***Handout* Kuliah Minggu – INTERAKSI ANTAR SPESIES – KOMPETISI**

Pokok Bahasan Kuliah:

JENIS-JENIS INTERAKSI ANTAR SPESIES

Interaksi	*Spesies1*	*Spesies 2*
KOMPETISI	–	–
Predasi	+	–
Herbivori	+	–
Parasitisme*	+	–
Mutualisme*	+	+
Komensalisme*	+	0
Amensalisme	–	0

*Hubungan simbiosis: kedua spesies hidup sangat berdekatan, bahkan menempel

KOMPETISI SEBAGAI BENTUK INTERAKSI

- Pengertian kompetisi
- Kompetisi asimetris

TIPE-TIPE KOMPETISI DI ALAM

- Kompetisi intraspesifik *vs.* interspesifik
- Contoh kompetisi intraspesifik: *self-thinning* pada tumbuhan
- Kompetisi eksploitatif *vs.* interferensi

PREDIKSI TEORITIS TENTANG KOMPETISI

KONSEP *NICHE* (RELUNG EKOLOGIS) & HASIL AKHIR KOMPETISI

- Pengertian *niche* (relung ekologis)
- *Fundamental niche* (relung dasar) *vs*. *realized niche* (relung nyata)
- *Competitive exclusion principle* (prinsip penyingkiran kompetitif)
- *Resource partitioning* (pembagian sumberdaya)
- *Character displacement* (pergeseran karakter morfologi)

MODEL MATEMATIS KOMPETISI

- Model kompetisi Lotka-Volterra

Sumber ilustrasi:

- Molles, M.C.Jr. Ecology: concepts and applications. McGraw-Hill, New York. Dari 4th edition (2008): **Gambar 13.4; 13.21**
- Krebs, C.J. 2001. Ecology. 5th. edition. Benjamin Cummings, New York. **Gambar 12.1; 12.1; 12.3; 12.14**
- Stiling, P. 2012. Ecology: global insights and investigations. McGraw-Hill, New York: **Gambar 11.3; 11.21; 11.22; 11.28**

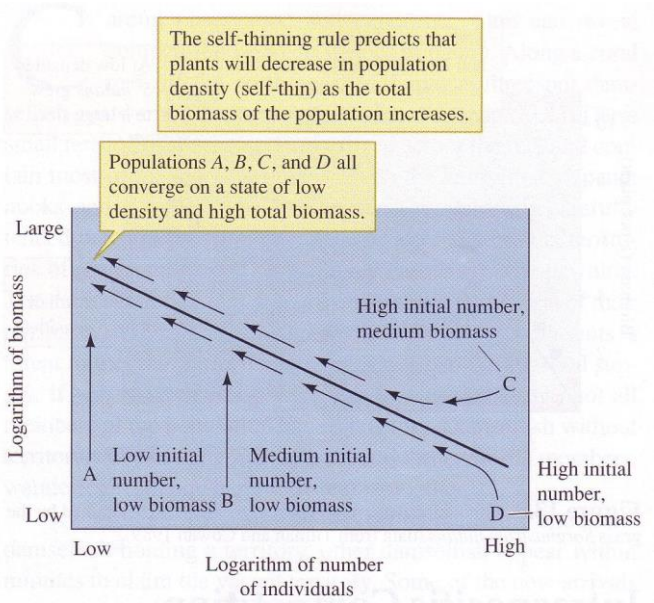


Figure 13.4 Self-thinning in plant populations (data from Westoby 1984).

