



STUDY MATERIAL

VIVEKANANDA COLLEGE THAKURPUKUR

NAAC ACCREDITED GRADE—'A'

Subject: Environmental Science

Topic: Speciation

Name of the Teacher:

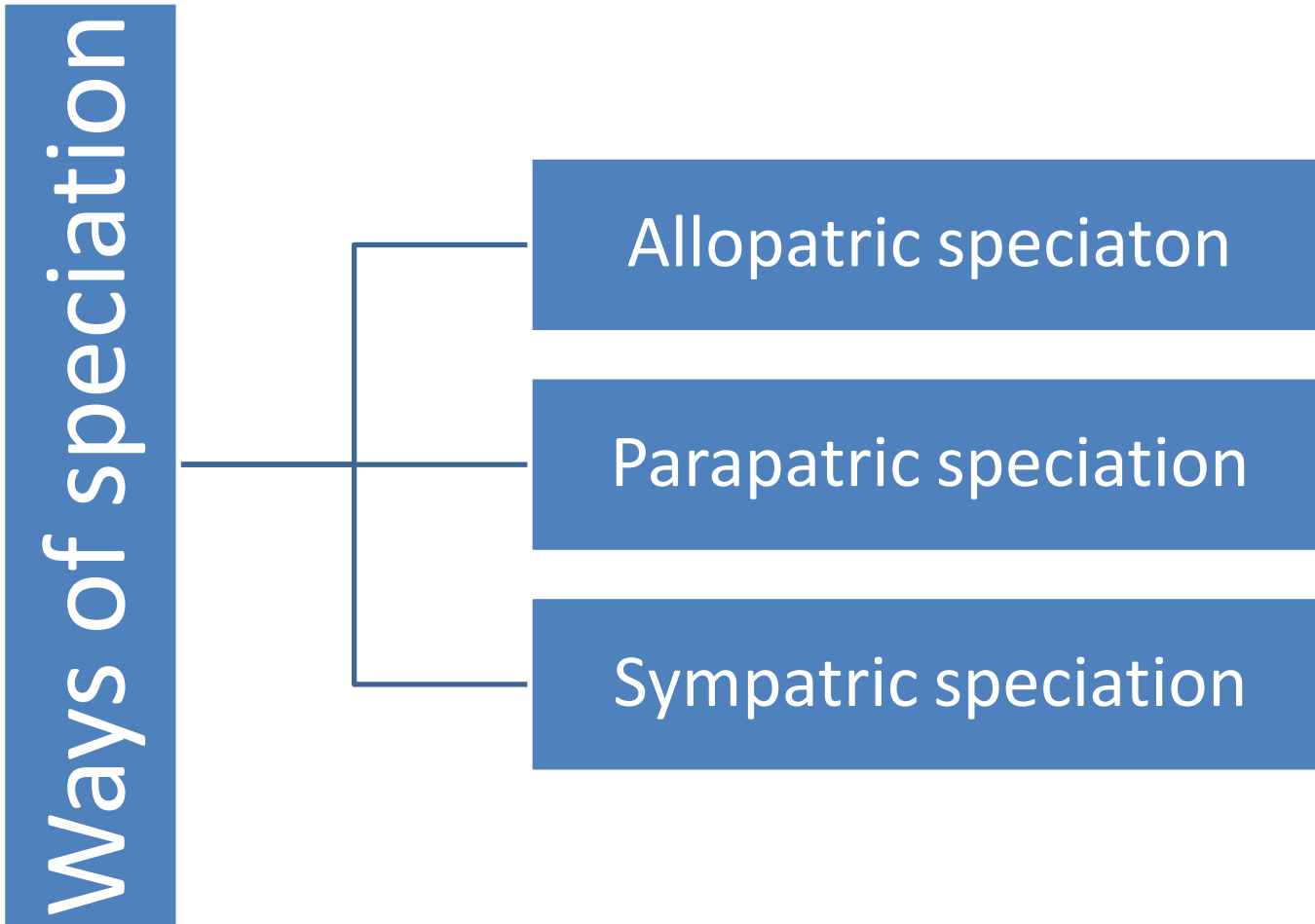
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speciation

- THE FORMATION OF NEW SPECIES
- Occurs when subpopulation are prevented from interbreeding

