

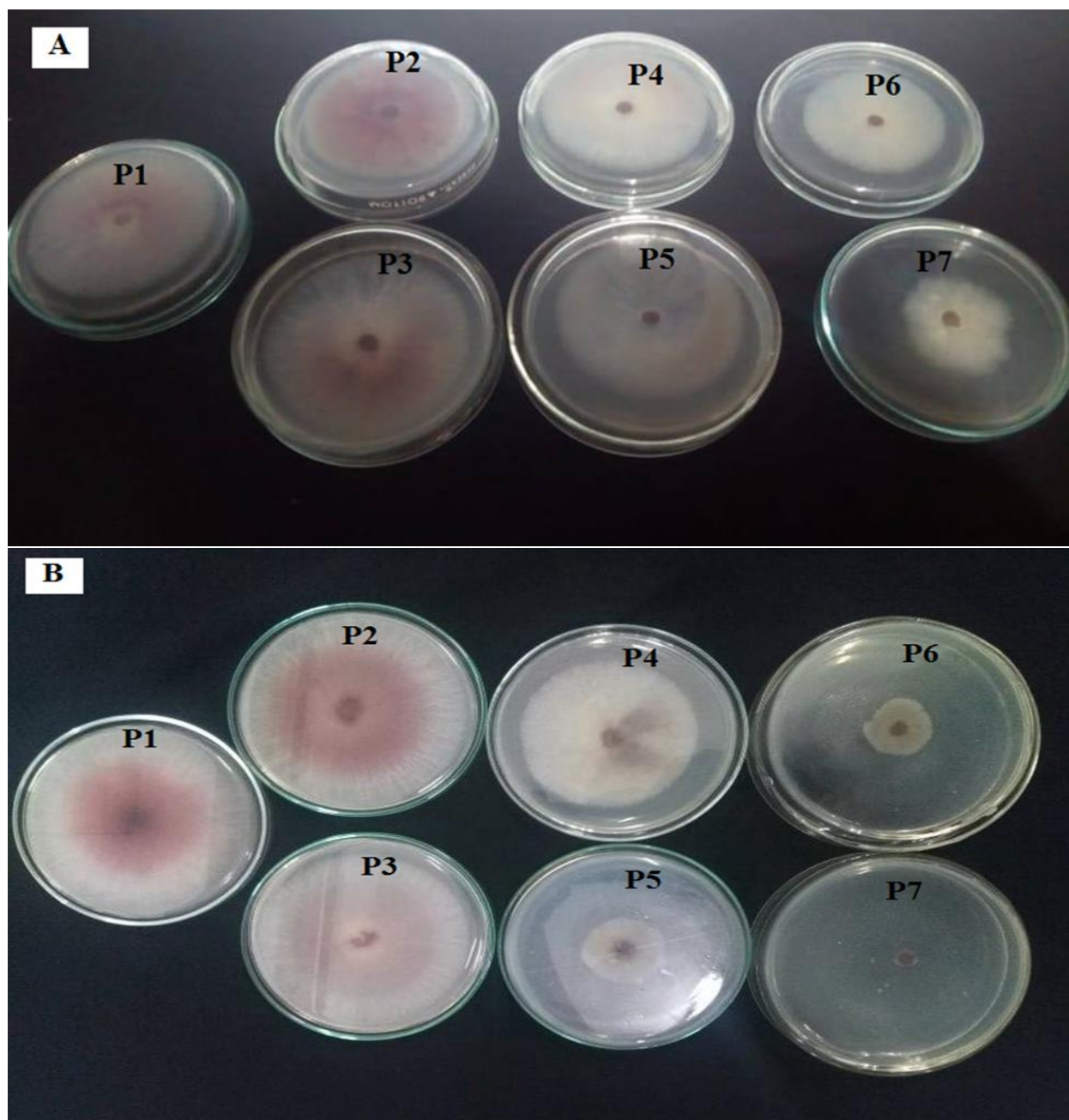


Figure S1a: Effect of different concentrations of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ (A) and CuO-NPs (B) on the antagonism of *F. oxysporum*. P1: control; P2: $5 \mu\text{g mL}^{-1}$; P3: $15 \mu\text{g mL}^{-1}$; P4: $30 \mu\text{g mL}^{-1}$; P5: $60 \mu\text{g mL}^{-1}$; P6: $70 \mu\text{g mL}^{-1}$ and P7: $90 \mu\text{g mL}^{-1}$.

