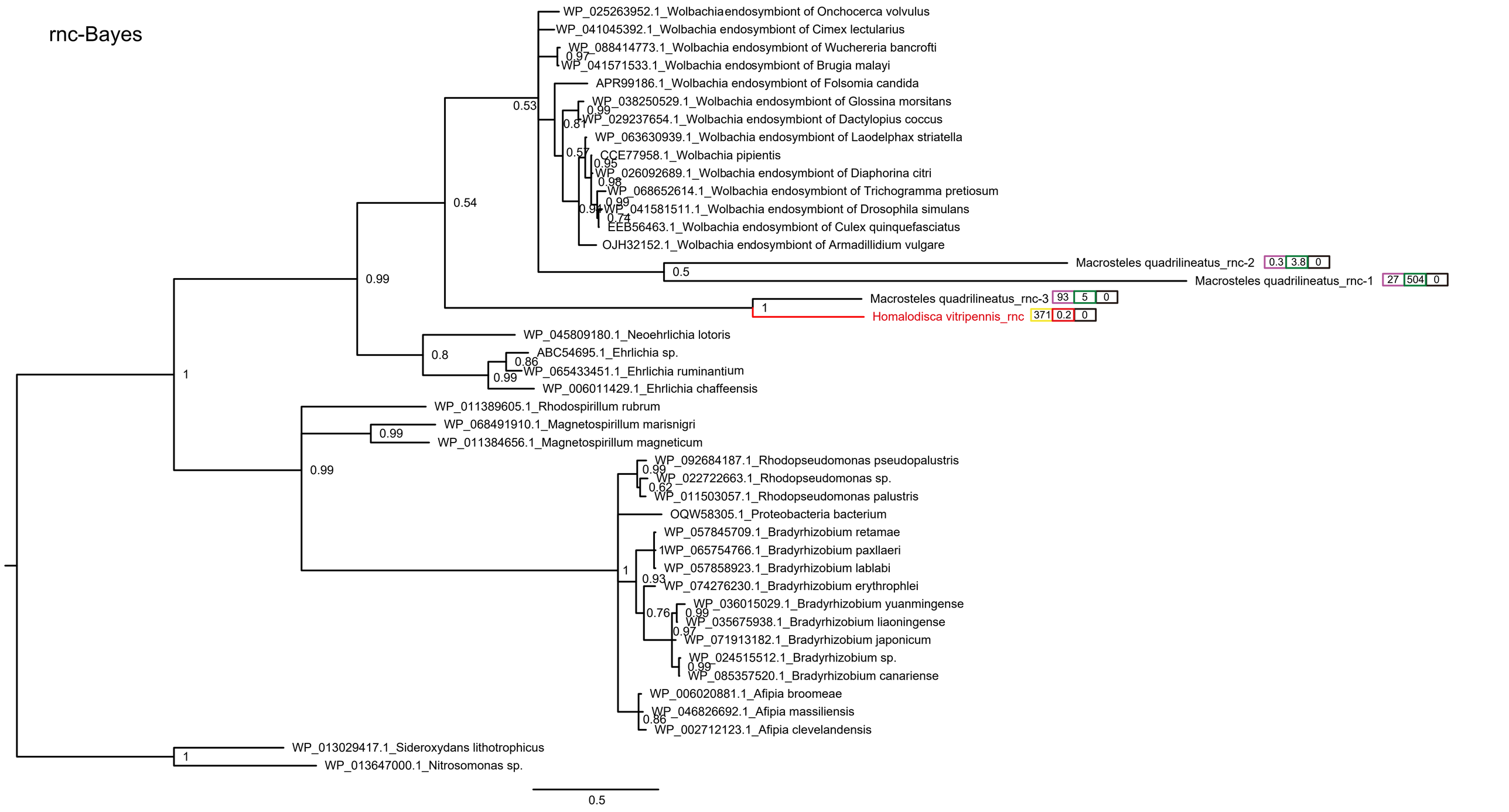
Figure S1 Bayesian and ML trees for 13 horizontally transferred genes (the highly divergent ATPase gene is excluded) and 2 duplicated mitochondrial support genes. Bayesian posterior probability and ML bootstrap value are shown for nodes with ≥50% support. Genes from this study are shown in red. Gene expression values (FPKM) of each tissue in ALF and GWSS are shown in colored boxes: GWSS-red bacteriome (red), GWSS-yellow bacteriome (yellow), GWSS-body (black), ALF-*Sulcia* bacteriocyte (purple), ALF-*Nasuia* bacteriocyte (green), and ALF-body (black).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rnc-ML
Model: LG+I+G

