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Piscicidal plants of Nepal: Toxicity Screening on fish

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A survey of the aboriginal fishermen in Chitwan District of Nepal identified the native names of 97 species of plants believed to possess piscicidal properties. Ninety-two were collected and identified. Eighty-two of these were tested for toxicity using grass carp (*Ctenopharyngodon idella*) fingerlings as test organisms. Thirty-six species that killed the fingerlings within 2 hours at 1% (w/v) extract concentration or less were categorized as poisonous. Extracts of these 36 Nepalese plant species were tested for toxicity on three species of predatory air-breathing fish (*Ophiocephalus punctatus, Clarias batrachus* and *Heteropneustes fossilis*) inhabiting the farm ponds. Out of these 36 plants, the ripe fruit of *Catunaregam spinosa* (Thunb.) Tirveng. (syn. *Randia dumetorum* Poir) (Rubiaceae) was the most toxic, with an LC50 value below 0.02–0.04% on the three species of fish; it lost its toxicity in 204 hours. The second most toxic of these 36 plants was *Polygonum hydropiper* L. (Polygonaceae) shoot extract and had LC50 values of 0.02–0.06% for all the three species of fish and lost its toxicity in 13 hours.

Aqueous extracts of dried, ripe fruit of *C. spinosa* tested for toxicity under laboratory conditions had a 5-hour LC50 of 0.0036% (weight/volume) for *Heteropneustes fossilis*. The dried shoot extract of *P. hydropiper* had a laboratory LC50 value of 0.096% for *Heteropneustes fossilis.* The environmental advantage of using these plant toxins to eradicate predatory fish before cultivating the economically viable species of fish is that the toxic effect disappears within a certain time period. The active ingredients in any of these plants were not isolated during this research. This research was funded by the Canadian International Developmental Research Centre (IDRC) and had resulted in three publications.

Speaker Biography

Augusthy Kulakkattolickal has three Master's Degrees (Masters in Experimental Biology from McGill University, Canada, Masters in Public Health from the University of Illinois, USA, and Master's in Zoology from the University of Calicut, India. His publications of the piscicidal plants of Nepal has been cited hundreds of times as updated by ResearchGate. Currently he is working as a Professor of Biology (Anatomy & Physiology) at City Colleges of Chicago, USA. Among other things, his expertise involves establishing cadaver theater/lab and planning cadaver prosection to teach Human Anatomy & Physiology for students pursuing medical careers.

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