SIMPLE AND SENSITIVE METHOD FOR DEMONSTRATING MERCAPTAN PRODUCTION BY MICROORGANISMS

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There is very little information in the literature concerning the production of mercaptans by microorganisms. Mercaptan production has been reported for anaerobes (Rettger, J. Biol. Chem. 2:71, 1906), fungi [Challenger, Sci. Progr. (London) 35:396, 1947], Escherichia coli (Fromageot and Moubacher, Enzymologia 2:121, 1937), and Proteus vulgaris (Masatashi, Biochem. Z. 136:198, 1923). However, Masatashi (Biochem. Z. 136:198, 1923) was not able to demonstrate any mercaptan production by E. coli, and Almy and James (J. Bacteriol. 12:319, 1926) were not able to demonstrate any mercaptan production by E. coli or P. vulgaris. The production of mercaptans must be widely distributed among bacteria, however, since the terms "foul-smelling," "pu-trid," etc. are commonly found in the literature.

Feigl (Spot tests II Organic applications, Elsevier, 1954, p. 164–168) mentioned two tests: (i) the catalytic acceleration of the iodine-azide reaction; and (ii) the precipitation of cuprous salts, which may be used to detect thiol ketones and mercaptans. While testing a number of bacterial isolates by the iodine-azide reaction, it was noted with several of the Pseudomonas, Serratia, and lactose-fermenting species that white vapors were produced when two drops of the iodine-azide reagent (3 g of sodium azide in 100 ml of 0.1 N iodine) were added to 1 or 2 ml of a 1% Trypticase (BBL) broth culture, 2 to 7 days old. This was not expected, since Feigl stated that a positive reaction for mercaptans is characterized by the "evolution of little bubbles of nitrogen." Slight gas evolution was, however, noted in almost all the cultures upon the addition of the reagent.

In verifying this reaction further, a similar production of white vapor was noted when a loopful of the iodine-azide reagent was held near the following pure compounds: n-amyl-, n-hexyl-, tert-hexyl-, n-octyl-, tert-octyl-, and n-decyl-mercaptan. If a loopful of the reagent was held in a stream of hydrogen sulfide, only bubbles were produced. It thus appears that white vapor formation rather than bubble formation is an indication of mercaptan compounds.

White vapors were noted in the case of amyl mercaptan at a dilution of 1:1,000,000 (one drop of the reagent added to 1 ml of distilled water containing 0.85 μg of amyl mercaptan). The limit of sensitivity appeared to be between 0.85 μg/ml and 0.45 μg/ml. For optimal observation of the vapors, it is recommended that the tube be held in front of a bright light, preferably a microscope lamp. It is also suggested that screw-cap tubes be used, and that an additional source of organic sulfur be added (viz., 0.1% cystine) to the medium.

This reaction, which is being investigated further, has proved most useful in the classification of a number of Pseudomonas species. This reaction appears to hold further promise as a taxonomic tool for a great variety of other microorganisms.

RAPID SPECIFIC AGGLUTINATION OF EATON AGENT
(MYCOPLASMA PNEUMONIAE)

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Laboratory diagnosis of primary atypical pneumonia (PAP) was, until recently, accomplished by nonspecific serological reactions, e.g., cold and strep MG agglutinations. Liu (J. Exptl.