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A metabolic study of Bacterium solonacearum E. F. S.

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Bacterium solonacearum E. F. S. is the organism causing the brown rot of the tomato, tobacco, and a number of other plants. Among the symptoms that it may produce is a peculiar form of dwarfing which suggests the possibility that this stunting is an intoxication effect. Preliminary to an investigation of this possibility a general study of the organism's metabolism was made. The organism grows slowly on a culture solution consisting of 1 per cent peptone, 5 per cent glucose and tap water. Excess of calcium carbonate does not apparently change its rate of growth. Upon Meyer's Mineral Medium, if the seeding be heavy and with an actively growing culture, the organism grows slowly. It grows very little, if at all, upon plain agar. The optimum reaction seems to be +12, Fuller's Scale. The addition of a minute amount of the aqueous extract of either crushed tomato plant or tomato fruit enormously stimulates growth in all media upon which growth is at all possible. Thus, one of the best media for the organism is Meyer's Mineral Medium enriched with 5 per cent glucose, 1 per cent peptone, and a small amount of either tomato plant or tomato fruit extract that has been neutralized. Grown for two months upon 1 per cent peptone, 5 per cent glucose, and tap water, with and without an excess of calcium carbonate, the following products are produced: Very small quantities of acetic acid and of ethyl alcohol; appreciable quantities of monamine, diamine, triamine, and ammonia. The amines were separated from the main body of the filtered culture medium by volatizing them after the addition of fixed alkali with a current of air as in the Folin method for the determination of ammonia. The determination of the different amines was made by the method of Weber and Wilson. In these cultures but a very small percentage of the glucose originally present had disappeared. No non-volatile acids could be detected.