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One of the bacterial strategies to respond to environmental pressures is the switch of their phenotypic traits by a mechanism called phase variation. This reversible process provides the generation of varied bacterial phenotypes, leading to a mixed population and colony diversity.

In this work it was aimed to isolate and characterize the virulence of colony morphology variants selected by environmental pressures from planktonic and sessile *P.aeruginosa*, in order to understand the biological significance of phase variation in virulent-bacteria selection.

Bacteria were *in vitro* stressed by continuous exposure to increased concentrations of benzalkonium chloride (BZK) and by heat and peroxide hydrogen shock. The stressed bacteria were suspended, serial diluted and plated onto TSA to inspect and collect colony morphology variants.

It was observed, for planktonic and biofilm states, that adaptation and heat and chemical shocks selected different colony morphologies. These differences were in colony circumference and outer edge (smooth or irregular), surface texture and surface shape (craters). All the colony morphotypes were collected and used to evaluate their biofilm formation ability and its susceptibility to some antimicrobials. Data revealed that some morphotypes shown less ability to form biofilms but were more tolerant to BZK. Other morphotypes, with more ability to form biofilms, were resistant to Ciprofloxacin, and others were susceptible to Ciprofloxacin but resistant to Erytromicine.

It can be concluded that *P.aeruginosa* is capable to undertake phenotypic changes when facing stress pressure. These different morphology variants may play a significant role in *P.aeruginosa* antimicrobial resistance, contributing its increased pathogenicity.