BEAST2 workflow

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Tools needed

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BEAST2: Software implementing MCMC for model parameter and tree inference

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Tree Annotator: Tool for summarising BEAST2 output files (.trees)

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FigTree/IcyTree/DensiTree: Tools for visualisation of trees (.trees)

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FigTree/IcyTree/DensiTree: Tools for visualisation of trees (.trees)

R(+RStudio)/Python/Matlab/etc: Post analysis, plotting, etc.

Workflow

Workflow

Workflow

Workflow

ACACACCC

TCACACCT

ACAGACTT

Tracer

BEAUti

BEAST2

log file

xml file

Workflow

ACACACCC

TCACACCT

ACAGACTT

Tracer

TreeAnnotator

log file

trees file

BEAUti

xml file

BEAST2

BEAUti

Bayesian **E**volutionary **A**nalysis **Uti**lity

GUI for setting up BEAST2 input file in xml format.

Input:
   Sequence alignment

Output:
   XML file

BEAUti

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BEAST2

Bayesian evolutionary analysis by sampling trees 2

Performs MCMC analyses of sequences under selected sequence evolution and tree model;

Planned as an extension of BEAST1, but now a separate package;

Has a modular design that makes it easy to extend.

Input:
    XML file

Output:
    log file
    trees file

BEAST2

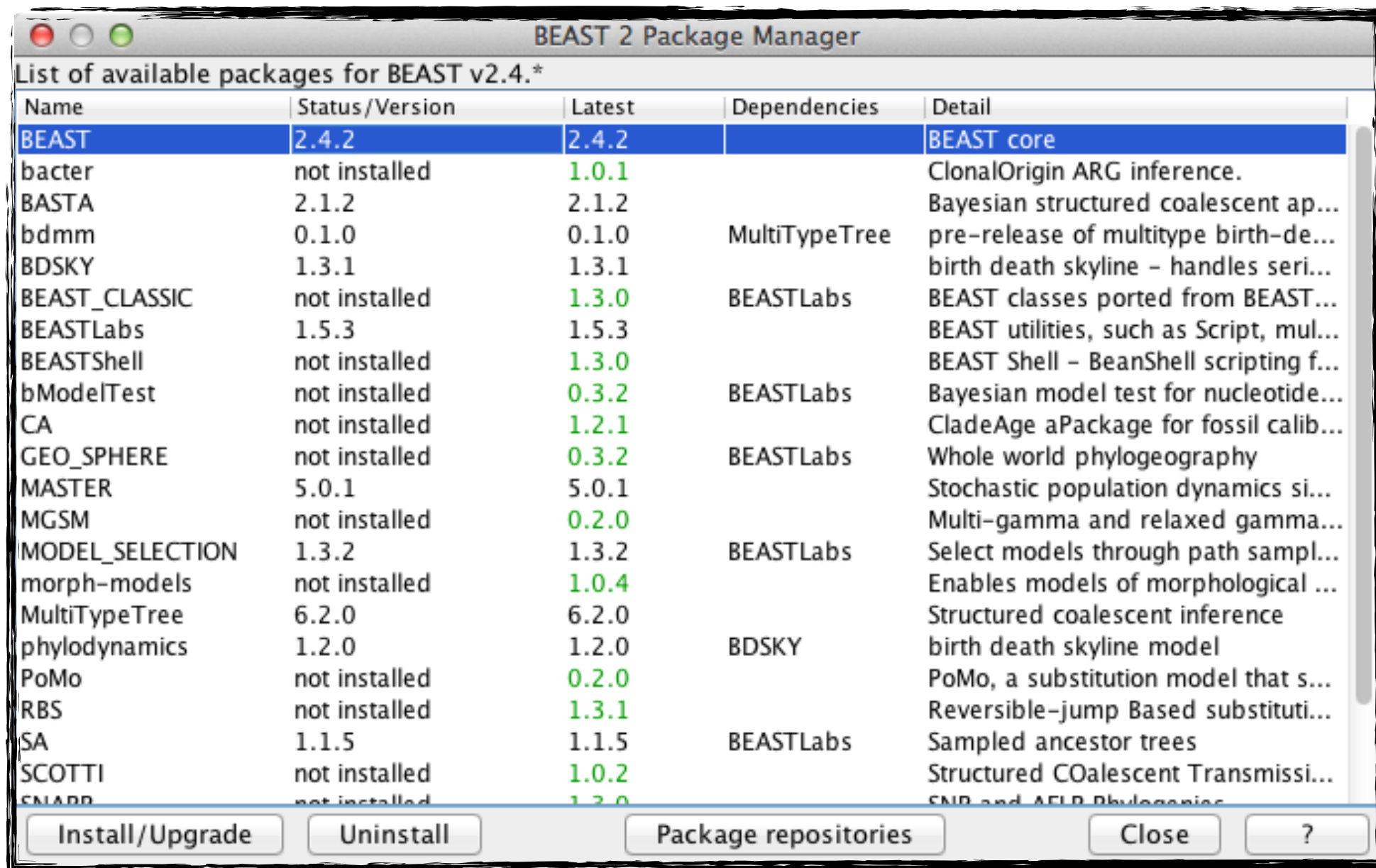|	BEAST 2.1	BEAST 1.8
COALESCENT TREE PRIORS		
Constant size	Drummond 2002	Drummond 2002
Exponential growth	Drummond 2002	Drummond 2002
Bayesian skyline	Drummond 2005	Drummond 2005
Extended Bayesian skyline	Heled 2008	Heled 2008
Bayesian skygrid	X	Gill 2013
Deterministic closed SIR	In preparation	Dearlove 2013
BIRTH-DEATH TREE PRIORS		
Yule		
Yule with one calibration	Heled 2012	
Birth-death		
Calibrated birth-death	Heled 2013	X
Birth-death with incomplete sampling		X
Birth-death serial sampling	Stadler 2012	X
Birth-death serial skyline	Stadler 2013	X
Birth-death SIR	Kuhnert 2013	X
AND MORE		
…		

