



Growth control of cyanobacteria strain LmTK01 using specific bacteria in laboratory (*in vitro*)



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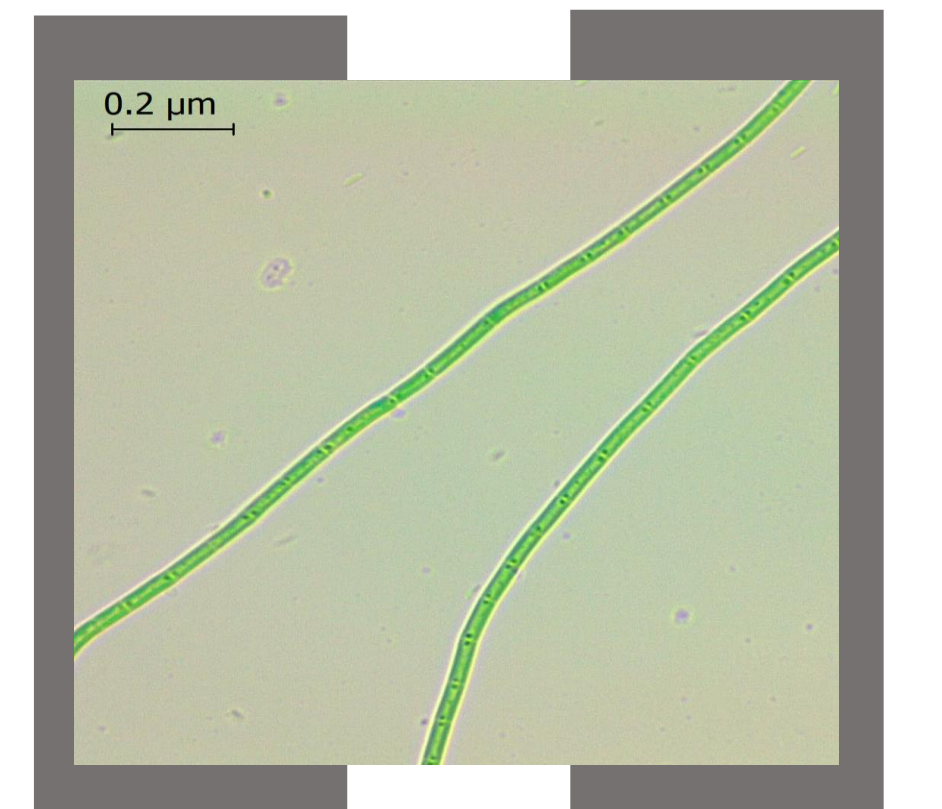
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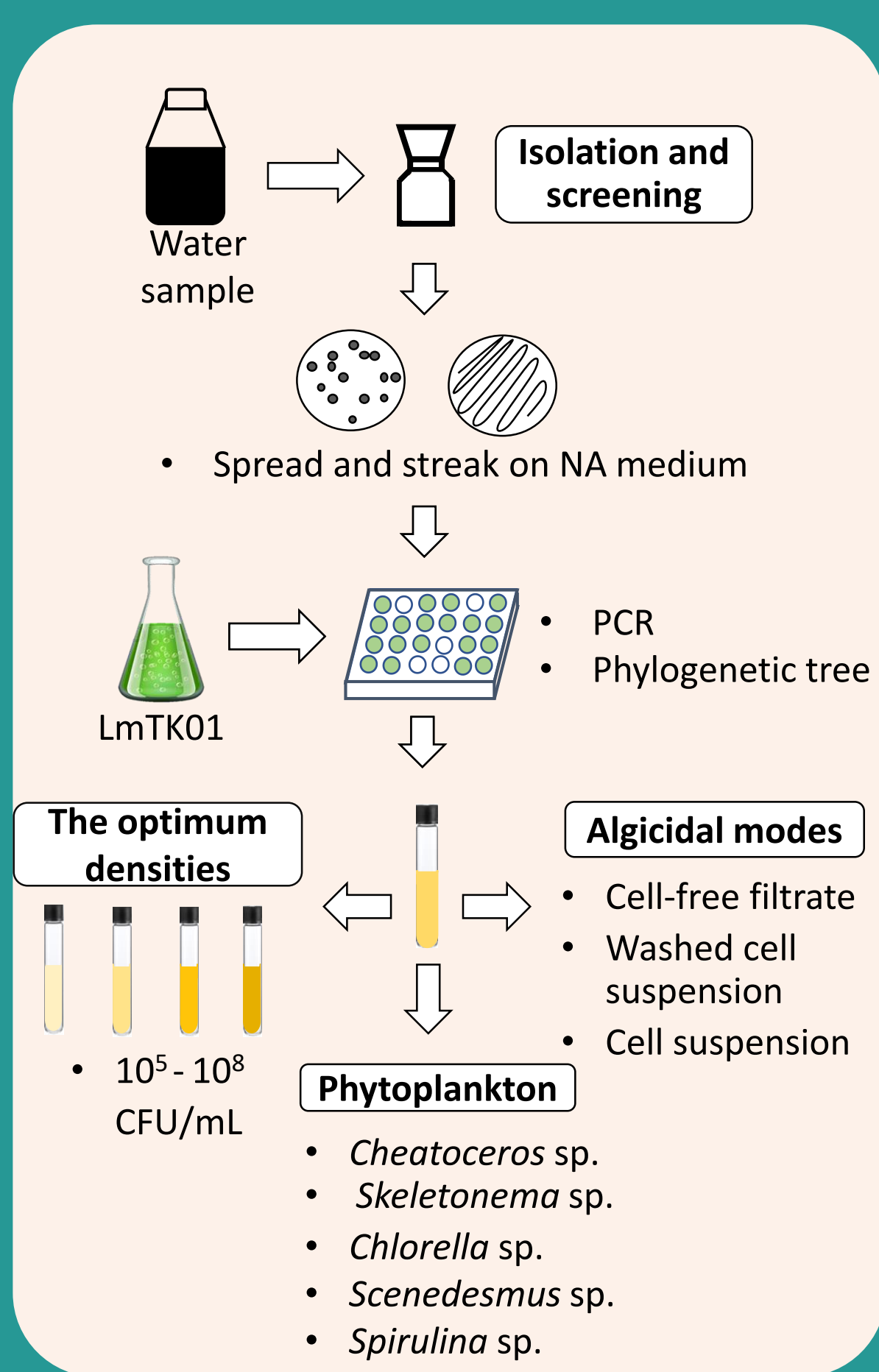
Introduction

