Katelyn Campbell

EEOB 563

Final Project Outline

**Phylogenetic Question**: How are myosin encoding genes (that are directly linked to muscular diseases)related phylogenetically?

**Question Type**: Evolutionary

**Database Link**:

Mutations/ WT genes of interest: MYH3, MYH6, MYH7 (myosin storage myopathy), MYH9, MYH11, MYO5A (Griscelli syndrome), MYO5B (might transport apical endosomes in brush border cells), MYO7A (non-syndromic deafness or Usher syndrome), MYBPC3 (hypertrophic cardiomyopathy)

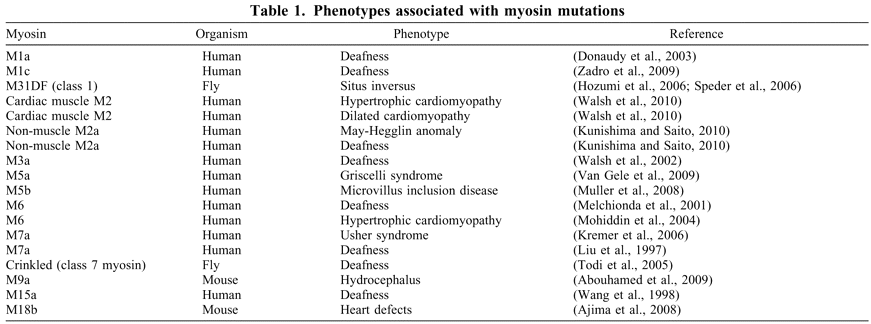
**Methods**:

Maximum Likelihood or Bayesian

References:

<https://ghr.nlm.nih.gov/condition/myosin-storage-myopathy#genes>

<http://jcs.biologists.org/content/125/7/1627>



<https://www.nmd-journal.com/article/S0960-8966(07)00052-1/abstract>

<https://www.physiology.org/doi/full/10.1152/ajpheart.00931.2006>

<https://www.uniprot.org/uniprot/P33176>

Links for sure used:

References

<https://www.uniprot.org/align/A201904136746803381A1F0E0DB47453E0216320D0039F0B>

<https://www.pnas.org/content/103/10/3681?ijkey=dc195dfe10963e5c98a4c942ab656d0dcfba7829&keytype2=tf_ipsecsha>

http://jcs.biologists.org/content/113/19/3353?ijkey=da31ea693b4249cb6c46fb809a159688d249eaa3&keytype2=tf\_ipsecsha

[katelync@hpc-class ~]$ ls

bin EEOB563-Spring2019 FinalProject mb\_myosin\_analysis.txt Myosin\_Final\_Project README.md

[katelync@hpc-class ~]$ cd Myosin\_Final\_Project/

[katelync@hpc-class Myosin\_Final\_Project]$ ls

aligned\_data.nxs aligned\_data.nxs.mcmc aligned\_data.nxs.run1.t aligned\_data.nxs.run2.t aligned\_data-prior.ckp aligned\_data-prior.mcmc aligned\_data-prior.t

aligned\_data.nxs.ckp aligned\_data.nxs.run1.p aligned\_data.nxs.run2.p aligned\_data.nxs.txt aligned\_data-prior.ckp~ aligned\_data-prior.p

[katelync@hpc-class Myosin\_Final\_Project]$ vi myscript.txt

[katelync@hpc-class Myosin\_Final\_Project]$ vi myscript.txt

[katelync@hpc-class Myosin\_Final\_Project]$ vi aligned\_data.nxs

[katelync@hpc-class Myosin\_Final\_Project]$ ls

aligned\_data.nxs aligned\_data.nxs.mcmc aligned\_data.nxs.run1.t aligned\_data.nxs.run2.t aligned\_data-prior.ckp aligned\_data-prior.mcmc aligned\_data-prior.t

aligned\_data.nxs.ckp aligned\_data.nxs.run1.p aligned\_data.nxs.run2.p aligned\_data.nxs.txt aligned\_data-prior.ckp~ aligned\_data-prior.p myscript.txt

[katelync@hpc-class Myosin\_Final\_Project]$ rm aligned\_data.nxs.\*

[katelync@hpc-class Myosin\_Final\_Project]$ ls

aligned\_data.nxs aligned\_data-prior.ckp aligned\_data-prior.ckp~ aligned\_data-prior.mcmc aligned\_data-prior.p aligned\_data-prior.t myscript.txt

[katelync@hpc-class Myosin\_Final\_Project]$ sbatch myscript.txt

Submitted batch job 5576

[katelync@hpc-class Myosin\_Final\_Project]$ ls -l

total 23592

-rw-r--r--. 1 katelync domain users 331297 Apr 18 17:37 aligned\_data.nxs

-rw-r--r--. 1 katelync domain users 4368 Apr 17 20:13 aligned\_data-prior.ckp

-rw-r--r--. 1 katelync domain users 4368 Apr 17 20:12 aligned\_data-prior.ckp~

-rw-r--r--. 1 katelync domain users 51373 Apr 17 20:12 aligned\_data-prior.mcmc

-rw-r--r--. 1 katelync domain users 1239318 Apr 17 20:12 aligned\_data-prior.p

-rw-r--r--. 1 katelync domain users 37331861 Apr 17 20:13 aligned\_data-prior.t

-rw-r--r--. 1 katelync domain users 725 Apr 18 17:35 myscript.txt

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:38 slurm-5576.out

[katelync@hpc-class Myosin\_Final\_Project]$ sstatus

-bash: sstatus: command not found

[katelync@hpc-class Myosin\_Final\_Project]$ qstat

-bash: qstat: command not found

[katelync@hpc-class Myosin\_Final\_Project]$ ls

aligned\_data.nxs aligned\_data-prior.ckp aligned\_data-prior.ckp~ aligned\_data-prior.mcmc aligned\_data-prior.p aligned\_data-prior.t myscript.txt slurm-5576.out

[katelync@hpc-class Myosin\_Final\_Project]$ squeue

JOBID PARTITION NAME USER ST TIME NODES NODELIST(REASON)

5567 long run252.s lwhuang R 1:53:20 1 hpc-class08

5562 long run2.sh lwhuang R 2:45:26 1 hpc-class23

5561 long run.sh lwhuang R 2:45:59 1 hpc-class23

5560 long run502.s lwhuang R 2:55:57 1 hpc-class09

5559 long run302.s lwhuang R 2:56:01 1 hpc-class09

5557 long run202.s lwhuang R 2:56:07 1 hpc-class09

5556 long run152.s lwhuang R 2:56:10 1 hpc-class09

5555 long run102.s lwhuang R 2:56:15 1 hpc-class09

5554 long run52.sh lwhuang R 2:56:18 1 hpc-class09

5553 long run32.sh lwhuang R 2:56:22 1 hpc-class09

5575 medium sh katelync R 35:12 1 hpc-class08

5572 medium sh zkazibwe R 1:05:22 1 hpc-class08

5566 medium sh zkazibwe R 1:54:33 1 hpc-class08

5564 medium sh zkazibwe R 1:55:14 1 hpc-class32

5496 long sh zwryder R 8:55:53 1 hpc-class03

5321 long sh jmahguib R 1-08:22:14 1 hpc-class04

5574 gpu sh skhaki R 39:35 1 hpc-class-gpu03

[katelync@hpc-class Myosin\_Final\_Project]$ ls

aligned\_data.nxs aligned\_data-prior.ckp aligned\_data-prior.ckp~ aligned\_data-prior.mcmc aligned\_data-prior.p aligned\_data-prior.t myscript.txt slurm-5576.out

[katelync@hpc-class Myosin\_Final\_Project]$ scancel 5575

[katelync@hpc-class Myosin\_Final\_Project]$ squeue

JOBID PARTITION NAME USER ST TIME NODES NODELIST(REASON)

