Isolation and characterization of native *Bacillus thuringiensis* isolates from rice ecosystems of Bapatla district, Andhra Pradesh

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ABSTRACT

ustainable pest management involves the exploration of native microbial resources as eco-friendly alternatives to chemical pesticides. The present study investigated the occurrence of native *Bacillus thuringiensis* (*Bt*) in rice ecosystems of Bapatla district, Andhra Pradesh. Twenty soil samples collected from five rice-growing mandals were processed using the sodium acetate selective isolation technique. Preliminary characterization yielded fifteen Gram-positive isolates, of which fourteen showed colony characteristics comparable to the reference strain HD-1. Biochemical characterization confirmed eleven isolates as *B. thuringiensis*. The confirmed isolates were screened for pathogenicity against third instar larvae of *Spodoptera litura* by leaf-dip bioassay. Considerable variation in insecticidal activity was observed among the native isolates, with larval mortality ranging from **50.00 to 90.00 per cent.** Six lepidopteran-specific isolates (BV • S • , BV, S • , BV, S, , BhV, S • , CV, S, and VeV, S,) recorded superior pathogenicity. The study demonstrated the occurrence of diverse native *B. thuringiensis* populations in rice ecosystems and identified six isolates exhibiting specific activity against lepidopteran larvae, indicating their potential for biological pest management.

Keywords: : *Bacillus thuringiensis*, Leaf-dip bioassay, Native isolates, Rice ecosystems and *Spodoptera litura*