

1 **Appendix B.**

2 Frequency of Type I and Type II errors in 12 different benchmark tests (see Table 1 for a  
3 description of these tests) for the two proposed methods (*EcoTest*, *BiogTest*). For the *BiogTest*  
4 method, three different underlying distributions of species relative abundances for the bench mark  
5 null communities were used (log-normal, geometric, broken-stick). These benchmark tests were  
6 applied for different variations of the original methods, including sample-size-based rarefaction  
7 curves for Hill numbers 1 (a) and 2 (b), and coverage-based rarefaction curves for Hill numbers 0  
8 (c), 1 (d) and 2 (e).

9 a)

	<i>EcoTest</i>		<i>BiogTest</i>					
			Log-normal		Geometric		Broken-stick	
	Type I error	Type II error	Type I error	Type II error	Type I error	Type II error	Type I error	Type II error
Benchmark test 1	7.20%	-	6.27%	-	29.60%	-	3.73%	-
Benchmark test 2	7.60%	-	0.00%	-	10.40%	-	0.00%	-
Benchmark test 3	-	0.00%	3.87%	-	27.33%	-	1.87%	-
Benchmark test 4	-	0.00%	0.00%	-	4.60%	-	0.00%	-
Benchmark test 5	-	0.13%	-	15.60%	-	7.60%	-	19.20%
Benchmark test 6	-	0.00%	-	46.44%	-	23.43%	-	47.70%
Benchmark test 7	-	0.45%	-	7.07%	-	3.31%	-	8.30%
Benchmark test 8	-	0.00%	-	8.79%	-	6.28%	-	10.50%
Benchmark test 9	5.47%	-	3.73%	-	34.00%	-	3.47%	-
Benchmark test 10	-	0.00%	8.00%	-	37.07%	-	7.73%	-
Benchmark test 11	-	0.00%	-	8.13%	-	3.87%	-	8.80%
Benchmark test 12	-	0.00%	-	3.20%	-	1.20%	-	3.87%

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11 b)

	<i>EcoTest</i>		<i>BiogTest</i>					
			Log-normal		Geometric		Broken-stick	
	Type I error	Type II error	Type I error	Type II error	Type I error	Type II error	Type I error	Type II error
Benchmark test 1	8.53%	-	6.00%	-	29.73%	-	3.47%	-
Benchmark test 2	9.20%	-	0.00%	-	4.00%	-	0.00%	-
Benchmark test 3	-	0.00%	4.40%	-	25.47%	-	2.67%	-
Benchmark test 4	-	0.00%	0.00%	-	1.26%	-	0.00%	-
Benchmark test 5	-	0.27%	-	26.607%	-	11.73%	-	34.13%
Benchmark test 6	-	0.00%	-	71.13%	-	36.82%	-	78.57%
Benchmark test 7	-	0.30%	-	12.93%	-	5.42%	-	17.19%
Benchmark test 8	-	0.00%	-	23.85%	-	8.79%	-	25.63%
Benchmark test 9	5.20%	-	3.07%	-	35.87%	-	2.67%	-
Benchmark test 10	-	0.00%	8.00%	-	36.53%	-	6.53%	-
Benchmark test 11	-	0.00%	-	10.13%	-	4.40%	-	11.60%
Benchmark test 12	-	0.00%	-	4.13%	-	1.60%	-	5.07%

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	<i>EcoTest</i>		<i>BiogTest</i>					
			Log-normal		Geometric		Broken-stick	
	Type I error	Type II error	Type I error	Type II error	Type I error	Type II error	Type I error	Type II error
Benchmark test 1	6.93%	-	5.47%	-	31.87%	-	2.53%	-
Benchmark test 2	14.00%	-	0.00%	-	12.00%	-	0.00%	-
Benchmark test 3	-	0.00%	3.87%	-	29.87%	-	1.74%	-
Benchmark test 4	-	0.00%	0.00%	-	9.62%	-	0.00%	-
Benchmark test 5	-	0.13%	-	17.47%	-	6.41%	-	20.27%
Benchmark test 6	-	0.00%	-	47.70%	-	18.83%	-	53.78%
Benchmark test 7	-	0.30%	-	8.28%	-	3.77%	-	10.12%
Benchmark test 8	-	0.00%	-	11.72%	-	3.77%	-	13.03%
Benchmark test 9	4.00%	-	3.73%	-	54.53%	-	5.47%	-
Benchmark test 10	-	0.10%	10.67%	-	60.67%	-	16.93%	-
Benchmark test 11	-	2.27%	-	14.67%	-	1.47%	-	16.67%
Benchmark test 12	-	0.80%	-	20.13%	-	0.40%	-	27.20%

15 d)

	<i>EcoTest</i>		<i>BiogTest</i>					
			Log-normal		Geometric		Broken-stick	
	Type I error	Type II error	Type I error	Type II error	Type I error	Type II error	Type I error	Type II error
Benchmark test 1	6.93%	-	5.61%	-	31.73%	-	2.67%	-
Benchmark test 2	13.60%	-	0.00%	-	4.80%	-	0.00%	-
Benchmark test 3	-	0.00%	3.47%	-	26.67%	-	2.00%	-
Benchmark test 4	-	0.00%	0.00%	-	2.09%	-	0.00%	-
Benchmark test 5	-	0.13%	-	23.20%	-	10.93%	-	29.01%
Benchmark test 6	-	0.00%	-	67.78%	-	36.82%	-	71.19%
Benchmark test 7	-	0.30%	-	11.28%	-	5.42%	-	13.29%
Benchmark test 8	-	0.00%	-	18.83%	-	7.14%	-	21.01%
Benchmark test 9	4.27%	-	4.13%	-	57.33%	-	5.33%	-
Benchmark test 10	-	0.10%	10.40%	-	62.40%	-	14.67%	-
Benchmark test 11	-	3.60%	-	15.33%	-	1.60%	-	16.80%
Benchmark test 12	-	0.80%	-	15.87%	-	1.07%	-	23.87%

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	<i>EcoTest</i>		<i>BiogTest</i>					
			Log-normal		Geometric		Broken-stick	
	Type I error	Type II error	Type I error	Type II error	Type I error	Type II error	Type I error	Type II error
Benchmark test 1	7.87%	-	5.73%	-	31.87%	-	2.27%	-
Benchmark test 2	15.60%	-	0.00%	-	3.20%	-	0.00%	-
Benchmark test 3	-	0.00%	4.13%	-	25.07%	-	2.14%	-
Benchmark test 4	-	0.00%	0.00%	-	1.67%	-	0.00%	-
Benchmark test 5	-	0.27%	-	31.20%	-	14.67%	-	36.90%
Benchmark test 6	-	0.00%	-	80.75%	-	44.35%	-	83.05%
Benchmark test 7	-	0.30%	-	14.48%	-	5.87%	-	18.28%
Benchmark test 8	-	0.00%	-	26.36%	-	10.50%	-	28.27%
Benchmark test 9	4.53%	-	4.40%	-	54.00%	-	4.80%	-
Benchmark test 10	-	0.20%	10.93%	-	60.93%	-	14.00%	-
Benchmark test 11	-	5.87%	-	16.13%	-	1.60%	-	17.87%
Benchmark test 12	-	1.33%	-	13.87%	-	0.80%	-	23.07%