BEAST2

BEAUti – installing BEAST2 packages

In BEAUti: File > Manage Packages

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In BEAUti: File > Manage Packages

Tracer

Summarises log files from BEAST2 runs;

Allows to check mixing, ESS, parameter correlations;

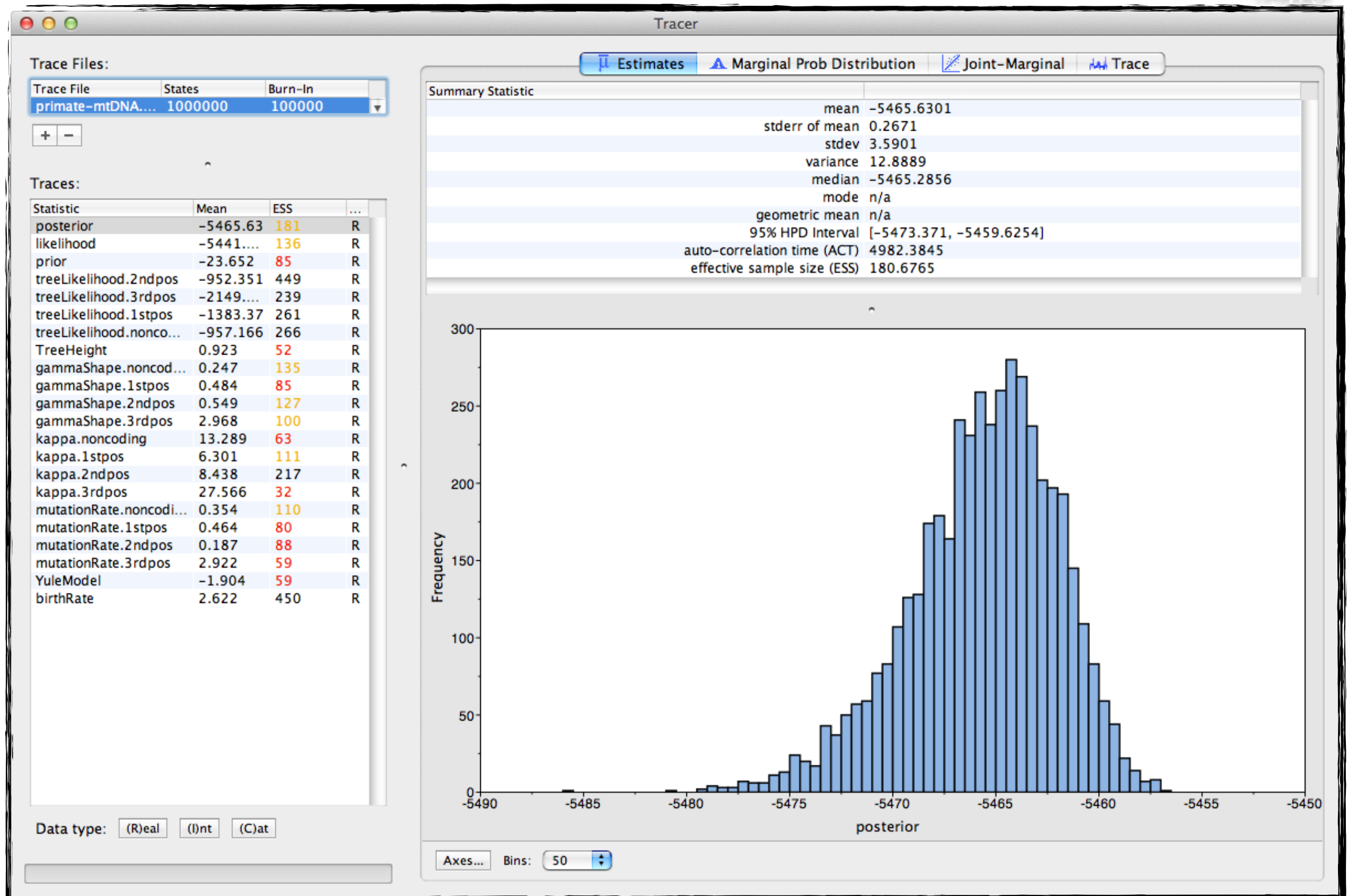Gives an overview of posterior parameter estimates;
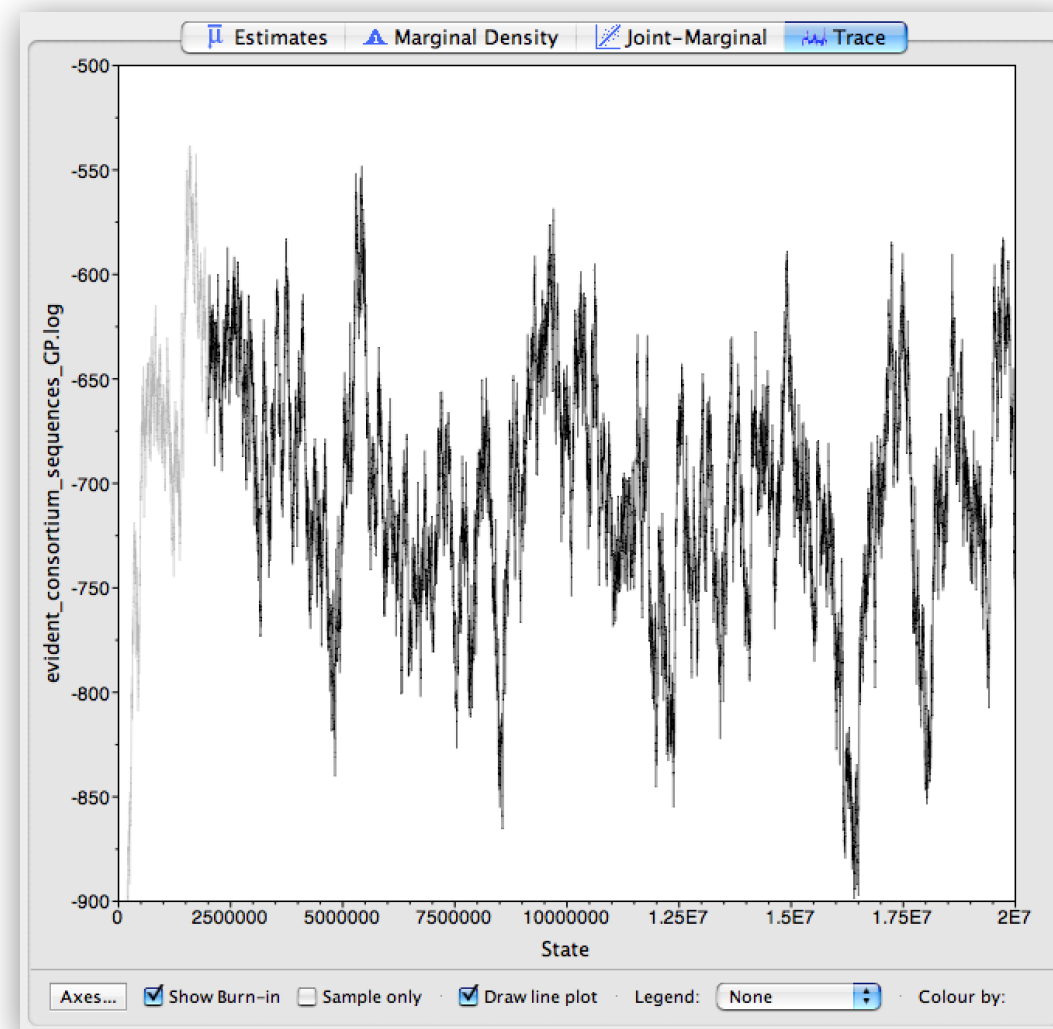
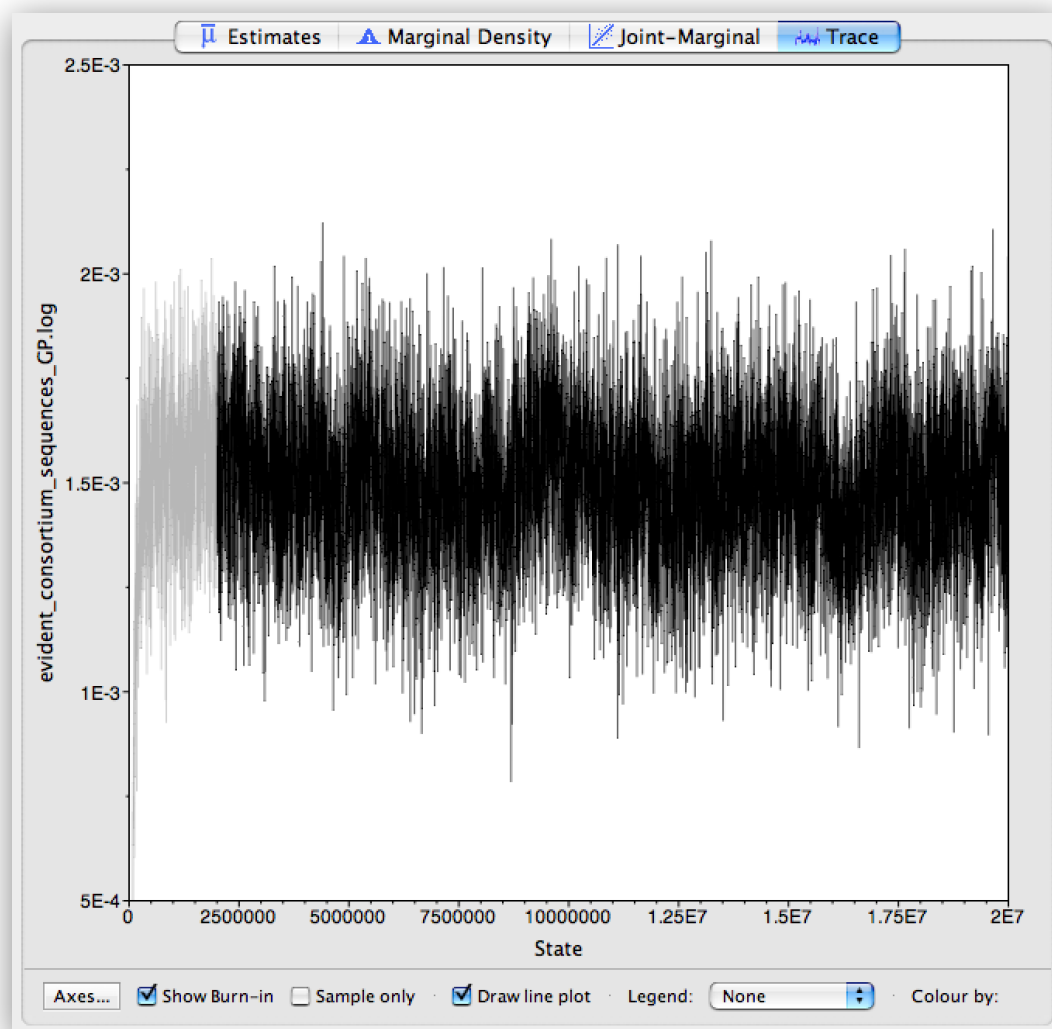Lets one compare results of several analyses.

