

Endonucleibacter puteoserpentis gen. nov. sp. nov.

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Abstract

Endonucleibacter is a bacterial genus known to invade the nuclei of deep-sea bathymodiolin mussels from hydrothermal vents and cold seeps. Nuclear infection begins with a single rod-shaped bacterium which grows to an unseptated filament of up to 20 µm length and then divides repeatedly until the nucleus is filled with up to 80 000 bacteria.

Genus *Endonucleibacter*

Etymology

[En.do.nu.cle.i.bac'ter] **Gr. pref. endo-**, within; **L. masc. n. nucleus**, a little nut and in biology, a nucleus; **N.L. masc. n. bacter**, a rod; **N.L. masc. n. Endonucleibacter**, a rod inside the nucleus

Nomenclatural type

Species *Endonucleibacter puteoserpentis*^{Ts}

Description

A bacterial genus known to invade the nuclei of deep-sea bathymodiolin mussels from hydrothermal vents and cold seeps. This clade was first discovered infecting *Bathymodiolus puteoserpentis* from the Logatchev hydrothermal vent field on the Mid-Atlantic Ridge. Fluorescence *in situ* hybridization and transmission electron microscopy analyses of the developmental cycle of *Endonucleibacter* showed that the infection of a nucleus begins with a single rod-shaped bacterium which grows to an unseptated filament of up to 20 µm length and then divides repeatedly until the nucleus is filled with up to 80 000 bacteria. The greatly swollen nucleus destroys its host cell and the bacteria are released after the nuclear membrane bursts. Intriguingly, the only nuclei that were never infected by *Endonucleibacter* were those of the gill bacteriocytes. These cells contain the symbiotic sulfur- and methane-oxidizing bacteria, suggesting that the mussel symbionts can protect their host nuclei against the parasite. *Endonucleibacter* belongs to a monophyletic clade of *Gammaproteobacteria* associated with marine metazoans as diverse as sponges, corals, bivalves, gastropods, echinoderms, ascidians and fish.

Classification

Bacteria » *Pseudomonadota* » *Gammaproteobacteria* » *Oceanospirillales* »
Endozoicomonadaceae » *Endonucleibacter*

References

Effective publication: Porras et al., 2024 [1]
Original (not valid) publication: Zielinski et al., 2009 [2]
Corrigendum: Oren et al., 2020 [3] (from "Endonucleobacter")

Registry URL

<https://seqco.de/i:32149>

Species *Endonucleibacter childressii*

Etymology

[chil.dres'si.i] **N.L. gen. masc. n.** *childressii*, of Childress, referring both to James J. Childress and to the species epithet of the deep-sea mussel host, *Gigantidas childressi*

Nomenclatural type

[NCBI Assembly: GCA_030674875.1](#) ^{Ts}

Description

A bacterium that invades the nuclei of deep-sea bathymodiolin mussels from cold seeps. This organism was discovered in *Gigantidas childressi* from the Mississippi Canyon cold seeps at the Gulf of México. Fluorescence *in situ* hybridization and transmission electron microscopy analyses of the developmental cycle of *E. childressii* showed that the infection of a nucleus begins with a single rod-shaped bacterium which grows to an unseptated filament of up to 20 µm length and then divides repeatedly until the nucleus is filled with up to 80 000 bacteria. The greatly swollen nucleus destroys its host cell and the bacteria are released after the nuclear membrane bursts. Intriguingly, the only nuclei that were never infected by *E. childressii* were those of the gill bacteriocytes. These cells contain methane-oxidizing bacteria, suggesting that the mussel symbionts can protect their host nuclei against the parasite. *E. childressii* belongs to a monophyletic clade of *Gammaproteobacteria* associated with marine metazoans as diverse as sponges, corals, bivalves, gastropods, echinoderms, ascidians and fish.

Classification

Bacteria » *Pseudomonadota* » *Gammaproteobacteria* » *Oceanospirillales* »
Endozoicomonadaceae » *Endonucleibacter* » *Endonucleibacter childressii*

References

Effective publication: Porras et al., 2024 [1]
Assigned taxonomically: Zielinski et al., 2009 [2]

Registry URL

<https://seqco.de/i:54834>

Species *Endonucleibacter puteoserpentis*^{Ts}

Etymology

[pu.te.o.ser.pen'tis] **N.L. gen. masc. n.** *puteoserpentis*, of the deep-sea mussel *Bathymodiolus puteoserpentis*, based on the species epithet of the host

Nomenclatural type

[NCBI Assembly: GCA_030674915.1](#)^{Ts}

Description

A bacterium that invades the nuclei of deep-sea bathymodiolin mussels from hydrothermal vents and cold seeps. This organism was first discovered in *Bathymodiolus puteoserpentis* from the Logatchev hydrothermal vent field on the Mid-Atlantic Ridge. Fluorescence *in situ* hybridization and transmission electron microscopy analyses of the developmental cycle of *E. puteoserpentis* showed that the infection of a nucleus begins with a single rod-shaped bacterium which grows to an unseptated filament of up to 20 µm length and then divides repeatedly until the nucleus is filled with up to 80 000 bacteria. The greatly swollen nucleus destroys its host cell and the bacteria are released after the nuclear membrane bursts. Intriguingly, the only nuclei that were never infected by *E. puteoserpentis* were those of the gill bacteriocytes. These cells contain the symbiotic sulfur- and methane-oxidizing bacteria, suggesting that the mussel symbionts can protect their host nuclei against the parasite. *E. puteoserpentis* belongs to a monophyletic clade of *Gammaproteobacteria* associated with marine metazoans as diverse as sponges, corals, bivalves, gastropods, echinoderms, ascidians and fish.

Classification

Bacteria » *Pseudomonadota* » *Gammaproteobacteria* » *Oceanospirillales* »
Endozoicomonadaceae » *Endonucleibacter* » *Endonucleibacter puteoserpentis*^{Ts}

References

Effective publication: Porras et al., 2024 [1]
Assigned taxonomically: Porras et al., 2024 [1]

Registry URL

<https://seqco.de/i:54836>

References

1. Porras et al. (2024). An intranuclear bacterial parasite of deep-sea mussels expresses apoptosis inhibitors acquired from its host. *Nature Microbiology*. DOI:10.1038/s41564-024-01808-5
2. Zielinski et al. (2009). Widespread occurrence of an intranuclear bacterial parasite in vent and seep bathymodiolin mussels. *Environmental Microbiology*. DOI:10.1111/j.1462-2920.2008.01847.x
3. Oren et al. (2020). Lists of names of prokaryotic Candidatus taxa. *International Journal of Systematic and Evolutionary Microbiology*. DOI:10.1099/ijsem.0.003789

Register List Certificate of Validation

On behalf of the *Committee on the Systematics of Prokaryotes Described from Sequence Data* (SeqCode Committee), we hereby certify that the Register List **seqco.de/r:zvnehbqd** submitted by **González Porras, Miguel Ángel** and including 3 new names has been successfully validated.

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