Multidimensional (co)evolutionary stability

Flo Débarre

@flodebarre

University of Exeter, UK.

Raleigh Convention Center, North Carolina, June 20-24, 2014

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Multidimensional (co)evolutionary stability

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@floresbarre

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Multidimensional (co)evolutionary stability

How does the number of traits under selection influence the stability of (co)evolutionary equilibria?

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Multidimensional (co)evolutionary stability

How does the number of traits under selection influence the stability of (co)evolutionary equilibria?

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Stabilities

Convergence stability (CS)

Evolutionary stability (ES)

Stabilities

Convergence stability (CS)

Changes in the mean traits

Attractor/Repellor

Evolutionary stability (ES)

Stabilities

Convergence stability (CS)

Changes in the mean traits

Attractor/Repellor

Evolutionary stability (ES)

Stabilities

Convergence stability (CS)

Changes in the mean traits

Attractor/Repellor

Evolutionary stability (ES)

Stabilities

Convergence stability (CS)

Changes in the mean traits
Attractor/Repellor

Evolutionary stability (ES)

Changes in the trait variances
Stabilizing/Diversifying selection

Stabilities

Convergence stability (CS)

Changes in the mean traits

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Stabilities

Convergence stability (CS)

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Evolutionary stability (ES)

Changes in the trait variances

Stabilizing/Diversifying selection

Three effects of dimensionality

Three effects of dimensionality

Combinatorial effect

Three effects of dimensionality

Combinatorial effect

CS ✓

ES ✓

Three effects of dimensionality

Combinatorial effect

Epistatic interactions

CS ✓

ES ✓

Three effects of dimensionality

Combinatorial effect

CS ✓
ES ✓

Epistatic interactions

CS ✓
ES ✓

Three effects of dimensionality

Combinatorial effect

CS ✓
ES ✓

Epistatic interactions

CS ✓
ES ✓

Trait correlations

Three effects of dimensionality

Combinatorial effect

CS ✓
ES ✓

Epistatic interactions

CS ✓
ES ✓

Trait correlations

CS (✓)
ES ✗

Conclusion

Increased dimensionality
destabilizes equilibria.

Three effects of dimensionality:

	CS	ES
Combinatorial effect	✓	✓
Epistatic interactions	✓	✓
Trait correlations	(✓)	✗

For more details, see
Débarre, Nuismer & Doebeli (2014), *The American Naturalist*, in press.

Talk uploaded on Figshare

Thanks for your attention!