

Degradation of Neonicotinoid Insecticides (Acetamiprid and Imidacloprid) Using Biochar of Rice Husk and Fruit Peels

Authors : Mateen Abbas, Abdul Muqeet Khan, Sadia Bashir, Muhammad Awais Khalid, Aamir Ghafoor, Zara Hussain, Mashal Shahid

Abstract : The irrational use of insecticides in everyday life has drawn attention worldwide towards its harmful effects. To mitigate the toxic effects of insecticides to humans, present study was planned on the degradation/detoxification of the neonicotinoid insecticides including imidacloprid and acetamiprid. Biocarbon of fruit peels (Banana & Watermelon) and biochar (activated or non-activated) of rice husk was utilized as adsorbents for degradation of selected pesticides. Both activated and non-activated biochar were prepared for treatment and then applied in different concentrations (0.5 to 2.0 ppm) and dosage (1.0 to 2.5g) to insecticides (Acetamiprid & Imidacloprid) as well as studied at different times (30-120 minutes). Reverse Phase-High Performance Liquid Chromatography (RP-HPLC) coupled with Photodiode array detector was used to quantify the insecticides. Results depicted that activated biochar of rice husk minimized the 73% concentrations of both insecticides however, watermelon activated biocarbon degraded 72% of imidacloprid and 56% of acetamiprid. Results proved the efficiency of the method employed and it was also inferred that high concentration of biocarbon resulted in larger percentage of degradation. The applied method is cheaper, easy and accessible that can be used to minimize the pesticide residues in animal feed. Degradation using biochar proved significant degradation, eco-friendly and economic method to reduce toxicity of insecticides.

Keywords : insecticides, acetamiprid, imidacloprid, biochar, HPLC

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