Article:

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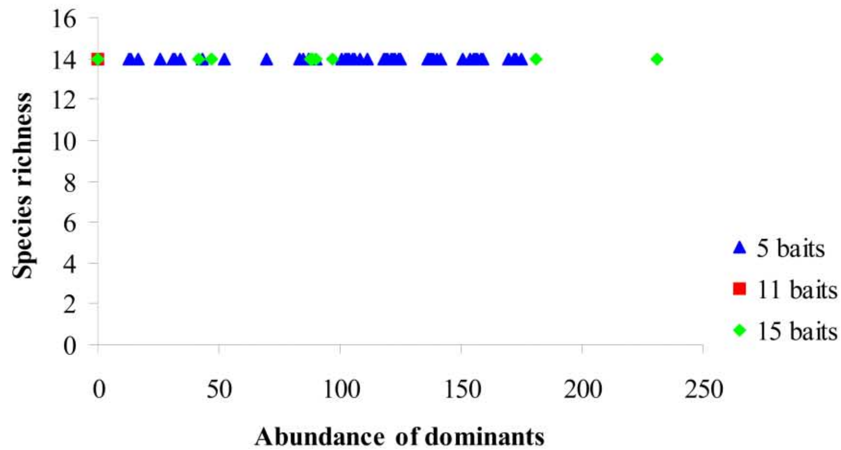
Appendix B from C. L. Parr et al., "Constraint and Competition in Assemblages: A Cross-Continental and Modeling Approach for Ants"

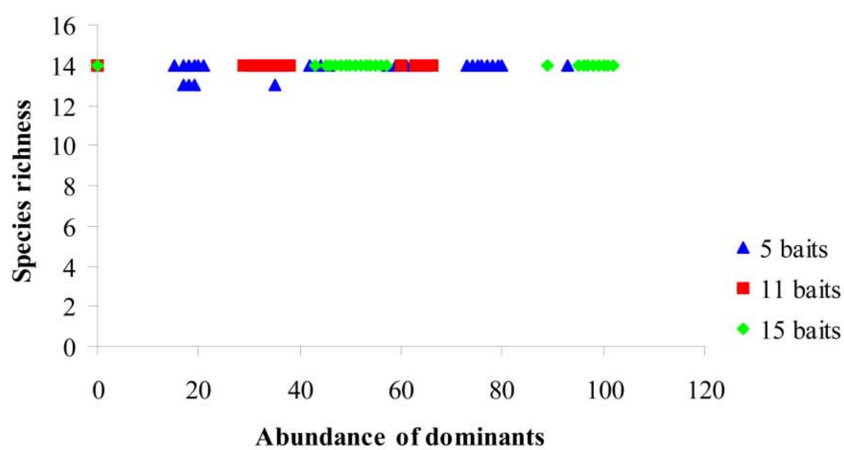
(Am. Nat., vol. 165, no. 4, p. 481)

Figures

A


Species richness
Abundance of dominants
5 baits
11 baits
15 baits

B


Species richness
Abundance of dominants
5 baits
11 baits
15 baits

C

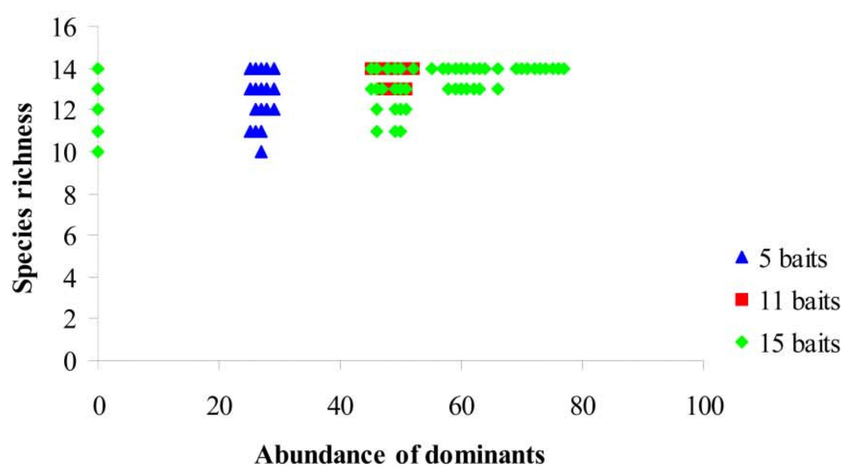
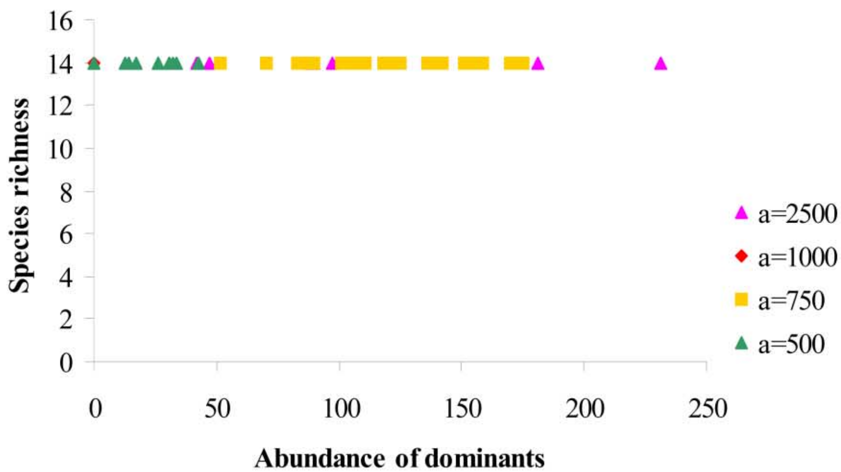
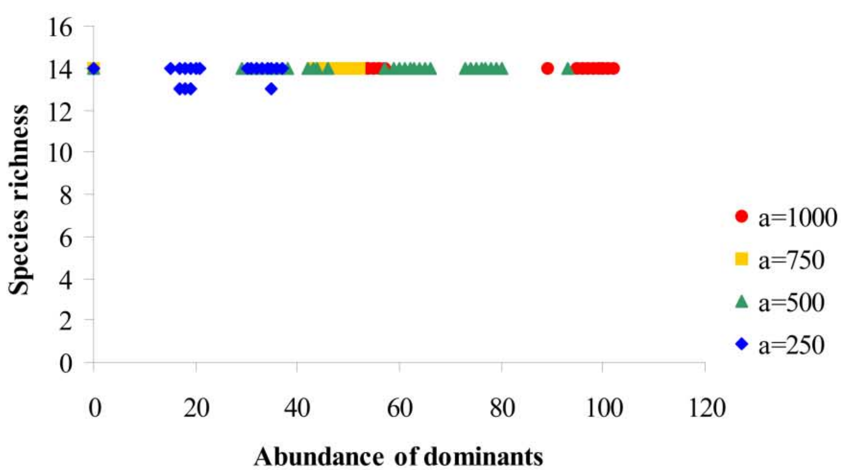

Species richness
Abundance of dominants
5 baits
11 baits
15 baits

Figure B1: Effect of changing bait number on the relationship between species richness and abundance score of dominant ants for three species abundance frequency distributions using the *Null 3* model, which includes patchiness within baits and alters the number of baits that are occupied. Number of baits occupied: five, 11, and 15 baits. Starting values for *a* ranged from 100 to 2,500. Each data set is the result of 100 iterations of the model. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


Species richness
Abundance of dominants
a=2500
a=1000
a=750
a=500

B


Species richness
Abundance of dominants
a=1000
a=750
a=500
a=250

C

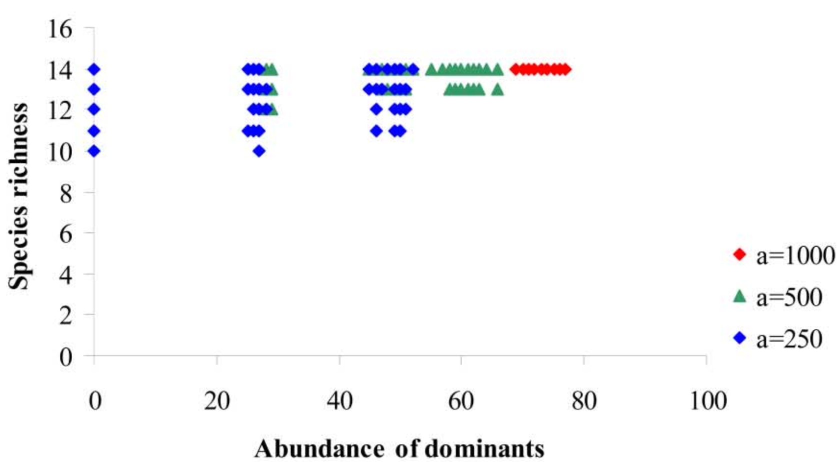
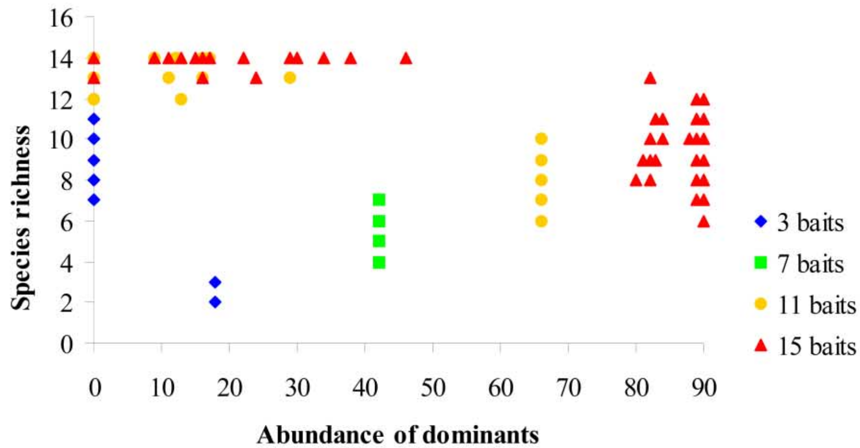
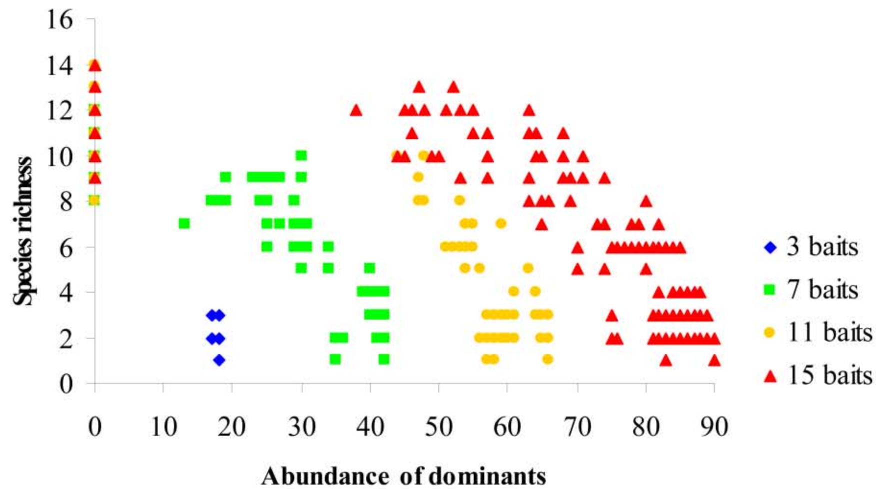

