

NOTES

CRYOMYCIN AND M-81 PRODUCTION FROM HEXAMETHYLENEDIAMINE

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Streptomyces griseus subsp. *psychrophilus* is a psychrophilic actinomycete which produces cryomycin¹⁾ and M-81²⁾, respectively, at low and moderate temperatures. This organism has recently been found to produce the same antibiotics from non-sugar carbon sources, *i.e.* alcohols, esters, *n*-paraffins *etc.*³⁾

Hexamethylenediamine is 1,6-hexanediamine, and is an intermediate in the manufacture of nylon. In microorganisms it is a substrate of amine oxidases⁴⁾.

In the course of studying the assimilation of hydrocarbons by microorganisms, we found that *S. griseus* subsp. *psychrophilus* assimilated hexamethylenediamine and produced, to a certain degree, its own antibiotics. The antibiotic production from hexamethylenediamine by this organism is described in this publication.

Materials and Methods

Organism: *Streptomyces griseus* subsp. *psychrophilus*, YOSHIDA, TANI, OGATA.¹⁾

Culture medium: The composition of the medium is as follows: Hexamethylenediamine bichloride, 0.5%; glycerol, 1.0%; K₂HPO₄, 0.2%; KH₂PO₄, 0.07%; yeast extract, 0.2% and MgSO₄·7H₂O, 0.02% in tap water, at pH 7.0 after sterilization. Hexamethylenediamine was added after independent sterilization with Millipore filtration. To investigate the action of hexamethylenediamine, omission and replacement tests on its components were carried out.

Cultivation: Cultivation was performed at 12°C for 7 days, and at 28°C for 4 days.

Antibiotic assay: The pulp disk method, using *Bacillus subtilis* IFO 3037 and *Serratia polymycticum* IFO 3055, respectively, as the test organisms for cryomycin and M-81, was used.

Results and Discussion

As shown in Table 1, a small quantity of cryomycin and M-81 were produced from hexamethylenediamine. The maximum yield

Table 1. Antibiotic production from hexamethylenediamine by *S. griseus* subsp. *psychrophilus*.

Medium	mcg/ml	
	Cryomycin (12°C, 7 days)	M-81 (28°C, 4 days)
I	—	—
II	35	150
III	trace	20
IV	30	100

I: -HMD, -glycerol II: -HMD, +(NH₄)₂SO₄
III: -glycerol IV: complete

was reduced compared with production in natural media.

In medium III, in which hexamethylenediamine was expected to act as the sole carbon source, antibiotic production was slight. In medium IV, however, in which hexamethylenediamine acted as the sole nitrogen source, and in medium II, in which hexamethylenediamine was replaced by 0.5% ammonium sulfate, rather good production was observed.

Since *Streptomyces griseus* subsp. *psychrophilus* can partially assimilate *n*-hexane, hexamethylenediamine is expected to be the sole carbon and nitrogen source for growth when cultivation conditions are improved. Improvements in culture conditions will be made in future.

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References

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