**Supplementary information**

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

Harsha Kundungal 1, Manjari Gangarapu 1, Saran Sarangapani 1, Arunkumar Patchaiyappan 1, Suja Purushothaman Devipriya1\*

*1. Department of Ecology and Environmental Sciences, Pondicherry University, Puducherry, India- 605014.*

C:\Users\pc\Desktop\NMR 1.tif

C:\Users\pc\Desktop\NMR 2.tif

C:\Users\pc\Desktop\NMR 3.tif

**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

C:\Users\pc\Desktop\GCMS.tif

**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 | Characterization  methods | Incubation  time (days) | Weight  loss (%) | Reference |
| *Rhodococcus ruber*  C208 | Soil from PE  waste disposal  site | LDPE film | Weight loss  Measurement, Biofilm formation. | 56 | 7.5 | Sivan et al. (2006) |
| *Pseudomonas* sp*.*  AKS2 | Soil bacteria | LDPE film | Weight loss  Measurement, Biofilm formation,  Surface analysis | 45 | 5 | Tribedi and Sil, (2013) |
| *Bacillus sphericus*  Alt | Marine water | LDPE film | Weight loss  Measurement, 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 loss  measurement;  Surface analysis | 30 | 1 | Harshvardhan and Jha, (2013) |
| *Bacillus pumilus*  M27 | 1.5 |
| *Bacillus subtilis*  H1584 | 1.75 |
| *Pseudomonas*  *aeruginosa* PAO1  (ATCC 15729) | Type strain  bacteria | LDPE film | Biofilm formation;  Weight loss  measurement;  Surface analysis;  Mechanical property;  Degraded products | 120 | 20 | Kyaw et al. (2012) |
| *Pseudomonas*  *aeruginosa* (ATCC  15692) | 11 |
| *Pseudomonas putida*  (ATCC 47054) | 9 |
| *Pseudomonas*  *syringae* (ATCC  10862) | 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