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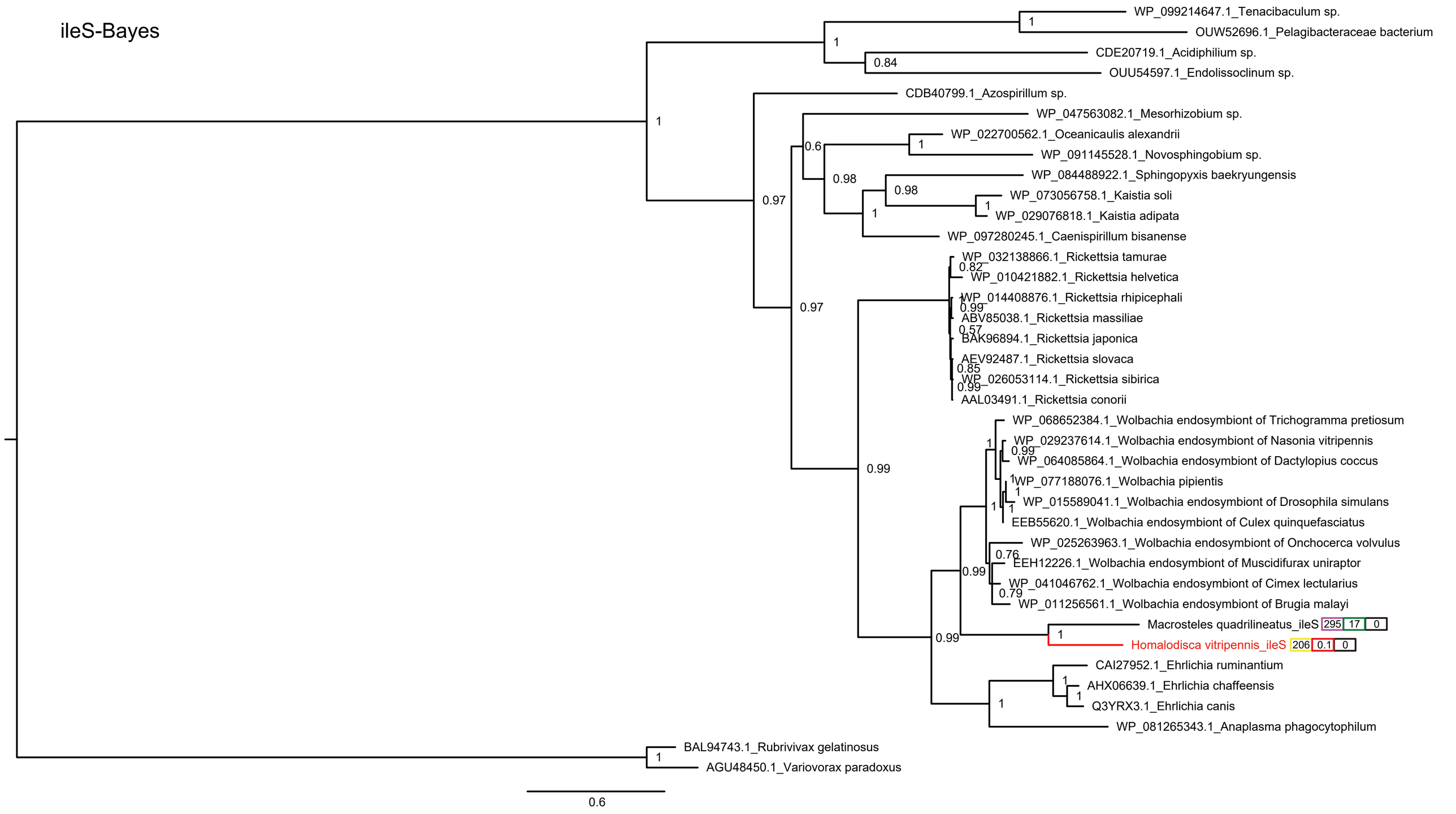
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ileS-ML
Model: LG+I+G

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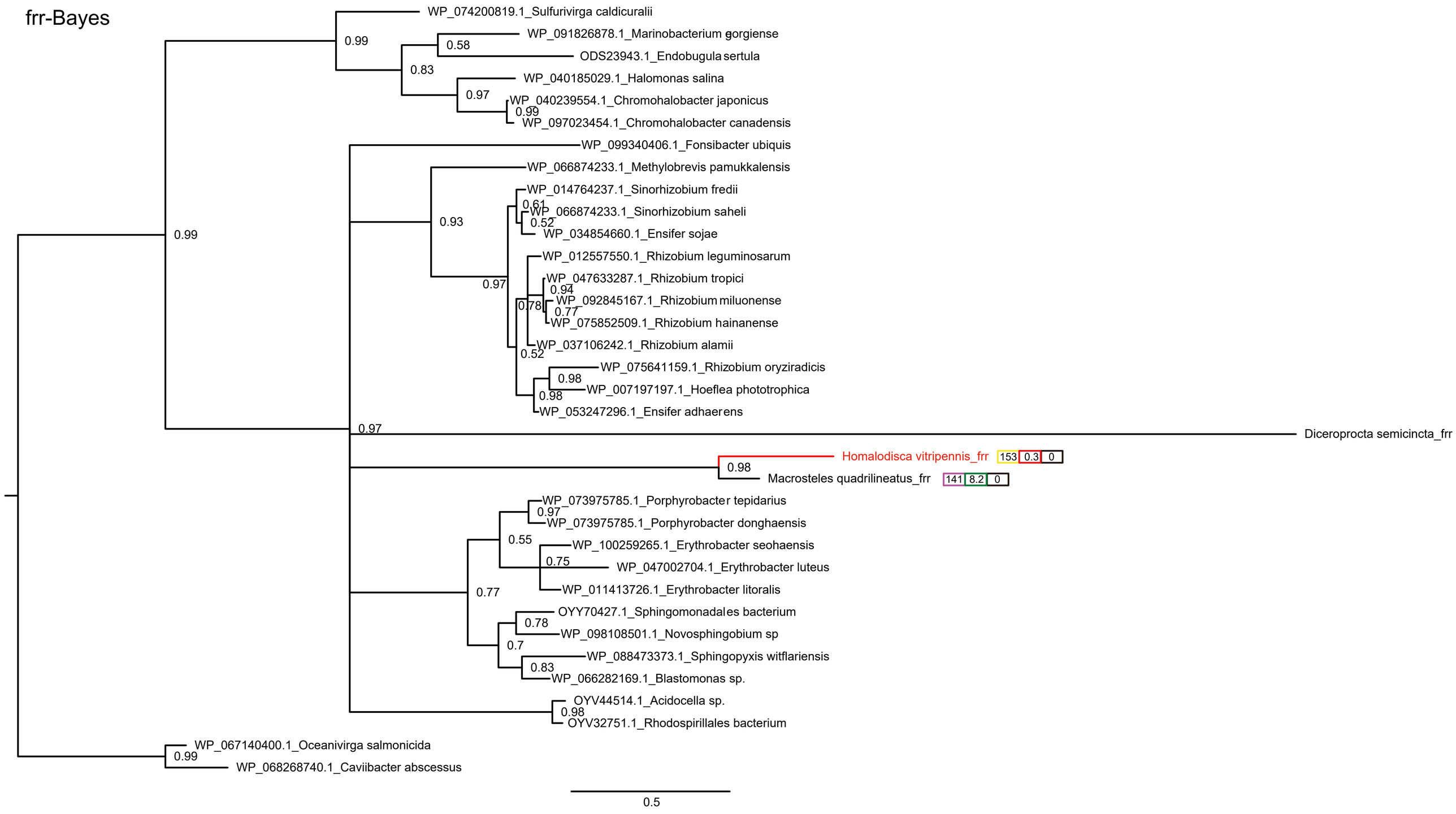
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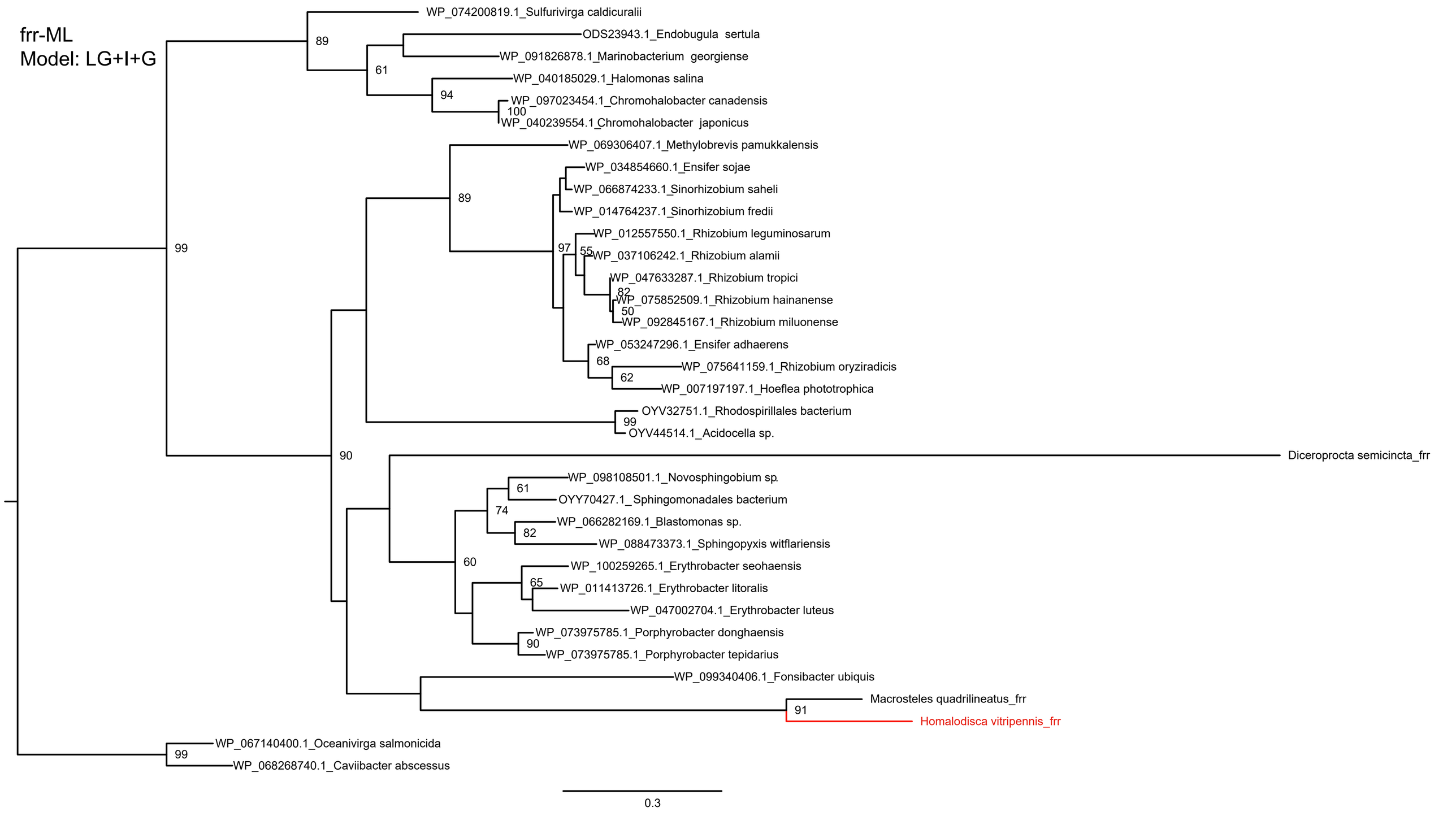
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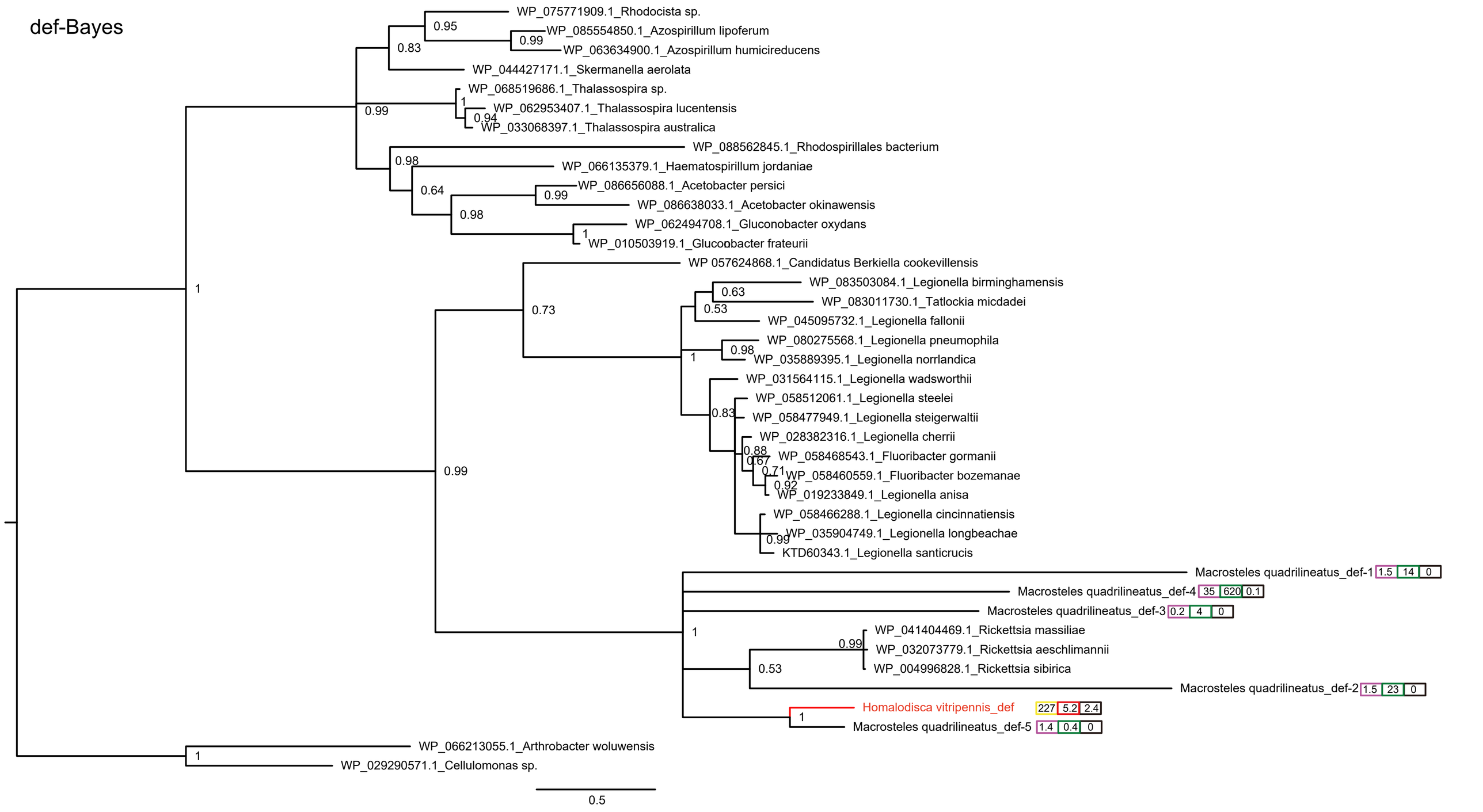
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WP_086656088.1_Acetobacter persici
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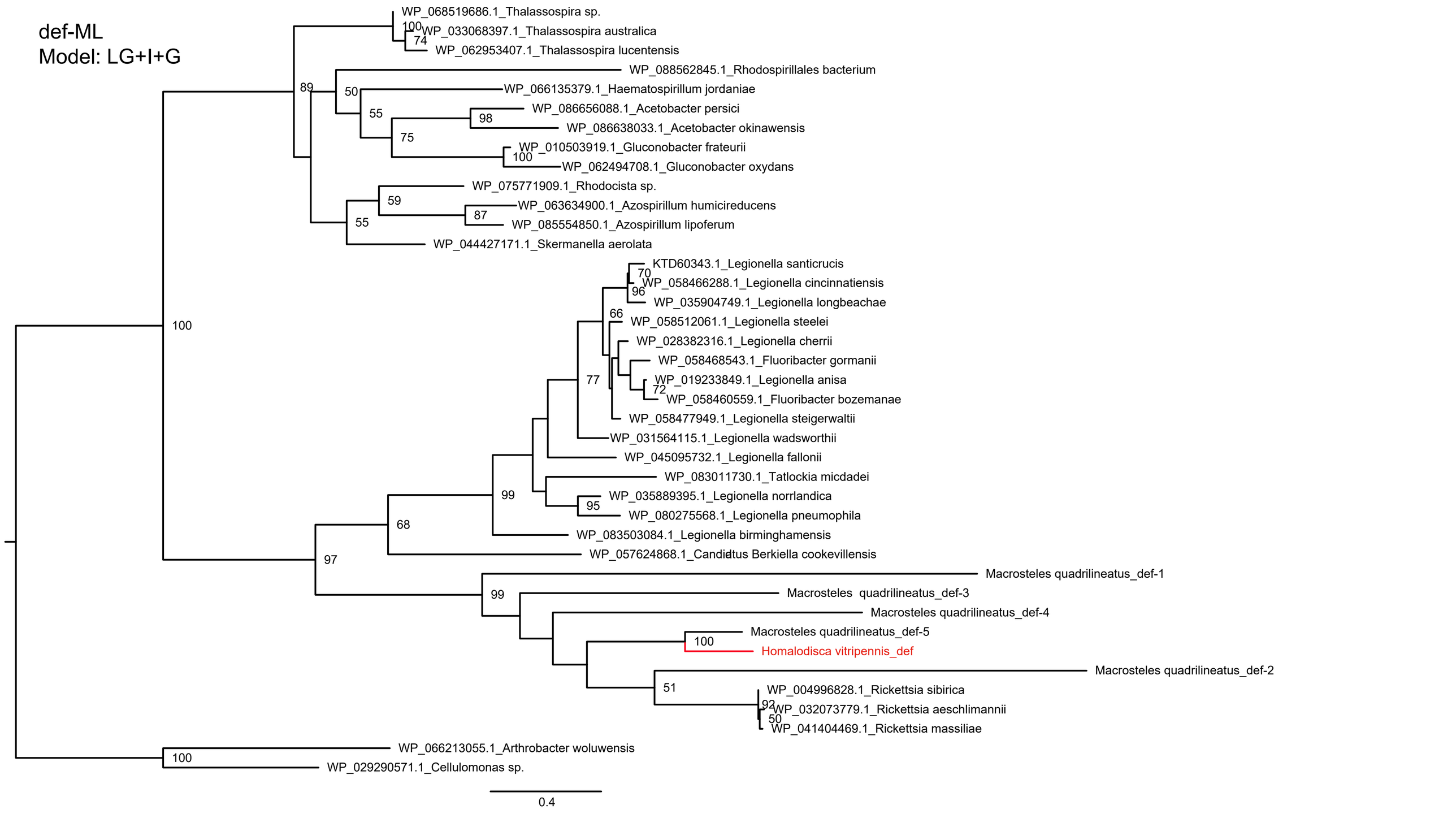
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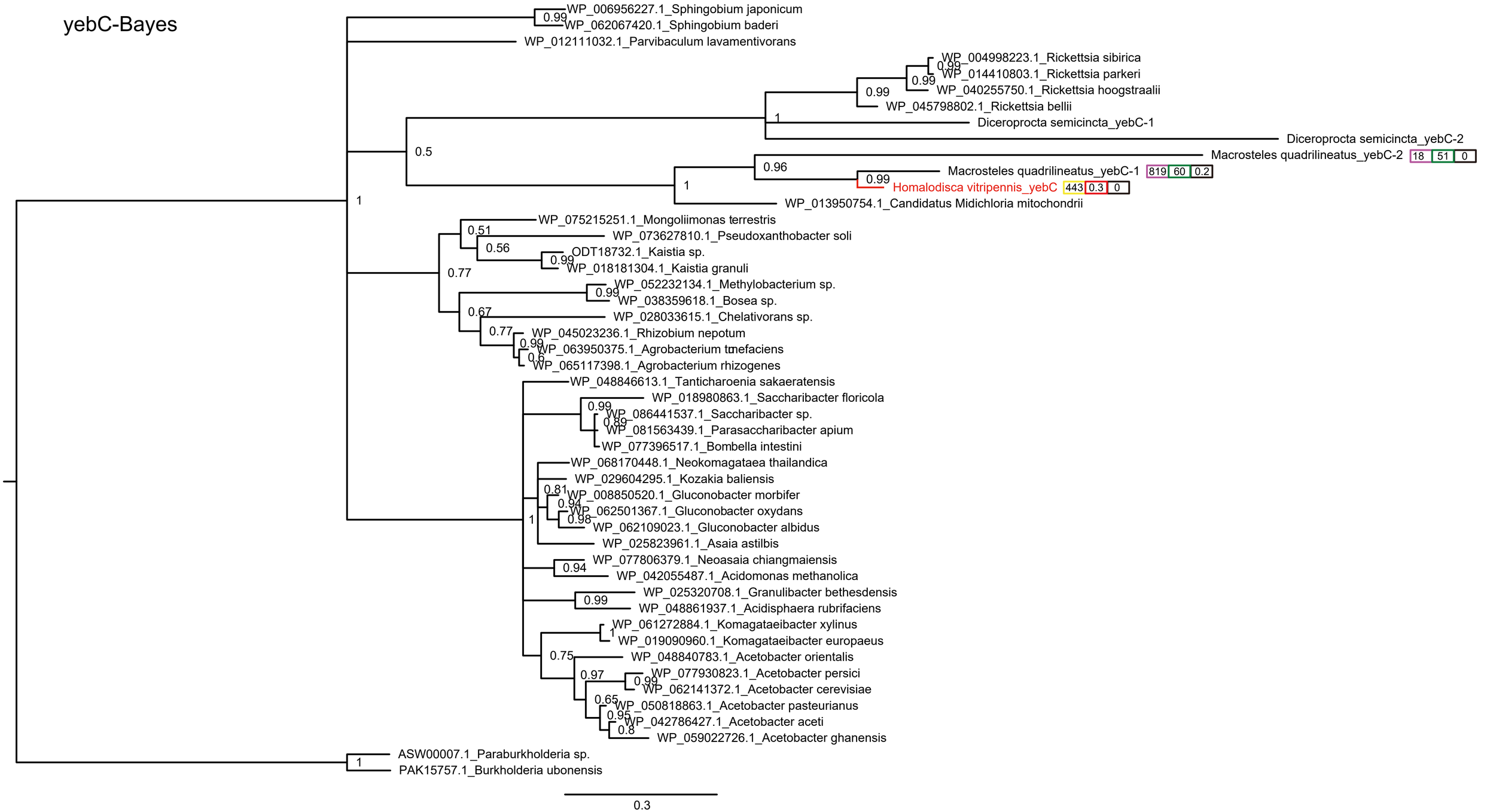
