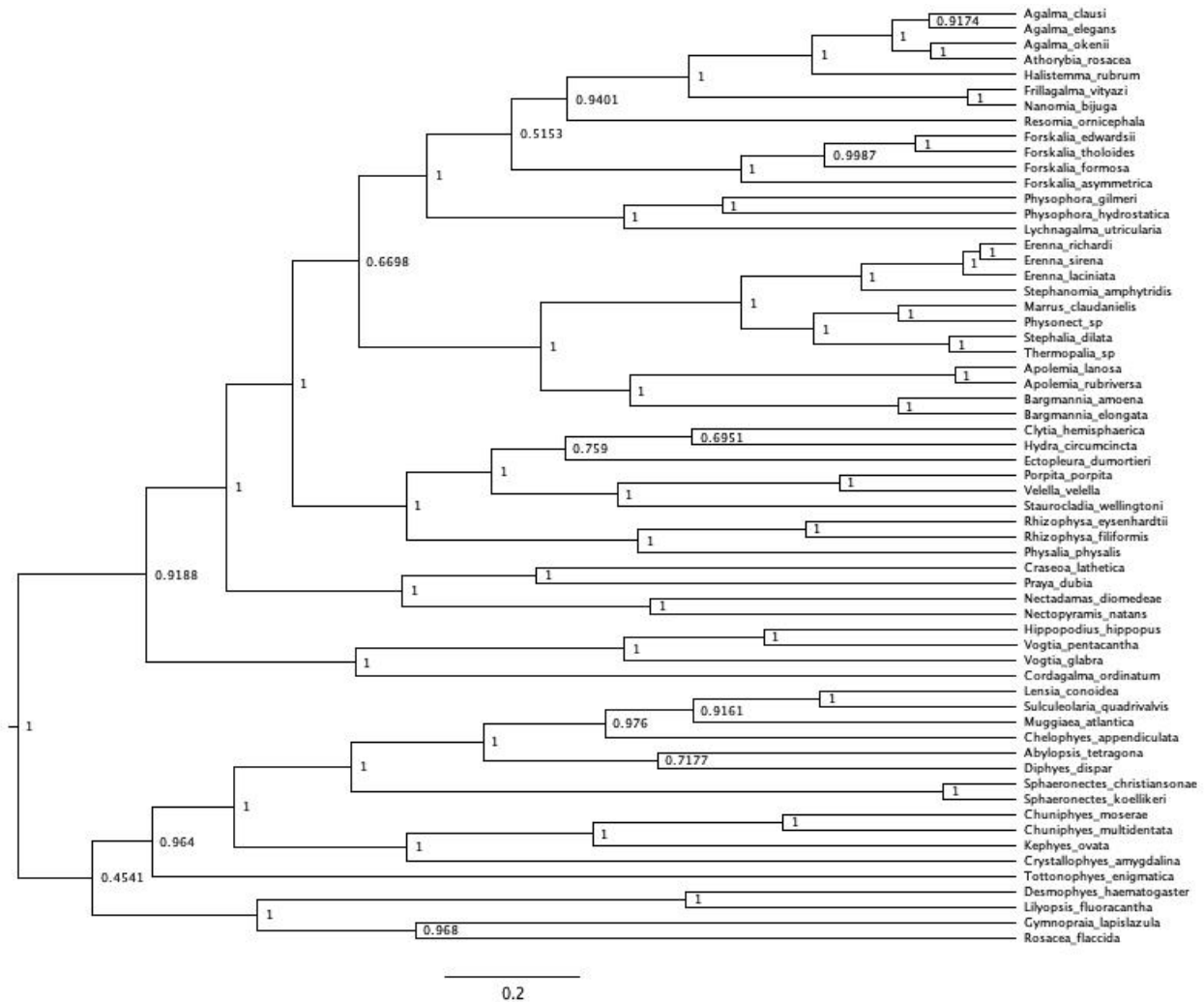8.1) Unconstrained ultrametric Bayesian time tree branch length and topology inference in RevBayes (node labels are bayesian posteriors). Arbitrary rooting. Newick tree file underneath.