5575 medium sh katelync CG 36:31 1 hpc-class08

5567 long run252.s lwhuang R 1:54:43 1 hpc-class08

5562 long run2.sh lwhuang R 2:46:49 1 hpc-class23

5561 long run.sh lwhuang R 2:47:22 1 hpc-class23

5560 long run502.s lwhuang R 2:57:20 1 hpc-class09

5559 long run302.s lwhuang R 2:57:24 1 hpc-class09

5557 long run202.s lwhuang R 2:57:30 1 hpc-class09

5556 long run152.s lwhuang R 2:57:33 1 hpc-class09

5555 long run102.s lwhuang R 2:57:38 1 hpc-class09

5554 long run52.sh lwhuang R 2:57:41 1 hpc-class09

5553 long run32.sh lwhuang R 2:57:45 1 hpc-class09

5572 medium sh zkazibwe R 1:06:45 1 hpc-class08

5566 medium sh zkazibwe R 1:55:56 1 hpc-class08

5564 medium sh zkazibwe R 1:56:37 1 hpc-class32

5496 long sh zwryder R 8:57:16 1 hpc-class03

5321 long sh jmahguib R 1-08:23:37 1 hpc-class04

5574 gpu sh skhaki R 40:58 1 hpc-class-gpu03

[katelync@hpc-class Myosin\_Final\_Project]$ sbatch

aligned\_data.nxs aligned\_data-prior.ckp~ aligned\_data-prior.p myscript.txt

aligned\_data-prior.ckp aligned\_data-prior.mcmc aligned\_data-prior.t slurm-5576.out

[katelync@hpc-class Myosin\_Final\_Project]$ sbatch myscript.txt

Submitted batch job 5577

[katelync@hpc-class Myosin\_Final\_Project]$ ls -tl

total 23596

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:41 slurm-5577.out

-rw-r--r--. 1 katelync domain users 4777 Apr 18 17:38 slurm-5576.out

-rw-r--r--. 1 katelync domain users 331297 Apr 18 17:37 aligned\_data.nxs

-rw-r--r--. 1 katelync domain users 725 Apr 18 17:35 myscript.txt

-rw-r--r--. 1 katelync domain users 37331861 Apr 17 20:13 aligned\_data-prior.t

-rw-r--r--. 1 katelync domain users 4368 Apr 17 20:13 aligned\_data-prior.ckp

-rw-r--r--. 1 katelync domain users 1239318 Apr 17 20:12 aligned\_data-prior.p

-rw-r--r--. 1 katelync domain users 51373 Apr 17 20:12 aligned\_data-prior.mcmc

-rw-r--r--. 1 katelync domain users 4368 Apr 17 20:12 aligned\_data-prior.ckp~

[katelync@hpc-class Myosin\_Final\_Project]$ vi slurm-5577.out

[katelync@hpc-class Myosin\_Final\_Project]$ vi aligned\_data.nxs

[katelync@hpc-class Myosin\_Final\_Project]$ sbatch myscript.txt

Submitted batch job 5578

[katelync@hpc-class Myosin\_Final\_Project]$ ls -tl

total 23604

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:45 slurm-5578.out

-rw-r--r--. 1 katelync domain users 331311 Apr 18 17:45 aligned\_data.nxs

-rw-r--r--. 1 katelync domain users 4777 Apr 18 17:41 slurm-5577.out

-rw-r--r--. 1 katelync domain users 4777 Apr 18 17:38 slurm-5576.out

-rw-r--r--. 1 katelync domain users 725 Apr 18 17:35 myscript.txt

-rw-r--r--. 1 katelync domain users 37331861 Apr 17 20:13 aligned\_data-prior.t

-rw-r--r--. 1 katelync domain users 4368 Apr 17 20:13 aligned\_data-prior.ckp

-rw-r--r--. 1 katelync domain users 1239318 Apr 17 20:12 aligned\_data-prior.p

-rw-r--r--. 1 katelync domain users 51373 Apr 17 20:12 aligned\_data-prior.mcmc

-rw-r--r--. 1 katelync domain users 4368 Apr 17 20:12 aligned\_data-prior.ckp~

[katelync@hpc-class Myosin\_Final\_Project]$ vi slurm-5578.out

[katelync@hpc-class Myosin\_Final\_Project]$ vi slurm-5578.out

[katelync@hpc-class Myosin\_Final\_Project]$ ls -tl

total 23609

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:45 aligned\_data.nxs.run2.t

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:45 aligned\_data.nxs.run2.p

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:45 aligned\_data.nxs.run1.t

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:45 aligned\_data.nxs.run1.p

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:45 aligned\_data.nxs.mcmc

-rw-r--r--. 1 katelync domain users 1459 Apr 18 17:45 slurm-5578.out

-rw-r--r--. 1 katelync domain users 331311 Apr 18 17:45 aligned\_data.nxs

-rw-r--r--. 1 katelync domain users 4777 Apr 18 17:41 slurm-5577.out

-rw-r--r--. 1 katelync domain users 4777 Apr 18 17:38 slurm-5576.out

-rw-r--r--. 1 katelync domain users 725 Apr 18 17:35 myscript.txt

-rw-r--r--. 1 katelync domain users 37331861 Apr 17 20:13 aligned\_data-prior.t

-rw-r--r--. 1 katelync domain users 4368 Apr 17 20:13 aligned\_data-prior.ckp

-rw-r--r--. 1 katelync domain users 1239318 Apr 17 20:12 aligned\_data-prior.p

-rw-r--r--. 1 katelync domain users 51373 Apr 17 20:12 aligned\_data-prior.mcmc

-rw-r--r--. 1 katelync domain users 4368 Apr 17 20:12 aligned\_data-prior.ckp~

[katelync@hpc-class Myosin\_Final\_Project]$ ls -tl

total 23609

-rw-r--r--. 1 katelync domain users 6649 Apr 18 17:46 slurm-5578.out

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:45 aligned\_data.nxs.run2.t

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:45 aligned\_data.nxs.run2.p

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:45 aligned\_data.nxs.run1.t

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:45 aligned\_data.nxs.run1.p

