

CHAPTER-6

CONCLUSION

Conclusion

The pathogenesis of *S. aureus* infections is mainly due to their virulence factors- abilities to form biofilms on polymer surfaces, multi-drug-resistant characteristic, cytotoxicity and enterotoxigenicity. This thesis investigated the antimicrobial susceptibilities of clinical and CA/environmental isolates of *S. aureus*, their biofilm formation pattern under different physiological stressed conditions, evaluation of cyto- and enterotoxigenicity.

A significant variability in adhesion and biofilm-forming properties was found among putative *S. aureus* strains isolated from clinical and CA/environmental isolates. This variability was clearly influenced by environmental conditions such as temperature, osmolarity and nutrient availability, pH as well as surface properties governing adherence. Thus, initial adhesion was increased by high ionic strength conditions, whereas biofilm formation was enhanced by glucose and by sodium chloride to some extent, which suggest that the presence of biofilms in food-processing surroundings would be conditioned by the adaptation to environmental stresses. More importantly, mature biofilms showed high resistance to antimicrobial agents. This finding explains why *S. aureus* biofilm-related infections often fail to respond to conventional antimicrobials. Finally, Enhancement of *S. aureus* biofilms by oxacillin at clinically achievable concentrations could also contribute to treatment failure.

Findings from Chapter 4 suggested that both clinical isolates and CA/environmental isolates of *S. aureus* strains demonstrated almost similar responses to antimicrobial agents, biofilm forming capacity, cytotoxicity and enterotoxigenicity although a little differences were observed in some isolates between both the categories.

This study therefore provides a baseline data for epidemiological studies in south-Assam region. These findings can be utilized in MRSA treatment programmes and

antimicrobials strategies in organized herds of those areas. Uneven microbiological conditions were found in each food zone which indicates the need to improve hygienic conditions as these food surfaces and its surrounding environments could thus be a reservoir for *S. aureus* forming complex communities. This must be considered as an alarming situation for community, so attention must be paid toward implementation of new ways for effective prophylaxis, control, and treatment of such infections in the food as well as clinical environments.