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WP_050818863.1_Acetobacter pasteurianus
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WP_042786427.1_Acetobacter aceti
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WP_059022726.1_Acetobacter ghanensis
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ASW00007.1_Paraburkholderia sp.
PAK15757.1_Burkholderia ubonensis
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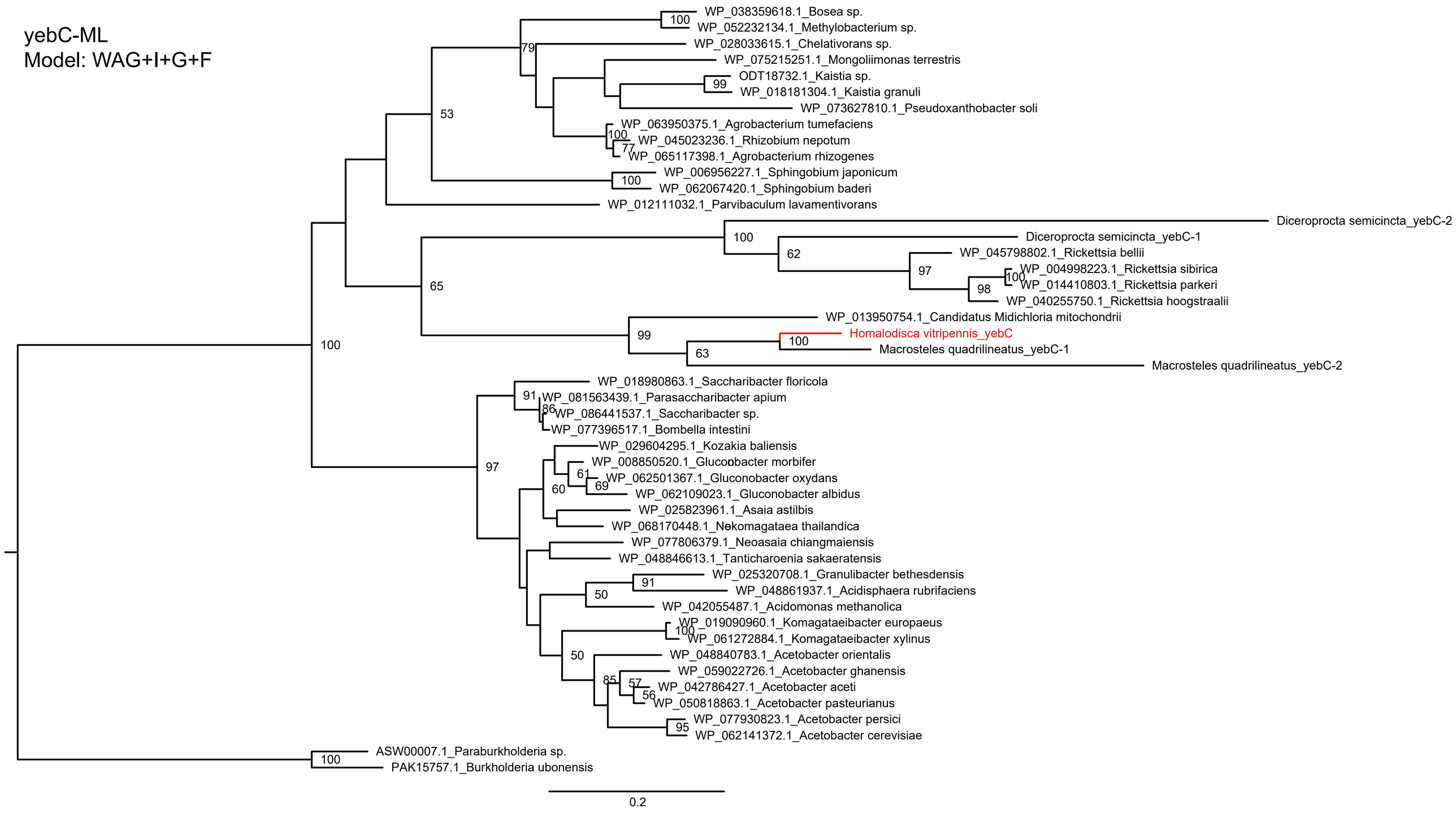
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WP_038359618.1_Bosea sp.
WP_052232134.1_Methylobacterium sp.
WP_028033615.1_Chelativorans sp.
WP_075215251.1_Mongoliimonas terrestris
ODT18732.1_Kaistia sp.