-rw-r--r--. 1 katelync domain users 0 Apr 18 17:45 aligned\_data.nxs.mcmc

-rw-r--r--. 1 katelync domain users 331311 Apr 18 17:45 aligned\_data.nxs

-rw-r--r--. 1 katelync domain users 4777 Apr 18 17:41 slurm-5577.out

-rw-r--r--. 1 katelync domain users 4777 Apr 18 17:38 slurm-5576.out

-rw-r--r--. 1 katelync domain users 725 Apr 18 17:35 myscript.txt

-rw-r--r--. 1 katelync domain users 37331861 Apr 17 20:13 aligned\_data-prior.t

-rw-r--r--. 1 katelync domain users 4368 Apr 17 20:13 aligned\_data-prior.ckp

-rw-r--r--. 1 katelync domain users 1239318 Apr 17 20:12 aligned\_data-prior.p

-rw-r--r--. 1 katelync domain users 51373 Apr 17 20:12 aligned\_data-prior.mcmc

-rw-r--r--. 1 katelync domain users 4368 Apr 17 20:12 aligned\_data-prior.ckp~

[katelync@hpc-class Myosin\_Final\_Project]$ vi slurm-5578.out

[katelync@hpc-class Myosin\_Final\_Project]$ ls -l

total 23685

-rw-r--r--. 1 katelync domain users 331311 Apr 18 17:45 aligned\_data.nxs

-rw-r--r--. 1 katelync domain users 25774 Apr 18 17:47 aligned\_data.nxs.ckp

-rw-r--r--. 1 katelync domain users 25774 Apr 18 17:46 aligned\_data.nxs.ckp~

-rw-r--r--. 1 katelync domain users 1290 Apr 18 17:47 aligned\_data.nxs.mcmc

-rw-r--r--. 1 katelync domain users 580 Apr 18 17:47 aligned\_data.nxs.run1.p

-rw-r--r--. 1 katelync domain users 23465 Apr 18 17:47 aligned\_data.nxs.run1.t

-rw-r--r--. 1 katelync domain users 580 Apr 18 17:47 aligned\_data.nxs.run2.p

-rw-r--r--. 1 katelync domain users 23465 Apr 18 17:47 aligned\_data.nxs.run2.t

-rw-r--r--. 1 katelync domain users 4368 Apr 17 20:13 aligned\_data-prior.ckp

-rw-r--r--. 1 katelync domain users 4368 Apr 17 20:12 aligned\_data-prior.ckp~

-rw-r--r--. 1 katelync domain users 51373 Apr 17 20:12 aligned\_data-prior.mcmc

-rw-r--r--. 1 katelync domain users 1239318 Apr 17 20:12 aligned\_data-prior.p

-rw-r--r--. 1 katelync domain users 37331861 Apr 17 20:13 aligned\_data-prior.t

-rw-r--r--. 1 katelync domain users 725 Apr 18 17:35 myscript.txt

-rw-r--r--. 1 katelync domain users 4777 Apr 18 17:38 slurm-5576.out

-rw-r--r--. 1 katelync domain users 4777 Apr 18 17:41 slurm-5577.out

-rw-r--r--. 1 katelync domain users 6967 Apr 18 17:47 slurm-5578.out

[katelync@hpc-class Myosin\_Final\_Project]$ sumt Connection reset by 10.24.107.165 port 22

MrBayes > exe aligned\_data.nxs

Executing file "aligned\_data.nxs"

UNIX line termination

Longest line length = 5420

Parsing file

Expecting NEXUS formatted file

Reading taxa block

Allocated taxon set

Defining new set of 61 taxa

Exiting taxa block

Reading characters block

Allocated matrix

Defining new character matrix with 5411 characters

Data is Protein

Gaps coded as -

Taxon 1 -> P35749

Taxon 2 -> Q13402

Taxon 3 -> Q13459

Taxon 4 -> Q9ULV0

Taxon 5 -> Q9NQX4

Taxon 6 -> Q14324

Taxon 7 -> A2RUH7

Taxon 8 -> O14950

Taxon 9 -> Q6WCQ1

Taxon 10 -> P33176

Taxon 11 -> P19105

Taxon 12 -> Q8WY64

Taxon 13 -> Q14896

Taxon 14 -> Q9Y2K3

Taxon 15 -> Q9UKX2

Taxon 16 -> P12883

Taxon 17 -> O00160

Taxon 18 -> Q9BUA6

Taxon 19 -> Q9Y4I1

Taxon 20 -> P35580

Taxon 21 -> B0I1T2

Taxon 22 -> Q13203

Taxon 23 -> Q02045

Taxon 24 -> P14649

Taxon 25 -> P24844

Taxon 26 -> Q96H55

Taxon 27 -> Q9UM54

Taxon 28 -> Q8NEV4

Taxon 29 -> Q8N1T3

Taxon 30 -> Q9H1R3

Taxon 31 -> Q7Z406

Taxon 32 -> O43795

Taxon 33 -> P13533

Taxon 34 -> O94832

Taxon 35 -> P35579

Taxon 36 -> Q96JP2

Taxon 37 -> Q9HD67

Taxon 38 -> Q86YV6

Taxon 39 -> Q6PIF6

Taxon 40 -> P11055

Taxon 41 -> Q12965

Taxon 42 -> P08590

Taxon 43 -> Q8IUG5

Taxon 44 -> A7E2Y1

Taxon 45 -> Q9Y6X6

Taxon 46 -> Q8WXR4

Taxon 47 -> Q9UBC5

Taxon 48 -> Q9Y623

Taxon 49 -> P12829

Taxon 50 -> P60660

Taxon 51 -> Q32MK0

Taxon 52 -> Q9UKX3

Taxon 53 -> Q9H6N6

Taxon 54 -> O00159

Taxon 55 -> Q15746

Taxon 56 -> P13535

Taxon 57 -> Q92614

Taxon 58 -> Q9UKN7

Taxon 59 -> P12882

Taxon 60 -> B2RTY4

Taxon 61 -> Q00872

Successfully read matrix

Setting default partition (does not divide up characters)

Setting model defaults

Seed (for generating default start values) = 1555646899

Setting output file names to "aligned\_data.nxs.run*."*

*Exiting characters block*

*Reached end of file*

*MrBayes > lset nucmodel=Protein*

*Successfully set likelihood model parameters*

*MrBayes > prset aamodelpr=fixed(wag)*

*Setting Aamodelpr to Fixed(Wag)*

*Successfully set prior model parameters*

*MrBayes > mcmcp ngen=1000000*

*Setting number of generations to 1000000*

*Successfully set chain parameters*

*MrBayes > sumt aligned\_data.nxs*

*Could not find parameter "aligned\_data.nxs"*

*MrBayes > mcmc*

*Running Markov chain*

*MCMC stamp = 0234723620*

*Seed = 1720589443*

*Swapseed = 1555646899*

*Model settings:*

*Data not partitioned --*

*Datatype = Protein*

*Aamodel = Wag*

*Substitution rates are fixed to the Wag rates*

*Covarion = No*

*# States = 20*

*State frequencies are fixed to the Wag frequencies*

*Rates = Equal*

*Active parameters:*

*Parameters*

*---------------------*

*Statefreq 1*

*Ratemultiplier 2*

*Topology 3*

*Brlens 4*

*---------------------*

*1 -- Parameter = Pi*

*Type = Stationary state frequencies*

*Prior = Fixed (Wag frequencies)*

*2 -- Parameter = Ratemultiplier*

*Type = Partition-specific rate multiplier*

*Prior = Fixed(1.0)*

*3 -- Parameter = Tau*

*Type = Topology*

*Prior = All topologies equally probable a priori*

*Subparam. = V*

*4 -- Parameter = V*

*Type = Branch lengths*

*Prior = Unconstrained:GammaDir(1.0,0.1000,1.0,1.0)*

*Number of chains per MPI processor = 1*

*The MCMC sampler will use the following moves:*

*With prob. Chain will use move*

*10.00 % ExtSPR(Tau,V)*

*10.00 % ExtTBR(Tau,V)*

*10.00 % NNI(Tau,V)*

*10.00 % ParsSPR(Tau,V)*

*40.00 % Multiplier(V)*

*14.00 % Nodeslider(V)*

*6.00 % TLMultiplier(V)*

*Division 1 has 4518 unique site patterns*

*Initializing conditional likelihoods*

*Using standard SSE likelihood calculator for division 1 (single-precision)*

*Initial log likelihoods and log prior probs for run 1:*

*Chain 1 -- -272547.305849 -- 120.571070*

*There are 7 more chains on other processor(s)*

*There are results from a previous run saved using the same filename(s).*

*Do you want to overwrite these results? (yes/no): no*

*Please specify a different file name before running the mcmc analysis.*

*You can do that using 'mcmc filename='. You can also move or*

*rename the old result files.*

*Error preparing print files on at least one processor*

*Error in command "Mcmc"*

*MrBayes > sumt*

*Summarizing trees in files "aligned\_data.nxs.run1.t" and "aligned\_data.nxs.run2.t*

*"*

*Using relative burnin ('relburnin=yes'), discarding the first 25 % of sampled tre*

*es*

*Writing statistics to files aligned\_data.nxs.*

*Examining first file ...*

*Found one tree block in file "aligned\_data.nxs.run1.t" with 2001 trees in last bl*