In recent years, algal blooms are worldwide problems in aquaculture ponds. Cyanobacteria strain LmTK01 is a blue-green algae that has been found to bloom and causes serious problem in shrimp ponds in Songkhla province, Thailand. The aim of this study was to use bacteria from aquaculture water to inhibit cyanobacteria strain LmTK01 growth.



Cyanobacteria strain LmTK01

Methodology



• Isolation and screening of algicidal bacteria

• The optimum densities of the strongest algicidal bacteria strain BP5 for control the growth of LmTK01 and effect on other algae

• Algicidal modes of the strongest algicidal bacteria strain BP5 for control the growth of LmTK01

- Cell densities of BP5 at 10^7 and 10^8 CFU/mL effectively inhibited algae growth by 55 and 100% and its specific inhibiting on LmTK01 (Fig 3,4).
- Algicidal modes of BP5 on algae growth showed that bacterial culture and cell-free filtrate effectively inhibited the growth of LmTK01. The algicidal modes were 98.21% and 95.20%. (Fig 5,6).

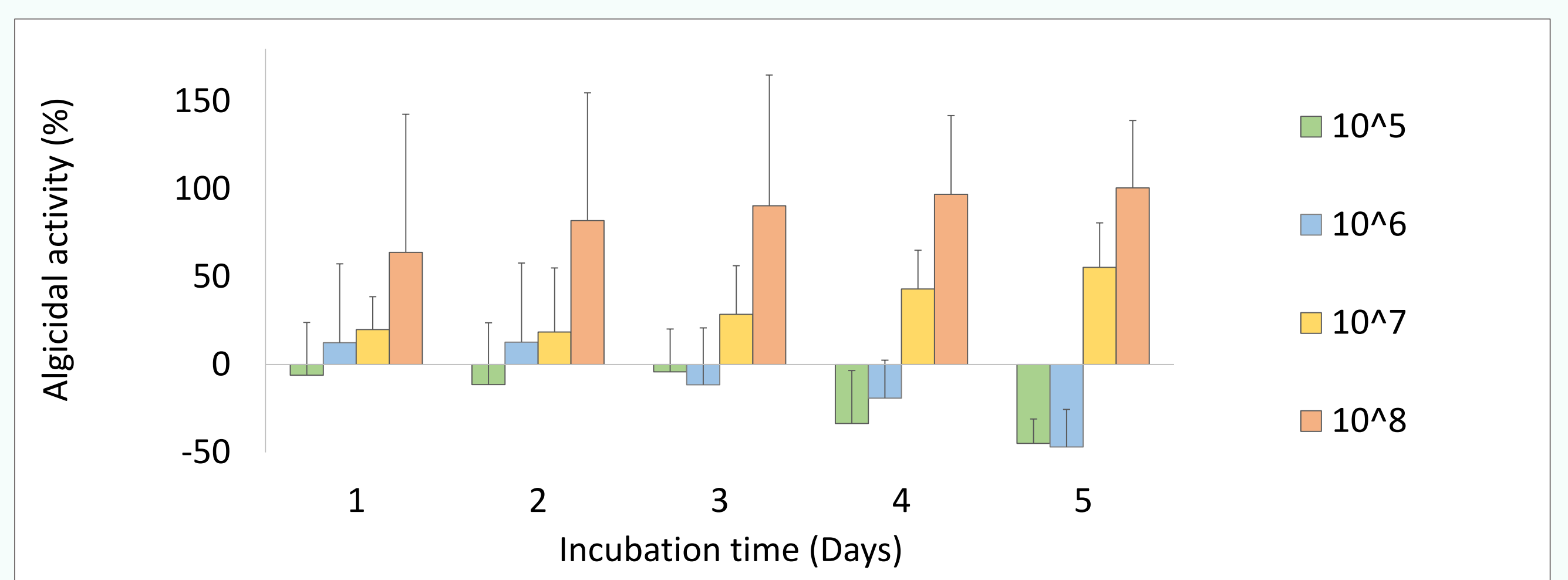


Fig. 3: Algicidal activity of strain BP5 at difference densities on growth of LmTK01.