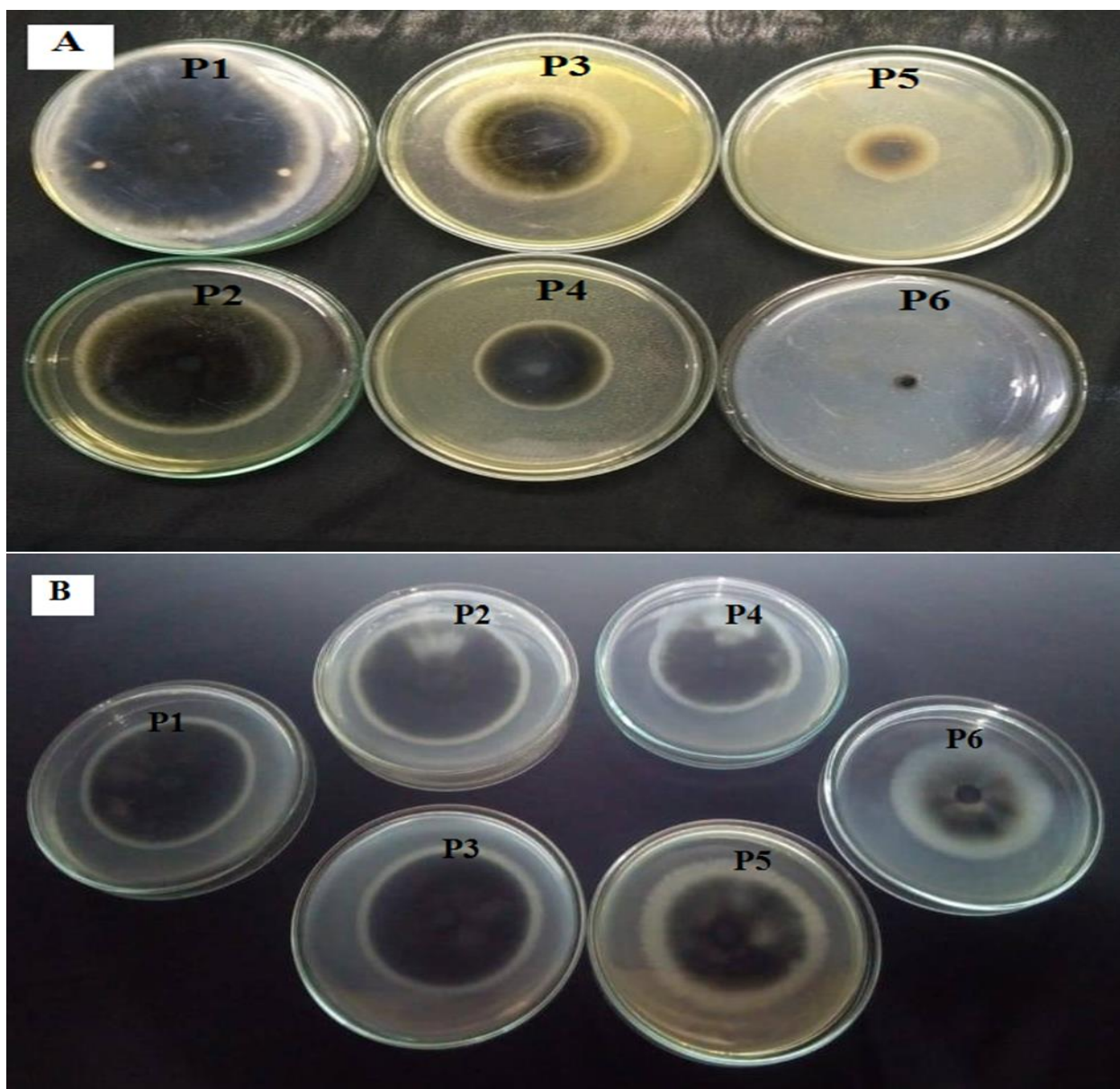


Figure S1b: Effect of different concentrations of CuO-NPs (A) and CuSO₄.5H₂O (B) on the antagonism of *M. phaseolina*. P1: control; P2: 5 $\mu\text{g mL}^{-1}$; P3: 15 $\mu\text{g mL}^{-1}$; P4: 30 $\mu\text{g mL}^{-1}$; P5: 60 $\mu\text{g mL}^{-1}$; and P6: 70 $\mu\text{g mL}^{-1}$.

