A report of 22 unrecorded bacterial species in Korea, isolated from Namhangang

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As part of a larger study of indigenous prokaryotic species diversity in South Korea, various samples from Namhangang were subjected to analyses. Fresh water, underwater sediment, and moss-inhabiting aerobic and anaerobic bacteria were isolated. 22 of the isolates were identified as unrecorded bacterial species in Korea that had ≥98.7% 16S rRNA gene sequence similarity with published species. The aerobic strains isolated were Kurthia gibsonii and Massilia plicata. Also identified were four facultative anaerobic strains: Bacillus hisashii, Enterococcus rotai, Paenibacillus vini, and Pediococcus pentosaceus. 16 strictly anaerobic strains were identified as Bacteroides xylanolyticus, Carnobacterium malaromaticum, Clostridium argentinense, Clostridium beijerinckii, Clostridium butyricum, Clostridium cavendishii, Clostridium diolis, Clostridium frigidicarnis, Clostridium perfringens, Clostridium saccharoperbutylicolicum, Clostridium sphenoides, Clostridium subterminale, Cutibacterium acnes, Paraclostridium bifermantans, Prevotella paludinis, and Romboutsia lituseburensis. Based on the examination of morphological, cultural, physiological, and biochemical properties of the isolates, descriptive information of these previously unrecorded species is provided here.

Keywords: anaerobes, Namhangang, unrecorded species

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INTRODUCTION

While molecular methods have supplanted traditional microbiological culture-based tools as the favored method of identification of microorganisms, isolation of cultivable bacterial strains is still useful in helping to understand the physiological and functional properties of bacteria (Stewart, 2012). Toward this end, the Korean government is directing projects to examine and gather unrecorded bacterial species in Korea as a part of a larger catalogue of indigenous genetic resources. Through this effort, a number of unrecorded bacterial species have been discovered and registered in the national resource database of Korea (NIBR, 2017).

In this study, we aimed to investigate the diversity of cultivable anaerobic bacteria from freshwater samples, which have been relatively under-studied in previous projects. Six locations in the Namhangang (Namhang River) tributary area were selected as sampling targets: Sinnaecheon, Hanpocheon, Jodaeneub Marshy Land, Yodocheon, Sainam Valley, and Jungnyeongcheon. The four rivers, namely Sinnaecheon, Hanpocheon, Yodocheon, and Jungnyeongcheon, are freshwater rivers with 10.19 km², 69.11 km², 150.5 km², and 130.19 km² areas, respectively. The Jodaeneub Marshy Land is downstream of Sinnaecheon and is a wetland that developed as a result of the accumulation of sandy loam along shoals. Sainam Valley is a low land area with streams between cliffs. The six sampling sites are evenly distributed across the Namhangang.

Here, we report 22 newly isolated bacterial strains belonging to the phylum Actinobacteria, Bacteroidetes, Firmicutes, and Proteobacteria, all of which are new records for South Korea.

MATERIALS AND METHODS

Fresh water, underwater sediment, and moss were collected between May 16 and Jun 27, 2017. Sampling sites were Sinnaecheon (N37°27’42.21”; E127°33’16.71”), Hanpocheon (N37°4’44.13”; E127°50’14.83”), Jodaeneub Marshy Land (N37°5’56.85”; E127°49’15.91”), Yodocheon (N36°59’33.79”; E127°45’32.67”), Sainam Valley
The gene was done using universal primers primized in Table 1.

Culture media, and incubation conditions are summarized in Table 1. The designation of strains, source of isolation, 20% glycerol suspension at long-term preservation, the isolates were stored using R2A or ABA. The optimum growth temperature was determined by incubating the isolates on corresponding agar medium for up to 1 week. For long-term preservation, the isolates were stored using 20% glycerol suspension at −80°C and lyophilized ampoules. The designation of strains, source of isolation, culture media, and incubation conditions are summarized in Table 1.

