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**Biochar Derived from Pond Apple (*Annona glabra*) as a Fertilizer to Enhance the Crop Yield:  
A Sustainable Approach**

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**Abstract**

The intensive use of inorganic fertilizers causes many economic, ecological, and social issues around the world. In the search to discover an effective fertilizer, biochar has been in the spotlight in recent years. Hence, the present study was focused on utilizing biochar derived from pond apple (*Annona glabra*), which is an aquatic invasive plant as a fertilizer without harming the environment. A pot experiment was carried out to determine the effects of biochar on plant growth. Biochar was applied to soil and growth differences were identified by comparing it with the control. Banana pepper (*Capsicum annum*) was selected as the experimental plant. Plant growth parameters (seed germination percentage, growth rate, root length, and number of leaves) were measured to determine the effects of biochar on plant growth. In each pot, 5 seeds of *C. annum* were sowed and examined for 14 days to get the germinate percentages. The other plant growth parameters were recorded after 45 days. Biochar treated with soil showed a significant increase ( $p < 0.05$ ) in average growth rate ( $14.46 \pm 6.67\%$ ), root lengths ( $4.94 \pm 0.27$  cm), and number of leaves ( $5.83 \pm 0.76$ ) in comparison to the control while seed germination percentages were kept as same value. An optimizing process was carried out by increasing the amount of biochar (5%, 7%, 10% by weight) to determine the ideal amount of biochar on plant growth. Considering the average growth rate, the best result ( $21.43 \pm 1.01\%$ ) was shown in pot treated with 7% biochar by weight. Henceforth, the utilization of biochar derived from *A. glabra* as a fertilizer is an effective approach to enhance crop yield while limiting the spread of these invasive aquatic plants in a sustainable and eco-friendly manner. As a result, the current study has suggested a green, sustainable strategy for the efficient use of aquatic invasive plants.

**Keywords:** Biochar, Fertilizers, Plant growth, Aquatic invasive plant