Species richness
Abundance of dominants
a=1000
a=500
a=250

Figure B2: Effect of changing starting abundance of ants on the relationship between species richness and abundance score of dominant ants for three species abundance frequency distributions using the *Null 3* model, which includes patchiness within baits and alters the number of baits that are occupied. Number of baits occupied: five, 11, and 15 baits. Starting values for a ranged from 100 to 2,500. Each data set is the result of 100 iterations of the model. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


16
14
12
10
8
6
4
2
0
Species richness
0
10
20
30
40
50
60
70
80
90
Abundance of dominants
3 baits
7 baits
11 baits
15 baits

B


16
14
12
10
8
6
4
2
0
Species richness
0
10
20
30
40
50
60
70
80
90
Abundance of dominants
3 baits
7 baits
11 baits
15 baits

C

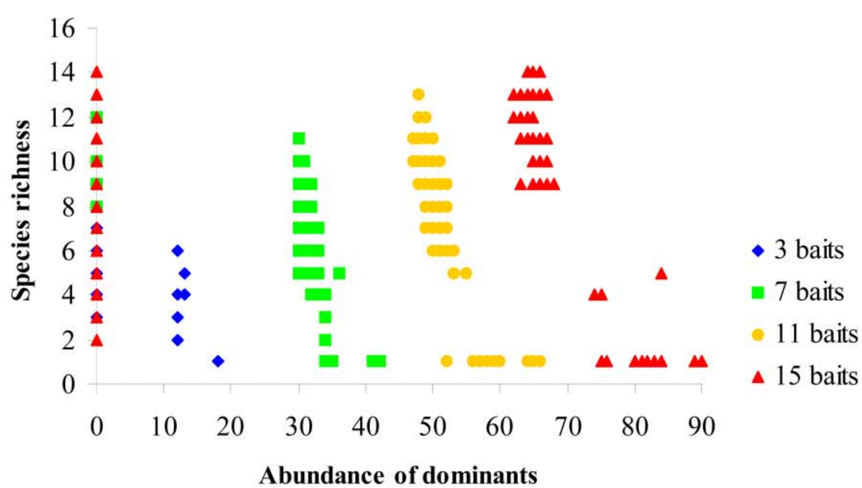
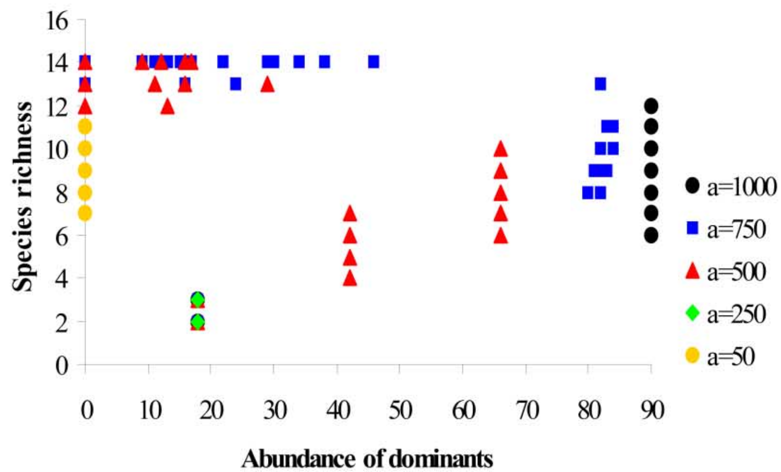
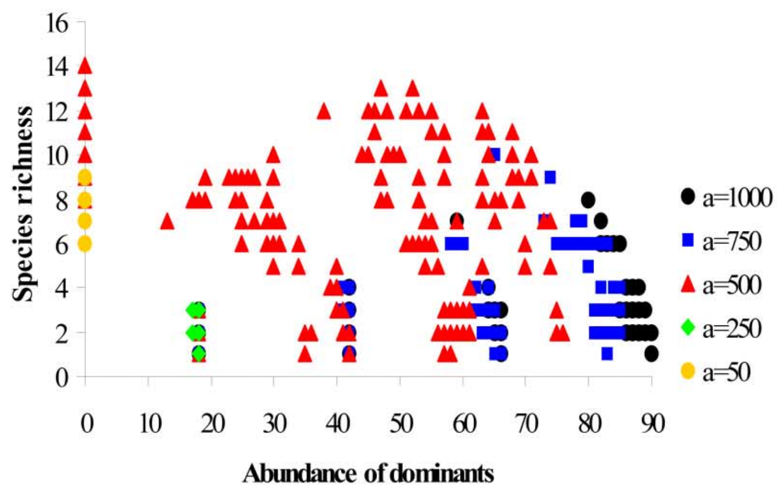

16
14
12
10
8
6
4
2
0
Species richness
0
10
20
30
40
50
60
70
80
90
Abundance of dominants
3 baits
7 baits
11 baits
15 baits

Figure B3: Effect of changing bait number on the relationship between species richness and abundance score of dominant ants for three species abundance frequency distributions using a competitive model (*Competition 1*) that simulates patchiness by changing the number of baits that are occupied. Number of baits occupied: five, 11, and 15 baits. Starting values for *a* ranged from 100 to 2,500. Each data set is the result of 100 iterations of the model. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


16
14
12
10
8
6
4
2
0
Species richness
0 10 20 30 40 50 60 70 80 90
Abundance of dominants
a=1000
a=750
a=500
a=250
a=50

B


16
14
12
10
8
6
4
2
0
Species richness
0 10 20 30 40 50 60 70 80 90
Abundance of dominants
a=1000
a=750
a=500
a=250
a=50

C

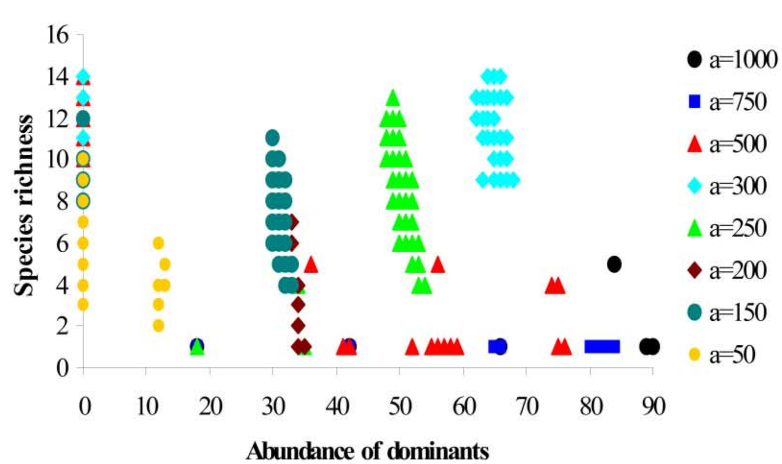
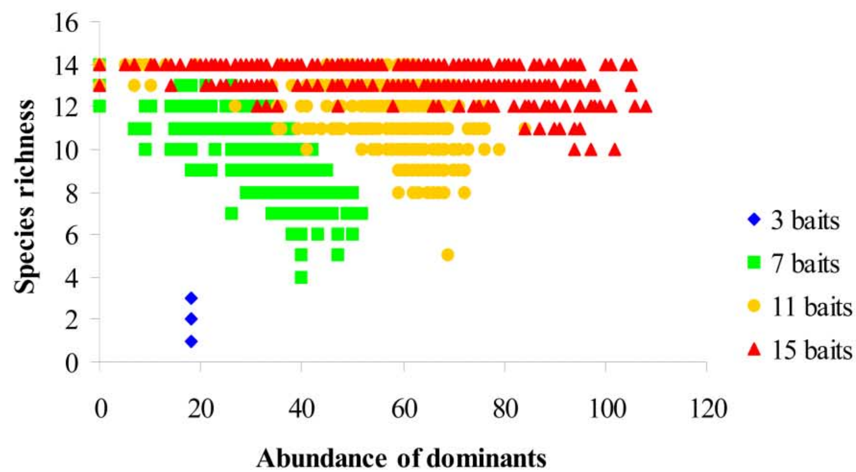
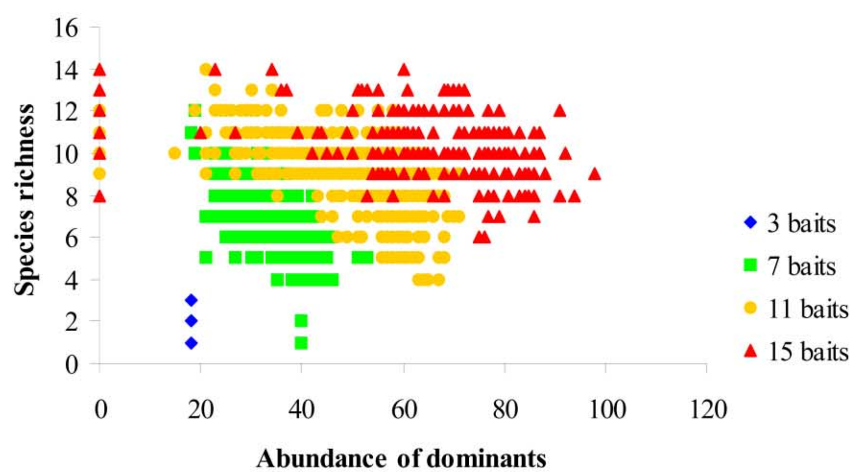

