Microenvironments

In Environmental microbiology, we are not concerned with the ecosystem as a whole, but we are concerned with **Microenvironments** (environmental sites In which microbial communities are concentrated).

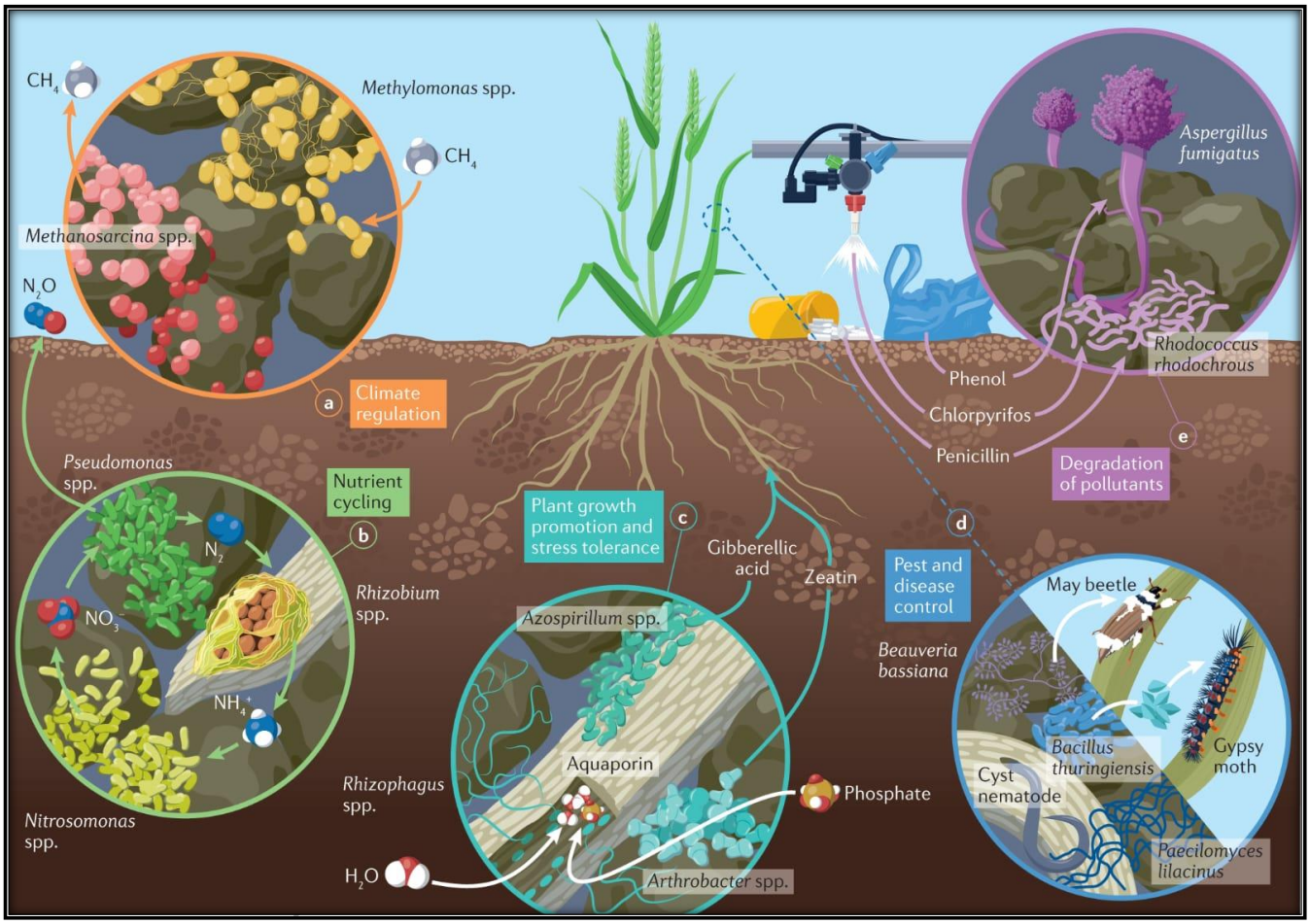
microenvironments are close together, but differ in physical and chemical measurements, such as temperature, pH, water activity, oxygen concentration, nutrients, toxic substances, and predators, therefore microbial communities differ according to the **microenvironments**.

for example In ($1m^2$) of soil, we find different Microenvironments and communities whose size does not exceed a few mμ, but carry out all the activities in the microscopic site.

