

### Strain identifier

**BacDive ID:** 5499      **DOI:** 10.13145/bacdive5499.20191129.4.1  
**Type strain:** yes      **Designation:** Cy I20 LIM -21  
**Culture col. no.:** DSM 7489, ATCC 23178, IAM 14306

### Sections

[Name and taxonomic classification](#)  
[Morphology and physiology](#)  
[Culture and growth conditions](#)  
[Isolation, sampling and environmental information](#)  
[Application and interaction](#)  
[Molecular biology](#)  
[Strain availability](#)  
[References](#)

### Name and taxonomic classification

|            |                             |   |
|------------|-----------------------------|---|
| Ref.: 3188 | <b>Domain</b>               | Bacteria  |
| Ref.: 3188 | <b>Phylum</b>               | Bacteroidetes   |
| Ref.: 3188 | <b>Class</b>                | Flavobacteriia  |
| Ref.: 3188 | <b>Order</b>                | Flavobacteriales                                      |
| Ref.: 3188 | <b>Family</b>               | Flavobacteriaceae                                     |
| Ref.: 3188 | <b>Genus</b>                | Cellulophaga  |
| Ref.: 3188 | <b>Species</b>              | Cellulophaga lytica                                   |
| Ref.: 3188 | <b>Full Scientific Name</b> | Cellulophaga lytica (Lewin 1969) Johansen et al. 1999 |
| Ref.: 3188 | <b>Designation:</b>         | Cy I20 LIM -21  |
| Ref.: 3188 | <b>Type strain:</b>         | yes   |

#### **Prokaryotic Nomenclature Up-to-date (PNU)**

|             |                      |  |
|-------------|----------------------|--|
| Ref.: 20215 | <b>Domain</b>        | Bacteria                               |
| Ref.: 20215 | <b>Phylum</b>        | Bacteroidetes                          |
| Ref.: 20215 | <b>Class</b>         | Flavobacteriia                         |
| Ref.: 20215 | Literature reference | Int. J. Syst. Evol. Microbiol. 62:1017 |
| Ref.: 20215 | <b>Family</b>        | Flavobacteriaceae                      |
| Ref.: 20215 | Literature reference | Int. J. Syst. Bacteriol. 42:327        |
| Ref.: 20215 | <b>Genus</b>         | Cellulophaga                           |

|             |                             |   |
|-------------|-----------------------------|---|
| Ref.: 20215 | Taxonomical status          | gen. nov. (VP)  |
| Ref.: 20215 | Literature reference        | Int. J. Syst. Bacteriol. 49:1231*   |
| Ref.: 20215 | <b>Species</b>              | Cellulophaga lytica   |
| Ref.: 20215 | Taxonomical status          | comb. nov. (VP)   |
| Ref.: 20215 | Literature reference        | Int. J. Syst. Evol. Microbiol. 7:2003   |
| Ref.: 20215 | <b>Full Scientific Name</b> | Cellulophaga lytica (Lewin 1969) Johansen et al. 1999 emend. Hahnke et al. 2016 |
| Ref.: 20215 | <b>Synonym</b>              | Cytophaga lytica  |

**Morphology and physiology**

|             |                                  |               |
|-------------|----------------------------------|---------------|
| Ref.: 43342 | <b>Gram stain</b>                | negative      |
| Ref.: 43342 | <b>Cell length</b>               | 1.5-5 µm      |
| Ref.: 43342 | <b>Cell width</b>                | 0.4-0.8 µm    |
| Ref.: 43342 | <b>Cell shape</b>                | rod-shaped    |
| Ref.: 43342 | <b>Motility</b>                  | yes           |
| Ref.: 43342 | <b>Cultivation medium used</b>   | Marine media  |
| Ref.: 43342 | <b>Colony shape</b>              | circular      |
| Ref.: 43342 | <b>Colony color</b>              | yellow-orange |
| Ref.: 3188  | <b>Name of produced compound</b> | rhapidosomes  |

**Enzymes**

Ref.: 43342  
Ref.: 43342  
Ref.: 43342  
Ref.: 43342  
Ref.: 43342  
Ref.: 43342

| Enzyme             | Enzyme activity | EC number |
|--------------------|-----------------|-----------|
| cytochrome oxidase | +               | 1.9.3.1   |
| DNase              | -               |           |
| lipase             | +/-             |           |
| urease             | -               | 3.5.1.5   |
| esterase           | +               |           |
| beta-galactosidase | +               | 3.2.1.85  |

