MICROCOCCUS RUBENS MIGULA 1900

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In working up material covering the genus Micrococcus Cohn for the sixth edition of the Bergey Manual of Determinative Bacteriology, it has been found that the poorly described species Micrococcus rubens Migula can be reidentified. By a fortunate chance, a sub-culture of the original Bujwid isolation of this organism has been preserved, and can be obtained from the American Type Culture Collection as Culture No. 186.

A sub-culture of the original isolation by Bujwid was sent from Bern, Switzerland, to Migula in Karlsruhe, Germany, about 1894, and given to Schneider by Migula for use in his studies on the value of bacterial pigments as a basis for recognition of species (Arb. bakt. Inst. Karlsruhe, 1, Heft 2, 1894, 201–232). Migula evidently studied the Bujwid culture for he describes this organism as Micrococcus rubens in his System der Bakterien, Bd. 2, 1900, page 177, giving the trinomial Micrococcus tetratusenues ruber Bujwid as a synonym. Migula then sent the culture to the Kral Collection as the following record appears on page 11 of the Kral catalog entitled Die gegenwärtige Bestand der vorm. Krälschen Sammlung von Mikroorganismen which was issued by Prof. Dr. Ernst Pribram in Vienna in 1919.

Micrococcus roseus (Bumm) Flügge

Var. Micr. rubens Migula
Syn. Micr. tetratusenues ruber Bujwid
Lit. Migula, Syst. d. B., 2, 177, 1900
Cult. Micr. tetratusenues ruber (Migula, Karlsruhe)

Lehmann and Neumann were working on the first edition of their Bakt. Diagnostik at the same time and evidently secured the Bujwid culture from the Kral Collection as they report on 10 cultures of red or pink micrococci on page 177 of the first edition of their bacteriology issued in 1896. As a result of their studies they accepted the culture originally isolated by Bumm and studied and named by Flügge in 1886, as a typical culture of Micrococcus roseus. At the same time they regarded four or five other cultures of reddish yellow to cinnabar red micrococci as cultures of a second variety of Micrococcus roseus. Among these four or five cultures was the Micrococcus tetratusenues ruber which they had secured from Kral. The two varieties of Micrococcus roseus appear in Lehmann

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2 This report has been prepared with the assistance of Dr. G. J. Hucker of the New York State Experiment Station Staff and Mrs. Eleanore Heist Clise, in charge of bibliographic research for the Bergey Manual Trust.
and Neumann's bacteriology as *Micrococcus roseus a typicus* and *Micrococcus roseus b roseo-fulvus*. They use the binomial *Micrococcus roseo-fulvus* in the index of the first edition and continue these names in the form given here up to and including the seventh edition of their *Bakt. Diagnostik* which appeared in 1927. Lehmann evidently also sent his cultures to Kral for the record of the *Micrococcus roseus var. roseofulvus* cultures appears in the 1919 catalog mentioned above in the following form:

*Micrococcus roseus* (Bumm) Flügge

Var. *Micr. roseofulvus* (Lehm. et Neum.)


roseus b roseofulvulv. 4" (Lehm. Würzb.); Micr. rubens = "Micr. roseus b roseofulvulv. 3" v. Micr. roseus var. Micr. rubens.

Lehmann and Neumann give only a brief description of *Micrococcus roseus var. roseo-fulvus*. The cultures regarded by Lehmann and Neumann as belonging to this variety of *Micrococcus roseus* were secured by me from the Kral Collection in 1925. When these pink and red organisms were found to be micrococi, the cultures were given to Dr. G. J. Hucker who examined them in his studies of micrococci (Technical Bulletin No. 135, New York State Experiment Station, May 1928). Hucker agreed with Lehmann and Neumann that Culture 2 was a variety of *Micrococcus roseus*. However, he found the characters of the culture labelled *Micrococcus roseus b roseo-fulvus* 3 (which is clearly the *Bacterium rubens* of Migula) to be distinctly different from those of *Micrococcus roseus* and he described (p. 27) this culture as *Micrococcus roseofulvus* Lehmann and Neumann. He did not realize at the time that this particular culture had previously been named *Micrococcus rubens* by Migula.

As the Migula name has priority, the organism described by Hucker as *Micrococcus roseofulvus* is to be included in the next edition of the Bergey Manual under the name given by Migula. Fortunately, Hucker's notes are available and give a more complete description of this organism than does his published record. Some further description has been added from a study of a subculture of this organism secured from the American Type Culture Collection. The complete description follows:


The following description is taken from Migula (*loc. cit.*) and from Hucker (*loc. cit.*) supplemented by unpublished notes from the latter.

Spheres: 1.3 to 4.0 microns, average size 2.1 microns, occurring in fours and in...
irregular masses, generally not singly or in pairs. Gram-negative to gram-variable.

Gelatin colonies: After several days, small, pink or flesh-colored, glistening, butyrous, 0.5 to several mm. in diameter. Smaller colonies have regular edges; larger colonies have lobate edges.

Gelatin streak: Thick, glistening, flesh-colored to carmine-red growth, generally spreading.

Gelatin stab: Scant, whitish growth along line of stab; surface growth flesh-red. After several weeks no liquefaction, but a slight softening of the medium underneath the growth.

Agar slant: luxuriant, thick, spreading, slimy, flesh-colored growth.

Broth: Bright red, slimy sediment. No pellicle.

Milk: Generally acid curd followed by slight peptonization.

Nitrites produced from nitrates in 18 hours.

Acid from glucose, sucrose, mannitol and glycerol. No action on lactose or starch.

Pigment soluble in ether, benzol, carbon bisulphide, chloroform and alcohol. Not soluble in water (Schneider, loc. cit.).

Saprophytic. Grows well at 28° to 37°C.

Aerobic.

Source: Original culture isolated by Bujwid in Bern, Switzerland and sent to Migula at Karlsruhe, Germany.

Habitat: Unknown.