WP_018181304.1_Kaistia granuli
WP_073627810.1_Pseudoxanthobacter soli
WP_063950375.1_Agrobacterium tumefaciens
WP_045023236.1_Rhizobium nepotum
WP_065117398.1_Agrobacterium rhizogenes
WP_006956227.1_Sphingobium japonicum
WP_062067420.1_Sphingobium baderi
WP_012111032.1_Parvibaculum lavamentivorans
Diceroprocta semicincta_yebC-2
Diceroprocta semicincta_yebC-1
WP_045798802.1_Rickettsia bellii
WP_004998223.1_Rickettsia sibirica
WP_014410803.1_Rickettsia parkeri
WP_040255750.1_Rickettsia hoogstraalii
WP_013950754.1_Candidatus Midichloria mitochondrii
Homalodisca vitripennis_yebC
Macrosteles quadrilineatus_yebC-1
Macrosteles quadrilineatus_yebC-2
WP_018980863.1_Saccharibacter floricola
WP_081563439.1_Parasaccharibacter apium
WP_086441537.1_Saccharibacter sp.
WP_077396517.1_Bombella intestini
WP_029604295.1_Kozakia baliensis
WP_008850520.1_Gluconobacter morbifer
WP_062501367.1_Gluconobacter oxydans
WP_062109023.1_Gluconobacter albidus
WP_025823961.1_Asaia astilbis
WP_068170448.1_Nakomagataea thailandica
WP_077806379.1_Neoasaia chiangmaiensis
WP_048846613.1_Tanticharoenia sakaeratensis
WP_025320708.1_Granulibacter bethesdensis
WP_048861937.1_Acidisphaera rubrifaciens
WP_042055487.1_Acidomonas methanolica
WP_019090960.1_Komagataeibacter europaeus
WP_061272884.1_Komagataeibacter xylinus
WP_048840783.1_Acetobacter orientalis
WP_059022726.1_Acetobacter ghanensis
WP_042786427.1_Acetobacter aceti
WP_050818863.1_Acetobacter pasteurianus
WP_077930823.1_Acetobacter persici
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ASW00007.1_Paraburkholderia sp.
PAK15757.1_Burkholderia ubonensis
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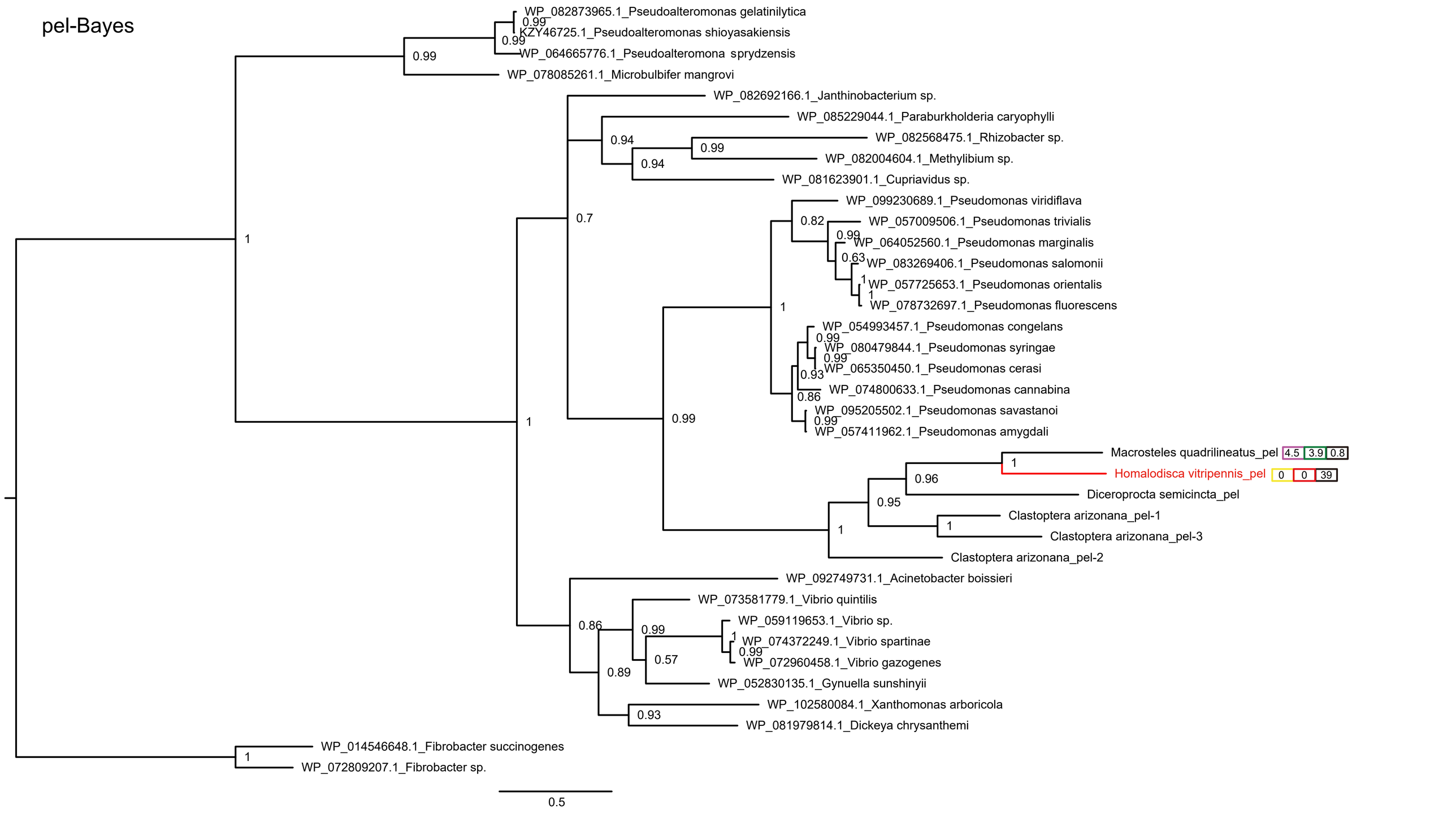
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KZY46725.1_Pseudoalteromonas shioyasakiensis
WP_064665776.1_Pseudoalteromona sprydzensis
WP_078085261.1_Microbulbifer mangrovi
WP_082692166.1_Janthinobacterium sp.
WP_085229044.1_Paraburkholderia caryophylli
WP_082568475.1_Rhizobacter sp.
WP_082004604.1_Methylibium sp.
WP_081623901.1_Cupriavidus sp.
WP_099230689.1_Pseudomonas viridiflava
WP_057009506.1_Pseudomonas trivialis
WP_064052560.1_Pseudomonas marginalis
WP_083269406.1_Pseudomonas salomonii
WP_057725653.1_Pseudomonas orientalis
WP_078732697.1_Pseudomonas fluorescens
WP_054993457.1_Pseudomonas congelans
WP_080479844.1_Pseudomonas syringae
WP_065350450.1_Pseudomonas cerasi
WP_074800633.1_Pseudomonas cannabina
WP_095205502.1_Pseudomonas savastanoi
WP_057411962.1_Pseudomonas amygdali
Macrosteles quadrilineatus_pel 4.5 3.9 0.8
Homalodisca vitripennis_pel 0 0 39
Diceroprocta semicincta_pel
Clastoptera arizonana_pel-1
Clastoptera arizonana_pel-3
Clastoptera arizonana_pel-2
WP_092749731.1_Acinetobacter boissieri
WP_073581779.1_Vibrio quintilis
WP_059119653.1_Vibrio sp.
WP_074372249.1_Vibrio spartinae
WP_072960458.1_Vibrio gazogenes
WP_052830135.1_Gynuella sunshinyii
WP_102580084.1_Xanthomonas arboricola
WP_081979814.1_Dickeya chrysanthemi
WP_014546648.1_Fibrobacter succinogenes
WP_072809207.1_Fibrobacter sp.
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pel-ML
Model: WAG+I+G

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WP_082873965.1_Pseudoalteromonas gelatinilytica
KZY46725.1_Pseudoalteromonas shioyasakiensis
WP_078085261.1_Microbulbifer mangrovi
WP_092749731.1_Acinetobacter boissieri
WP_073581779.1_Vibrio quintilis
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WP_059119653.1_Vibrio sp.
WP_072960458.1_Vibrio gazogenes
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WP_085229044.1_Paraburkholderia caryophylli
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WP_082568475.1_Rhizobacter sp.
WP_082004604.1_Methylibium sp.
WP_082692166.1_Janthinobacterium sp.