16
14
12
10
8
6
4
2
0
Species richness
0 10 20 30 40 50 60 70 80 90
Abundance of dominants
a=1000
a=750
a=500
a=300
a=250
a=200
a=150
a=50

Figure B4: Effect of changing starting abundance of ants on the relationship between species richness and abundance score of dominant ants for three species abundance frequency distributions using a competitive model (*Competition 1*) that simulates patchiness by changing the number of baits that are occupied. Starting values for *a* ranged from 100 to 2,500. Each data set is the result of 100 iterations of the model. Number of baits occupied: five, 11, and 15 baits. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


Species richness
Abundance of dominants
0
2
4
6
8
10
12
14
16
0
20
40
60
80
100
120
3 baits
7 baits
11 baits
15 baits

B


Species richness
Abundance of dominants
0
2
4
6
8
10
12
14
16
0
20
40
60
80
100
120
3 baits
7 baits
11 baits
15 baits

C

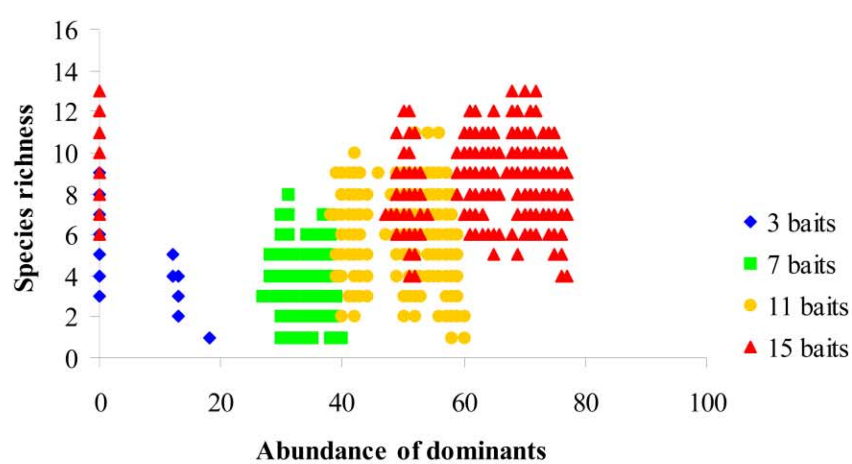
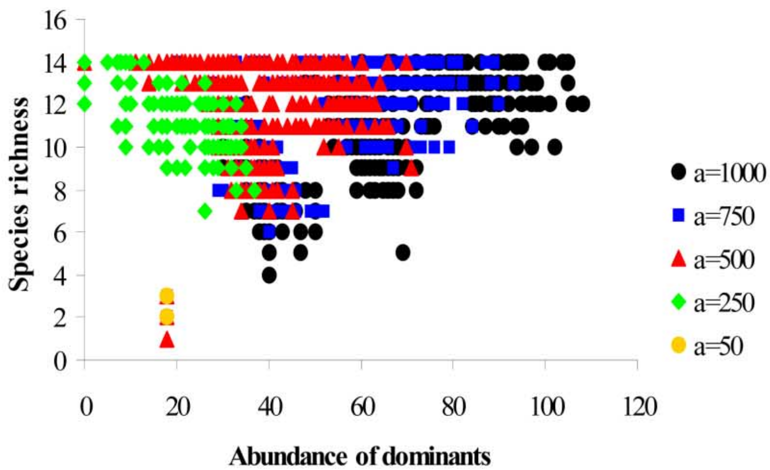
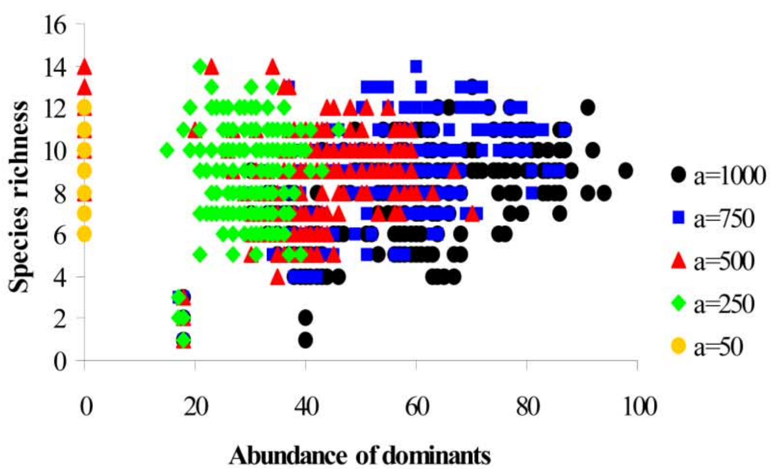

Species richness
Abundance of dominants
0
2
4
6
8
10
12
14
16
0
20
40
60
80
100
3 baits
7 baits
11 baits
15 baits

Figure B5: Effect of changing bait number on the relationship between species richness and abundance score of dominant ants for three species abundance frequency distributions using a competitive model (*Competition 2*) that simulates patchiness by changing the number of baits that are occupied and by modifying the probability of selection of the baits. Starting values for *a* ranged from 100 to 2,500. Each data set is the result of 100 iterations of the model. Number of baits occupied: five, 11, and 15 baits. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


Species richness
Abundance of dominants
0
2
4
6
8
10
12
14
16
0
20
40
60
80
100
120
a=1000
a=750
a=500
a=250
a=50

B


Species richness
Abundance of dominants
0
2
4
6
8
10
12
14
16
0
20
40
60
80
100
a=1000
a=750
a=500
a=250
a=50

C

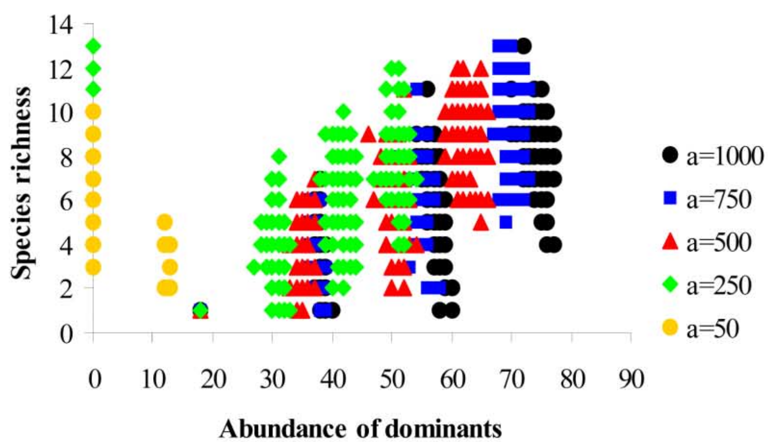
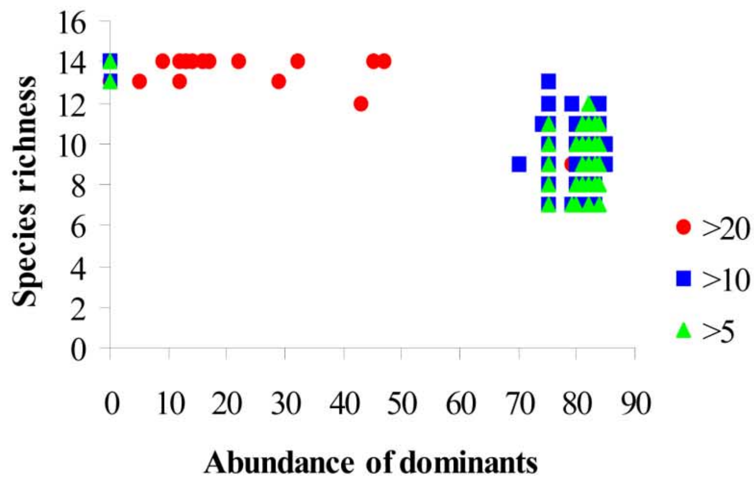
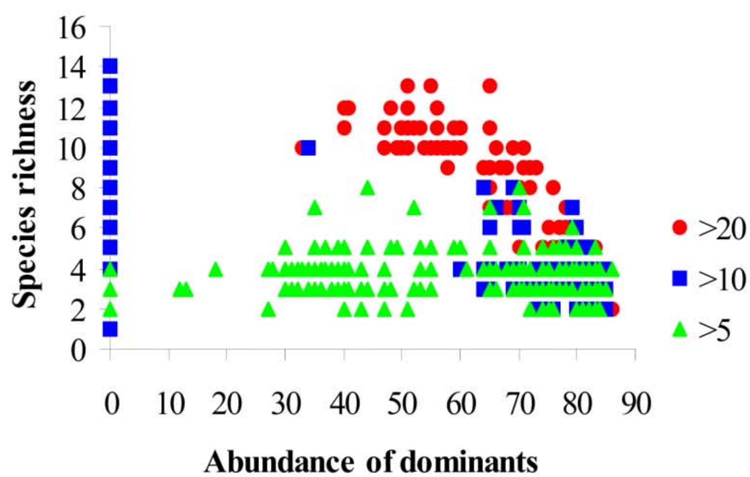

