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Herpetosiphon aurantiacus gen. et sp. n., a New Filamentous Gliding Organism

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In 1961, during a study of aquatic myxobacters (E. E. Jeffers, Ph.D. Thesis, Iowa State Univ., Ames, 1964), three similar strains of a gliding microorganism were isolated from the slimy coatings of *Chara* sp. growing in Birch Lake, Minn. They were given to one of us (JGH) to identify and were considered to be unique organisms. Since that time, other strains have been isolated from well water and cow dung in Iowa, from hot springs in California and Mexico, and from marine shores of France, Eire, Lagos, and Samoa.

The original isolation procedure consisted of making a single streak of the natural material on a plate of 0.3% peptonized milk (Difco) in 1.5% agar and then incubating it at room temperature in a moist chamber. Cultures were purified by repeated transfer of the leading edge of growth.

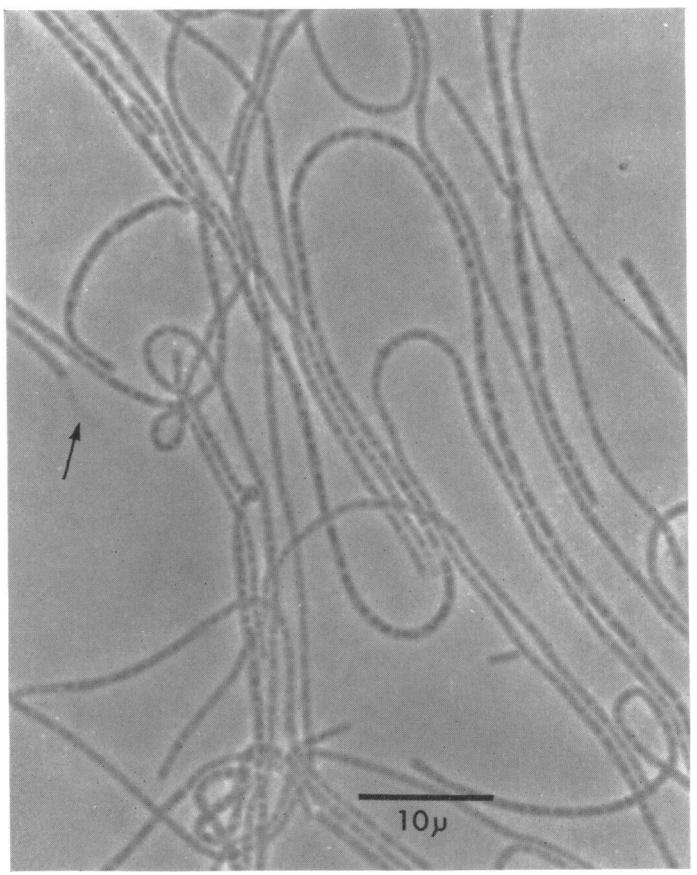

FIG. 1. *Phase-contrast photomicrograph of Herpetosiphon aurantiacus. A short extension of the sheath is shown (arrow).* × 1,700.

A description of one species of the new genus,

based on the three strains from Minnesota, follows.

Herpetosiphon aurantiacus gen. et sp. n.

Produces unbranched, ensheathed filaments composed of procaryotic, gram-negative, cylindrical, nonflagellated cells measuring 1.0 to 1.5 by 5 to 10 μ (Fig. 1). The cells divide by transverse septum formation. Filaments attain lengths of 500 μ or more and exhibit a slow gliding motility on a solid surface; the sheath seems to move with the filament, the cells do not glide within the sheath. Separate cells are not released from filaments. Does not contain sulfur granules or deposit iron or manganese salts on the sheath. Does not contain chlorophyll.

Colonies on dilute agar media (e.g., 0.3% peptonized milk) are flat, spreading, and rough with a swirled appearance. Occasionally, growth will accumulate in tall (0.5 mm) structures which do not contain obvious resting stages. Orange pigment produced. No growth in 0.3% peptonized milk broth.

Hydrolyzes starch, gelatin, casein, and tributyrin, but not cellulose. Growth on tyrosine agar produces a clear zone and reddish-brown pigment. Catalase positive, and cytochrome oxidase, indole, and Voges-Proskauer negative. Does not reduce nitrate to nitrite.

The guanine plus cytosine content of the deoxyribonucleic acid, determined by M. Mandel (M. D. Anderson Hospital, Houston, Tex.) with the buoyant-density method, is 48.1 $\pm$ 1.2%.

The three strains used in this description, 114-95, 300-49, and 300-59, are identical in the features studied and have been deposited with the American Type Culture Collection, Rockville, Md. Strain 114-95 was chosen as the type strain. Descriptions of other species will be published shortly.

The organism bears a close resemblance to the blue-green procaryotic organisms in its possession of filaments, gram-negative cell wall, division by septum formation, and gliding motility. These attributes allow it to be classified with the other gliding bacteria in the order *Flexibacterales*, as revised by S. Soriano and R. A. Lewin (Antonie van Leeuwenhoek J. Microbiol. Serol. **31**:66, 1965). Unbranched, sheathed filaments containing chlorophylls and bilin pigments have been classified in the genus *Lyngbya*, of which *Herpetosiphon* may be regarded as an apochlorotic counterpart.