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ABSTRACT BOOK

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PC-95611-05 The colorimetric indicator STC facilitates tuberculosis culture diagnosis using the MODS technique

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Background: The Microscopic-Observation Drug-Susceptibility (MODS) broth culture technique sensitively diagnoses TB in 1–3 weeks, but is time-consuming because cultures must be examined microscopically at least thrice weekly to detect TB growth with concurrent drug-susceptibility testing. We sought to increase the efficiency of MODS by adding a colorimetric growth indicator.

Methods: We evaluated the use of the redox indicator STC (2,3-diphenyl-5-(2-thienyl)tetrazolium chloride) for detecting microbial growth in MODS cultures. 969 sputum samples were divided into halves that were cultured (1) in standard MODS as described previously with repeated microscopic examination of culture wells, and (2) in parallel cultures in media containing STC that were examined by naked eye, followed by microscopic examination only if STC formed a colored precipitate. Drug susceptibility was determined concurrently from parallel cultures containing isoniazid and rifampicin.

Results: The indicator STC did not inhibit tuberculosis growth and produced coloration visible by naked eye only in wells that contained microbial growth, obviating repeated microscopy of culture-negative wells. STC-MODS decreased the time required for examination of MODS cultures by approximately 85%. A typical MODS culture plate containing 5 clinical samples normally required an average total reading time of 73 minutes, compared with 10 minutes for MODS with STC (Figure). STC-MODS allowed naked eye detection of growth after a median of 12 days (IQR 9–14) vs. 10 days (IQR 8–14) when all culture wells were examined microscopically.

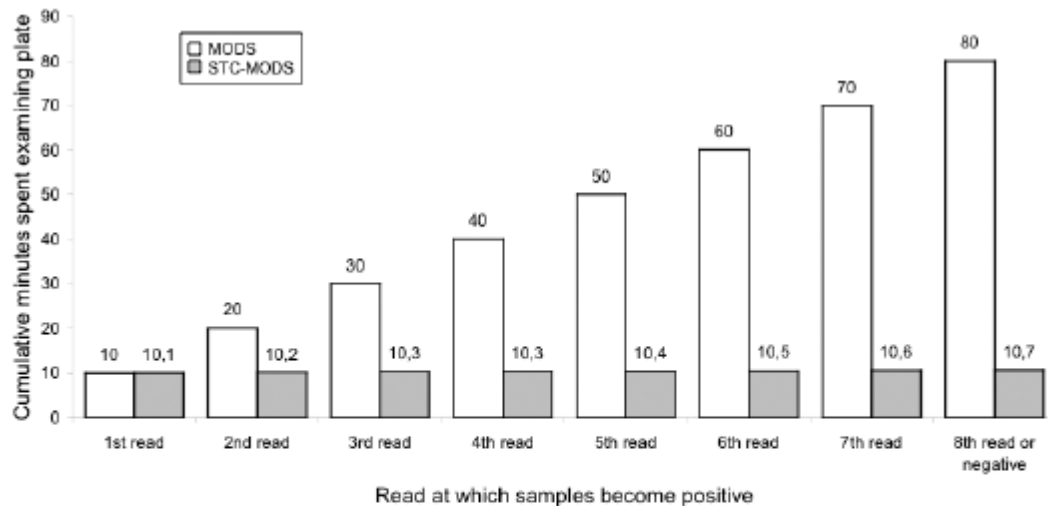


Figure STC reduces culture reading time for the MODS TB diagnostic technique.

Conclusions: Adding the indicator STC to the MODS culture broth obviated repeated microscopic inspection of negative cultures, reducing sample reading time considerably but delaying diagnosis slightly. In high-throughput settings, the addition of STC is an inexpensive and effective way to increase the efficiency of the MODS assay.

