

MORPHOGENESIS IN *ARTHROBACTER* SPECIES

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ABSTRACT

This paper presents data to show that arthrobacterial morphology depends upon the nature of nutrients in the culture media and the age of the cultures. Biotin has been shown to be a key nutrient affecting morphogenesis. Angular growth due to subpolar and bipolar germination and germination of two adjacent cocci have been indicated as the cause for the appearance of 'V' forms in *Arthrobacter*. Life-cycle of *A. ruber* n.sp. has been photomicrographically illustrated.

INTRODUCTION

IN the general introduction to the genus *Arthrobacter* Bergey's Manual (1957) describes the member species as follows:

"In young cultures the cells appear as rods which may vary in size and shape from straight to bent, curved, swollen or club-shaped forms; snapping division may show angular cell arrangement. Short filament formation with rudimentary budding may occur, especially in richer liquid media. Gram negative or Gram variable coccoid cells are characteristically observed in cultures after one or more days."

Skerman (1959) held the view that true persisting branching in *Arthrobacter* has never been observed and suggested that this should be the guideline between *Nocardia* and *Arthrobacter*, provided in the latter organism rod forms get completely transformed into cocci or coccoids.

The morphological features and life-cycle of *A. globiformis*, the type species, has been studied by several workers (Conn and Dimmick, 1947; Stevenson, 1961; Veldkamp *et al.*, 1963). Mulder (1963) examined in detail the morphological pattern in *A. globiformis* and made a comparison thereof with that of *Mycobacterium phlei*, *Brevibacterium linens* and *Cellulomonas* species.

Sacks (1954) observed a correlation between morphogenesis and growth of *A. citreus*. Sgueros (1955; 1957) reported on the life-cycle of *A. oxydans* and the origin of 'V'-shaped cell arrangement. The origin of 'V' forms