ABSTRACT

Modification of riparian vegetation via land use change alters leaf litter processing rates in streams. This study aimed at investigating the effect of land use change from forestry to agriculture on leaf litter decomposition in the upper Mara River catchment, Kenya. The study involved collecting, drying and weighing leaves of Eucalyptus saligna (exotic) and Macrocalyx neubotonia (native). About 6g of each leaf species was enclosed in litter bags measuring 11 x 11cm and mesh size of 10mm. The bags were exposed randomly in six streams; three draining agricultural and three draining indigenous forests. They were later retrieved at intervals of 0, 1,3,7,14,28 and 48 days, dried and weighed. The difference in processing rates of Eucalyptus leaves were statistically not significant (insert test and statistics) between streams draining indigenous forest (mean -k = 0.039±0.009, pooled data) and streams draining agricultural areas decaying Macrocalyx leaves were –k = 0.095±0.005 in streams draining agricultural areas and k=0.062±0.01 for streams draining indigenous forest. The two values differed significantly (t = 2.892, d.f=4, p= < 0.05). Significant differences in processing rates were also evident between Eucalyptus and Macrocalyx leaves in streams draining indigenous and agricultural forests respectively (ttest, $p<0.05$). It would take 63 and 69 days for 90% of leaves of Eucalyptus to be processed in agricultural and forested streams respectively whilst Macrocalyx leaves would take 24 and 53 days. Processing rates for the two leaves were generally higher in agricultural streams than in forested streams most probably due to higher nutrients especially Phosphate concentration arising from agricultural land. In all the study streams SRP had significant correlation with decay rates for both species. Significant differences in processing rates observed between the two leave species could be attributed to differences in leave toughness and the presence of inhibitory compounds in eucalypts. The findings of this study suggest that land use change interacts with change in the composition of riparian tree species to influence decomposition rates of leaf litter in streams. This has implications on the functional organization of shredders and nutrient cycling in streams. This study confirms that land use activity has an effect on litter decomposition rates in Upper Mara catchment streams. However Eucalyptus decomposition did not respond to change in land use activity because of its poor quality which masks the land use effect.