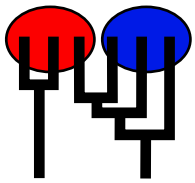
P.infestans Lineage_corrected New Data Set

MIGRATION RATE AND POPULATION SIZE ESTIMATION
using the coalescent and maximum likelihood or Bayesian inference
Migrate-n version 3.6.11 [June-18-15]
Program started at Thu Sep 22 19:00:12 2016
Program finished at Sat Oct 1 00:08:16 2016



Options

Datatype: Microsatellite data [Brownian motion]
Missing data: not included

Inheritance scalers in use for Thetas:
All loci use an inheritance scaler of 1.0
[The locus with a scaler of 1.0 used as reference]
Random number seed: (with internal timer) 2130826594
Start parameters:

Theta values were generated from the FST-calculation

M values were generated from the FST-calculation

Connection type matrix:
where m = average (average over a group of Thetas or M,
s = symmetric M, S = symmetric 4Nm, 0 = zero, and not estimated,
* = free to vary, Thetas are on diagonal

Population	1	2	3
1 LC__Fake_diploi	*	*	*
2 LC__Fake_diploi	*	*	*
3 LC__Fake_diploi	*	*	*

Order of parameters:

1	Θ_1	<displayed>
2	Θ_2	<displayed>
3	Θ_3	<displayed>
4	$M_{2->1}$	<displayed>

5	$M_{3->1}$	<displayed>
6	$M_{1->2}$	<displayed>
7	$M_{3->2}$	<displayed>
8	$M_{1->3}$	<displayed>
9	$M_{2->3}$	<displayed>

Mutation rate among loci: Varying ([crudely] estimated from data)

Rates per locus: 2.81739, 2.08696, 0.41739, 0.93913, 0.41739, 0.31304, 0.73043, 0.41739, 0.93913, 1.35652, 1.04348, 0.52174

Analysis strategy: Bayesian inference

Proposal distributions for parameter

Parameter	Proposal
Theta	Metropolis sampling
M	Metropolis sampling

Prior distribution for parameter

Parameter	Prior	Minimum	Mean*	Maximum	Delta	Bins
Theta	Uniform	0.000000	75.000000	150.000000	15.000000	1500
M	Uniform	0.000000	250.000000	500.000000	50.000000	1500

Markov chain settings: Long chain

Number of chains: 1

Recorded steps [a]: 5000

Increment (record every x step [b]: 100

Number of concurrent chains (replicates) [c]: 20

Visited (sampled) parameter values [a*b*c]: 10000000

Number of discard trees per chain (burn-in): 2000

Multiple Markov chains:

Static heating scheme: 4 chains with temperatures 1000000.00 3.00 1.50 1.00

Swapping interval is 1

Print options:

Data file: Pinf3MexpopsLC_farthest_Migrate.txt

Output file: Pinf3MexpopsLC_run2outputfile

Log file: Pinf3MexpopsLC_run2log

Posterior distribution raw histogram file: bayesfile

Print data: Yes

Print genealogies [only some for some data type]: None

Data summary

Datatype: Microsatellite data
[Fragment length is translated to repeats]
Number of loci: 12

Population	Locus	Gene copies data	(missing)
1 LC__Fake_diploid_Michoacan_population	1	87	(41)
	2	68	(60)
	3	86	(42)
	4	86	(42)
	5	86	(42)
	6	86	(42)
	7	86	(42)
	8	86	(42)
	9	86	(42)
	10	86	(42)
	11	86	(42)
	12	86	(42)
2 LC__Fake_diploid_Tlaxcala_population	1	57	(65)
	2	72	(50)
	3	82	(40)
	4	84	(38)
	5	82	(40)
	6	82	(40)
	7	82	(40)
	8	82	(40)
	9	82	(40)
	10	82	(40)
	11	82	(40)
	12	82	(40)
3 LC__Fake_diploid_Toluca_population	1	44	(30)
	2	52	(22)
	3	50	(24)
	4	50	(24)
	5	50	(24)
	6	50	(24)
	7	51	(23)
	8	51	(23)
	9	50	(24)
	10	52	(22)

	11	50	(24)
	12	51	(23)
Total of all populations	1	188	(136)
	2	192	(132)
	3	218	(106)
	4	220	(104)
	5	218	(106)
	6	218	(106)
	7	219	(105)
	8	219	(105)
	9	218	(106)
	10	220	(104)
	11	218	(106)
	12	219	(105)