PCR amplification and gene sequencing of 16S rRNA were done using universal primers (27F, 5′-AGA GTTTGATCMTGGCTCAG-3′ and 1492R, 5′-TACG GYTACCTTGTTACGACTT-3′) as described previously (Shin et al., 2016). The sequences were identified by comparing them to the type strain sequence database hosted by the EzBioCloud server (Yoon et al., 2017). Based on pairwise sequence similarity, an isolate showing 98.7% or higher similarity to a type strain with a published name, but whose presence has not been reported in Korea, was identified as an unrecorded species.

For phylogenetic analyses, the 16S rRNA gene sequences were aligned using EzEditor program (Jeon et al., 2014). Phylogenetic trees were inferred using the neighbor-joining (NJ) and maximum-likelihood (ML) algorithms implemented in MEGA v. 7.0 program (Kumar et al., 2016). The Jukes-Cantor model and general time reversible model were used for calculating evolutionary distances of NJ and ML trees, respectively. Bootstrap analysis with 1,000 re-samplings was used to evaluate the trees.

Colonial morphology was observed using cells of 2- to 3-days old on R2A or ABA agar plates. Cellular morphology and cell size were examined by transmission electron microscopy (JEM-3010, Jeol). Gram staining was performed using a Gram-Staining kit (Sigma-Aldrich). Physiological properties were examined by using API 20NE for aerobic strains or API 20A galleries for anaerobic strains (bioMérieux). Oxygen requirement for growth was determined by incubating the inoculated R2A or ABA agar plates at both aerobic and anaerobic conditions.

RESULTS AND DISCUSSION

22 isolates, which had at least 98.7% sequence similarity with previously recognized bacterial type strains, were identified as unrecorded bacterial species in the Republic of Korea. The similarity-based identification was further supported by phylogenetic trees (Fig. 1). Each isolate formed a well-supported monophyletic clade with the type strain of identified bacterial species, confirming the proper assignment of the isolate to the species with published names. The tree topology of the maximum-likelihood method was consistent with that of the neighbor-joining tree. The strain information and identification results are summarized in Table 1.

The unrecorded species belonged to the class Actinobacteria (1 strain) of the phylum Actinobacteria, the class Betaproteobacteria (1 strain) of the phylum Proteobacteria, the class Bacteroidia (2 strains) of the phylum Bacteroidetes, the classes Bacilli (6 strains), and Clostridia (12 strains) of the phylum Firmicutes. At generic and family level, those strains belonged to 13 different genera in 11 families: Bacillus of Bacillaceae, Carnobacterium of Carnobacteriaceae, Clostridium and Bacteroides of Clostridiales and Lachnospiraceae, Enterococcus of Enterococcaceae, Pediococcus of Lactobacillaceae, Massilia of Oxalobacteraceae, Paenibacillus of Paenibacillaceae, Paraclostridium and Romboutsia of Peptostreptococcaceae, Kurthia of Planococcaceae, Prevotella of Prevotellaceae, and Cutibacterium of Propionibacteriaceae.

The cells of isolates were Gram-reaction-negative or positive, rods or cocci, flagellated or non-flagellated bacteria. Colonial colors were white or yellow. None of the isolates produced diffusible pigment on R2A or ABA. Two of the isolates were strict aerobes, four were facultative anaerobes, and 16 were strict anaerobes. Aerobic strains were isolated from moss, and anaerobic strains were isolated from fresh water, underwater sediment, and moss. All the isolates exhibited specific physiological characteristics and enzymatic properties. The detailed feature of carbon source utilization, glucose fermentation, degradation of high molecular weight compounds, and presence of metabolic enzymes are given in the strain descriptions below.

From the results of sequence similarities and phylogenetic trees, we identified 22 strains from the Namhangang samples, including Bacillus hisashii, Bacteroides xylanolyticus, Carnobacterium maltaromaticum, Clostridium argentinense, Clostridium beijerinckii, Clostridium butyricum, Clostridium cavideshii, Clostridium diolis, Clostridium frigidicarnis, Clostridium perfingens, Clostridium saccharoperbutyloceticum, Clostridium sphenoides, Clostridium subterminale, Cutibacterium acnes, Enterococcus rotai, Kurthia gibsonii, Massilia plicata, Paenibacillus vini, Paraclostridium bifermcetans, Pediococcus pentosaceus, Prevotella paludivienvis, and Romboutsia lituseburensis. These 22 bacterial species have been previously reported in other locations, but are new reports for Korea.
Table 1. Taxonomic affiliations and summary of unrecorded species isolated from Namhangang.

