Aromatic compound degraders as colony forming units on 0.1% benzoate agar were isolated from an industrial effluent discharge site and areas surrounding the oil recovery stations of Bombay High. Seven isolates showed very good growth in up to 1% benzoate concentration. Strain P₂d, an industrial effluent isolate was used for the present study as it could grow luxuriantly in benzoate, forming wine-red colouration and showed the presence of both ring cleavage pathways namely, ortho and meta. The culture was identified as *Pseudomonas mendocina* strain P₂d based on its morphological, cultural and biochemical characteristics.

*Pseudomonas mendocina* strain P₂d is a versatile culture having ability to degrade a wide range of aromatic compounds including monoaromatic, polyaromatic, chlorinated and nitro-compounds. An array of enzymes namely, catechol 1,2-dioxygenase, catechol 2,3-dioxygenase, protocatechuate 3,4-dioxygenase, tyrosinase/catechol-oxidase, are formed during dissimilation of the aromatic compounds.

Growth in the presence of benzoate results in formation of yellow to orange to red colouration. Transformation product I (TP I) formed a black
spot on TLC and white precipitate with lead acetate, confirming it to be catechol. Transformation product II (TP II) is identified as 2-hydroxymuconic semialdehyde (HMS), due to its yellow colour, absorption peak at 375 nm and comparison with standard HMS formed from culture Pseudomonas cepacia AC1100. Red colour formed during growth on benzoate and catechol is due to transformation product III (TP III). Qualitative tests showed this product to be a quinone. Melting point and infra-red spectrum of the derivative of quinone with aniline confirm its identity as ortho-benzoquinone. The red product, ortho-benzoquinone formed from benzoate is not used by Pseudomonas mendocina strain P₂d for growth and no oxygen uptake is seen. Thus, benzoate is metabolized via meta ring cleavage pathway and catechol, HMS and ortho-benzoquinone are the intermediates of benzoate biodegradation. Catechol is the common intermediate for HMS and ortho-benzoquinone formation and the proposed pathway is shown in Fig. 39.

Growth of Pseudomonas mendocina strain P₂d in the presence of tyrosine results in pink to brown to reddish-black colouration. Products formed in the culture broth on the basis of qualitative test, were identified as dopaquinone and melanin. However, dopa and melanin are not utilized by
the culture, showing the presence of an alternative pathway operating simultaneously for utilization of tyrosine.

*Ortho*-benzoquinone, dopa and melanin are the transformation products formed enzymatically as by-products from benzoate and tyrosine.

*Pseudomonas mendocina* strain P₂d forms an exopolysaccharide during growth in benzoate. Surprisingly, in the presence of sugars, no exopolysaccharide is formed but is conspicuously present in benzoate grown cells. The exopolysaccharide gels on incubation in cold. Deionised D/W was effective in extracting the exopolysaccharide and 592.9 mg of exopolysaccharides/100 ml broth, was obtained from ice incubated cells. R.T. incubated cells gave ten times less exopolysaccharide yield.

Exopolysaccharide of *Pseudomonas mendocina* strain P₂d had a good emulsifying activity.

The exopolysaccharide is a heteropolysaccharide containing rhamnose, fucose, glucose, ribose, arabinose and mannose. On cold incubation, the exopolysaccharide absorbs moisture and swells resulting in an increased wet weight and becomes viscous.
*Pseudomonas mendocina* strain P2d, an industrial effluent isolate has multiple enzymes involved in the degradation of wide range of aromatic compounds and various coloured intermediates are formed during growth on these compounds. The culture forms an exopolysaccharide to possibly afford protection during growth of cells on benzoate. The exopolysaccharide, an heteropolysaccharide, has an interesting property of gelling under cold incubation.