Allelic data

LC__Fake_diploid_Michoacan_population

Indiv.	1	2	3	4	5	6	7	8	9	10	11	12
Ind-----01	12.12	13.13	11.13	15.15	12.12	12.12	11.23	11.11	12.16	11.14	14.15	13.13
Ind---0102	?.11	?.24	?.11	?.15	?.12	?.12	?.23	?.11	?.16	?.11	?.14	?.13
Ind-----02	11.?	24.?	13.?	15.?	12.?	12.?	23.?	11.?	16.?	22.?	14.?	13.?
Ind-----03	11.11	24.24	12.13	15.15	12.12	12.12	23.23	11.11	16.16	21.21	14.14	13.13
Ind---0304	?.11	?.13	?.11	?.15	?.12	?.12	?.16	?.11	?.15	?.13	?.11	?.11
Ind-----04	11.?	24.?	13.?	15.?	12.?	12.?	23.?	11.?	17.?	14.?	11.?	13.?
Ind-----05	12.12	?.?	11.13	15.17	14.14	11.12	23.23	11.12	17.18	11.11	14.15	13.13
Ind---0506	?.29	?.20	?.12	?.15	?.12	?.12	?.16	?.11	?.17	?.?	?.15	?.13
Ind-----06	71.72	20.?	12.?	15.?	14.?	12.?	23.?	12.?	17.?	14.14	15.?	14.?
Ind-----07	11.25	24.24	11.13	11.17	14.14	12.12	16.23	11.12	16.18	11.11	14.14	11.13
Ind---0708	?.11	?.24	?.11	?.11	?.14	?.12	?.11	?.11	?.16	?.?	?.11	?.11
Ind-----08	28.?	24.?	13.?	11.?	14.?	12.?	23.?	11.?	16.?	17.17	15.?	11.?
Ind-----09	11.71	24.28	11.13	15.15	12.12	12.12	15.23	11.12	16.17	11.11	14.15	13.13
Ind---0910	72.12	?.24	?.12	?.15	?.12	?.12	?.23	?.11	?.16	?.?	?.11	?.14
Ind-----10	12.?	24.?	12.?	17.?	14.?	12.?	23.?	12.?	17.?	17.17	15.?	14.?
Ind-----11	30.30	47.47	12.12	15.15	12.14	12.12	15.23	11.12	15.17	14.14	14.14	11.14
Ind---1112	?.11	?.?	?.11	?.17	?.12	?.12	?.15	?.11	?.16	?.?	?.15	?.11
Ind-----12	12.?	?.?	13.?	21.?	14.?	12.?	15.?	12.?	17.?	15.15	15.?	14.?
Ind-----13	12.12	31.31	11.13	15.17	14.14	11.12	23.23	11.12	18.18	21.21	14.15	13.13
Ind---1314	?.11	?.?	?.11	?.15	?.14	?.11	?.23	?.11	?.16	?.?	?.14	?.11
Ind-----14	12.?	?.?	11.?	15.?	14.?	12.?	23.?	11.?	16.?	16.16	15.?	14.?
Ind-----15	11.11	28.28	12.12	15.15	12.12	12.12	23.23	11.11	15.16	14.14	15.15	11.14
Ind---1516	?.11	?.23	?.11	?.11	?.14	?.12	?.23	?.11	?.12	?.?	?.14	?.11
Ind-----16	11.?	23.?	13.?	17.?	14.?	12.?	23.?	11.?	16.?	14.14	14.?	13.?
Ind-----17	25.71	23.28	11.13	11.11	14.14	11.12	16.23	11.11	16.17	11.11	14.15	11.11
Ind---1718	72.11	?.24	?.11	?.17	?.14	?.12	?.15	?.11	?.16	?.?	?.15	?.11
Ind-----18	11.?	24.?	13.?	21.?	14.?	12.?	23.?	11.?	16.?	19.19	15.?	11.?
Ind-----19	?.?	24.24	12.12	15.17	12.14	11.12	16.23	12.12	17.17	11.11	14.15	11.14
Ind---1920	?.29	?.28	?.11	?.15	?.14	?.12	?.23	?.11	?.12	?.?	?.14	?.11
Ind-----20	29.?	28.?	13.?	15.?	14.?	12.?	23.?	11.?	12.?	14.14	14.?	14.?
Ind-----21	12.12	24.28	12.12	16.16	12.12	12.12	10.23	11.11	15.15	13.13	14.14	11.13
Ind---2122	?.71	?.28	?.11	?.15	?.14	?.12	?.23	?.11	?.17	?.?	?.16	?.11
Ind-----22	72.?	47.?	13.?	17.?	14.?	12.?	23.?	11.?	17.?	11.11	16.?	13.?
Ind-----23	12.12	24.24	11.13	17.17	12.14	12.12	23.23	11.11	16.17	11.11	15.15	13.13
Ind---2324	?.71	?.24	?.11	?.15	?.14	?.12	?.15	?.11	?.17	?.?	?.14	?.13
Ind-----24	72.?	24.?	11.?	17.?	14.?	12.?	15.?	11.?	17.?	21.21	14.?	14.?
Ind-----25	?.?	?.?	11.13	11.15	12.14	12.12	23.23	11.11	16.17	15.15	11.14	13.14

LC__Fake_diploid_Michoacan_population

Indiv.	1	2	3	4	5	6	7	8	9	10	11	12
Ind---2526	?.12	?.24	?.11	?.15	?.14	?.12	?.23	?.11	?.16	?.?	?.11	?.13
Ind-----26	12.?	24.?	13.?	17.?	14.?	12.?	23.?	12.?	17.?	22.22	15.?	13.?
Ind-----27	11.71	26.28	11.13	15.15	12.12	12.12	16.23	11.11	17.17	11.11	14.14	13.13
Ind---2728	72.11	?.24	?.11	?.17	?.14	?.11	?.23	?.11	?.12	?.?	?.15	?.11
Ind-----28	12.?	28.?	11.?	17.?	14.?	12.?	23.?	11.?	16.?	14.14	15.?	11.?
Ind-----29	12.12	24.28	11.13	11.15	14.14	12.12	15.23	11.11	17.18	11.11	15.15	11.13
Ind---2930	?.11	?.23	?.12	?.11	?.12	?.12	?.23	?.11	?.12	?.?	?.15	?.13
Ind-----30	27.?	24.?	12.?	16.?	14.?	12.?	23.?	11.?	15.?	11.11	15.?	13.?
Ind-----31	11.71	28.28	11.13	15.17	12.14	12.12	23.23	11.12	16.17	11.11	14.15	13.14
Ind---3132	72.11	?.24	?.12	?.17	?.14	?.12	?.23	?.11	?.16	?.?	?.15	?.13
Ind-----32	11.?	24.?	12.?	17.?	14.?	12.?	23.?	11.?	16.?	14.14	15.?	13.?
Ind-----33	12.12	24.24	11.13	11.15	12.14	12.12	23.23	11.12	17.17	11.11	15.15	11.13
Ind---3334	?.11	?.47	?.11	?.15	?.12	?.12	?.23	?.11	?.15	?.?	?.11	?.11
Ind-----34	12.?	47.?	13.?	17.?	12.?	12.?	23.?	12.?	17.?	16.16	15.?	13.?
Ind-----35	12.12	27.27	12.12	15.17	12.14	12.12	23.23	11.11	17.17	11.11	14.15	11.14
Ind---3536	?.12	?.?	?.11	?.15	?.12	?.12	?.23	?.12	?.17	?.?	?.11	?.11
Ind-----36	28.?	?.?	13.?	15.?	14.?	12.?	23.?	12.?	17.?	11.11	11.?	11.?
Ind-----37	28.29	?.?	11.13	13.17	12.14	12.12	23.23	11.12	15.16	11.11	14.15	11.13
Ind---3738	?.11	?.?	?.12	?.11	?.12	?.11	?.23	?.11	?.17	?.?	?.11	?.14
Ind-----38	11.?	?.?	12.?	15.?	14.?	12.?	23.?	12.?	17.?	16.16	14.?	14.?
Ind-----39	11.12	?.?	11.13	15.15	14.14	12.12	23.23	11.11	16.17	11.11	14.15	13.14
Ind---3940	?.11	?.13	?.11	?.15	?.14	?.12	?.15	?.11	?.16	?.?	?.11	?.11
Ind-----40	11.?	13.?	13.?	17.?	14.?	12.?	23.?	11.?	16.?	11.11	14.?	13.?
Ind-----41	71.72	23.47	11.13	15.15	12.14	12.12	15.23	11.12	17.17	14.14	14.15	11.13
Ind---4142	?.11	?.?	?.11	?.15	?.12	?.12	?.16	?.11	?.17	?.?	?.15	?.11
Ind-----42	11.?	?.?	13.?	15.?	12.?	12.?	16.?	12.?	17.?	23.23	15.?	13.?
Ind-----43	71.72	24.28	11.13	11.11	14.14	12.12	23.23	11.11	16.18	13.13	15.15	11.14

