

**STUDIES ON BIODEGRADATION OF
NITROPHENOL ISOMERS BY MIXED
BACTERIAL CULTURES**

R
REFERENCE ONLY

A thesis submitted to the
UNIVERSITY OF MYSORE

For the Degree of
DOCTOR OF PHILOSOPHY
In
Biotechnology

**UNIVERSITY LIB
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October 2003

DECLARATION

I hereby declare that the thesis entitled "*Studies on biodegradation of nitrophenol isomers by mixed bacterial cultures*" submitted for the degree of Doctor of Philosophy in Biotechnology to the University of Mysore is the result of work carried out by me under the guidance of Dr. S. Divakar in the Department of Fermentation Technology and Bioengineering, Central Food Technological Research Institute, Mysore during the period November 1998 to October 2003.

I further declare that the results of the work have not been submitted for the award of any degree, diploma or fellowship.

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I hereby declare that the thesis entitled "*Studies on biodegradation of nitrophenol isomers by mixed bacterial cultures*" submitted by Ms. Shabana Basheer for the degree of Doctor of Philosophy in Biotechnology of the University of Mysore is the result of research work carried out by her at the Department of Fermentation Technology and Bioengineering, CFTRI, Mysore under my guidance during the period from November 1998 to October 2003

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To my sister . . .
Rahmathunnisa S. A.

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ABBREVIATIONS

AC	- aminocatechol
ADNT	- α -amino-4,6-dinitrotoluene
ATA	- anaerobic toxicity assay
AU	- activity units
BHI	- brain heat infusion
BMP	- biochemical methane potential
BQ	- benzoquinone
BT	- benzenetriol
C	- catechol
CFU	- colony forming units
d	- doublet
dd	- doublet of a doublet
DAHAT	- 2,4- diamino-6-hydroxyl aminotoluene
DANT	- 2,4- diamino-6- dinitrotoluene
2D HMQCT	- Two-Dimensional Heteronuclear Multiple Quantum Coherence Transfer
Dinoseb	- 2-sec-butyl-4,6-dinitrophenol
DMSO	- dimethyl sulphoxide
DNOC	- dinitro-o-cresol
DNP	- dinitrophenol
DNT	- dinitrotoluene
Fenitrothion	- o,o-dimethyl-o- (3-methyl-4-nitrophenyl) thiophosphate
GC	- gas chromatography
¹H	- proton
HAB	- hydroxylaminobenzene
β-HMA	- β -hydroxyl maleylacetate
HMUAL	- hydroxy muconicsemialdehyde
HMX	- octahydro-1,3,5,7- tetranitro-1,3,5,7- tetracozine
HPLC	- high pressure liquid chromatography
HQ	- hydroquinone
β-KA	- β -keto adipic acid
m	- multiplet
MA	- maleyl acetate

Mix NPs	- mixture of the three mononitrophenol isomers-ONP, MNP and PNP
MNC	- 4-methyl-5- nitrocatechol
MNP	- m-Nitrophenol
MP	- methyl parathion
MR-VP	- methyl red- Voges Proskauer
MUA	- cis,cis- muconic acid
MUL	- muconolactone
NAD	- nicotinamide adenine dinucleotide
NADPH	- nicotinamide adenine dinucleotide phosphate
NC	- nitrocatechol
NHQ	- nitrohydroquinone
NMR	- nuclear magnetic resonance
OD	- optical density
ONP	- o-Nitrophenol
PCP	- pentachlorophenol
Picloram	- o,o-dimethyl-o-4-nitro-m-tolyl phosphorothioate
PNP	- p-Nitrophenol
RDX	- hexahydro-1,3,5-trinitro-1,3,5- triazine
s	- singlet
TCA	- tricarboxylic acid cycle
TLC	- thin layer chromatography
TNT	- 2,4,6- trinitrotoluene
UV	- ultraviolet

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