

Litter Fall and Decomposition of Mangrove Species (*Excoecaria agallacha*) in a Newly Emerged Island (Nayachar), West Bengal, India : w.r.f Soil Microarthropods

M.K.DEY¹ and A.K.HAZRA²

¹Zoological Survey of India, New Alipore, Kolkata-53

Abstracts:- Mangrove leaf litter (*Excoecaria agallacha*) fall and decomposition was estimated using litter bags throughout the year at four sites of Nayachar Island. *Excoecaria agallacha* is the most common species in Nayachar Island (Latitude 21° 58' 50" N and Longitude 88° 04' 60" E). This species tends to occupy the inner parts of the island. This study presents the decomposition rate for *Excoecaria agallacha* leaf litter throughout the year (Premonsoon, monsoon and post monsoon). It also quantifies physico-chemical factors along with the microarthropods population abundance throughout the decomposition process. The result showed that breakdown of leaf litter was season and microarthropods population (Acarina, Collembola, Coleoptera, Hymenoptera, Isopoda etc.) dependent. A significant ($P < 0.05$) higher amount of mass loss, rate of decomposition, decay constant and amount of nutrient return from leaf litter (*Excoecaria agallacha*) were observed during the post monsoon period.

Keywords:- Decomposition, Mangrove, Soil arthropods, Nayachar Island.

I. INTRODUCTION

Nutrients are up taken by plants for their growth and development and portion of these nutrients is accumulated in plant body [1-2]. Conversely considerable amount of nutrients are returned to the soil embryonic phase of development has been found to be very low as the decomposition on mangrove forest are influenced by several parameters, including mangrove species (*Excoecaria agallacha*), season and position of the stand in the supra tidal zone [3-4]. Arthropods are one of the group of soil fauna which inhabit the soil and the overlying layer of organic debris. According to Kuhnelt (1963) [5], there was hardly an arthropodan group, which was not found in the soil. The arthropods usually referred to collectively as the soil micro arthropod fauna [6], including Acarina, Collembola, Protura, Pauropoda, Diplura and Symphyla. The first two groups are the abundant faunal groups in most soil in comparison to

other group (Kuhnelt (1963) [5]. The present investigation also laid emphasis on the study of the decomposition process of *Excoecaria agallacha* leaf litters and the succession of different micro-arthropods population in the different phases of litter decomposition processes of Nayachar Island. This study also emphasizes that i> leaf litter decomposition rates of *Excoecaria agallacha* in pre monsoon, monsoon, and post monsoon ii> return rate of N, P and K in the soil for *Excoecaria agallacha* litter decomposition in different season.

II. MATERIAL AND METHODS

Excoecaria agallacha mangrove plants were chosen for the study of mangrove leaves decomposition. Litter decomposition rate has been determined by litterbags methods. The litterbags were made of nylon, mesh sizes (6mm²) were used for present study [7]. Freshly fallen leaves of different mangroves plant were collected from the mangrove belt of Nayachar Island. The leaves were chopped with size (1inch) into uniform lengths then dried in air. Each nylon bags was filled with 200gm air-dried litter. A set of 4 such bags was made for each selected sites. A total of 12(4×3) bags were made in three different localities. Bags were placed at a depth 5 inch under the soil. The litter bags at the rate of decompose leaves were drawn at an intervals of 3 months for one year. Microarthropods from each litter bags were extracted by modified Tullgren funnel [8]. The collected fauna were sorted out into different groups and identified with the help of Stereoscopic binocular microscope followed by taxonomic key. Decompose soil sample were study with the help of laboratory standard method [9] and statistical analysis done by STATISTICA, Version 7.0. The study carried out in the coastal environment of West Bengal experienced three distinct seasons mainly determined by two major meteorological parameters (temperature and rainfall) each with four months duration viz. Premonsoon (March-June), Monsoon (July-October), Postmonsoon (November-February) [10]. Nayachar Island Map Source: Researchgate.net).