***Handout* Kuliah Minggu 9 : INTERAKSI ANTAR SPESIES – PARASITISME, PENYAKIT, MUTUALISME**

Pokok Bahasan Kuliah:

I. PARASITISME & PENYAKIT

PARASITISME SEBAGAI BENTUK INTERAKSI

KLASIFIKASI & PENGERTIAN

- Simbion, parasit, patogen, parasitoid
- Mikroparasit vs. makroparasit
- Ektoparasit vs. endoparasit
- Holoparasit vs hemiparasit

SIKLUS HIDUP PARASIT YANG KOMPLEKS (contoh-contoh)

MEKANISME PERTAHANAN INANG

EFEK EKOLOGIS PARASITISME

DINAMIKA & PENYEBARAN PENYAKIT

II. MUTUALISME

MUTUALISME SEBAGAI BENTUK INTERAKSI

- Beberapa generalisasi
- Manfaat mutualisme

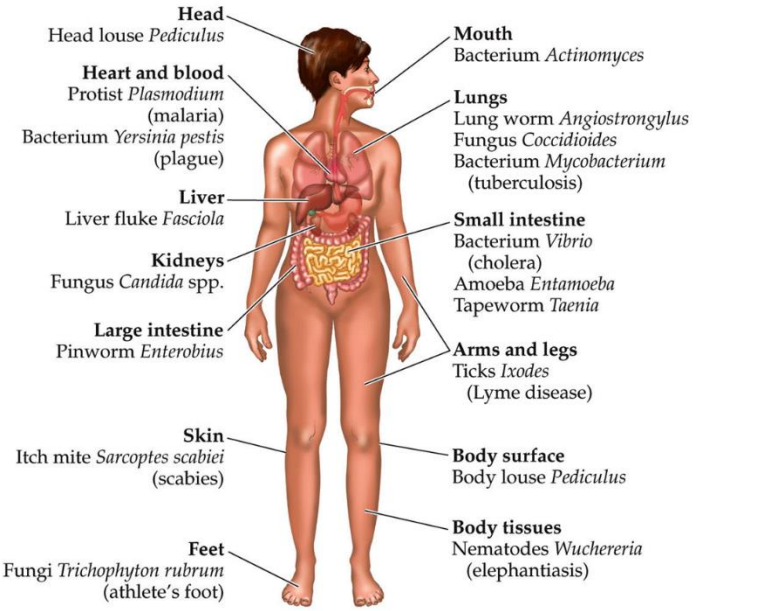
TIPE DAN CONTOH MUTUALISME

- Mutualisme tumbuhan dan hewan: penyerbukan, pemencaran
- Mutualisme untuk memperoleh nutrien: mikoriza, *Rhizobium*, lumut kerak, karang
- Mutualisme untuk pertahanan

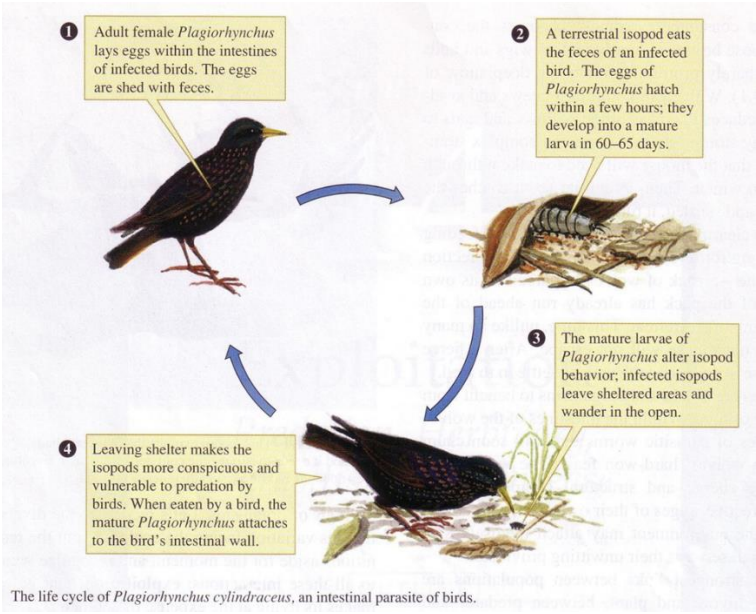
MODEL MATEMATIS MUTUALISME

Sumber ilustrasi:

- Krebs, C.J. 2001. Ecology. 5th. edition. Benjamin Cummings, New York. **Gambar 15.1**
- Molles, M.C.Jr. Ecology: concepts and applications. McGraw-Hill, New York. Dari 4th edition (2008): **Gambar 14.2**
- Stiling, P. 2012. Ecology: global insights and investigations. McGraw-Hill, New York: **Gambar 15.5**
- "Parasitism": www.striepen.uga.edu/medpara/.../intropara sitologlogy2012.ppt
- sciencedaily.com
- http://penyakitmalaria.org/



***ECOLOGY*, Figure 13.3**



The life cycle of *Plagiorhynchus cylindraceus*, an intestinal parasite of birds.

