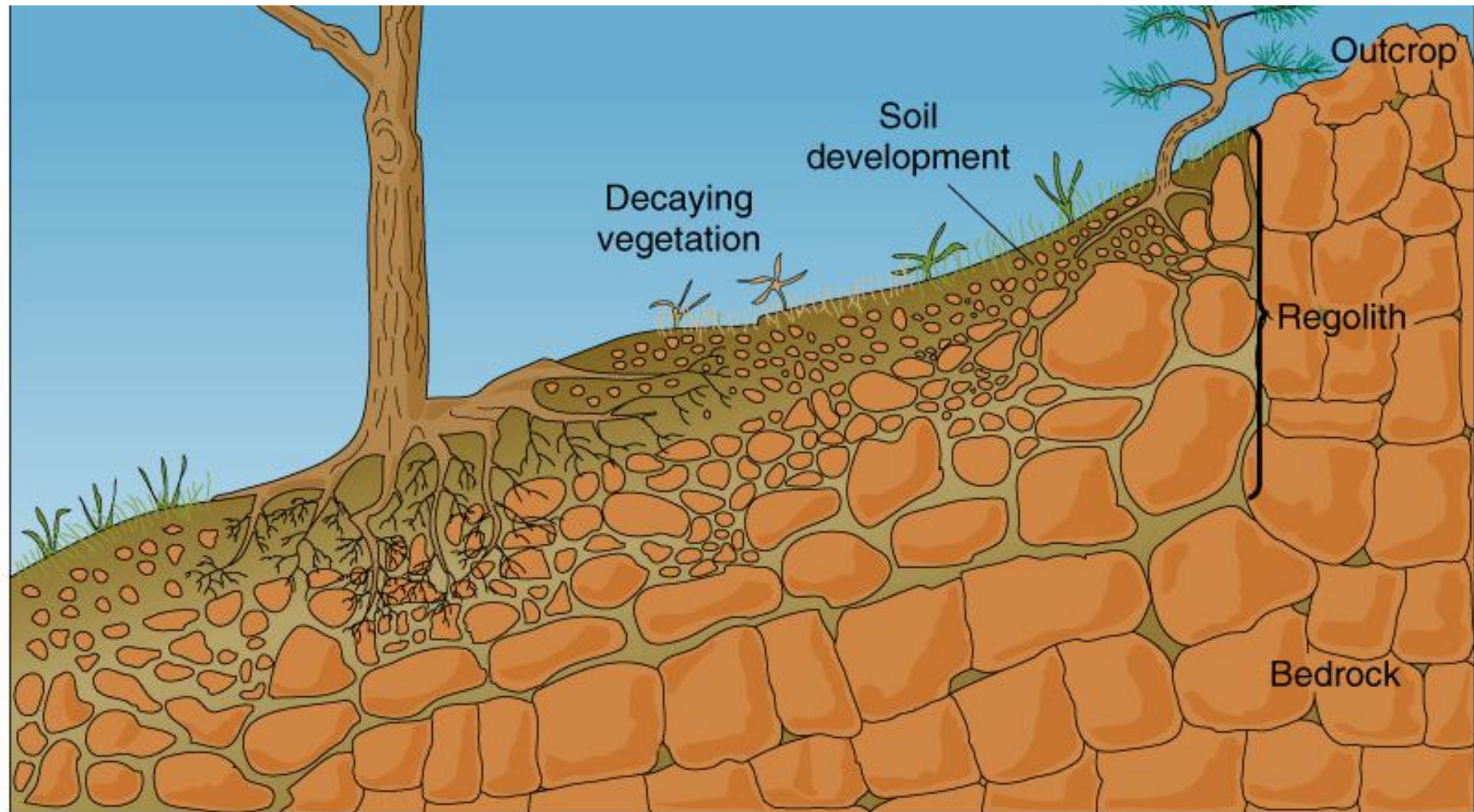




Tema 6.
XEODINÁMICA EXTERNA I:
O solo

SOLO

Parte superior da rocha meteorizada capaz de suportar vida vexetal

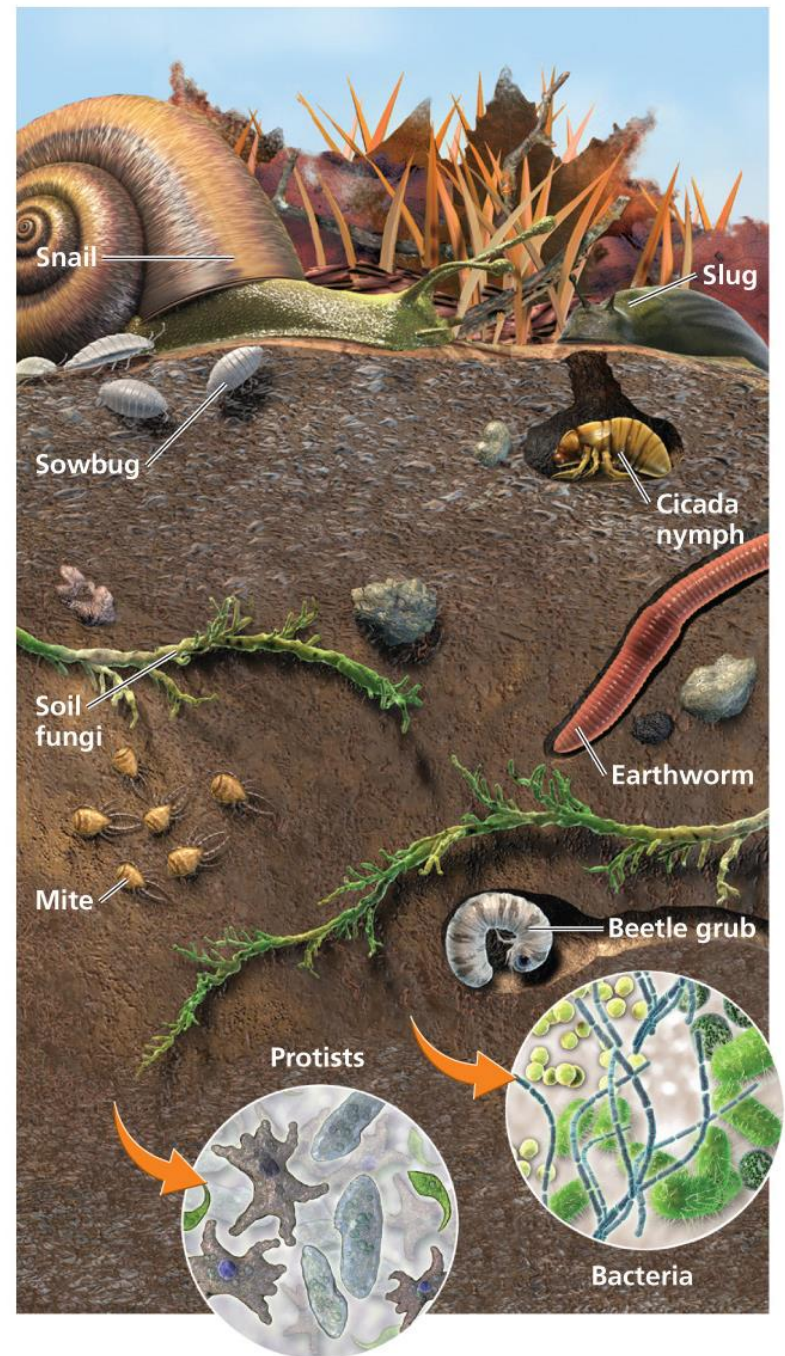


Soil as a system

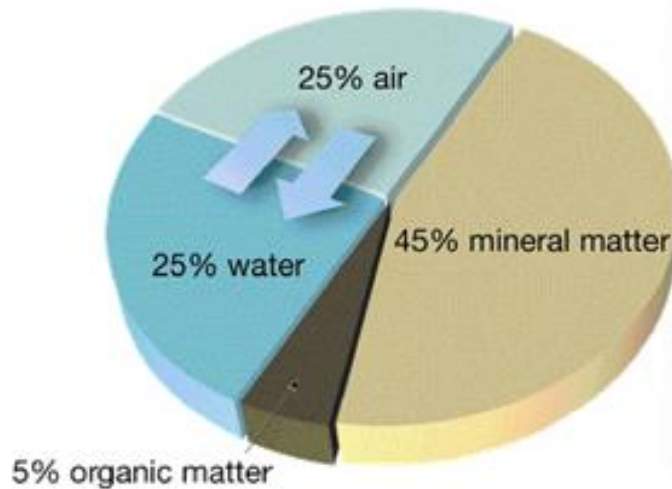
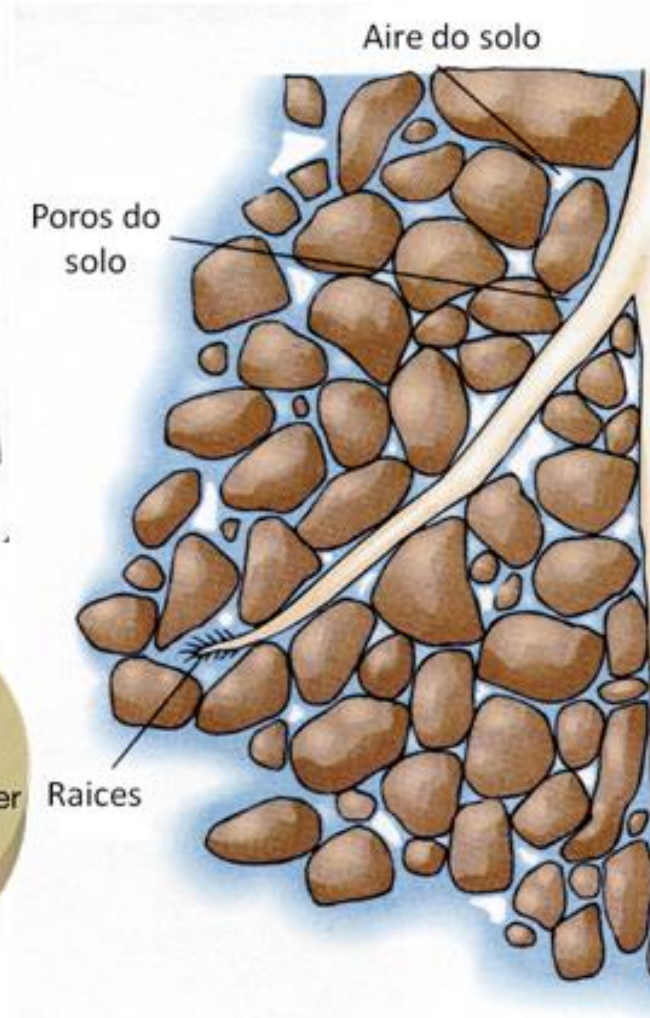
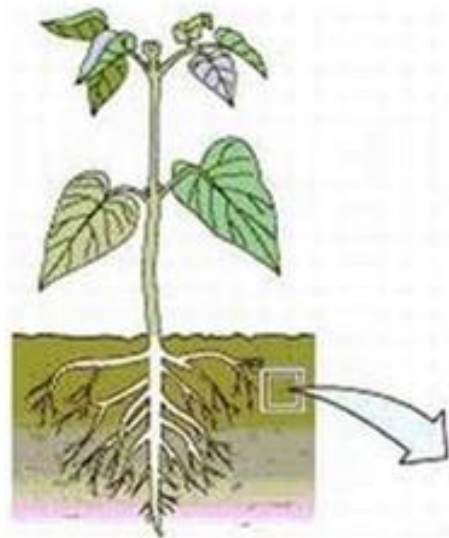
Soil consists of mineral matter, organic matter, air, and water

- Dead and living microorganisms, and decaying material
- Bacteria, algae, earthworms, insects, mammals, amphibians, and reptiles

