SummarizeMCMCResults

Description

Convert the log file generated by our MCMC sampling method to be readable by Tracer.

PhyloNet Version: 3.6.3

Usage

```
SummarizeMCMCResults -mode "Tracer" [-cl chainLength] [-bl burnInLength] [-sf sampleFrequency] [-outfile
filename] [-truenet networkString]
```

Settings		
-cl *chainLength*	The length of the MCMC chain. Set to the same value used in MCMC_SEQ.	required
-bl *burnInLength*	The number of iterations in burn-in period. Set to the same value used in MCMC_SEQ.	required
-sf *sampleFrequency*	The sample frequency. Set to the same value used in MCMC_SEQ.	required
-outfile *filename*	The name of tracer log file you want to generate. Can contain path.	required
-truenet *networkString*	The network you want to summarize its parameters.	required

Example

If we run MCMCseq_example1.nex , which is one of the example in the description of command MCMC_SEQ, we will get following output. Suppose it is printed into file example_mcmcseq_1.out.

Then the content of example_mcmcseq_1.out looks like:

```
MCMC_SEQ -cl 50000 -bl 10000 -sgt (gt0, gt1) -snet (net1) -sps 0.04 -pre 20
Output files under /Users/zhujiafan
SET _POP_SIZE_MEAN = 0.046099144360160785
SET _POP_SIZE_WINDOW_SIZE = 0.0023049572180080394
SET _TIME_WINDOW_SIZE = 0.0025150755969370955
---------------------- Logger: ----------------------
Iteration; Posterior; ESS; Likelihood; Prior; ESS; #Reticulation
1; -2370.95407; 0.00000; -2370.64467; -0.30939; 0.00000; 1;
[0.03712369495639094](((C:0.023825648320444256,B:0.023825648320444256)I2:0.050125924499740626)I3#H1:0.4705848357733278::
0.4977571578778074,(A:0.0974846983098242 4,I3#H1:0.02353312548963936::0.5022428421221926)I1:0.44705171028368845)I0;
2; -2370.02122; 0.00000; -2365.48071; -4.54051; 0.00000; 1;
[0.08740412526529193](((A:0.0644782523371697)I3#H1:0.011085100576159218::0.7394821248524521,(B:0.012295023776453121,C:
0.012295023776453121)I2:0.06326832913687579)I1:0.7099466953690496,I3#H1:0.7210317959452088::0.2605178751475479)I0;
3; -2372.45184; 1.00000; -2368.78300; -3.66884; 1.00000; 1;
[0.09033941530851464](((A:0.045146002769816694)I3#H1:0.00758594477703 6023::0.8848743613665822,(C:0.01813233140385818,B:
0.01813233140385818)I2:0.03459961614299453)I1:3.898141499134046,I3#H1:3.905727443911082::0.11512563863341785)I0;
4; -2367.92188; 2.00000; -2365.28211; -2.63977; 2.00000; 1;
[0.07069491916656903](((B:0.00872426064648134,C:0.00872426064648134)I2:0.06083313993717342,(A:0.006588553878875061)I3#H1:
0.06296884670477969::0.8996115971738128)I1:5.372106361639526,I3#H1:5.435075208344306::0.10038840282618722)I0;
5; -2370.70912; 3.00000; -2367.77665; -2.93247; 3.00000; 1;
[0.06524159621009873](((B:0.0020694551571076533,C:0.0020694551571076533)I2:0.05700062041463809,(A:0.05752026401374041)I3#H1:
0.0015498115580053276::0.6506663662068655)I1:3.895283178099869,I3#H1:3.8968329896578746::0.34933363379313453)I0;
6; -2370.17278; 4.00000; -2367.72976; -2.44302; 4.00000; 1;
[0.08326098635086286](((B:0.01573581643597444,C:0.01573581643597444)I2:0.054166996949172486,(A:0.05445033542656785)I3#H1:
0.01545247795857907::0.2708973259263968)I1:3.1609361182119855,I3#H1:3.1763885961705647::0.7291026740736032)I0;
7; -2375.23091; 5.00000; -2370.29901; -4.93190; 5.00000; 1;
[0.05379778176231088](((((C:0.00999397908818145,B:0.00999397908818145)I2:0.08374945041951844)I3#H1:0.006697029242945116::
0.7206438532760768,A:0.100440458750645)I1:14.193400722603458,I3#H1:14.200097751846403::0.27935614672392317)I0;
8; -2367.29436; 6.00000; -2366.26747; -1.02688; 6.00000; 1;
[0.03543271735376193](((B:0.005849707761867801,C:0.005849707761867801)I2:0.07841641875267599,(A:0.01271426487814302)I3#H1:
0.07155186163640077::0.8622136520013726)I1:4.6994134208375336,I3#H1:4.770965282473934::0.13778634799862743)I0;
9; -2373.22179; 7.00000; -2368.15899; -5.06280; 7.00000; 1;
[0.06618446114985434]((A:0.06301458366842101,((B:0.0020198944585432693,C:0.0020198944585432693)I2:0.00993963859785437)I3#H1:
0.051055050612023374::0.8453466268608258)I1:5.141614377672805,I3#H1:5.1926694282848285::0.15465337313917416)I0;
10; -2378.18933; 8.00000; -2366.39462; -11.79471; 8.00000; 2;
[0.09440157575724482](((((C:0.005310928295931936,B:0.005310928295931936)I2:0.05954064895844466,A:0.0648515772543766)I1:
16.126610263480238)#H1:6.7365747769686415::0.20921855279391943)#H2:1.3049036309951738::0.8790975883804708,#H1:
8.041478407963815::0.7907814472060806):0.9036343768434847,#H2:2.2085380078386585::0.1209024116195292)I0;
---------------------- Summarization: ----------------------
Burn-in = 10000, Chain length = 50000, Sample size = 8, Acceptance rate = 0.70918
--------------- Operations ---------------
Operation:NarrowNNI; Used:20970; Accepted:0 ACrate:0.0
Operation:Swap-Nodes; Used:2783; Accepted:611 ACrate:0.21954725116780452
Operation:SubtreeSlide; Used:20754; Accepted:6081 ACrate:0.29300375831165076
Operation:Scale-Time; Used:2201; Accepted:1484 ACrate:0.6742389822807815
Operation:Add-Reticulation; Used:258; Accepted:4 ACrate:0.015503875968992248
Operation:Slide-SubNet; Used:13653; Accepted:4412 ACrate:0.32315242071339634
Operation:TreeScaler; Used:5202; Accepted:2824 ACrate:0.5428681276432141
Operation:Flip-Reticulation; Used:804; Accepted:22 ACrate:0.02736318407960199
Operation:Change-PopSize-Prior-Param; Used:437; Accepted:220 ACrate:0.5034324942791762
Operation:Scale-Root-Time; Used:2722; Accepted:2350 ACrate:0.8633357825128581
Operation:Scale-PopSize-Prior-Param; Used:367; Accepted:327 ACrate:0.8910081743869209
Operation:Scale-All; Used:620; Accepted:72 ACrate:0.11612903225806452
Operation:Move-Head; Used:914; Accepted:163 ACrate:0.17833698030634573
