

## Morrone (1994) Geodis output file using nesting procedure 2

Differentiating population structure from history - Geodis 2.4  
(c) Copyright, 1999-2005 David Posada and Alan Templeton  
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Input file: /Users/anthonydeo/Desktop/endemism/geodis\_in\_corrected  
Endemic Areas

Tue Oct 04 07:57:30 EDT 2005

PERMUTATION ANALYSIS OF Clade NL\_all\_areas  
BASED ON 1000 RESAMPLES

### PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 854.7780

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
OR EQUAL TO THE OBSERVED CHI-SQUARE = 0.9960

### PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE
Clade NL_all_areas	29.7726	29.3762
AreaA	27.3300	30.3300
AreaB	24.9335	30.1665
AreaC	24.0000	30.0000
AreaD	26.6870	29.1020
AreaE	25.6680	30.2680
AreaF	25.6680	30.8680
AreaG	28.2900	28.5700
AreaH	28.0363	28.0712
AreaI	28.6257	30.4251
AreaJ	28.6988	30.8328
AreaK	29.8190	29.2636
AreaL	29.4089	30.4052
AreaM	29.1500	30.9347
AreaN	32.1789	25.9066
AreaO	32.6000	26.7661
AreaP	31.6764	29.9749
AreaQ	31.4000	27.8000
AreaR	33.0000	25.2500
AreaS	32.8857	25.7810
AreaT	33.4293	26.1927
AreaU	32.6000	26.0667
AreaV	26.0000	29.3300
AreaW	33.0000	25.5000
AreaX	33.0000	25.5000
AreaY	31.4000	27.8000

CLADE AreaA (Tip)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	0.0000	1.0000	1.0000
NESTED CLADE	286.8587	0.7140	0.3420
CLADE AreaB (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	110.4557	0.0260	0.9740
NESTED CLADE	546.0154	1.0000	0.0000
CLADE AreaC (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	0.0000	1.0000	1.0000
NESTED CLADE	644.2397	1.0000	0.0240
CLADE AreaD (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	111.4255	0.4210	0.5800
NESTED CLADE	348.0913	0.7210	0.2800
CLADE AreaE (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	94.6845	0.3610	0.6400
NESTED CLADE	467.1164	0.9100	0.0910
CLADE AreaF (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	90.4487	0.3230	0.6770
NESTED CLADE	479.1686	0.9090	0.0910
CLADE AreaG (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	0.0000	1.0000	1.0000
NESTED CLADE	182.3632	0.4760	0.6000
CLADE AreaH (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	14.1063	0.0480	0.9520
NESTED CLADE	231.1298	0.3750	0.6250
CLADE AreaI (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	87.1086	0.0000	1.0000
NESTED CLADE	183.0558	0.0020	0.9980
CLADE AreaJ (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	92.8078	0.0010	0.9990
NESTED CLADE	213.4780	0.0500	0.9500
CLADE AreaK (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	126.9143	0.2600	0.7410
NESTED CLADE	123.7725	0.0160	0.9850
CLADE AreaL (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	98.0104	0.0000	1.0000

NESTED CLADE	151.6237	0.0000	1.0000
CLADE AreaM (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	58.4785	0.0000	1.0000
NESTED CLADE	175.6309	0.0050	0.9950
CLADE AreaN (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	43.9939	0.0000	1.0000
NESTED CLADE	425.4233	0.9680	0.0320
CLADE AreaO (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	115.5090	0.0390	0.9610
NESTED CLADE	403.8773	0.9440	0.0560
CLADE AreaP (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	60.1466	0.0000	1.0000
NESTED CLADE	232.3671	0.1340	0.8660
CLADE AreaQ (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	0.0000	1.0000	1.0000
NESTED CLADE	235.3772	0.5720	0.5180
CLADE AreaR (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	23.2919	0.0720	0.9310
NESTED CLADE	530.8647	0.9620	0.0410
CLADE AreaS (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	65.2732	0.0240	0.9760
NESTED CLADE	486.4032	0.9830	0.0170
CLADE AreaT (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	86.1339	0.0420	0.9580
NESTED CLADE	507.6696	0.9910	0.0090
CLADE AreaU (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	140.1122	0.5470	0.4600
NESTED CLADE	444.4408	0.8810	0.1260
CLADE AreaV (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	0.0000	1.0000	1.0000
NESTED CLADE	419.1176	0.8180	0.2070
CLADE AreaW (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	0.0000	1.0000	1.0000
NESTED CLADE	513.4029	0.8870	0.1500

