ECOLOGOCAL NICHE CONCEPTS

IFAS

India's No **1** for NEET, IIT-JAM, GATE and NET Exams

www.ifasonline.com

9172266888

Gause exclusion principle / Competitive exclusion principle :

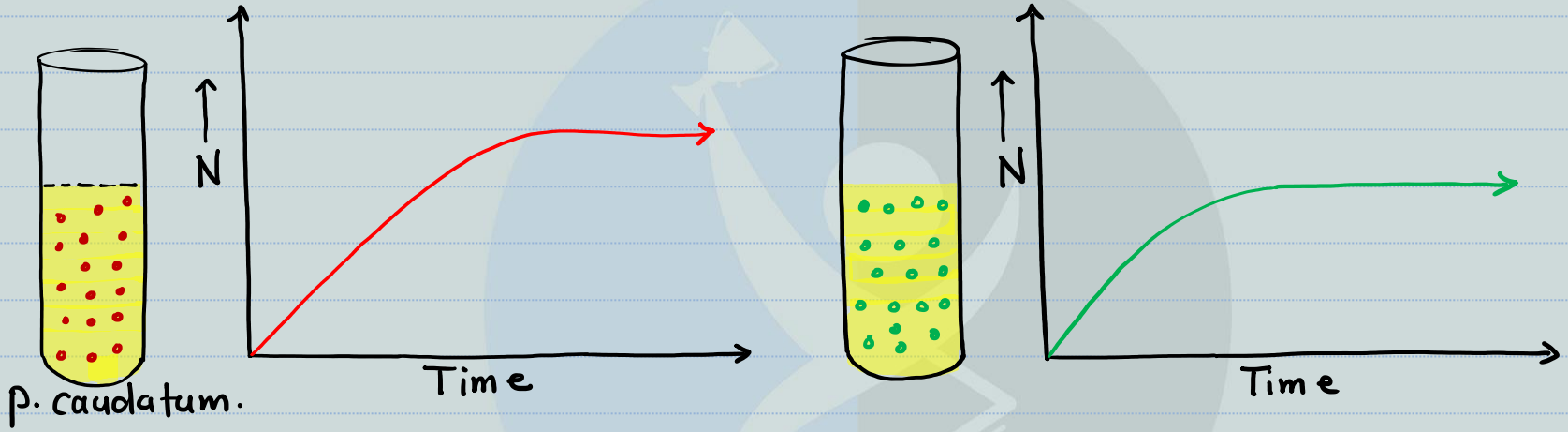
" Two diff. species can not co-exist in same Niche for longer duration "

Gause's experiment :

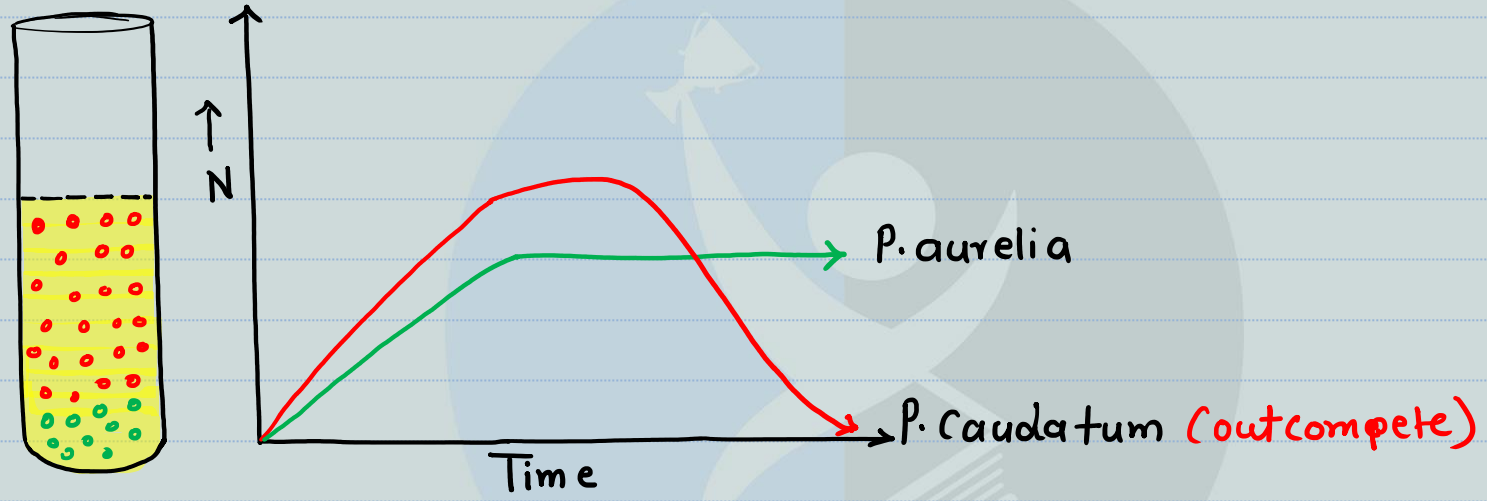
- Orgauism : Paramecium caudatum
  Paramecium aurelia.