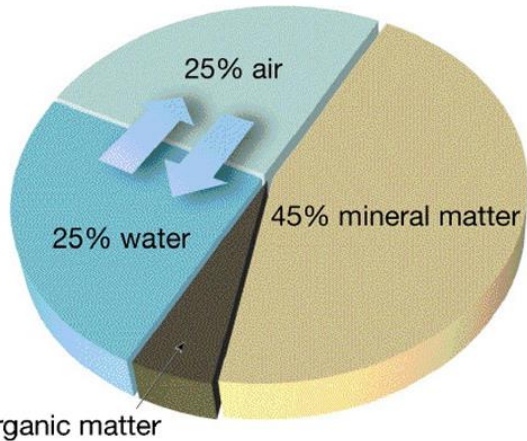
Since soil is composed of living and non-living matter, it is considered an ecosystem



COMPOÑENTES DO SOLO



COMPOÑENTES SÓLIDOS INORGÁNICOS



Parent material
(rock)

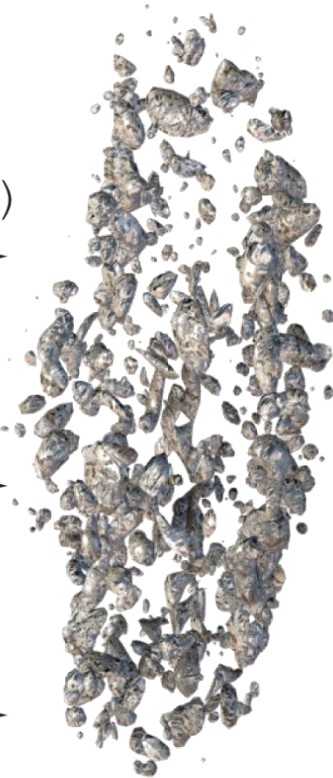
Physical weathering
(wind, rain, thermal expansion
and contraction, water freezing)



Chemical weathering
(water and gases)



Biological weathering
(tree roots and lichens)

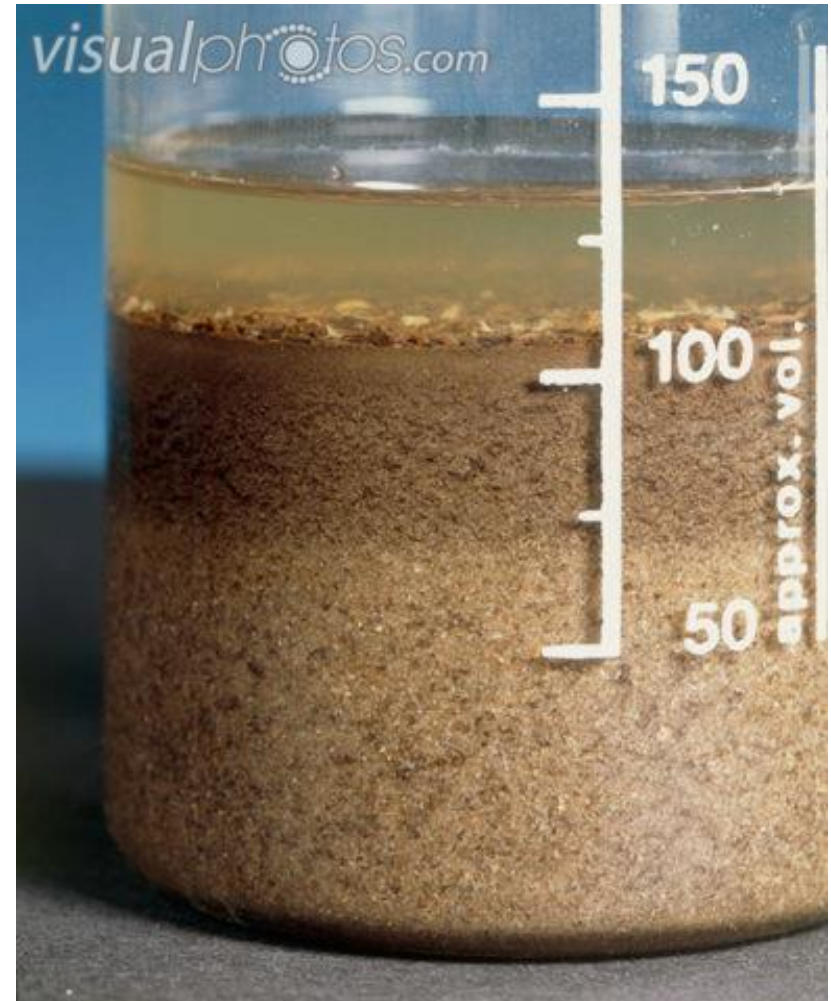
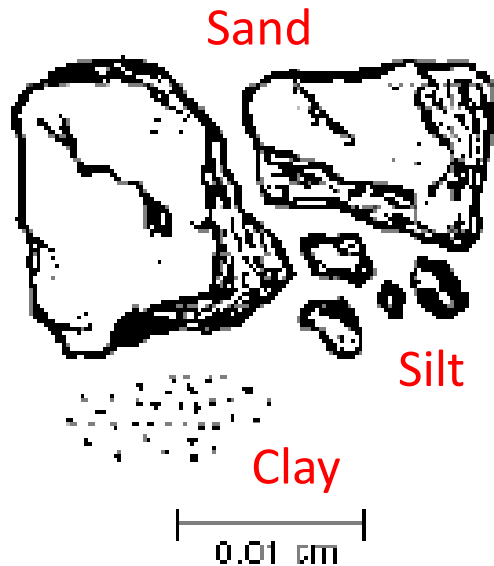