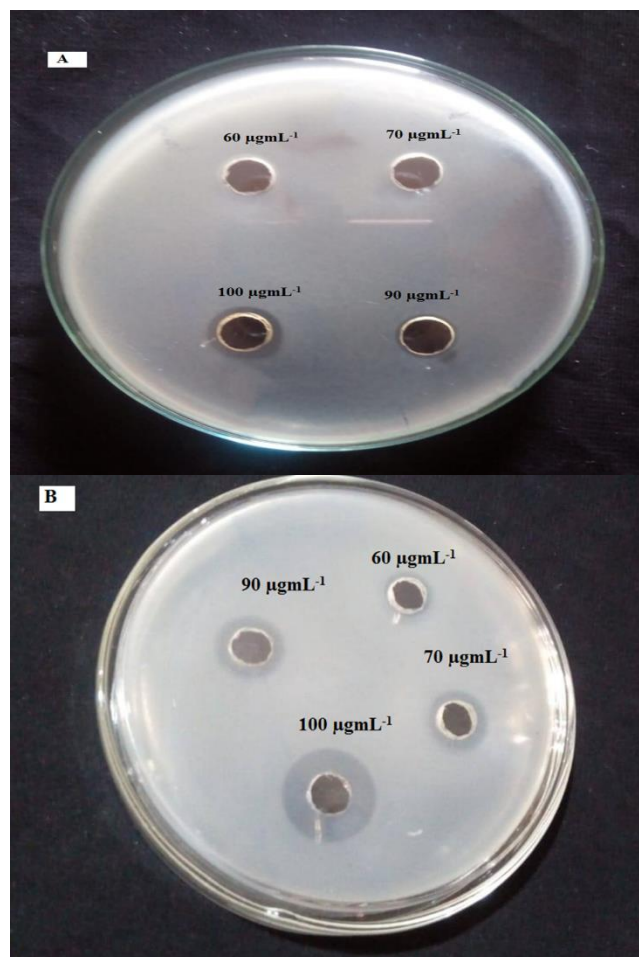
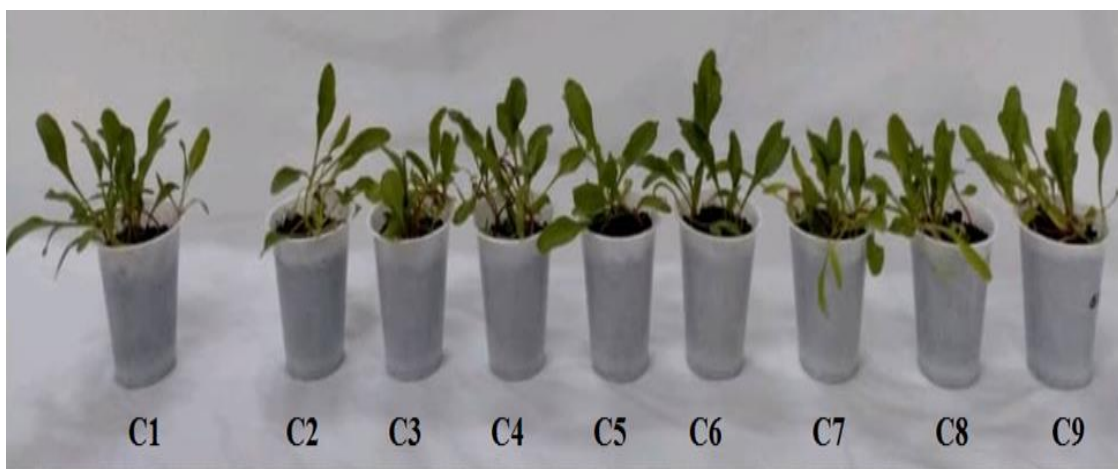
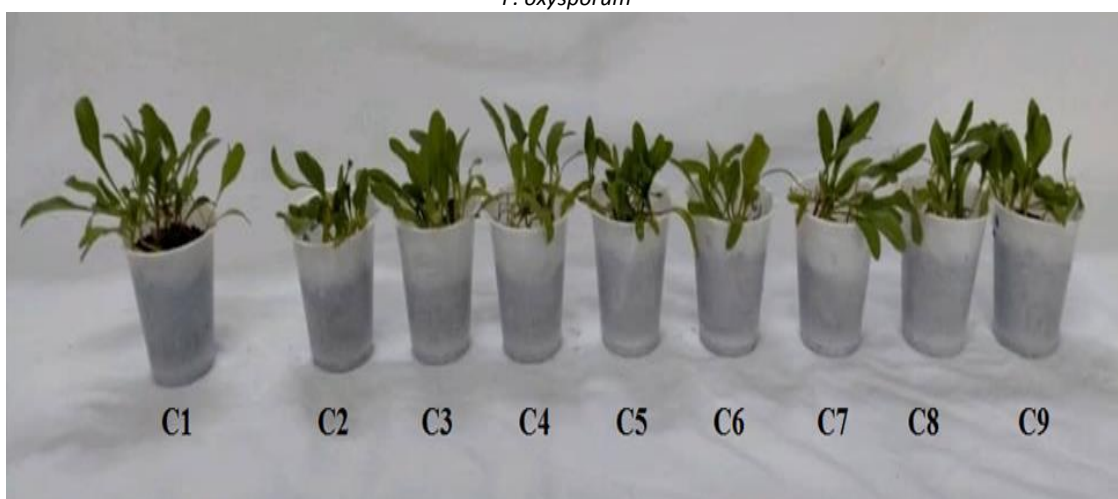


