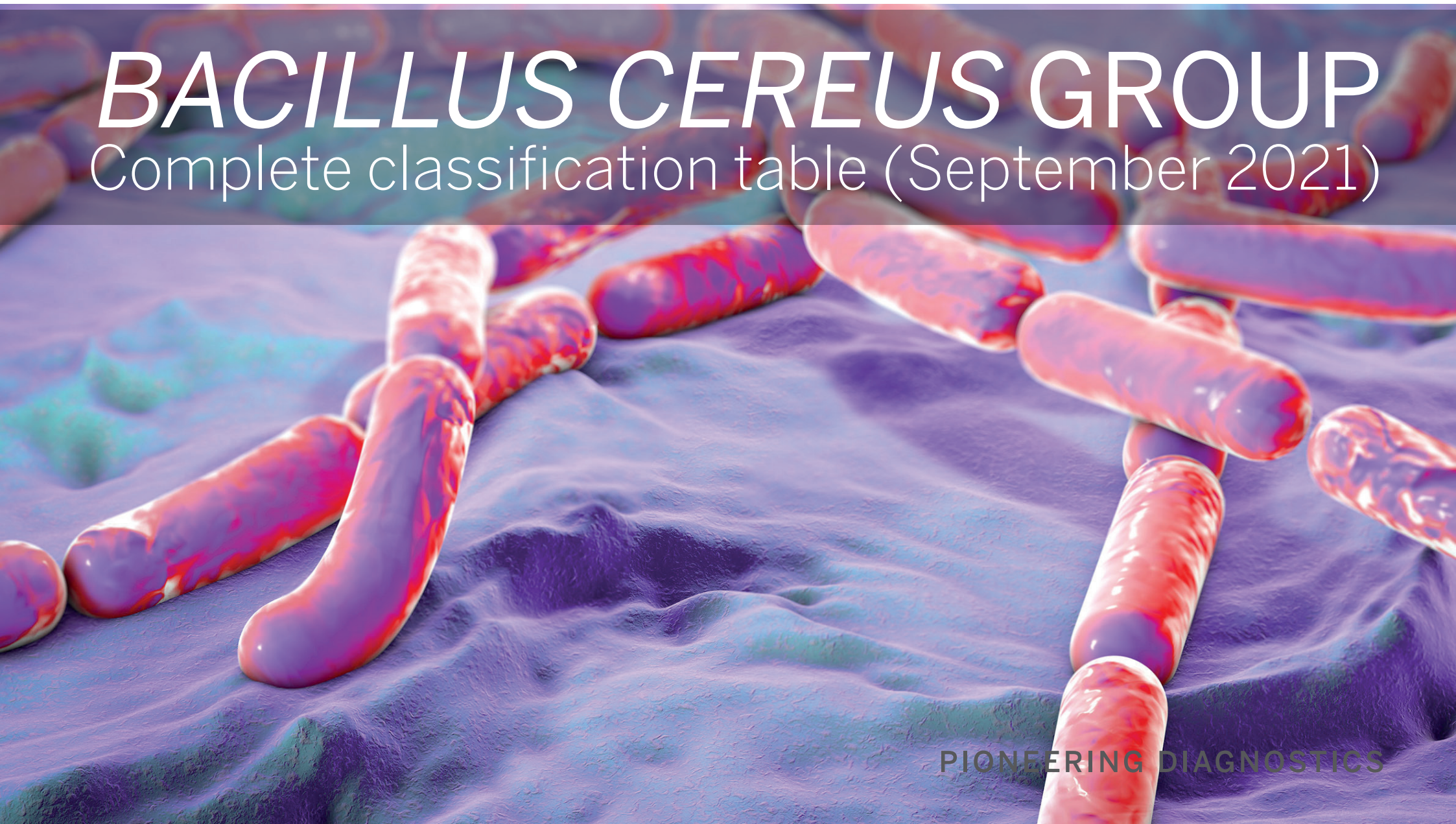




BACILLUS CEREUS GROUP

Complete classification table (September 2021)



