Textile venus clam, green mussel and hard clam were obtained from Pasar Basah Pasir Penambang. This cross-sectional study was conducted at Pasar Basah Pasir Penambang, Kuala Selangor through a random sampling method. The data analysis was analyzed using SPSS software through a non-parametric Kruskall-Wallis test, the microplastics concentration between different bivalves sample is significantly different with value $p<0.05$. The results of the study also found that fiber is the most common form of microplastic found in all bivalves' samples, and black is the dominant color of microplastic found.

Keywords: *Microplastics, bivalves.*

CHAPTER 1

INTRODUCTION

1.1 Background

Microplastics (MPs), defined as plastic components or fragments smaller than 5 mm, are most likely the most prevalent type of plastic pollution in the ocean today. (Law & Thompson, 2014). The amount of microplastics will undoubtedly rise as bigger, single plastic items degrade, eventually breaking down into millions of microplastic bits. (Cózar et al., 2014). Furthermore, worldwide plastics manufacturing is expanding due to increased demand, since microplastic resources are now so crucial to humans that we cannot exist without them. (Gutti, 2018). Microplastics contamination can be caused by various factors including human activity, which is likely to have a negative health impact on humans themselves(Vital et al., 2021)

Primary and secondary microplastics are distinguished. Primary microplastics are created and intended for external human use, whereas secondary microplastics form because of the breakdown of large plastic fragments (Smith et al., 2018a). Some microplastics are produced in industry as raw materials for other products, others are formed because of the breakdown of large pieces of plastic, and still others can be found in tyres, textiles, paint ropes, and waste treatment(Bartolo & Lart, 2018; J. Li, Liu, et al., 2018). The presence of microplastic in the environment is determined by aquatic studies(Sandra & Radityaningrum, 2021; Sarmah et al., 2018; Wagner et al., 2014). Microplastics are classified as polyethylene (plastic bags and bottles), polystyrene (food containers), nylon, or PVC(Mistri et al., 2020; T. Zhang et al., 2022). Heat, UV light, oxidation, mechanical action, and biodegradation by living organisms such as bacteria degrade these plastic items, resulting in smaller particles that can eventually be classified as microplastics(Ng et al., 2018; Zhou et al., 2018).