Cite this as: Hera NADEEM, Pieter MALAN, Amir KHAN, Mohd ASIF, Mansoor AHMAD SIDDIQUI, Simon TUHAFENI ANGOMBE, Faheem AHMAD. New insights on the utilization of ultrasonicated mustard seed cake: chemical composition and antagonistic potential for root-knot nematode, *Meloidogyne javanica*[J]. Journal of Zhejiang University Science B, 2021, 22(7): 563-574.
http://doi.org/10.1631/jzus.B2000746

New insights on the utilization of ultrasonicated mustard seed cake: chemical composition and antagonistic potential for root-knot nematode, *Meloidogyne javanica*

Key Words: Plant-parasitic nematode, Plant by-product, Sono-extraction, Liquid chromatography-electrospray ionization-mass spectrometry (LC-ESI-MS), Natural compound, Nematode management

- The effect of ultrasonic features on the extraction efficiency of secondary metabolites in mustard seed cake (MSC)

- The nematostatic potential of sonicated seed cake was examined against the J2s of root-knot nematode, *Meloidogyne javanica*. It also significantly suppressed the root-knot index in tomato roots - the root-knot index (RKI) value was 0.94. The lethal concentration (LC50ppm) values for sonicated extract (SE) were 51.76, 29.79, and 13.34, respectively, at 6, 12, and 18 h of the exposure period, and the LC50ppm values for non-sonicated extract (NSE) were 116.95, 76.38, and 55.59, respectively at similar exposure time. Sinapine and gluconapin were identified as the major compounds in ultrasonic-assisted MSC. Due to the high extraction efficiency of metabolites in the SE, all treatments of SE were shown to be antagonistic to J2s.

- The results show that a 35 ppm concentration of a sonicated extract sample (SE) of MSC caused 65% J2s mortality at 18 h exposure period in vitro.
- This study of ultrasonication activity-based profiling of MSC may help to generate target-based compounds at a scale that is relevant for the control of disease caused by nematodes in economic crops.

Plant-parasitic nematode; Plant by-product; Sono-extraction; LC-ESI MS; Natural compounds; Nematode management