LC__Fake_diploid_Tlaxcala_population

Indiv.	1	2	3	4	5	6	7	8	9	10	11	12
Ind-----44	41.41	24.49	13.13	15.17	11.14	11.12	23.23	11.12	11.16	13.13	15.15	11.11
Ind---4445	?.?	?.27	?.11	?.13	?.11	?.11	?.16	?.11	?.15	?.?	?.15	?.11
Ind-----45	?.?	54.?	11.?	15.17	14.?	12.?	15.?	13.?	17.?	14.14	15.?	13.?
Ind-----46	52.52	27.27	13.13	15.15	14.14	12.12	16.23	11.11	17.18	14.14	15.18	11.11
Ind---4647	?.18	?.?	?.11	?.13	?.14	?.12	?.15	?.11	?.12	?.?	?.15	?.13
Ind-----47	18.?	?.?	13.?	15.?	14.?	12.?	23.?	11.?	17.?	14.14	15.?	13.?

LC__Fake_diploid_Tlaxcala_population

Indiv.	1	2	3	4	5	6	7	8	9	10	11	12
Ind-----48	47.48	23.27	13.13	15.17	12.14	12.12	16.15	11.13	16.16	13.13	15.15	11.14
Ind---4849	?.13	?.49	?.13	?.15	?.14	?.12	?.16	?.11	?.14	?.?	?.15	?.14
Ind-----49	25.?	49.?	13.?	17.20	14.?	12.?	23.?	11.?	17.?	14.14	15.?	14.?
Ind-----50	?.?	23.29	13.13	13.20	12.14	12.12	16.23	12.12	11.17	14.14	15.18	13.13
Ind---5051	?.43	?.27	?.13	?.15	?.12	?.11	?.23	?.11	?.17	?.?	?.15	?.11
Ind-----51	43.?	27.?	13.?	15.?	14.?	12.?	23.?	13.?	18.?	13.13	15.?	17.?
Ind-----52	25.25	27.27	11.13	15.15	14.14	12.12	16.16	12.12	14.16	14.14	15.15	14.14
Ind---5253	?.?	?.26	?.13	?.15	?.14	?.11	?.16	?.11	?.14	?.?	?.15	?.11
Ind-----53	?.?	26.?	13.?	15.?	14.?	12.?	16.?	11.?	18.?	15.15	15.?	13.?
Ind-----54	?.?	24.24	11.13	15.15	12.14	11.12	23.23	11.13	14.18	14.14	15.15	14.17
Ind---5455	?.?	?.23	?.11	?.15	?.14	?.12	?.16	?.11	?.16	?.?	?.15	?.14
Ind-----55	?.?	23.?	13.?	17.?	14.?	12.?	23.?	11.?	17.?	16.16	15.?	14.?
Ind-----56	29.29	24.27	13.13	13.13	11.14	11.12	16.16	11.11	17.17	13.13	15.15	11.13
Ind---5657	?.27	?.24	?.13	?.13	?.11	?.12	?.15	?.11	?.12	?.?	?.15	?.11
Ind-----57	27.?	24.?	13.?	13.?	14.?	12.?	16.?	11.?	17.?	18.18	18.?	13.?
Ind-----58	45.46	49.49	13.13	15.15	11.11	11.12	15.18	13.13	14.14	13.13	15.15	11.11
Ind---5859	?.45	?.24	?.13	?.13	?.11	?.12	?.15	?.11	?.16	?.?	?.15	?.13
Ind-----59	46.52	24.?	13.?	15.?	14.?	12.?	23.?	11.?	16.?	14.14	15.?	14.?
Ind-----60	29.29	27.52	11.11	15.15	11.12	12.12	16.23	11.13	17.18	13.13	14.15	11.14
Ind---6061	?.27	?.28	?.11	?.15	?.14	?.12	?.15	?.12	?.11	?.?	?.14	?.11
Ind-----61	27.?	28.?	13.?	17.?	14.?	12.?	15.?	13.?	17.?	14.14	15.?	14.?
Ind-----62	45.46	27.27	11.13	13.15	12.14	12.12	15.18	11.11	17.18	13.13	15.15	14.14
Ind---6263	?.?	?.24	?.11	?.15	?.11	?.11	?.15	?.11	?.17	?.?	?.15	?.14
Ind-----63	?.?	57.?	13.?	15.?	14.?	12.?	23.?	12.?	18.?	17.17	15.?	14.?
Ind-----64	29.29	24.24	12.12	13.15	12.12	11.12	18.23	11.11	17.18	15.15	14.15	14.17
Ind---6465	?.25	?.26	?.11	?.15	?.12	?.11	?.16	?.11	?.12	?.?	?.13	?.13
Ind-----65	44.45	26.?	13.?	15.?	14.?	11.?	15.?	11.?	17.?	16.16	15.?	14.?
Ind-----66	?.?	23.26	13.13	13.17	14.14	12.12	15.18	11.11	16.17	13.13	15.15	11.14
Ind---6667	?.?	?.23	?.11	?.13	?.11	?.11	?.15	?.11	?.18	?.?	?.15	?.13
Ind-----67	?.?	49.?	13.?	15.?	14.?	12.?	16.?	12.?	18.?	16.16	15.?	13.?
Ind-----68	45.46	24.26	11.13	15.15	12.14	12.12	16.23	11.11	17.18	16.16	15.18	11.11
Ind---6869	?.25	?.24	?.11	?.13	?.14	?.12	?.16	?.11	?.12	?.?	?.14	?.11
Ind-----69	46.?	24.?	13.?	13.?	14.?	12.?	16.?	11.?	15.?	15.15	18.?	14.?
Ind-----70	27.27	23.23	12.12	15.17	11.14	12.12	16.16	11.11	12.17	13.13	15.15	11.14
Ind---7071	?.25	?.23	?.12	?.13	?.11	?.11	?.15	?.11	?.14	?.?	?.15	?.14
Ind-----71	45.46	27.?	12.?	15.?	14.?	12.?	23.?	12.?	17.?	16.16	15.?	14.?
Ind-----72	29.29	?.?	13.13	13.15	11.14	12.12	23.23	11.12	12.18	14.14	15.15	11.14
Ind---7273	?.?	?.24	?.11	?.13	?.14	?.12	?.15	?.11	?.14	?.?	?.15	?.11
Ind-----73	?.?	27.?	13.?	13.?	14.?	12.?	16.?	12.?	16.?	15.15	15.?	13.?

