

CHAPTER 34

MEDICAL SCIENCES
MEDICAL MICROBIOLOGY

Doctoral Theses

01. MEENAKSHI
Evaluation of Pulsed Field Gel Electrophoresis as an Epidemiological Marker for Typing of *S. Enterica* Subsp. *Enterica* Ser. Typhi.
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Abstract
(Not Verified)

Enteric fever is endemic in our country and carries high rate of morbidity and mortality. Identifying and characterizing various clones, especially MDR *S. Typhi* is considerable importance, as it helps in outbreak characterization; which can lead to initiation of control measures. The outbreaks of *S. Typhi* in 1990s in India limited the usefulness of phage typing as E1 became the predominant phage type. In the current project, pulse field gel electrophoresis (PFGE)- a genotypic typing technique with high typeability, reproducibility and discriminatory power, was standardized using PulseNet protocol (CDC, 2013) with *Xba*I restriction enzyme to type the Indian *S. Typhi* isolates. Six hundred and sixty four *S. Typhi* isolates were selected from over twenty-three medical centers of India. *S. Typhi* isolates were typed using antimicrobial susceptibility testing, bio-typing, phage typing and PFGE. Eighty-nine different PFGE profiles were delineated and divided into 16 groups. The PFGE profile X15 was the commonest PFGE profile (4.36%). Amongst the MDR category, the commonest PFGE profiles were X15, X45, X24, X28 and X31. Majority of them belonged to E1 PT (phage type) with biotype I. Reproducibility was tested by Hardwick's (2001) method. Dice coefficient was calculated and dendrogram was generated by Bionumerics 7.1 software (Applied Maths, Belgium). The dice coefficient varied between 0.64 and 1. The typeability and discriminatory index of PFGE was found to be 100% and 0.9, respectively in contrast to phage typing which had values of 76.4% and 0.25, respectively. The study evinced strong correlation amongst MDR *S. Typhi* isolates. Multiple PFGE profiles in the region highlighted the co-existence of multiple MDR clones in the Indian subcontinent.

Contents

1. Introduction 2. Review of literature 3. Methodology 4. Results 5. Discussion 6. Conclusion. Appendices. References.