



Aquatic Insects and their Control Measures

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Aquatic insects are an essential component of any natural and healthy aquatic ecosystem. A large number of aquatic insects prey on carp spawn and fry in the nursery ponds, particularly after and during rains. In freshwater ecosystems, insects are the most diverse group of animals. Dragonfly nymphs, Ranatra (Water stick), Gerris (Water spider), Corixa, Cybister (Diving beetle), Notonecta (Back swimmer), Belostoma (Giant bug), Nepa (Water scorpion), and other aquatic insects were captured using netting (1/8th to 1/16th inch mesh) and Kerosene as well as Diesel.

Keywords: Fish, Aquatic insect, Impact, Control

Introduction

In freshwater bodies, insects are the most diverse group of organisms. The major groups of aquatic insects contribute significantly to the biota of freshwater communities. Aquatic insects play an important role in the ecosystem function of a water body. Aquatic insects, in addition to performing ecosystem functions, are reliable indicators of human impact on the freshwater ecosystem. Insects have been demonstrated to be an excellent method for evaluating ecological hypotheses (Batzar and Wissinger 1996).

In the absence of predators and competitors, non-predatory carp culture and intensive feeding of the fish make the leftover feed available for aquatic insects. This allows the aquatic insect fauna in commercial aquaculture ponds in northwest Bangladesh to thrive. In pond systems, insect abundance (count) was found to be tremendous than in lakes (Nasiruddin *et al.* 2014). Marco *et al.* (1999) discovered that ponds with reasonable aquatic plants had a greater diversity of dragonfly species than ponds with no vegetation or extreme vegetation. The greatest abundance of aquatic insects was observed in aquaculture ponds during or after the rainy season (Yapo *et al.* 2013; Kashyap *et al.* 2013 and Nasiruddin *et al.* 2014).

Several more aquatic insects (dragonfly nymphs, backswimmers, water scorpions, and so on) are dangerous to fish larvae because they prey on fish juvenile as well as compete for nutrition (Roysfarm 2019; Gonzalez and Leal 1995; Sano *et al.* 2011 and Kashyap *et al.* 2013). Early fry rearing in specially prepared nurseries is a critical step in aquaculture practices because tender carp fry mortality is very high during the early stages. Although the environmental factors in controlled circumstances are more favorable for spawning than in natural waters, the complexity of factors makes providing optimal conditions for appropriate growth and survival impossible. Some of the limiting factors that contribute to the low survival rate of carp spawn in nurseries include poor water quality parameters, overstocking, a scarcity of food, as well as resultant decrease in rearing conditions (Saini *et al.* 2012).

Developments of aquatic insects

Aquatic insects are an essential component of any healthy natural aquatic ecosystem and are frequently used to assess the health of an ecosystem (Pondinformer, 2019). The presence of aquatic weeds, as well as excess organic matter, increases the number of aquatic insects (Roysfarm 2019). Nursery pond management entails heavy fertilization with organic manures before spawn release, which may result in the development of predatory insects. Predatory aquatic insects are just as dangerous. Their abundance over a large part of the year, particularly during and after the rains, poses a massive problem in tropical climates.