(((((((((((((Agalma_clausi[&index=17]:0.136491,Agalma_elegans[&index=16]:0.136491)
[&index=62,posterior=0.833555,age_95%_HPD={0.065936,0.217688}]:0.058012,(Agalma_okenii[&index=19]:
0.130204,Athorybia_rosacea[&index=18]:0.130204)
[&index=63,posterior=0.993342,age_95%_HPD={0.050125,0.221838}]:0.064299)
[&index=64,posterior=1.000000,age_95%_HPD={0.113623,0.279255}]:0.123016,Halistemma_rubrum[&index=20]:
0.317519)[&index=65,posterior=1.000000,age_95%_HPD={0.181973,0.481102}]:0.172599,
(Frillagalma_vityazi[&index=15]:0.079137,Nanomia_bijuga[&index=14]:0.079137)
[&index=66,posterior=1.000000,age_95%_HPD={0.018991,0.192787}]:0.410981)
[&index=67,posterior=1.000000,age_95%_HPD={0.341514,0.672032}]:0.233374,Resomia_ornicephala[&index=13]:
0.723492)[&index=68,posterior=0.933422,age_95%_HPD={0.5049,0.928478}]:0.222808,
((((Forskalia_edwardsii[&index=26]:0.170594,Forskalia_tholoides[&index=25]:0.170594)
[&index=69,posterior=1.000000,age_95%_HPD={0.065877,0.303887}]:0.143970,Forskalia_formosa[&index=27]:
0.314564)[&index=70,posterior=0.994674,age_95%_HPD={0.148742,0.520531}]:
0.146640,Forskalia_asymmetrica[&index=24]:0.461204)
[&index=71,posterior=1.000000,age_95%_HPD={0.240311,0.679394}]:0.356407,((Physophora_gilmeri[&index=22]:
0.495783,Physophora_hydrostatica[&index=23]:0.495783)
[&index=72,posterior=1.000000,age_95%_HPD={0.215226,0.781338}]:
0.161785,Lychnagalma_utricularia[&index=21]:0.657568)

[&index=73,posterior=1.000000,age_95%_HPD={0.380976,0.948744}]:0.160043)
[&index=74,posterior=0.503329,age_95%_HPD={0.610487,0.994624}]:0.128689)
[&index=75,posterior=1.000000,age_95%_HPD={0.763075,1.13394}]:0.080633,((((Clytia_hemisphaerica[&index=33]:
0.524401,Hydra_circumcincta[&index=31]:0.524401)
[&index=76,posterior=0.758988,age_95%_HPD={0.277106,0.752388}]:0.158127,Ectopleura_dumortieri[&index=32]:
0.682528)[&index=77,posterior=0.603196,age_95%_HPD={0.505994,0.949314}]:0.127116,
((Porpita_porpita[&index=29]:0.250658,Velella_velella[&index=28]:0.250658)
[&index=78,posterior=1.000000,age_95%_HPD={0.148432,0.378081}]:
0.302557,Staurocladia_wellingtoni[&index=30]:0.553216)
[&index=79,posterior=1.000000,age_95%_HPD={0.363111,0.753122}]:0.256428)
[&index=80,posterior=1.000000,age_95%_HPD={0.648244,1.03405}]:0.144281,
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[&index=81,posterior=1.000000,age_95%_HPD={0.073875,0.578532}]:0.267689,Physalia_physalis[&index=36]:
0.608767)[&index=82,posterior=1.000000,age_95%_HPD={0.329224,0.854765}]:0.345157)
[&index=83,posterior=1.000000,age_95%_HPD={0.784189,1.15186}]:0.073008)
[&index=84,posterior=0.438083,age_95%_HPD={0.927538,1.13807}]:0.123228,(((((Erenna_richardi[&index=7]:
0.055102,Erenna_sirena[&index=8]:0.055102)[&index=85,posterior=0.998668,age_95%_HPD={0.013602,0.114792}]:
0.032270,Erenna_laciniata[&index=6]:0.087372)
[&index=86,posterior=1.000000,age_95%_HPD={0.033102,0.170015}]:
0.187192,Stephanomia_amphytridis[&index=5]:0.274564)
[&index=87,posterior=1.000000,age_95%_HPD={0.100485,0.515635}]:0.261076,((Marrus_claudanielis[&index=9]:
0.225364,Physonect_sp[&index=10]:0.225364)
[&index=88,posterior=1.000000,age_95%_HPD={0.070883,0.372318}]:0.170020,(Stephalia_dilata[&index=12]:
0.118679,Thermopalia_sp[&index=11]:0.118679)
[&index=89,posterior=1.000000,age_95%_HPD={0.034154,0.234605}]:0.276705)
[&index=90,posterior=1.000000,age_95%_HPD={0.245144,0.598548}]:0.140256)
[&index=91,posterior=1.000000,age_95%_HPD={0.317504,0.720465}]:0.309097,((Apolemia_lanosa[&index=4]:
0.095636,Apolemia_rubriversa[&index=3]:0.095636)
