I. INTRODUCTION

During recent years, poultry scenario in India has changed from small-scale backyard farming to a fast developing full-fledged commercial industry. Need for poultry meat and eggs is increasing, making poultry rearing a profitable enterprise with assertion of early returns. The health status of poultry is subjected to considerable fluctuations due to the occurrence of multifactorial diseases. Among bacterial diseases, Fowl Cholera (FC) caused by *P. multocida* ranks as one of the most important diseases causing high morbidity and mortality. Due to fowl cholera alone, a global loss of worth 200 million US dollars has been estimated in poultry industry.

Incidence of fowl cholera is on the rise possibly due to its acute nature. Heavy mortality is encountered in the affected flock before any diagnosis could be made. During October 1980 to March 1989, Kulkarni *et al.* (1990), reported 306 outbreaks of Pasturellosis in Marathwada region, in sheep, goats, cattle, buffaloes and poultry. Four reports on fowl cholera were confirmed by laboratory diagnosis.

Chemotherapy is of limited value because of the rapid onset of clinical signs and emergence of multiple drug resistant bacterial strains, leaving vaccination as the only final option.
16 serotypes of *P. multocida* exists, so practical use of conventional vaccine is limited (Pastuer anaculture vaccines). A live vaccine of low virulence available in United States of America appears to be effective against some heterologus challenge; however, it requires multiple doses to be effective. Further, more such vaccines pose post-vaccinal reactions and disease outbreaks resulting in osteomyilits, synovitis or pneumonia. Inspite of using these conventional vaccines, losses due to fowl cholera are still being reported.

All these factors necessitated a clear understanding on the antigenic structure, type of immunity, pathogenesis and immunogens expressed during natural infection to evolve protection strategies for effective control of the disease. Moreover, several workers have reported that protective immunogen(s), common to all serotypes is fully expressed only, when the organism is grown *in vivo* and this cell-associated antigen(s) may not be expressed when the organism is grown *in vitro*, but to achieve this objective, simple *in vitro* methods are not available.

For this purpose, biofilm form of pathogen has some additional features and usefulness. A bacterial biofilm is a structured community of bacterial cells enclosed in a self-produced polymeric matrix and adherent to an inert or living surface. These biofilms are more resistant to the most defenses allowing the survival of organism in a hostile *in vivo*
and in vitro environments and mimic the in vivo natural adhesion of the pathogens when grown in vitro (Costerton et al., 1999).

Recently, by utilizing biofilm mode of growth of *P. multocida* A-1 serotype in vitro, certain unique antigens have been identified (Vadakel, 2001). These antigens need to be assessed for their immunogenicity, protective titer, cross protection, etc. Keeping the above facts in view, the present endeavour was undertaken with the following objectives.

1. To study the prevalence of fowl cholera in different parts of Karnataka based on post mortem records during 1994-2004.

2. Preparation of antigen.

3. Standardization of passive haemagglutination test.

4. Immunization of birds with different vaccines including biofilm vaccine.

5. To study the kinetics of humoral immune response of poultry birds against Fowl Cholera (biofilm, broth and commercial vaccine).

6. To assess the seroprevalence of Fowl Cholera.

7. To assess the cell mediated immune response.