<table>
<thead>
<tr>
<th>Order</th>
<th>Family</th>
<th>Genus</th>
<th>Strain ID</th>
<th>NIBR ID</th>
<th>Most closely related species</th>
<th>Similarity (%)</th>
<th>Isolation source</th>
<th>Medium</th>
<th>Incubation condition</th>
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<tr>
<td>Bacteroidales</td>
<td>Prevotellaceae</td>
<td>Prevotella</td>
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<td>R2A</td>
<td>25°C, 2d</td>
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<td>KB_A_32</td>
<td><em>Cutibacterium acnes</em></td>
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<td>ABA</td>
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</table>
Cells are Gram-reaction-negative, non-flagellated, short rod-shaped and approximately 0.6×1.2 μm in size. Colonies are mucoid, convex, and pale white colored after 3 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Does not possess catalase or urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin, but not gelatin. Produces acids from D-glucose, D-mannitol (weakly), D-lactose, D-saccharose (weakly), D-maltose, salicin, D-xylose, L-arabinose, glycerol (weakly), D-cellobiose, D-mannose, D-melezitose (weakly), D-raffinose (weakly), D-sorbitol (weakly), L-rhamnose, and D-trehalose (weakly). Strain HYN0075 (KBA_34) was isolated from the underwater sediment of Yodocheon, Korea.

Description of *Prevotella paludivivens* HYN0075

Cells are Gram-reaction-negative, non-flagellated, rod-shaped and approximately 0.4×0.8 μm in size. Colonies are circular, viscous, and white colored after 2 days on
R2A at 25°C. Cells are strict aerobes. Reduces nitrate to nitrite. Possesses activities of oxidase and β-galactosidase, but not urease or arginine dihydrolase. Hydrolyzes esculin and gelatin. Does not produce indole from L-tryptophan. Does not produce acids from glucose. Utilizes D-glucose, L-arabinose, D-mannose, and D-maltose as a sole carbon source, but not from D-mannitol, N-acetyl-glucosamine, gluconate, caprate, adipate, malate, citrate, or phenylacetate. Strain HYN0061 (KBA_21) was isolated from a moss of Sinnaecheon, Korea.

**Description of Bacillus hisashii HYN0081**

Cells are Gram-reaction-positive, flagellated, rod-shaped and approximately 0.6 × 3.0 μm in size. Colonies are convex and pale yellow colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are facultative anaerobes. Possesses catalase, but not urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin, but not gelatin. Produces acids from D-glucose, D-mannitol, D-lactose, D-saccharose, D-maltose, salicin, D-xyllose, L-arabinose, glycerol, D-cellobiose, D-mannose, D-melezitose, D-raffinose, D-sorbitol, L-rhamnose, and D-trehalose. Strain HYN0081 (=KBA_38) was isolated from the underwater sediment of Jungnyeongcheon, Korea.

**Description of Paenibacillus vini HYN0088**

Cells are Gram-reaction-negative, non-flagellated,
rod-shaped and approximately 0.6 × 1.2 μm in size. Colonies are circular and pale white colored after 3 days of incubation on anaerobe basal agar at 30°C. Cells are facultative anaerobes. Does not possess catalase or urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin weakly, but not gelatin. Produces acids from D-glucose, D-mannitol, D-lactose, D-saccharose, D-maltose, salicin, D-xylose, L-arabinose, glycerol, D-cellobiose, D-mannose, D-melezitose, D-raffinose, D-sorbitol, L-rhamnose, and D-trehalose. Strain HYN0087 (KBA_33) was isolated from the fresh water of Yodocheon, Korea.

