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Ekologi Populasi

Bagian 1: Struktur populasi

Siti Nurleily Marlina



01

KONSEP DAN DEFINISI

02

STRUKTUR POPULASI

03

DINAMIKA POPULASI

04

SEJARAH KEHIDUPAN



A large herd of wildebeest is crossing a river in a savanna landscape. The herd is spread across the scene, with many animals in the water and others on the banks. The background shows a dense forest of green trees and bushes. The text "KONSEP DAN DEFINISI POPULASI" is overlaid on a dark blue rectangular background in the center of the image.

KONSEP DAN DEFINISI POPULASI



POPULASI

Sekelompok organisme dari suatu spesies yang menempati wilayah tertentu.

Individu-individu suatu populasi:

- ✧ Menempati area yang sama;
- ✧ Bergantung pada sumber daya yang sama;
- ✧ Dipengaruhi oleh kondisi lingkungan yang sama.



EKOLOGI POPULASI

Mempelajari populasi dalam kaitannya dengan lingkungan terhadap karakteristik populasi.

- ✦ Perubahan ukuran dan komposisi populasi.
- ✦ Penyebab ekologis fluktuasi populasi.



DEFINISI ISTILAH

VARIABEL

-vary+able-

- ✦ “Memunyai kecenderungan untuk berubah”.
- ✦ Faktor-faktor yang dapat/cenderung mengalami perubahan.

DINAMIKA

- ✦ “Dicirikan dengan perubahan atau progress yang berkelanjutan”.
- ✦ Perubahan-perubahan yang mencirikan suatu sistem.



STRUKTUR POPULASI

PEMBENTUK STRUKTUR POPULASI

Merupakan konsekuensi dari cara organisme berinteraksi dengan lingkungannya, dengan organisme lain, dan pengaruh interaksi tersebut terhadap evolusi organisme.

Pemahamannya penting untuk membantu dalam pembuatan keputusan yang berkaitan dengan manajemen alam dan konservasi organisme.





KARAKTERISTIK TERPENTING

01 Ukuran

02 Densitas

03 Pola dispersi

04 Struktur umur

05 Struktur spasial

06 Rasio seks

07 Variabilitas

01 UKURAN POPULASI

Cacah individu anggota suatu populasi pada waktu tertentu (“ N ”).

Seringkali juga disebut kelimpahan (*abundance*).



02 DENSITAS POPULASI

Cacah individu populasi per satuan luas/volume.

Cara pengukuran:

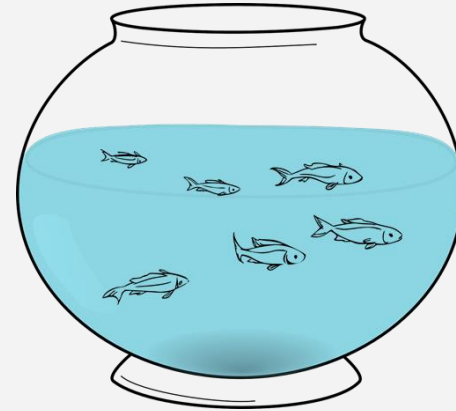
- ✦ Sensus
- ✦ Sampling

Seringkali lebih berpengaruh daripada kelimpahan.



PERHITUNGAN KELIMPAHAN & DENSITAS POPULASI

10 ekor kelinci
2 ekor rusa
1000 m² Habitat
Densitas kelinci?
Densitas rusa?



6 ekor ikan platy
4 L air
Densitas platy?



03 POLA DISPERSI

Pola penjarakan antar individu dalam populasi.

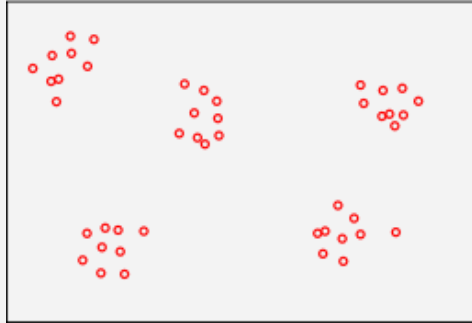
Berguna untuk melepaskan diri dari tekanan kompetisi.