Species richness
Abundance of dominants
0
2
4
6
8
10
12
14
0
10
20
30
40
50
60
70
80
90
a=1000
a=750
a=500
a=250
a=50

Figure B6: Effect of changing starting abundance of ants on the relationship between species richness and abundance score of dominant ants for three species abundance frequency distributions using a competitive model (*Competition 1*) that simulates patchiness by changing the number of baits that are occupied and by modifying the probability of selection of the baits. Starting values for a ranged from 100 to 2,500. Each data set is the result of 100 iterations of the model. Number of baits occupied: five, 11, and 15 baits. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


16
14
12
10
8
6
4
2
0
Species richness
0 10 20 30 40 50 60 70 80 90
Abundance of dominants
>20
>10
>5

B


16
14
12
10
8
6
4
2
0
Species richness
0 10 20 30 40 50 60 70 80 90
Abundance of dominants
>20
>10
>5

C

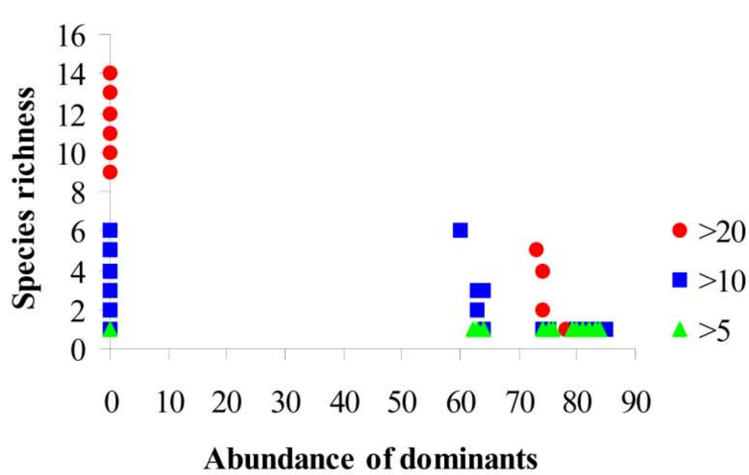
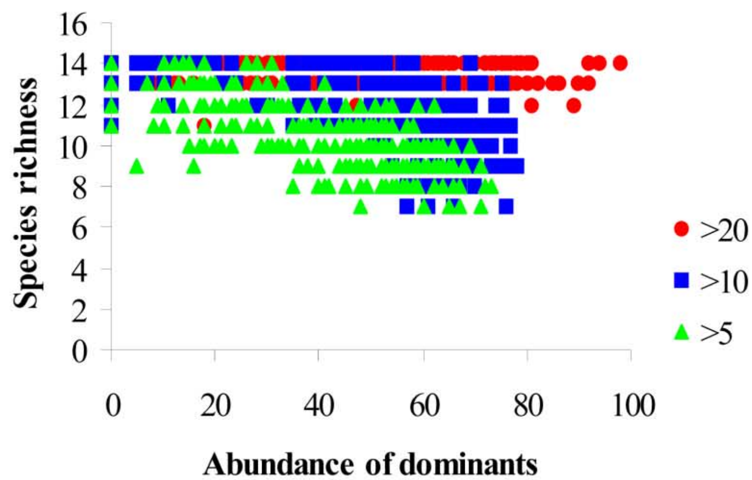
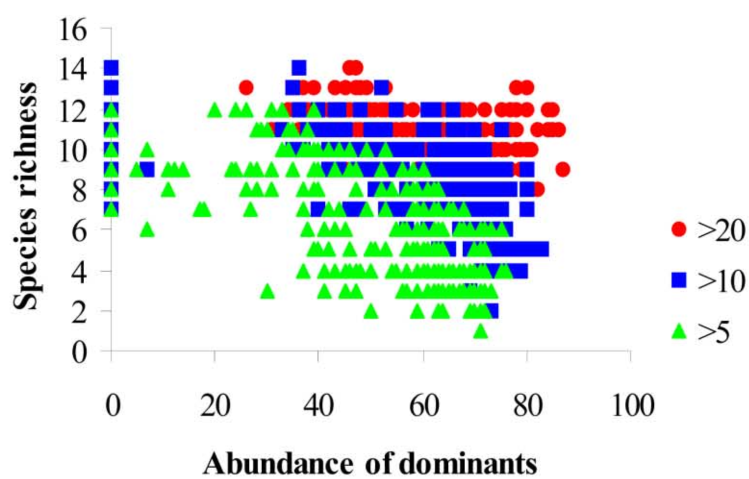

16
14
12
10
8
6
4
2
0
Species richness
0 10 20 30 40 50 60 70 80 90
Abundance of dominants
>20
>10
>5

Figure B7: Effect of changing threshold number of ants required to monopolize a bait on the relationship between species richness and abundance score of dominant ants using a competitive model (*Competition 3*) that simulates increased competition by decreasing the threshold number of ants required to achieve dominance. An even bait distribution and 15 baits were used, with the dominance threshold varied. Each data set is the result of 100 model iterations. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


16
14
12
10
8
6
4
2
0
Species richness
0
20
40
60
80
100
Abundance of dominants
>20
>10
>5

B


16
14
12
10
8
6
4
2
0
Species richness
0
20
40
60
80
100
Abundance of dominants
>20
>10
>5

C

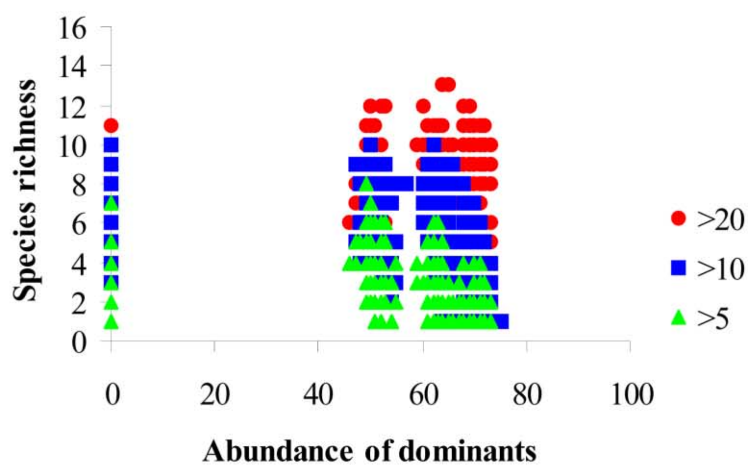
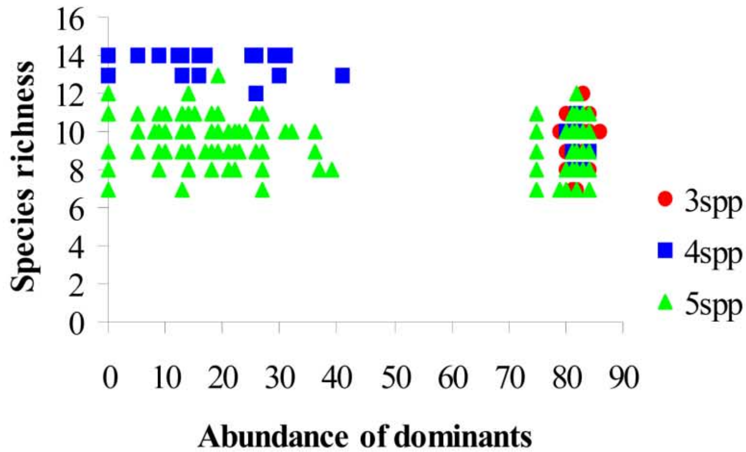
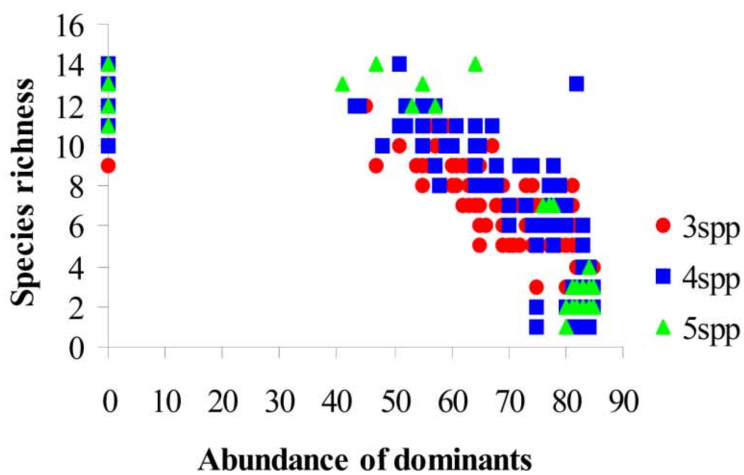

16
14
12
10
8
6
4
2
0
Species richness
0
20
40
60
80
100
Abundance of dominants
>20
>10
>5

Figure B8: Effect of changing threshold number of ants required to monopolize a bait on the relationship between species richness and abundance score of dominant ants using a competitive model (*Competition 3*) that simulates increased competition by decreasing the threshold number of ants required to achieve dominance. A Poisson bait distribution and 15 baits were used, with the dominance threshold varied. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