Ways



Allopatric speciation

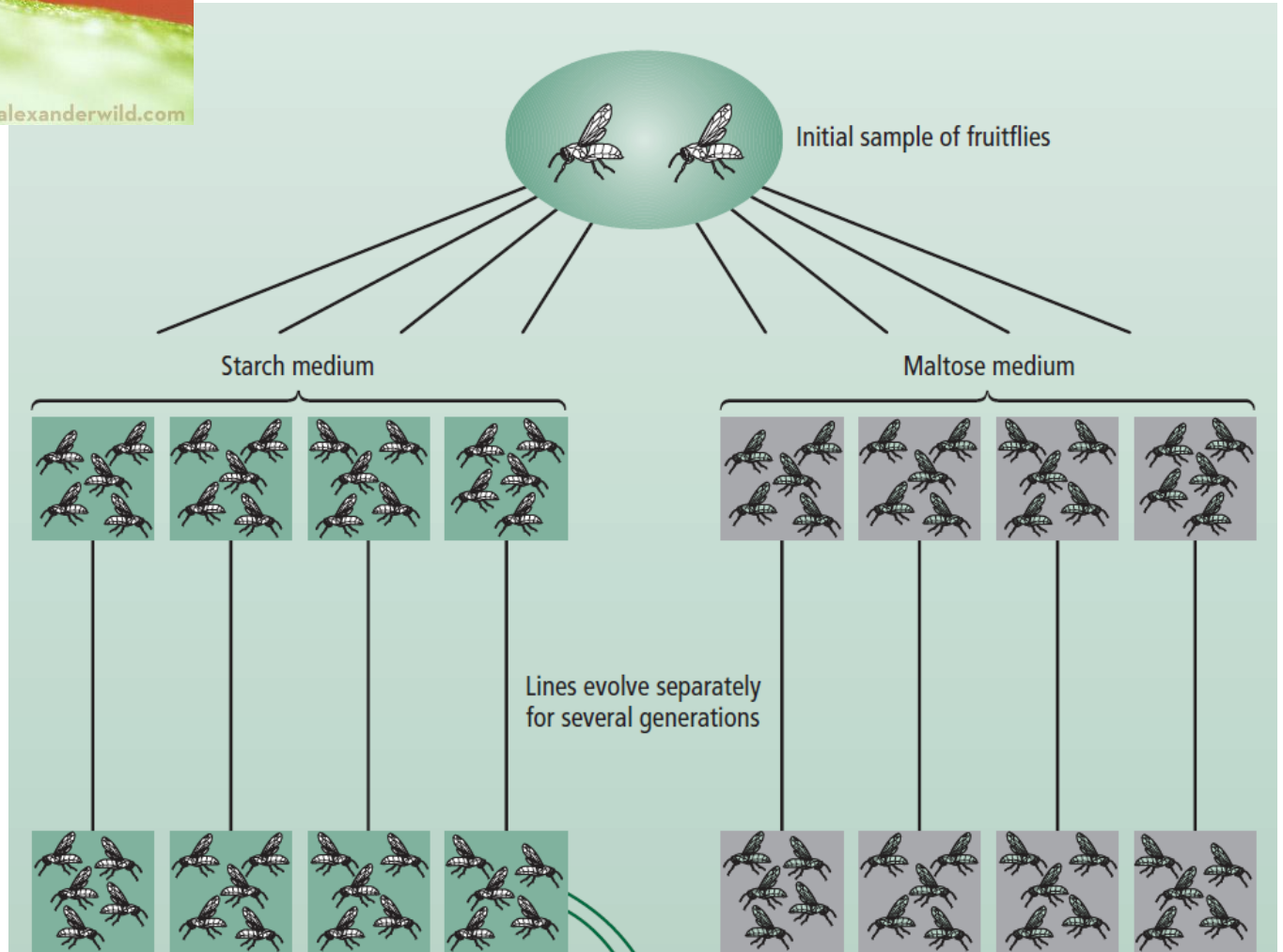
- Subpopulations are geographically isolated
 - May be mountain range or river etc
 - No longer mating between separated population
 - Different populations adapted to different environment
 - Not mate successfully even if experimentally reunite
 - Most common type of speciation
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- Separating small populations are more susceptible to genetic drift, gene flow, founder effect and mutation

Explanation

- Diane Dodd examined effect of geographical isolation on fruit flies
- Parent species divide into two groups
- Sm and Sf feed with starch
- M,m and Mf feed with maltose
- When recollect Sm prefer Sf for mating
- Mm prefer the Mf for mating