*ock*

*Expecting the same number of trees in the last tree block of all files*

*Tree reading status:*

*0 10 20 30 40 50 60 70 80 90 100*

*v-------v-------v-------v-------v-------v-------v-------v-------v-------v-------v*

*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\**

*Read a total of 4002 trees in 2 files (sampling 3002 of them)*

*(Each file contained 2001 trees of which 1501 were sampled)*

*General explanation:*

*In an unrooted tree, a taxon bipartition (split) is specified by removing a*

*branch, thereby dividing the species into those to the left and those to the*

*right of the branch. Here, taxa to one side of the removed branch are denoted*

*'.' and those to the other side are denoted '\*'. Specifically, the '.' symbol*

*is used for the taxa on the same side as the outgroup.*

*In a rooted or clock tree, the tree is rooted using the model and not by*

*reference to an outgroup. Each bipartition therefore corresponds to a clade,*

*that is, a group that includes all the descendants of a particular branch in*

*the tree. Taxa that are included in each clade are denoted using '\*', and*

*taxa that are not included are denoted using the '.' symbol.*

*The output first includes a key to all the bipartitions with frequency larger*

*or equual to (Minpartfreq) in at least one run. Minpartfreq is a parameter to*

*sumt command and currently it is set to 0.10. This is followed by a table*

*with statistics for the informative bipartitions (those including at least*

*two taxa), sorted from highest to lowest probability. For each bipartition,*

*the table gives the number of times the partition or split was observed in all*

*runs (#obs) and the posterior probability of the bipartition (Probab.), which*

*is the same as the split frequency. If several runs are summarized, this is*

*followed by the minimum split frequency (Min(s)), the maximum frequency*

*(Max(s)), and the standard deviation of frequencies (Stddev(s)) across runs.*

*The latter value should approach 0 for all bipartitions as MCMC runs converge.*

*This is followed by a table summarizing branch lengths, node heights (if a*

*clock model was used) and relaxed clock parameters (if a relaxed clock model*

*was used). The mean, variance, and 95 % credible interval are given for each*

*of these parameters. If several runs are summarized, the potential scale*

*reduction factor (PSRF) is also given; it should approach 1 as runs converge.*

*Node heights will take calibration points into account, if such points were*

*used in the analysis.*

*Note that Stddev may be unreliable if the partition is not present in all*

*runs (the last column indicates the number of runs that sampled the partition*

*if more than one run is summarized). The PSRF is not calculated at all if*

*the partition is not present in all runs.The PSRF is also sensitive to small*

*sample sizes and it should only be considered a rough guide to convergence*

*since some of the assumptions allowing one to interpret it as a true potential*

*scale reduction factor are violated in MrBayes.*

*List of taxa in bipartitions:*

*1 -- P35749*

*2 -- Q13402*

*3 -- Q13459*

*4 -- Q9ULV0*

*5 -- Q9NQX4*

*6 -- Q14324*

*7 -- A2RUH7*

*8 -- O14950*

*9 -- Q6WCQ1*

*10 -- P33176*

*11 -- P19105*

*12 -- Q8WY64*

*13 -- Q14896*

*14 -- Q9Y2K3*

*15 -- Q9UKX2*

*16 -- P12883*

*17 -- O00160*

*18 -- Q9BUA6*

*19 -- Q9Y4I1*

*20 -- P35580*

*21 -- B0I1T2*

*22 -- Q13203*

*23 -- Q02045*

*24 -- P14649*

*25 -- P24844*

*26 -- Q96H55*

*27 -- Q9UM54*

*28 -- Q8NEV4*

*29 -- Q8N1T3*

*30 -- Q9H1R3*

*31 -- Q7Z406*

*32 -- O43795*

*33 -- P13533*

*34 -- O94832*

*35 -- P35579*

*36 -- Q96JP2*

*37 -- Q9HD67*

*38 -- Q86YV6*

*39 -- Q6PIF6*

*40 -- P11055*

*41 -- Q12965*

*42 -- P08590*

*43 -- Q8IUG5*

*44 -- A7E2Y1*

*45 -- Q9Y6X6*

*46 -- Q8WXR4*

*47 -- Q9UBC5*

*48 -- Q9Y623*

*49 -- P12829*

*50 -- P60660*

*51 -- Q32MK0*

*52 -- Q9UKX3*

*53 -- Q9H6N6*

*54 -- O00159*

*55 -- Q15746*

*56 -- P13535*

*57 -- Q92614*

*58 -- Q9UKN7*

*59 -- P12882*

*60 -- B2RTY4*

*61 -- Q00872*

*Key to taxon bipartitions (saved to file "aligned\_data.nxs.parts"):*

*ID -- Partition*

*--------------------------------------------------------------------*

*1 -- .\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\**

*2 -- .\*...........................................................*

*3 -- ..\*..........................................................*

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*56 -- .......................................................\*.....*

*57 -- ........................................................\*....*

*58 -- .........................................................\*...*

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*61 -- ............................................................\**

*62 -- .\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*.\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\**

*63 -- ......\*..............\*.......................................*

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*65 -- .\*\*\*\*\*\*\*\*\*\*\*\*...\*\*\*.\*\*\*\*\*\*\*\*\*\*.\*.\*.\*\*\*\*.\*\*\*.\*\*\*.\*\*\*..\*\*.\*\*.\*\**

*66 -- .\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*.\*\*\*\*\*\*\*\*\*\*\*\*\*\*.\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\**

*67 -- .\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*.\*\*\*\*\*\*\*\*\*\*.\*\*\*.\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\**

*68 -- .......\*..\*......\*....\*\*\*................\*......\*\*...........*

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*82 -- ..\*........................................................\*.*

*83 -- .............\*\*\*................\*......\*...\*...\*...\*...\*..\*..*

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*85 -- .............................\*.......\*............\*..........*

*86 -- .............\*\*\*................\*......\*...\*...\*...\*\*..\*..\*..*

*87 -- ...............................\*..............\*..............*

*88 -- ..............\*........................\*.......\*.......\*..\*..*

*89 -- .....\*\*.....\*........\*......................................\**

*90 -- .......................\*.................\*......\*\*...........*

*91 -- .....\*\*\*\*\*\*.\*....\*...\*\*\*\*....\*.......\*...\*......\*\*\*...\*.....\**

*92 -- ...................................\*.....................\*...*

*93 -- ....................\*............\*...........................*

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*97 -- ................\*...\*.....\*.\*..\*.\*......\*.....\*......\*.......*

*98 -- .......\*..\*.............\*....................................*

*99 -- .......\*..\*......\*....\*.\*....................................*

*100 -- .\*\*\*\*\*\*\*\*\*\*\*\*...\*\*\*.\*\*\*\*\*\*\*\*\*\*.\*.\*.\*\*\*\*.\*\*..\*\*\*.\*\*\*..\*\*..\*.\*\**

*101 -- ...\*\*.............\*......\*...................................*

*102 -- .\*..................................\*.\*......................*

*103 -- ...........................\*................\*\*...............*

*104 -- .\*.................................\*\*.\*..................\*...*

*105 -- .\*..............\*...\*.....\*.\*..\*.\*.\*\*.\*.\*.....\*......\*...\*...*

*106 -- .............................\*....................\*..........*

*107 -- .......\*..\*..................................................*

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*109 -- .....\*......\*................................................*

*110 -- .................\*....\*......................................*

*111 -- .....\*\*\*\*\*\*.\*....\*...\*\*\*\*................\*......\*\*..........\**

*112 -- ............................\*..\*..............\*......\*.......*

*113 -- .\*\*.............\*...\*.....\*\*\*..\*.\*.\*\*.\*.\*...\*\*\*......\*...\*.\*.*

*114 -- .........................................\*......\*............*

*115 -- .\*\*\*\*......\*....\*.\*.\*....\*\*\*\*..\*.\*.\*\*.\*.\*...\*\*\*......\*...\*.\*.*

