Abstract: Effects of wavelength and amplitude of periodical 2D cosinusoidal perturbations on Rayleigh-Taylor(RT) instability growth at the gas-liquid interface was investigated. A layer of low-strength, dissolved-in-water-gelatin was employed for modeling the liquid driven with gas explosive mixture products. It was shown that wavelength was a main influence factor on RT instability growth, and short-wavelength perturbations grew more rapidly in the linear stage, but long-wavelength perturbations grew more rapidly in the nonlinear stage.