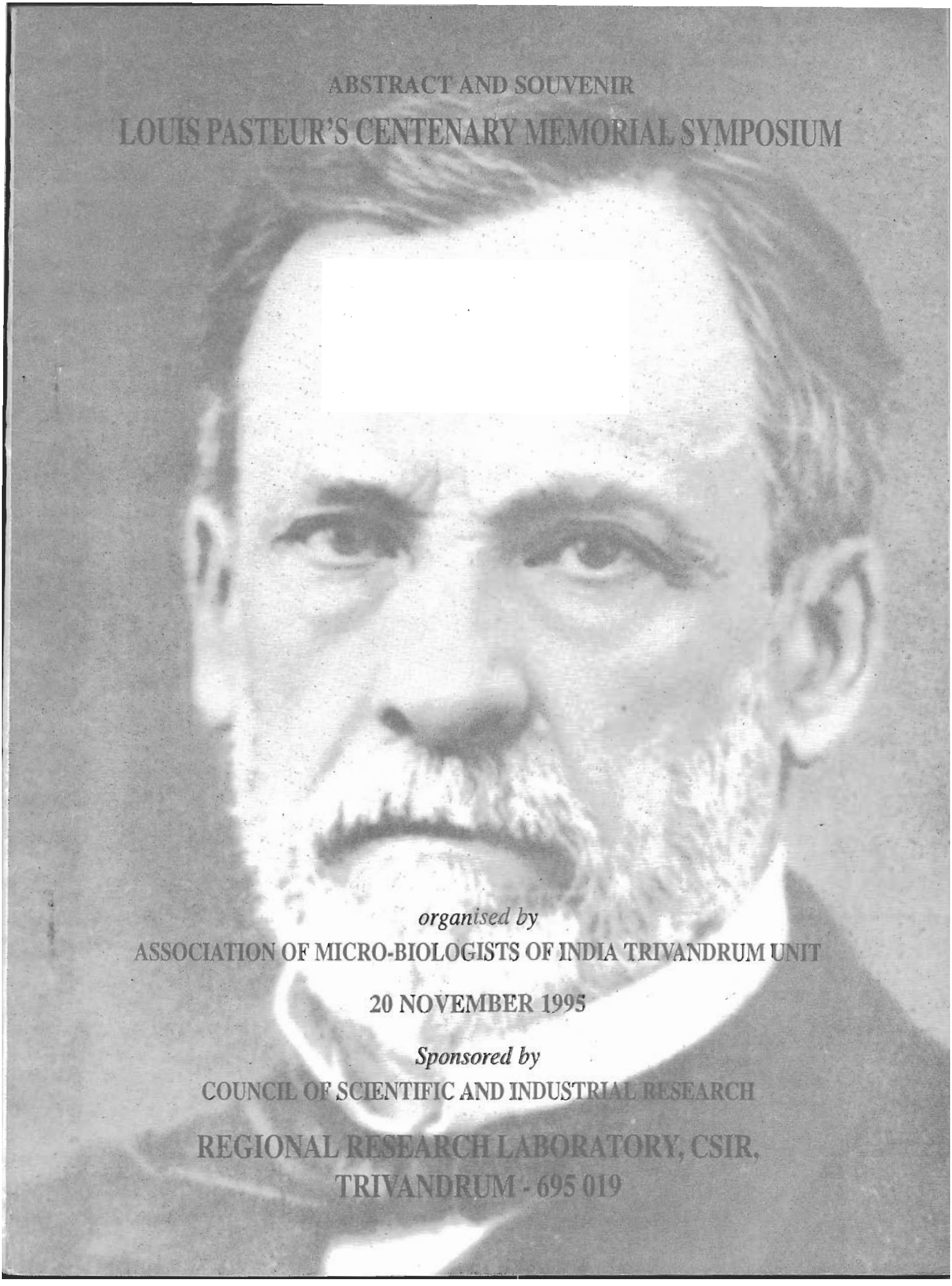
ABSTRACT AND SOUVENIR

LOUIS PASTEUR'S CENTENARY MEMORIAL SYMPOSIUM



organised by

ASSOCIATION OF MICRO-BIOLOGISTS OF INDIA TRIVANDRUM UNIT

20 NOVEMBER 1995

Sponsored by

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

REGIONAL RESEARCH LABORATORY, CSIR,
TRIVANDRUM - 695 019

BIOCHEMICAL INCOMPATIBILITY IN SIMULTANEOUS DEGRADATION OF CHLORO-AND NON-CHLORO AROMATIC COMPOUNDS

A. A. M. Kunhi
Microbiology Department
Central Food Technological Research Institute
Mysore - 570 013

ABSTRACT

Most bacteria are unable to degrade chloro- and methyl or other substituted aromatics simultaneously because of metabolic incompatibility. This has been shown to be due to the inhibition of the meta-ring cleaving enzyme, catechol 2,3-dioxygenase which are normally involved in the degradation of naturally occurring aromatic compounds such as phenol, cresols, xylenols, benzene and enzyme, catechol 1,2-dioxygenase in the presence of high levels of halocatechols, especially 3-chlorocatechol. Dark brown colour often observed in sewage is due to the accumulation of the auto-oxidation products of chlorocatechols. Many a times, chloroaromatic degrading organisms possessing a meta -fission pathway cleave chlorocatechols resulting in the formation of dead end metabolites, the chloromuconic semialdehydes. However, microbial strains that can degrade mixtures of phenol, chlorophenol and cresols have been developed by using stringent selection pressure mutations or gene-cloning techniques, though substrates and at relatively low rates. A mixed culture system consisting of two, different *Pseudomonas* strains that can independently degrade phenol and chlorobenzoates has been shown to be highly compatible and could simultaneously degrade these compounds upto 10 mM levels.