LC__Fake_diploid_Tlaxcala_population

Indiv.	1	2	3	4	5	6	7	8	9	10	11	12
Ind-----74	?.?	26.27	12.12	13.17	11.14	11.12	15.18	12.13	17.17	14.14	15.15	11.11
Ind---7475	?.25	?.?	?.13	?.15	?.14	?.12	?.15	?.11	?.16	?.?	?.14	?.11
Ind-----75	27.?	?.?	13.?	17.?	14.?	12.?	23.?	12.?	17.?	14.14	15.?	13.?
Ind-----76	?.?	27.49	11.11	13.15	11.14	12.12	11.23	11.12	17.17	13.13	15.15	11.14
Ind---7677	?.27	?.24	?.13	?.13	?.12	?.12	?.16	?.12	?.16	?.?	?.15	?.14
Ind-----77	29.?	24.?	13.?	13.?	14.?	12.?	15.?	12.?	17.?	25.25	15.?	14.?
Ind-----78	45.46	23.23	13.13	15.17	14.14	12.12	16.23	11.12	12.16	14.14	15.15	11.14
Ind---7879	?.?	?.11	?.11	?.13	?.14	?.11	?.16	?.11	?.11	?.?	?.15	?.14
Ind-----79	?.?	49.?	13.?	17.?	14.?	12.?	18.?	12.?	17.?	14.14	18.?	14.?
Ind-----80	43.44	?.?	11.13	13.20	14.14	12.12	18.23	11.11	11.17	14.14	15.15	13.14
Ind---8081	?.?	?.?	?.13	?.13	?.11	?.12	?.15	?.11	?.16	?.?	?.15	?.11
Ind-----81	?.?	?.?	13.?	17.?	11.?	12.?	16.?	11.?	16.?	18.18	15.?	13.?
Ind-----82	?.?	26.26	13.13	15.15	12.14	11.12	15.23	13.13	17.17	14.14	15.15	11.13
Ind---8283	?.25	?.24	?.13	?.13	?.11	?.11	?.16	?.11	?.17	?.?	?.15	?.11
Ind-----83	25.?	24.?	13.?	15.?	14.?	12.?	15.?	12.?	18.?	14.14	15.?	14.?
Ind-----84	45.45	24.49	11.13	15.15	14.14	11.12	15.16	11.11	12.16	14.14	15.15	13.14

LC__Fake_diploid_Toluca_population

Indiv.	1	2	3	4	5	6	7	8	9	10	11	12
Ind-----85	13.13	29.46	11.13	15.21	14.14	12.12	16.23	11.11	16.17	13.13	15.15	11.14
Ind---8586	?.?	?.24	?.11	?.15	?.14	?.12	?.15	?.11	?.16	?.?	?.11	?.11
Ind-----86	?.?	25.?	13.?	17.?	14.?	12.?	23.?	11.?	17.?	14.14	15.?	11.?
Ind-----87	30.31	28.28	11.13	17.17	14.14	12.12	15.23	11.11	16.17	13.13	15.15	11.14
Ind---8788	?.25	?.24	?.11	?.15	?.14	?.12	?.15	?.11	?.17	?.?	?.15	?.14
Ind-----88	25.?	49.?	13.?	15.?	14.?	12.?	23.?	11.?	17.?	14.14	15.?	14.?
Ind-----89	31.31	24.24	11.13	15.17	14.14	12.12	15.15	11.11	16.16	13.13	15.15	14.14
Ind---8990	?.29	?.24	?.11	?.15	?.12	?.11	?.15	?.11	?.16	?.?	?.15	?.11
Ind-----90	29.?	28.?	13.?	15.?	12.?	11.?	23.?	11.?	16.?	15.15	19.?	14.?
Ind-----91	16.16	48.50	13.13	15.15	14.14	12.12	15.15	11.11	16.16	13.13	15.15	11.13
Ind---9192	?.27	?.24	?.11	?.13	?.12	?.12	?.15	?.11	?.16	?.?	?.15	?.11
Ind-----92	27.?	49.?	13.?	15.?	14.?	12.?	16.?	11.?	17.?	13.13	15.?	13.?
Ind-----93	29.29	29.49	11.13	17.17	14.14	12.12	16.23	11.11	16.16	13.13	15.15	14.14
Ind---9394	?.27	?.28	?.11	?.17	?.14	?.11	?.15	?.11	?.16	?.?	?.13	?.11
Ind-----94	27.?	48.?	13.?	17.?	14.?	12.?	23.?	11.?	17.?	13.13	15.?	11.?
Ind-----95	13.26	24.49	11.13	17.17	12.14	12.12	15.23	12.12	16.21	13.13	15.15	14.14
Ind---9596	?.25	?.23	?.11	?.13	?.14	?.11	?.16	?.11	?.12	?.?	?.15	?.11

LC__Fake_diploid_Toluca_population

Indiv.	1	2	3	4	5	6	7	8	9	10	11	12
Ind-----96	29.?	26.27	13.?	15.?	14.?	12.?	18.23	12.13	17.?	15.15	15.?	13.14
Ind-----97	45.46	24.26	11.13	13.15	12.14	12.12	16.23	11.11	16.16	11.11	15.15	14.17
Ind---9798	?.13	?.26	?.12	?.13	?.14	?.12	?.15	?.11	?.16	?.?	?.15	?.11
Ind-----98	24.?	49.?	12.?	15.?	14.?	12.?	23.?	11.?	17.?	16.16	15.?	14.?
Ind-----99	25.25	24.49	11.13	13.15	14.14	12.12	16.23	11.11	16.17	13.13	14.15	11.14
Ind--99100	?.?	?.23	?.11	?.13	?.11	?.12	?.23	?.11	?.16	?.?	?.15	?.11
Ind----100	?.?	49.?	13.?	15.?	14.?	12.?	23.?	11.?	17.?	13.13	22.?	14.?
Ind----101	24.27	24.25	11.13	15.15	14.14	12.12	15.15	11.11	16.16	13.13	14.15	11.14
Ind-101102	22.25	49.24	?.11	?.15	?.12	?.12	?.15	?.11	?.16	16.16	?.15	?.11
Ind----102	25.?	24.?	13.?	15.?	12.?	12.?	23.?	11.?	16.?	13.13	15.?	11.?
Ind----103	12.40	24.50	12.12	17.19	12.14	11.12	16.23	11.11	16.17	14.14	15.15	11.14
Ind-103104	4.?	?.24	?.11	?.15	?.14	?.12	?.16	?.11	?.16	?.?	?.15	?.11
Ind----104	?.?	27.?	13.?	21.?	14.?	12.?	23.?	11.?	16.?	13.13	15.?	14.?
Ind----105	13.29	24.24	11.13	13.15	14.14	12.12	16.23	11.12	15.16	13.13	15.20	11.14
Ind-105106	6.?	?.24	?.11	?.15	?.14	?.11	?.15	?.11	?.16	?.?	?.15	?.14
Ind----106	?.?	52.?	13.?	15.?	14.?	11.?	23.?	11.?	16.?	13.13	15.?	14.?
Ind----107	25.25	24.26	12.12	15.15	14.14	12.12	16.23	11.11	17.17	13.13	15.19	11.11
Ind-107108	8.25	?.49	?.11	?.15	?.14	?.12	?.23	?.11	?.15	?.?	?.14	?.11
Ind----108	39.40	49.?	13.?	15.?	14.?	12.?	23.?	11.?	16.?	13.13	15.?	11.?
Ind----109	25.28	24.29	13.13	15.15	14.14	12.12	23.23	11.11	16.18	13.13	15.15	11.14