Dipengaruhi faktor lingkungan & sosial.

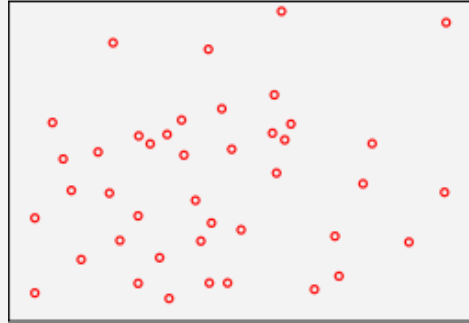
Ada tiga macam:

- ✦ clumped (menggerombol)
- ✦ uniform/regular/even (seragam)
- ✦ random (acak)

JENIS-JENIS POLA DISPERSI



CLUMPED



RANDOM



UNIFORM



POLA DISPERSI **CLUMPED** (MENGGEROMBOL)

Paling sering ditemukan di alam.

Penyebab: sumber daya atau perilaku

- ✦ Bagian habitat yang kondisinya lebih cocok daripada bagian yang lain.
- ✦ Biji jatuh di dekat induknya, atau hanya berkecambah di lingkungan tertentu.
 - ✦ Alasan keamanan atau kelompok sosial.



POLA DISPERSI **RANDOM** (AGAK)

Jarak antar individu tidak dipengaruhi oleh individu yang lain.

Tidak ada ketertarikan atau penolakan antar individu.

- ✧ Tidak umum ditemukan di alam.

Spesies pohon hewan tertentu dapat terdistribusi random.

- ✧ Di area dengan habitat yang sesuai.
- ✧ Dapat disebabkan oleh cara dispersal.



POLA DISPERSI **UNIFORM** (SERAGAM/TERATUR)

Individu tersebar dengan jarak lebih teratur.

Karena interaksi antar individu dalam populasi di habitat relatif homogen.

