List of Figures

1. Formation of central aromatic intermediates from various aromatic compounds
2. Modes of aromatic ring cleavage
3. Degradation of nitroaromatic compounds and chloro-compounds
4. Pathways for melanin formation
5. Exopolysaccharide biosynthesis and assembly in gram-positive and gram-negative bacteria
6. Sampling sites of the Bombay High oil fields
7. Growth of strain P2d on benzoate agar medium
8. Gas chromatographic fatty acid profile as obtained from Microbial Identification System
9. Growth of strain P2d at 0.1%, 0.3%, 0.5%, 0.7% and 1.0% benzoate concentration
10. Variations in colour of medium at different intervals of growth of strain P2d in 0.3% benzoate medium
11. Strain P2d grown at R.T. for 48 h in varying benzoate concentrations
12. Colour formation by strain P2d during growth in 0.3% benzoate medium at varying rpm
13. UV-Visible spectra of culture supernatant of strain P2d grown in benzoate medium (0.3%) for varying period (h)
14. Formation of catechol and HMS during the growth of strain P2d in 0.3% benzoate medium
15. TLC pattern of ether extracts of acidified (A) and unacidified (B) culture supernatant during growth in 0.3% benzoate medium at different time intervals (h)
16. HPLC chromatogram of (a) standard catechol; (b) red supernatant of culture grown in 0.3% benzoate medium; (c) catechol mixed with red supernatant
17. UV-Visible spectra of (a) standard catechol; (b) supernatant of strain P2d incubated with 25 mM catechol for 3 h
18 Range of colours obtained from catechol on treatment for 3 h of resting cells of strain P2d with varying catechol concentration

19 TLC profile of ether extracts of strain P2d cells incubated with different concentrations of catechol (mM)

20 UV-Visible spectrum of (a) TP I eluted from TLC in phosphate buffer (0.5 M, pH 7); (b) standard HMS from catechol using strain P2d and Pseudomonas cepacia AC1100

21 HPLC chromatogram of (a) standard HMS; (b) yellow culture supernatant of P2d cells grown in 0.1% benzoate medium for 24 h

22 HPLC chromatogram of (a) red supernatant of culture grown in 0.3% benzoate medium; (b) HMS mixed with red supernatant

23 HPLC chromatogram of (a) red supernatant of culture grown in 0.3% benzoate medium; (b) red supernatant decolourised with acid (c) red supernatant decolourised with sodium-dithionite

24 Growth of strain P2d in 0.3% benzoate, 0.3% benzoate with 2 mM 2,2' bipyridyl and 0.3% benzoate with 0.2% glucose and 2 mM 2,2' bipyridyl

25 UV-Visible spectrum of culture supernatant of strain P2d grown in benzoate (0.3%) for 48 h with 2,2’bipyridyl (2 mM) and for 24 h without 2,2’bipyridyl (10⁻³)

26 UV-Visible scan of supernatant of strain P2d grown in 0.3% benzoate medium for 24 h, decolorized with 0.5 N HCl and sodium-dithionite

27 HPLC chromatogram of (a) ortho-benzoquinone obtained from catechol (b) red supernatant of strain P2d grown in 0.3% benzoate medium for 24 h (c) ortho-benzoquinone mixed with red supernatant

28 Infra-red spectrum of 4,5-dianilino-o-benzoquinone

29 Colour formation by strain P2d during growth in 0.2% tyrosine medium at different time intervals

30 Growth of strain P2d in 0.2% tyrosine medium

31 Estimation of tyrosine and dopa at different time intervals

32 HPLC chromatogram of (a) standard tyrosine; (b) pink supernatant of 24 h old culture grown in 0.2% tyrosine medium; (c) brown supernatant of 48 h old culture grown in 0.2% tyrosine medium; (d) black supernatant of 72 h old culture grown in 0.2% tyrosine medium

33 Micrograph of strain P2d showing capsules
34 Strain P2d EPS stained by congo-red method

35 Scanning electron micrograph of strain P2d cells

36 Biomass and EPS yield in strain P2d at (a) different time intervals during growth in 0.3% benzoate medium; (b) varying benzoate concentration; (c) varying nitrogen concentration; (d) varying calcium-chloride concentration

37 SDS-PAGE profile of whole cell proteins of strain P2d cells

38 Gas chromatogram of (a) standard sugars; (b) hydrolysed EPS of strain P2d

39 Proposed pathway for sodium benzoate degradation by *Pseudomonas mendocina* P2d