

## Leaf litter decomposition and carbon dioxide evolution of some potential agroforestry species in southern Sri Lanka

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Decomposition of leaf litter of six agroforestry species, namely, *Gliricidia sepium*, *Macaranga peltata* (kande), *Alstonia macrophylla* (hawari nuga), *Artocarpus heterophyllus* (jak fruit), *Terminalia catappa* (Indian almond) and *Mangifera indica* (mango) was studied using the litter bag technique, and carbon dioxide evolution from leaf litter was determined under laboratory condition by soil respirometry at the Faculty of Agriculture, Mapalana, Sri Lanka. All the experiments were arranged in a Randomised Complete Block Design with five replicates.

Considerable inter specific variations in decomposition and carbon dioxide evolution from leaf litter were evident among the litter types ( $p < 0.05$ ). *G. sepium* showed the greatest mass loss, losing 60%

of its initial dry weight by 30 days. On the other hand, *M. indica* was the slowest to decompose. It showed a remarkable resistance to decomposition and maintained over 50% of its mass up to five months. Decomposition rate of leaf litter was highest in *G. sepium* followed by *A. heterophyllus*, *T. catappa*, *A. macrophylla*, *M. peltata* and *M. indica*.

Carbon dioxide evolution for all the species was significantly greater during the first week ( $p < 0.01$ ). The peak carbon dioxide release was observed after 1 week in *G. sepium*, 2 weeks in *A. macrophylla*, *M. peltata*, *A. heterophyllus* and *M. indica* and 3 weeks in *T. catappa*. Thereafter, carbon dioxide release showed a downward trend over time. The highest amount of carbon dioxide was released by *A. macrophylla* ( $0.5023 \text{ mg CO}_2 \text{ g}^{-1} \text{ litter h}^{-1}$ ) where as the lowest was by *M. indica* ( $0.1703 \text{ mg CO}_2 \text{ g}^{-1} \text{ litter h}^{-1}$ ). Unlike in the other species, a clear peak in carbon dioxide evolution was not evident in *M. indica* and its rate of carbon dioxide evolution remained almost constant for 14 to 28 days of incubation which was unique to this species.

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