

Evaluation of Growth Performance on Newly Developed Slip Form Vertical Growing Panels

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ABSTRACT

Greenery and sustainability are playing an important role, as today's world tends to tackle the global warming. Green environments tend to reduce the negative impact of global warming, preserve precious natural resources and improve the quality of lifestyle[1]. The act of greening generally involves incorporating more environment friendly systems into one's environment such as home, workplaces, and public places. External green wall cultivation is one of the main structural components, which is used in green building designs/ greenery environments. It is part of an integrated solution for sick building syndrome problems. The present study focuses on the evaluation of growth performance of *Centella asiatica* (Gotukola) plants, *Rhoeo spathacea* (Boat Lily), and *Hedera helix* (English Ivy) on newly developed slip form vertical growing panels. It aims to find an innovative method to address the drawbacks of existing green walls, such as wash off of plant nutrients during irrigation and the potential of causing damages to the cultivated walls etc. Slip form vertical growing wall panels were prepared as described in literature using three different sustainable homogenous mixtures that were reinforced with three different weights of alkaline hydrogen peroxide pretreated coir fibers [2]. In addition, growth parameters of plant height, leaf area, and number of leaves per plants were measured for the selected crops, which were grown in prepared slip form panels (fig.1). The average leaf area of Gotukola, Rhoeo, and English Ivy varied between 4.13 cm²-5.3cm², 14.45-20.28cm² and 9.71-14.07cm² respectively. Further, there was no significant variation in the leaf area of cultivated crops grown in the three different wall panels after 7 weeks. Similar variations were observed in the readings of average number of leaves per plant and plant height. Thus, the comparison of variations of growth parameters indicates that the all three different wallpanels could be used for preparation of vertical growing panels while the most suitable wall panels were selected through cost analysis.



Figure 1: Prepared Slip Form Wall Panels (a) before cultivation, (b, c, d) after cultivation.

Keywords: *Centella asiatica* (Gotukola) plants, *Rhoeo spathacea* (Boat Lily), *Hedera helix* (English Ivy)

REFERENCES

- [1] A. L. Virtudes, 'Benefits of Greenery in Contemporary City', IOP Conf. Ser. Earth Environ. Sci., vol. 44, no. 3, p. 032020, Oct. 2016, doi: 10.1088/1755-1315/44/3/032020.
- [2] K.R Jayasingha, K.H.G.P Tharanga, D.G.J.P Dayarathne, M.M.I Ahamed, T.N Fernando and A.P Pallewatta, (2021). 'Pretreated Coir Fibres Reinforced Biocomposite Structures for Green Wall Cultivations', Accepted full paper to be published in 12th International Conference on Structural Engineering and Construction Management 2021.