Aquirickettsia rohweri gen. nov. sp. nov.

Submitted by Nguyen, Huong

Genus *Aquirickettsia*

Etymology

[A.qui.ric.ketts'i.a] **L. fem. n.** *aqua*, water; **N.L. fem. n.** *Rickettsia*, a bacterial genus; **N.L. fem. n.** *Aquirickettsia*, an aquatic *Rickettsia*

Nomenclatural type

Species *Aquirickettsia rohweri*[Ts]

Description

The genus *Aquirickettsia* (corrected from *Aquarickettsia* by Oren and Garrity, 2021) was placed in the family Midichloriaceae using a maximum-likelihood tree (PhyML, 1,000 bootstrap replicates) built using the full-length 16S rRNA gene recovered from the metagenome-assembled genome of *A. rohweri*. A Bayesian phylogeny generated from a concatenated amino acid alignment of 92 orthologous, single-copy marker genes fruther supported this placement. The clade (bootstrap support 91) contained other uncultured and uncharacterized bacteria associated with marine invertebrates, including symbionts of the soft coral *Gorgonia ventalina*, the stony corals *Orbicella annularis*, *Orbicella faveolata* and *Acropora cervicornis*, the sponge *Cymbastela concentrica*. It also included symbionts of two freshwater hosts, the ciliate *Euplotes woodruffi* and the cnidarian *Hydra oligactis*. The name refers to the genus's association with aquatic organisms. (Klinges et al., 2019)

Classification

Bacteria » *Pseudomonadota* » *Alphaproteobacteria* » *Rickettsiales* » "Midichloriaceae" » *Aquirickettsia*

References

Effective publication: Klinges et al., 2019 [1]
Corrigendum: Oren, Garrity, 2021 [2] (from "Aquarickettsia")

Registry URL

https://seqco.de/i:50452

Species *Aquirickettsia rohweri*[Ts]

Etymology

[roh'we.ri] **N.L. gen. n.** *rohweri*, named after Dr. Forest Rohwer, whose group first described this taxon in corals

Nomenclatural type

Genome sc|0006972 [Ts]

Description

This species is circumscribed by a high-quality metagenome-assembled genome (1.28 Mb, 97.3% complete, with 0.39% contamination, and 1,469 predicted genes) from the coral *Acropora cervicornis*. Its 16S rRNA gene showed species-level homology with sequences from endosymbionts of *Trichoplax adhaerens*, as well as with sequences from both sponge and coral hosts. It is named after Dr. Forest Rohwer, who first described this taxon in corals.

It lacks genes to synthesize most sugars and amino acids but possesses several genes linked to pathogenicity including Tlc, an antiporter that exchanges host ATP for ADP, and a complete Type IV secretion system. Despite its inability to metabolize nitrogen, *A. rohweri* possesses the NtrY-NtrX two-component system involved in sensing and responding to extracellular nitrogen. The authors hypothesize that *A. rohweri* reduces coral health by consuming host nutrients and energy, weakening and eventually killing host cells. They also hypothesize that nutrient enrichment, which is increasingly common on coral reefs, encourages unrestricted growth of *A. rohweri* in its host by providing abundant N-rich metabolites to be scavenged. (Klinges et al., 2019)

Classification

Bacteria » *Pseudomonadota* » *Alphaproteobacteria* » *Rickettsiales* » “Midichloriaceae” » *Aquirickettsia* » *Aquirickettsia rohweri*[Ts]

References

Effective publication: Klinges et al., 2019 [1]
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References

1. Klinges et al. (2019). Phylogenetic, genomic, and biogeographic characterization of a novel and ubiquitous marine invertebrate-associated Rickettsiales parasite, *Candidatus* Aquarickettsia rohweri, gen. nov., sp. nov. *The ISME Journal*. DOI: 10.1038/s41396-019-0482-0
2. Oren, Garrity (2021). Candidatus List No. 2. Lists of names of prokaryotic Candidatus taxa. *International Journal of Systematic and Evolutionary Microbiology*. DOI: 10.1099/ijsem.0.004671

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:h04z_ne0** submitted by **Nguyen, Huong** and including 2 new names has been successfully validated.

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