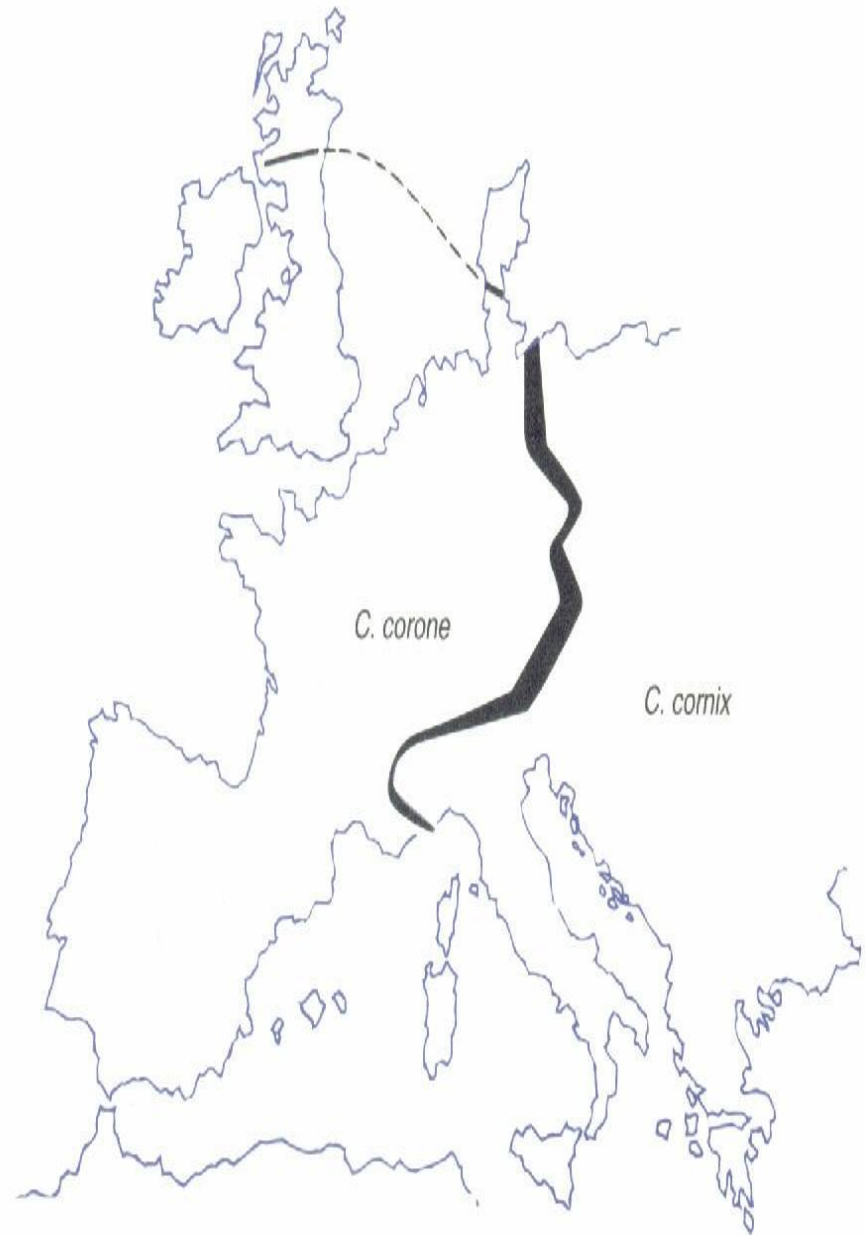
Example



parapatric speciation

- The population does not mate randomly
- Individuals are more likely to mate with their geographic neighbors than with individuals in a different part of the population's range
- Reduced gene flow within the population

- Two species of crows, *Corvus corone* and *Corvus cornix*, meet along a line in central Europe. Along that line they produce hybrids. Speciation is incomplete.



