

MICROBIAL ACTIVITIES IN THE DECAY OF RHIZOPHORA MANGLE LEAVES

Jack W. Fell

Rosenstiel School of Marine and Atmospheric Science
University of Miami, 4600 Rickenbacker Causeway
Miami, FL 33149

ABSTRACT

Red mangrove (*Rhizophora mangle* L.) leaf fall has been estimated at approximately three tons (dry wt)/acre/year. The degradation of these leaves is a combination of bacterial, fungal and meiofaunal activities. Initiating with the living leaves and following through the decay process in the water, there is a definite sequence of fungal invaders. The role of the fungi is considered to be the conversion of leaf carbon compounds to microbial protein. Absolute nitrogen values in decaying leaves increase at an approximate rate of 30 μ g/day/gm dry wt of leaf. This microbial protein is utilized by a variety of meiofaunal organisms including nematodes, copepods, amphipods, polychaetes, forams, etc. These invertebrates inhabit the leaf surface within the first 24 hours after leaf fall; during later stages of decay the animals invade the internal leaf layers. Animal numbers reach a peak of about 70 animals/cm² of leaf surface within 4 weeks of submergence. The animals feed on the microbial protein either by direct consumption of the microbes or indirectly through leaf fragmentation. The rate of decay appears to be dependent on temperature. Laboratory studies of the individual components of the system indicates optimal rates at from 24 to 33°C, whereas 37°C and above may retard or possibly stop the decay process. This leaf degradation system is important in the production of organic materials required to drive certain estuarine food chains. It is also of interest in connection with the fate of leaf tissue that alternatively becomes incorporated into peat.