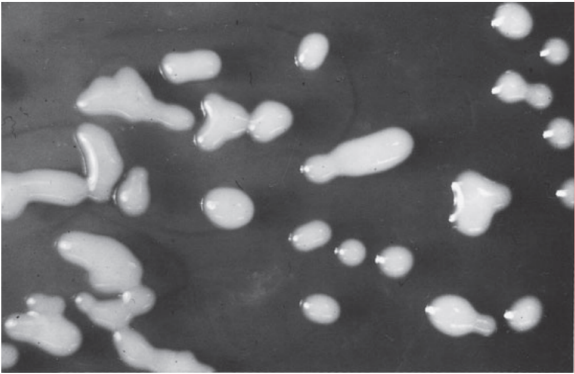
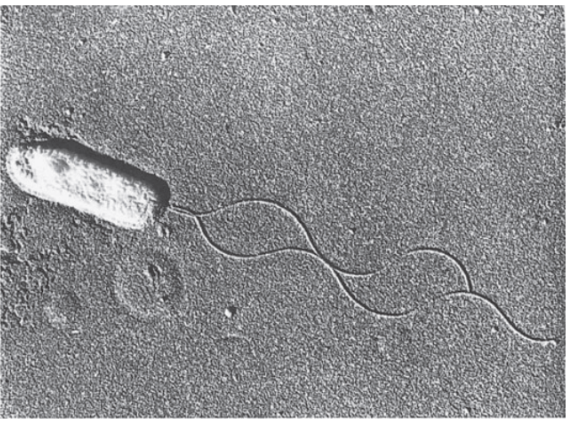


ON IDENTIFICATION OF COMMON MICROBES

No.	Name	Figure #1	Figure #2	Reference	Note	Type
1	<i>Rhizobium leguminosarum</i>	 <b>Colonies of <i>Rhizobium leguminosarum</i> on mineral-salts mannitol agar (× 1.5)</b>	 <b>Cell of <i>Rhizobium leguminosarum</i> biovar trifolii showing two polar flagella (× 14,000)</b>	Kuykendall, L. David, John M. Young, Esperanza Martínez-Romero, Allen Kerr, and Hiroyuki Sawada. “Rhizobium Frank 1889, 338AL.” In Bergey’s Manual® of Systematic Bacteriology, edited by Don J. Brenner, Noel R. Krieg, George M. Garrity, James T. Staley, David R. Boone, Paul Vos, Michael Goodfellow, Fred A. Rainey, and Karl-Heinz Schleifer, 325–40. New York: Springer-Verlag, 2005. <a href="https://t.me/self_learners/25">https://t.me/self_learners/25</a>	Hình ảnh đại thể, vi thể	Morphology
2	<i>Rhizobium sp.</i>	<ul style="list-style-type: none"><li>• YMA slant cultures in sealed containers can be stored for 2–3 years or longer at 2 °C. Cultures usually survive for around 2 months at 15 °C.</li><li>• Long-term storage at -20 °C or -80 °C is recommended: turbid suspensions from fresh broth cultures are mixed with equal volumes of sterile 80% glycerol in water and allowed to stand for 1 hr at room temperature before storing in small aliquots in the freezer.</li><li>• Individual aliquots are thawed as required. Norris (1963) described a preservation method using small porcelain beads which, after inoculation and drying over silica gel, can be used individually to inoculate YMB for subsequent recovery of the bacteria.</li><li>• Stock cultures of pathogenic species may be routinely maintained on agar slants in screw-capped vials at 4 °C for 2 months on YMA or on either of the following media (in g/L of tap water):<ul style="list-style-type: none"><li>♪ (a) glucose, 20; yeast extract, 10; CaCO3, 20; and agar, 20.</li></ul></li></ul> <b>OR</b> <ul style="list-style-type: none"><li>♪ (b) glucose, 10; yeast extract, 10; (NH4)2SO4, 1.0; KH2PO4, 0.25; and agar, 20.</li></ul> <li>• Lyophilized cultures stored at 4 °C remain viable for at least 25 years.</li>		Kuykendall, L. David, John M. Young, Esperanza Martínez-Romero, Allen Kerr, and Hiroyuki Sawada. “Rhizobium Frank 1889, 338AL.” In Bergey’s Manual® of Systematic Bacteriology, edited by Don J. Brenner, Noel R. Krieg, George M. Garrity, James T. Staley, David R. Boone, Paul Vos, Michael Goodfellow, Fred A. Rainey, and Karl-Heinz Schleifer, 325–40. New York: Springer-Verlag, 2005. <a href="https://t.me/self_learners/25">https://t.me/self_learners/25</a>	Quy trình giữ giống	Maintenace procedure
3	<i>Rhizobium sp.</i>	<b>Đặc điểm hình thái</b> <ul style="list-style-type: none"><li>• Rods 0.5–1.0 × 1.2–3.0 μm</li><li>• Nonsporeforming</li><li>• <b>Gram negative</b></li><li>• Motile by 1–6 peritrichous flagella (<b>tiền mao lớn ở đuôi tế bào</b>)</li><li>• Fimbriae (<b>tiền mao nhỏ, dọc theo tế bào</b>) have been described on some strains.</li></ul> <b>Đặc điểm sinh lý</b> <ul style="list-style-type: none"><li>• Aerobic, possessing a respiratory type of metabolism with oxygen as the terminal electron acceptor.</li><li>• Optimal temperature for growth, 25–30 °C; some species can grow at temperatures &gt; 40 °C.</li><li>• Optimal pH for growth, 6–7; range pH 4–10.</li><li>• Generation times of <i>Rhizobium</i> strains are 1.5–5.0 hr.