- Culture media.

1. Both the species cultured on separate media:-



2. Both the species grown together in same culture media.



Ecological Niche Concept

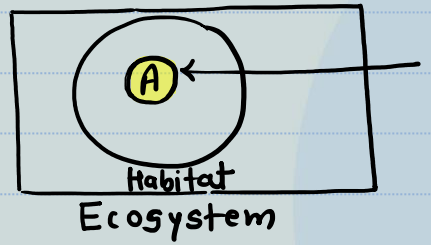
1. Spatial Niche concept : 1904 Grinnell.

2. Trophic Niche concept : 1971 Odum

3. n-Dimensional / Hyper-volumic / Multi-dimensional Niche concept : 1957 - Hutchinson.

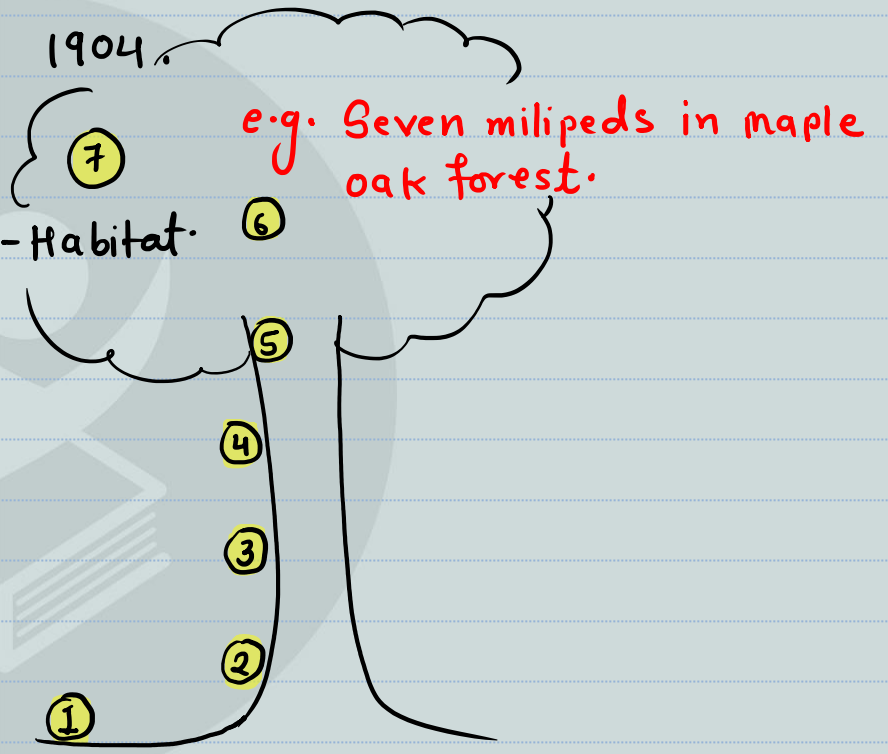
1. Spatial Niche Concept: Grinnell 1904.