CLADE AreaX (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	0.0000	1.0000	1.0000	
NESTED CLADE	513.4029	0.8610	0.1830	

CLADE AreaY (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	0.0000	1.0000	1.0000	
NESTED CLADE	235.3772	0.5490	0.5660	

NO INTERIOR/TIP CLADES EXIST IN THIS GROUP

PERMUTATION ANALYSIS OF Clade NL\_0\_1  
 BASED ON 1000 RESAMPLES

PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 6.5476

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
 OR EQUAL TO THE OBSERVED CHI-SQUARE = 1.0000

PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE
Clade NL_0_1	25.1783	30.3003
AreaB	24.9335	30.1665
AreaE	25.6680	30.2680
AreaF	25.6680	30.8680

CLADE AreaB (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	110.4557	0.5820	0.4450	
NESTED CLADE	119.1204	0.6750	0.3520	

CLADE AreaE (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	94.6845	0.7280	0.3870	
NESTED CLADE	89.5886	0.3130	0.8020	

CLADE AreaF (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	90.4487	0.6140	0.4880	
NESTED CLADE	111.7857	0.5680	0.5340	

NO INTERIOR/TIP CLADES EXIST IN THIS GROUP

PERMUTATION ANALYSIS OF Clade NL\_0\_2  
BASED ON 1000 RESAMPLES

PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 1.3333

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
OR EQUAL TO THE OBSERVED CHI-SQUARE = 1.0000

PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE
Clade NL_0_2	33.0000	25.3750
AreaR	33.0000	25.2500
AreaW	33.0000	25.5000
AreaX	33.0000	25.5000

CLADE AreaR (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	23.2919	1.0000	0.5100
NESTED CLADE	23.2919	1.0000	0.5100

CLADE AreaW (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	0.0000	1.0000	1.0000
NESTED CLADE	11.6459	0.7430	1.0000

CLADE AreaX (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	0.0000	1.0000	1.0000
NESTED CLADE	11.6459	0.7670	1.0000

NO INTERIOR/TIP CLADES EXIST IN THIS GROUP

PERMUTATION ANALYSIS OF Clade NL\_0\_3  
BASED ON 1000 RESAMPLES

PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 117.1875

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
OR EQUAL TO THE OBSERVED CHI-SQUARE = 0.9920

PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE		
Clade NL_0_3	29.1731	29.7596		
AreaA	1.0000	31.0000		
AreaC	24.0000	30.0000		
AreaD	26.5000	31.0000		
AreaG	28.0000	31.0000		
AreaH	28.8000	30.8680		
AreaK	30.4236	30.3945		
AreaP	30.0896	28.8872		
AreaQ	29.3300	30.6700		
AreaV	25.0000	31.0000		
AreaY	29.3300	30.6700		
CLADE AreaA (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	0.0000	1.0000	1.0000	
NESTED CLADE	121.9450	0.3450	0.7080	
CLADE AreaC (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	0.0000	1.0000	1.0000	
NESTED CLADE	575.1715	0.9720	0.0650	
CLADE AreaD (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	166.6343	0.6160	0.4030	
NESTED CLADE	328.6803	0.7150	0.3040	
CLADE AreaG (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	0.0000	1.0000	1.0000	
NESTED CLADE	177.8276	0.5970	0.5400	
CLADE AreaH (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	107.7528	0.4180	0.5870	
NESTED CLADE	157.5669	0.3000	0.7050	
CLADE AreaK (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	195.4463	0.4810	0.5410	
NESTED CLADE	236.6056	0.3230	0.6990	
CLADE AreaP (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	278.2630	0.5840	0.4160	
NESTED CLADE	291.3923	0.6760	0.3240	
CLADE AreaQ (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	0.0000	1.0000	1.0000	
NESTED CLADE	89.9469	0.2130	0.9660	
CLADE AreaV (Tip)				
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=	
WITHIN CLADE	0.0000	1.0000	1.0000	

