**Supplementary information**

**Role of Pretreatment and Evidence for the Mineralization of Low Density Polyethylene Films by Greater Waxworm**

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**Figure S1.** 1H NMR spectra of (A) WC, (B) ER of waxworm fed on WC, (C) UTLDPE, (D) ER of waxworm fed on UTLDPE, (E) PTLDPE, (F) ER of waxworm fed on PTLDPE



**Figure S2.** GCMS of ER of Waxworm fed on (A) WC, (B) ER of Waxworm fed on PTLDPE

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Microbial strain | Source of the microbes | Type of the Polyethylene used | Characterizationmethods | Incubationtime (days) | Weightloss (%) | Reference |
| *Rhodococcus ruber*C208 | Soil from PEwaste disposalsite | LDPE film | Weight lossMeasurement, Biofilm formation. | 56 | 7.5 | Sivan et al. (2006) |
| *Pseudomonas* sp*.*AKS2 | Soil bacteria | LDPE film | Weight lossMeasurement, Biofilm formation,Surface analysis | 45 | 5 | Tribedi and Sil, (2013) |
| *Bacillus sphericus*Alt | Marine water | LDPE film | Weight lossMeasurement, Biofilm formation,Surface analysis,Thermal analysis,Mechanical property | 180 | 10 | Sudhakar et al. (2008) |
| *Bacillus cereus* BF20 | 2.5 |
| *Kocuria palustris*M16 | Marine water | LDPE film | Biofilm formation;Weight lossmeasurement;Surface analysis | 30 | 1 | Harshvardhan and Jha, (2013) |
| *Bacillus pumilus*M27 | 1.5 |
| *Bacillus subtilis*H1584 | 1.75 |
| *Pseudomonas**aeruginosa* PAO1(ATCC 15729) | Type strainbacteria | LDPE film | Biofilm formation;Weight lossmeasurement;Surface analysis;Mechanical property;Degraded products | 120 | 20 | Kyaw et al. (2012) |
| *Pseudomonas**aeruginosa* (ATCC15692) | 11 |
| *Pseudomonas putida*(ATCC 47054) | 9 |
| *Pseudomonas**syringae* (ATCC10862) | 11.3 |
| *Aspergillus nomius*  | Soil from Waste dumping site | LDPE film | Weight loss measurement, Morphological analysis, Degraded products | 90 | 4.9 | Abraham et al. (2017) |
| *Streptomyces* sp | 5.2 |
| Pseudomonas citronellolis EMBS027  | Municipal land fill soil | LDPE film | Weight loss measurement, Surface analysis, Functional group analysis, Thermal analysis | 4 | 17.8 | Bhatia et al. (2014) |
| Bacillus amyloliquefaciens (KC924446)  | Municipal solid waste land fill soil | LDPE  | Weight loss measurement, Surface analysis, Functional group analysis,CO2 evolution test | 60 | 11 |  Das and Kumar, (2015) |
| Bacillus amyloliquefaciens (KC924447) | 16 |
| *Brevibaccillus borstelensis*  | soil | LDPE | Weight loss measurement, Functional group analysis | 30 | 11 | Hadad et al. (2005) |
|  Acinetobacter baumanii | Municipal land fill soil | LDPE film | Functional group analysis, Degraded products, Tensile strength | 30 | NA | Pramila and Ramesh, (2015) |
| Pseudomonas sp. | Mangrove soil | PE | Weight loss measurement | 30 | 20.5 | Kathiresan, (2003) |
| Staphylococcus sp.  | 16.3 |
| Moraxella sp. | 7.7 |
| Micrococcus sp. | 6.6 |
| Streptococcus sp. | 2.1 |
| Aspergillus glaucus | 28.8 |
| Aspergillus niger | 17.3 |

**Supplementary Table 1** Summary of the reported microbial strains associated with Polyethylene degradation