**Description of Kurthia gibsonii HYN0065**

Cells are Gram-reaction-positive, flagellated, rod-shaped and approximately 0.6 × 2.4 μm in size. Colonies are irregular and yellow colored after 2 days on R2A at 25°C. Cells are strict aerobes. Does not reduce nitrate to nitrite. Does not possess activities of oxidase, β-galactosidase, urease, or arginine dihydrolase. Does not hydrolyze esculin or gelatin. Does not produce indole from L-tryptophan. Does not produce acids from glucose. Utilizes N-acetyl-glucosamine as a sole carbon source, but not from D-glucose, L-arabinose, D-mannose, D-mannitol, D-maltose, gluconate, caprate, adipate, malate, citrate, or phenylacetate. Strain HYN0065 (KBA_25) was isolated from a moss of Hanpocheon, Korea.

**Description of Carnobacterium maltaromaticum HYN0064**

Cells are Gram-reaction-positive, non-flagellated, rod-shaped and approximately 0.5 × 1.6 μm in size. Colonies are convex, circular, and pale white colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Possesses catalase (weak reaction), but not urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin, but not gelatin. Produces acids from D-glucose, D-saccharose, D-maltose, salicin, D-cellobiose, D-mannose, and D-trehalose, weakly from D-mannitol, D-lactose, glycerol, and D-sorbitol, but not from D-xylose, L-arabinose, D-melezitose, D-raffinose, or L-rhamnose. Strain HYN0064 (KBA_24) was isolated from the underwater sediment of Jodaeneub Marshy Land, Korea.

**Description of Enterococcus rotai HYN0074**

Cells are Gram-reaction-positive, non-flagellated, ovoid-shaped and approximately 1.0 × 1.1 μm in size. Colonies are mucoid, convex, and pale white after 3 days of incubation on anaerobe basal agar at 30°C. Cells are facultative anaerobes. Possesses urease, but not catalase. Does not produce indole from L-tryptophan. Hydrolyzes esculin weakly, but not gelatin. Produces acids from D-glucose, D-lactose, D-saccharose, D-maltose, salicin, D-xylose, L-arabinose, glycerol, D-cellobiose, D-mannose, D-melezitose, D-raffinose, D-sorbitol, L-rhamnose, and D-trehalose. Strain HYN0074 (KBA_23) was isolated from the underwater sediment of Yodocheon, Korea.

**Description of Pediococcus pentosaceus HYN0082**

Cells are Gram-reaction-positive, non-flagellated, cocci-shaped and approximately 1.1 × 1.5 μm in size. Colonies are circular, convex, and pale white colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are facultative anaerobes. Does not possess catalase or urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin, but not gelatin. Produces acids from D-glucose, D-lactose, D-maltose, salicin, D-xylose (weakly), L-arabinose, D-cellobiose, D-mannose, L-rhamnose, and D-trehalose, but not from D-mannitol, D-saccharose, glycerol, D-melezitose, D-raffinose, or D-sorbitol. Strain HYN0082 (KBA_39) was isolated from a moss of Hanpocheon, Korea.

**Description of Clostridium argentinense HYN0087**

Cells are Gram-reaction-positive, non-flagellated, rod-shaped and approximately 0.4 × 1.6 μm in size. Colonies are pale yellow colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Does not possess catalase or urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin and gelatin. Does not produce acids from D-glucose, D-mannitol, D-lactose, D-saccharose, D-maltose, salicin, D-xylose, L-arabinose, glycerol, D-cellobiose, D-mannose, D-melezitose, D-raffinose, D-sorbitol, L-rhamnose, or D-trehalose. Strain HYN0087 (KBA_44) was isolated from the underwater sediment of Yodocheon, Korea.

**Description of Clostridium beijerinckii HYN0084**

Cells are Gram-reaction-positive, flagellated, rod-shaped and approximately 0.7 × 2.3 μm in size. Colonies are mucoid, circular, and pale yellow colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Does not possess catalase or urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin, but not gelatin. Produces acids from D-glucose, D-mannitol, D-lactose, D-saccharose, D-maltose, salicin, D-xylose, L-arabinose, glycerol, D-cellobiose, D-mannose, D-melezitose, D-raffinose, D-sorbitol, L-rhamnose, and D-trehalose. Strain HYN0084 (KBA_41) was isolated from the underwater sediment of Hanpocheon, Korea.
Description of *Clostridium butyricum* HYN0083

Cells are Gram-reaction-positive, non-flagellated, rod-shaped and approximately 0.9 × 2.3 μm in size. Colonies are irregular and pale yellow colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Does not possess catalase or urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin, but not gelatin. Produces acids from D-glucose, D-mannitol, D-lactose, D-saccharose, D-maltose, salicin, D-xy-
lose, L-arabinose, glycerol, D-cellobiose, D-mannose, D-melezitose, D-raffinose, D-sorbitol, L-rhamnose, and D-trehalose. Strain HYN0083 (KBA_40) was isolated from the underwater sediment of Jodaeneub Marshy Land, Korea.