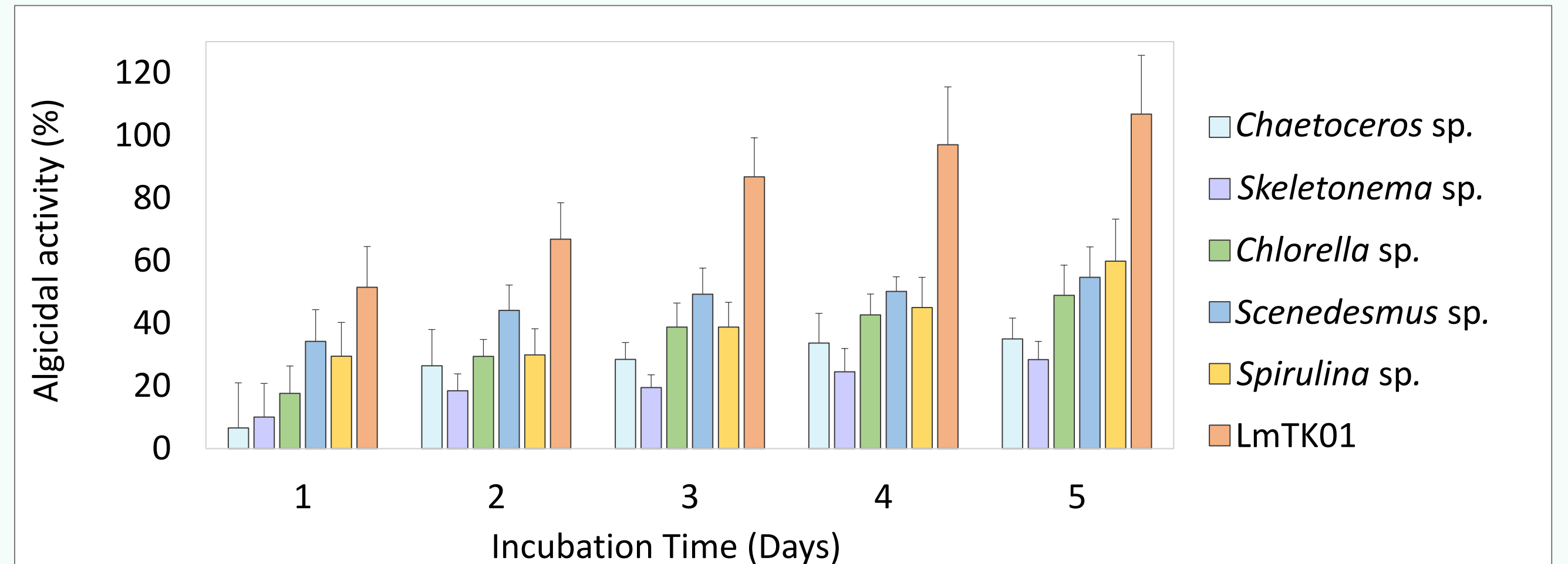


Fig. 4: Algicidal activity of strain BP5 on microalgae growth for 5 days.

Results

- Fifty-three strains of bacteria were inoculated with LmTK01. BP5 showed the strongest inhibiting on LmTK01 growth (99.94%) within 7 days of incubation (Fig 1).
- Nucleotides analyses revealed that strain BP5 was similar to bacterial genus *Fictibacillus* sp.