*116 -- ......\*..............\*......................................\**

*117 -- .......................\*.........................\*...........*

*118 -- .............\*\*\*................\*......\*.......\*...\*...\*..\*..*

*119 -- .............\*.............................\*.................*

*120 -- .........................................\*......\*\*...........*

*121 -- .\*\*........\*....\*...\*.....\*\*\*..\*.\*.\*\*.\*.\*...\*\*\*......\*...\*.\*.*

*122 -- .......................\*........................\*\*...........*

*123 -- .\*\*\*\*...........\*.\*.\*....\*\*\*\*..\*.\*.\*\*.\*.\*...\*\*\*......\*...\*.\*.*

*124 -- ....................\*..........\*.\*............\*..............*

*125 -- .....\*\*.....\*........\*.......\*.......\*............\*...\*.....\**

*126 -- ...\*\*......\*......\*......\*...................................*

*127 -- .\*\*..\*\*\*\*\*\*.\*...\*\*..\*\*\*\*\*.\*\*\*\*.\*.\*.\*\*\*\*.\*\*..\*\*\*.\*\*\*..\*\*..\*.\*\**

*128 -- .....\*\*..............\*......................................\**

*129 -- .......\*..\*...........\*.\*....................................*

*130 -- .\*\*\*\*\*\*\*\*\*\*.\*...\*\*\*.\*\*\*\*\*\*\*\*\*\*.\*.\*.\*\*\*\*.\*\*..\*\*\*.\*\*\*..\*\*..\*.\*\**

*131 -- .....\*\*.....\*........\*.......................................*

*132 -- .....\*......\*...............................................\**

*133 -- ..\*........\*...............\*................\*\*.............\*.*

*134 -- ..\*..\*\*\*\*\*\*.\*....\*...\*\*\*\*..\*.\*.......\*...\*..\*\*..\*\*\*...\*....\*\**

*--------------------------------------------------------------------*

*Summary statistics for informative taxon bipartitions*

*(saved to file "aligned\_data.nxs.tstat"):*

*ID #obs Probab. Sd(s)+ Min(s) Max(s) Nruns*

*-----------------------------------------------------------------*

*62 3002 1.000000 0.000000 1.000000 1.000000 2*

*63 3002 1.000000 0.000000 1.000000 1.000000 2*

*64 3002 1.000000 0.000000 1.000000 1.000000 2*

*65 3002 1.000000 0.000000 1.000000 1.000000 2*

*66 3002 1.000000 0.000000 1.000000 1.000000 2*

*67 3002 1.000000 0.000000 1.000000 1.000000 2*

*68 3002 1.000000 0.000000 1.000000 1.000000 2*

*69 3002 1.000000 0.000000 1.000000 1.000000 2*

*70 3002 1.000000 0.000000 1.000000 1.000000 2*

*71 3002 1.000000 0.000000 1.000000 1.000000 2*

*72 3002 1.000000 0.000000 1.000000 1.000000 2*

*73 3002 1.000000 0.000000 1.000000 1.000000 2*

*74 3002 1.000000 0.000000 1.000000 1.000000 2*

*75 3002 1.000000 0.000000 1.000000 1.000000 2*

*76 3002 1.000000 0.000000 1.000000 1.000000 2*

*77 3002 1.000000 0.000000 1.000000 1.000000 2*

*78 3002 1.000000 0.000000 1.000000 1.000000 2*

*79 3002 1.000000 0.000000 1.000000 1.000000 2*

*80 3002 1.000000 0.000000 1.000000 1.000000 2*

*81 3002 1.000000 0.000000 1.000000 1.000000 2*

*82 3002 1.000000 0.000000 1.000000 1.000000 2*

*83 3002 1.000000 0.000000 1.000000 1.000000 2*

*84 3002 1.000000 0.000000 1.000000 1.000000 2*

*85 3002 1.000000 0.000000 1.000000 1.000000 2*

*86 3002 1.000000 0.000000 1.000000 1.000000 2*

*87 3002 1.000000 0.000000 1.000000 1.000000 2*

*88 3002 1.000000 0.000000 1.000000 1.000000 2*

*89 3002 1.000000 0.000000 1.000000 1.000000 2*

*90 3002 1.000000 0.000000 1.000000 1.000000 2*

*91 3002 1.000000 0.000000 1.000000 1.000000 2*

*92 3002 1.000000 0.000000 1.000000 1.000000 2*

*93 3002 1.000000 0.000000 1.000000 1.000000 2*

*94 3002 1.000000 0.000000 1.000000 1.000000 2*

*95 3002 1.000000 0.000000 1.000000 1.000000 2*

*96 3002 1.000000 0.000000 1.000000 1.000000 2*

*97 3000 0.999334 0.000942 0.998668 1.000000 2*

*98 2997 0.998334 0.001413 0.997335 0.999334 2*

*99 2994 0.997335 0.002827 0.995336 0.999334 2*

*100 2979 0.992338 0.000471 0.992005 0.992672 2*

*101 2968 0.988674 0.008480 0.982678 0.994670 2*

*102 2932 0.976682 0.015075 0.966023 0.987342 2*

*103 2922 0.973351 0.009422 0.966689 0.980013 2*

*104 2908 0.968688 0.016959 0.956696 0.980680 2*

*105 2877 0.958361 0.017430 0.946036 0.970686 2*

*106 2868 0.955363 0.000942 0.954697 0.956029 2*

*107 2834 0.944037 0.001884 0.942705 0.945370 2*

*108 2701 0.899734 0.024968 0.882079 0.917388 2*

*109 2376 0.791472 0.039572 0.763491 0.819454 2*

*110 2366 0.788141 0.001884 0.786809 0.789474 2*

*111 2309 0.769154 0.028737 0.748834 0.789474 2*

*112 2265 0.754497 0.023083 0.738175 0.770819 2*

*113 2201 0.733178 0.040043 0.704863 0.761492 2*

*114 2178 0.725516 0.047109 0.692205 0.758827 2*

*115 2035 0.677881 0.040985 0.648901 0.706862 2*

*116 1995 0.664557 0.005182 0.660893 0.668221 2*

*117 1936 0.644903 0.016959 0.632911 0.656895 2*

*118 1817 0.605263 0.022141 0.589607 0.620919 2*

*119 1184 0.394404 0.022612 0.378414 0.410393 2*

*120 1026 0.341772 0.018844 0.328448 0.355097 2*

*121 956 0.318454 0.007537 0.313125 0.323784 2*

*122 799 0.266156 0.042869 0.235843 0.296469 2*

*123 792 0.263824 0.037687 0.237175 0.290473 2*

*124 736 0.245170 0.023555 0.228514 0.261825 2*

*125 693 0.230846 0.028737 0.210526 0.251166 2*

*126 644 0.214524 0.005653 0.210526 0.218521 2*

*127 616 0.205197 0.060300 0.162558 0.247835 2*

*128 613 0.204197 0.039101 0.176549 0.231845 2*

*129 564 0.187875 0.002827 0.185876 0.189873 2*

*130 542 0.180546 0.039572 0.152565 0.208528 2*

*131 511 0.170220 0.009893 0.163225 0.177215 2*

*132 496 0.165223 0.004711 0.161892 0.168554 2*

*133 367 0.122252 0.016488 0.110593 0.133911 2*

*134 272 0.090606 0.041456 0.061292 0.119920 2*

*-----------------------------------------------------------------*

*+ Convergence diagnostic (standard deviation of split frequencies)*

*should approach 0.0 as runs converge.*

*Summary statistics for branch and node parameters*

*(saved to file "aligned\_data.nxs.vstat"):*

*95% HPD Interval*

*--------------------*

*Parameter Mean Variance Lower Upper Median PSRF+*

*Nruns*

*---------------------------------------------------------------------------------*