NESTED CLADE	479.5330	0.9010	0.1710
CLADE AreaY (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	0.0000	1.0000	1.0000
NESTED CLADE	89.9469	0.2000	0.9660

NO INTERIOR/TIP CLADES EXIST IN THIS GROUP

PERMUTATION ANALYSIS OF Clade NL\_0\_7  
 BASED ON 1000 RESAMPLES

PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 3.7714

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
 OR EQUAL TO THE OBSERVED CHI-SQUARE = 1.0000

PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE
Clade NL_0_7	32.9505	26.5237
AreaO	32.6000	26.7661
AreaT	33.4293	26.1927

CLADE AreaO (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	115.5090	0.6680	0.3610
NESTED CLADE	116.6539	0.6050	0.4240

CLADE AreaT (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	86.1339	0.4620	0.5670
NESTED CLADE	106.7261	0.4530	0.5760

NO INTERIOR/TIP CLADES EXIST IN THIS GROUP

PERMUTATION ANALYSIS OF Clade NL\_0\_8  
 BASED ON 1000 RESAMPLES

PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 7.9167

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
OR EQUAL TO THE OBSERVED CHI-SQUARE = 1.0000

PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE
Clade NL_0_8	29.0267	30.4149
AreaI	28.6257	30.4251
AreaL	29.4089	30.4052

CLADE AreaI (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	87.1086	0.2890	0.7110
NESTED CLADE	91.1669	0.3560	0.6440

CLADE AreaL (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	98.0104	0.6550	0.3450
NESTED CLADE	99.0967	0.6570	0.3430

NO INTERIOR/TIP CLADES EXIST IN THIS GROUP

PERMUTATION ANALYSIS OF Clade NL\_1\_1  
BASED ON 1000 RESAMPLES

PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 11.6228

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
OR EQUAL TO THE OBSERVED CHI-SQUARE = 0.9980

PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE
Clade NL_1_1	29.0562	30.5393
NL_0_8	29.0267	30.4149
NL_0_9	29.1500	30.9347

CLADE NL_0_8 (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	95.2270	0.8320	0.1680
NESTED CLADE	93.9517	0.7920	0.2080

CLADE NL_0_9 (Interior)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	58.4785	0.0590	0.9410
NESTED CLADE	74.7275	0.1920	0.8080

PART III. TEST OF INTERIOR VS. TIP CLADES:

TYPE OF DISTANCE	I-T DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	-36.7485	0.0770	0.9230
NESTED CLADE	-19.2242	0.1970	0.8030

PERMUTATION ANALYSIS OF Clade NL\_1\_2  
 BASED ON 1000 RESAMPLES

PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 123.6746

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
 OR EQUAL TO THE OBSERVED CHI-SQUARE = 0.0030

PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE
Clade NL_1_2	29.0963	29.8511
NL_0_1	25.1783	30.3003
NL_0_2	33.0000	25.3750
NL_0_3	30.5023	29.6857
NL_0_10	28.6988	30.8328

CLADE NL\_0\_1 (Tip)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	112.9760	0.0000	1.0000
NESTED CLADE	440.9246	0.9980	0.0020

CLADE NL\_0\_2 (Tip)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	17.4689	0.0030	0.9970
NESTED CLADE	607.9402	1.0000	0.0000

CLADE NL\_0\_3 (Interior)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	216.2403	0.0020	0.9980
NESTED CLADE	286.5302	0.1700	0.8300

CLADE NL\_0\_10 (Interior)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	92.8078	0.0000	1.0000
NESTED CLADE	150.7748	0.0000	1.0000

PART III. TEST OF INTERIOR VS. TIP CLADES:

TYPE OF DISTANCE	I-T DISTANCE	PROB.<=	PROB.>=
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WITHIN CLADE	86.5060	0.8690	0.1310
NESTED CLADE	-245.3745	0.0000	1.0000

PERMUTATION ANALYSIS OF Clade NL\_1\_3  
 BASED ON 1000 RESAMPLES

PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 0.0000

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
 OR EQUAL TO THE OBSERVED CHI-SQUARE = 1.0000

PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE
Clade NL_1_3	32.6000	26.0667
NL_0_4	32.6000	26.0667
NL_0_5	32.6000	26.0667