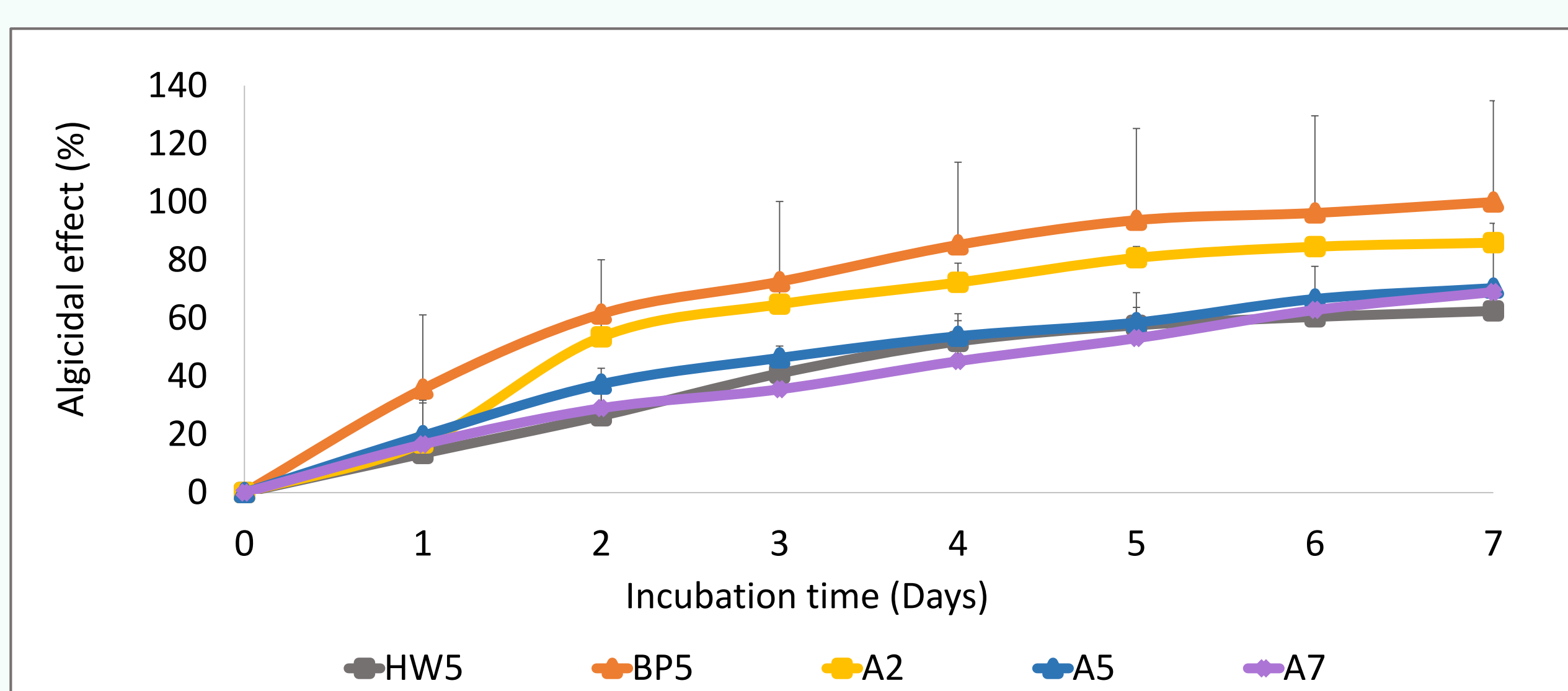


Fig. 1: Algicidal activity of bacteria 5 strains from aquaculture pond on growth of LmTK01.