WP_095205502.1_Pseudomonas savastanoi
WP_057411962.1_Pseudomonas amygdali
WP_054993457.1_Pseudomonas cannabina
WP_080479844.1_Pseudomonas syringae
WP_065350450.1_Pseudomonas cerasi
WP_054993457.1_Pseudomonas congelans
WP_057009506.1_Pseudomonas trivialis
WP_057725653.1_Pseudomonas orientalis
WP_078732697.1_Pseudomonas fluorescens
WP_083269406.1_Pseudomonas salomonii
WP_064052560.1_Pseudomonas marginalis
WP_099230689.1_Pseudomonas viridiflava
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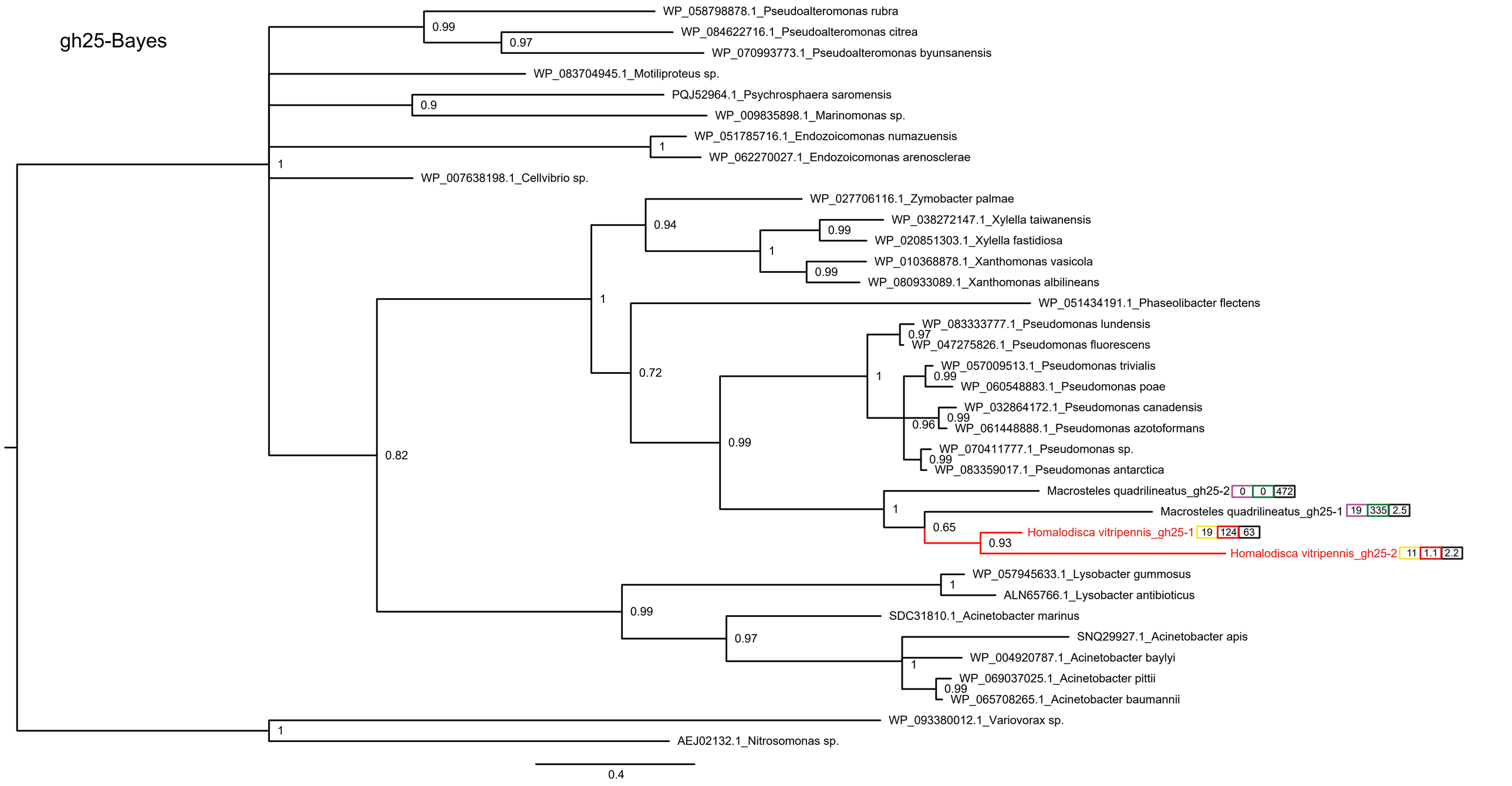
Clastoptera arizonana_pel-1
Clastoptera arizonana_pel-3
Diceroprocta semicincta_pel
Macrosteles quadrilineatus_pel
Homalodisca vitripennis_pel
WP_014546648.1_Fibrobacter succinogenes
WP_072809207.1_Fibrobacter sp.

0.4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WP_084622716.1_Pseudoalteromonas citrea
WP_070993773.1_Pseudoalteromonas byunsanensis
WP_083704945.1_Motiliproteus sp.
PQJ52964.1_Psychrosphaera saromensis
WP_009835898.1_Marinomonas sp.
WP_051785716.1_Endozoicomonas numazuensis
WP_062270027.1_Endozoicomonas arenosclerae
WP_007638198.1_Cellvibrio sp.
WP_027706116.1_Zymobacter palmae
WP_038272147.1_Xylella taiwanensis
WP_020851303.1_Xylella fastidiosa
WP_010368878.1_Xanthomonas vasicola
WP_080933089.1_Xanthomonas albilineans
WP_051434191.1_Phaseolibacter flectens
WP_083333777.1_Pseudomonas lundensis
WP_047275826.1_Pseudomonas fluorescens
WP_057009513.1_Pseudomonas trivialis
WP_060548883.1_Pseudomonas poae
WP_032864172.1_Pseudomonas canadensis
WP_061448888.1_Pseudomonas azotoformans
WP_070411777.1_Pseudomonas sp.
WP_083359017.1_Pseudomonas antarctica
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Macrosteles quadrilineatus_gh25-1 19 335 2.5
Homalodisca vitripennis_gh25-1 19 124 63
Homalodisca vitripennis_gh25-2 11 1.1 2.2
WP_057945633.1_Lysobacter gummosus
ALN65766.1_Lysobacter antibioticus
SDC31810.1_Acinetobacter marinus
SNQ29927.1_Acinetobacter apis
WP_004920787.1_Acinetobacter baylyi
WP_069037025.1_Acinetobacter pittii
WP_065708265.1_Acinetobacter baumannii
WP_093380012.1_Variovorax sp.
AEJ02132.1_Nitrosomonas sp.
0.4

gh25-ML
Model: WAG+I+G

WP_007638198.1_ Cellvibrio sp.
WP_051785716.1_ Endozoicomonas numazuensis
WP_062270027.1_ Endozoicomonas arenosclerae
WP_009835898.1_ Marinomonas sp.
PQJ52964.1_ Psychrosphaera saromensis
WP_058798878.1_Pseudoalteromonas rubra
WP_070993773.1_ Pseudoalteromonas byunsanensis
WP_084622716.1_ Pseudoalteromonas citrea
WP_083704945.1_ Motiliproteus sp.
ALN65766.1_Lysobacter antibioticus
WP_057945633.1_Lysobacter gummosus
SDC31810.1_Acinetobacter marinus
SNQ29927.1_ Acinetobacter apis
WP_004920787.1_Acinetobacter baylyi
WP_065708265.1_Acinetobacter baumannii
WP_069037025.1_Acinetobacter pittii
WP_010368878.1_Xanthomonas vasicola
WP_080933089.1_Xanthomonas albilineans
WP_020851303.1_Xylella fastidiosa
WP_038272147.1_Xylella taiwanensis
WP_027706116.1_ Zymobacter palmae
WP_051434191.1_ Phaseolibacter flectens
WP_083333777.1_ Pseudomonas lundensis
WP_047275826.1_ Pseudomonas fluorescens
WP_032864172.1_Pseudomonas canadensis
WP_061448888.1_ Pseudomonas azotoformans
WP_060548883.1_ Pseudomonas poae
WP_057009513.1_ Pseudomonas trivialis
WP_083359017.1_ Pseudomonas antarctica
WP_070411777.1_ Pseudomonas sp.
Homalodisca vitripennis_gh25-1
Homalodisca vitripennis_gh25-2
Macrosteles quadrilineatus_gh25-1
Macrosteles quadrilineatus_gh25-2
WP_093380012.1_ Variovorax sp.
AEJ02132.1_Nitrosomonas sp.

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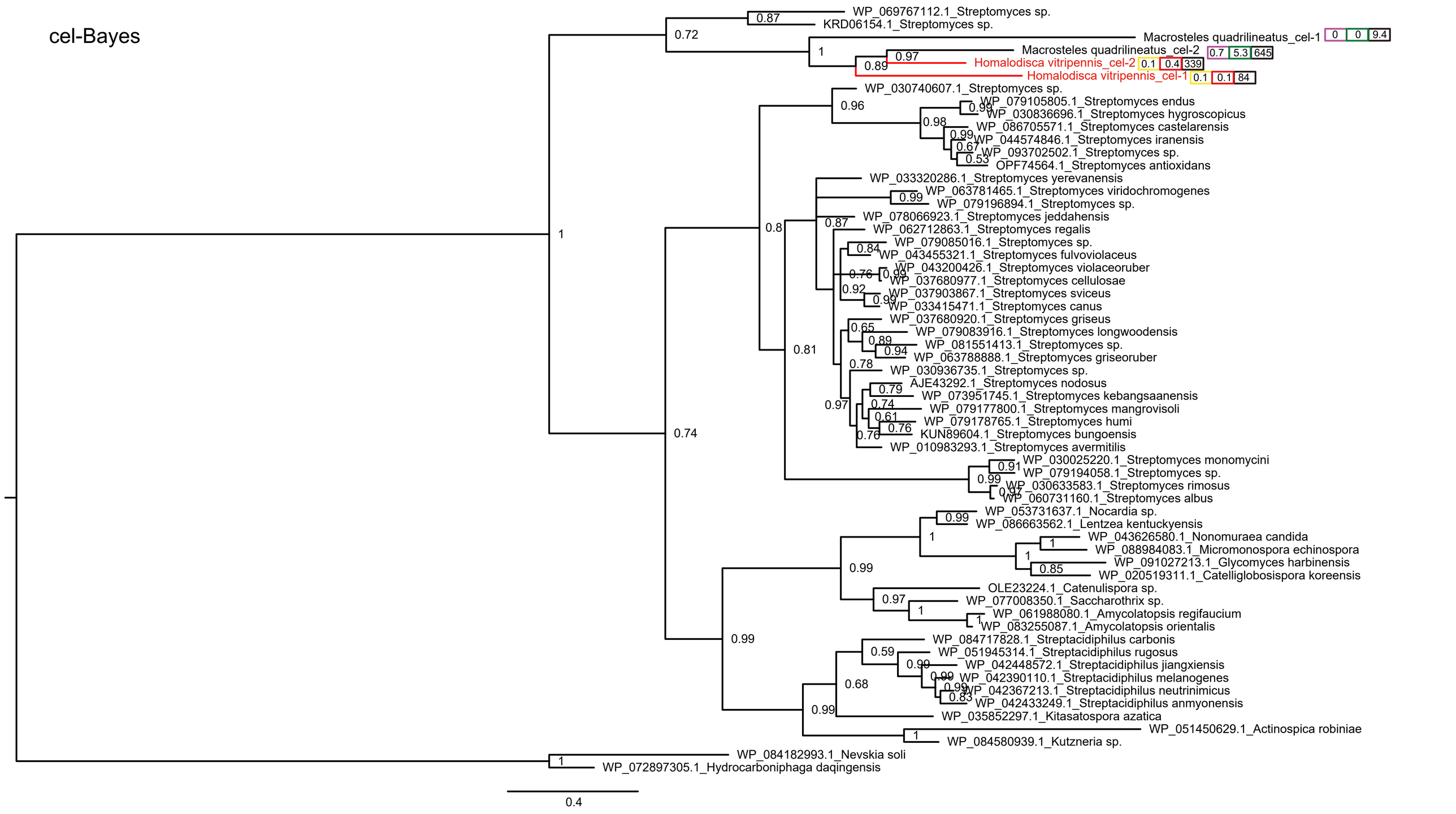
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KRD06154.1_Streptomyces sp.
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Macrosteles quadrilineatus_cel-2
Homalodisca vitripennis_cel-2
Homalodisca vitripennis_cel-1
WP_030740607.1_Streptomyces sp.
WP_079105805.1_Streptomyces endus
WP_030836696.1_Streptomyces hygroscopicus
WP_086705571.1_Streptomyces castelarensis
WP_044574846.1_Streptomyces iranensis
WP_093702502.1_Streptomyces sp.