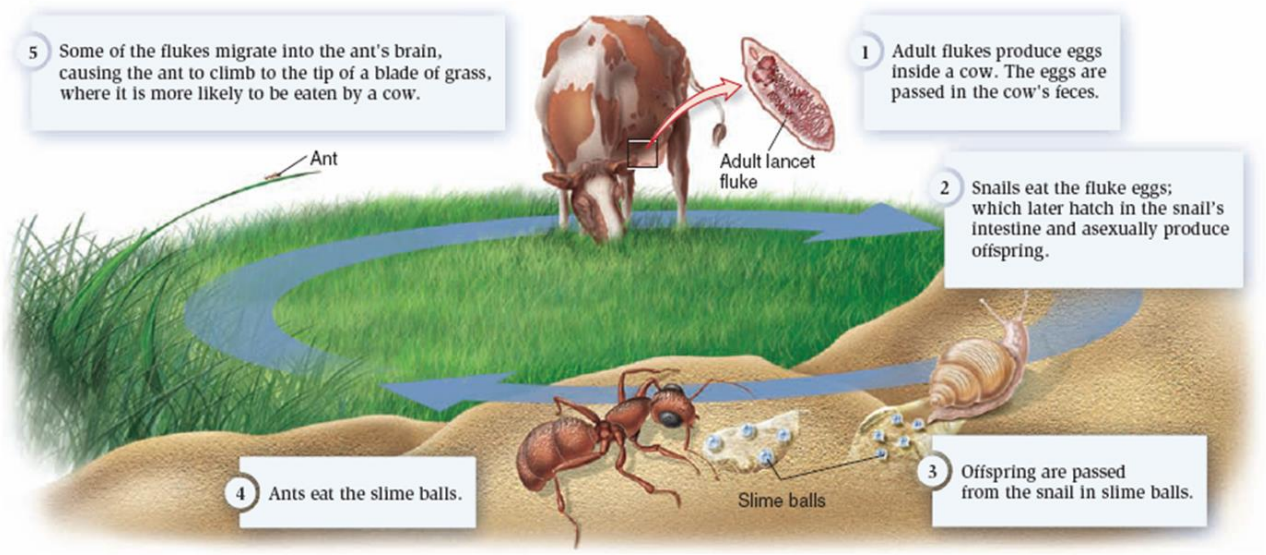
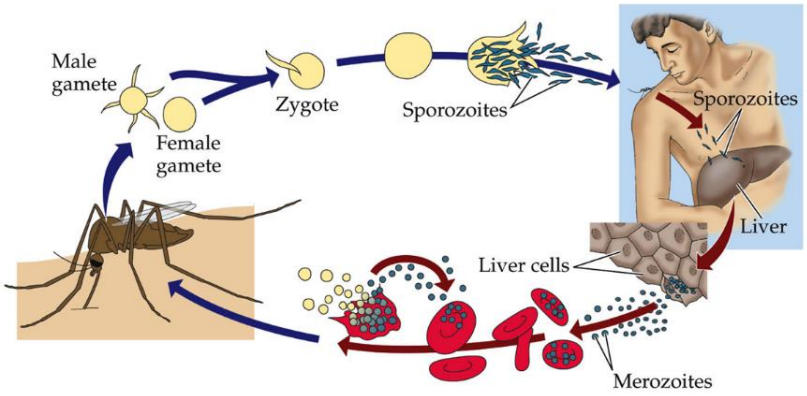