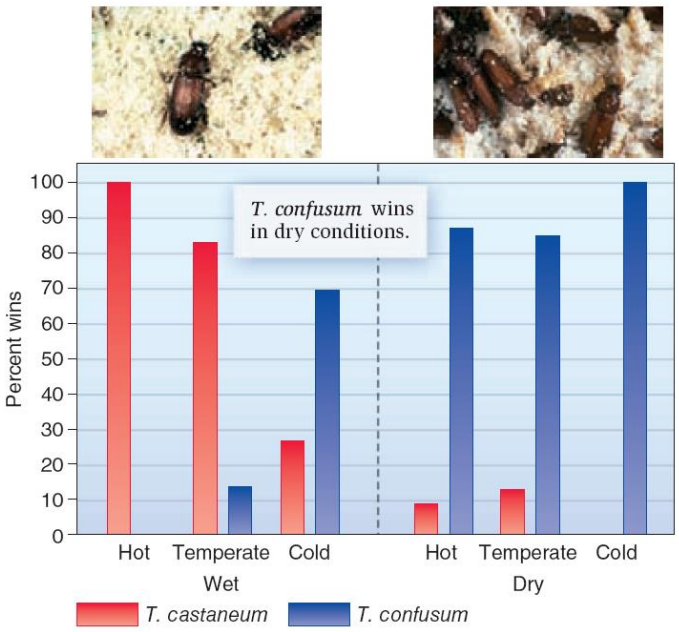


Figure 11.3 Competitive ability can be influenced by the abiotic environment. Results of competition between the flour beetles *Tribolium castaneum* and *Tribolium confusum* show that each species usually performs better in a given habitat; for example, *T. confusum* does better in dry conditions.

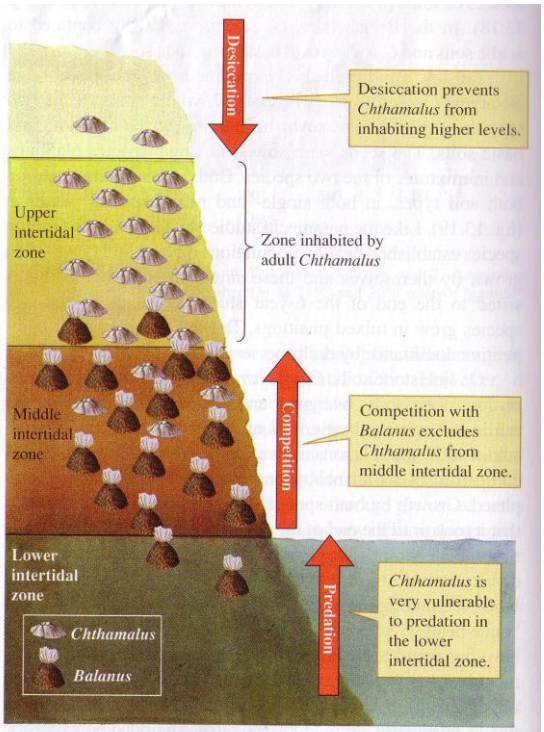
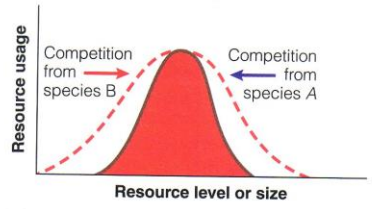
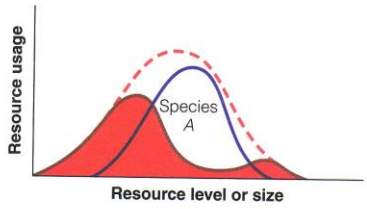


Figure 13.21 Environmental factors restricting the distribution of *Chthamalus* to the upper intertidal zone.



(a)



(b)

FIGURE 12.14

Two possible relationships between fundamental and realized niches for a hypothetical species C. *The fundamental niche is shown as a dashed red line and the realized niche is shaded red. (a) Species* A *and* B *compete for the resource and cause the realized niche of species* C *to shrink to the central optimum. Note that the curves are symmetrical and bell shaped. (b) A dominant species* A *(blue line) forces species* C *out of its optimum into the peripheral part of its fundamental niche, causing a bimodal, asymmetrical realized niche shown in red. Plants competing for nitrogen could show either of these patterns. (Modified from Austin 1999.)*