Input:
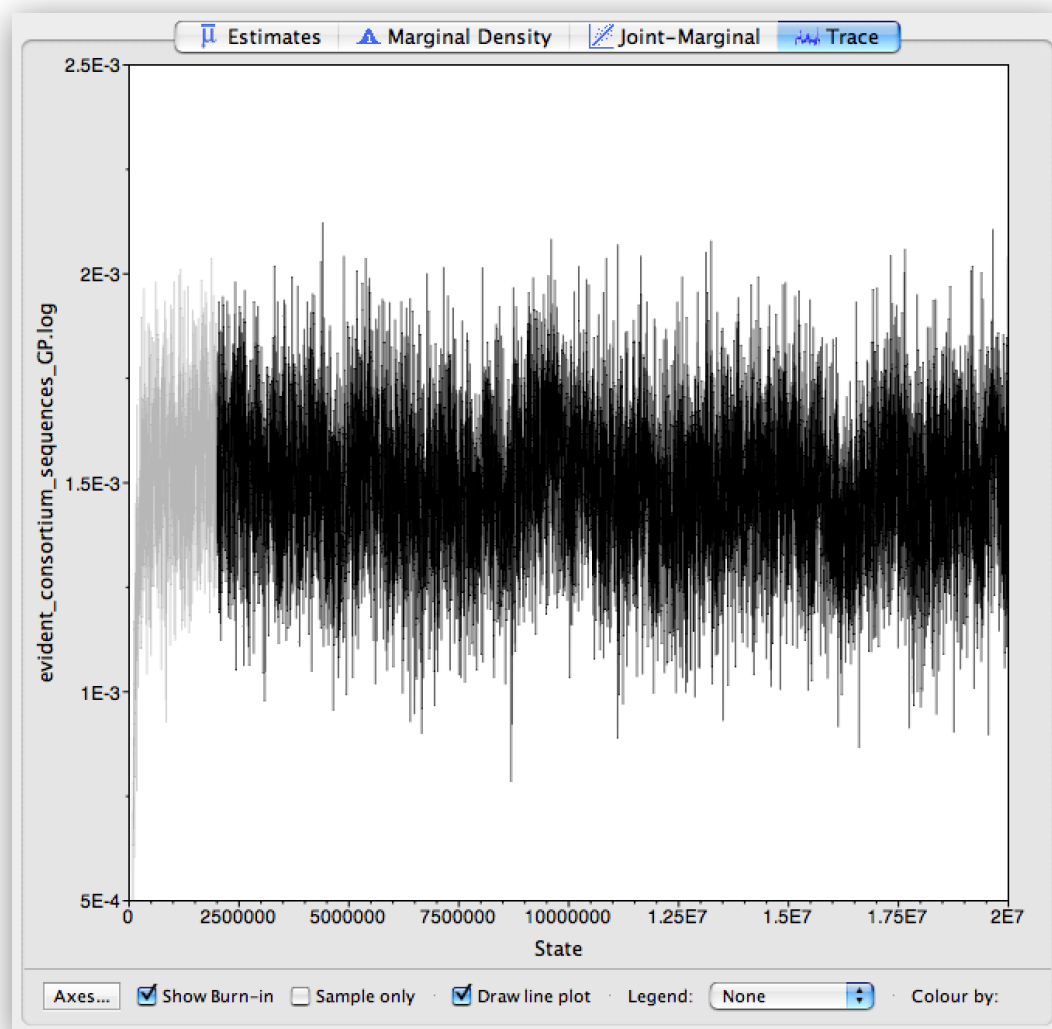   log file

