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**Evaluation of Physico-Chemical Properties of Coco Peat based Growing Media
Enhanced with Rubber and Compost for Agricultural Applications**

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Abstract

This study was conducted to evaluate the suitability of cocopeat-based media for multiplication of microbial antagonists. The usage of cocopeat to formulate products for agricultural and horticultural purposes reduces the environmental impacts due to burning of waste cocopeat. In this study compost has been incorporated as a nutrient supplier and rubber has been utilized as a binding agent in the production of handmade coco peat blocks. Nine media were developed using different composition ratios of individual substrates of cocopeat, compost and rubber, with the evaluation criteria including Water Retention Capacity (WRC), Total Porosity (TP), Aeration Porosity (AP), Water Holding Porosity (WHP), Moisture Content (MC) and pH. Coconut fiber fragments were removed, and the compost was sieved to achieve a fine texture and ensure a uniformly distributed mixture. All nine treatments exhibited an identical bulk density of 0.18g/cm³. As the amount of rubber (Dry Rubber Content (DRC) ~20.88%) increased, the surfaces of the blocks became uneven and exhibited cavities due to lump formation with a higher amount of rubber. Incorporation of cocopeat-rubber increased WRC of the media compared to the compost-coco peat-rubber due to the higher spongy texture than compost enriched media. All media tested in this study demonstrated TP exceeding 50%. Increased AP, which enhances aeration and provides a better oxygen supply, was significantly elevated ($p < 0.05$) with the addition of rubber in media with nil compost, low compost and high compost. The highest WHP (62.89%) was observed in low compost media prepared from low rubber content and cocopeat may facilitate earlier colonization. Out of nine media, combinations of cocopeat-low rubber and coco peat-medium rubber showed the highest MC, and WRC and WHP of those two media and low compost-low rubber-cocopeat media were statistically comparable. pH of all nine media varied between 6.34-6.58, and the optimum pH for fungi sporulation was stated as 5.8-7.0. Overall, low compost-low rubber-cocopeat media is a suitable substrate for growth of microbial antagonists due its nutrients availability and water holding capacity.

Keywords: *Microbial antagonists, Substrate, Physical properties, Cocopeat*