*------*

*length[1] 0.146952 0.000090 0.129818 0.166877 0.147086 1.000*

*2*

*length[2] 0.299791 0.000377 0.259099 0.335890 0.299146 1.000*

*2*

*length[3] 0.466438 0.000776 0.409950 0.519265 0.466716 1.000*

*2*

*length[4] 0.285332 0.000296 0.251089 0.316058 0.284740 1.001*

*2*

*length[5] 0.312014 0.000459 0.271589 0.351687 0.310790 1.001*

*2*

*length[6] 0.344526 0.000555 0.298184 0.389646 0.344661 1.002*

*2*

*length[7] 0.263247 0.001172 0.191677 0.327489 0.262182 1.000*

*2*

*length[8] 0.017848 0.000103 0.001613 0.037297 0.015941 1.000*

*2*

*length[9] 0.424457 0.019202 0.155314 0.680403 0.431378 1.002*

*2*

*length[10] 1.010241 0.007533 0.842618 1.177655 1.007863 1.000*

*2*

*length[11] 0.022272 0.000128 0.004382 0.045980 0.020680 1.000*

*2*

*length[12] 1.921380 0.028208 1.608675 2.268183 1.912183 1.000*

*2*

*length[13] 0.322479 0.001004 0.252391 0.383537 0.325469 1.009*

*2*

*length[14] 0.315527 0.000229 0.289162 0.346145 0.315574 1.000*

*2*

*length[15] 0.021962 0.000013 0.015429 0.029388 0.021705 1.001*

*2*

*length[16] 0.036292 0.000024 0.026968 0.045834 0.036019 1.000*

*2*

*length[17] 0.191701 0.000427 0.154889 0.234921 0.190747 1.000*

*2*

*length[18] 0.193724 0.003049 0.078469 0.298764 0.195883 1.000*

*2*

*length[19] 0.191538 0.000190 0.165195 0.218456 0.191356 1.000*

*2*

*length[20] 0.096822 0.000070 0.080721 0.113688 0.096658 1.003*

*2*

*length[21] 0.311374 0.000688 0.256689 0.361330 0.310973 1.002*

*2*

*length[22] 0.212442 0.001240 0.144456 0.283724 0.210895 1.000*

*2*

*length[23] 0.230607 0.002250 0.148278 0.330413 0.227591 1.001*

*2*

*length[24] 0.181310 0.002880 0.075653 0.285698 0.182517 1.000*

*2*

*length[25] 0.035807 0.000357 0.000910 0.070225 0.033706 1.000*

*2*

*length[26] 0.858795 0.002812 0.759298 0.961801 0.859874 1.001*

*2*

*length[27] 0.811357 0.002020 0.728296 0.904606 0.809332 1.004*

*2*

*length[28] 0.263899 0.000584 0.212475 0.307874 0.263711 1.000*

*2*

*length[29] 0.313847 0.000591 0.267376 0.361996 0.313615 1.001*

*2*

*length[30] 0.511384 0.002051 0.428165 0.608094 0.511473 1.000*

*2*

*length[31] 0.262115 0.000254 0.232224 0.295523 0.261728 1.006*

*2*

*length[32] 0.259074 0.000513 0.216260 0.303725 0.257440 1.001*

*2*

*length[33] 0.037776 0.000025 0.027944 0.047582 0.037517 1.002*

*2*

*length[34] 0.226299 0.000575 0.181740 0.278104 0.225802 1.001*

*2*

*length[35] 0.125707 0.000079 0.106632 0.141279 0.125823 1.000*

*2*

*length[36] 0.772087 0.001769 0.695800 0.857310 0.771777 1.001*

*2*

*length[37] 0.911440 0.001419 0.839895 0.984347 0.910998 1.002*

*2*

*length[38] 0.267844 0.001728 0.188203 0.349313 0.268073 1.000*

*2*

*length[39] 0.338199 0.000386 0.295881 0.375935 0.337989 1.000*

*2*

*length[40] 0.104599 0.000065 0.089841 0.120582 0.104413 1.000*

*2*

*length[41] 0.144941 0.000352 0.106646 0.181410 0.145185 1.002*

*2*

*length[42] 0.117850 0.001885 0.019472 0.192462 0.120692 1.005*

*2*

*length[43] 0.591420 0.001058 0.530095 0.655655 0.591878 1.000*

*2*

*length[44] 0.190035 0.000184 0.165823 0.217498 0.189216 1.000*

*2*

*length[45] 0.955674 0.002994 0.853833 1.059858 0.955689 1.003*

*2*

*length[46] 0.321446 0.000666 0.269961 0.372131 0.321809 1.000*

*2*

*length[47] 0.301828 0.000593 0.255322 0.349796 0.300597 1.001*

*2*

*length[48] 0.043934 0.000023 0.035746 0.054752 0.043752 1.002*

*2*

*length[49] 0.091783 0.000723 0.039290 0.144011 0.090315 1.000*

*2*

*length[50] 0.069013 0.000687 0.023236 0.121027 0.066493 1.001*

*2*

*length[51] 0.414121 0.001919 0.334037 0.501130 0.413868 1.004*

*2*

*length[52] 0.118747 0.000066 0.103682 0.134795 0.118855 1.000*

*2*

*length[53] 0.340826 0.000633 0.294226 0.391578 0.338553 1.000*

*2*

*length[54] 0.221281 0.000465 0.177660 0.261275 0.221468 1.001*

*2*

*length[55] 0.566165 0.003425 0.446182 0.675261 0.565961 1.000*

*2*

*length[56] 0.036725 0.000024 0.027145 0.046184 0.036448 1.001*

*2*

*length[57] 0.371290 0.000852 0.318005 0.433170 0.371443 1.002*

*2*

*length[58] 0.418403 0.000992 0.358931 0.486702 0.417919 1.000*

*2*

*length[59] 0.013432 0.000008 0.007964 0.018963 0.013201 1.001*

*2*

*length[60] 0.387569 0.000660 0.337476 0.436981 0.386675 1.002*

*2*

*length[61] 0.317788 0.000993 0.254775 0.377604 0.318211 1.002*

*2*

*length[62] 0.038632 0.000039 0.026807 0.050674 0.038360 1.000*

*2*

*length[63] 0.320797 0.002474 0.222862 0.417941 0.323533 1.000*

*2*

*length[64] 0.526427 0.001695 0.444997 0.604556 0.527083 1.002*

*2*

*length[65] 0.207131 0.000815 0.153775 0.263747 0.205810 1.000*

*2*

*length[66] 0.063860 0.000137 0.039936 0.085745 0.063215 1.000*

*2*

*length[67] 0.377236 0.000583 0.330762 0.424592 0.376981 1.000*

*2*

*length[68] 1.133938 0.046516 0.739227 1.574543 1.117401 1.004*