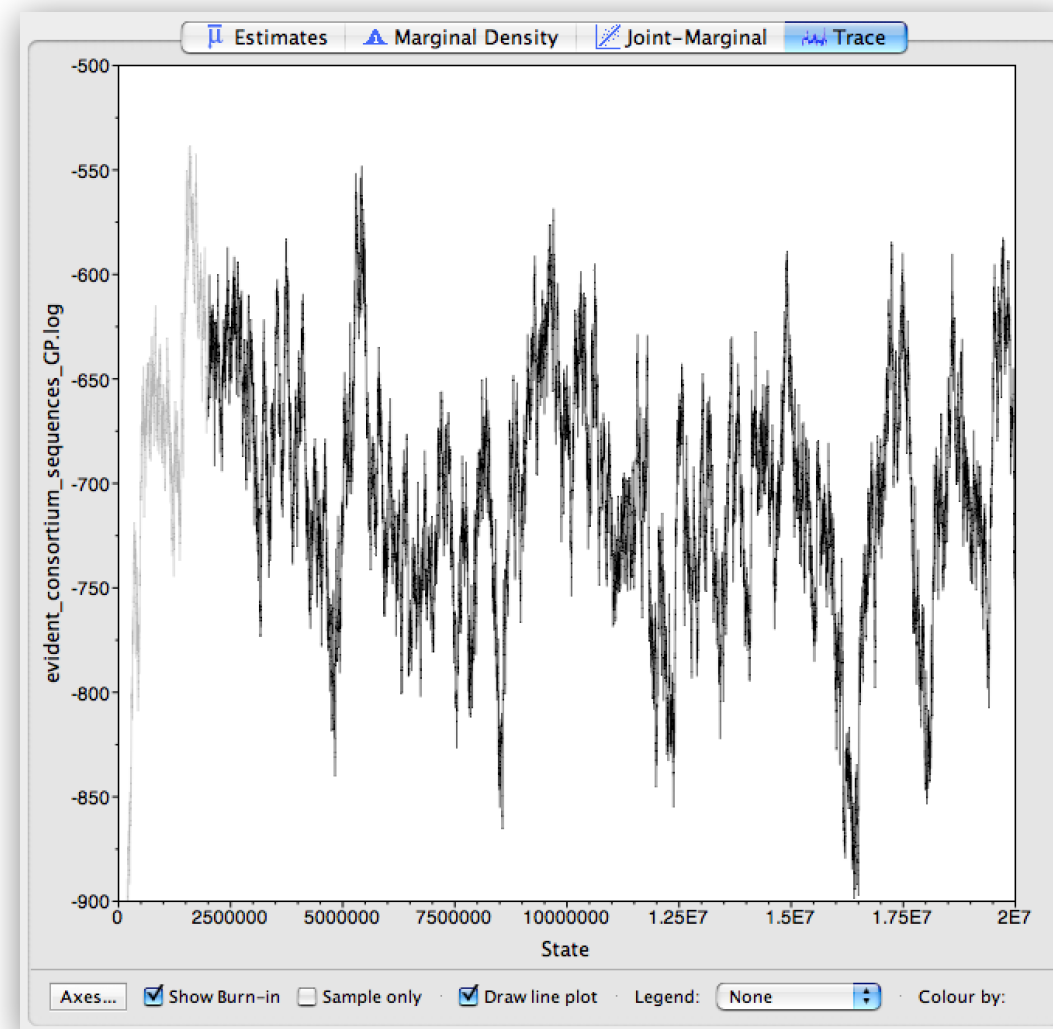**Output:**
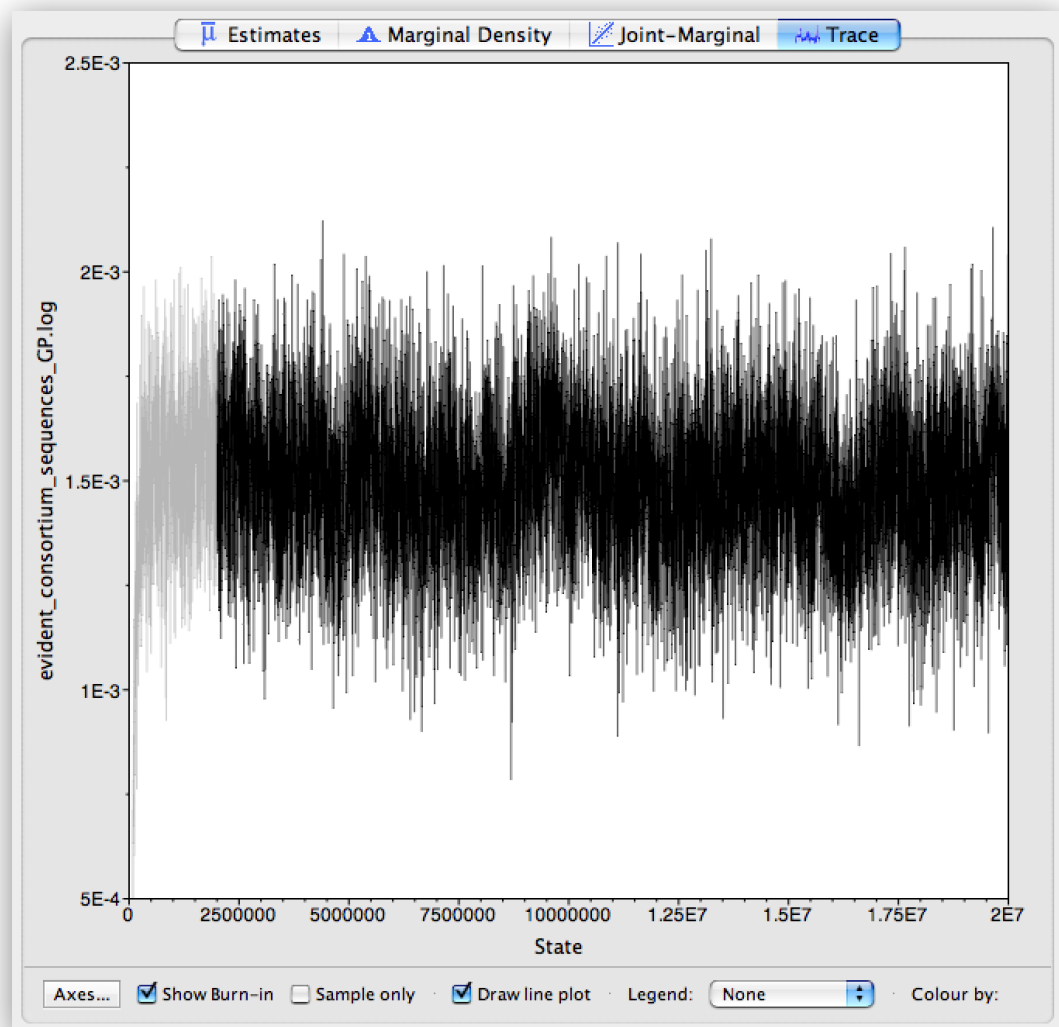