Description of *Clostridium cavendishii* HYN0062

Cells are Gram-reaction-positive, flagellated, rod-shaped and approximately 0.2 × 1.1 μm in size. Colonies are convex with lobate margins and creamy white colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Does not possess catalase or urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin and gelatin. Produces acids from D-glucose, D-maltose, salicin, D-cellobiose, D-mannose, and D-trehalose, but not from D-mannitol, D-lactose, D-saccharose, D-mannose, D-raffinose, D-sorbitol, or L-rhamnose. Strain HYN0062 (KBA_22) was isolated from the underwater sediment of Jodaeneub Marshy Land, Korea.

Description of *Clostridium diolis* HYN0068

Cells are Gram-reaction-positive, flagellated, rod-shaped and approximately 0.8 × 2.2 μm in size. Colonies are circular and white colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Does not possess catalase or urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin, but not gelatin. Produces acids from D-glucose, D-mannitol, D-lactose, D-saccharose, D-maltose, salicin, D-xyllose, L-arabinose, glycerol (weakly), D-cellobiose, D-mannose, D-melezitose, D-raffinose, D-sorbitol, L-rhamnose, and D-trehalose. Strain HYN0068 (KBA_28) was isolated from the underwater sediment of Hanpocheon, Korea.

Description of *Clostridium frigidicarnis* HYN0076

Cells are Gram-reaction-positive, non-flagellated, rod-shaped and approximately 0.6 × 3.0 μm in size. Colonies are irregular with uneven margins and pale yellow colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Does not possess catalase or urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin, but not gelatin. Produces acids from D-maltose and glycerol (weakly), but not from D-glucose, D-mannitol, D-lactose, D-saccharose, salicin, D-xyllose, L-arabinose, D-cellobiose, D-mannose, D-melezitose, D-raffinose, D-sorbitol, L-rhamnose, or D-trehalose. Strain HYN0076 (KBA_35) was isolated from the underwater sediment of Sainam Valley, Korea.

Description of *Clostridium perfringens* HYN0080

Cells are Gram-reaction-positive, non-flagellated, straight rod-shaped and approximately 1.1 × 2.4 μm in size. Colonies are circular, slightly raised, and yellow colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Does not possess catalase or urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin and gelatin. Produces acids from D-glucose, D-lactose, D-saccharose, D-maltose, glycerol, D-mannose, D-raffinose (weakly), and D-trehalose, but not from D-mannitol, salicin, D-xyllose, L-arabinose, D-cellobiose, D-melezitose, D-sorbitol, or L-rhamnose. Strain HYN0080 (KBA_37) was isolated from the underwater sediment of Jungnyeongcheon, Korea.

Description of *Clostridium saccharoperbutylacetonicum* HYN0066

Cells are Gram-reaction-positive, non-flagellated, straight rod-shaped with rounded ends and approximately 0.8 × 2.9 μm in size. Colonies are circular and white colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Possesses catalase, but not urease. Does not produce indole from L-tryptophan. Hydrolyzes gelatin, but not esculin. Produces acids from glycerol, D-mannose, and D-sorbitol, but not from D-glucose, D-mannitol, D-lactose, D-saccharose, D-maltose, salicin, D-xyllose, L-arabinose, D-cellobiose, D-melezitose, D-raffinose, L-rhamnose, or D-trehalose. Strain HYN0066 (KBA_26) was isolated from a moss of Sinnaecheon, Korea.