*2*

*length[69] 0.407526 0.001478 0.338045 0.486634 0.406832 1.001*

*2*

*length[70] 0.461175 0.005487 0.307426 0.603316 0.459374 1.000*

*2*

*length[71] 0.400852 0.006782 0.247421 0.574678 0.399877 1.000*

*2*

*length[72] 0.099342 0.000290 0.065005 0.132097 0.099126 1.000*

*2*

*length[73] 0.273991 0.001072 0.211403 0.339723 0.273174 1.000*

*2*

*length[74] 0.314003 0.000820 0.258880 0.369332 0.312929 1.000*

*2*

*length[75] 0.493481 0.021372 0.207436 0.773081 0.487487 1.000*

*2*

*length[76] 0.439636 0.001067 0.380123 0.503764 0.438995 1.001*

*2*

*length[77] 0.688005 0.001530 0.607441 0.764285 0.687272 1.000*

*2*

*length[78] 0.117564 0.000630 0.070650 0.168300 0.116322 1.002*

*2*

*length[79] 0.097064 0.000117 0.076545 0.118496 0.096719 1.002*

*2*

*length[80] 0.383959 0.000959 0.326442 0.444423 0.384297 1.000*

*2*

*length[81] 0.057431 0.000040 0.045224 0.070469 0.057241 1.000*

*2*

*length[82] 0.472590 0.001269 0.405251 0.544550 0.473316 1.002*

*2*

*length[83] 0.102532 0.000289 0.070924 0.137307 0.102541 1.000*

*2*

*length[84] 0.065449 0.000054 0.052200 0.080410 0.065410 1.003*

*2*

*length[85] 0.376678 0.004195 0.255011 0.498358 0.374999 1.000*

*2*

*length[86] 0.286781 0.000591 0.238156 0.331412 0.286752 1.000*

*2*

*length[87] 0.268587 0.000767 0.215836 0.325551 0.268764 1.002*

*2*

*length[88] 0.024515 0.000021 0.016017 0.033739 0.024148 1.000*

*2*

*length[89] 0.853560 0.010490 0.658353 1.049103 0.850913 1.003*

*2*

*length[90] 0.826233 0.029943 0.475694 1.154369 0.814593 1.001*

*2*

*length[91] 0.880462 0.008433 0.697300 1.058877 0.879398 1.001*

*2*

*length[92] 0.449685 0.001395 0.379612 0.520930 0.450981 1.000*

*2*

*length[93] 0.432801 0.001151 0.369461 0.500666 0.432099 1.000*

*2*

*length[94] 0.038821 0.000027 0.028984 0.049199 0.038696 1.000*

*2*

*length[95] 0.018136 0.000014 0.011367 0.025789 0.017995 1.000*

*2*

*length[96] 0.018736 0.000011 0.012488 0.025248 0.018540 1.000*

*2*

*length[97] 0.117148 0.000825 0.064055 0.175669 0.116262 1.000*

*2*

*length[98] 0.291549 0.009166 0.111262 0.480699 0.286416 1.000*

*2*

*length[99] 0.563572 0.024773 0.272078 0.875082 0.556161 1.004*

*2*

*length[100] 0.185839 0.003172 0.083693 0.304506 0.181488 1.001*

*2*

*length[101] 0.179681 0.001567 0.101748 0.257588 0.181388 1.000*

*2*

*length[102] 0.119126 0.000547 0.076230 0.165427 0.119327 1.000*

*2*

*length[103] 0.176225 0.001474 0.103391 0.251071 0.177373 1.000*

*2*

*length[104] 0.126205 0.000664 0.074830 0.176521 0.125787 1.003*

*2*

*length[105] 0.136622 0.000654 0.091767 0.189893 0.136222 1.002*

*2*

*length[106] 0.121302 0.001635 0.047189 0.203547 0.118896 1.000*

*2*

*length[107] 0.031266 0.000305 0.002184 0.064426 0.028540 1.000*

*2*

*length[108] 0.152559 0.001484 0.074154 0.227667 0.156607 1.002*

*2*

*length[109] 0.068517 0.000638 0.021313 0.119017 0.068320 1.000*

*2*

*length[110] 0.170600 0.006095 0.014963 0.310579 0.162978 1.000*

*2*

*length[111] 0.291259 0.005762 0.141865 0.429087 0.288873 1.000*

*2*

*length[112] 0.083612 0.000456 0.041433 0.124716 0.083090 1.000*

*2*

*length[113] 0.126062 0.001614 0.040264 0.196521 0.132059 1.000*

*2*

*length[114] 0.138961 0.003452 0.028655 0.247434 0.142335 1.000*

*2*

*length[115] 0.127422 0.001943 0.045958 0.216570 0.127999 1.000*

*2*

*length[116] 0.061896 0.000973 0.003713 0.116936 0.058881 1.003*

*2*

*length[117] 0.144238 0.003866 0.021311 0.250499 0.146576 1.001*

*2*

*length[118] 0.033646 0.000068 0.017003 0.048818 0.033553 0.999*

*2*

*length[119] 0.032204 0.000061 0.017446 0.047192 0.031986 1.008*

*2*

*length[120] 0.088940 0.001810 0.010496 0.168231 0.085282 1.004*

*2*

*length[121] 0.093981 0.003360 0.000330 0.173491 0.105792 0.999*

*2*

*length[122] 0.078940 0.001478 0.000444 0.141280 0.077000 1.006*

*2*

*length[123] 0.063736 0.002169 0.000103 0.149943 0.056837 0.999*

*2*

*length[124] 0.079521 0.000428 0.040918 0.120254 0.079116 1.002*

*2*

*length[125] 0.248955 0.004917 0.137129 0.408085 0.246571 0.999*

*2*

*length[126] 0.045070 0.001639 0.000007 0.123280 0.034761 0.999*

*2*

*length[127] 0.123086 0.002064 0.038365 0.208418 0.127672 1.001*

*2*

*length[128] 0.060145 0.000672 0.015589 0.111374 0.058750 0.999*

*2*

*length[129] 0.098514 0.002556 0.001405 0.192486 0.093132 1.002*

*2*

*length[130] 0.088327 0.003243 0.002722 0.195361 0.080968 0.998*

*2*

*length[131] 0.046770 0.000811 0.000074 0.098830 0.042712 1.000*

*2*

*length[132] 0.061825 0.001486 0.000072 0.129385 0.056647 1.004*

*2*

*length[133] 0.137794 0.002487 0.007639 0.202848 0.147507 1.004*

*2*

*length[134] 0.085281 0.001461 0.014770 0.146092 0.083625 0.997*

*2*

*---------------------------------------------------------------------------------*