OPF74564.1_Streptomyces antioxidans
WP_033320286.1_Streptomyces yerevanensis
WP_063781465.1_Streptomyces viridochromogenes
WP_079196894.1_Streptomyces sp.
WP_078066923.1_Streptomyces jeddahensis
WP_062712863.1_Streptomyces regalis
WP_079085016.1_Streptomyces sp.
WP_043455321.1_Streptomyces fulvoviolaceus
WP_043200426.1_Streptomyces violaceoruber
WP_037680977.1_Streptomyces cellulosae
WP_037903867.1_Streptomyces sviceus
WP_033415471.1_Streptomyces canus
WP_037680920.1_Streptomyces griseus
WP_079083916.1_Streptomyces longwoodensis
WP_081551413.1_Streptomyces sp.
WP_063788888.1_Streptomyces griseoruber
WP_030936735.1_Streptomyces sp.
AJE43292.1_Streptomyces nodosus
WP_073951745.1_Streptomyces kebangsaanensis
WP_079177800.1_Streptomyces mangrovisoli
WP_079178765.1_Streptomyces humi
KUN89604.1_Streptomyces bungoensis
WP_010983293.1_Streptomyces avermitilis
WP_030025220.1_Streptomyces monomycini
WP_079194058.1_Streptomyces sp.
WP_030633583.1_Streptomyces rimosus
WP_060731160.1_Streptomyces albus
WP_053731637.1_Nocardia sp.
WP_086663562.1_Lentzea kentuckyensis
WP_043626580.1_Nonomuraea candida
WP_088984083.1_Micromonospora echinospora
WP_091027213.1_Glycomyces harbinensis
WP_020519311.1_Catelliglobosispora koreensis
OLE23224.1_Catenulispora sp.
WP_077008350.1_Saccharothrix sp.
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WP_042448572.1_Streptacidiphilus jiangxiensis
WP_042390110.1_Streptacidiphilus melanogenes
WP_042367213.1_Streptacidiphilus neutrinimicus
WP_042433249.1_Streptacidiphilus anmyonensis
WP_035852297.1_Kitasatospora azatica
WP_051450629.1_Actinospica robiniae
WP_084580939.1_Kutzneria sp.
WP_084182993.1_Nevskia soli
WP_072897305.1_Hydrocarboniphaga daqingensis
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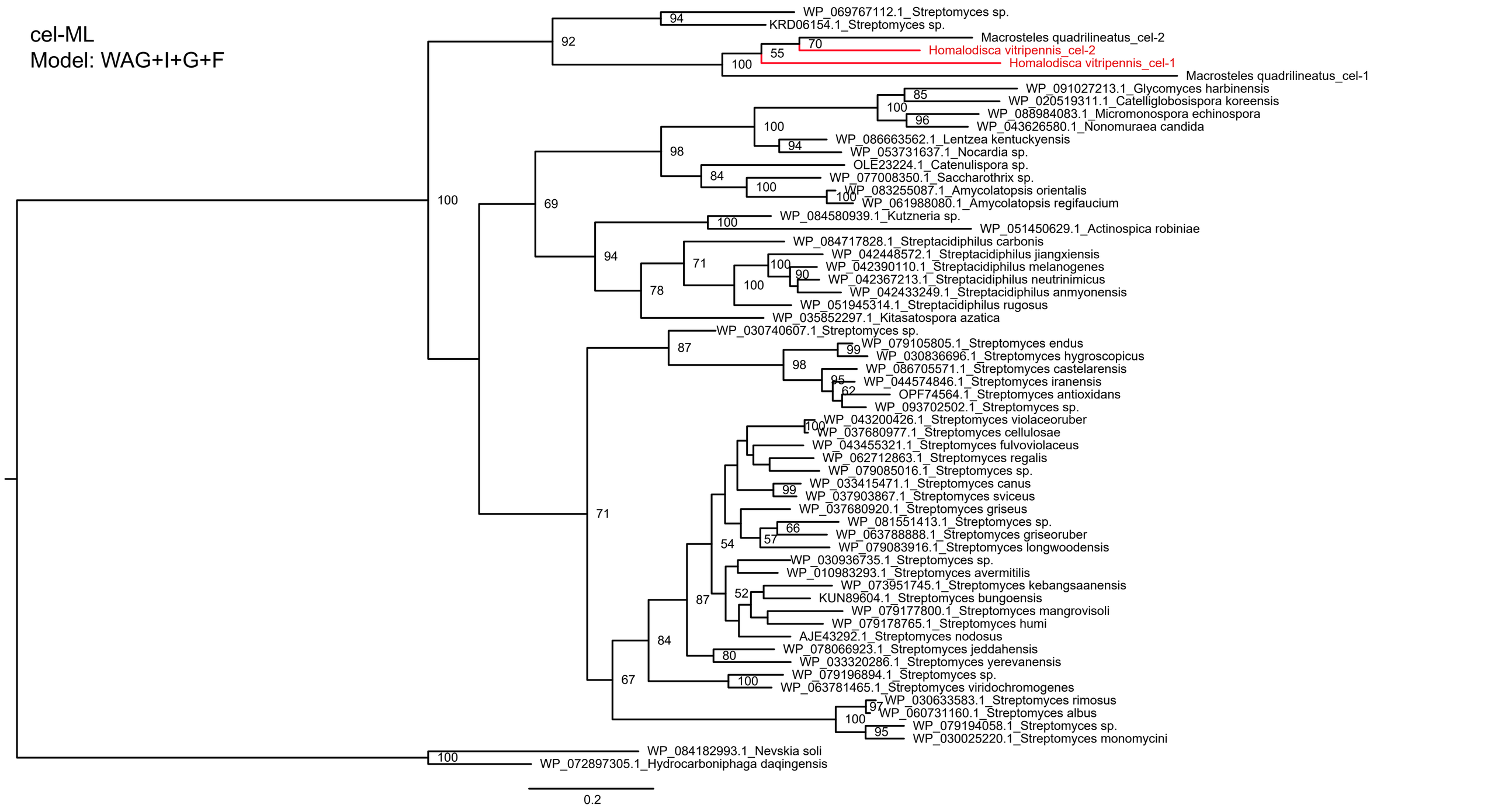
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Macrosteles quadrilineatus_cel-1
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WP_043626580.1_Nonomuraea candida
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OLE23224.1_Catenulispora sp.
WP_077008350.1_Saccharothrix sp.
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WP_061988080.1_Amycolatopsis regifaucium
WP_084580939.1_Kutzneria sp.
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WP_084717828.1_Streptacidiphilus carbonis
WP_042448572.1_Streptacidiphilus jiangxiensis
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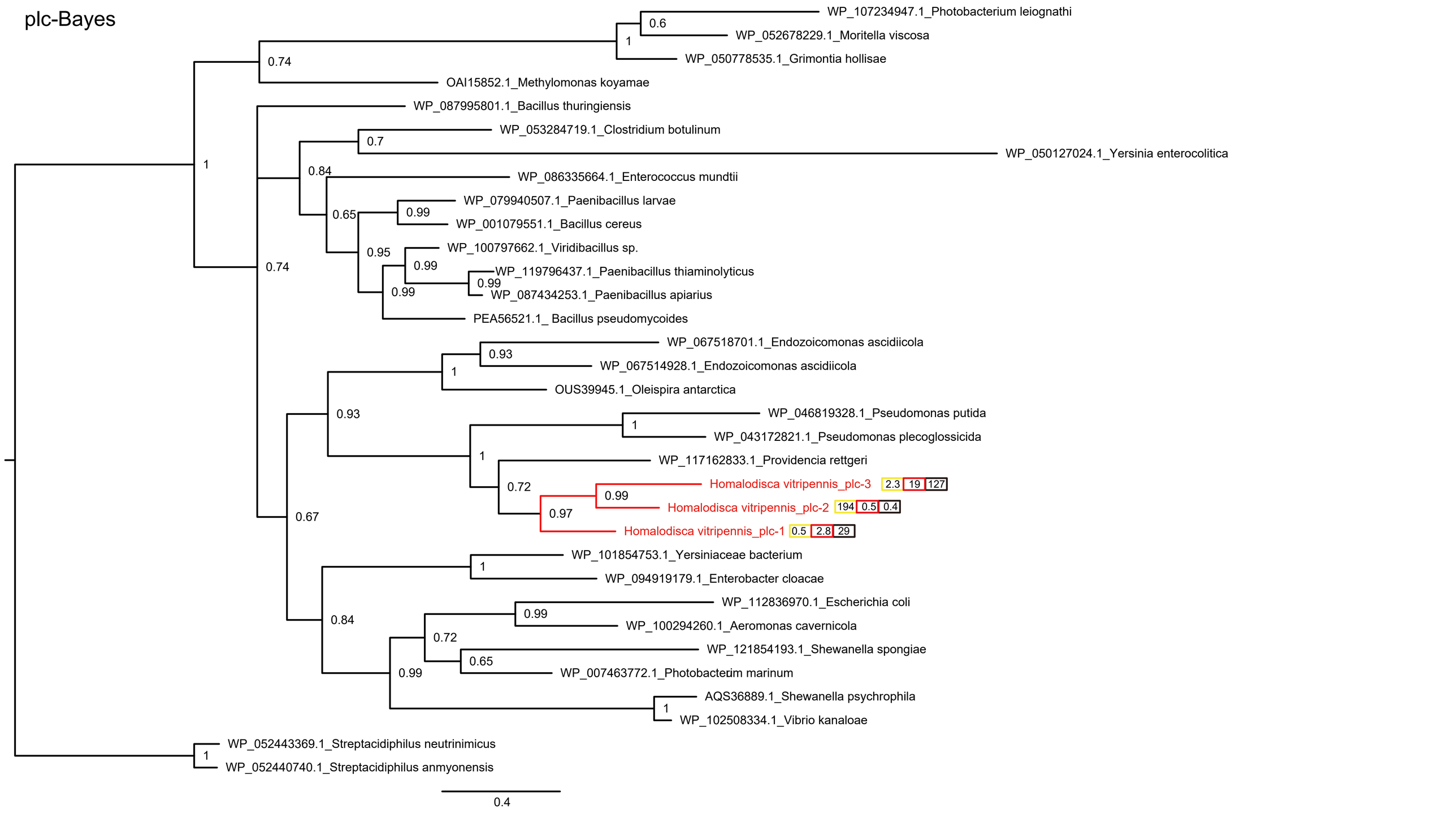
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WP_087995801.1_Bacillus thuringiensis
WP_053284719.1_Clostridium botulinum
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WP_050127024.1_Yersinia enterocolitica
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WP_043172821.1_Pseudomonas plecoglossicida
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WP_117162833.1_Providencia rettgeri
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WP_121854193.1_Shewanella spongiae
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WP_007463772.1_Photobacterium marinum
