Dietary Euphorbia hirta extract improved the resistance of sharptooth catfish Clarias gariepinus to Aeromonas hydrophila

ABSTRACT

Aqueous and methanol extracts of lemon Citrus limon peel, Euphorbia hirta (aerial parts), and fenugreek Trigonella foenum-graecum seeds were tested for their in vitro antimicrobial activities against the bacterium Aeromonas hydrophila. A swab paper disk method showed that the methanol extract of E. hirta (EHE) had the largest inhibition zone and the lowest minimal inhibitory concentration compared to all other herbal extracts. Based on these results, EHE was included in the diets of Sharptooth Catfish Clarias gariepinus at 0 (control), 2, 5, or 7 g/kg of diet (experiment 1). Each treatment was conducted in triplicate, with 30 fish (mean weight ± SE = 9.4 ± 0.4 g) in each replicate. After 30 d, the growth, feed intake, hepatosomatic index (HSI), and plasma biochemical parameters were measured. With a separate batch of Sharptooth Catfish, the efficacy of the EHE diets in conferring fish resistance to A. hydrophila over 30 d was compared to that of a diet containing oxytetracycline (OTC; experiment 2). Six treatments were conducted in triplicate groups of 30 fish (mean weight ± SE = 9.0 ± 0.3 g); the Control fish were fed the control diet and were not injected with A. hydrophila, while the Control-AH and OTC-AH groups were infected with A. hydrophila and were fed either the control diet or the diet containing OTC at 1 g/199 g. The other three treatments included fish that were injected with A. hydrophila but fed diets with increasing EHE at 2, 5, or 7 g/kg. Experiment 1 showed no change to growth, feeding efficiency, HSI, or plasma biochemical parameters. In experiment 2, however, fish that were fed dietary EHE at 5 g/kg had significantly lower mortality than the Control-AH group, with further resistance observed for fish fed EHE at 7 g/kg. Dietary OTC was more effective than EHE as a prophylactic to A. hydrophila infection in Sharptooth Catfish. Nevertheless, EHE can potentially be a valuable dietary supplement to improve the resistance of Sharptooth Catfish to A. hydrophila infection.

Keyword: Euphorbia hirta; Sharptooth catfish; Diet; Aeromonas hydrophila; Clarias gariepinus