*------*

*+ Convergence diagnostic (PSRF = Potential Scale Reduction Factor; Gelman*

*and Rubin, 1992) should approach 1.0 as runs converge. NA is reported when*

*deviation of parameter values within all runs is 0 or when a parameter*

*value (a branch length, for instance) is not sampled in all runs.*

*Summary statistics for partitions with frequency >= 0.10 in at least one run:*

*Average standard deviation of split frequencies = 0.010525*

*Maximum standard deviation of split frequencies = 0.060300*

*Average PSRF for parameter values (excluding NA and >10.0) = 1.001*

*Maximum PSRF for parameter values = 1.009*

*Clade credibility values:*

*Subtree rooted at node 116:*

*/----- Q13402 (2)*

*/-100+*

*| \----- Q6PIF6 (39)*

*/-98-+*

*| \---------- Q9HD67 (37)*

*/-------97------+*

*| | /----- Q96JP2 (36)*

*| \---100---+*

*| \----- Q9UKN7 (58)*

*|*

*| /----- O00160 (17)*

*| /------100------+*

*| | \----- Q12965 (41)*

*/-96-+ |*

*| | | /----- B0I1T2 (21)*

*| | /-100+ /---100---+*

*| | | | | \----- O94832 (34)*

*| | | | |*

*| | | \-100-+ /----- Q8N1T3 (29)*

*| | | | /-100+*

*| | | | | \----- O00159 (54)*

*| \-100+ \-75-+*

*| | | /----- O43795 (32)*

*/-73-+ | \-100+*

*| | | \----- Q9UBC5 (47)*

*| | |*

*| | \-------------------------- Q9UM54 (27)*

*| |*

*| | /----- Q13459 (3)*

*| | /---100---+*

*| | | \----- B2RTY4 (60)*

*| | |*

*| \---------90---------+ /----- Q8NEV4 (28)*

*| | /-100+*

*| | | \----- Q8WXR4 (46)*

*/-68-+ \-97-+*

*| | \---------- Q9Y6X6 (45)*

*| |*

*| | /----- Q9ULV0 (4)*

*| | /-100+*

*| | | \----- Q9Y4I1 (19)*

*| | /-100+*

*| | | \---------- Q9NQX4 (5)*

*| |------------99-----------+*

*| | \--------------- Q96H55 (26)*

*| |*

*| \----------------------------------------- Q8WY64 (12)*

*|*

*| /----- Q14324 (6)*

*| /----79---+*

*| | \----- Q14896 (13)*

*| |*

*| /---------100--------+ /----- A2RUH7 (7)*

*| | | /-100+*

*| | | | \----- Q13203 (22)*

*/--99-+ | \-66-+*

*| | | \---------- Q00872 (61)*

*| | |*

*| | | /----- O14950 (8)*

*| | | /-94-+*

*| | | | \----- P19105 (11)*

*| | | /-100+*

*| | | | \---------- P24844 (25)*

*| | | /-100-+*

*| | /-77-+ | | /----- Q9BUA6 (18)*

*| | | | | \----79---+*

*| | | | | \----- Q02045 (23)*

*| | | | /-100+*

*| | | | | | /----- P14649 (24)*

*| | | | | | /-64-+*

*| | | | | | | \----- P60660 (50)*

*| | | | | \----100---+*

*/-100+ | | | /-100+ | /----- P08590 (42)*

*| | | | | | | \-73-+*

*| | | | | | | \----- P12829 (49)*

*| | \-100+ \-100+ |*

*| | | | \-------------------------- Q6WCQ1 (9)*

*| | | |*

*| | | \------------------------------- P33176 (10)*

*| | |*

*| | | /----- Q9H1R3 (30)*

*| | | /-96-+*

*| | | | \----- Q32MK0 (51)*

*| | | /-100+*

*| | | | \---------- Q86YV6 (38)*

*| | \-----------100-----------+*

*| | \--------------- Q15746 (55)*

*| |*

*| | /----- Q8IUG5 (43)*

*| \----------------------100---------------------+*

*| \----- Q92614 (57)*

*/-100+*

*| | /------------------------------------ Q9Y2K3 (14)*

*| | |*

*| | | /---------- Q9UKX2 (15)*

*| | | |*

*| | | /-100+ /----- Q9Y623 (48)*

*| | | | \-100+*

*| | | /-100-+ \----- P12882 (59)*

*| | /-61-+ | |*

*| | | | /-100+ \--------------- P13535 (56)*

*| | | | | |*

*| | | | /-100+ \--------------------- P11055 (40)*

*--100+ | | | | |*

*| | | | | \-------------------------- Q9UKX3 (52)*

*| | /-100+ \-100+*

*| | | | | /----- P12883 (16)*

*| | | | \-----------100-----------+*

*| | | | \----- P13533 (33)*

*| \----100---+ |*

*| | \----------------------------------------- A7E2Y1 (44)*

*| |*

*| \---------------------------------------------- Q9H6N6 (53)*

*|*

*\-------------------------------------------------------------- Q7Z406 (31)*

*Root part of tree:*

*/------------------------------------------------------------------- P35749 (1)*

*|*

*|------------------------------------------------------------------- P35579 (35)*

*+*

*| /--------------------------------- (116)*

*\---------------100---------------+*

*\--------------------------------- P35580 (20)*

*Phylogram (based on average branch lengths):*

*/-- P35749 (1)*

*|*

*|-- P35579 (35)*

*|*

*| /---- Q13402 (2)*

*| /----+*

*| | \----- Q6PIF6 (39)*

*| /+*

*| |\------------ Q9HD67 (37)*

*| /-+*

*| | | /---------- Q96JP2 (36)*

*| | \-----+*

*| | \----- Q9UKN7 (58)*

*| |*

*| | /-- O00160 (17)*

*| | /-----+*

*| | | \-- Q12965 (41)*

*| /+ |*

*| || | /---- B0I1T2 (21)*

*| || /--+ /----+*

*| || | | | \--- O94832 (34)*

*| || | | |*

*| || | \-+ /---- Q8N1T3 (29)*

*| || | |/---+*

*| || | || \--- O00159 (54)*

*| |\-+ \+*

*| | | | /---- O43795 (32)*

*| /-+ | \--+*

*| | | | \---- Q9UBC5 (47)*

*| | | |*

*| | | \---------- Q9UM54 (27)*

*| | |*

*| | | /------ Q13459 (3)*

*| | | /-----+*

*| | | | \----- B2RTY4 (60)*

*| | | |*

*| | \-+ /--- Q8NEV4 (28)*

*| | | /------+*

*| | | | \---- Q8WXR4 (46)*

*| /-+ \-+*

*| | | \------------ Q9Y6X6 (45)*

*| | |*

*| | | /--- Q9ULV0 (4)*

*| | | /-+*

*| | | | \-- Q9Y4I1 (19)*

*| | | /----+*

*| | | | \---- Q9NQX4 (5)*

*| | |-+*

*| | | \----------- Q96H55 (26)*

*| | |*

*| | \------------------------- Q8WY64 (12)*

*| |*

*| | /----- Q14324 (6)*

*| | /+*

*| | |\---- Q14896 (13)*

*| | |*

*| | /----------+ /---- A2RUH7 (7)*

*+ | | |/---+*

*| | | || \--- Q13203 (22)*

*| /-+ | \+*

*| | | | \---- Q00872 (61)*

*| | | |*

*| | | | /- O14950 (8)*

*| | | | |*

*| | | | |- P19105 (11)*

*| | | | /---+*

*| | | | | \- P24844 (25)*

*| | | | /------+*

*| | | /--+ | | /-- Q9BUA6 (18)*

*| | | | | | \--+*

*| | | | | | \-- Q02045 (23)*

*| | | | | /-------------+*

*| | | | | | | /-- P14649 (24)*

*| | | | | | | /-+*

*| | | | | | | | \- P60660 (50)*

*| | | | | | \----------+*

*| /--+ | | | /------+ | /- P08590 (42)*

*| | | | | | | | \-+*

*| | | | | | | | \- P12829 (49)*

*| | | \-----------+ \----+ |*

*| | | | | \----- Q6WCQ1 (9)*

*| | | | |*

*| | | | \------------- P33176 (10)*

*| | | |*

*| | | | /------ Q9H1R3 (30)*

*| | | | /-+*

*| | | | | \----- Q32MK0 (51)*

*| | | | /---+*

*| | | | | \---- Q86YV6 (38)*

*| | | \-----+*

*| | | \------- Q15746 (55)*

*| | |*

*| | | /------- Q8IUG5 (43)*

*| | \--------+*

*| | \----- Q92614 (57)*

*|/----+*

*|| | /---- Q9Y2K3 (14)*

*|| | |*

*|| | | / Q9UKX2 (15)*

*|| | | |*

*|| | | /+ Q9Y623 (48)*

*|| | | ||*

*|| | | |\ P12882 (59)*

*|| | /+ |*

*|| | || |- P13535 (56)*

*|| | || |*

*|| | ||/+- P11055 (40)*

*|+ | ||||*

*|| | |||\- Q9UKX3 (52)*

*|| | /+\+*

*|| | || |/ P12883 (16)*

*|| | || \+*

*|| | || \ P13533 (33)*

*|| \---+|*

*|| |\--- A7E2Y1 (44)*

*|| |*

*|| \---- Q9H6N6 (53)*

*||*

*|\---- Q7Z406 (31)*

*|*

*\-- P35580 (20)*

*|-----------| 1.000 expected changes per site*

*Calculating tree probabilities...*

*Credible sets of trees (1558 trees sampled):*

*50 % credible set contains 278 trees*

*90 % credible set contains 1258 trees*

*95 % credible set contains 1408 trees*

*99 % credible set contains 1528 trees*

*MrBayes >*