Relative mutation rate among loci estimated from the data

Locus	Relative mutation rate	Number of alleles
1	2.81739	27
2	2.08696	20
3	0.41739	4
4	0.93913	9
5	0.41739	4
6	0.31304	3
7	0.73043	7
8	0.41739	4
9	0.93913	9
10	1.35652	13
11	1.04348	10
12	0.52174	5
All	1.00000	9.6

Bayesian Analysis: Posterior distribution table

Locus	Parameter	2.5%	25.0%	Mode	75.0%	97.5%	Median	Mean
1	Θ_1	0.00000	0.00000	0.85000	1.70000	4.10000	1.65000	1.03660
1	Θ_2	0.00000	0.00000	1.55000	3.20000	71.90000	3.25000	10.54695
1	Θ_3	0.00000	0.00000	8.25000	48.50000	123.40000	49.75000	57.42043
1	$M_{2->1}$	0.000	0.000	5.500	10.667	36.000	10.833	12.324
1	$M_{3->1}$	0.000	2.000	8.167	14.000	42.000	12.167	14.249
1	$M_{1->2}$	0.000	0.000	0.167	8.333	50.333	8.500	17.914
1	$M_{3->2}$	0.000	4.667	10.500	17.000	33.000	13.500	16.200
1	$M_{1->3}$	0.000	0.000	4.500	9.667	28.667	9.833	19.773
1	$M_{2->3}$	0.000	0.000	5.167	9.667	23.667	9.833	13.627
2	Θ_1	0.00000	1.20000	3.05000	5.10000	12.10000	4.15000	4.74805
2	Θ_2	0.00000	0.00000	0.05000	0.90000	2.60000	0.95000	2.52611
2	Θ_3	0.00000	0.00000	2.05000	30.10000	129.70000	47.45000	55.61001
2	$M_{2->1}$	0.000	0.000	0.167	9.000	37.000	9.167	21.863
2	$M_{3->1}$	0.000	11.333	17.833	25.667	42.333	21.500	30.307
2	$M_{1->2}$	0.667	6.333	17.500	42.667	200.000	99.500	106.285
2	$M_{3->2}$	37.000	46.667	61.500	94.667	187.667	85.833	103.285
2	$M_{1->3}$	7.000	15.667	23.500	31.000	118.333	57.500	71.296
2	$M_{2->3}$	0.000	14.333	25.833	40.000	65.000	34.167	63.766
3	Θ_1	0.00000	0.00000	2.85000	10.50000	89.40000	16.45000	41.77251
3	Θ_2	0.00000	0.20000	2.05000	3.70000	30.30000	3.55000	10.50148
3	Θ_3	0.20000	0.30000	3.35000	21.90000	48.30000	65.45000	67.69466
3	$M_{2->1}$	0.000	0.000	0.167	9.000	68.667	9.167	23.014
3	$M_{3->1}$	0.000	0.000	0.167	6.333	85.000	6.500	21.895
3	$M_{1->2}$	0.000	0.000	0.167	4.667	39.667	4.833	11.852
3	$M_{3->2}$	0.000	0.000	0.167	8.333	56.333	8.500	16.162
3	$M_{1->3}$	0.000	0.000	0.167	22.000	226.667	22.167	51.690
3	$M_{2->3}$	0.000	5.333	24.500	40.333	278.333	36.167	66.111
4	Θ_1	0.00000	0.00000	0.05000	0.80000	2.10000	0.85000	0.02803
4	Θ_2	0.00000	0.00000	0.05000	0.80000	2.10000	0.85000	0.09166
4	Θ_3	0.00000	0.00000	0.05000	15.80000	118.30000	15.85000	48.09317
4	$M_{2->1}$	43.333	324.000	337.500	369.333	425.333	275.833	262.718
4	$M_{3->1}$	343.333	451.333	484.167	500.000	500.000	440.500	429.327
4	$M_{1->2}$	167.333	346.000	408.167	441.667	500.000	355.833	323.663

