Track: (AF) Agro & Food Processing Technologies

Systemic screening and selection of unique source for extraction and commercialization of bio-insecticides from neem plant (*Azadirachta indica*)

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Azadirachta indica A. Juss., commonly known as Neem, is an important medicinal tree species from meliaceae family, is well-known for their broad spectrum biological applications. Since the ancient period (1500 BC–600 BC), it has been used as a prime ingredient in Ayurveda, Unani & Siddha, formulations to cure infectious and deadly diseases (Alzohairy, M. A. 2016). Various tissues of this tropical evergreen tree have been used for household remedies against various ailments (Kuravadi et al. 2015). In addition to its therapeutic potential, neem is a prominent source of bio-insecticides used in agricultural field for crop protection (Chaudhary, 2017). Now a day's considerable attention is increasing for natural resource based bio-insecticides in integrated pest management (IPM) practices. Commercially available synthetic insecticides are persistent for longer duration in nature, contaminates agricultural field, air/ground/surface water, and causes extinction of non-targeted beneficial organisms. Azadirachtin and nimbin is highly acknowledged bio-insecticides available in neem plant (Sidhu et al. 2003). Molecular and structural complexity hinders in the chemical synthesis of these compounds in the laboratory. In this present investigation, a phytochemical assessment was undertaken for systemic selection and screening of unique source for extraction and commercialization of bio-insecticides from neem plant. Various tissues (leaf, root, flower and seed) samples were harvested from 3-years-old neem plants from the experimental garden at IIT Guwahati. The samples were dried in an oven at 30±2°C temperature. Optimum separation and purification of azadirachtin and nimbin were achieved by high performance liquid chromatography (HPLC) by following the methodology from Srivastava and Chaturvedi (2011). The amount of azadirachtin content in increasing order was observed in leaves (1.37±0.05 mg/gm dry wt), flowers (4.69±0.13 mg/gm dry wt), roots (5.6±0.06 mg/gm dry wt), and seed (7.11±0.0.01 mg/gm dry wt), whereas significant amount of nimbin content was observed in increasing order in flowers (0.01±0.00 mg/gm dry wt), leaves (0.02±0.00 mg/gm dry wt), roots (0.25±0.01 mg/gm dry wt) and seeds (0.26±0.0.02 mg/gm dry wt). In conclusion, this study has

screened tissue specific variation of azadirachtin and nimbin contents in neem plant to find out the unique source of targeted metabolites for extraction and commercialization.

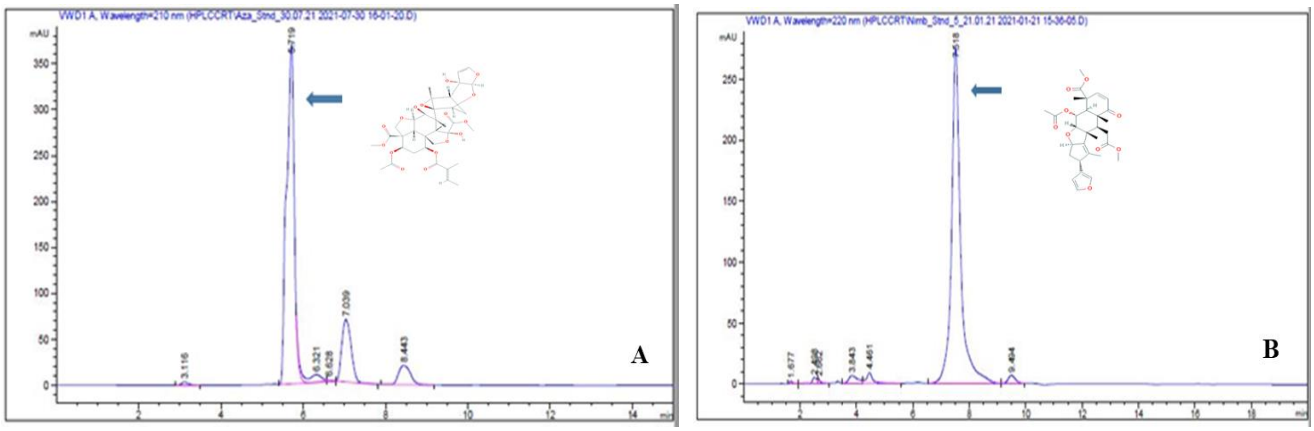

Fig 1: (A) HPLC chromatogram of azadirachtin peak showing at 5.7 retention time (min), **(B)** HPLC chromatogram of nimbin peak showing at 7.23 retention time (min).

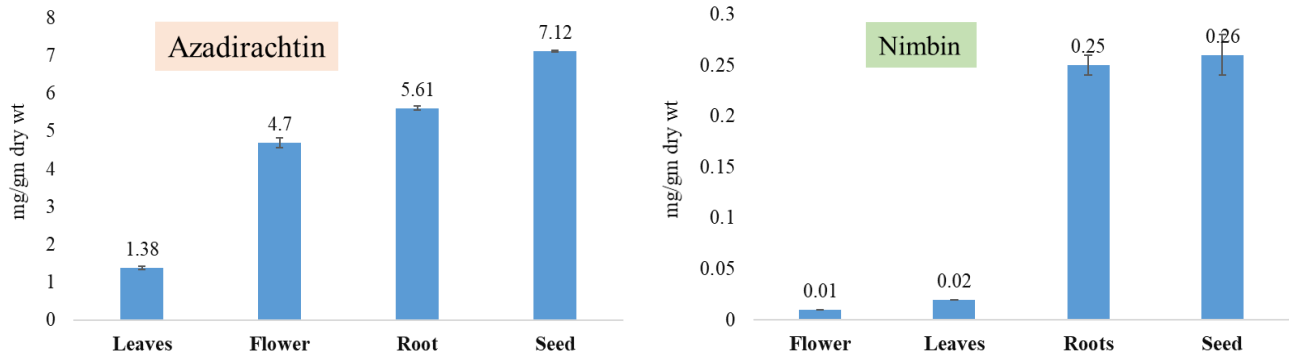

Fig 2: Azadirachtin and Nimbin analysis from different plant parts of neem plant (*Azadirachta indica)*

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