Paenibacillus, a novel pathogen of Biomphalaria glabrata, an intermediate host for schistosomiasis
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Introduction

Schistosomiasis is the second most widespread tropical parasitic disease after malaria. To achieve the objective of schistosomiasis eradication in a decade, various research strategies and treatment programs were recommended and supported by WHO. One of these applicable approaches is based on the control of snail vectors in endemic area. Previous field studies have shown that competitor or predator introduction could be effective but no systemic investigation has ever been conducted to identify snail microbial pathogen and evaluate its molluscside effect. In this work, our aim is to provide a characterization of a novel infectious agent isolated from unhealthy Biomphalaria snails in our laboratory.

Unhealthy snails exhibits white nodules.

Massive bacterial infiltration in snail tissues

Histological section of the headfoot (A) and the kidney (B) regions of infected snails.

M. Lumen; MC: Mantle cavity; V: Ureter; Ves: Vesicle

Paenibacillus induces a massive mortality.

Discussion

Paenibacillus sp closely related to P. alvei has been isolated from unhealthy Biomphalaria snails. Histopathological examination has shown massive bacterial infiltration leading to an overall disorganization of snail tissues. Exposure of healthy snails to Paenibacillus infected snails led to a massive mortality. Moreover, egg hatching was significantly lower in exposed snails than in control whereas the spawning appeared to be unaffected. Embryonic lethality is correlated with the presence of this pathogenic bacteria in eggs. This study reports the first description of a novel Paenibacillus strain as snail microbial pathogen by affecting both adult and embryonic stages of Biomphalaria, the vector snail of schistosomiasis.