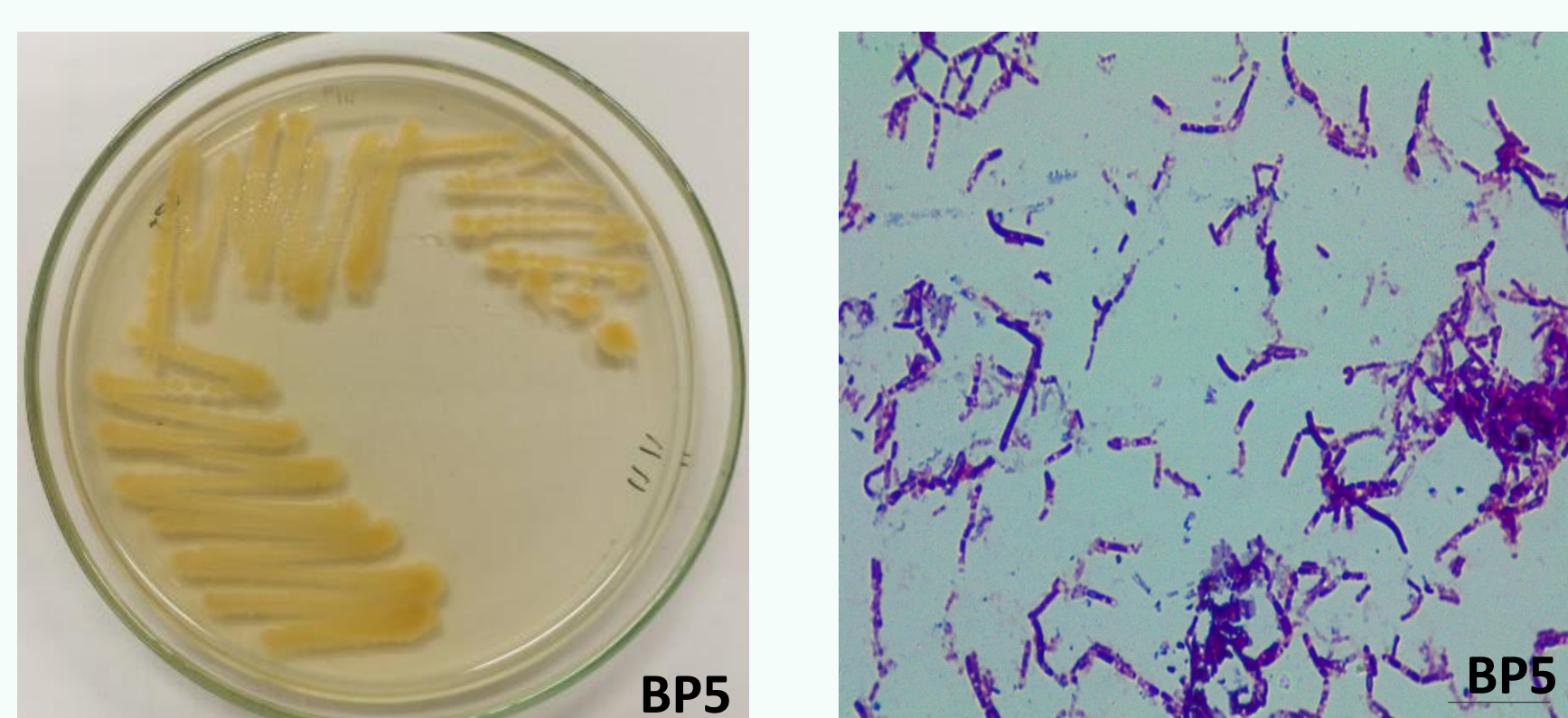


Fig. 2: Morphology and gram stain of the strongest algicidal bacteria strain BP5.