[&index=92,posterior=1.000000,age_95%_HPD={0.029689,0.178489}]:0.546215,(Bargmannia_amoena[&index=1]:
0.196712,Bargmannia_elongata[&index=2]:0.196712)
[&index=93,posterior=1.000000,age_95%_HPD={0.062916,0.396918}]:0.445139)
[&index=94,posterior=1.000000,age_95%_HPD={0.287919,0.928763}]:0.202886)
[&index=95,posterior=0.986684,age_95%_HPD={0.557312,1.08738}]:0.305425)
[&index=96,posterior=1.000000,age_95%_HPD={1.00665,1.31782}]:0.102547,(Nectadamas_diomedeae[&index=42]:
0.741280,Nectopyramis_natans[&index=43]:0.741280)
[&index=97,posterior=1.000000,age_95%_HPD={0.270785,1.18176}]:0.511428)
[&index=98,posterior=0.994674,age_95%_HPD={1.10399,1.41905}]:0.066075,((((Hippopodius_hippopus[&index=39]:
0.352169,Vogtia_pentacantha[&index=40]:0.352169)
[&index=99,posterior=1.000000,age_95%_HPD={0.176497,0.538951}]:0.208697,Vogtia_glabra[&index=41]:
0.560866)[&index=100,posterior=1.000000,age_95%_HPD={0.359047,0.756489}]:
0.300789,Cordagalma_ordinatum[&index=38]:0.861656)
[&index=101,posterior=1.000000,age_95%_HPD={0.644202,1.04814}]:0.255230,Praya_dubia[&index=37]:1.116886)
[&index=102,posterior=1.000000,age_95%_HPD={0.946268,1.38703}]:0.201897)
[&index=103,posterior=0.934754,age_95%_HPD={1.18455,1.4953}]:0.067914,Craseoa_lathetica[&index=44]:
1.386698)[&index=104,posterior=0.609854,age_95%_HPD={1.28079,1.5001}]:0.113290,
(((((((((Lensia_conoidea[&index=54]:0.299387,Sulculeolaria_quadrivalvis[&index=53]:0.299387)
[&index=105,posterior=1.000000,age_95%_HPD={0.15729,0.473692}]:0.186753,Muggiaea_atlantica[&index=52]:
0.486140)[&index=106,posterior=0.854860,age_95%_HPD={0.329449,0.638834}]:
0.141170,Chelophyes_appendiculata[&index=55]:0.627310)
[&index=107,posterior=0.917443,age_95%_HPD={0.466817,0.760953}]:0.120441,Abylopsis_tetragona[&index=51]:
0.747751)[&index=108,posterior=0.520639,age_95%_HPD={0.608205,0.900299}]:
0.087150,Diphyes_dispar[&index=50]:0.834901)
[&index=109,posterior=1.000000,age_95%_HPD={0.661868,0.987107}]:0.159585,
(Sphaeronectes_christiansonae[&index=56]:0.083872,Sphaeronectes_koellikeri[&index=57]:0.083872)
[&index=110,posterior=1.000000,age_95%_HPD={0.021875,0.174288}]:0.910613)
[&index=111,posterior=1.000000,age_95%_HPD={0.828068,1.16892}]:0.160037,
(((Chuniphyes_moserae[&index=49]:0.341933,Chuniphyes_multidentata[&index=48]:0.341933)
[&index=112,posterior=1.000000,age_95%_HPD={0.124008,0.622217}]:0.304510,Kephyes_ovata[&index=47]:

0.646443)[&index=113,posterior=1.000000,age_95%_HPD={0.387905,0.963532}]:
0.248108,Crystallophyes_amygdalina[&index=46]:0.894551)
[&index=114,posterior=1.000000,age_95%_HPD={0.71352,1.10992}]:0.259971)
[&index=115,posterior=1.000000,age_95%_HPD={0.953354,1.30324}]:
0.112438,Tottonophyes_enigmatica[&index=45]:1.266960)
[&index=116,posterior=0.994674,age_95%_HPD={1.08562,1.44416}]:0.093839,
((Desmophyes_haematogaster[&index=60]:0.542072,Lilyopsis_fluoracantha[&index=61]:0.542072)
[&index=117,posterior=1.000000,age_95%_HPD={0.259188,0.878659}]:0.539298,
(Gymnopraia_lapislazula[&index=58]:0.744611,Rosacea_flaccida[&index=59]:0.744611)
[&index=118,posterior=0.986684,age_95%_HPD={0.394869,1.0137}]:0.336760)
[&index=119,posterior=1.000000,age_95%_HPD={0.806627,1.3484}]:0.279429)
[&index=120,posterior=0.748336,age_95%_HPD={1.18968,1.49805}]:0.139188)
[&index=121,posterior=1.000000,age_95%_HPD={1.49884,1.50088}]:0.000000;

8.2) Ultrametric Bayesian time tree branch length inference in RevBayes (node labels are bayesian posteriors). Topology clamped to the Bayesian constrained topology inference in SM7. Tree rooted using outgroup constraint. Newick tree file underneath.