Species richness
Abundance of dominants
3spp
4spp
5spp

B


Species richness
Abundance of dominants
3spp
4spp
5spp

C

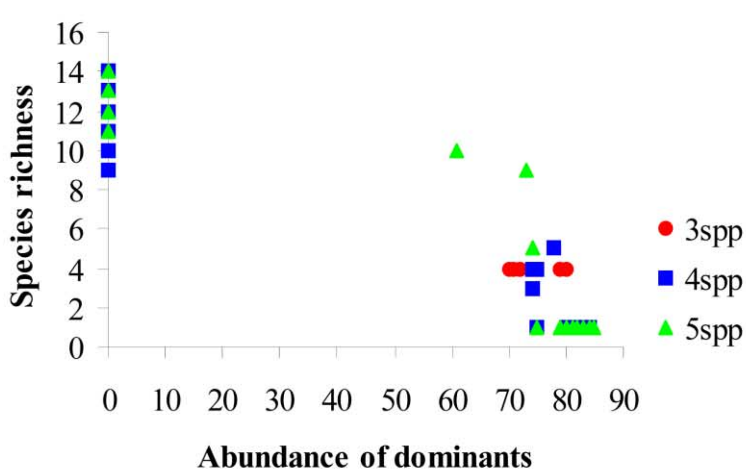

Species richness
Abundance of dominants
3spp
4spp
5spp

Figure B9: Effect of modifying the number of species able to coexist at a bait on the relationship between species richness and abundance score of dominant ants using a competitive model (*Competition 4*) that simulates altered competition by modifying the number of species able to coexist at a bait. An even bait distribution and 15 baits were used, with the dominance threshold varied. Each data set is the result of 100 iterations of the model. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

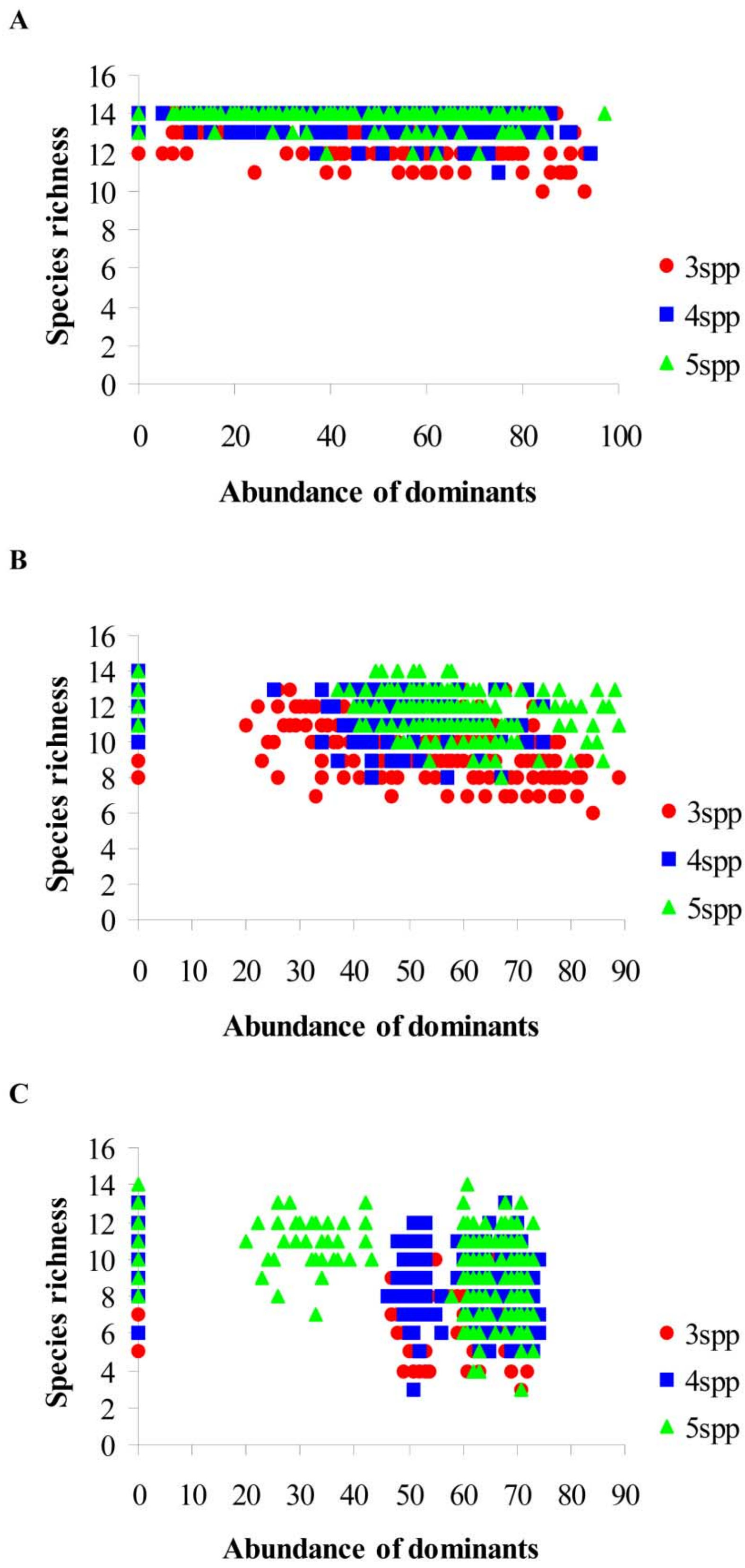
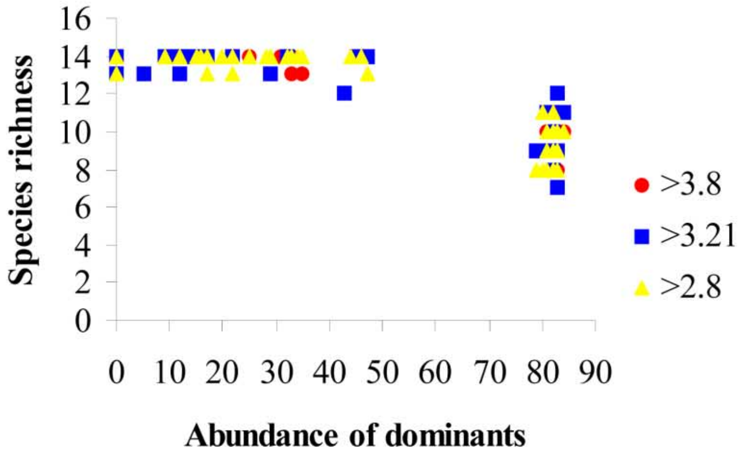
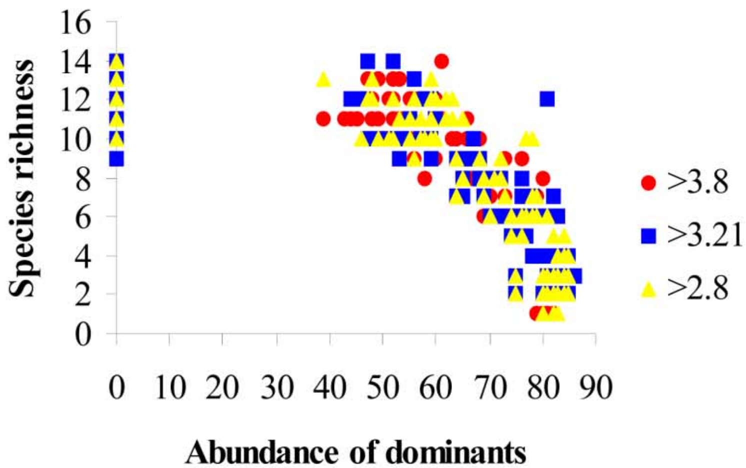

A
16
14
12
10
8
6
4
2
0
0
20
40
60
80
100
Species richness
Abundance of dominants
3spp
4spp
5spp
B
16
14
12
10
8
6
4
2
0
0
10
20
30
40
50
60
70
80
90
Species richness
Abundance of dominants
3spp
4spp
5spp
C
16
14
12
10
8
6
4
2
0
0
10
20
30
40
50
60
70
80
90
Species richness
Abundance of dominants
3spp
4spp
5spp

Figure B10: Effect of modifying the number of species able to coexist at a bait on the relationship between species richness and abundance score of dominant ants using a competitive model (*Competition 4*) that simulates altered competition by modifying the number of species able to coexist at a bait. A Poisson bait distribution and 15 baits were used, with the dominance threshold varied. Each data set is the result of 100 iterations of the model. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


Species richness
Abundance of dominants
0 10 20 30 40 50 60 70 80 90
0 2 4 6 8 10 12 14 16
>3.8
>3.21
>2.8

B


Species richness
Abundance of dominants
0 10 20 30 40 50 60 70 80 90
0 2 4 6 8 10 12 14 16
>3.8
>3.21
>2.8

C

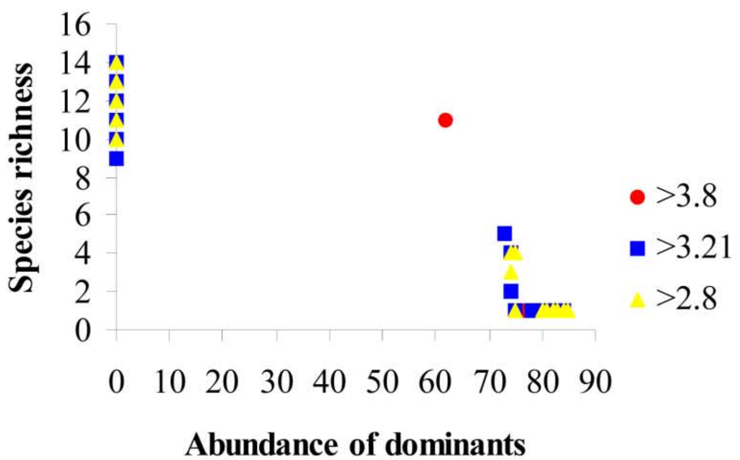

Species richness
Abundance of dominants
0 10 20 30 40 50 60 70 80 90
0 2 4 6 8 10 12 14 16
>3.8
>3.21
>2.8

Figure B11: Sensitivity analysis of the model of species richness and abundance score of dominant ants to changing the value of the mean abundance threshold. Conducted using *Competition 1*, 15 baits only, and an even bait distribution. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