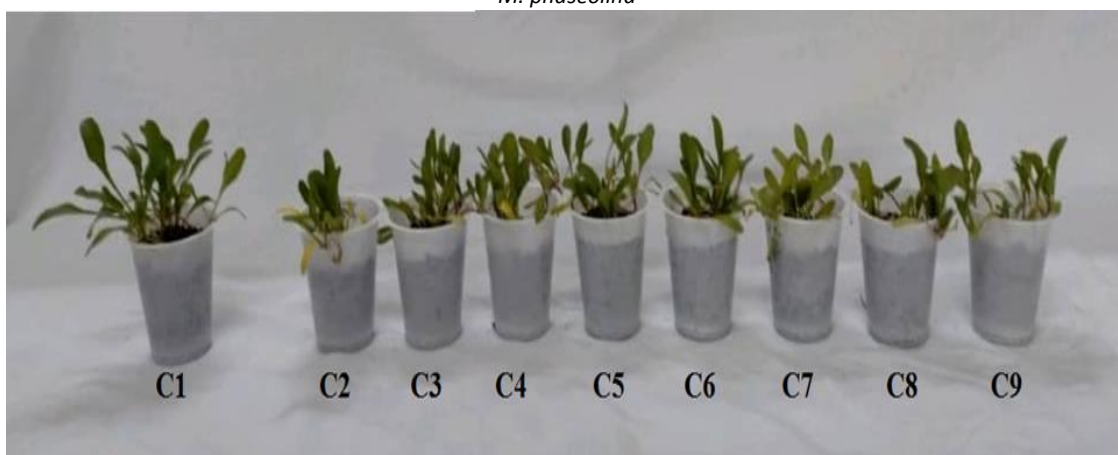
Figure S1c: Effect of different concentrations of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ (A) and CuO-NPs (B) on the antagonism of *P. Carotovorum*.



F. oxysporum



M. phaseolina



P. Carotovorum

Figure S2. Effect of different concentrations of CuO-NPs on some parameters of seedling of sugar beet under infected with different plant pathogenic microorganisms. C1: uninfected; C2: infected; C3: 5 µg mL⁻¹; C4: 15 µg mL⁻¹; C5: 30 µg mL⁻¹; C6: 60 µg mL⁻¹; C7: 90 µg mL⁻¹; C8: 120 µg mL⁻¹ and C9: 150 µg mL⁻¹.