Description of *Clostridium subterminale* HYN0077

Cells are Gram-reaction-positive, flagellated, rod-shaped and approximately 0.6 × 2.3 μm in size. Colonies are irregular and pale white colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Does not possess catalase or urease. Does not produce indole from L-tryptophan. Does not hydrolyze esculin or gelatin. Produces acids from D-glucose weakly, but not from D-mannitol, D-lactose, D-saccharose, D-maltose, salicin, D-xyllose, L-arabinose, glycerol, D-cellobiose, D-mannose, D-melezitose, D-raffinose, D-sorbitol, L-rhamnose, and D-trehalose. Strain HYN0077 (KBA_36) was isolated from the fresh water of Yodocheon, Korea.

Description of *Clostridium sphenoides* HYN0070

Cells are Gram-reaction-positive, non-flagellated, oval-shaped and approximately 0.9 × 1.6 μm in size. Colonies circular and white colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Does not possess catalase or urease. Produce indole from L-tryptophan weakly. Hydrolyzes esculin,
but not gelatin. Produces acids from D-glucose, D-mannitol, D-lactose, D-saccharose, D-maltose, salicin (weakly), D-xylose, L-arabinose, glycerol, D-cellobiose, D-mannose, D-melezitose (weakly), D-raffinose, D-sorbitol (weakly), L-rhamnose, and D-trehalose. Strain HYN0070 (KBA_30) was isolated from the underwater sediment of Jungnyeongcheon, Korea.

**Description of Bacteroides xylanolyticus HYN0067**

Cells are Gram-reaction-negative, flagellated, rod-shaped and approximately 0.6×2.5 μm in size. Colonies are mucoid and pale white colored after 3 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Does not possess catalase or urease. Does not produce indole from L-tryptophan. Hydrolyzes esculin, but not gelatin. Does not produce acids from D-glucose, D-mannitol, D-lactose, D-saccharose, D-maltose, salicin, D-xylose, L-arabinose, glycerol, D-cellobiose, D-mannose, D-melezitose, D-raffinose, D-sorbitol, L-rhamnose, and D-trehalose. Strain HYN0067 (KBA_27) was isolated from the underwater sediment of Hanpocheon, Korea.

**Description of Paraclostridium bifermentans HYN0063**

Cells are Gram-reaction-positive, flagellated, rod-shaped and approximately 0.4×1.6 μm in size. Colonies are irregular, mucoid, and pale yellow colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Does not possess catalase or urease. Produces indole from L-tryptophan. Produces acids from D-glucose, D-maltose, D-mannose, and D-sorbitol (weakly), but not from D-mannitol, D-lactose, D-saccharose, salicin, D-xylose, L-arabinose, glycerol, D-cellobiose, D-mannose, D-melezitose, D-raffinose, D-sorbitol, L-rhamnose, or D-trehalose. Strain HYN0063 (KBA_23) was isolated from the underwater sediment of Hanpocheon, Korea.

**Description of Romboutsia lituseburensis HYN0072**

Cells are Gram-reaction-negative, flagellated, short rod-shaped and approximately 0.6×1.7 μm in size. Colonies are circular and white colored after 2 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Produces acids from D-glucose, D-mannitol, D-lactose, D-saccharose, D-maltose, salicin, D-xylose, L-arabinose, glycerol, D-cellobiose, D-mannose, D-melezitose, D-raffinose, D-sorbitol, L-rhamnose, and D-trehalose. Strain HYN0072 (KBA_31) was isolated from the underwater sediment of Jungnyeongcheon Rive, Korea.

**Description of Cutibacterium acnes HYN0073**

Cells are Gram-reaction-positive, non-flagellated, rod-shaped and approximately 0.4×1.89 μm in size. Colonies are mucoid, convex, and pale yellow colored after 3 days of incubation on anaerobe basal agar at 30°C. Cells are strict anaerobes. Produces acids from D-glucose, glycerol, D-mannose, and D-sorbitol, but not from D-mannitol, D-lactose, D-saccharose, salicin, D-xylose, L-arabinose, D-cellobiose, D-melezitose, D-raffinose, L-rhamnose, or D-trehalose. Strain HYN0073 (KBA_32) was isolated from the underwater sediment of Sainam Valley, Korea.

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