CLADE NL\_0\_4 (Interior)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	140.1122	1.0000	0.6900
NESTED CLADE	140.1122	0.8480	0.8420

CLADE NL\_0\_5 (Interior)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	140.1122	1.0000	0.6900
NESTED CLADE	140.1122	0.8420	0.8480

NO INTERIOR/TIP CLADES EXIST IN THIS GROUP

PERMUTATION ANALYSIS OF Clade NL\_1\_4  
 BASED ON 1000 RESAMPLES

PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 8.2560

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
 OR EQUAL TO THE OBSERVED CHI-SQUARE = 0.9260

PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE
Clade NL_1_4	32.6116	26.2526
NL_0_6	32.1789	25.9066
NL_0_7	32.9505	26.5237

CLADE NL\_0\_6 (Interior)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	43.9939	0.0040	0.9970
NESTED CLADE	81.8650	0.0960	0.9050

CLADE NL\_0\_7 (Tip)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	112.4576	0.7270	0.2740
NESTED CLADE	123.6046	0.9610	0.0400

PART III. TEST OF INTERIOR VS. TIP CLADES:

TYPE OF DISTANCE	I-T DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	-68.4637	0.0060	0.9950
NESTED CLADE	-41.7396	0.0540	0.9470

PERMUTATION ANALYSIS OF Clade NL\_2\_1  
BASED ON 1000 RESAMPLES

PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 47.8217

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
OR EQUAL TO THE OBSERVED CHI-SQUARE = 0.0800

PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE
Clade NL_2_1	29.0685	30.1542
NL_1_1	29.0562	30.5393
NL_1_2	29.0783	29.8469

CLADE NL\_1\_1 (Tip)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	89.3525	0.0000	1.0000
NESTED CLADE	100.8099	0.0000	1.0000

CLADE NL\_1\_2 (Interior)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	308.1992	1.0000	0.0000
NESTED CLADE	306.8798	1.0000	0.0000

PART III. TEST OF INTERIOR VS. TIP CLADES:

TYPE OF DISTANCE	I-T DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	218.8466	1.0000	0.0000
NESTED CLADE	206.0700	1.0000	0.0000

PERMUTATION ANALYSIS OF Clade NL\_2\_2  
 BASED ON 1000 RESAMPLES

PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 6.2947

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
 OR EQUAL TO THE OBSERVED CHI-SQUARE = 0.8680

PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE
Clade NL_2_2	32.6108	26.2405
NL_1_3	32.6000	26.0667
NL_1_4	32.6116	26.2526

CLADE NL\_1\_3 (Interior)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	140.1122	0.9730	0.0360
NESTED CLADE	144.4304	0.8890	0.1200

CLADE NL\_1\_4 (Tip)

TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	105.2681	0.3370	0.6720
NESTED CLADE	105.1386	0.3110	0.6980

PART III. TEST OF INTERIOR VS. TIP CLADES:

TYPE OF DISTANCE	I-T DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	34.8441	0.9550	0.0540
NESTED CLADE	39.2917	0.8450	0.1640

PERMUTATION ANALYSIS OF Clade NL\_3\_total  
 BASED ON 1000 RESAMPLES

PART I. PERMUTATIONAL CONTINGENCY TEST:

OBSERVED CHI-SQUARE STATISTIC = 91.9337

THE PROBABILITY OF A RANDOM CHI-SQUARE BEING GREATER THAN  
OR EQUAL TO THE OBSERVED CHI-SQUARE = 0.0000

PART II. GEOGRAPHIC DISTANCE ANALYSIS:

GEOGRAPHICAL CENTERS	LATITUDE	LONGITUDE
Clade NL_3_total	29.7243	29.4316
NL_2_1	29.0718	30.1530
NL_2_2	32.6108	26.2405

CLADE NL_2_1 (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	216.0937	0.0000	1.0000
NESTED CLADE	247.5416	0.0000	1.0000

CLADE NL_2_2 (Tip)			
TYPE OF DISTANCE	DISTANCE	PROB.<=	PROB.>=
WITHIN CLADE	107.6873	0.0000	1.0000
NESTED CLADE	445.8401	1.0000	0.0000

NO INTERIOR/TIP CLADES EXIST IN THIS GROUP

\*\* ANALYSIS FINISHED \*\*  
It took 23.7500 seconds.