Smaller particles
of parent material

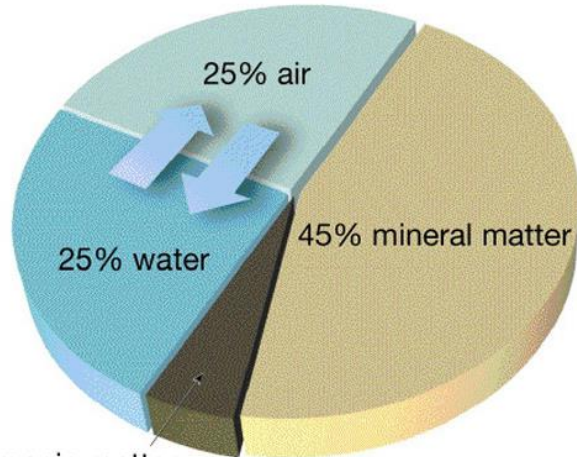
METEORIZACIÓN DA ROCHA NAI

CLASIFICACIÓN POR TAMAÑOS

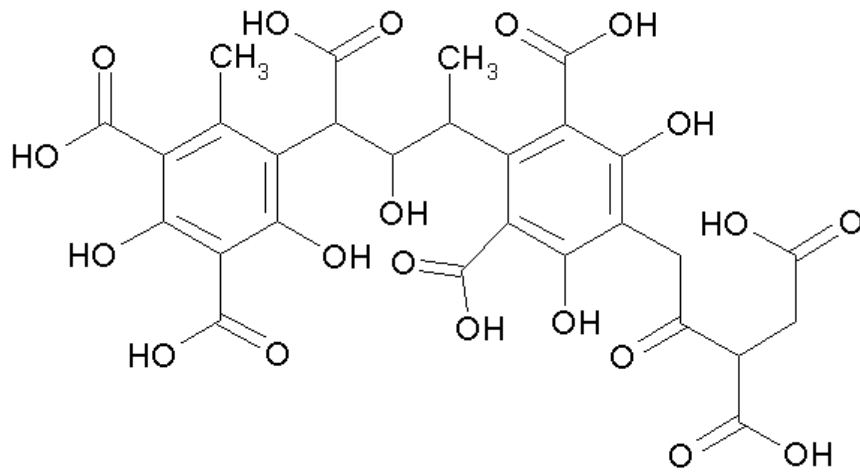
AREAS
LIMOS
ARXILAS



COMPOÑENTES SÓLIDOS ORGÁNICOS



5% organic matter



FOLLATO

HUMUS

Ácido húmico

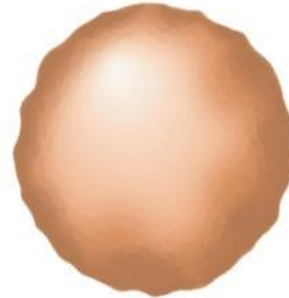
DESCOMPOSICIÓN MATERIA ORGÁNICA

TEXTURA DUN SOLO

Clay
(less than 0.002 mm diameter)



Silt
(0.002 – 0.05 mm diameter)

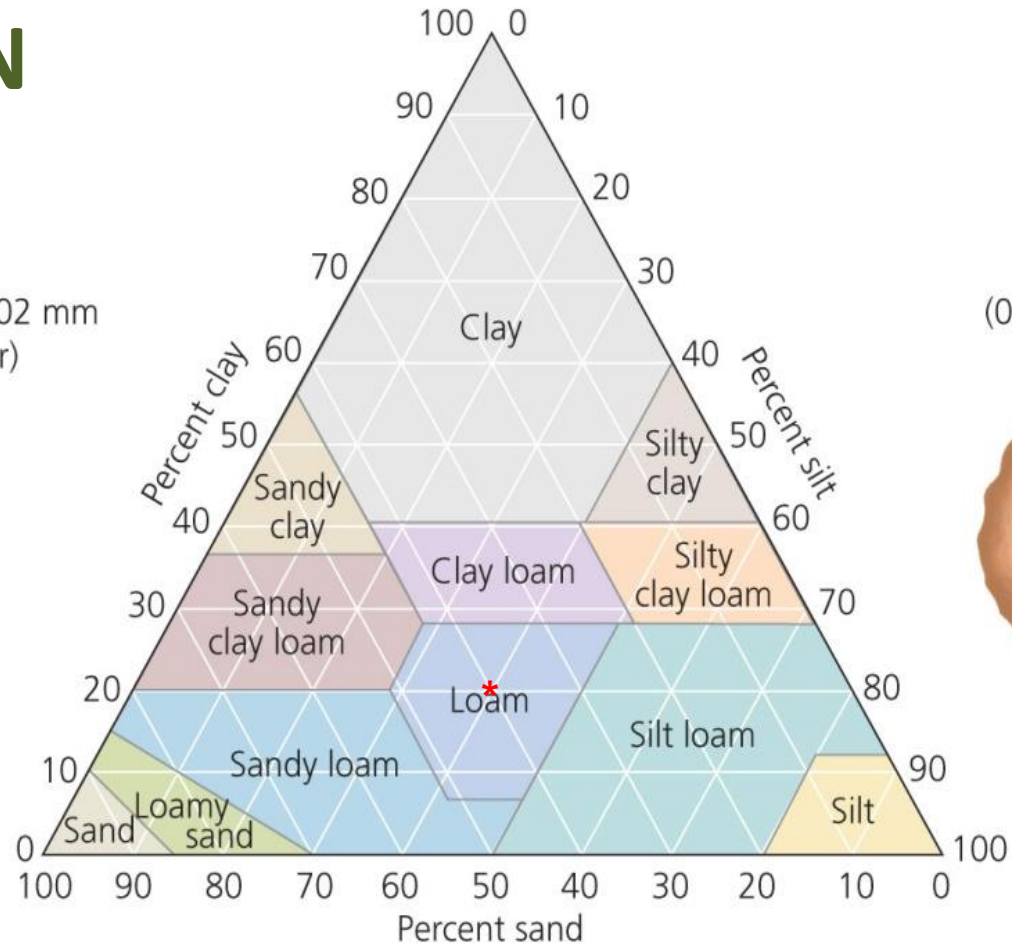


The Composition:

20 % Clay

40% Silt

40% Sand



Sand
(0.05 – 2 mm diameter)