   insight
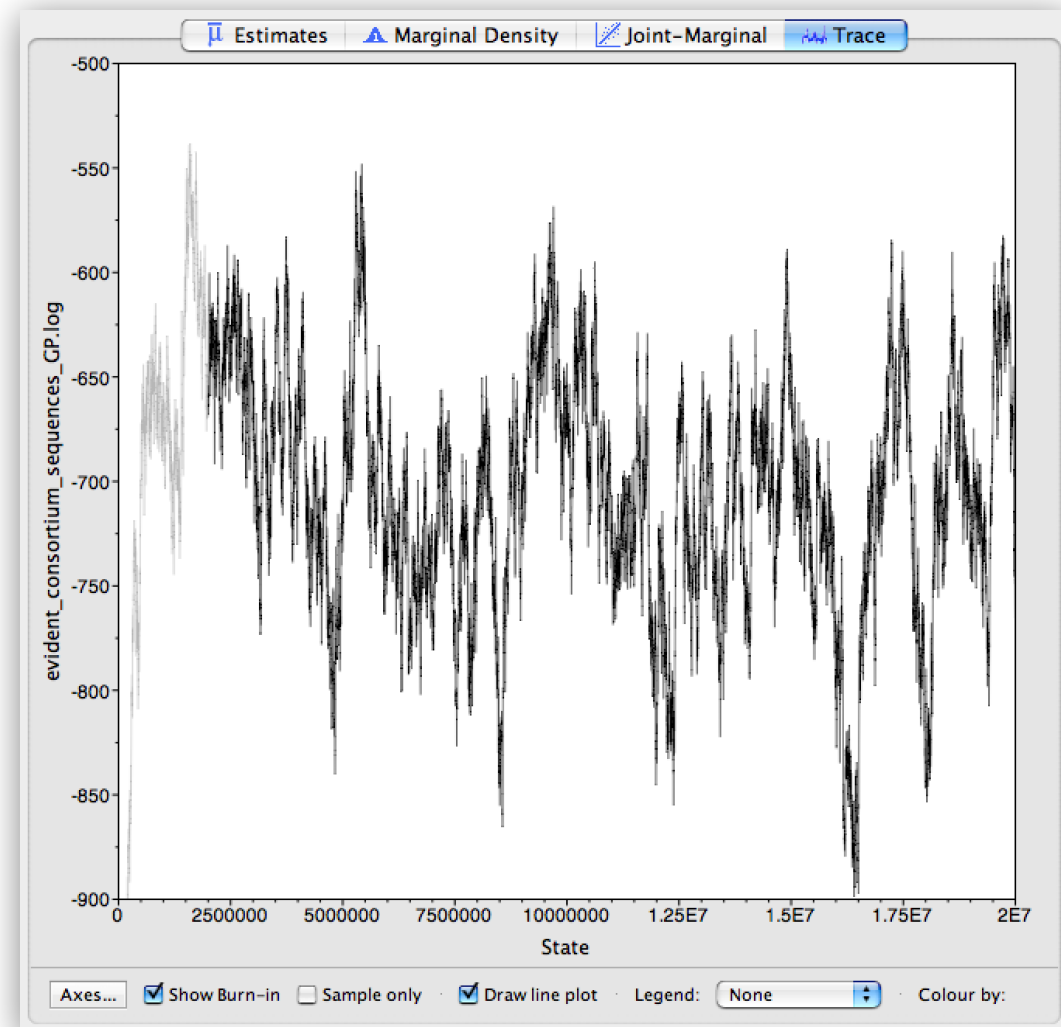
Tracer