"Space"



Niche / Micro-Habitat.

"Space occupied by an orgauism"



e.g. Seven milipeds in maple oak forest.

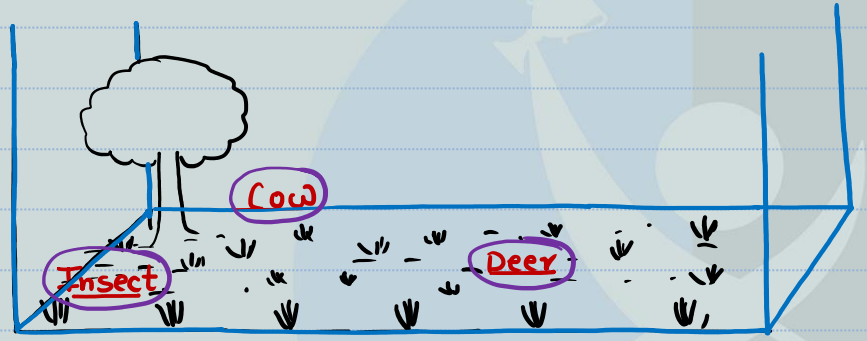
2. Trophic Niche Concept: 1971 odum.

Position in Ecosystem. / Ecological role.

- Habitat – Address
- Niche – profession = Ecological role.

" Particular area/space occupied by an orgawism to play it's Ecological role. "

e.g. Grassland: Herbivores

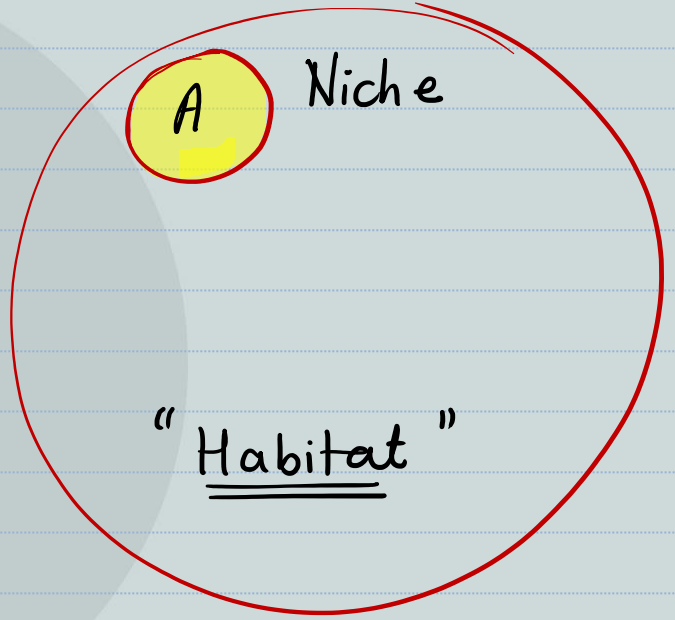


"All Herbivores are present in diff-diff. Niche."

3. n-dimensional / Hyper-volumic Niche concept : 1957 Hutchinson.