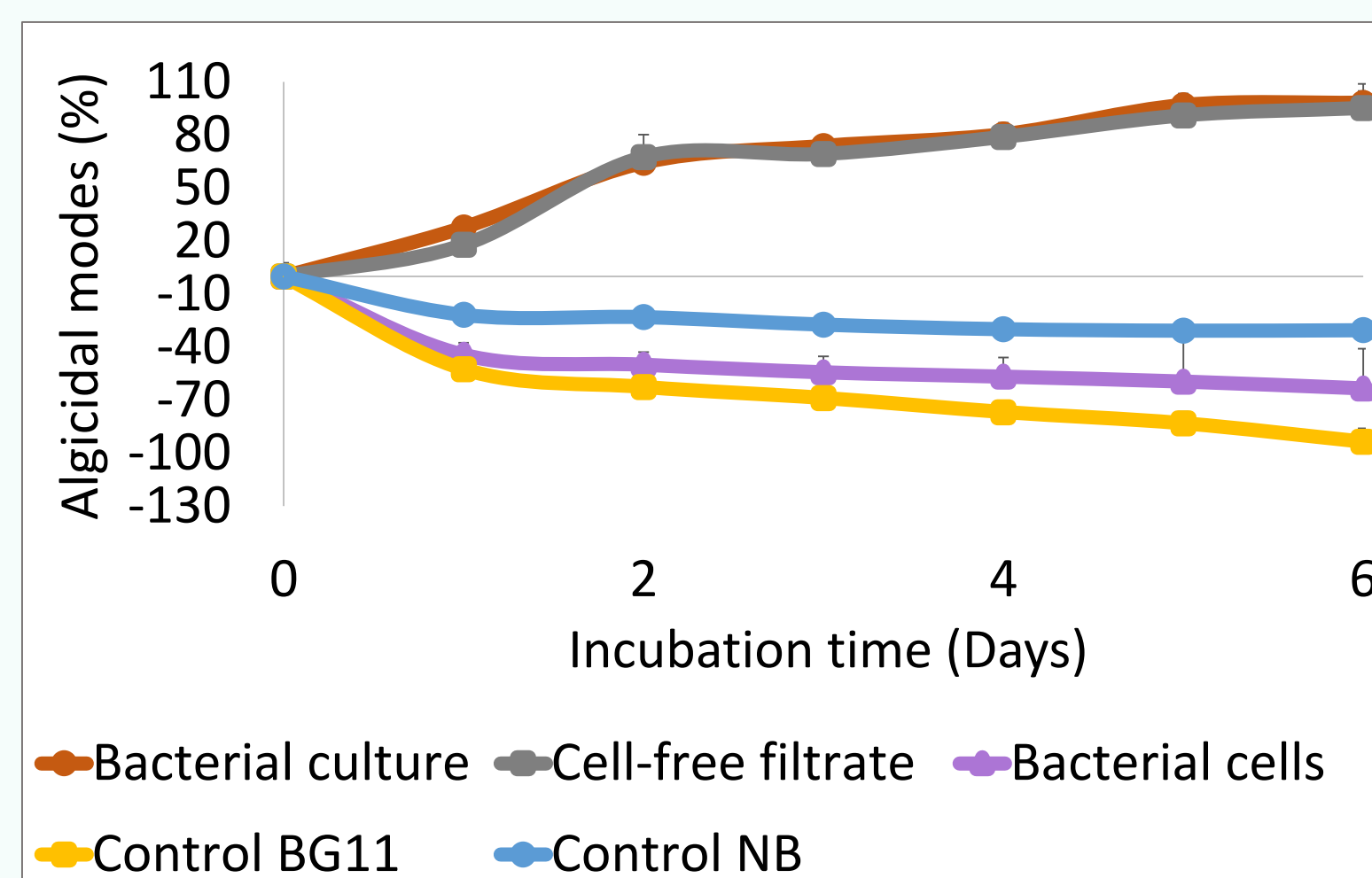


Fig. 5: Algicidal modes of strain BP5 on growth of LmTK01 for 6 days .