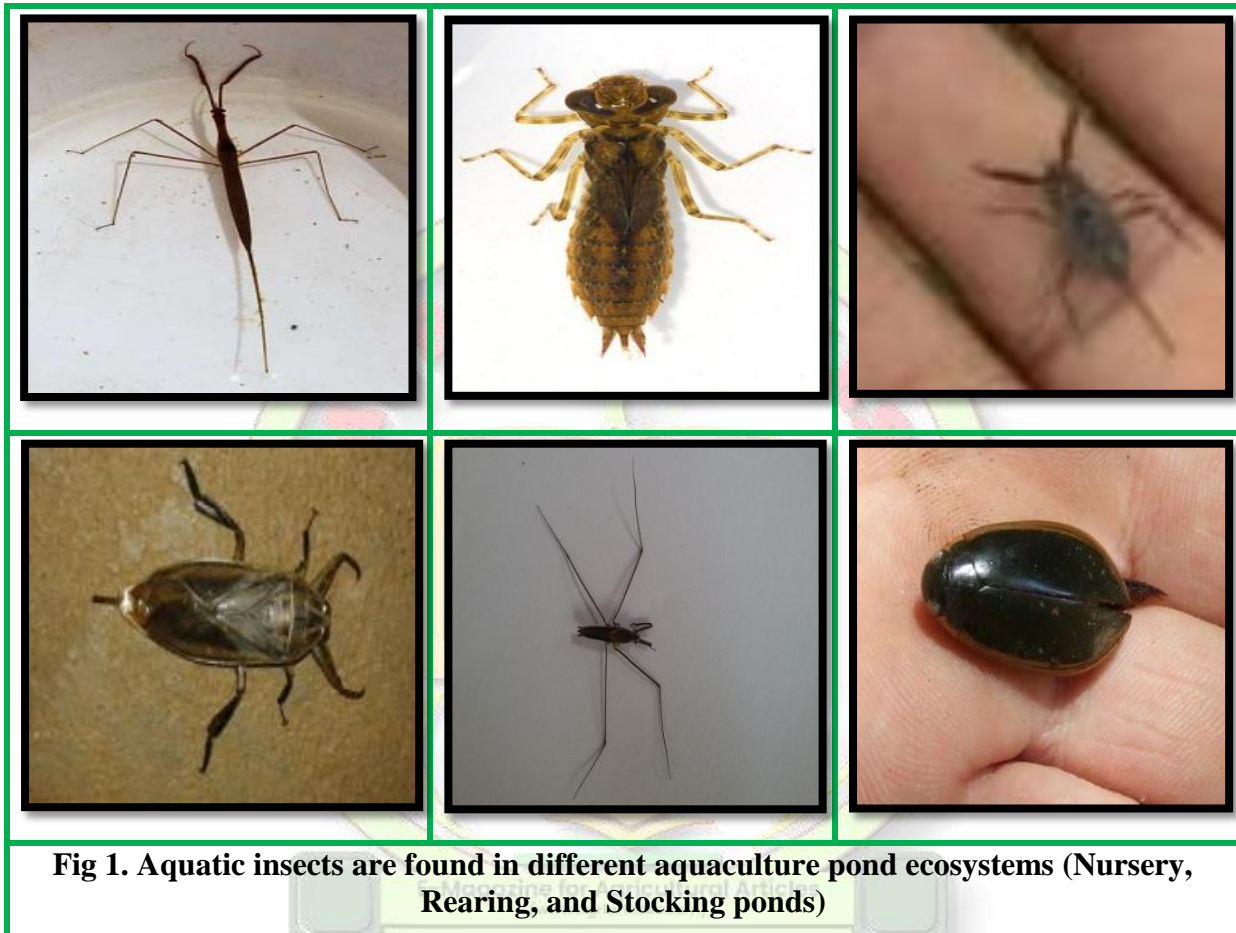


Fig 1. Aquatic insects are found in different aquaculture pond ecosystems (Nursery, Rearing, and Stocking ponds)

Effect of insects on larval rearing of fish

The aquatic insect also has a variety of feeding habits, the majority of which are for food (Sinha & Ramachandran, 1985). Dragonfly nymphs are the most common predators of fish spawn. Within 3 hours, a 15-mm-long nymph consumes seven carp spawn (Sinha & Ramachandran, 1985). Beetles and bugs are the most common predatory insects. *Cybister*, *Sternolophus*, and *gyrus* beetles are among the beetles that cause significant damage to young fishes. Aquatic bugs are extremely predatory and can even harm fingerlings. The most dreaded is the *Belostomatidicum*, a giant water bug. Similarly, stick insects of the genus *Ranatra* and water scorpions of the genus *Laccotrephes* are voracious carp fry predators. Backswimmers (*Notonectidae*), the classic example of which is the *Anisops*, cause the most depredations. The *Notonecta* use their piercing mouthparts to suck out the body fluids of carp hatchlings and fry.

Control of aquatic insects

It is necessary to use a selective insecticide that kills aquatic insects without harming fish food organisms. Mustard oil mixed with cheap washing soap at a ratio of 56:18 kg/ha is a very well technique that was developed by CICFRI (India) for predatory aquatic insect pest management within the next few hours of application. While this treatment kills the entire surface breather, the majority of gill breathers are unaffected. Insect eradication is a primary consideration in good nursery pond management practices. The assessments are including repeated netting of ponds with a small mesh net, as well as the application of appropriate insecticides as well as soap oil emulsion.

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