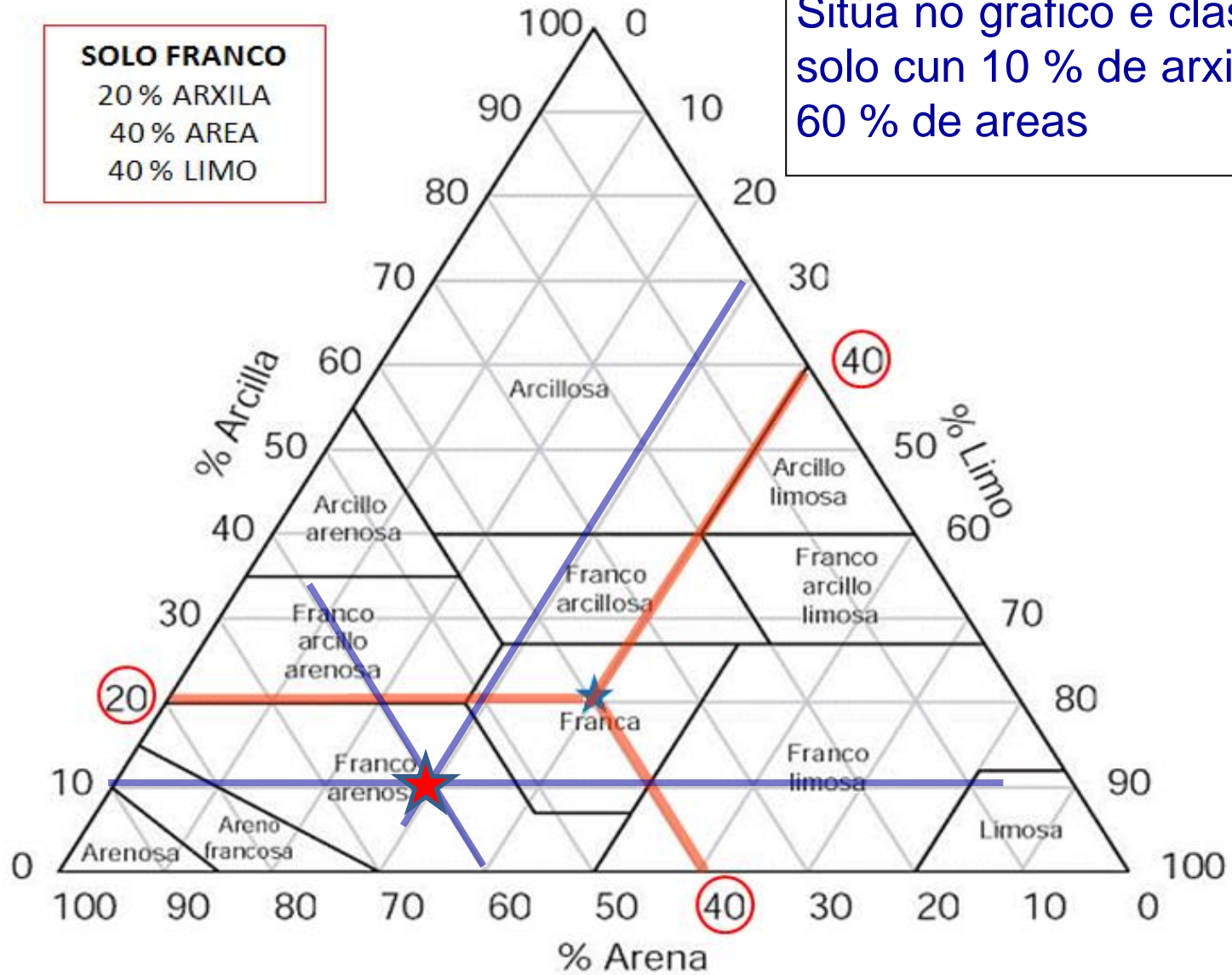


EXERCICIO PÁXINA 78

Sitúa no gráfico e clasifica un solo cun 10 % de arxilas e un 60 % de areas

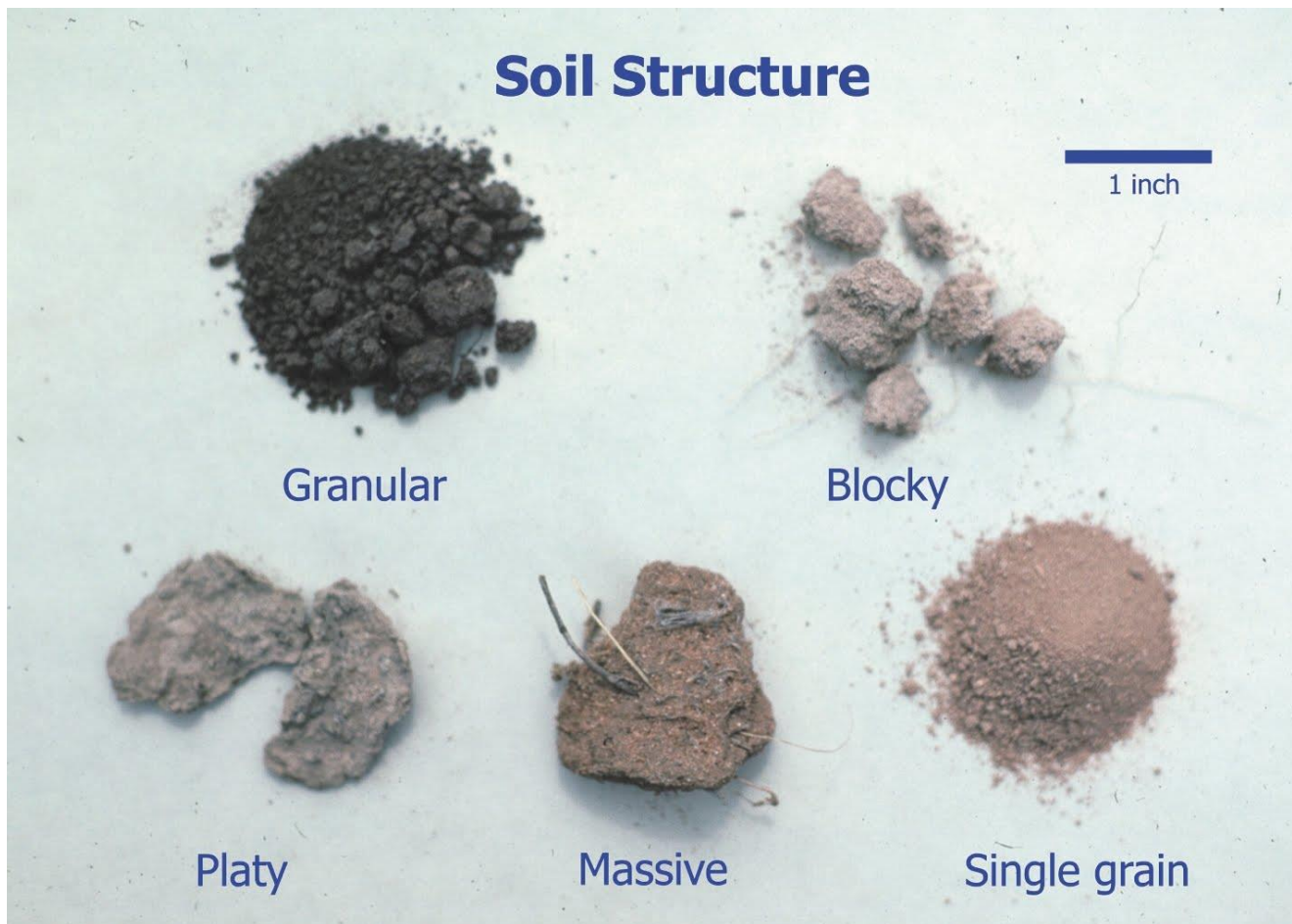
SOLO FRANCO

20 % ARXILA
40 % AREA
40 % LIMO



ESTRUTURA DUN SOLO

A estrutura dun solo refírese á forma e agrupamento destes agregados.