Microenvironments include i**nterfaces** in aquatic environments, terrestrial environments, and the biological environment (humans, animals, and plants). These surfaces are where nutrients are concentrated, such as:

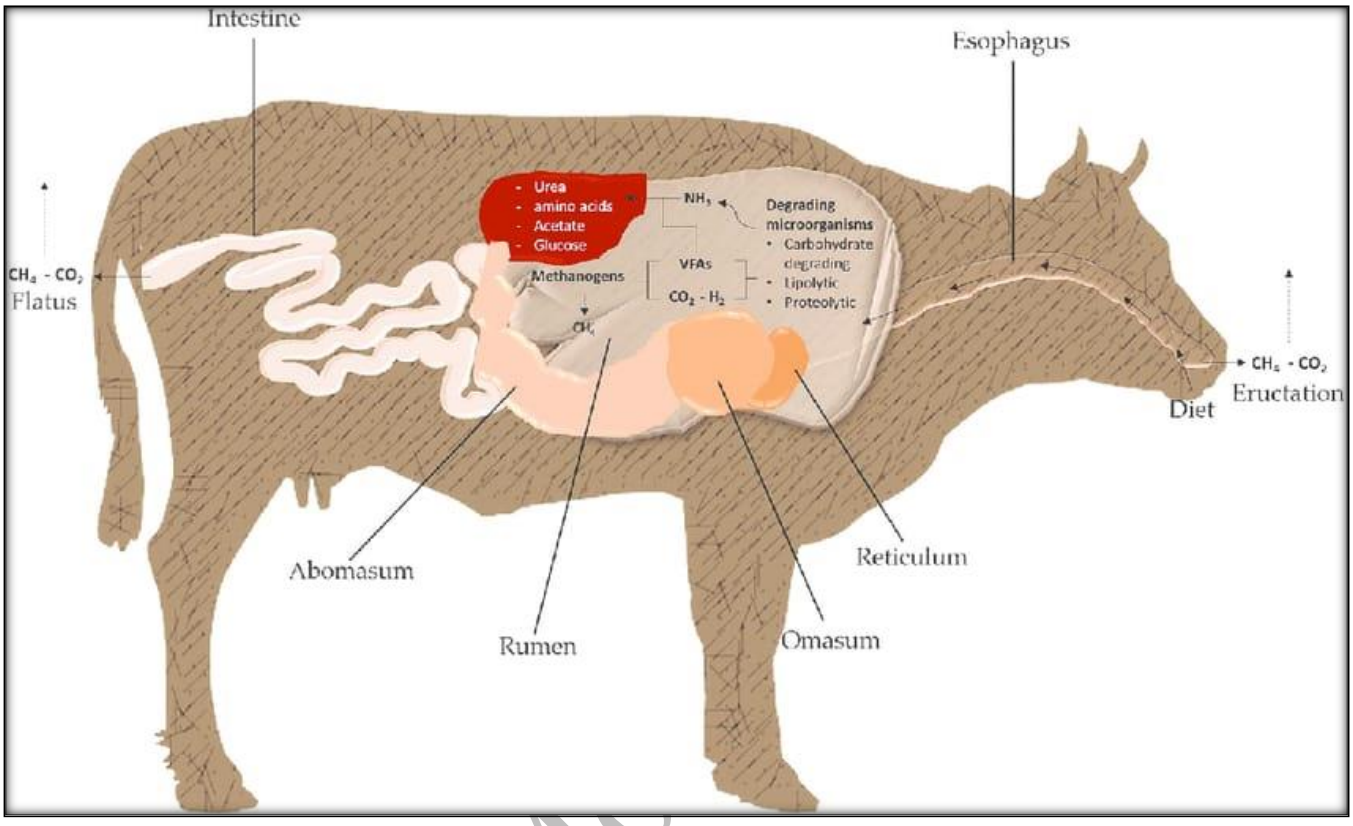
1- **Rhizosphere** is location between the soil solution and the surface of the roots
2- i**nterfaces** between the soil particles, air and the soil particles, air and the water surface**.**
3- **cyanobacterial bloom** interfaces between the air and the water surface (in lentic water)
4- **interfaces** between the organic particles and the water.
5-**rumen of ruminant animals**, is a microenvironment for microorganisms, especially cellulose decomposers.

8− **The human intestine**, is considered a microenvironment for microbial communities such as *E. coli* and yeasts such as Candida.



shape (3-1) Rhizosphere and Interfaces in Soil

Shape (3-2) Cyanobacterial blooms



Shape (3-3) Digestive system in ruminant,Rumen as Microenvironment