

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.

Week 11 – Microbial species concepts.

Background reading for Tuesday, November 7, 2006

(Taylor et al. 2000) – Species recognition in fungi

(Gevers et al. 2005) – Species recognition in bacteria

(Doolittle 1999) – Doolittle’s extension of horizontal gene transfer to all of bacteria

(Daubin et al. 2003) – From Ochaman’s lab, evidence that HGT is not a big worry.

Reading for discussion on Thursday, November 9, 2006

Half of the class, last names beginning with A to J, read: prokaryotic microbes:

(Whitaker et al. 2003) (Martiny et al. 2006)

Half of the class, last names beginning K to W, read: eukaryotic microbes:

(Dettman et al. 2003b) (Taylor et al. 2006)

Historical Dogma: Small organisms have global distributions or, “Everything is everywhere, the environment selects.” Bass-Becking (1934).

(Coleman 2002)

(Fenchel and Finlay 2004)

(Finlay 2002)

(Finlay and Fenchel 2004)

Fungal Species

Dogma

(Petersen and Hughes 1999)

Phylogenetic species

(Taylor et al. 2000)

(Koufopanou et al. 1997)

(Geiser et al. 1998)

(Kasuga et al. 1999; Kasuga et al. 2003)

(Taylor and Fisher 2003)

(Taylor et al. 2006)

Bacterial species

(Stackebrandt et al. 2002)
(Bapteste, Susko et al. 2005)
(Coenye, Gevers et al. 2005)
(Eardly and van Berkum 2005)
(Konstantinidis and Tiedje 2005)
(Ochman, Lerat et al. 2005)
(Taylor, Schupp et al. 2005)
(Gevers et al. 2005)

Review

(Feil et al. 1999)
(Smith et al. 2000)
Martiny et al. 2006)

Dogma

(Goodfellow et al. 1997)

Extremes

One species
Sonea 1991 (cited in (Doolittle 1999))

Over one-billion species

(Dykhuisen 1998)

Modern thinking

(Cohan 2001)
(Lawrence 2001)
(Cohan 2002a; Cohan 2002b)

Bacterial Biodiversity

(Horner-Devine et al. 2004)
(Papke and Ward 2004)
(Whitaker, Grogan and Taylor 2003)
(Keller and Zengler 2004)
(Green and Bohannan 2006)

Examples

E. coli

(Dykhuisen and Green 1991)
(Guttman 1997)

Neisseria

(Feil et al. 2000; Feil et al. 1999)
(Holmes et al. 1999; Smith et al. 1999; Spratt et al. 1995)

Helicobacter

(Suerbaum et al. 1998)

Rhizobium

(Souza et al. 1992)

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