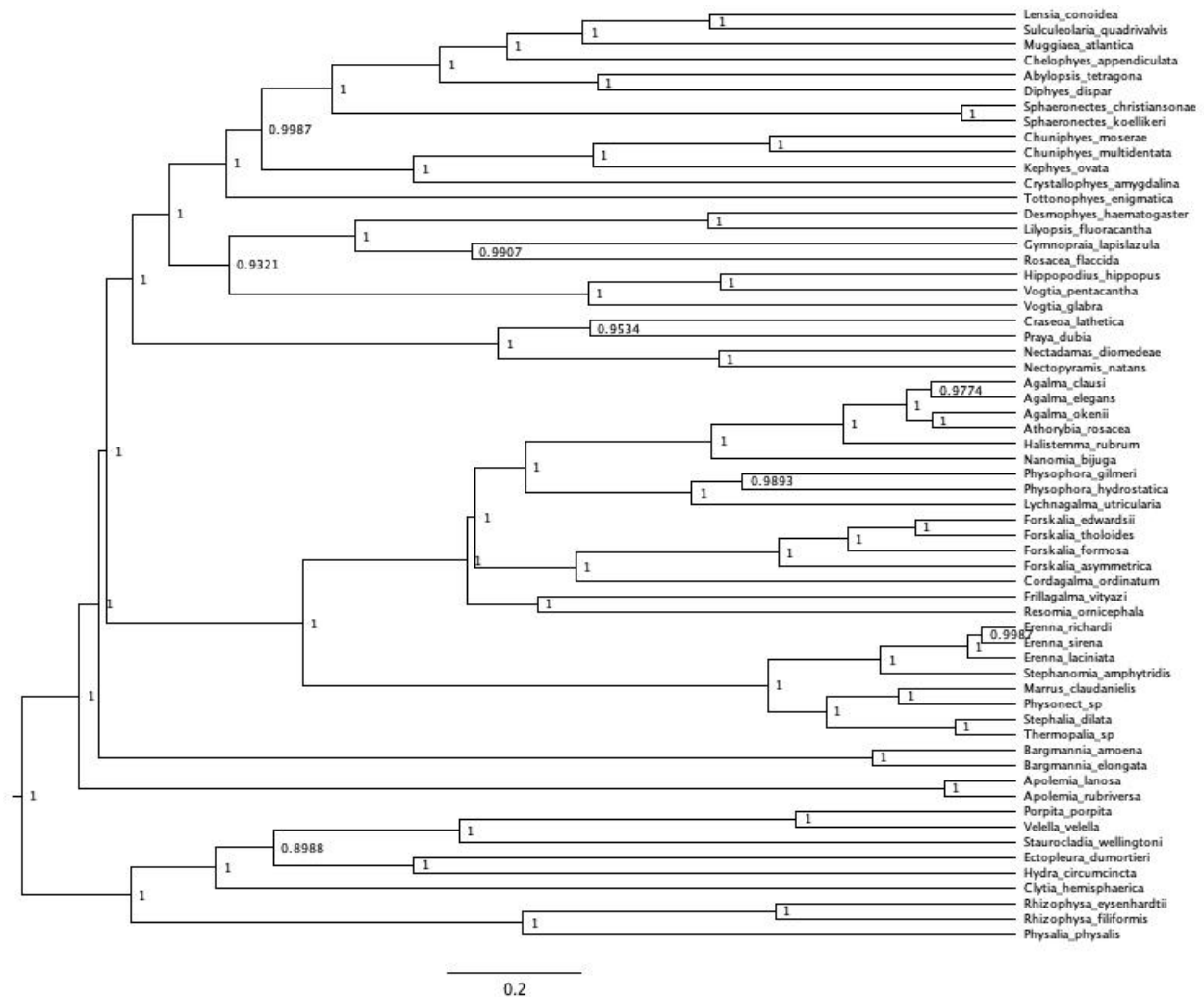
((((((((((((((((Lensia_conoidea[&index=46]:0.303550,Sulculeolaria_quadrivalvis[&index=45]:0.303550)
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0.428627)[&index=63,posterior=1.000000,age_95%_HPD={0.388813,0.465234}]:
0.073450,Chelophyes_appendiculata[&index=44]:0.502077)
[&index=64,posterior=1.000000,age_95%_HPD={0.464556,0.537631}]:0.063253,(Abylopsis_tetragona[&index=42]:
0.413478,Diphyes_dispar[&index=43]:0.413478)
[&index=65,posterior=1.000000,age_95%_HPD={0.368896,0.473875}]:0.151852)
[&index=66,posterior=1.000000,age_95%_HPD={0.530972,0.603199}]:0.098858,
(Sphaeronectes_christiansonae[&index=41]:0.052277,Sphaeronectes_koellikeri[&index=40]:0.052277)
[&index=67,posterior=1.000000,age_95%_HPD={0.029184,0.071637}]:0.611911)
[&index=68,posterior=1.000000,age_95%_HPD={0.633457,0.699096}]:0.066389,
(((Chuniphyes_moserae[&index=50]:0.242742,Chuniphyes_multidentata[&index=51]:0.242742)
[&index=69,posterior=1.000000,age_95%_HPD={0.202191,0.283849}]:0.172728,Kephyes_ovata[&index=49]:
0.415470)[&index=70,posterior=1.000000,age_95%_HPD={0.366124,0.465571}]:
0.170904,Crystallophyes_amygdalina[&index=48]:0.586374)
[&index=71,posterior=1.000000,age_95%_HPD={0.53881,0.631883}]:0.144202)
[&index=72,posterior=1.000000,age_95%_HPD={0.699614,0.762914}]:
0.030810,Tottonophyes_enigmatica[&index=39]:0.761386)
[&index=73,posterior=1.000000,age_95%_HPD={0.730458,0.795008}]:0.042828,
(((((Hippopodius_hippopus[&index=58]:0.271871,Vogtia_pentacantha[&index=57]:0.271871)
[&index=74,posterior=1.000000,age_95%_HPD={0.227508,0.315139}]:0.113312,Vogtia_glabra[&index=56]:
0.385183)[&index=75,posterior=1.000000,age_95%_HPD={0.346144,0.429449}]:
0.270332,Gymnopraia_lapislazula[&index=55]:0.655515)
[&index=76,posterior=1.000000,age_95%_HPD={0.609742,0.694077}]:0.042010,Rosacea_flaccida[&index=54]:
0.697525)[&index=77,posterior=1.000000,age_95%_HPD={0.652373,0.73615}]:0.044807,
(Desmophyes_haematogaster[&index=52]:0.323454,Lilyopsis_fluoracantha[&index=53]:0.323454)
[&index=78,posterior=1.000000,age_95%_HPD={0.272225,0.373523}]:0.418878)