</li><li>• Colonies are usually white or beige, circular, convex, semi-translucent or opaque, raised and mucilaginous, usually 2–4 mm in diameter within 3–5 days on yeast-mannitol-mineral salts agar (YMA).</li></ul> <b>Đặc điểm sinh hóa</b> <ul style="list-style-type: none"><li>• Growth on carbohydrate media is usually accompanied by copious amounts of extracellular polysaccharide. (<b>tạo ra màng nhầy mạnh khi phát triển trên môi trường có carbohydrate</b>)</li><li>• Pronounced turbidity develops after 2 or 3 days in aerated or agitated broth.</li><li>• Chemoorganotrophic, utilizing a wide range of carbohydrates and salts of organic acids as sole carbon sources, without gas formation.</li><li>• <b>Cellulose and starch are not utilized.</b></li><li>• Produce an acidic reaction in <b>mineral-salts medium</b> (MSM) containing mannitol or other carbohydrates.</li><li>• Ammonium salts, nitrate, nitrite, and most amino acids can serve as nitrogen sources.</li><li>• Strains of some species will grow in a simple mineral-salts medium with vitamin-free casein hydrolysate as the sole source of both carbon and nitrogen, but strains of many species require one or more <b>growth factors such as biotin, pantothenate, or nicotinic acid.</b></li><li>• Peptone is poorly utilized.</li><li>• Casein, starch, chitin, and agar are not hydrolyzed.</li></ul>	<b>Đặc điểm cố định đạm tạo nốt sần</b> <ul style="list-style-type: none"><li>• All known <i>Rhizobium</i> species include strains which induce hypertrophisms in plants as root nodules with or without symbiotic nitrogen fixation.</li><li>• Some cells of symbiotic bacterial species enter root hair cells of leguminous plants (Family Leguminosae) via invagination or by wounds (“crack entry”) and elicit the production of root nodules wherein the bacteria engage as intracellular symbionts, usually fixing nitrogen. (<b>Cơ chế xâm nhiễm tạo nốt sần cố định đạm</b>)</li></ul> <b>Cơ chế sinh học phân tử cố định đạm tạo nốt sần</b> <ul style="list-style-type: none"><li>• Many well-defined nodulation (<i>nod</i>) and nitrogen fixation (<i>nif</i>) genes are clustered on large plasmids or megaplasmids (pSyms).</li><li>• Plasmid transfer between species results in the expression and stable inheritance of the particular plant-interactive properties of the plasmid-donor species.</li><li>• Plant host specificity is usually for a few legume genera but may, in some strains, include a wide variety of legume genera and is to some extent determined by the chemical structure of the lipochito-oligosaccharide <i>Nod</i> factors produced. <b>These chitin-like molecules induce nodule organogenesis in the absence of bacteria.</b> (<b>Cơ chế thực vật tiết ra hợp chất thu hút vi khuẩn cố định đạm để tạo nốt sần</b>)</li><li>• In root nodules the bacteria occur as endophytes that exhibit pleomorphic forms, termed “bacteroids”, which reduce or fix gaseous atmospheric nitrogen into a combined form utilizable by the host plant.</li></ul>	Kuykendall, L. David, John M. Young, Esperanza Martínez-Romero, Allen Kerr, and Hiroyuki Sawada. “Rhizobium Frank 1889, 338AL.” In Bergey’s Manual® of Systematic Bacteriology, edited by Don J. Brenner, Noel R. Krieg, George M. Garrity, James T. Staley, David R. Boone, Paul Vos, Michael Goodfellow, Fred A. Rainey, and Karl-Heinz Schleifer, 325–40. New York: Springer-Verlag, 2005. <a href="https://t.me/self_learners/25">https://t.me/self_learners/25</a>	Đặc điểm sinh học	Key characteristics