Supplementary Materials:

I Corresponding chromogenic medium for 2.3.2 is as follows:

Amylase detection medium: 20 g starch (FuChen, China), 0.5 g $K_2HPO_4 \cdot 3H_2O$(GuangFu, China), 0.01 g $FeSO_4 \cdot 7H_2O$(Shuangshuang, China), 1 g KNO_3(Shuangshuang, China), 0.5 g NaCl, 0.05 g $MgSO_4 \cdot 7H_2O$(Guangnuo,China), 20 g agar, and 1 L water;

Cellulase detection medium: 0.5 g $K_2HPO_4 \cdot 3H_2O$, 0.25 g $MgSO_4 \cdot 7H_2O$, 2 g Gelatin (Shuangshuang, China), 1.88 g carboxymethylcellulose calcium salt (Kaixin, China), 0.2 g of congo red(Zhongqin, China), 20 g of agar and 1 L of water;

Protease detection medium: 20 g skim milk powder (Yili, China), 20 g agar, and 1 L water).

Table S1. Primer sequences of antimicrobial substance genes.

lipopeptide	Primer
Surfactin	F-TCGGGACAGGAAGACATCAT
	R-CCACTCAAACGGATAATCCTGA
Polyketide synthases	F-TSGCSTGCTTGGAYGCSATC
	R-TGGAANCCGCCGAABCCGCT
Iturin	F-CCCCCTCGGTCAAGTGAATA
	R-TTGGTTAAGCCCTGATGCTC
Non-ribosomal polypeptide synthase	F- GCSTACSYSATSTACACSTCSGG
	R- SASGTCVCCSGTSCGCTAS
Fengycin	F-CCTGGAGAAAGAATATACCGTACCY
	R- GCTGGTTCAGTTKGATCACAT

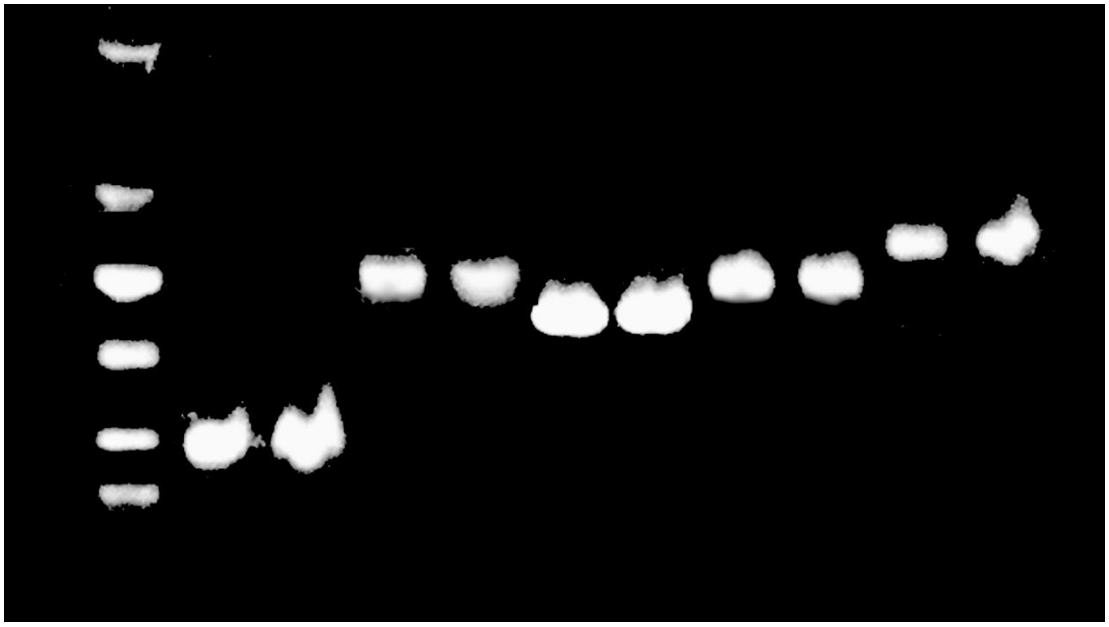

Figure S1. Detection of synthesis genes of antimicrobial lipopeptides of antagonistic bacteria. The bands from left to right are 2000 marker; determination of Surfactin produced by *P. polymyxa* YF; determination of Polyketide synthases produced by *P. polymyxa* YF; determination of iturin produced by *P. polymyxa* YF; determination of Non-ribosomal polypeptide synthase produced by *P. polymyxa* YF; determination of fengycin produced by *P. polymyxa* YF.