**Halophily**

Ref.: 43342  
Ref.: 43342

| Salt | Tested relation | Salt conc. |
|------|-----------------|------------|
| NaCl | growth          | 1-5 %      |
| NaCl | no growth       | 10 %       |

**Metabolite utilization**

Ref.: 43379

| Chebi ID | Metabolite | Utilization activity | Kind of utilization tested |
|----------|------------|----------------------|----------------------------|
| 2509     | Agar       | +                    | assimilation               |



|             |        |                        |     |                  |
|-------------|--------|------------------------|-----|------------------|
| Ref.: 43342 | 2509   | Agar                   | +   | hydrolysis       |
| Ref.: 43342 | 17548  | Alginic acid           | -   | hydrolysis       |
| Ref.: 43379 | 17548  | Alginic acid           | +   | assimilation     |
| Ref.: 43379 | 85146  | Carboxymethylcellulose | +   | assimilation     |
| Ref.: 43342 | 85146  | Carboxymethylcellulose | +   | hydrolysis       |
| Ref.: 43342 | 3435   | Carrageenan            | +   | hydrolysis       |
| Ref.: 43342 |        | Casamino acids         | +   | nitrogen source  |
| Ref.: 43342 |        | Casein                 | +/- | hydrolysis       |
| Ref.: 43342 | 17057  | Cellobiose             | +   | builds acid from |
| Ref.: 43342 | 62968  | Cellulose              | +   | degradation      |
| Ref.: 43342 | 17029  | Chitin                 | +/- | hydrolysis       |
| Ref.: 43342 | 15824  | D-Fructose             | +   | builds acid from |
| Ref.: 43342 | 12936  | D-Galactose            | +   | builds acid from |
| Ref.: 43342 | 17634  | D-Glucose              | +   | builds acid from |
| Ref.: 43342 | 16899  | D-Mannitol             | +   | builds acid from |
| Ref.: 43342 | 16024  | D-Mannose              | +   | builds acid from |
| Ref.: 43342 | 65327  | D-Xylose               | +/- | builds acid from |
| Ref.: 43342 | 4767   | Elastin                | -   | hydrolysis       |
| Ref.: 43342 | 4853   | Esculin                | +   | hydrolysis       |
| Ref.: 43379 | 5291   | Gelatin                | +   | assimilation     |
| Ref.: 43342 | 5291   | Gelatin                | +   | hydrolysis       |
| Ref.: 43342 | 17754  | Glycerol               | +/- | builds acid from |
| Ref.: 43342 | 30849  | L-Arabinose            | +/- | builds acid from |
| Ref.: 43342 | 16015  | L-Glutamic acid        | +   | nitrogen source  |
| Ref.: 43342 | 62345  | L-Rhamnose             | +/- | builds acid from |
| Ref.: 43342 | 17895  | L-Tyrosine             | +   | degradation      |
| Ref.: 43342 | 17716  | Lactose                | +   | builds acid from |
| Ref.: 43342 | 17306  | Maltose                | +   | builds acid from |
| Ref.: 43342 | 506227 | N-Acetylglucosamine    | -   | builds acid from |
| Ref.: 43342 | 17632  | Nitrate                | -   | reduction        |
| Ref.: 43342 |        | Peptone                | +   | nitrogen source  |
| Ref.: 43379 | 28017  | Starch                 | +   | assimilation     |
| Ref.: 43342 | 28017  | Starch                 | +   | hydrolysis       |
| Ref.: 43342 | 17992  | Sucrose                | +   | builds acid from |
| Ref.: 43342 | 27082  | Trehalose              | +   | builds acid from |
| Ref.: 43342 | 27226  | Uric acid              | -   | degradation      |



|             |                            |                                 |
|-------------|----------------------------|---------------------------------|
| Ref.: 43342 | <b>Nutrition type</b>      | chemoheterotroph                |
| Ref.: 43342 | <b>Decomposition/lysis</b> | Na+ is a requirement for growth |
| Ref.: 43342 | <b>Oxygen tolerance</b>    | aerobe                          |
| Ref.: 43342 | <b>Pigment name</b>        | Flexirubin                      |

