

**A Certain Strain of Soil Bacteria capable of metabolizing D-Forms but not L-Forms of *threo*-2-Phenylserine and Its Benzoyl Derivative\***

While engaged in the study of metabolism by soil bacteria of benzoic acid derivatives, amino acids, and acylated amino acids,<sup>1-4)</sup> we observed that a strain of soil bacteria, KT 85 (*Pseudomonas* sp.), had the ability to utilize D-form but not L-form of *threo*-2-phenylserine and its benzoyl derivative as the sole source of carbon. The composition of the culture medium used in the experiment were as follows: NH<sub>4</sub>Cl, 0.1 g.; K<sub>2</sub>HPO<sub>4</sub>, 0.1 g.; MgSO<sub>4</sub>·7H<sub>2</sub>O, 0.05 g.; 1%CaCl<sub>2</sub>·6H<sub>2</sub>O, 2 drops; 1%FeCl<sub>3</sub>·6H<sub>2</sub>O, 1 drop; organic substance to be tested, 0.2 g.; distilled water, 100 cc.; pH 7.0~7.2 (adjusted with 10% NaOH). Thus, we were able to demonstrate that KT 85 can be transferred without any reduction in the rate of population growth into the above medium containing *threo*-2-phenyl-D-serine or its benzoyl derivative, but not in that containing *threo*-2-phenyl-L-serine or its benzoyl derivative.

On the other hand, we were able to demonstrate that KT 85 attacked benzoyl-*threo*-2-phenyl-DL-serine to give benzoyl-*threo*-2-phenyl-L-serine as follows: KT 85, grown in slant bouillon agar, was inoculated into 200 cc. of the above culture medium containing 2 g. of benzoyl-*threo*-2-phenyl-DL-serine and incubated at 25° for 33 days. The culture medium thus obtained was heated at 80° for several minutes and centrifuged for 30 minutes at 3,000g to remove the insoluble mass. The supernatant was concentrated *in vacuo* to a small volume, acidified with HCl, and extracted several times with ether. The ether layer was evaporated to dryness and the residue was recrystallized from water to 0.93 g. of needle crystals, m.p. 119~120°;  $[\alpha]_D^{15} -32.7^\circ$  (N NaOH, c=2), *Anal. Calcd.* for C<sub>16</sub>H<sub>15</sub>O<sub>4</sub>N: C, 67.36; H, 5.30; N, 4.91. Found: C, 67.29; H, 5.25; N, 4.99. It gave no depression of melting point on admixture with benzoyl-*threo*-2-phenyl-L-serine (I), m.p. 119~120°,  $[\alpha]_D^{15} -32.8^\circ$  (N NaOH, c=2), or with benzoyl-*threo*-2-phenyl-D-serine (II), m.p. 118~119°,  $[\alpha]_D^{15} +33.0^\circ$  (N NaOH, c=2), it melted at ca. 149~153°. Incidentally, benzoyl-*threo*-2-phenyl-DL-serine melts at 160~161°. (I) and (II) were synthesized from *threo*-2-phenyl-L-serine<sup>5)</sup> ( $[\alpha]_D^{15} -31.5^\circ$  (H<sub>2</sub>O, c=2)) and *threo*-2-phenyl-D-serine<sup>5)</sup> ( $[\alpha]_D^{15} +32.0^\circ$  (H<sub>2</sub>O, c=2)), respectively.

KT 85 has the following characteristics: Aerobic; short rod-shaped; motile; polar flagella; gram-negative; yields water-soluble yellowish green pigment that diffuses through the medium; optimal temperature at around 28°. KT 85 belongs to the *Pseudomonas* group and can be cultivated in the above synthetic culture medium containing benzoic, *p*-hydroxybenzoic, phenylacetic, or cinnamic acid as the sole source of carbon.

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- 1) Y. Kameda, E. Toyoura: *Ann. Rept. Fac. Pharm. Kanazawa Univ. Japan*, **1**, 32(1951).
- 2) *Idem.*: *Yakugaku Zasshi*, **72**, 791(1952).
- 3) Y. Kameda, E. Toyoura, H. Yamazoe, Y. Kimura, Y. Yasuda: *Nature*, **170**, 888(1952).
- 4) Y. Kameda, E. Toyoura, Y. Kimura: *Ann. Rept. Fac. Pharm. Kanazawa Univ. Japan*, **7**, 37(1957).
- 5) Y. Kameda, E. Toyoura, Y. Kimura, K. Matsui, Y. Hotta: *Yakugaku Zasshi*, **78**, in press(1958).