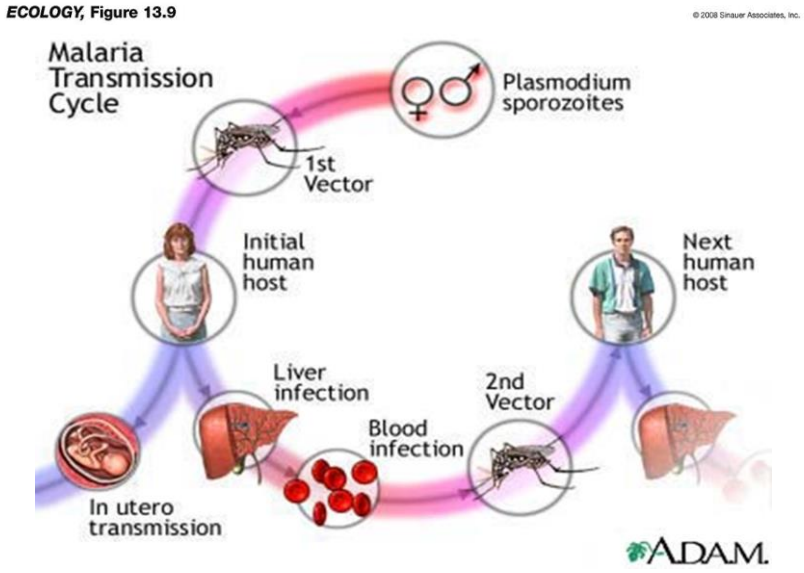
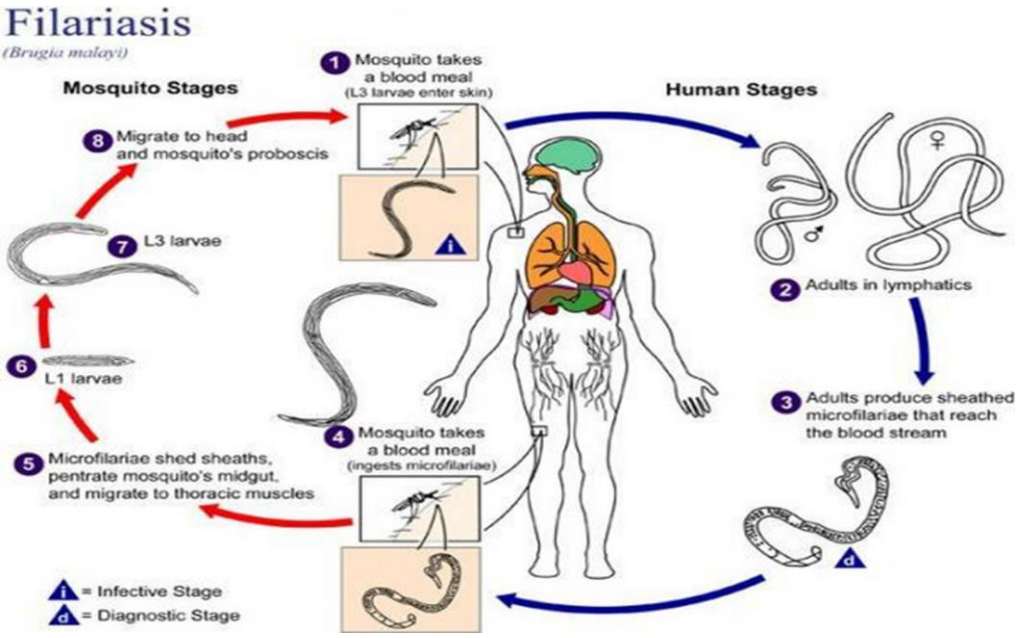