Locus	Parameter	2.5%	25.0%	Mode	75.0%	97.5%	Median	Mean
4	$M_{3->2}$	353.333	453.333	490.833	499.000	500.000	455.167	446.063
4	$M_{1->3}$	0.000	7.000	17.167	37.667	131.333	34.167	53.071
4	$M_{2->3}$	0.000	1.333	11.833	25.000	123.667	23.833	68.930
5	Θ_1	0.00000	0.20000	1.35000	2.40000	44.30000	2.25000	7.26908
5	Θ_2	0.00000	0.00000	1.95000	32.20000	124.70000	32.25000	44.99877
5	Θ_3	0.00000	0.00000	3.05000	12.40000	116.50000	61.95000	63.78782
5	$M_{2->1}$	0.000	0.000	0.167	6.000	23.333	6.167	6.838
5	$M_{3->1}$	0.000	0.333	6.500	11.333	56.000	10.833	14.462
5	$M_{1->2}$	0.000	2.000	6.500	10.333	20.000	8.500	7.911
5	$M_{3->2}$	0.000	4.000	9.833	16.333	33.000	13.500	14.125
5	$M_{1->3}$	0.000	13.667	37.833	48.667	213.667	41.167	62.302
5	$M_{2->3}$	0.000	1.667	9.500	23.000	147.667	21.500	40.119
6	Θ_1	0.00000	0.60000	2.85000	5.00000	84.40000	4.55000	18.35158
6	Θ_2	0.00000	0.00000	3.15000	22.00000	89.50000	53.35000	60.06537
6	Θ_3	0.00000	0.00000	3.05000	15.00000	106.00000	34.75000	48.17134
6	$M_{2->1}$	0.000	0.000	0.167	6.333	48.333	6.500	13.395
6	$M_{3->1}$	0.000	0.000	0.167	7.000	55.333	7.167	12.874
6	$M_{1->2}$	0.000	2.000	10.167	19.333	105.667	17.500	31.745
6	$M_{3->2}$	0.000	0.000	0.167	12.667	55.333	12.833	17.837
6	$M_{1->3}$	0.000	0.667	11.500	28.333	205.333	27.500	59.751
6	$M_{2->3}$	0.000	0.000	0.167	16.000	219.000	16.167	48.240
7	Θ_1	0.00000	0.10000	1.45000	2.70000	57.50000	2.55000	8.01669
7	Θ_2	0.00000	0.00000	1.65000	7.10000	111.50000	7.15000	25.62181
7	Θ_3	0.00000	0.00000	3.35000	29.00000	133.80000	55.05000	60.25160
7	$M_{2->1}$	1.000	8.667	14.833	21.667	33.333	17.167	17.154
7	$M_{3->1}$	0.000	4.000	10.167	16.333	31.333	13.500	14.027
7	$M_{1->2}$	0.000	6.333	13.833	23.667	55.000	20.167	23.473
7	$M_{3->2}$	3.667	11.333	18.167	25.000	42.667	20.833	21.801
7	$M_{1->3}$	2.000	11.333	18.833	30.000	55.667	25.500	29.495
7	$M_{2->3}$	1.000	13.333	23.500	35.000	70.000	30.167	39.990
8	Θ_1	0.00000	0.00000	1.85000	3.90000	47.30000	3.95000	16.80647
8	Θ_2	0.00000	0.00000	0.05000	26.80000	124.80000	28.55000	47.96743
8	Θ_3	0.00000	0.00000	1.15000	11.70000	96.20000	28.35000	41.26181
8	$M_{2->1}$	0.000	0.000	0.167	4.000	46.000	4.167	15.889
8	$M_{3->1}$	0.000	0.000	0.167	6.333	55.000	6.500	16.910
8	$M_{1->2}$	0.000	0.000	0.167	7.000	45.667	7.167	15.573
8	$M_{3->2}$	0.000	0.000	1.833	9.000	41.667	9.167	12.064

Locus	Parameter	2.5%	25.0%	Mode	75.0%	97.5%	Median	Mean
8	$M_{1->3}$	0.000	0.000	0.167	24.000	104.333	24.167	70.801
8	$M_{2->3}$	0.000	0.000	0.167	12.333	84.333	12.500	28.686
9	Θ_1	0.00000	1.00000	3.95000	8.60000	66.20000	7.85000	20.93207
9	Θ_2	0.00000	0.40000	2.85000	6.80000	70.00000	6.45000	15.65468
9	Θ_3	0.00000	0.00000	1.45000	3.30000	57.70000	3.35000	11.32426
9	$M_{2->1}$	0.000	0.000	0.167	6.000	23.667	6.167	12.093
9	$M_{3->1}$	0.000	0.000	0.167	6.333	50.333	6.500	12.974
9	$M_{1->2}$	0.000	0.000	3.167	7.333	29.333	7.500	8.079
9	$M_{3->2}$	0.000	0.000	0.167	4.333	15.000	4.500	4.312
9	$M_{1->3}$	0.000	0.000	0.167	7.333	52.333	7.500	15.602
9	$M_{2->3}$	0.000	0.000	0.167	6.333	19.667	6.500	6.430
10	Θ_1	0.00000	0.00000	0.05000	2.00000	13.40000	2.05000	5.26574
10	Θ_2	0.00000	0.00000	1.65000	10.30000	43.50000	10.35000	31.54461
10	Θ_3	0.00000	0.00000	0.05000	1.90000	36.10000	1.95000	6.93604
10	$M_{2->1}$	20.667	37.000	53.500	66.000	117.000	58.833	64.647
10	$M_{3->1}$	11.000	29.000	41.833	53.000	77.333	42.833	43.415
10	$M_{1->2}$	10.333	43.667	64.167	74.667	95.333	57.500	56.234
10	$M_{3->2}$	0.000	0.000	0.167	7.667	32.000	7.833	10.724
10	$M_{1->3}$	11.000	20.333	29.500	48.667	113.667	46.167	52.892
10	$M_{2->3}$	0.000	0.000	3.500	11.000	39.333	11.167	16.518
11	Θ_1	0.00000	0.60000	2.25000	3.70000	13.20000	3.15000	4.31056
11	Θ_2	0.00000	0.30000	1.45000	2.30000	5.00000	2.05000	1.58552
11	Θ_3	1.40000	1.50000	5.05000	23.10000	39.20000	71.55000	71.73641
11	$M_{2->1}$	0.000	0.000	0.167	4.667	13.667	4.833	4.364
11	$M_{3->1}$	0.000	0.000	0.167	3.333	11.333	3.500	3.231
11	$M_{1->2}$	0.000	0.000	0.167	5.000	15.667	5.167	4.222
11	$M_{3->2}$	0.000	0.000	0.167	4.667	17.000	4.833	4.948
11	$M_{1->3}$	0.000	0.000	0.167	5.667	27.333	5.833	8.149
11	$M_{2->3}$	0.333	10.000	16.500	23.333	39.000	18.833	19.457
12	Θ_1	0.00000	0.70000	2.05000	3.10000	6.30000	2.55000	2.47030
12	Θ_2	0.00000	1.00000	4.25000	8.00000	86.90000	7.35000	26.79280
12	Θ_3	0.00000	0.00000	0.95000	7.30000	82.40000	7.35000	29.33201
12	$M_{2->1}$	0.000	0.000	0.167	4.667	16.333	4.833	4.807
12	$M_{3->1}$	0.000	0.000	0.167	4.000	12.667	4.167	3.728
12	$M_{1->2}$	0.000	0.000	0.167	8.667	24.667	8.833	9.141
12	$M_{3->2}$	0.000	0.000	0.167	7.333	42.333	7.500	11.381
12	$M_{1->3}$	0.000	0.000	0.167	6.000	40.000	6.167	11.247