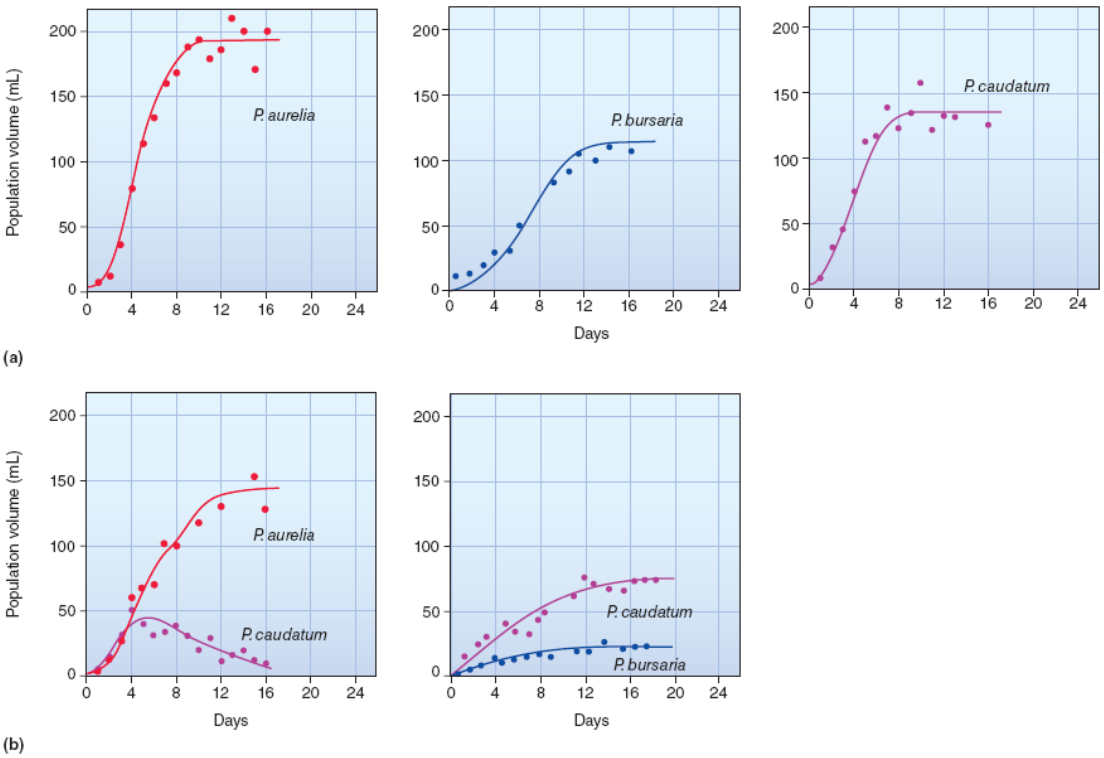


Figure 11.21 **Competition among *Paramecium* species.** **(a)** Each of three species, *Paramecium aurelia*, *Paramecium bursaria*, and *Paramecium caudatum*, grows according to the logistic model when grown alone. **(b)** When *P. aurelia* is grown with *P. caudatum*, the density of *P. aurelia* is lowered compared to when grown alone, but *P. caudatum* goes extinct. When *P. caudatum* is grown with *P. bursaria* (right), the population densities of both are lowered but they coexist.

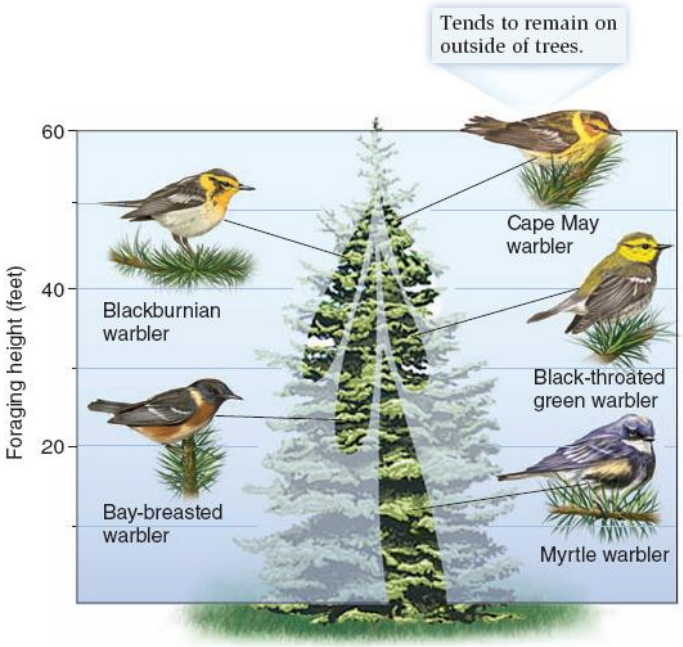


Figure 11.22 **Resource partitioning.** Among five species of warblers feeding in North American spruce trees, each warbler species prefers to feed at a different height and portion of the tree, thus reducing competition. (Redrawn from MacArthur, 1958.)

