**Thermus ruber** sp. nov., nom. rev.

L. G. LOGINOVA,* L. A. EGOROVA, R. S. GOLOVACHEVA, AND L. M. SEREGINA

Institute of Microbiology, Academy of Sciences of the USSR, Moscow, USSR

The name *Thermus ruber* Logina, Egorova, Golovacheva, and Seregina 1975 is revived for the same organism on which the original description was based. In this paper we revive the name *Thermus ruber* Logina et al. (10). The potato-peptone-yeast extract broth used contained 20 ml of potato broth, 0.5 g of peptone, 0.1 g of yeast extract, and distilled water to 100 ml. The minimal medium used contained 0.2 g of KCl, 3 g of KH₂PO₄, 1 g of KH₂PO₃, 0.2 g of MgSO₄·7H₂O, and distilled water to 1 liter (pH 8.0).

The intracellular pigment was studied by the method of Jackson et al. (6). Absorption spectra of acetone, methanol-acetone (1:1), and hexane extracts of the bacterial pigment were recorded with a spectrophotometer (Specord, Jena, German Democratic Republic). The methods used for studying the fatty acid composition of *T. ruber* have been described previously (2). The description below is based on five strains.

**Description of Thermus ruber** sp. nov., nom. rev. *Thermus ruber* (ru'ber: M.L. adj. ruber red) cells are gram-negative nonmotile rods that are 3 to 6 by 0.5 to 0.8 μm, have rounded ends, and are nonsporeforming. In potato-peptone-yeast extract broth incubated at 60°C with shaking (260 rpm), filamentous forms (20 to 40 μm in length) are observed along with shorter rods after a few hours. No filamentous forms are seen after 16 h of incubation. Obligately thermophilic. On potato-peptone-yeast extract medium, the temperature range for growth is 35 to 40°C (minimal) to 70°C (maximal), and the optimum temperature is 60°C (the generation time is then 60 min). A bright red intracellular carotenoid pigment is produced, which resembles retro-dehydro-γ-carotene (neo ruber, = Loginova strain 21) (10).

**Habitat:** hot springs.

The type strain is All-Union Collection of Microorganisms, Moscow, USSR, strain 1258 (= Loginova strain 21) (10).

**Description of the type strain.** The type strain has all of the characteristics listed above for the species. A bright red intracellular carotenoid pigment is produced. This strain was isolated from a hot spring (70 to 93°C, pH 6.5 to 7.3) in the Kamchatka Peninsula. The original culture was at 60°C.

**Differentiation from other species.** Gram-negative, nonmotile, heterotrophic bacteria growing aerobically at a neutral pH and high temperatures are usually assigned to the genus *Thermus*. To date, only one species of *Thermus, Thermus aquaticus*, has been validly published (15). Two other species, "Thermus flavus" (14) and "Thermus thermophilus" (13), have been published, but they did not appear in the Approved Lists of Bacterial Names (15). These three species (*T. aquaticus," "T. flavus," and "T. thermophilus") produce a bright orange intracellular pigment of the α-carotene type (3, 13, 14). In addition, *T. aquaticus* utilizes ammonium sulfate and glutamate as sole nitrogen sources, reduces nitrates, and peptonizes milk. "T. flavus" cannot utilize β-galactose, sucrose, maltose, lactose, or glycerol; and "T. thermophilus" cannot utilize sucrose, maltose, or D-mannitol. Furthermore, the generation time of "T. thermophilus" is 18 to 20 min (15), which is much shorter than the generation time of *T. ruber*.

All of the properties described above differentiate *T. ruber* from *T. aquaticus, "T. flavus," and "T. thermophilus."

With the addition of *T. ruber*, the genus *Thermus* now includes not only extreme thermophilic bacteria, but also obligately thermophilic bacteria.

---

* Corresponding author.
LITERATURE CITED