- ✦ Kompetisi
- ✦ Alelopati
- ✦ Teritorialitas
- ✦ Intervensi manusia



Penguins



Creosote bush



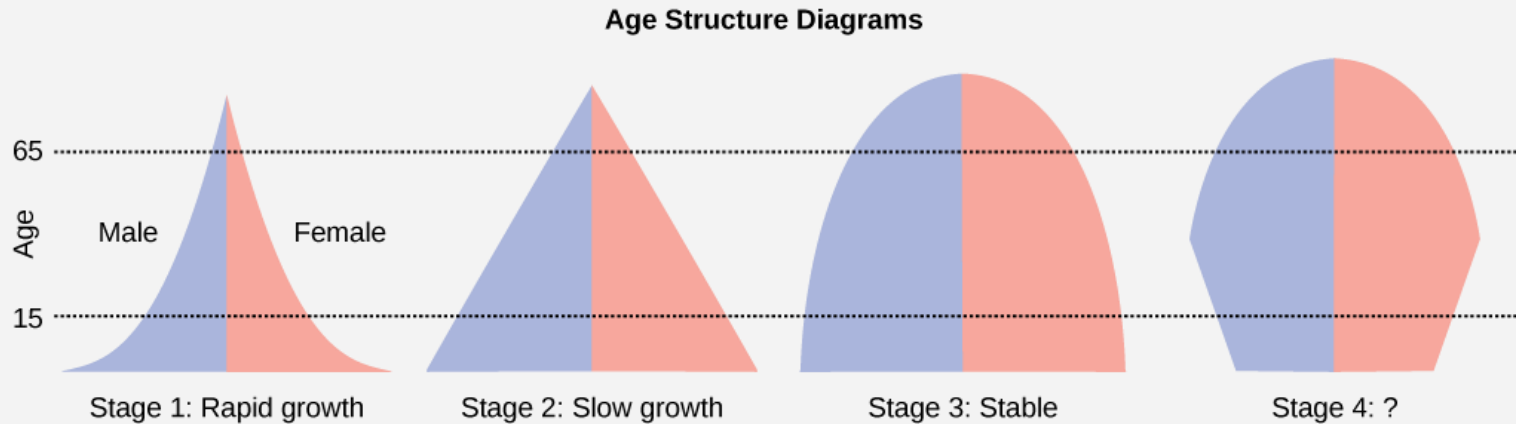
04 STRUKTUR UMUR

Distribusi individu suatu populasi pada berbagai kelompok umur.

Parameter yang berkaitan dengan struktur umur:

- ✧ Fekunditas (*birth rate*).
- ✧ Waktu generasi.
- ✧ Laju kematian (*death rate*).

DIAGRAM STRUKTUR UMUR

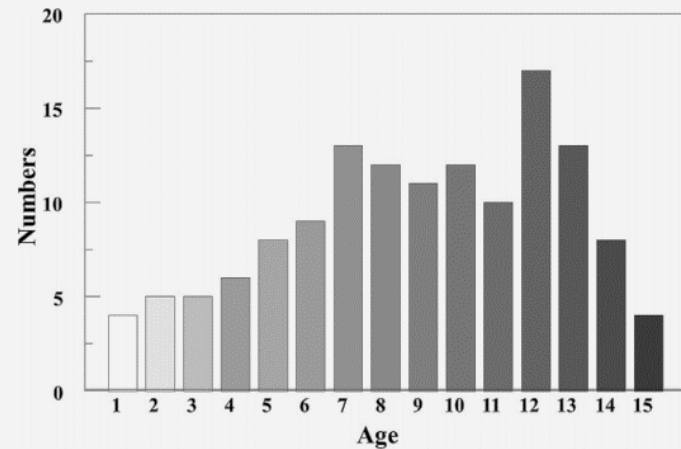


Struktur umur dapat mempengaruhi dinamika populasi, karena menyebabkan variasi atas berbagai macam variabel populasinya.



DAMPAK PREDASI PADA STRUKTUR UMUR

Contoh kasus populasi elk di Amerika Utara



STRUKTUR POPULASIA

Struktur umur populasi elk dengan tingkat pemangsaan sangat tinggi pada anak baru lahir.

05 STRUKTUR SPASIAL

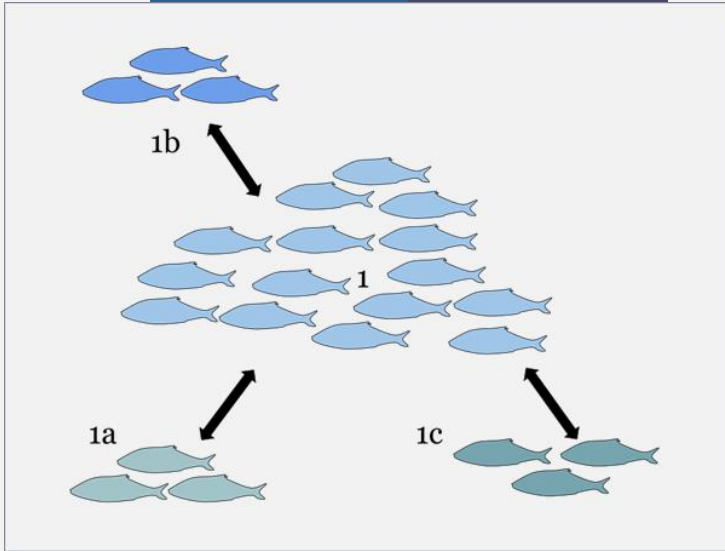
Organisme di alam terdistribusi dalam pola spasial tertentu.

