

## The effect of *Eclipta alba* and *Arctium lappa* extracts on *Ichthyophthirius multifiliis*

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Ichthyophthiriosis is caused by the ciliate *Ichthyophthirius multifiliis*, which occurs in both farmed and aquarium fish. This parasite causes lesions on the skin, gills and other organs described as fish pox, and can also cause economic losses in the aquaculture sector. Invasion is manifested by the presence of sand-sized white nodules on the skin and fins, their hyperemia and fraying with possible cavities. Other clinical symptoms in fish are: dyspnoea, blindness as well as changes in internal organs. Intense infestation can lead to death of infected fish, especially in fry. Combating the infestation consists in using preparations that kill or inhibit the development of various forms of the parasite present both in infected fish and in water. These preparations can be used as an additive to water or in the form of short-term therapeutic baths. In order to find effective natural compounds for the control of *I. multifiliis*, the in vitro effect of aqueous and methanolic extracts of *Eclipta alba* and dried *Arctium lappa* root on trophophthas and teronts of this protozoan was assessed. *E. alba* and *A. lappa* extracts significantly reduced the survival of trophies and teronts. *E. alba* and *A. lappa* methanol

extracts killed all trophytes at a concentration of 3200 mg L<sup>-1</sup>. All trophytes were killed after exposure to an aqueous extract of *E. alba* at the same concentration. *E. alba* methanol extract at a concentration of 200 mg L<sup>-1</sup> killed 35% of the trophons within an hour, and the aqueous extract at a concentration of 400 mg L<sup>-1</sup> killed 30% of the trophons at the same time. A methanol extract of *A. lappa* at a concentration of 400 mg L<sup>-1</sup> killed 35% of the trophons within an hour, and an aqueous extract at a concentration of 400 L<sup>-1</sup> killed 15% of the trophons within four hours. *E. alba* methanol extract at a concentration of 400 mg L<sup>-1</sup> killed 100% of the teronts, similarly, *A. lappa* methanol extract at a concentration of 800 mg L<sup>-1</sup> killed 100% of the teronts within one hour. A water extract of *E. alba* at a concentration of 1600 mg L<sup>-1</sup> killed 100% of teronts within an hour, and an aqueous extract of *A. lappa* killed 100% of teronts at a concentration of 3200 mg L<sup>-1</sup> within four hours. Extracts of *E. alba* and *A. lappa* can be a source of new compounds to combat ichthyophthiriosis in the form of therapeutic baths or addition to water.