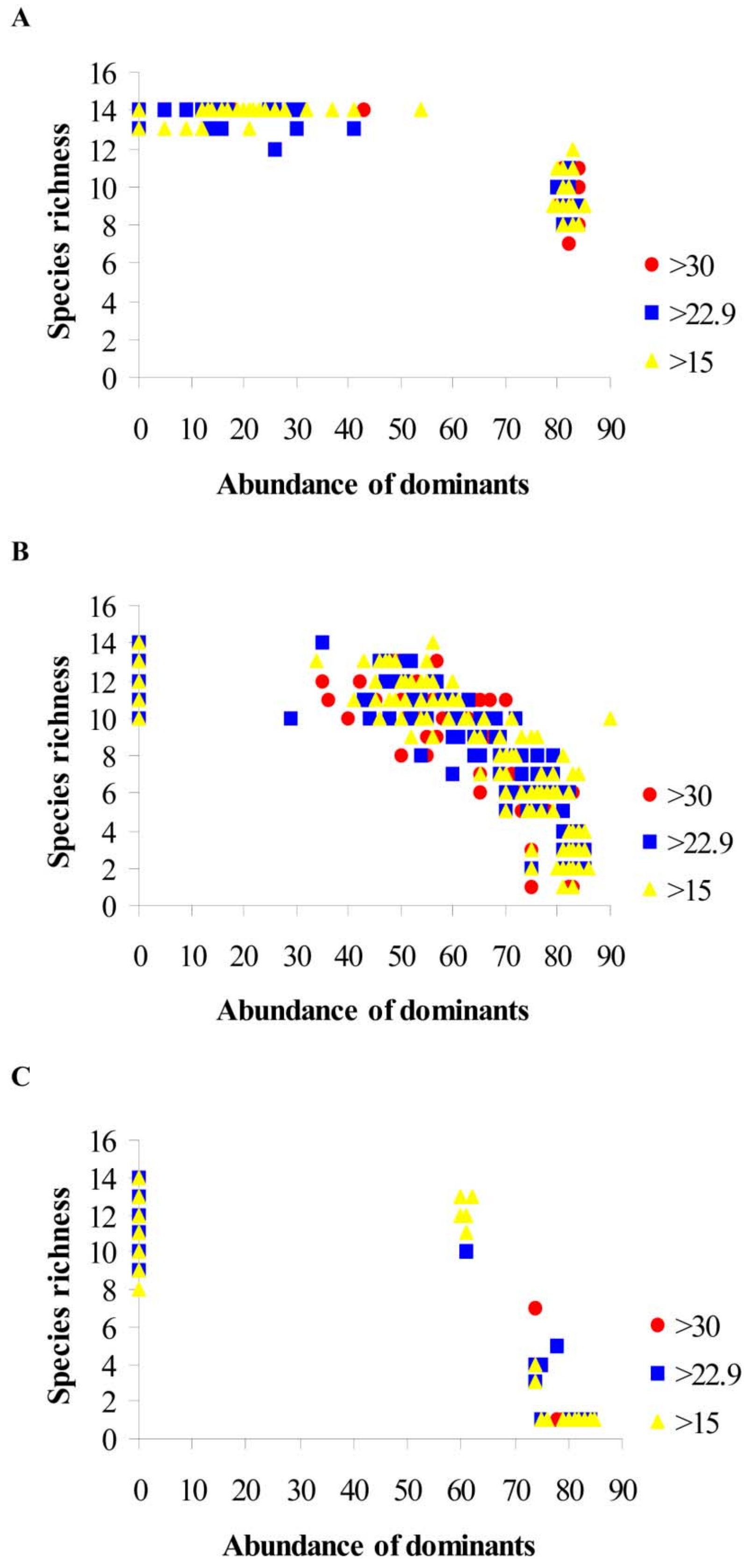
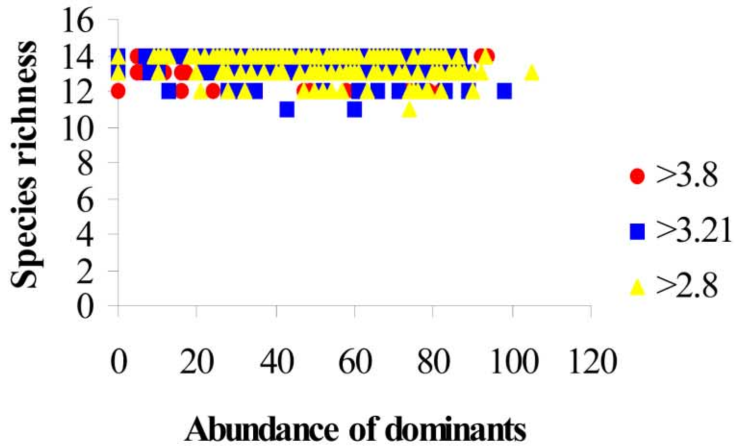
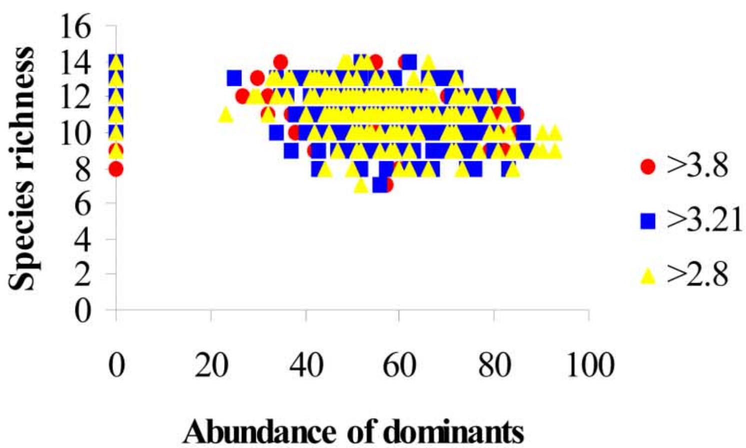

A
Species richness
Abundance of dominants
>30
>22.9
>15
B
Species richness
Abundance of dominants
>30
>22.9
>15
C
Species richness
Abundance of dominants
>30
>22.9
>15

Figure B12: Sensitivity analysis of the model of species richness and abundance score of dominant ants to changing the value of the monopolization threshold. Conducted using *Competition 1*, 15 baits only, and an even bait distribution. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


Species richness
16
14
12
10
8
6
4
2
0
0
20
40
60
80
100
120
Abundance of dominants
>3.8
>3.21
>2.8

B


Species richness
16
14
12
10
8
6
4
2
0
0
20
40
60
80
100
Abundance of dominants
>3.8
>3.21
>2.8

C

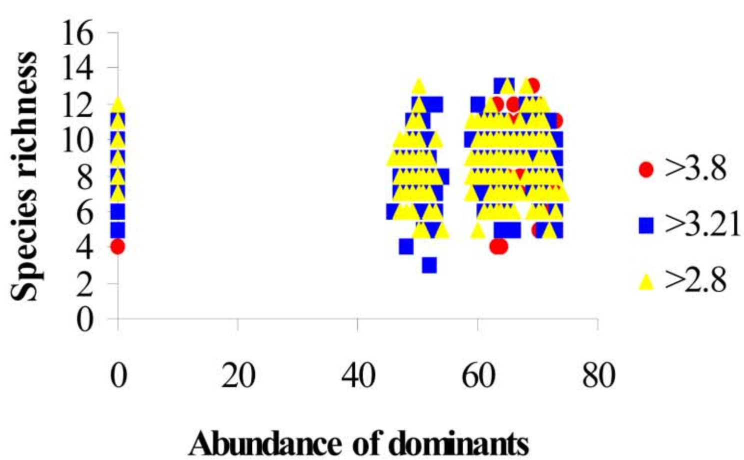
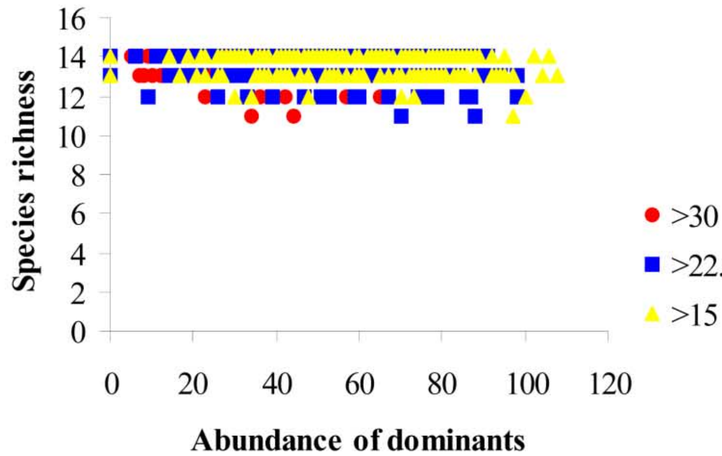
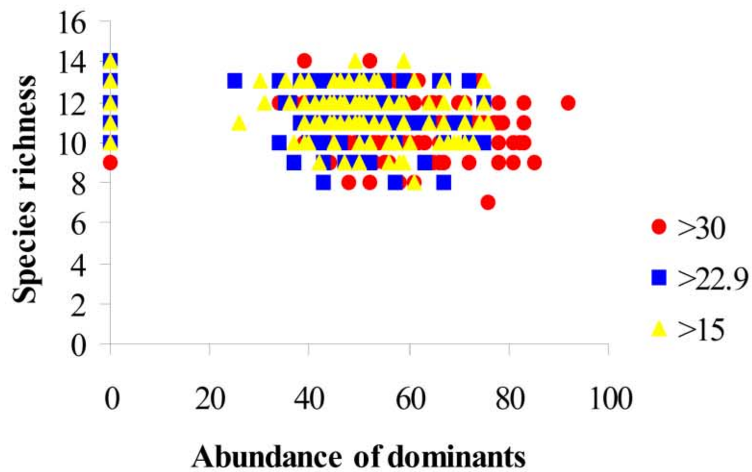

Species richness
16
14
12
10
8
6
4
2
0
0
20
40
60
80
Abundance of dominants
>3.8
>3.21
>2.8

