



Preliminary Assessment of Plastic Nurdle Contamination Along the Western Coast of Sri Lanka Following the MSC ELSA 3 Incident

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A preliminary assessment of plastic nurdle contamination was conducted along selected beaches on the western coast of Sri Lanka following the MSC ELSA 3 maritime incident in May 2025, which resulted in extensive shoreline accumulation of pre-production plastic pellets. Given the limited baseline data available for the region, the study aimed to quantify nurdle abundance, evaluate spatial and short-term temporal variability, and characterize the physical condition of recovered pellets. Systematic weekly surveys were conducted over a 13-week period (July–September 2025) at nine fixed coastal sites (Egoda Uyana to Browns Beach) using standardized 10-minute timed searches along 50 m transects positioned at high-tide wrack lines. Nurdle abundance showed spatial variability, with mean counts ranging from ~15 to over 3,000 nurdles per 10-minute survey, with higher abundances generally observed at southern sites, while several northern locations consistently recorded low counts throughout the study period. Temporally, total weekly counts across all sites ranged from 2,085 to 15,009 nurdles, with distinct episodic peaks observed during late July and late August. Physical characterization indicated a strong dominance of white or transparent nurdles (>90%) across all sites, with minor proportions of yellowed pellets and negligible occurrence of charred material. While the survey followed the shoreline accumulation observed after the MSC ELSA 3 incident, residual pellets from earlier events (particularly the X-Press Pearl spill) may persist within coastal sediments or be reintroduced through coastal transportation processes. The observed spatial and temporal patterns likely show the influence of nearshore hydrodynamics, including wave action, tidal variability, and wrack-line formation, suggesting that nurdle distribution along the western coastline is dynamic and subject to ongoing redistribution. This study provides a baseline dataset for post-spill assessment and highlights the need for extended monitoring to better understand the long-term fate and transport of plastic pellets in Sri Lanka's coastal environment.

Keywords: *Plastic nurdles, Coastal pollution, MSC ELSA 3, Sri Lanka*