[&index=79,posterior=1.000000,age_95%_HPD={0.708122,0.784062}]:0.061883)
[&index=80,posterior=1.000000,age_95%_HPD={0.770597,0.830632}]:0.021675,Craseoa_lathetica[&index=38]:
0.825889)[&index=81,posterior=1.000000,age_95%_HPD={0.794168,0.857662}]:0.028184,
((Nectadamas_diomedeae[&index=60]:0.281031,Nectopyramis_natans[&index=61]:0.281031)
[&index=82,posterior=1.000000,age_95%_HPD={0.224303,0.329264}]:0.171094,Praya_dubia[&index=59]:0.452125)
[&index=83,posterior=1.000000,age_95%_HPD={0.378128,0.517556}]:0.401947)
[&index=84,posterior=1.000000,age_95%_HPD={0.818754,0.883549}]:0.020831,((((((((((Agalma_okenii[&index=26]:
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[&index=85,posterior=1.000000,age_95%_HPD={0.055491,0.095955}]:0.022176,Agalma_elegans[&index=24]:
0.097500)[&index=86,posterior=1.000000,age_95%_HPD={0.076292,0.118116}]:
0.014808,Agalma_clausi[&index=27]:0.112307)
[&index=87,posterior=1.000000,age_95%_HPD={0.089114,0.136687}]:0.067075,Halistemma_rubrum[&index=23]:
0.179383)[&index=88,posterior=1.000000,age_95%_HPD={0.143896,0.214021}]:
0.133033,Nanomia_bijuga[&index=22]:0.312416)
[&index=89,posterior=1.000000,age_95%_HPD={0.257523,0.365434}]:0.184848,((Physophora_gilmeri[&index=29]:
0.275750,Physophora_hydrostatica[&index=30]:0.275750)
[&index=90,posterior=1.000000,age_95%_HPD={0.225574,0.339549}]:
0.050970,Lychnagalma_utricularia[&index=28]:0.326720)
[&index=91,posterior=1.000000,age_95%_HPD={0.271887,0.381591}]:0.170545)
[&index=92,posterior=1.000000,age_95%_HPD={0.441594,0.558556}]:0.049013,((((Forskalia_edwardsii[&index=32]:
0.103065,Forskalia_tholoides[&index=33]:0.103065)
[&index=93,posterior=1.000000,age_95%_HPD={0.079956,0.130011}]:0.067212,Forskalia_formosa[&index=34]:
0.170276)[&index=94,posterior=1.000000,age_95%_HPD={0.14113,0.203422}]:
0.071351,Forskalia_asymmetrica[&index=31]:0.241628)
[&index=95,posterior=1.000000,age_95%_HPD={0.202614,0.280223}]:
0.204464,Cordagalma_ordinatum[&index=35]:0.446092)
[&index=96,posterior=1.000000,age_95%_HPD={0.400238,0.493962}]:0.100186)