Penyebab:

- ✦ Input energi
- ✦ Disturbansi,
- ✦ interaksi spesies

Distribusi spasial suatu spesies dipengaruhi oleh skala.

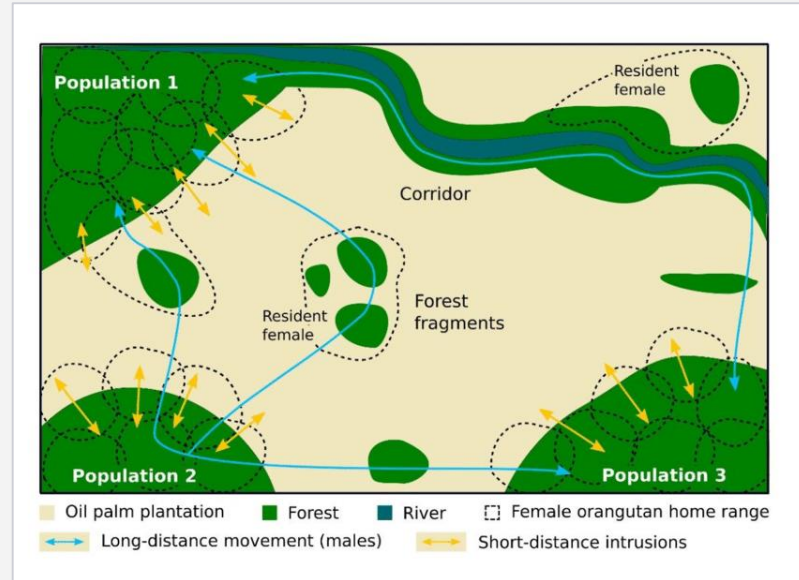
Bentuk struktur spasial: METAPOPOPULASI





DINAMIKA METAPOPOPULASI

Contoh kasus orangutan Borneo



STRUKTUR POPULASIA

Representasi skematis fungsi metapopulasi orangutan di lanskap terfragmentasi.

06 RASIO SEKS

Proporsi jumlah individu tiap kelompok seks.

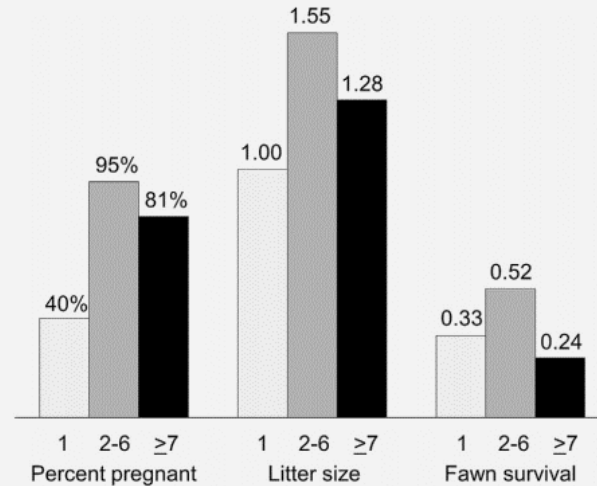
Jumlah betina (umumnya) lebih penting bagi laju pertumbuhan populasi.

- ✦ Pada banyak spesies, pejantan kawin dengan lebih dari satu betina.



EFEK UMUR DAN SEKS

Contoh kasus *desert mule deer*



Pengaruh umur terhadap fertilitas, jumlah anakan, dan kelangsungan hidup anak *desert mule deer*.

07 VARIABILITAS

Perbedaan antar individu dalam suatu populasi.

Variasi dapat karena sebab genetik, lingkungan, atau gabungan keduanya.

Contoh:

- ✧ Dimorfisme seksual
- ✧ Metamorfosis





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A close-up photograph of two prairie dogs in a field. They are facing each other and appear to be kissing or nuzzling. The prairie dog on the left has its mouth slightly open, and the one on the right has its mouth closed. They are both looking towards each other.

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