Abstract

The litter decomposition is a complex and essential process that deals with the nutrient cycling and replenishment of soil fertility. Studies on the process of litter fall, its decomposition rate and nutrient circulation have received extensive attention. Extensive study on litter decomposition in forest ecosystem is very limited. Majority of the studies and associated information is based on the single species litter decomposition. The present study focused on the percentage rate of leaf litter degradation at three different insitu experiments which started on November (post monsoon), March (Premonsoon) and June (post monsoon season) in Pampadum Shola National Park, Kerala. The samples were collected at various stages of insitu litter degradation experiment using litter bag technique. The results showed that an average of 33.39% (after nine months) of litter was degraded. Almost constant degradation rate was observed after six months of decomposition. Post monsoon season showed high rate of litter degradation as compared with monsoon and premonsoon season. The carbon dioxide evolution rate or microbial respiration was done using soil respirometer. Post monsoon season showed high rate of carbon dioxide evolution. The loss/formation of novel phytochemical components and the functional groups were noticed at the end of the experiment. Some of the secondary metabolites and functional groups were lost at the end of the experiment mostly due to the chemical reactions. The prevalence of various bacteria at various stages of decomposition was also analysed. Nine bacteria were commonly present in the entire experimental period. The enzymatic activity of the isolated litter bacteria was checked and those bacteria which produced all the major enzymes were designated as potential litter degrading bacteria. The molecular identification of these bacterial strains revealed that the species were B. firmus, B. cereus, B. mojavensis, B. anthracis and Solibacillus silvestris.