**Culture and growth conditions**

|             |                                   |   |
|-------------|-----------------------------------|---|
| Ref.: 3188  | <b>Culture medium</b>             | BACTO MARINE BROTH (DIFCO 2216) (DSMZ Medium 514), 25°C   |
| Ref.: 3188  | <b>Culture medium growth</b>      | yes   |
| Ref.: 3188  | <b>Culture medium link</b>        | <a href="https://www.dsmz.de/microorganisms/medium/pdf/DSMZ_Medium514.pdf">https://www.dsmz.de/microorganisms/medium/pdf/DSMZ_Medium514.pdf</a> |
| Ref.: 3188  | <b>Culture medium</b>             | CYTOPHAGA (marine) MEDIUM (DSMZ Medium 172), 25°C   |
| Ref.: 3188  | <b>Culture medium growth</b>      | yes   |
| Ref.: 3188  | <b>Culture medium link</b>        | <a href="https://www.dsmz.de/microorganisms/medium/pdf/DSMZ_Medium172.pdf">https://www.dsmz.de/microorganisms/medium/pdf/DSMZ_Medium172.pdf</a> |
| Ref.: 43342 | <b>Culture medium</b>             | Nutrient agar   |
| Ref.: 43342 | <b>Culture medium growth</b>      | yes   |
| Ref.: 43342 | <b>Culture medium</b>             | Nutrient agar + 8% NaCL   |
| Ref.: 43342 | <b>Culture medium growth</b>      | yes   |
| Ref.: 43342 | <b>Culture medium</b>             | CYT agar  |
| Ref.: 43342 | <b>Culture medium growth</b>      | yes   |
| Ref.: 43342 | <b>Culture medium composition</b> | 1g casein, 0.5g yeast extract, 0.5g CaCL2*H2O, 0.5g MgSO4*H2O, 15g agar, 1000ml deionized water   |
| Ref.: 43342 | <b>Culture medium</b>             | Marine agar   |
| Ref.: 43342 | <b>Culture medium growth</b>      | yes   |
| Ref.: 43342 | <b>Culture medium</b>             | Marine media  |
| Ref.: 43342 | <b>Culture medium growth</b>      | yes   |

| Ref.: 3188 | <b>Temperatures</b> | <table border="1"> <tr> <th>Kind of temperature</th> <th>Temperature</th> </tr> <tr> <td>growth</td> <td>25 °C</td> </tr> </table> | Kind of temperature | Temperature | growth | 25 °C |
|------------|---------------------|--|---------------------|-------------|--------|-------|
|            |                     | Kind of temperature  | Temperature         |             |        |       |
| growth     | 25 °C               |  |                     |             |        |       |

Ref.: 3188

|        |          |
|--------|----------|
| growth | 20-30 °C |
|--------|----------|

Ref.: 43342

|         |          |
|---------|----------|
| optimum | 22-30 °C |
|---------|----------|

Ref.: 43342

|        |          |
|--------|----------|
| growth | 35-40 °C |
|--------|----------|

Ref.: 43342

|        |      |
|--------|------|
| growth | 4 °C |
|--------|------|

Ref.: 43342

|        |       |
|--------|-------|
| growth | -2 °C |
|--------|-------|

Ref.: 3188

**Temperature range**

mesophilic

Ref.: 43342

**Temperature range**

psychrophilic

**pH**

Ref.: 43342

| Kind of pH | pH    |
|------------|-------|
| optimum    | 7-7.5 |

### Isolation, sampling and environmental information

Ref.: 3188

**Sample type/isolated from**

beach mud

Ref.: 3188

**Country**

Costa Rica

Ref.: 3188

**Continent**

Middle and South America

Ref.: 43342

**Sample type/isolated from**

coastal sand and mud, tidal pools and macroalgal samples

Ref.: 43342

**Geographic location (country and/or sea, region)**

Limon, Costa Rica

Ref.: 43342

**Country**

USA

Ref.: 43342

**Continent**

North America

Ref.: 43342

**Geographic location**

9.0°/-83.0°

**Isolation sources categories**

| Cat1           | Cat2     | Cat3          |
|----------------|----------|---------------|
| #Environmental | #Aquatic | #Coast        |
| #Environmental | #Aquatic | #Mud (Sludge) |
| #Environmental | #Aquatic | #Marine       |

### Application and interaction

Ref.: 3188

**Biosafety level**

1 Risk group (German classification)

### Molecular biology



Ref.: 3188      **GC-content**                      33.2 mol%

Ref.: 43342      **GC-content**                      33.5-34.5 mol% thermal denaturation, midpoint method (Tm)

