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### Research Article

## Occurrence of Macro- and Microplastics on Pasir Pandak Beach, Sarawak, Malaysia

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### Abstract

Pasir Pandak Beach is close to human settlements, resorts, and food stalls. It becomes a place for gathering of beachgoers especially during weekend. As a result, the beach became polluted with rubbish, particularly plastics (e.g., macro- and micro-plastics). Hence, this study was done to determine the occurrence of macro- and micro-plastics on the Pasir Pandak Beach, Kuching, Sarawak, Malaysia. Transect quadrat was used during the samples collection on the beach. The samples were then undergone the wet peroxide oxidation, filtering and classifying under dissecting microscope. Macroplastics were isolated for ATR-FTIR and SEM analyses, while microplastics were separated according to their sizes, colors, and types. Approximately 101.70 items/m<sup>2</sup> of macro-plastics and 1084 items/m<sup>2</sup> of micro-plastics were found in this study. Clean Coast Index (CCI) was also estimated and the calculated CCI value obtained was >20, which indicated as extremely dirty beach. Fragments of carpet/canvas/mat and hardware crate/item were the most abundance macroplastics found, followed by plastic ropes/fishing lines and bottle caps. HDPE, PES, PP, and PS were the main identified polymers. Fibers, filaments, fragments, and foams were identified for micro- and macro-plastics. Microplastics with smaller sizes of 0.25-0.50 mm were available abundantly and they comprise 63.47 % of the total microplastics found. Clear/white, black, and blue were the main colors for microplastics. SEM images presented that those adhering particles, grooves, pits, fractures, and flakes were the common patterns of degradation. No relationship was apparent between macro- and micro-plastics at each station. The abundance of macro- and micro-plastics showed that they were mainly controlled by the land-based input. As Pasir Pandak beach is busy with local communities and beachgoers, the presence of macro- and micro-plastics on the beach posing a severe threat for marine environment, thus further studies on the behavior of this emerging pollutant from beach to the seas are necessary.

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