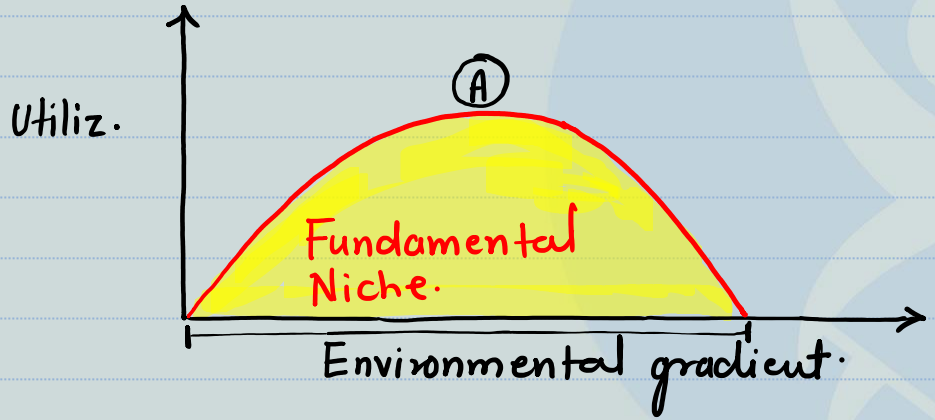
- Space X
- Troplic / Ecological role X
- Environmental gradient : Niche

= " n-dimension's "

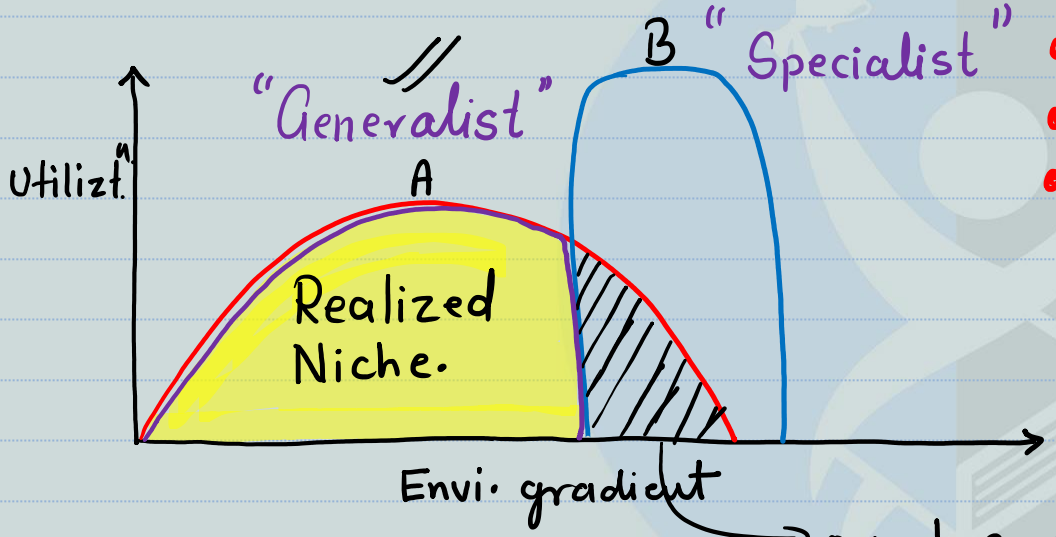


Fundamental Niche: Niche occupied by any orgaism in absence of Competitors.

- According it's "Range of tolerance"



Realised Niche: Actual Niche which can be Utilized by any orgaism in presence of Competitor's.

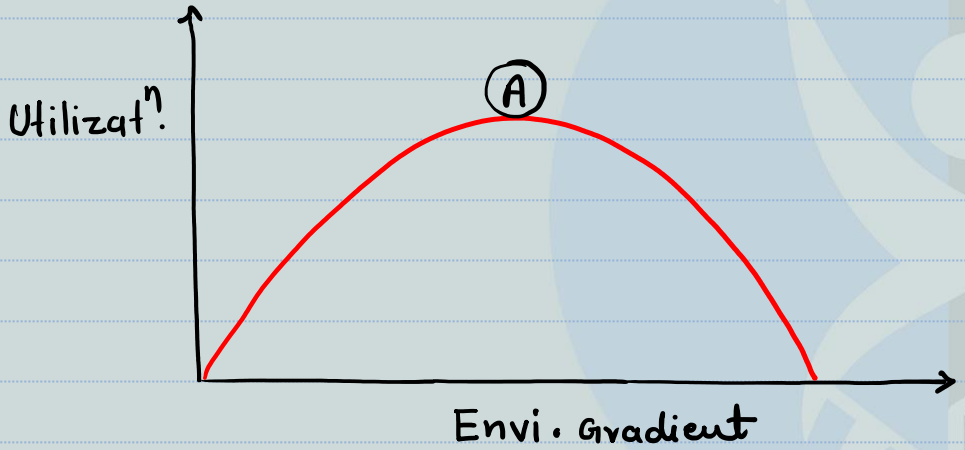


- Competitor
- Inhibition.
- Sharing.