Ref.: 3188      **GC-content**                      32.1 mol% sequence analysis

|             | <b>Sequence database</b>                            | <b>Sequence accession description</b>  | <b>Sequence accession number</b> | <b>Sequence length(bp)</b> | <b>Associated NCBI tax ID</b> |
|-------------|---|--|----------------------------------|----------------------------|-------------------------------|
| Ref.: 3188  | INSDC   | C.lytica 16S ribosomal RNA   | M62796                           | 1525                       | 979                           |
| Ref.: 3188  | 16S rRNA gene, Marker Gene (DDBJ Direct submission) | Cellulophaga lytica gene for 16S ribosomal RNA, partial sequence, strain: NBRC 14961                       | AB517706                         | 1445                       | 979                           |
| Ref.: 20218 | Marker Gene (DDBJ Direct submission)                | Cellulophaga lytica gene for 16S ribosomal RNA, partial sequence, strain: ATCC 23178                       | D12666                           | 1256                       | 867900                        |
| Ref.: 20218 | Marker Gene (EMBL Direct submission)                | TPA: Cellulophaga lytica DSM 7489 transfer-messenger mRNA Cellu_lytic_7489, single chain mature transcript | HG783493                         | 396                        | 867900                        |
| Ref.: 3188  | complete genome, GenBank Genome project data        | Cellulophaga lytica DSM 7489, complete genome  | CP002534                         | 3765936                    | 867900                        |
| Ref.: 43342 | Genbank   | 16S rRNA gene sequences  | AB032509                         |                            |                               |
| Ref.: 43342 | Genbank   | 16S rRNA gene sequences  | AB032512                         |                            |                               |
| Ref.: 43342 | Genbank   | 16S rRNA gene sequences  | AB032513                         |                            |                               |
| Ref.: 43342 | Genbank   | 16S rRNA gene sequences  | AB032510                         |                            |                               |
| Ref.: 43342 | Genbank   | 16S rRNA gene sequences  | AB032511                         |                            |                               |
| Ref.: 43342 | GenBank   | GyrB gene sequences  | AB034215                         |                            |                               |
| Ref.: 43342 | GenBank   | GyrB gene sequences  | AB034213                         |                            |                               |
| Ref.: 43342 | GenBank   | GyrB gene sequences  | AB034214                         |                            |                               |
| Ref.: 43342 | GenBank   | GyrB gene sequences  | AB034218                         |                            |                               |
| Ref.: 43342 | GenBank   | GyrB gene sequences  | AB034217                         |                            |                               |
| Ref.: 43342 | GenBank   | GyrB gene sequences  | AB034216                         |                            |                               |

**Strain availability**

Ref.: 3188      **Culture collection no.**                      DSM 7489, ATCC 23178, IAM 14306

Ref.: 3188      **Strain history**                                      <- H. Reichenbach, Cy I20 <- ATCC <- R.A. Lewin, LIM -21

**Associated Passport(s) in StrainInfo**

- Ref.: 20218 52227 - <http://www.straininfo.net/strains/52227>  
Ref.: 20218 52225 - <http://www.straininfo.net/strains/52225>  
Ref.: 20218 160875 - <http://www.straininfo.net/strains/160875>

**References**

- Ref.: 3188 Leibniz Institut DSMZ-Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH; Curators of the DSMZ; DSM 7489
- Ref.: 20215 D.Gleim, M.Kracht, N.Weiss et. al.: Prokaryotic Nomenclature Up-to-date - compilation of all names of Bacteria and Archaea, validly published according to the Bacteriological Code since 1. Jan. 1980, and validly published nomenclatural changes since.
- Ref.: 20218 Verslyppe, B., De Smet, W., De Baets, B., De Vos, P., Dawyndt P. StrainInfo introduces electronic passports for microorganisms.. Syst Appl Microbiol. 37: 42-50 2014 (10.1016/j.syapm.2013.11.002, 24321274)
- Ref.: 43342 None None (None Eds.); None: None. None None: None-None 0 ISBN 978 (10.1007/978-0-387-68572-4, None)
- Ref.: 43379 R. A. Lewin A Classification of Flexibacteria. J. gen. Microbiol. 58: 189-206 1969 (10.1099/00221287-58-2-189, None)

**\* These References are textmined**

[back to top](#)