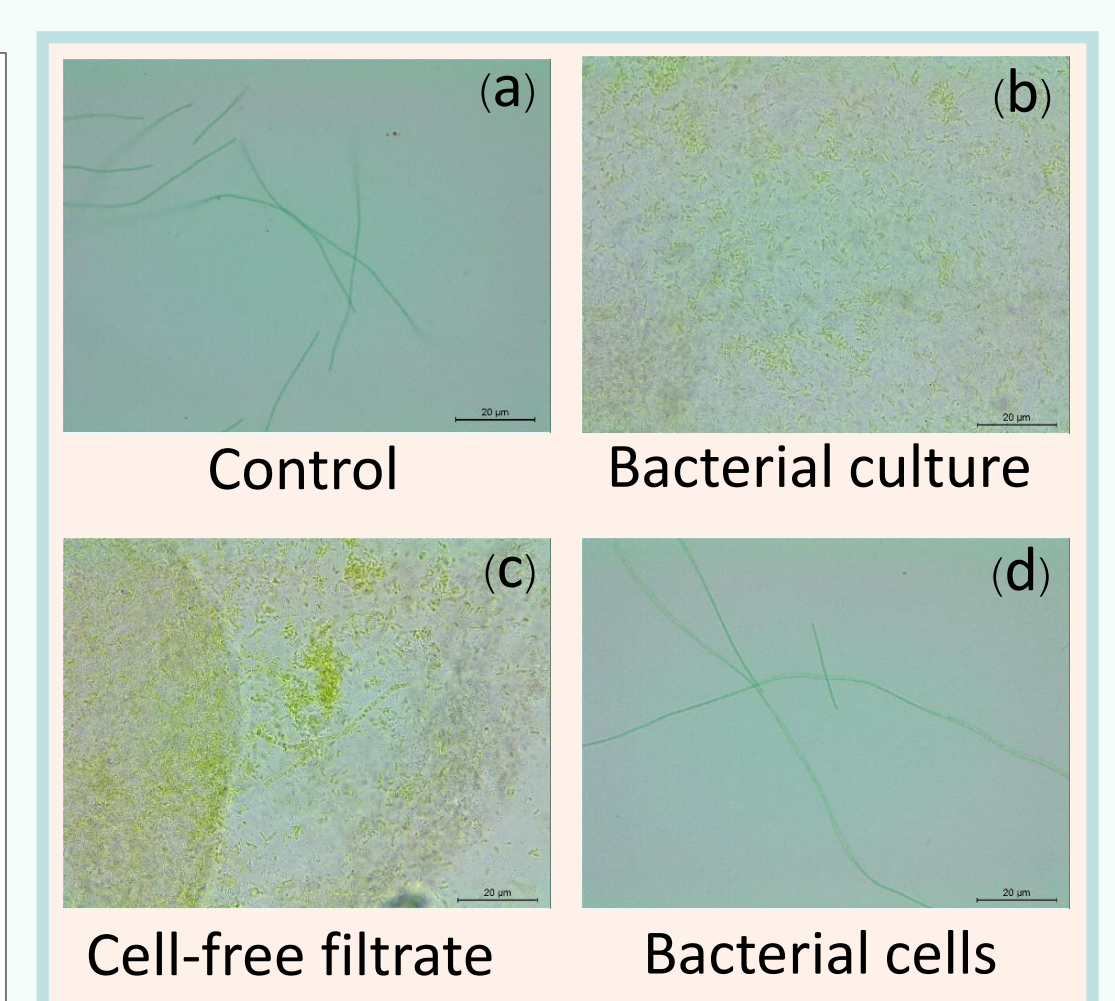


Fig. 6: Algicidal modes of BP5 on growth of LmTK01 under a magnified microscope 400x.

Conclusion

- BP5 is a specific algicidal bacteria for control LmTK01 growth. It's similar to genus *Fictibacillus*.
- The optimum densities of BP5 are 10^7 - 10^8 CFU/mL, which do not give negative affect on other algae.
- BP5 cloud inhibited the growth of LmTK01 (more than 90%) by indirect mode.