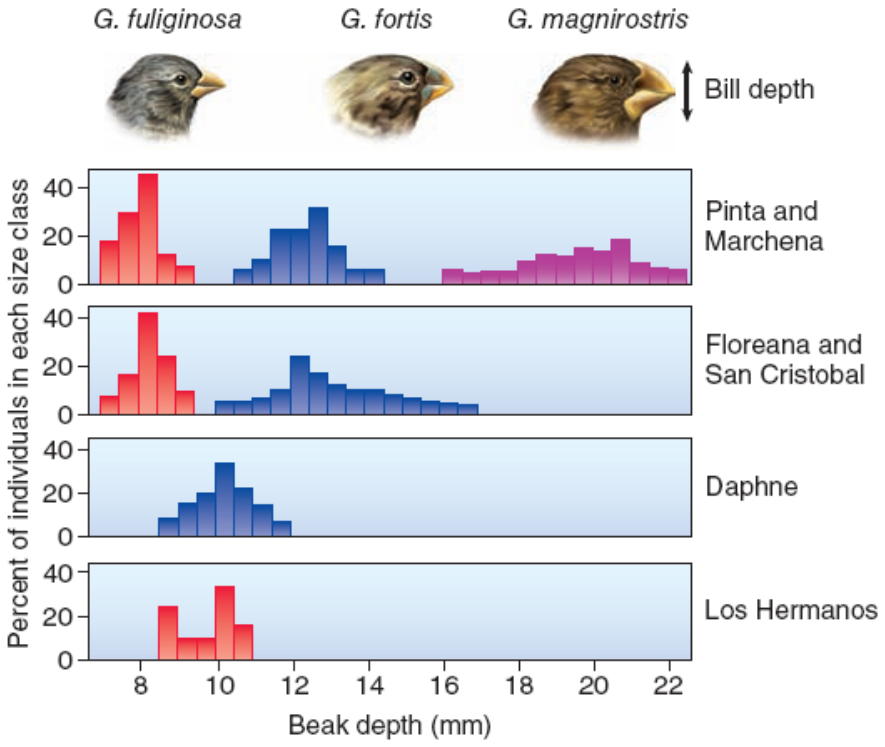


Figure 11.28 **Character displacement in beak size among Galápagos finches.** (After Lack, 1947.)

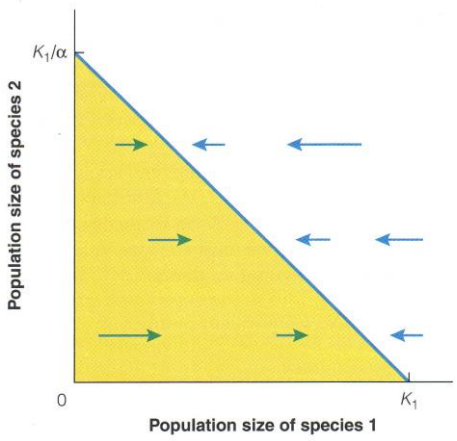


FIGURE 12.1
Changes in population size of species 1 when competing with species 2. Populations in the yellow area will increase in size and will come to equilibrium at some point on the blue diagonal line. The size of the arrows indicate the approximate rate at which the population will move toward the blue diagonal line. The blue diagonal line represents the zero growth isocline, all those points at which $dN_1/dt = 0$.

