

Plant and Microbial Biology 220. Critical Thinking in Microbiology
Tu-Th 12:30-2:00 pm, 106 Mulford
John Taylor -- 2006

Evolution

Week 10 – Phylogenetics, the big tree of life.

Week 11 – Microbial species concepts.

Week 12 – Microbial genetic exchange.

Topics.

Cost of Sex

Value of Sex

Rare asexual organisms

Many asexual fungi

How to distinguish between clonality and recombination from population genetic data.

Tree length

Index of Association

Genealogical congruence

How to be misled by failing to recognize species boundaries.

Examples

Coccidioides

Recombination

Clonality

Migration

Letharia

Direct evidence for recombination, indirect evidence for migration

General background for Tuesday

Taylor, J. W., D. M. Geiser, A. Burt, and V. Koufopanou. 1999. The evolutionary biology and population genetics underlying fungal strain typing. *Clinical Microbiology Reviews* 12:126-146.

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Testing for bacterial (or fungal) recombination.

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- Hanage, W. P., Fraser, C. & Spratt, B. G. (2006). The impact of homologous recombination on the generation of diversity in bacteria. *Journal of Theoretical Biology* **239**, 210-219
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Papke, R. T., Koenig, J. E., Rodriguez-Valera, F. & Doolittle, W. F. (2004). Frequent recombination in a saltern population of *Halorubrum*. *Science* **306**, 1928-1929

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Testing for Horizontal Gene Transfer

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Examples of HGT at deep time scales

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Horizontal Gene Transfer in bacteria

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Horizontal Transfer in Fungi

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Range of genetic exchange in bacteria

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Reading for Thursday

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Background for Thursday

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