Operation:TreeRootScaler; Used:5128; Accepted:1579 ACrate:0.3079173166926677
Operation:WildNNI; Used:5090; Accepted:0 ACrate:0.0
Operation:TNodeReheight; Used:41825; Accepted:6414 ACrate:0.15335325762104005
Operation:Change-Time; Used:15414; Accepted:7158 ACrate:0.464383028415726
Operation:Scale-PopSize; Used:549; Accepted:478 ACrate:0.8706739526411658
Operation:Change-Inheritance; Used:797; Accepted:443 ACrate:0.5558343789209536
Operation:Move-Tail; Used:2360; Accepted:26 ACrate:0.011016949152542373
Operation:Delete-Reticulation; Used:251; Accepted:3 ACrate:0.01195219123505976
Operation:WilsonBalding; Used:5250; Accepted:0 ACrate:0.0
Operation:Change-PopSize; Used:1651; Accepted:788 ACrate:0.47728649303452453
```

```
Overall MAP = -2367.294357178221
(((B:0.005849707761867801,C:0.005849707761867801)I2:0.07841641875267599,(A:0.01271426487814302)I3#H1:0.07155186163640077::
0.8622136520013726)I1:4.6994134208375336,I3#H1:4.770965282473934::0.13778634799862743)I0;
-------------- 95% credible set of topologies --------------
Rank = 0; Size = 5; Percent = 62.50; MAP = -2367.294357178221:(((B:0.005849707761867801,C:0.005849707761867801)I2:
0.07841641875267599,(A:0.01271426487814302)I3#H1:0.07155186163640077::0.8622136520013726)I1:4.6994134208375336,I3#H1:
4.770965282473934::0.13778634799862743)I0; Ave=-2369.709994467344; ((A:0.03528388419342861)I3#H1:4.236997904111553::
0.26626965889975657,((B:0.010102314281057883,C:0.010102314281057883)I2:0.057003358439330895,I3#H1:0.031821788526960174::
0.7337303411002434)I1:4.205176115584593)I0;
Rank = 1; Size = 2; Percent = 25.00; MAP = -2373.221789051192:((A:0.06301458366842101,((B:0.0020198944585432693,C:
0.0020198944585432693)I2:0.00993963859785437)I3#H1:0.051055050612023374::0.8453466268608258)I1:5.141614377672805,I3#H1:
5.1926694282848285::0.15465337313917416)I0; Ave=-2374.2263488001636; (((B:0.0060069367733623594,C:0.0060069367733623594)I2:
0.04684454450868641)I3#H1:9.696383590065615::0.13967807336196159,(A:0.081727521209533,I3#H1:0.028876039927484234::
0.8603219266380384)I1:9.667507550138131)I0;
Rank = 2; Size = 1; Percent = 12.50; MAP = -2378.189329515679:((((((C:0.005310928295931936,B:0.005310928295931936)I2:
0.05954064895844466,A:0.0648515772543766)I1:16.126610263480238)#H1:6.7365747769686415::0.20921855279391943)#H2:
1.3049036309951738::0.8790975883804708,#H1:8.041478407963815::0.7907814472060806):0.9036343768434847,#H2:2.2085380078386585::
0.1209024116195292)I0; Ave=-2378.189329515679; ((((A:0.0648515772543766,(B:0.005310928295931936,C:0.005310928295931936)I2:
0.05954064895844466)I1:16.126610263480238)#H2:6.7365747769686415::0.20921855279391943)#H1:2.2085380078386585::
0.1209024116195292,(#H2:8.041478407963815::0.7907814472060806,#H1:1.3049036309951738::0.8790975883804708):0.9036343768434847)I0;

Total elapsed time : 23.77700 s
```