POROSIDADE E PERMEABILIDADE

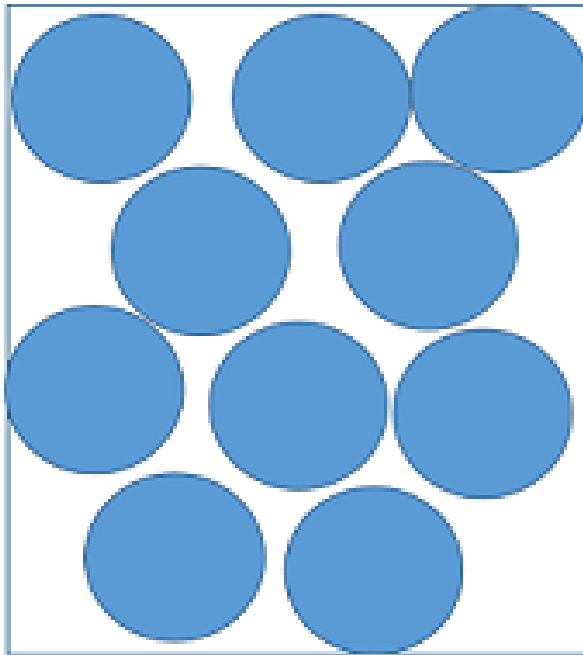
Son dúas propiedades dos solos que dependen en boa medida da textura e estrutura.

A **porosidade** é a proporción do volume total do solo ocupado polos poros.

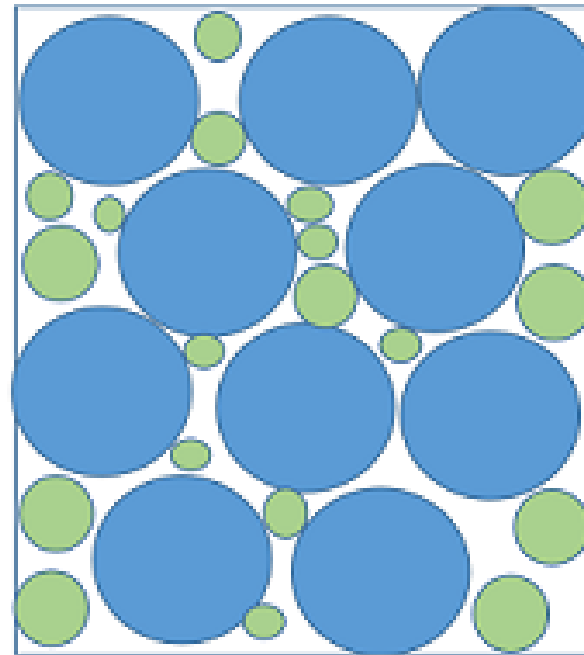
A **permeabilidade** é a facilidade coa que os fluídos atravesan o solo.