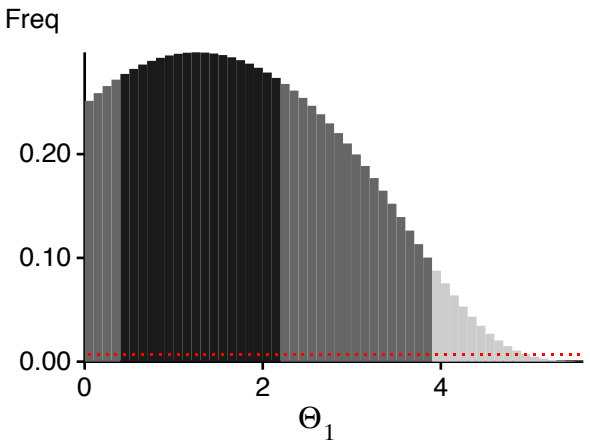
Locus	Parameter	2.5%	25.0%	Mode	75.0%	97.5%	Median	Mean
12	$M_{2->3}$	0.000	0.000	0.167	13.667	74.667	13.833	23.228
All	Θ_1	0.00000	0.30000	1.25000	2.20000	3.90000	1.85000	1.40841
All	Θ_2	0.00000	0.00000	0.85000	1.60000	3.70000	1.65000	1.22306
All	Θ_3	0.00000	0.50000	1.55000	2.50000	4.20000	2.05000	1.63954
All	$M_{2->1}$	0.000	0.000	2.500	5.000	11.000	5.167	2.440
All	$M_{3->1}$	0.000	1.333	4.500	7.333	13.000	6.167	4.405
All	$M_{1->2}$	0.000	3.000	6.833	10.000	15.000	7.833	6.809
All	$M_{3->2}$	0.000	3.000	6.833	10.000	15.333	7.833	6.724
All	$M_{1->3}$	1.333	8.333	13.167	17.667	25.333	13.833	13.422
All	$M_{2->3}$	0.000	5.000	9.167	12.667	18.000	9.500	9.090

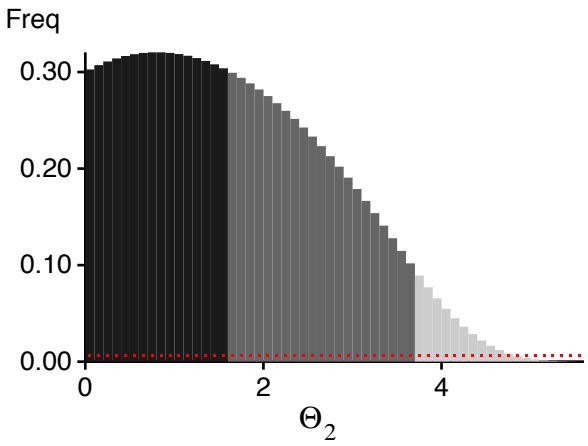
Citation suggestions:

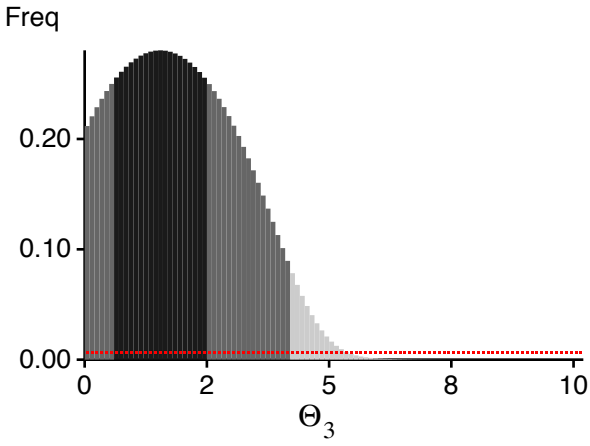
Beerli P., 2006. Comparison of Bayesian and maximum-likelihood inference of population genetic parameters. Bioinformatics 22:341-345

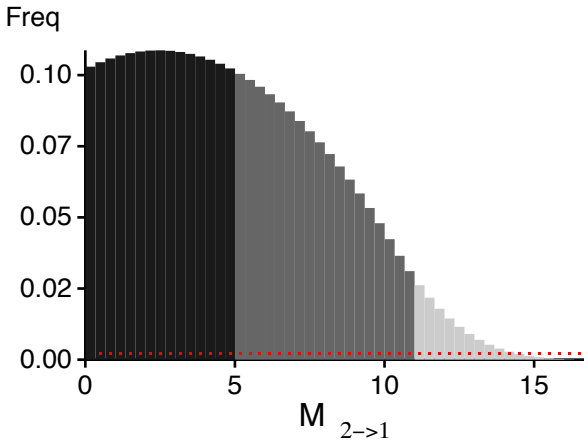
Beerli P., 2009. How to use MIGRATE or why are Markov chain Monte Carlo programs difficult to use? In Population Genetics for Animal Conservation, G. Bertorelle, M. W. Bruford, H. C. Hauffe, A. Rizzoli, and C. Vernesi, eds., vol. 17 of Conservation Biology, Cambridge University Press, Cambridge UK, pp. 42-79.

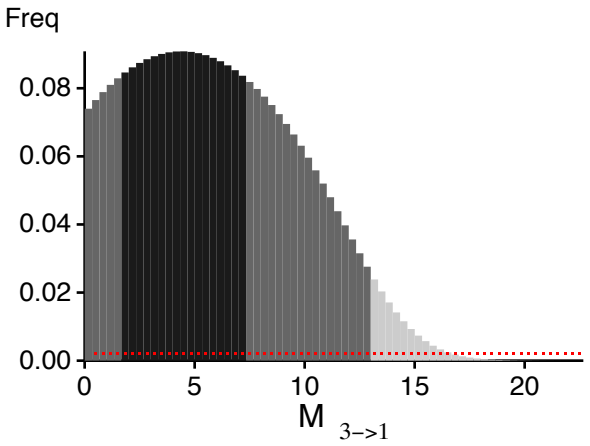
Bayesian Analysis: Posterior distribution over all loci