Figure B13: Sensitivity analysis of the model of species richness and abundance score of dominant ants to changing the value of the mean abundance threshold. Conducted using *Competition 1*, 15 baits only, and a Poisson bait distribution. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


Species richness
Abundance of dominants
>30
>22.9
>15

B


Species richness
Abundance of dominants
>30
>22.9
>15

C

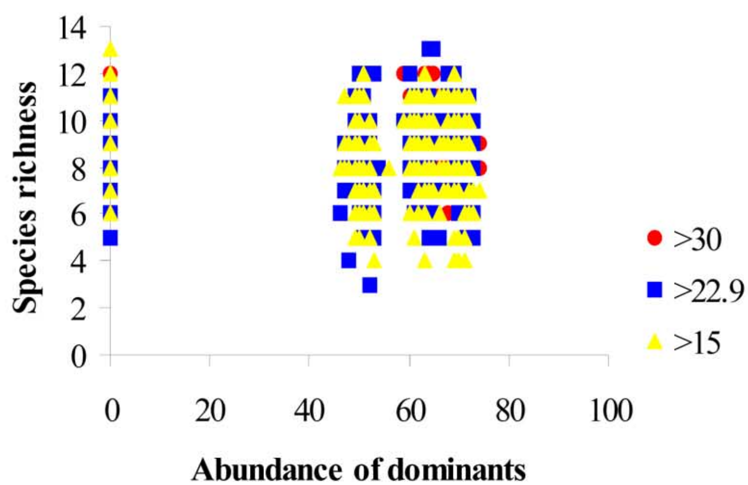
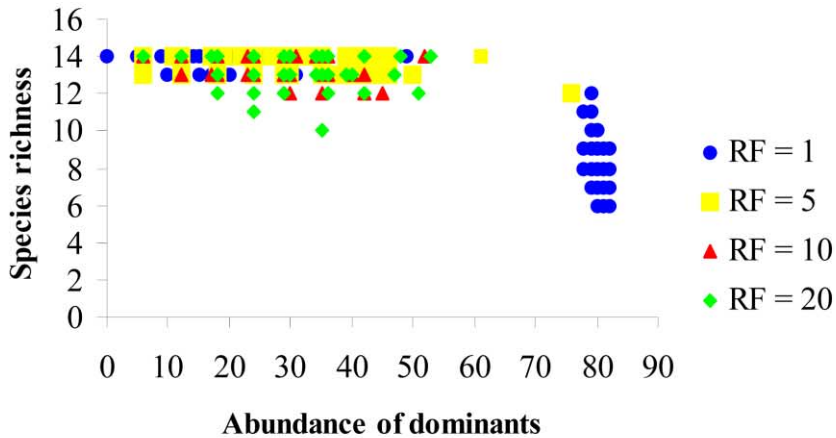
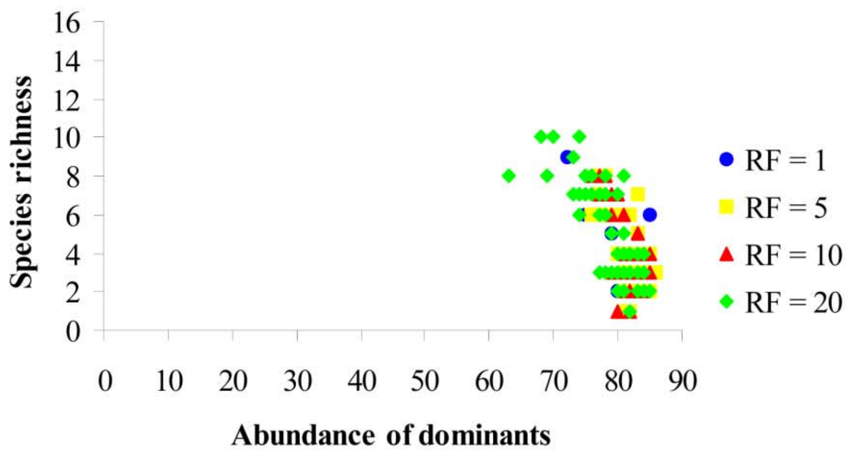

Species richness
Abundance of dominants
>30
>22.9
>15

Figure B14: Sensitivity analysis of the model of species richness and abundance score of dominant ants to changing the value of the monopolization threshold. Conducted using *Competition 1*, 15 baits only, and a Poisson bait distribution. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


Species richness
Abundance of dominants
RF = 1
RF = 5
RF = 10
RF = 20

B


Species richness
Abundance of dominants
RF = 1
RF = 5
RF = 10
RF = 20

C

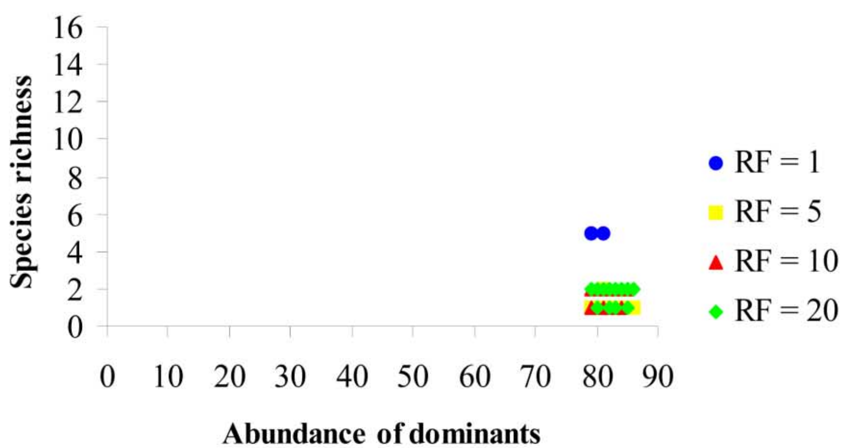
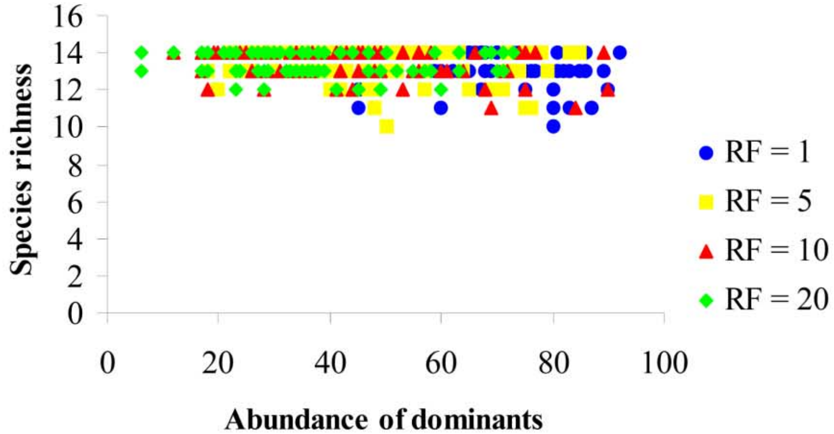
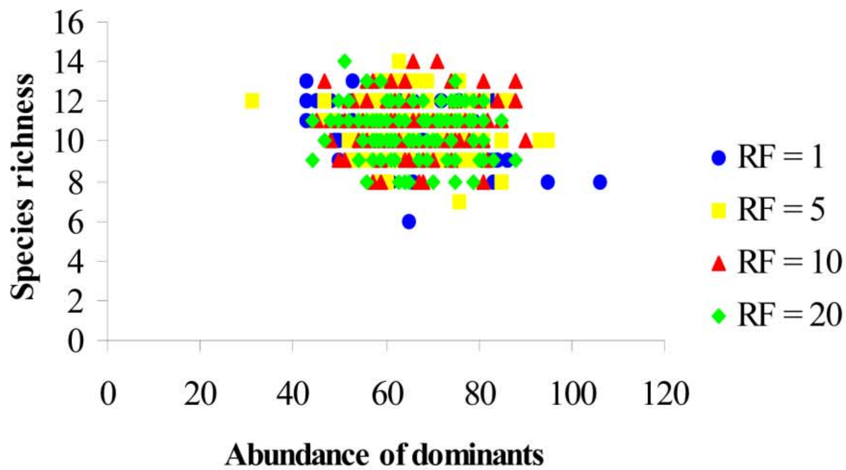

Species richness
Abundance of dominants
RF = 1
RF = 5
RF = 10
RF = 20

Figure B15: Effect of increasing recruitment factor (*RF*) on modeled dominance–species richness relationship. In this case, there is a species with low abundance that recruits better than all other species. Modeled using *Competition 1*, 15 baits only, and an even bait distribution. Each data set is the result of 100 iterations of the model. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