POROSIDADE

TEXTURA - ESTRUTURA

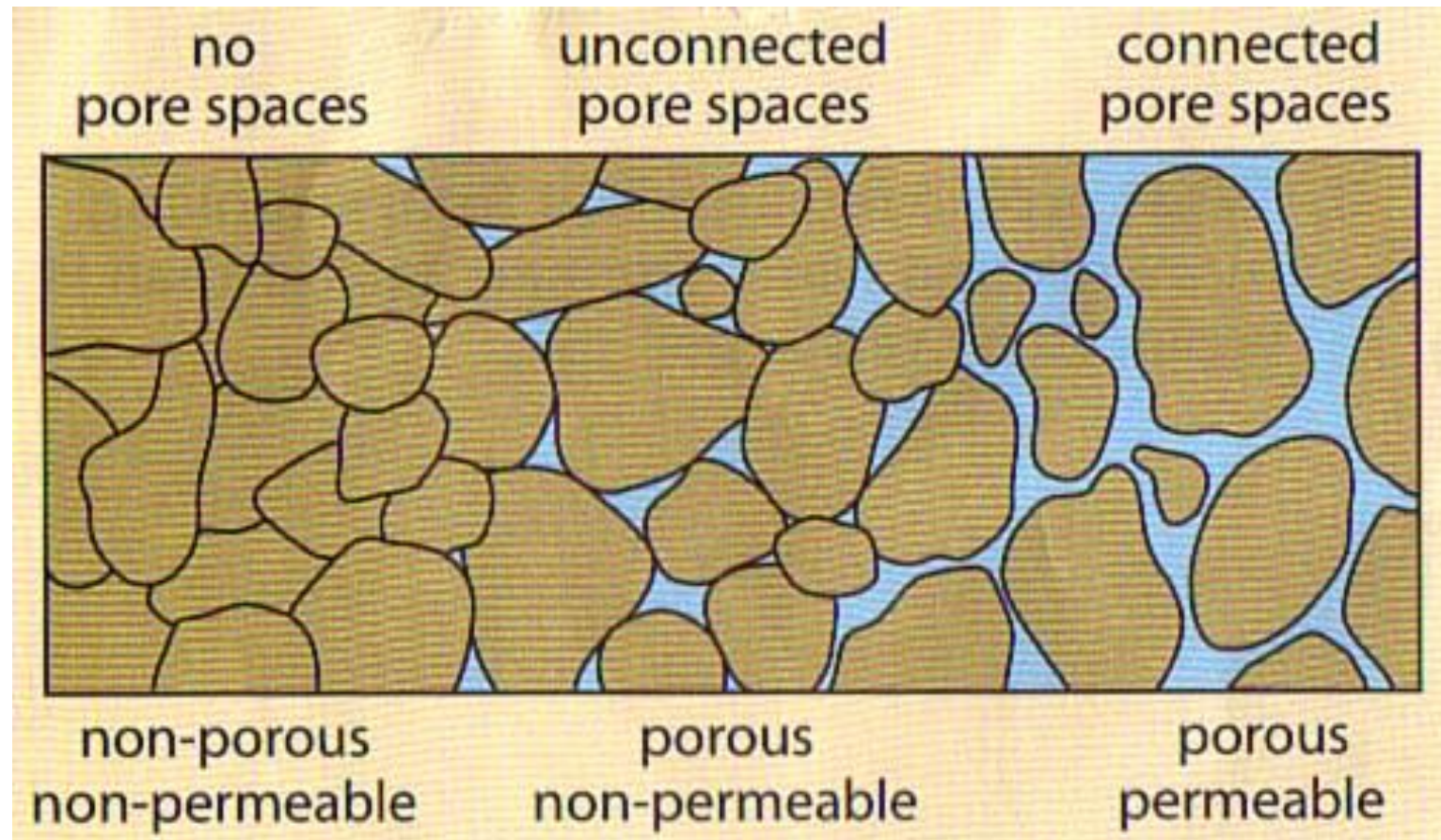


High porosity – large spaces

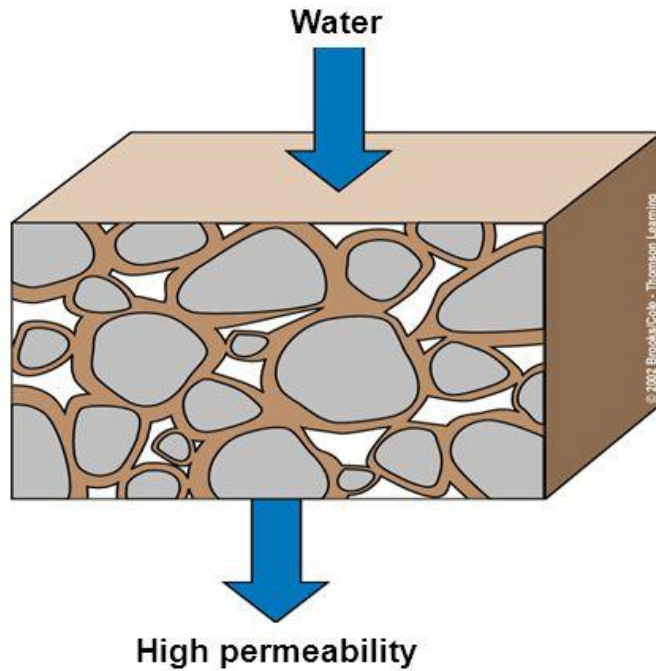


Low porosity – small spaces

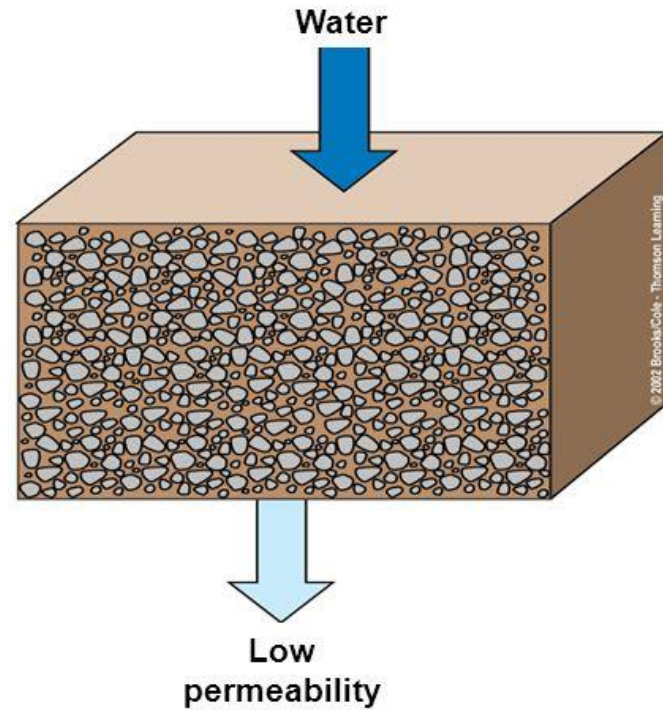
PERMEABILIDADE: CONEXIÓN POROS



CONEXIÓN DOS POROS



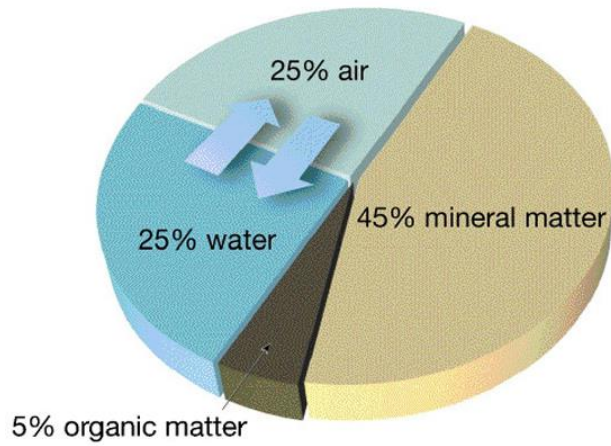
AREOSO



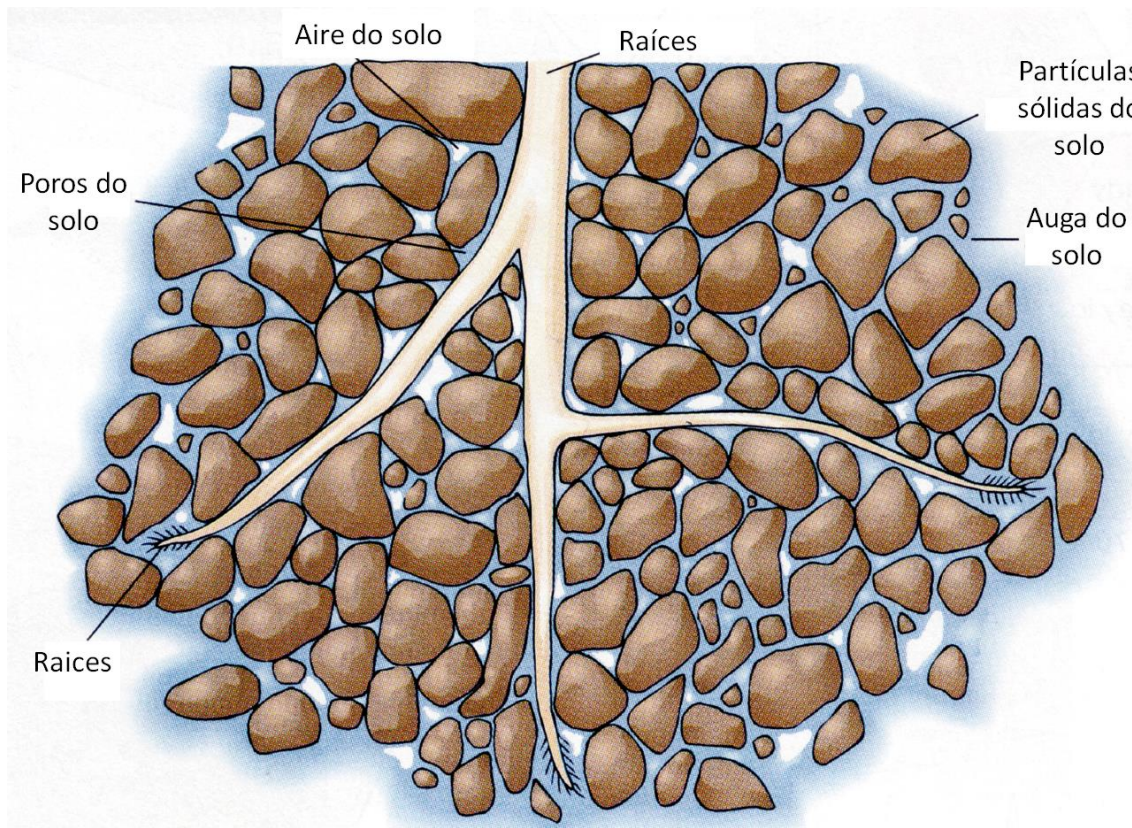
ARXILOSO

POROS:

- DISOLUCIÓN DO SOLO
- ATMOSFERA DO SOLO

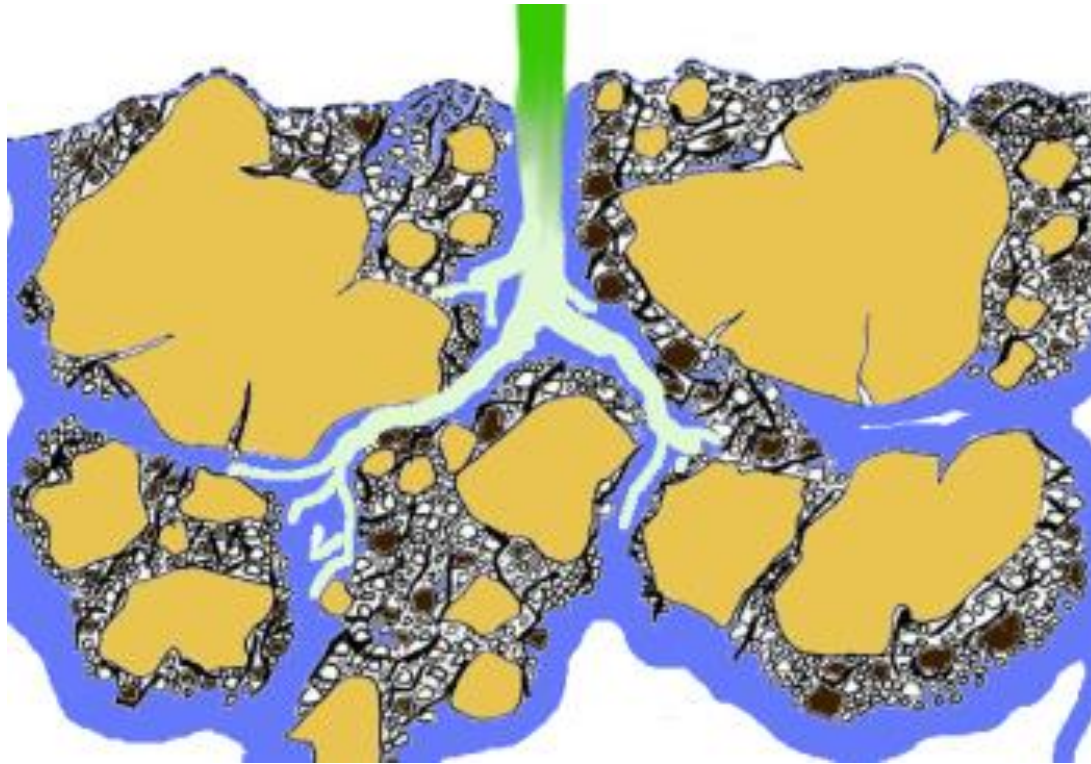


INTERCAMBIABLES

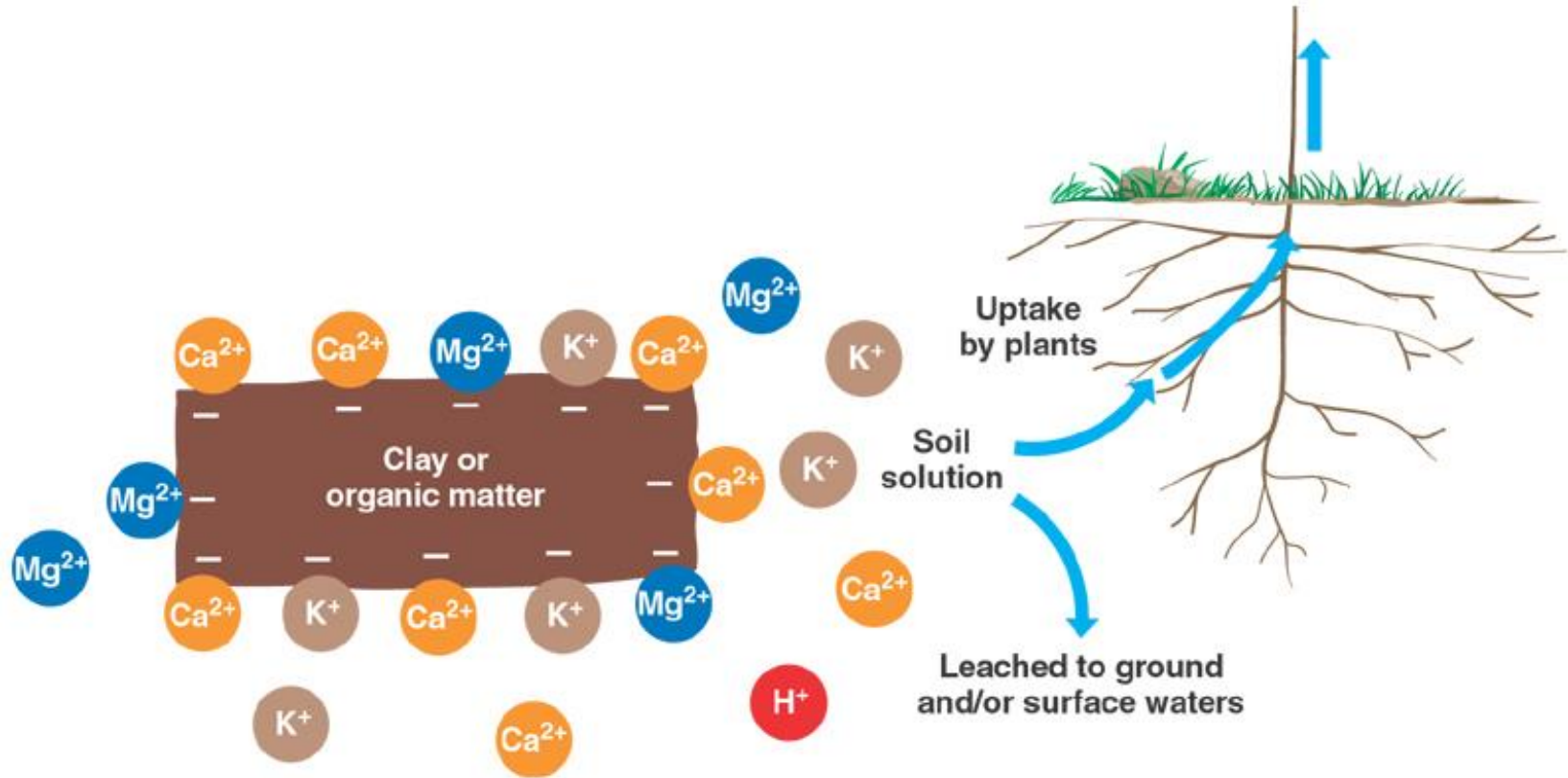


DISOLUCIÓN DO SOLO

AUGA E IÓNS



NUTRICIÓN VEXETAL

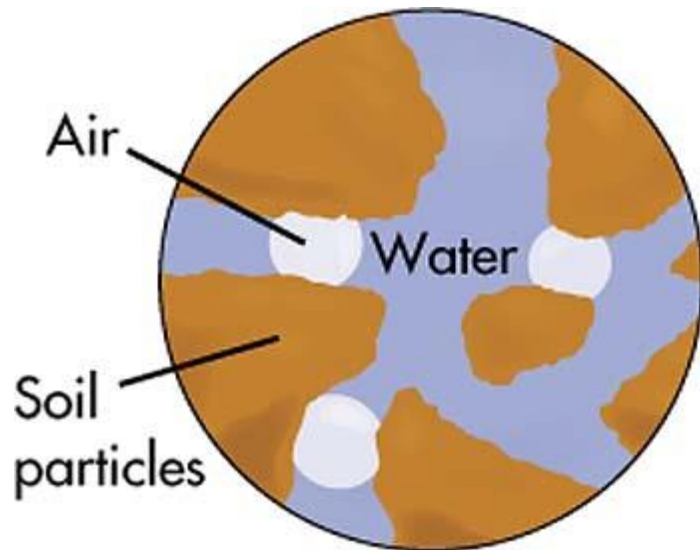


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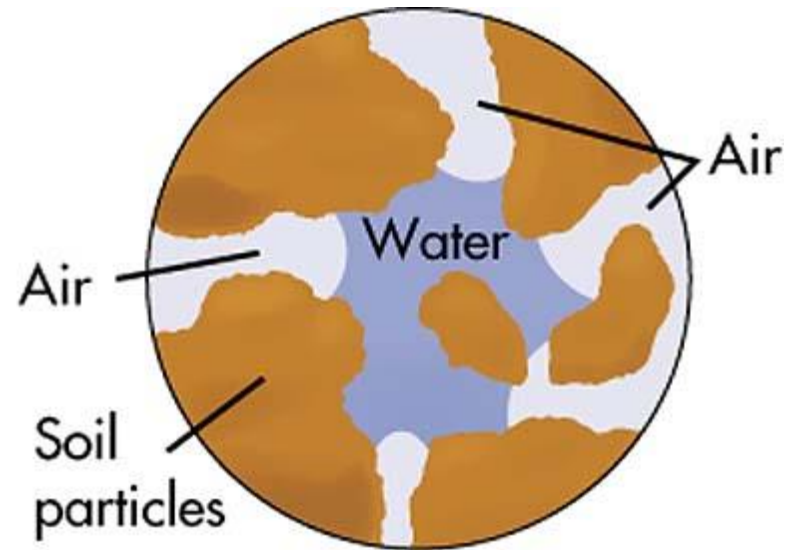
**IÓNES EN EQUILIBRIO CO COMPLEJO DE
CAMBIO**