AQS36889.1_Shewanella psychrophila
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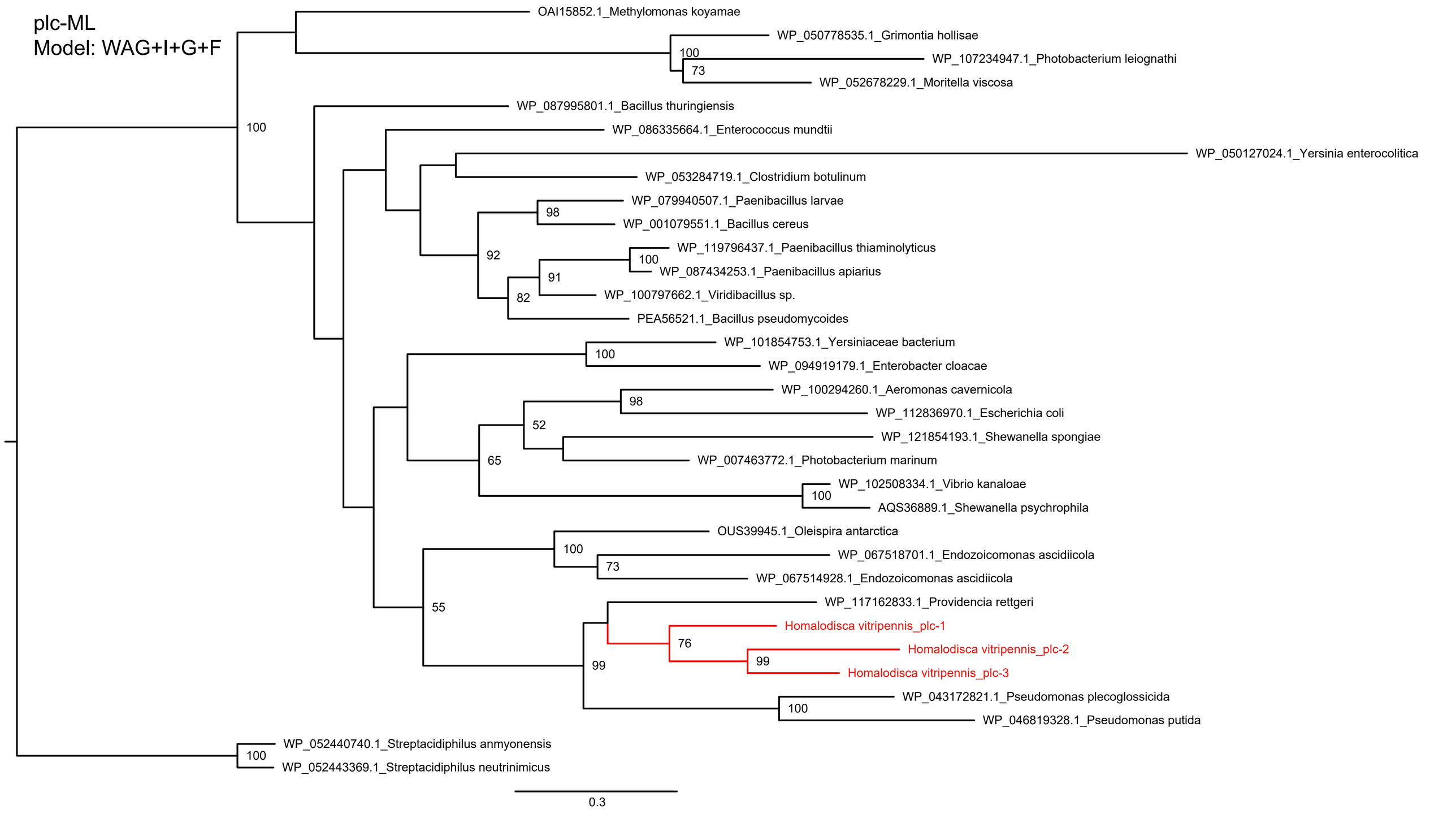
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WP_052678229.1_Moritella viscosa
WP_087995801.1_Bacillus thuringiensis
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WP_086335664.1_Enterococcus mundtii
WP_050127024.1_Yersinia enterocolitica
WP_053284719.1_Clostridium botulinum
WP_079940507.1_Paenibacillus larvae
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WP_119796437.1_Paenibacillus thiaminolyticus
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WP_100797662.1_Viridibacillus sp.
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WP_112836970.1_Escherichia coli
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WP_067518701.1_Endozoicomonas ascidiicola
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Homalodisca vitripennis_plc-2
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WP_046819328.1_Pseudomonas putida
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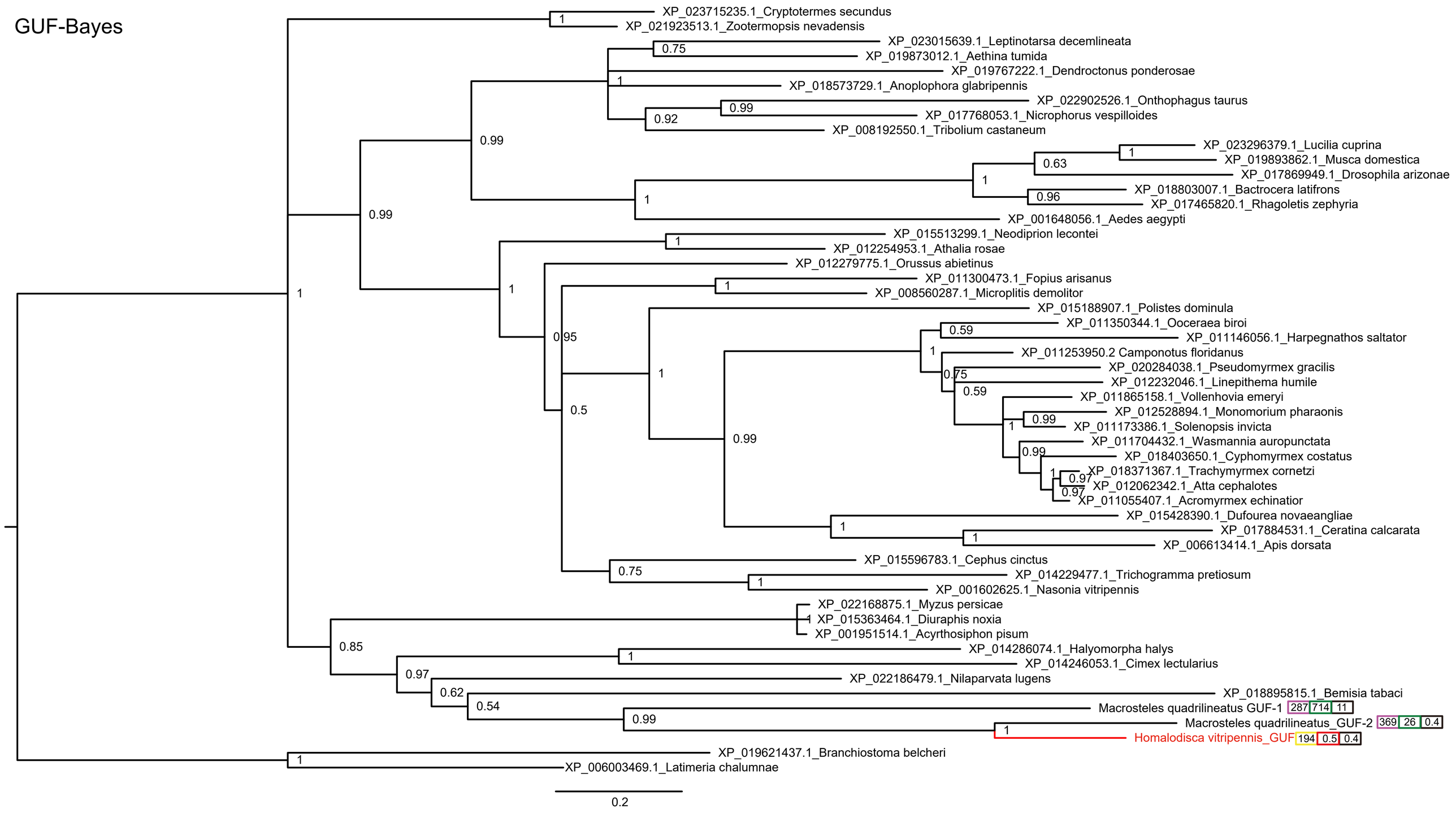
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XP_023015639.1_Leptinotarsa decemlineata
XP_019873012.1_Aethina tumida
XP_019767222.1_Dendroctonus ponderosae
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XP_022902526.1_Onthophagus taurus
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XP_008192550.1_Tribolium castaneum
XP_023296379.1_Lucilia cuprina
XP_019893862.1_Musca domestica
XP_017869949.1_Drosophila arizonae
XP_018803007.1_Bactrocera latifrons
XP_017465820.1_Rhagoletis zephyria
XP_001648056.1_Aedes aegypti
XP_015513299.1_Neodiprion lecontei
XP_012254953.1_Athalia rosae
XP_012279775.1_Orussus abietinus
XP_011300473.1_Fopius arisanus
XP_008560287.1_Microplitis demolitor
XP_015188907.1_Polistes dominula
XP_011350344.1_Ooceraea biroi
XP_011146056.1_Harpegnathos saltator
XP_011253950.2 Camponotus floridanus
XP_020284038.1_Pseudomyrmex gracilis
XP_012232046.1_Linepithema humile
XP_011865158.1_Vollenhovia emeryi
XP_012528894.1_Monomorium pharaonis
XP_011173386.1_Solenopsis invicta
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XP_006613414.1_Apis dorsata
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XP_014229477.1_Trichogramma pretiosum
XP_001602625.1_Nasonia vitripennis
XP_022168875.1_Myzus persicae
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287 714 11
Macrosteles quadrilineatus_GUF-2
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Homalodisca vitripennis_GUF
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XP_019621437.1_Branchiostoma belcheri
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GUF-ML
Model: LG+I+G

XP_015363464.1_Diuraphis noxia
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XP_022168875.1_Myzus persicae
XP_018895815.1_Bemisia tabaci
Homalodisca vitripennis_GUF
Macrosteles quadrilineatus_GUF-2
Macrosteles quadrilineatus_GUF-1
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XP_012254953.1_Athalia rosae
XP_015188907.1_Polistes dominula
