

The anti-leech potential of the solvent extract of Bornean neem leaves and ultra-high performance liquid chromatography-high-resolution mass spectrometry profiling

ABSTRACT

Aquaculture plays a vital role in the Malaysian economy and food production however, sometimes the development is impeded by parasites. The parasitic leech *Zeylanicobdella arugamensis* (Hirudinea) infest the sea bass, snappers and groupers. They feed on the blood and cause secondary infection which could cause host death in a short time. In this study, the leaves of the neem plant (*Azadirachta indica*) (Meliaceae) have been selected as a natural product for the elimination of the parasitic leeches *Z. arugamensis* and to evaluate the phytochemical composition via ultra-high performance liquid chromatography–high-resolution mass spectrometry system (UHPLC-HRMS). The parasitic leeches were collected from Universiti Malaysia Sabah aquaculture facilities and challenged with various concentration of neem leaves methanol extract. The results revealed significant antileech activity of the methanol extract against *Z. arugamensis* with total mortality at the concentration of 25, 50 and 100 mg/ml in an average period of 35.81 ± 5.40 , 14.18 ± 0.99 and 9.21 ± 1.51 min, respectively. The analysis of UHPLCHRMS showed the existence of isorhamnetin, myricetin, myricetin 3-O-galactoside, trifolin, and quercetin (flavonoids), 2-(3,4-dihydroxyphenyl) acetamide, apocynin, p-coumaric acid, scopoletin, and, phloretin (phenolics), pulegone, and carvone (terpenoids). Thus, the research showed that methanol extract of neem leaves contained effective bioactive compounds with anti-leech effects. This study will be very helpful to fish farmers in Malaysia and other Southeast Asian countries to control the parasitic leeches in aquaculture using a natural product.