PIONEERING DIAGNOSTICS

23 species identified within the <i>Bacillus cereus</i> Group (September 2021)	Official classification (publication in internat. journal of systematic and evolutionary microbiology)	Established membership of the <i>Bacillus cereus</i> Group	Phylogenetic Group affiliation	Implication in foodborne outbreaks	Diversity tested in published ISO16140-2 validation studies	Number of available isolate in collections (ATCC/NCTC/DSMZ)
<i>Bacillus cereus</i> stricto sensu [1]	√ (1887)	√	III	Yes, few data reported. Phylogenetic group associated to foodborne outbreak [16, 17]	√ All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium	Type strain: ATCC 14579 (= NCTC 2599=DSM 31). Many wild strains available in these collections
<i>Bacillus thuringiensis</i> [2]	√ (1915)	√	II, III, IV, V, VI	Yes, few data reported. Phylogenetic group associated to foodborne outbreak [16-17]	√ All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium	Type strain: ATCC 10792 (=DSM 2046). Many wild strains available in ATCC but none in NCTC collections
<i>Bacillus anthracis</i> [3]	√ (1875)	√	III	Yes, few data reported. Phylogenetic group associated to foodborne outbreak [16-17]	NA	Type strain: ATCC 14578 (=NCTC 10340 No type strain in DSMZ). No wild strain available in these collections
<i>Bacillus mycoides</i> [4]	√(1886) (1995 – clarification)	√	VI	No, few data reported. Phylogenetic group NOT associated to foodborne outbreak [16-17]	√ All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	Type strain: ATCC 6462 (=NCTC 12974 =DSM 2048). Many wild strains available in these collections
<i>Bacillus pseudomycoides</i> [5]	√(1998)	√	I	No, few data reported. Phylogenetic group NOT associated to foodborne outbreak [16-17]	√ All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	Type strain: DSM 12442 (No type strain in ATCC/NCTC). One wild strain available in DSMZ collection
<i>Bacillus weihenstephanensis</i> [6]	√ (1998)	√	VI	No, few data reported. Phylogenetic group NOT associated to foodborne outbreak [16-17]	√ All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium	Type strain: DSM 11821 (=CIP 105772T=NBRC 101238 =WSBC 10204=CCUG 58725 =CCM 4872 =KCTC 3975 =WS 2480) (No Type strain in ATCC/NCTC). Many wild strains in these collections
<i>Bacillus cytotoxicus</i> [7]	√(2013)	√	VII	Yes, few data reported. Phylogenetic group associated to foodborne outbreak [16-17]	√ All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium	Type strain: DSM 22905 (No type strain in ATCC/NCTC). No wild strain available in these collections
<i>Bacillus toyonensis</i> [8]	√ (2014)	√	V	Yes, few data reported. Phylogenetic group associated to foodborne outbreak [16-17]	All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	No strain in DSMZ nor NCTC
<i>Bacillus bingmayongensis</i> [13]	(2014) not yet validly published	NA	<70% panC affiliation	NA	NA	Proposed type strain : DSM 25427 (No type strain in ATCC/NCTC). No wild strain available in these collections
<i>Bacillus wiedmannii</i> [9]	√ (2016)	√	II	Few data reported. Phylogenetic group associated to foodborne outbreak [16-17]	All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	Type strain: DSM 102050 (No type strain in ATCC/NCTC). No wild strain available in these collections
<i>Bacillus paranthracis</i> [10]	√ (2017)	√	III	Few data reported. Phylogenetic group associated to foodborne outbreak [16-17]	All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	No strain available in these collections
<i>Bacillus pacificus</i> [10]	√ (2017)	√	III	Few data reported. Phylogenetic group associated to foodborne outbreak [16-17]	All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	No strain available in these collections

23 species identified within the <i>Bacillus cereus</i> Group (September 2021)	Official classification (publication in internat. journal of systematic and evolutionary microbiology)	Established membership of the <i>Bacillus cereus</i> Group	Phylogenetic Group affiliation	Implication in foodborne outbreaks	Diversity tested in published ISO16140-2 validation studies	Number of available isolate in collections (ATCC/NCTC/DSMZ)
<i>Bacillus tropicus</i> [10]	√ (2017)	√	III	Few data reported. Phylogenetic group associated to foodborne outbreak [16, 17]	All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	No strain available in these collections
<i>Bacillus albus</i> [10]	√ (2017)	√	II	Few data reported. Phylogenetic group associated to foodborne outbreak [16-17]	All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	No strain available in these collections
<i>Bacillus mobilis</i> [10]	√ (2017)	√	II	Few data reported. Phylogenetic group associated to foodborne outbreak [16-17]	All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	No strain available in these collections
<i>Bacillus luti</i> [10]	√ (2017)	√	II	Few data reported. Phylogenetic group NOT associated to foodborne outbreak [16-17]	All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	No strain available in these collections
<i>Bacillus proteolyticus</i> [10]	√ (2017)	√	II	Few data reported. Phylogenetic group NOT associated to foodborne outbreak [16-17]	All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	No strain available in these collections
<i>Bacillus nitratireducens</i> [10]	√ (2017)	√	IV	Few data reported. Phylogenetic group NOT associated to foodborne outbreak [16-17]	All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	No strain available in these collections
<i>Bacillus paramycooides</i> [10]	√ (2017)	√	II	Few data reported. Phylogenetic group associated to foodborne outbreak [16-17]	All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	No strain available in these collections
<i>Bacillus fungorum</i> [14]	√ (2020)	√	II	Few data reported. Phylogenetic group associated to foodborne outbreak [16-17]	All 7 major phylogenetic group are tested for ISO16140-2 validation of the chromogenic medium with no distinction of the species	No strain available in these collections
<i>Bacillus clarus</i> [15]	(2020) not yet validly published	NA	VI	Few data reported. Phylogenetic group associated to foodborne outbreak [16-17]	NA	No strain available in these collections
<i>Bacillus gaemokensis</i> [11]	√ (2021)	√	<70% panC affiliation	NA	NA	No strain available in these collections
<i>Bacillus manliponensis</i> [12]	√ (2021)	√	<70% panC affiliation	NA	NA	Type strain: DSM 26473 (No type strain in ATCC/NCTC). No wild strain available in these collections

[1] Frankland & Frankland, 1887
[2] Berliner, 1915
[3] Cohn 1872
[4] Flügge 1886
[5] Nakamura 1998

[6] Lechner et al. 1998
[7] Guinebrière et al. 2013
[8] Jiménez et al. 2014
[9] Miller et al. 2016
[10] Liu et al. 2017

[11] Jung et al. 2021
[12] Jung et al. 2021
[13] Liu et al. 2014
[14] Liu et al. 2020
[15] Mendez Acevedo et al. 2020