XP_015428390.1_Dufourea novaeangliae
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XP_011253950.2 Camponotus floridanus
XP_011146056.1_Harpegnathos saltator
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XP_011865158.1_Vollenhovia emeryi
XP_011704432.1_Wasmannia auropunctata
XP_011055407.1_Acromyrmex echinatior
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XP_008192550.1_Tribolium castaneum
XP_023715235.1_Cryptotermes secundus
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XP_019621437.1_Branchiostoma belcheri

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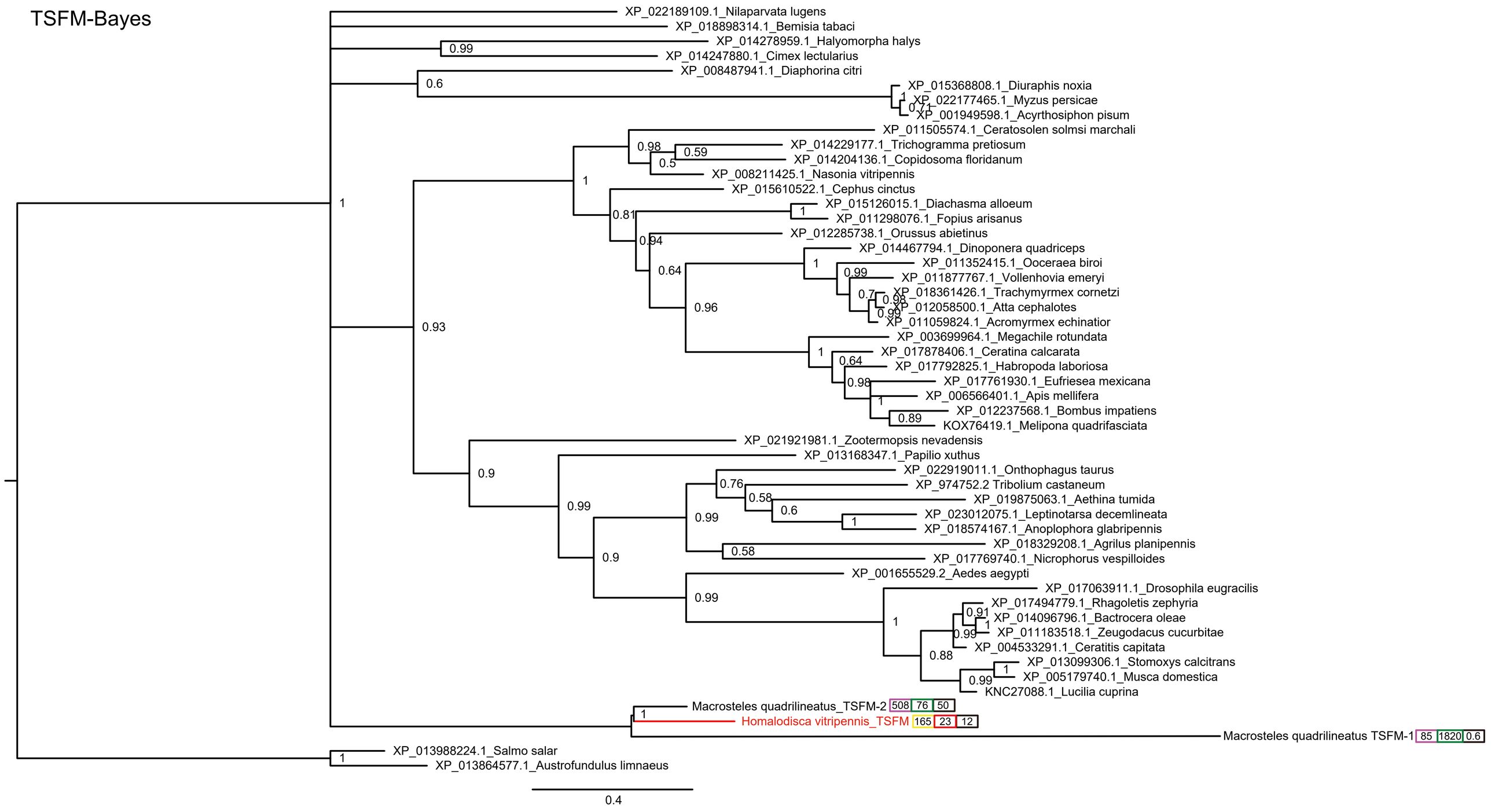
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XP_015126015.1_Diachasma alloeum
XP_011298076.1_Fopius arisanus
XP_012285738.1_Orussus abietinus
XP_014467794.1_Dinoponera quadriceps
XP_011352415.1_Ooceraea biroi
XP_011877767.1_Vollenhovia emeryi
XP_018361426.1_Trachymyrmex cornetzi
XP_012058500.1_Atta cephalotes
XP_011059824.1_Acromyrmex echinatior
XP_003699964.1_Megachile rotundata
XP_017878406.1_Ceratina calcarata
XP_017792825.1_Habropoda laboriosa
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XP_006566401.1_Apis mellifera
XP_012237568.1_Bombus impatiens
KOX76419.1_Melipona quadrifasciata
XP_021921981.1_Zootermopsis nevadensis
XP_013168347.1_Papilio xuthus
XP_022919011.1_Onthophagus taurus
XP_974752.2 Tribolium castaneum
XP_019875063.1_Aethina tumida
XP_023012075.1_Leptinotarsa decemlineata
XP_018574167.1_Anoplophora glabripennis
XP_018329208.1_Agrilus planipennis
XP_017769740.1_Nicrophorus vespilloides
XP_001655529.2_Aedes aegypti
XP_017063911.1_Drosophila eugracilis
XP_017494779.1_Rhagoletis zephyria
XP_014096796.1_Bactrocera oleae
XP_011183518.1_Zeugodacus cucurbitae
XP_004533291.1_Ceratitis capitata
XP_013099306.1_Stomoxys calcitrans
XP_005179740.1_Musca domestica
KNC27088.1_Lucilia cuprina
Macrosteles quadrilineatus_TSFM-2 508 76 50
Homalodisca vitripennis_TSFM 165 23 12
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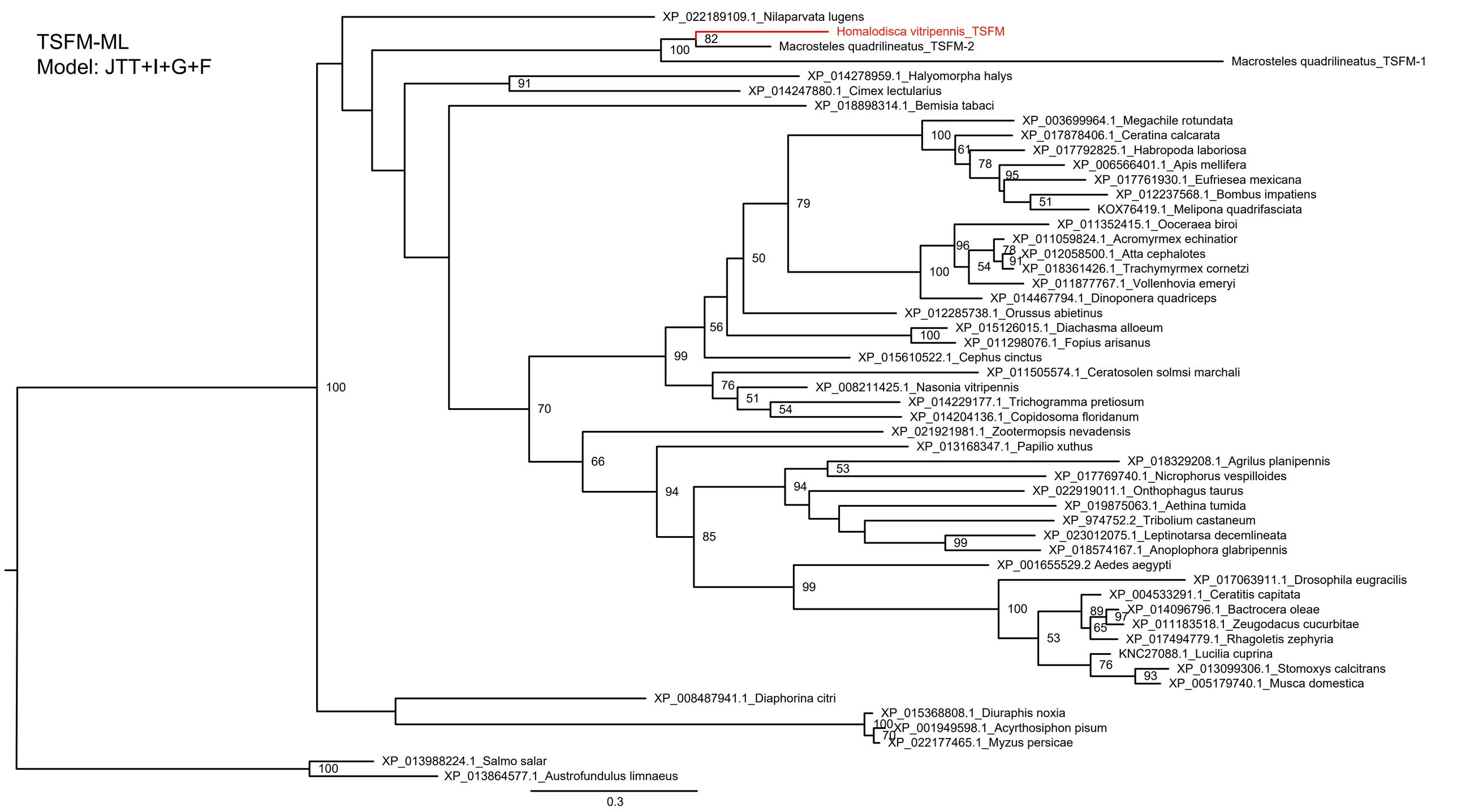
TSFM-ML
Model: JTT+I+G+F
XP_022189109.1_Nilaparvata lugens
Homalodisca vitripennis_TSFM
Macrosteles quadrilineatus_TSFM-2
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XP_014278959.1_Halyomorpha halys
XP_014247880.1_Cimex lectularius
XP_018898314.1_Bemisia tabaci
XP_003699964.1_Megachile rotundata
XP_017878406.1_Ceratina calcarata
XP_017792825.1_Habropoda laboriosa
XP_006566401.1_Apis mellifera
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XP_011059824.1_Acromyrmex echinatior
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XP_018361426.1_Trachymyrmex cornetzi
XP_011877767.1_Vollenhovia emeryi
XP_014467794.1_Dinoponera quadriceps
XP_012285738.1_Orussus abietinus
XP_015126015.1_Diachasma alloeum
XP_011298076.1_Fopius arisanus
XP_015610522.1_Cephus cinctus
XP_011505574.1_Ceratosolen solmsi marchali
XP_008211425.1_Nasonia vitripennis
XP_014229177.1_Trichogramma pretiosum
XP_014204136.1_Copidosoma floridanum
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