

Review about the Factors Effect on Asian Swamp Eel (*Monopterus Albus*)



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Submission: April 23, 2018; **Published:** June 13, 2018

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Introduction

There are many factors might influence the life and the growth of Asian swamp eel (*Monopterus albus*), however, *M. albus* can adapt with tough environmental conditions more than other fishes [1]. It usually burrows deep inside the mud during prolonged deficiency of water [2]. It can also move over dry land for short distances [3].

Factors effect on Asian swamp eel (*Monopterus albus*)

Effect of salt on *M. albus*: It has been reported that *M. albus* can grow in low saline water [4], it has been recorded that *M. albus* survive in brackish water up to 16gL⁻¹ for many weeks [5]. However, exposing *M. albus* to 25% salty water for 4 days led to significant elevation in glutamine protein abundance in their liver and muscle [6].

Effect of endosulfan on *M. albus*: *Monopterus albus* habitat in rice fields, which make it exposed to toxic pesticides used in the rice fields, especially endosulfan, because it is the most commonly insecticides. It has been proven that endosulfan caused mortality of the eel was after 72 hours of exposure concentration of 1.00µgL⁻¹ [7]. Endosulfan is an organochlorine insecticide has been classified as Class IB and Class II pesticides from World Health Organisation (WHO) and the United States Environmental Protection Agency (USEPA) due to its toxic behaviour [8]. Endosulfan consider as persistent organic pollutant with 3 to 7 days half-life in the water and it can also last up to 5 months [9]. Although endosulfan has been banned in many European countries and some Asian countries, but unfortunately it is still widely used in the rice fields in most of the developing countries due to its effectiveness and low application price [10]. Endosulfan is highly toxic to the swamp eels, its toxicity depends on the concentrations and exposure times [11,12].

Effect of *Gnathostoma* infection on Asian swamp eel: *Gnathostoma spinigerum* is the major causative agent of human gnathostomiasis [13]. The route of infection is ingestion of uncooked larvae in the fresh water eel [14]. Asian Swamp Eel infection was the greatest among all infected animal species

mainly in Thailand, high numbers of *Gnathostoma* larvae found in the infected swamp eel, the distributions of *Gnathostoma* larvae was 57.0% in the liver and 43.0% in the muscles [15]. It has been reported that *Gnathostoma* infection in swamp eels was the highest during the rainy season [16]. Intensity of *Gnathostoma spinigerum* Infective Larvae in Thailand can affect the standard farming of the culture of eels and the risk of consuming undercooked eels [17]. Imported Asian swamp live eels are a potential source of human gnathostomiasis in the United States, the distribution of the infection was 58.3% in the liver, 19.4% in the muscle, 13.8% in gastrointestinal tract, and 8.3% in the kidneys [18].

Effect of rotenone on Asian swamp eel: Rotenone used for the assessment and management of fishes to eradicate the unwanted introduced species and control their numbers [19]. Rotenone consider a lethal chemical to a wide range of species [20]. It has been used to remove unwanted non-native fishes [21]. It has been reported in Florida that 100% mortality of adult swamp eels was achieved only at 8mg/L which conduct the effectiveness of rotenone as management tool against eel as well as many other aquatic organisms in the treated area [22]. Despite the successes in killing Asian swamp eel, the chemical remains controversial largely because of its broad toxicity and the potential for massive kills of non-targeted animals [23].

Effect of ammonia on Asian swamp eel: The toxicity of ammonia occurs because of the limitation factors in eel farm design and management [24], as is the main nitrogenous excretory product of eel [25]. Sometimes there is no proper water flow and small space giving in the eel tanks due to economic considerations lead to high concentrations of ammonia which may inhibit their growth [26] or cause mortalities [27]. It has been found that the lethal threshold concentration of unionised ammonia for both elvers and glass eels is 1mg-N⁻¹ [28].

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DOI: [10.19080/CTBEB.2018.15.555915](https://doi.org/10.19080/CTBEB.2018.15.555915)

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