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THE INFLUENCE OF AGE AND NUTRITION UPON SIZE AND MORPHOLOGY OF *B. MESENTRICUS*

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(Abstract)

Two strains of *B. mesentericus* were grown on glucose agar, nutrient agar, and cedar extract agar. Strain A. was obtained from the American Type Culture Collection and Strain B. was isolated from the soil. Strain A. when received was growing on glycerine agar. Typical cells of this strain were measured before transfers to new media were made. The average width was 0.9μ and the average length was 3.2μ. Strain B. had been grown previously on cedar agar, and measurements made from an old culture revealed an average width of 1.25μ, and an average length of 3.25μ.

Characteristic of strain A. was the number of morphological variants observed and the greatly lengthened phase of adjustment; the extremely long, filament-like embryonic cells predominated this phase. Characteristic of strain B. was the number of cells showing the abnormally large diameters; for this strain growth was good in all phases.

Both A. and B. strains were cultured through four successive transfers on nutrient agar before the investigation was begun. This mode of preparation allowed both strains to accustom themselves to the same conditions. The action of both strains during this adjustment-to-similar-conditions period may be described as regular; that is, both strains exhibited the same regular growth pattern.

The materials of study consisted of 2 per cent nigrosine slide preparations made at intervals of two hours, from which measurements and observations were made. Measurements were made of ten representative cells from each slide and an average for each two-hour interval was thus determined.

The measurements for strain A. were, when grown on: (1) nutrient agar, varied from 3.63 × 0.63μ to 4.81 × 1.33μ, (2) glucose agar, varied from 3.41 × 0.96μ to 4.85 × 1.41μ, and (3) cedar agar extract agar, showing the greatest variation, 3.73 × 0.58μ to 7.67 × 0.74μ.

The measurements for strain B. were: (1) nutrient agar 2.96 × 0.75μ to 4.57 × 1.57μ, (2) glucose agar, 3.38 × 1.14μ to 4.61 × 1.81μ, (3) cedar agar extract agar, 2.99 × 1.26μ to 4.42 × 1.53μ.

Other cultural characters observed in both strains include changes or shifts in time required for the culture to reach a "phase of crisis"; this time varied from 7.5 to 12 hours. The presence of long narrow cell types in strain A. was noted in all cultures on all types of media during the first eight hours of growth. On the other hand, strain B. showed, almost in every instance, the dominant cell type to be the comparatively large blunt cell with the increase in girth quite apparent. The investigation was continued for 20 hours when the definite "phase of decrease" was well started and the spores had begun to appear.