Species richness
Abundance of dominants
RF = 1
RF = 5
RF = 10
RF = 20

B


Species richness
Abundance of dominants
RF = 1
RF = 5
RF = 10
RF = 20

C

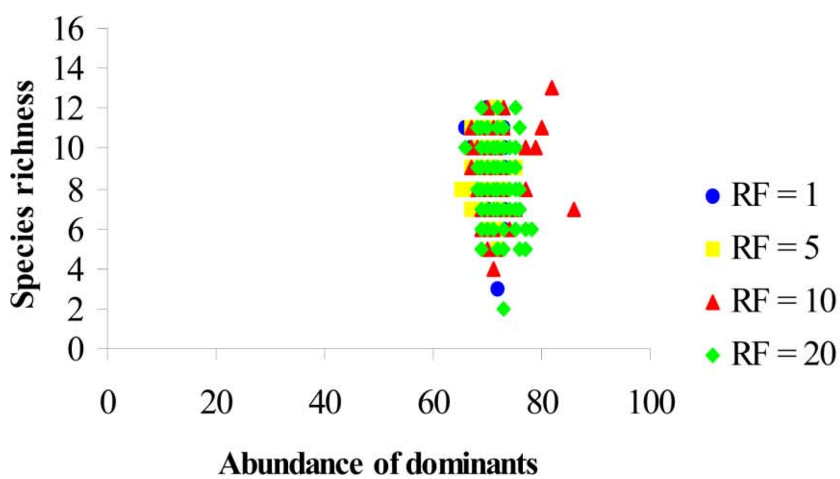
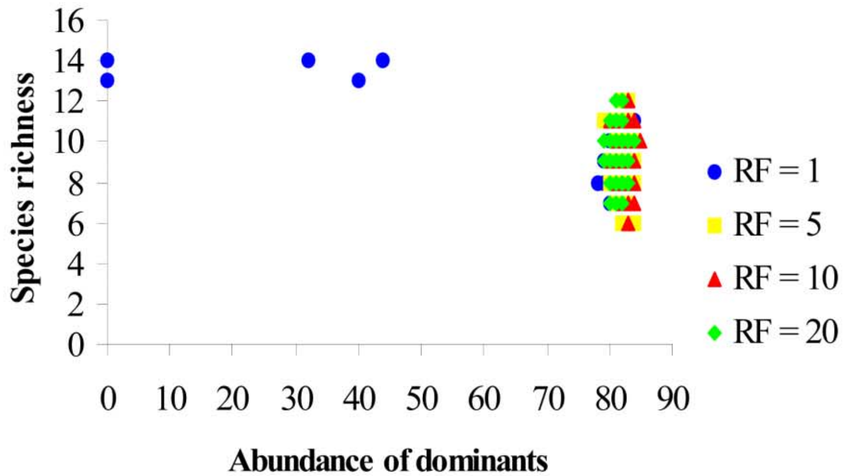
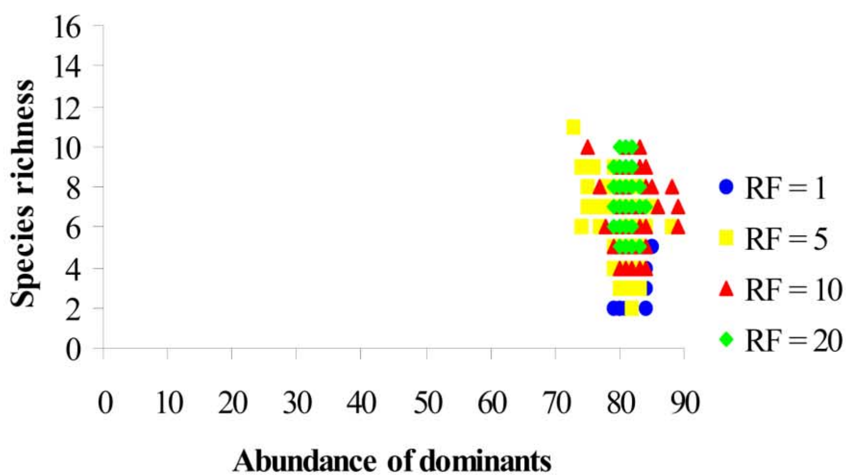

Species richness
Abundance of dominants
RF = 1
RF = 5
RF = 10
RF = 20

Figure B16: Effect of increasing recruitment factor (*RF*) on modeled dominance–species richness relationship. In this case, there is a species with low abundance that recruits better than all other species. Modeled using *Competition 1*, 15 baits only, and a Poisson bait distribution. Each data set is the result of 100 iterations of the model. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


Species richness
Abundance of dominants
RF = 1
RF = 5
RF = 10
RF = 20

B


Species richness
Abundance of dominants
RF = 1
RF = 5
RF = 10
RF = 20

C

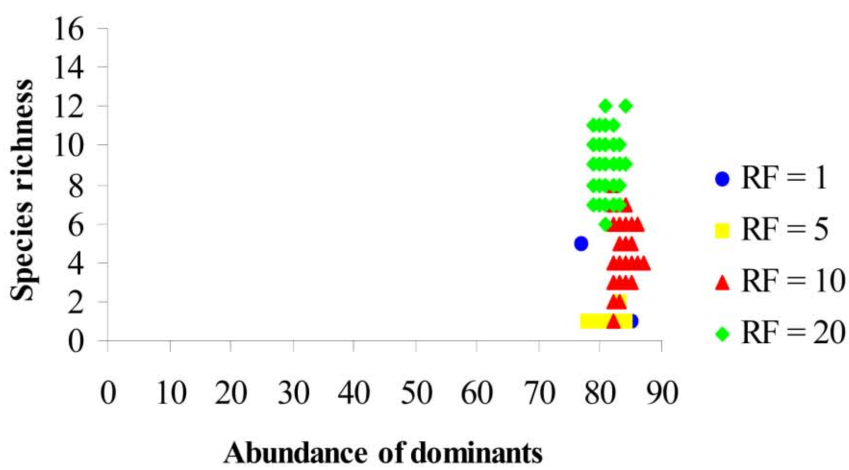
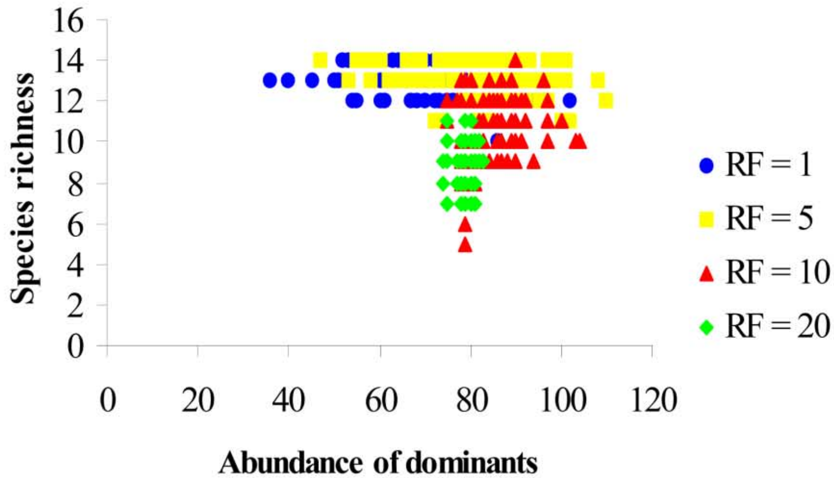
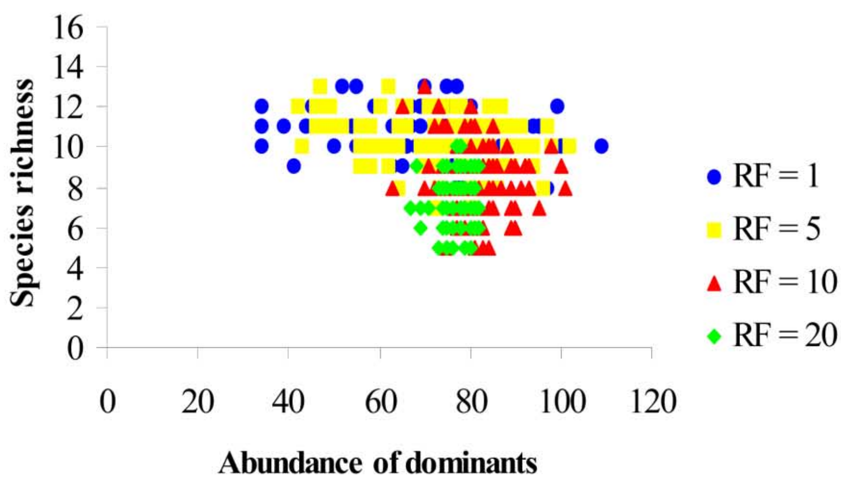

Species richness
Abundance of dominants
RF = 1
RF = 5
RF = 10
RF = 20

Figure B17: Effect of increasing recruitment factor (*RF*) on modeled dominance–species richness relationship. In this case, there is a species with high abundance that has impaired recruitment compared to all the other species. Modeled using *Competition 1*, 15 baits only, and an even bait distribution. Each data set is the result of 100 iterations of the model. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.

A


Species richness
Abundance of dominants
RF = 1
RF = 5
RF = 10
RF = 20

B


Species richness
Abundance of dominants
RF = 1
RF = 5
RF = 10
RF = 20

C

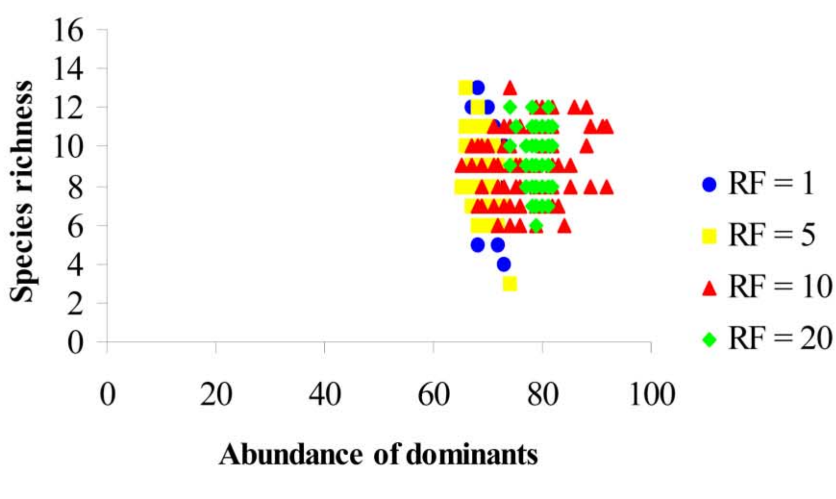

Species richness
Abundance of dominants
RF = 1
RF = 5
RF = 10
RF = 20

Figure B18: Effect of increasing recruitment factor (*RF*) on modeled dominance–species richness relationship. In this case, there is a species with high abundance that has impaired recruitment compared to all the other species. Modeled using *Competition 1*, 15 baits only, and a Poisson bait distribution. Each data set is the result of 100 iterations of the model. *A*, Even abundance frequency distribution; *B*, realistic abundance frequency distribution; *C*, skewed abundance frequency distribution.