

## ABSTRACT

Sugarcane white leaf (SCWL) disease caused by plant pathogenic phytoplasma (*Candidatus* Phytoplasma) consider to be the most important disease of sugarcane in Thailand and continue to be severe problems to sugarcane grower, especially in northeastern Thailand. The objective of this research was to screen and determine the ability of plant growth promoting rhizobacteria and endophytic bacteria to control SCWL disease. The 558 and 401 bacteria were isolated from rhizospheric soil and sugarcane stalks in eleven provinces of Thailand, Lop Buri, Suphan Buri, Nakhon Pathom, Ratchaburi, Kanchanaburi, Nakhon Sawan, Kamphaeng Phet, Nakhon Ratchasima, Udon Thani, Khon Kaen and Chaiyaphum. All isolates were screened for the ability to produce tetracyclines and growth promoting activity *in vitro*. A total of 959 isolates, 503 isolates were able to grow on nitrogen free medium. The 480 and 230 isolates indicated as solubilizer of phosphorus and potassium, respectively. Forty three of which positively isolates exhibited phytohormone (IAA) synthesis. To screen for *in vitro* antibiotic activity, the tested bacteria (tetracyclines sensitive strain) were conducted by paper disc agar diffusion. Only eighteen rhizospheric bacterial isolates showed *in vitro* antagonism against the tetracyclines sensitive strain, whereas none of stalk endophytes isolated inhibited growth of the tester. Among these, twelve isolates were determined tetracyclines production by high performance liquid chromatography. The result revealed that all twelve isolates could not produce tetracyclines. Furthermore, 25 isolates of *Bacillus subtilis*-like colony were used to screen the surfactin production. Surfactin is produced by *B. subtilis* and known as one of the most powerful biosurfactants with antimicrobial properties, including anti-phytoplasma activity. The surfactin production assays was performed by drop-collapse method. The results showed that three isolates could produce surfactin. However, potential isolates needs further test *in vivo* to uncover their efficacy as effective bacteria to control SCWL disease.

**Keywords:** sugarcane white leaf disease, plant growth promoting rhizobacteria, endophytic bacteria