Tracer

Tracer

Mixing well! 😄

Tracer

Mixing well! 😄

Not mixing! 😭

TreeAnnotator

Analyse trees file from BEAST2 runs;

Produces Maximum Clade Credibility (MCC tree) with node annotations (posterior probability);

Input:
trees file

Output:
summary (MCC) tree

TreeAnnotator

FigTree

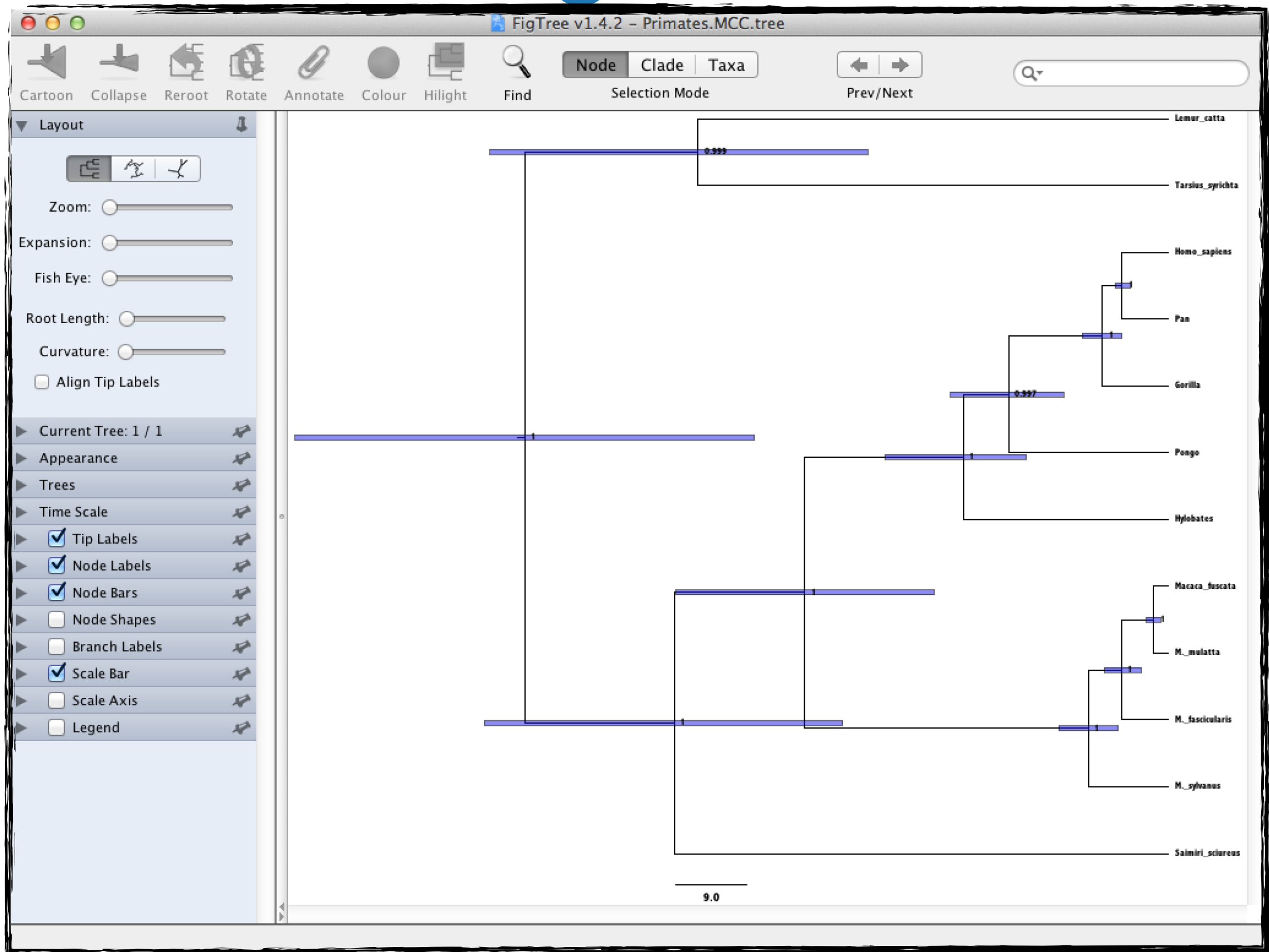View tree sets and summary trees from BEAST2 runs.
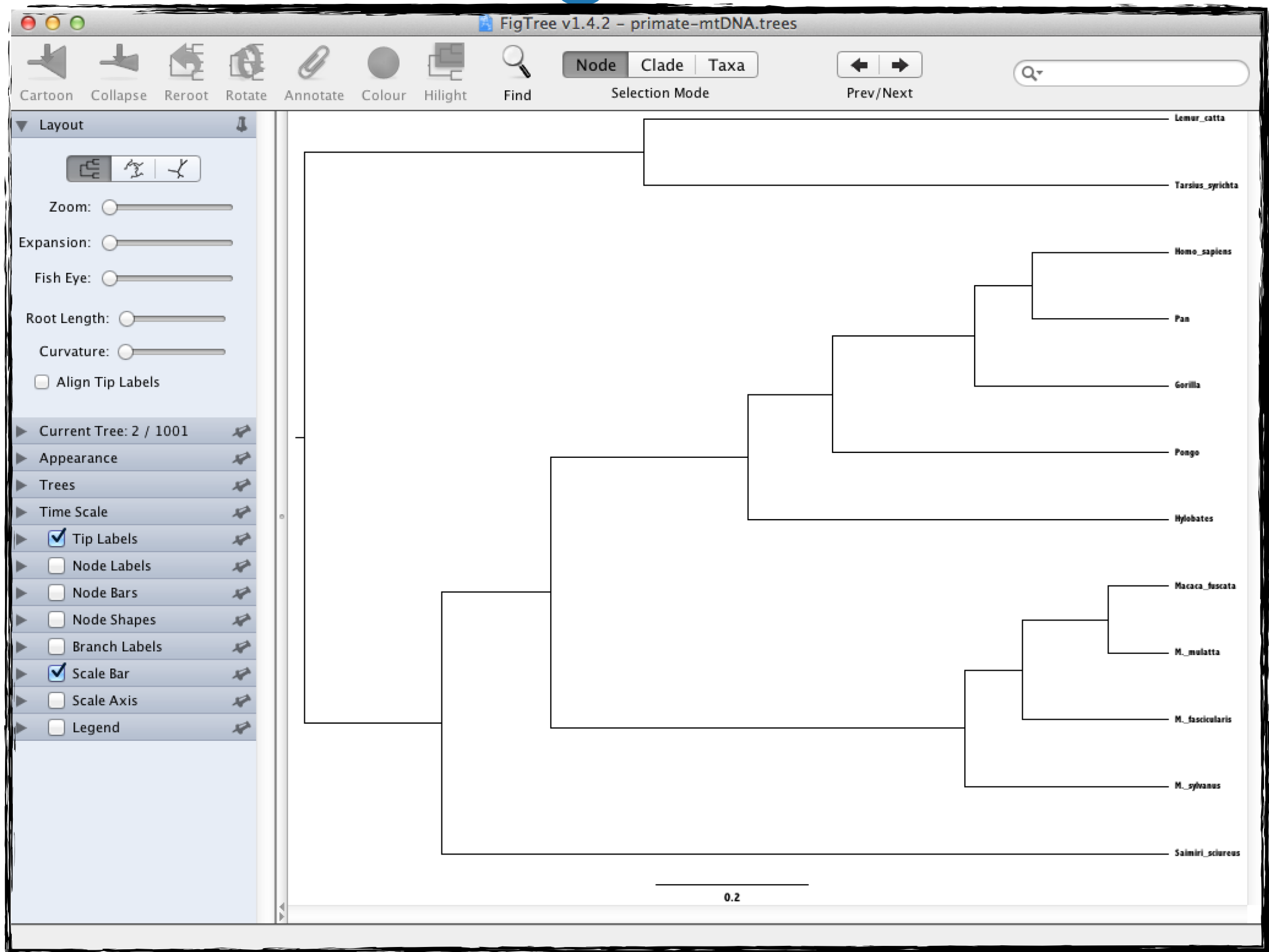
Input:
 trees file