Suppose we want to analyze the parameters of sampled top network using Tracer, we can write such a NEXUS file. Note that the "truenet" string is copied from the "Rank = 0" network. And remember to put the log file into SETS section.

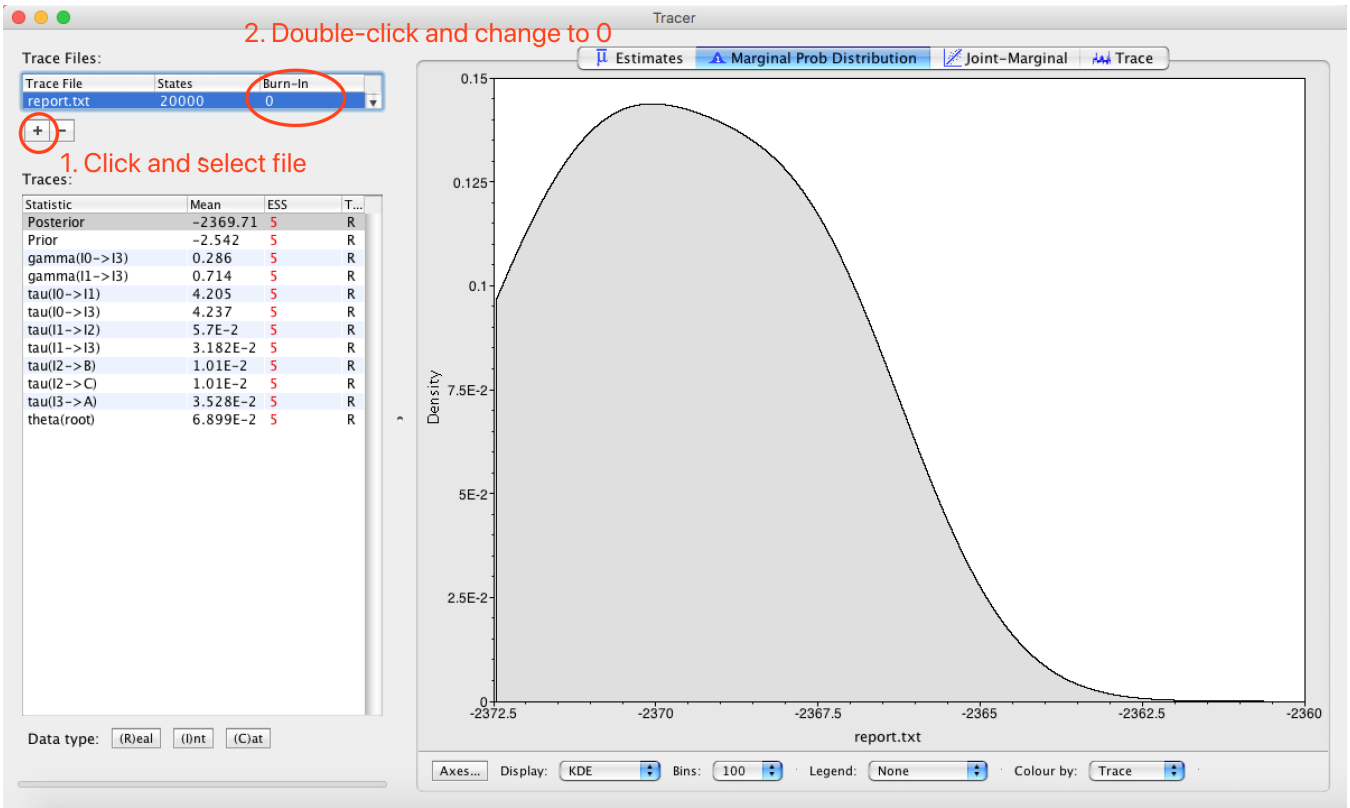
```
#NEXUS

BEGIN SETS;
/Users/zhujiafan/Documents/BioinfoData/Report/example_mcmcseq_1.out
END;

BEGIN PHYLONET;
SummarizeMCMCResults -cl 50000 -bl 10000 -sf 5000
-mode "Tracer"
-outfile "/Users/zhujiafan/Documents/BioinfoData/Report/report.txt"
-truenet "(((B:0.005849707761867801,C:0.005849707761867801)I2:0.07841641875267599,(A:0.01271426487814302)I3#H1:
0.07155186163640077::0.8622136520013726)I1:4.6994134208375336,I3#H1:4.770965282473934::0.13778634799862743)I0; ";
END;
```

Run this NEXUS file using PhyloNet. PhyloNet will print a string showing how nodes are labeled, and report.txt is generated, which is readable by Tracer.

Following is what we will see after import report.txt into Tracer. In the column of Statistic, gamma represents inheritance probability, tau represents branch length, and theta represents population mutation rate.


Tracer
2. Double-click and change to 0
Trace Files:
Trace File
States
Burn-In
report.txt
20000
0
1. Click and select file
Traces:
Statistic
Mean
ESS
T...
Posterior -2369.71 5 R
Prior -2.542 5 R
gamma(I0->I3) 0.286 5 R
gamma(I1->I3) 0.714 5 R
tau(I0->I1) 4.205 5 R
tau(I0->I3) 4.237 5 R
tau(I1->I2) 5.7E-2 5 R
tau(I1->I3) 3.182E-2 5 R
tau(I2->B) 1.01E-2 5 R
tau(I2->C) 1.01E-2 5 R
tau(I3->A) 3.528E-2 5 R
theta(root) 6.899E-2 5 R
Data type: (R)eal (I)nt (C)at
Estimates
Marginal Prob Distribution
Joint-Marginal
Trace
Density
0.15
0.125
0.1
7.5E-2
5E-2
2.5E-2
0
-2372.5
-2370
-2367.5
-2365
-2362.5
-2360
report.txt
Axes...
Display: KDE
Bins: 100
Legend: None
Colour by: Trace