[&index=97,posterior=1.000000,age_95%_HPD={0.507452,0.597718}]:0.007801,(Frillagalma_vityazi[&index=36]:
0.484913,Resomia_ornicephala[&index=37]:0.484913)
[&index=98,posterior=1.000000,age_95%_HPD={0.429571,0.53891}]:0.069166)
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[&index=100,posterior=1.000000,age_95%_HPD={0.018897,0.050147}]:0.014764,Erenna_laciniata[&index=14]:

0.048236)[&index=101,posterior=1.000000,age_95%_HPD={0.029937,0.066898}]:
0.088412,Stephanomia_amphytridis[&index=17]:0.136648)
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0.119899,Physonect_sp[&index=20]:0.119899)
[&index=103,posterior=1.000000,age_95%_HPD={0.088168,0.153072}]:0.076593,(Stephalia_dilata[&index=18]:
0.063481,Thermopalia_sp[&index=19]:0.063481)
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[&index=105,posterior=1.000000,age_95%_HPD={0.158451,0.23898}]:0.059330)
[&index=106,posterior=1.000000,age_95%_HPD={0.204796,0.305585}]:0.458222)
[&index=107,posterior=1.000000,age_95%_HPD={0.655514,0.770082}]:0.160859)
[&index=108,posterior=1.000000,age_95%_HPD={0.836674,0.904831}]:0.007175,(Bargmannia_amoena[&index=12]:
0.143318,Bargmannia_elongata[&index=13]:0.143318)
[&index=109,posterior=1.000000,age_95%_HPD={0.099958,0.187042}]:0.738760)
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0.072665,Apolemia_rubriversa[&index=11]:0.072665)
[&index=111,posterior=1.000000,age_95%_HPD={0.042241,0.102293}]:0.826741)
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[&index=113,posterior=1.000000,age_95%_HPD={0.189604,0.305318}]:0.271084,Physalia_physalis[&index=7]:
0.518503)[&index=114,posterior=1.000000,age_95%_HPD={0.449205,0.596834}]:0.460795)
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0.815237)[&index=117,posterior=1.000000,age_95%_HPD={0.75859,0.868878}]:0.062908,
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0.380380,Staurocladia_wellingtoni[&index=6]:0.621496)
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[&index=120,posterior=1.000000,age_95%_HPD={0.824274,0.926813}]:0.121856)
[&index=121,posterior=1.000000,age_95%_HPD={1,1}]:0.000000;