Output:
 insight

FigTree

FigTree

DensiTree

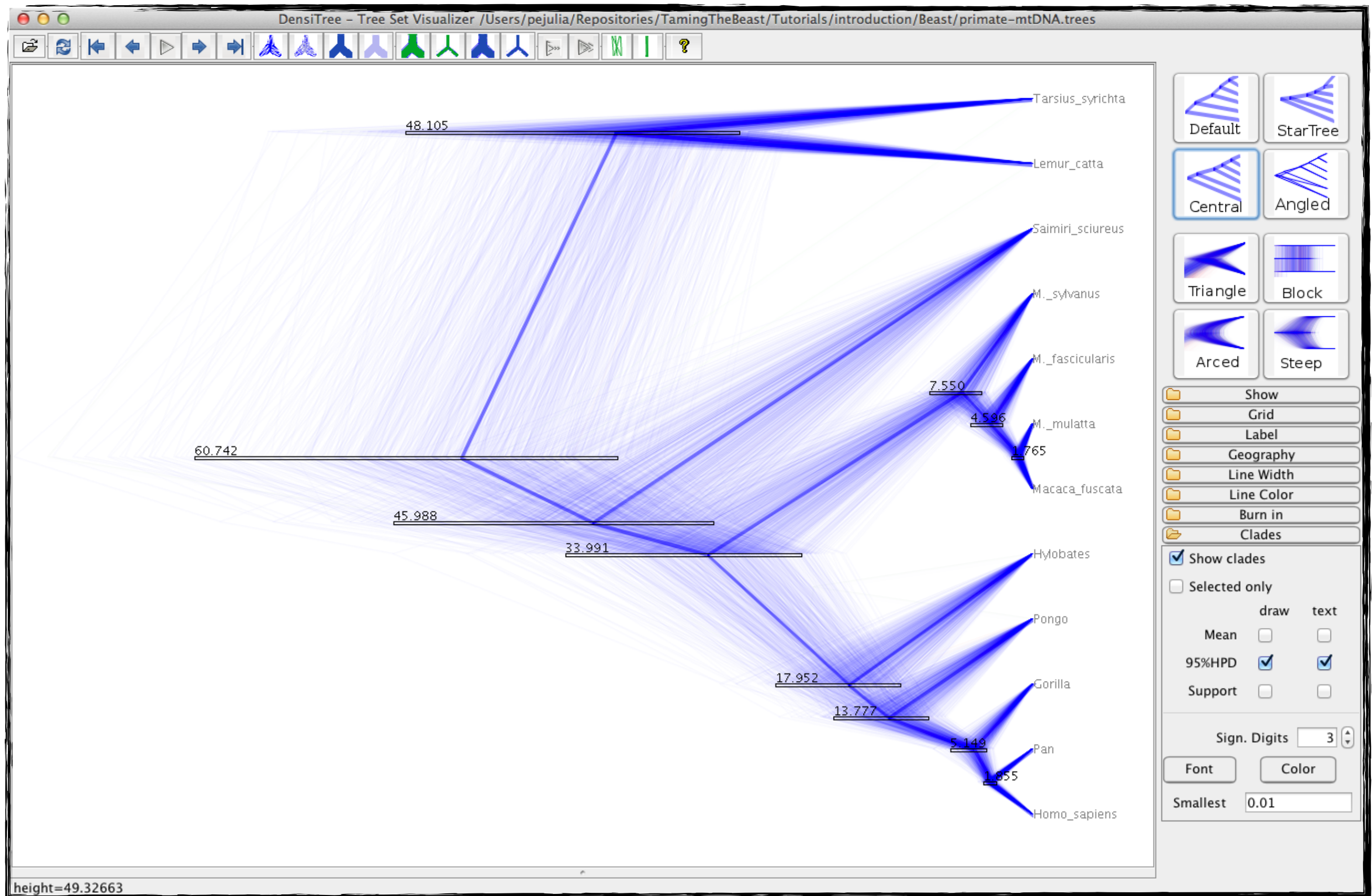View the distribution of trees from BEAST2 runs.

Input:
    trees file

Output:
    insight

DensiTree

Time to tame!