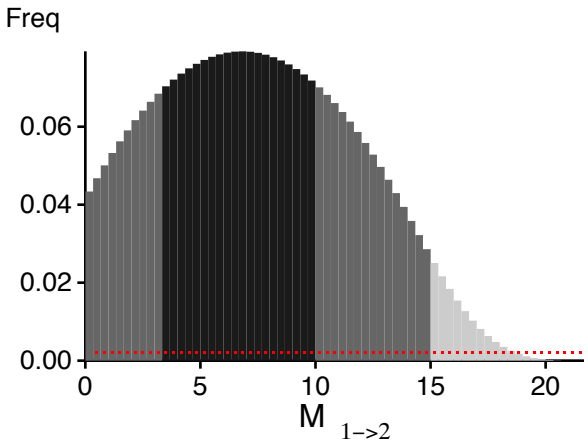


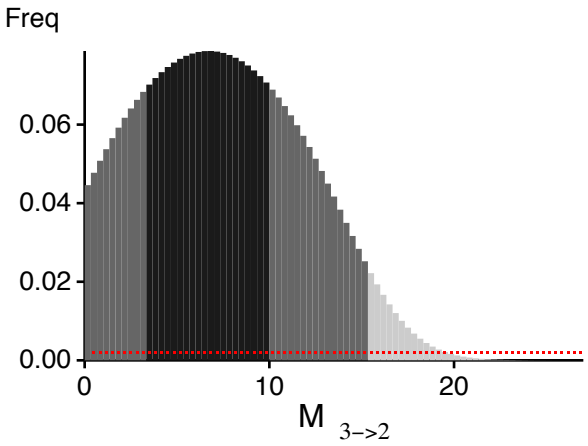


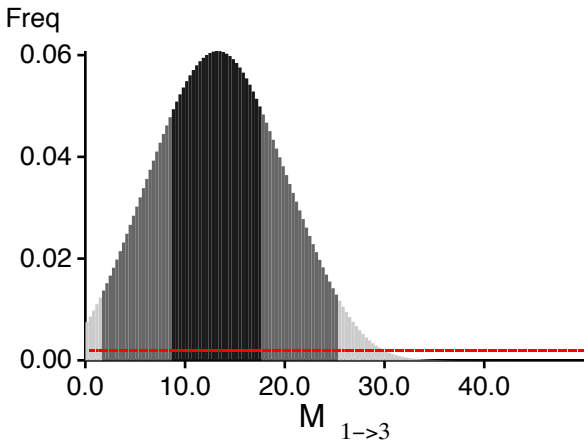


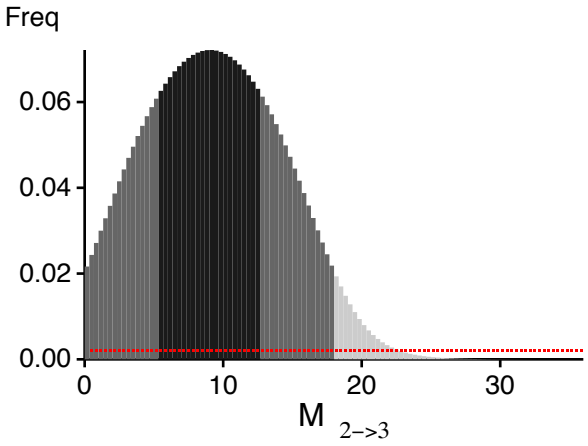







Freq
0.06
0.04
0.02
0.00
0
10
20
M 3–>2


Freq
0.06
0.04
0.02
0.00
0.0
10.0
20.0
30.0
40.0
M 1–>3


Freq
0.06
0.04
0.02
0.00
0
10
20
30
M 2–>3

Log-Probability of the data given the model (marginal likelihood)

Use this value for Bayes factor calculations:
BF = Exp[ln(Prob(D | thisModel) - ln(Prob(D | otherModel)
or as LBF = 2 (ln(Prob(D | thisModel) - ln(Prob(D | otherModel))
shows the support for thisModel]

Locus	Raw thermodynamic score(1a)	Bezier approximation score(1b)	Harmonic mean(2)
1	-265074.34	-42655.24	-196.20
2	-403856.10	-64852.90	-156.80
3	-1826.19	-453.74	-60.80
4	-6051123.81	-969011.26	-1066.89
5	-2706.59	-561.77	-39.10
6	-373.99	-128.67	-58.72
7	-123320.47	-19819.01	-64.79
8	-897.91	-259.68	-88.72
9	-7115.53	-1385.70	-145.89
10	-58406.13	-9571.47	-130.48
11	-6417.58	-1182.64	-98.89
12	-5825.98	-1116.41	-72.61
All	-6926711.69	-1110765.54	-1946.95

(1a, 1b and 2) are approximations to the marginal likelihood, make sure that the program run long enough!
(1a, 1b) and (2) should give similar results, in principle.
But (2) is overestimating the likelihood, it is presented for historical reasons and should not be used
(1a, 1b) needs heating with chains that span a temperature range of 1.0 to at least 100,000.
(1b) is using a Bezier-curve to get better approximations for runs with low number of heated chains
[Scaling factor = 232.933453
Citation suggestions:
Beerli P. and M. Palczewski, 2010. Unified framework to evaluate panmixia and migration direction among multiple sampling locations, Genetics, 185: 313-326.

Acceptance ratios for all parameters and the genealogies

Parameter	Accepted changes	Ratio
Θ_1	2956658/6663680	0.44370
Θ_2	3195369/6671029	0.47899
Θ_3	4171802/6663920	0.62603
$M_{2->1}$	3035204/6665793	0.45534
$M_{3->1}$	3088226/6667010	0.46321
$M_{1->2}$	3191471/6665185	0.47883
$M_{3->2}$	3147395/6665792	0.47217
$M_{1->3}$	3245434/6664481	0.48697
$M_{2->3}$	3267068/6665707	0.49013
Genealogies	23140618/60007403	0.38563

MCMC-Autocorrelation and Effective MCMC Sample Size

Parameter	Autocorrelation	Effective Sampe Size
Θ_1	0.93974	41632.35
Θ_2	0.89560	73792.26
Θ_3	0.72706	222560.47
$M_{2->1}$	0.97826	13840.46
$M_{3->1}$	0.97410	17431.51
$M_{1->2}$	0.97288	18489.98
$M_{3->2}$	0.96565	23906.77
$M_{1->3}$	0.97769	14222.53
$M_{2->3}$	0.98126	11905.24
Ln[Prob(DIG)]	0.96547	21630.89

Potential Problems

This section reports potential problems with your run, but such reporting is often not very accurate. Whith many parameters in a multilocus analysis, it is very common that some parameters for some loci will not be very informative, triggering suggestions (for example to increase the prior range) that are not sensible. This suggestion tool will improve with time, therefore do not blindly follow its suggestions. If some parameters are flagged, inspect the tables carefully and judge wether an action is required. For example, if you run a Bayesian inference with sequence data, for macroscopic species there is rarely the need to increase the prior for Theta beyond 0.1; but if you use microsatellites it is rather common that your prior distribution for Theta should have a range from 0.0 to 100 or more. With many populations (>3) it is also very common that some migration routes are estimated poorly because the data contains little or no information for that route. Increasing the range will not help in such situations, reducing number of parameters may help in such situations.

Param 5 (Locus 4): Upper prior boundary seems too low!
Param 7 (Locus 4): Upper prior boundary seems too low!