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New Perspectives of Biodegradable Plastics PLA in waste management- A Review

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Abstract: Plastic is an indecomposable material and it could continue to stay around for 1000 years until it finally gets broken down. Pollution is menacing the human health, food, water safety and the environment causing climate change frequently. Macro-plastics account for around 88% of the total plastic leakage to the environment in 2019, which is nearly 20 million metric tons (MT) polluting all the ecosystem. Micro plastics and Nano plastic are formed by natural phenomena such as solar radiation, winds, and currents, as well as by other physical or chemical means. Primary micro plastics are shed from synthetic textiles, tires, and other products through abrasion. Nano plastics can cross cell membrane walls and penetrate living organisms. To get rid from such uneven situation, non-conventional plastic is drawing attention to the entire human civilization. Marine biodegradable plastics can be either bio-based or fossil fuel-derived that oppose conventional plastics. Biodegradable plastics have emerged among the most promising materials for replacing conventional fossil fuels, which have had many negative impacts on the environment, including different pollution. The present review has unveiled emergence of poly lactic acid (PLA), a promising biodegradable plastic to eradicate the deleterious effects on society. In this work, we have compared PLA with Polypropylene (PP) and Polyethylene terephthalate (PET) from the physico-chemical properties for having insight of PLA. Additionally, we are illuminating the composites of PLA to be used for progressive industrialization, diagnostic applications, 3D printing, food packaging. The present review work will be a guiding note for researchers on PLA to discover new areas for employment of PLA based materials for a sustainable society.