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Special Purpose Culture Media Containing Propylene Glycol

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During an investigation into the antimicrobial activity of propylene glycol (Olitzky, J. Pharm. Sci. **54**:787, 1965), a distinct difference in susceptibility to propylene glycol was noted between gram-positive and gram-negative bacteria. Coagulase-positive staphylococci were the most resistant of the cultures tested. It occurred to us that this differential activity of propylene glycol might be useful for preparing selective culture media, and we therefore observed the effect of various concentrations of propylene glycol in solid culture media on the recovery of mixed bacterial populations.

In the two systems found to be useful thus far, propylene glycol is incorporated into Trypticase Soy Agar in concentrations of 6 or 12% (v/v). This is easily accomplished by dissolving an appropriate amount of dehydrated culture media in a solution of either 6 or 12% (v/v) propylene glycol in distilled water. We have routinely prepared 5% blood-agar plates using the base agar with propylene glycol. Prepared plates are stable for as long as 2 weeks when stored in a refrigerator. Propylene glycol may be added to previously prepared melted agar media by pipetting an appropriate amount directly from the stock bottle into the melted agar prior to pouring plates. We have had no problem with contaminants—apparently there are no viable bacteria in 100% propylene glycol. Viscosity does present a problem in the quantitative transfer from stock bottle to the melted agar.

Propylene glycol (6%)-agar is useful for isolating staphylococci or streptococci from an inoculum which also contains motile gram-negative bacilli, particularly *Proteus*. When mixtures, in various proportions, of *Escherichia coli*, *Proteus* sp., *Staphylococcus aureus*, and *Streptococcus pyogenes* were streaked on 6% propylene glycol-agar, well-isolated colonies of each bacterial type were found. Swarming of *Proteus* was completely eliminated, even on prolonged incubation.

In general, only colonies of staphylococci developed when clinical material containing coagulase-positive *Staphylococcus aureus* along with other bacteria was streaked onto 12% propylene glycol-agar plates. The following cultures from our stock culture collection were completely inhibited on 12% propylene glycol-agar: *Bordetella bronchiseptica*, *Escherichia coli*, *Hafnia*, *Mima-Herellea*, *Pseudomonas*, *Proteus*, and *Serratia*. Among the gram-positive cocci used, *Sarcina*, micrococci, *Gaffkya*, *Staphylococcus epidermidis*, and *Streptococcus pyogenes* grew poorly or not at all. *Streptococcus faecalis* grew moderately well. Since some of the bacterial types were represented by only one or two strains, there is the possibility that strain differences may exist. Cultures of the *Bacillus* genus grow quite well, but this has not interfered with the use of 12% propylene-glycol-agar as a medium for the detection of coagulase-positive staphylococci.