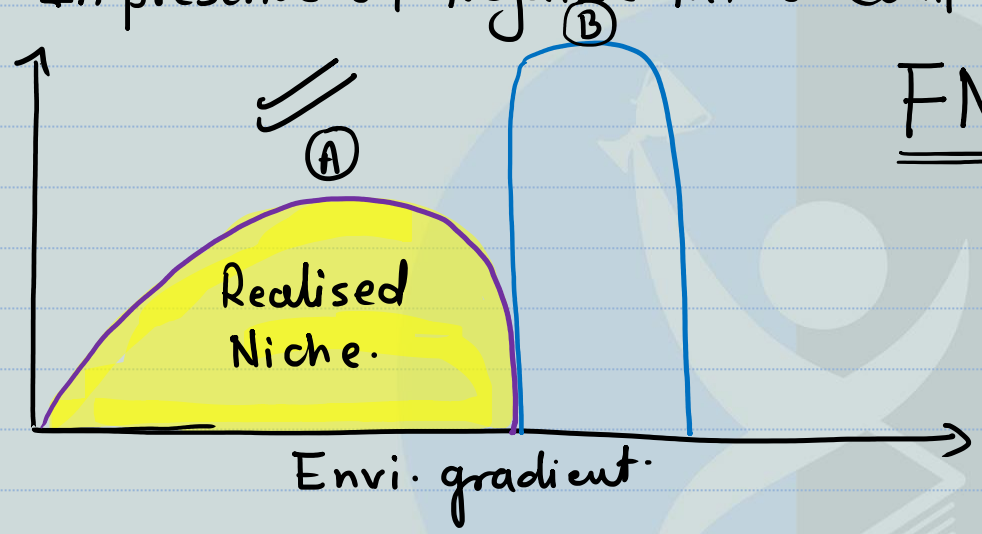
} Always leads to Competition.

Interaction's will affect Niche of an orgauism:

1. No int^{n} present: FN = RN

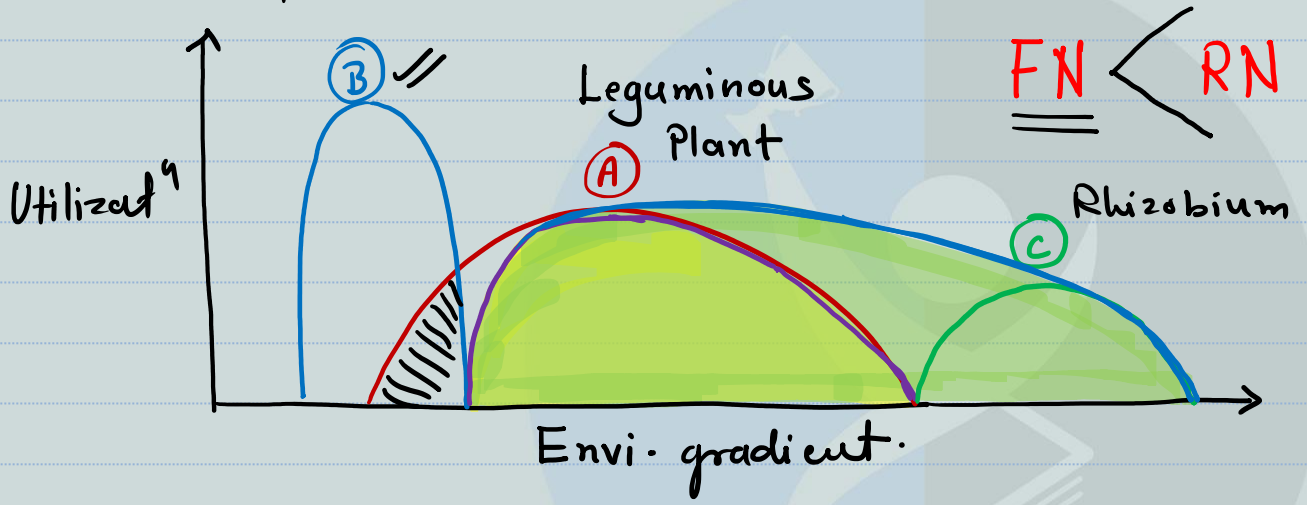


Q. In presence of Negative int^{n} : Competitor, inhibition, co-existance.



FN > RN

3. In presence of Positive : Mutualism, facilitation etc.

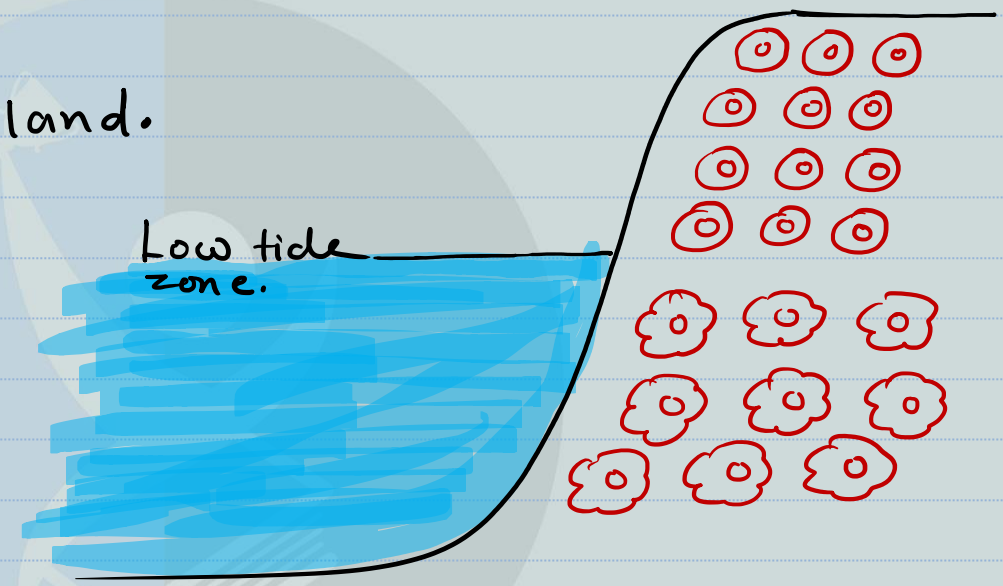


- Competition
  $F > R$
- Inhibition
  $F > R$
- Co-existance
  $F > R$
- Mutualism
  $F < R$
- facilitation
  $F < R$
- No interaction
  $F = R$

Connell experiment:

- Rocky coast of Scottland.
  - Chthamalus
  - Balanus



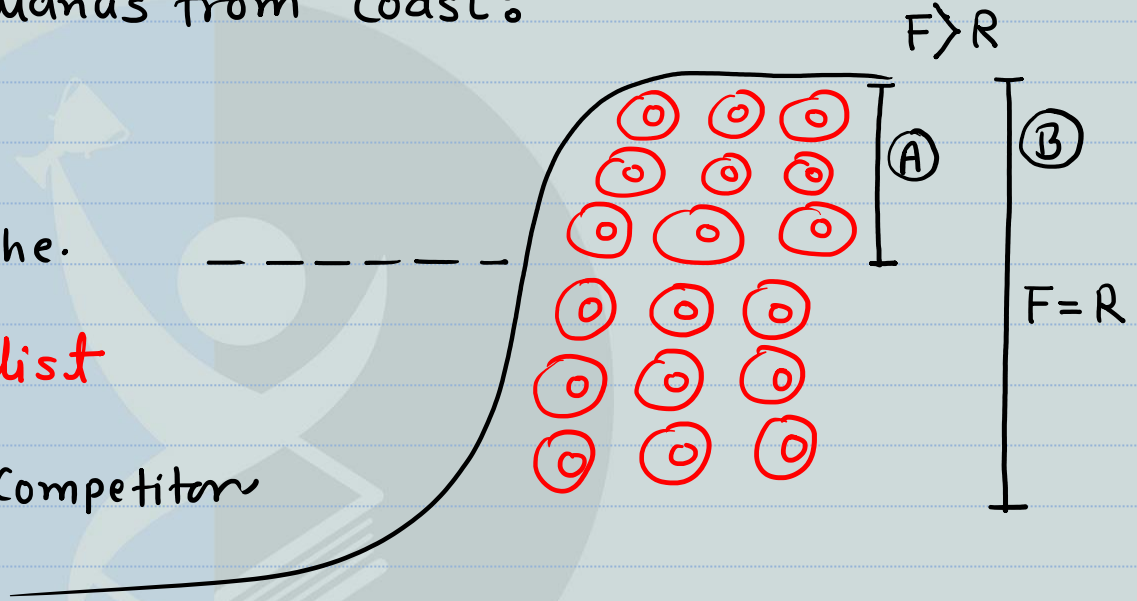


Step 1: Removal of Balanus from coast:

A = Realised Niche
B = Fundamental Niche.

Ethamalus = Generalist

– Weak Competitor

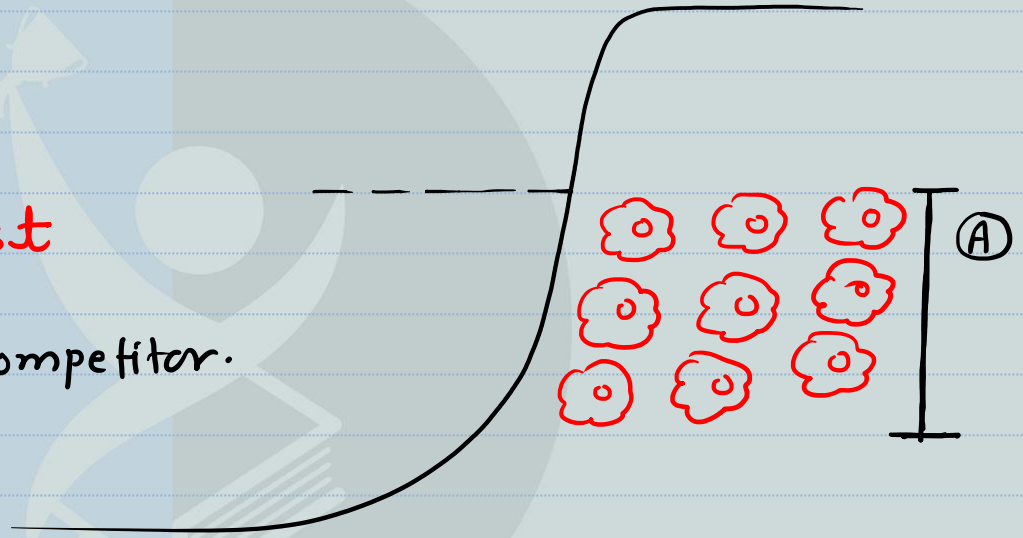


Step2: Removal of cthamalus from coast:

A = F = R

Balanus = Specialist

– Strong competitor.



HAPPY LEARNING

THANKS

IFAS

India's No **1** for NEET, IIT-JAM, GATE and NET Exams

www.ifasonline.com

9172266888