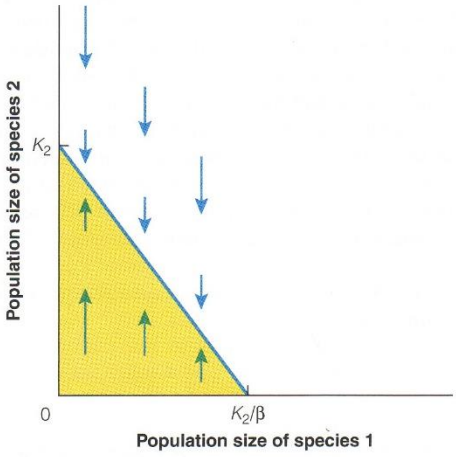


FIGURE 12.2
Changes in population size of species 2 when competing with species 1. Populations in the yellow area will increase in size and will come to equilibrium at some point on the blue zero growth isocline, *all those points at which* $dN_2/dt = 0$. *The sizes of the arrows indicate the approximate rates at which the population will move toward the isocline.*

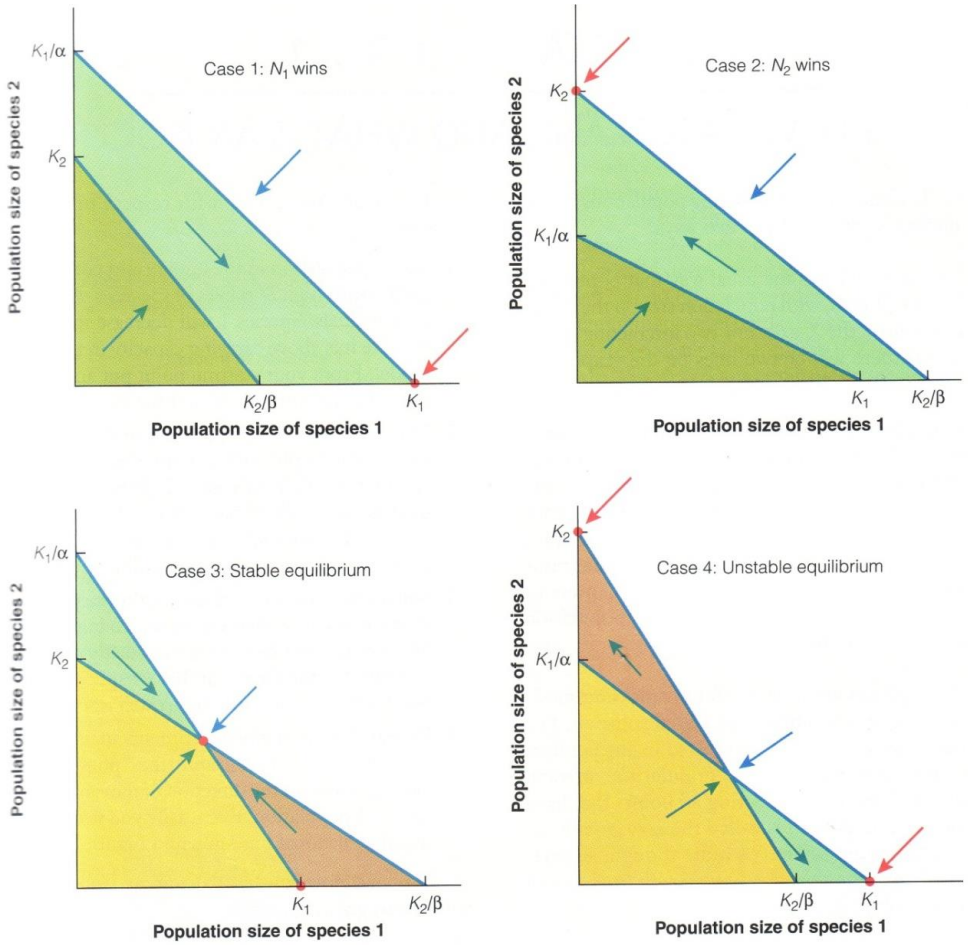


FIGURE 12.3

Four possible outcomes of competition between two species. Blue arrows indicate direction of change in populations, and red dots and red arrows indicate the final equilibrium points. In the yellow zone, both species can increase; in the green zone, only species 1 can increase; in the brown zone, only species 2 can increase; and in the white zone both species must decline.