Figure 15.5 **Parasite life cycles can be complex.** The life cycle of the lancet fluke, *Dicrocoelium dendriticum*, involves behavioral changes in ants, one of its three hosts, that increase its transmission rate.







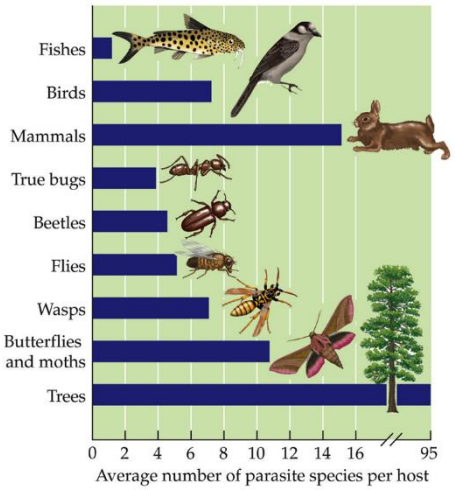


Figure 13.4

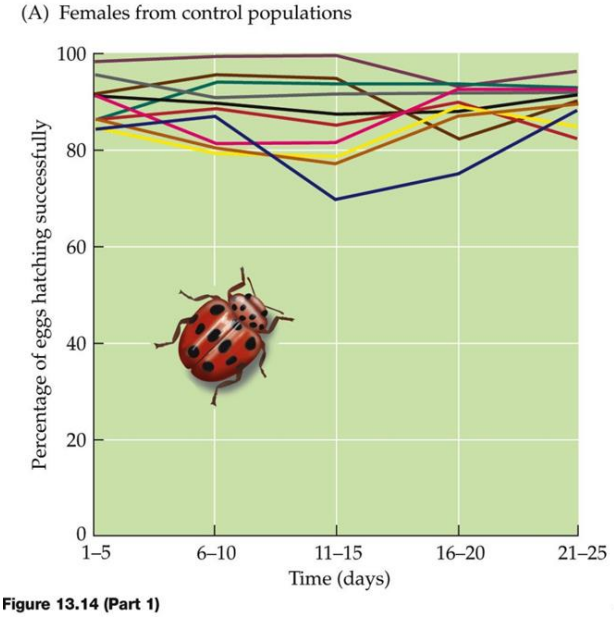


Figure 13.14 (Part 1)

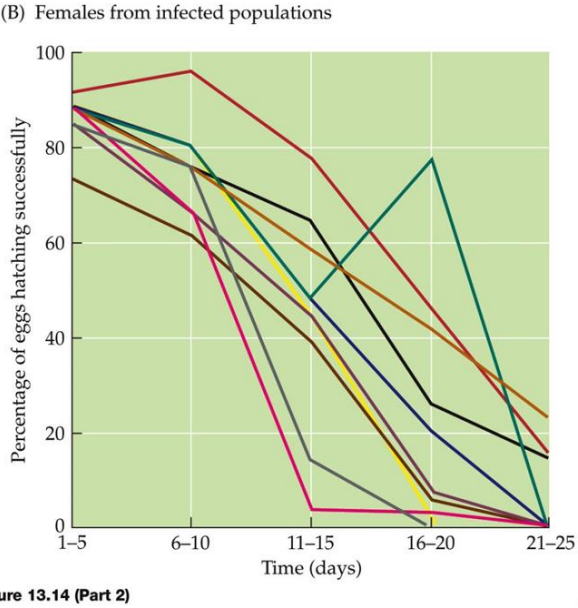


Figure 13.14 (Part 2)

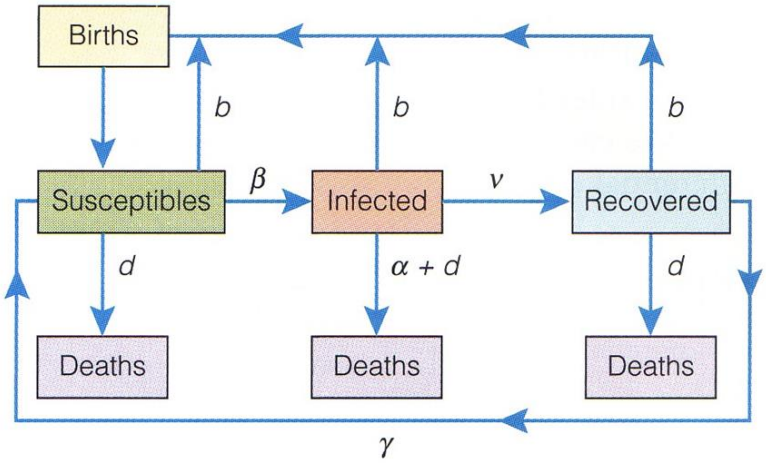


FIGURE 15.1

Compartment model for a directly transmitted microparasitic infection such as measles. Hosts are divided into susceptibles, infected, and recovered and immune. The parameters controlling this simple model are in the natural birth (b) and death (d) rates of the host, and the parameters of the disease agent: disease-induced deaths (α), recovery rate (ν), transmission rate (β) and rate of loss of immunity (γ). (From Anderson and May 1979.)

Growth rate of population

Maximum population density

Positive effect of species 2 on species 1

$$\frac{dN_1}{dt} = r_1 N_1 \frac{(X_1 - N_1 + \alpha N_2)}{(X_1)}$$

Per capita growth rate

Population size

and

$$\frac{dN_2}{dt} = r_2 N_2 \frac{(X_2 - N_2 + \beta N_1)}{(X_2)}$$

where α and β are the positive effects of species 2 on species 1 and of species 1 on species 2, respectively, and are better termed mutualism coefficients. In this situation, the maximal population density when each species is alone is represented by X, not K, because such densities no longer represent real carrying capacities. The reason is that although there is a carrying capacity, K, while a mutualist is alone, the presence of its fellow mutualist can increase the carrying capacity.