Sympatric Speciation

- Occurs due to reproductive isolation within a population due to polymorphism
- It has two types of reproductive isolation
- Post mating isolation
- Pre mating isolation

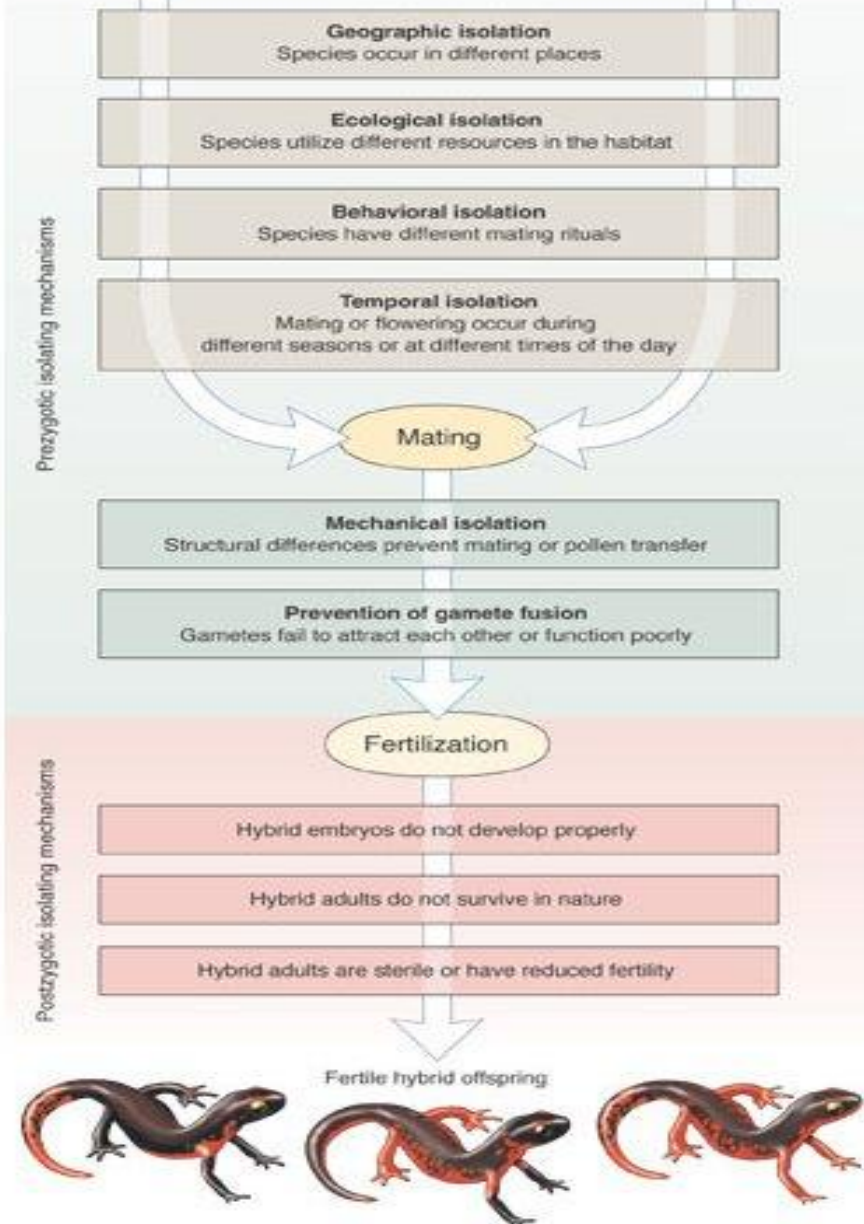
How does reproductive isolation evolve?

Premating or prezygotic mechanisms:

- a) Ecological or habitat isolation**
- b) Seasonal or temporal isolation**
- c) Sexual or ethological isolation**
- d) Mechanical isolation**
- e) Isolation by different pollinators**
- f) Gametic isolation**

Postmating or zygotic mechanisms:

- a) Hybrid inviability**
- b) Hybrid sterility**
- c) Hybrid breakdown**



Different mechanisms prevent reproduction between individuals of different species. These may occur premating or postmating, as illustrated here with two species of salamander.

The green lacewings, *Chrysoperla carnea* and *Chrysoperla downesi* may illustrate an example of sympatric speciation.



Different species of bowerbird construct elaborate bowers and decorate them with different colors in order to woo females. The Satin bowerbird (left) builds a channel between upright sticks, and decorates with bright blue objects, while the MacGregor's Bowerbird (right) builds a tall tower of sticks and decorates with bits of charcoal.

Evolutionary changes in mating rituals, such as bower construction, can contribute to speciation.



Offspring inviability or sterility

- All that courting and mating is wasted if the offspring of matings between the two groups do not survive or cannot reproduce.
- Mule etc

**THANKS
FOR
YOUR
SUPPORT**