DISPOÑIBILIDADE DE AUGA PARA AS PLANTAS

CONTIDO EN AIRE E AUGA NOS POROS DEPENDE DO TAMAÑO DOS POROS E DA PLUVIOSIDADE

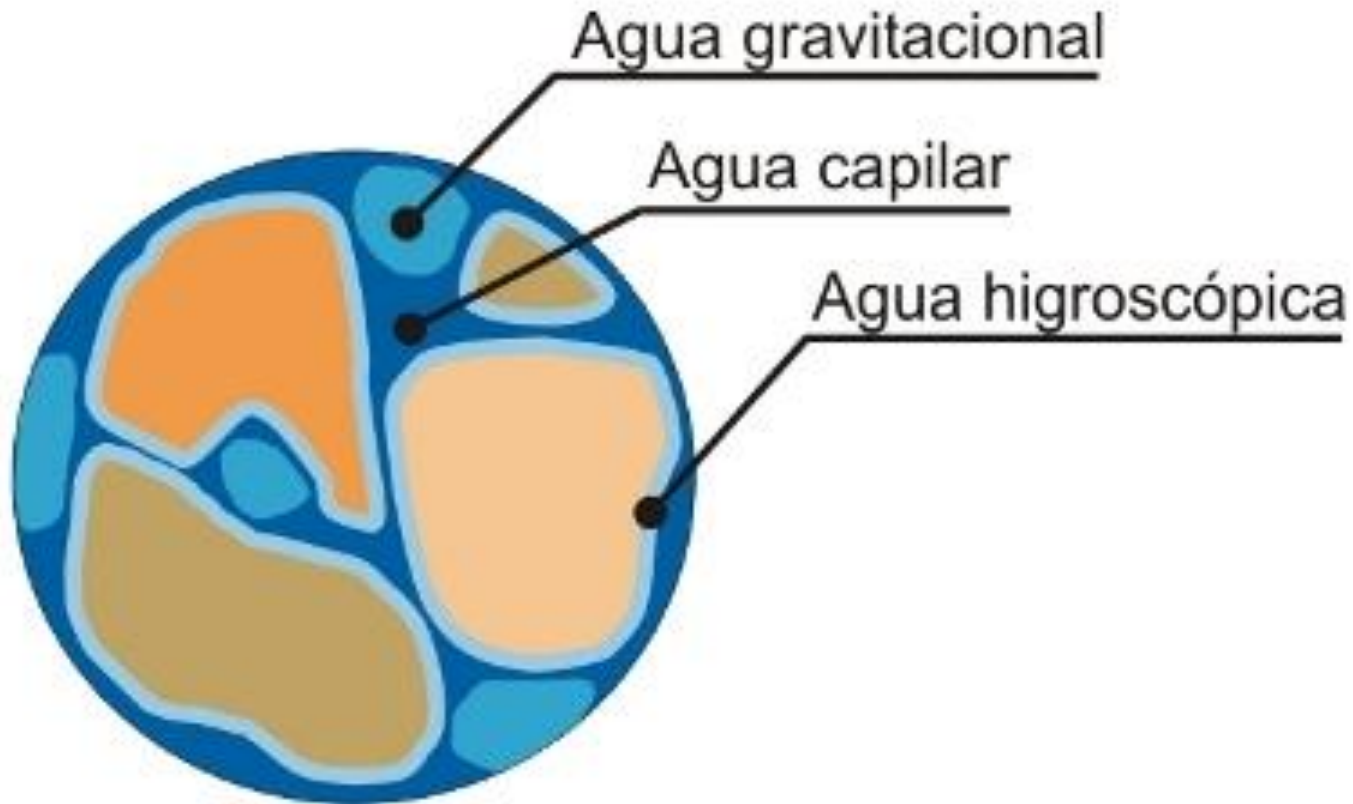


(a) Wet (saturated) soil

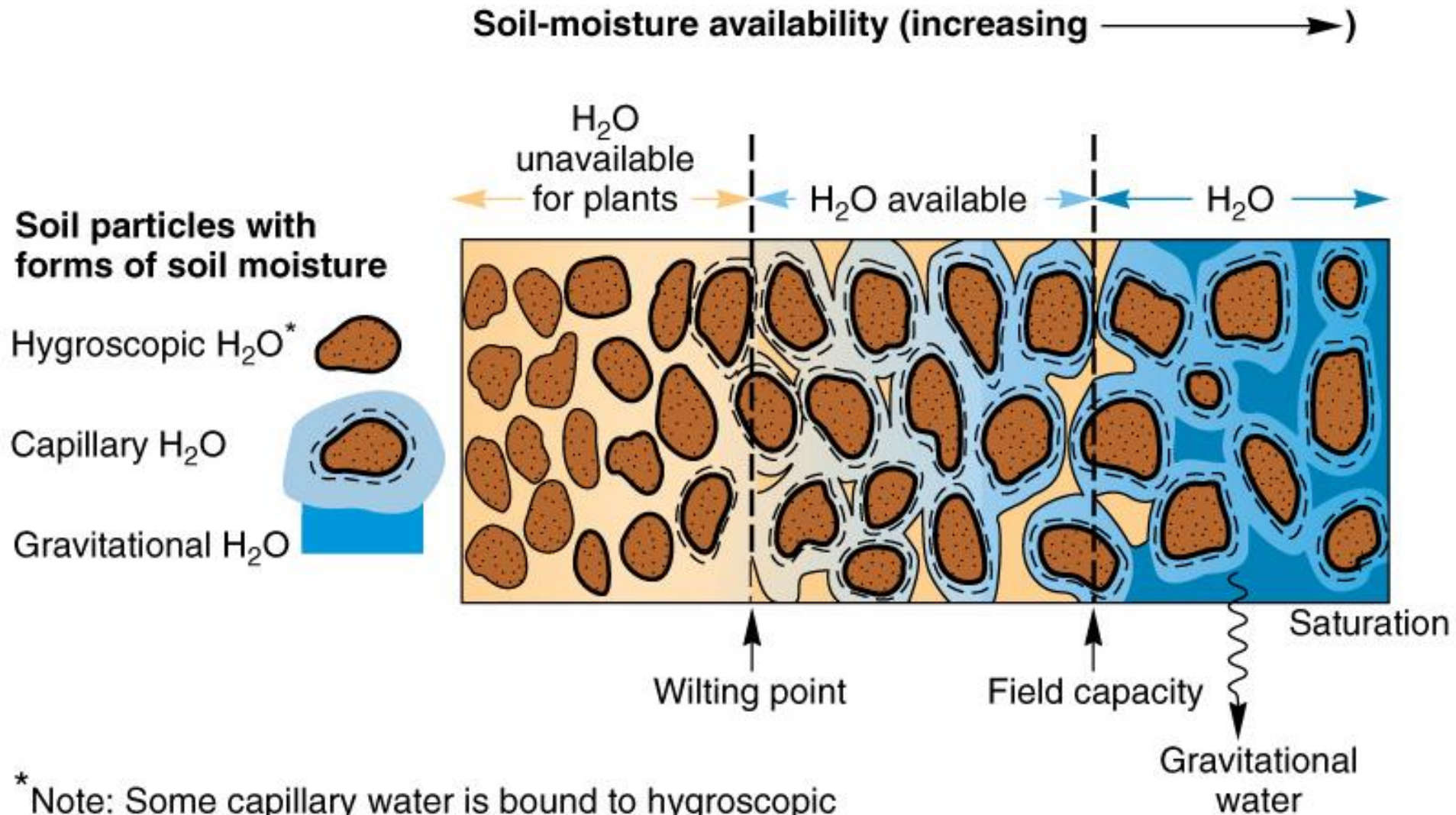


(b) Dry soil

GRAVITACIONAL – CAPILAR – HIGROSCÓPICA



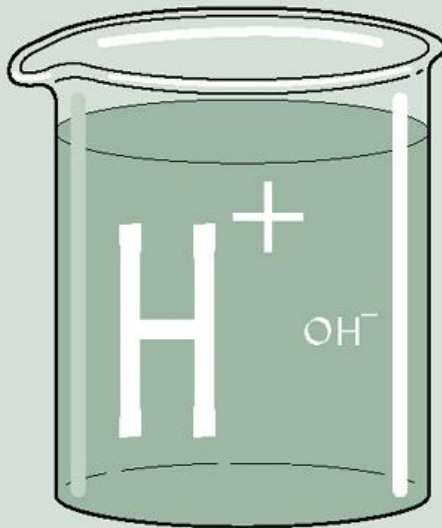
IMPORTANTE PARA O DESENVOLVIMENTO DA VIDA NO SOLO



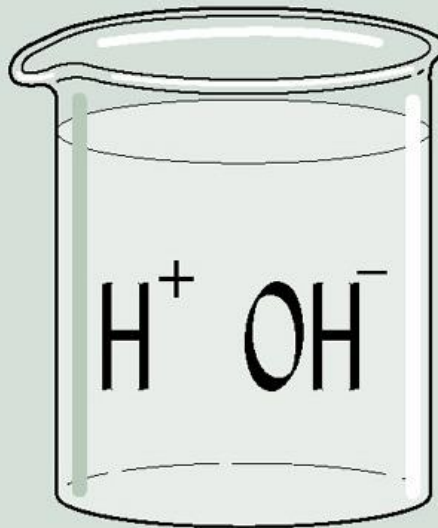
* Note: Some capillary water is bound to hygroscopic water on soil particle and is also unavailable.

pH DO SOLO

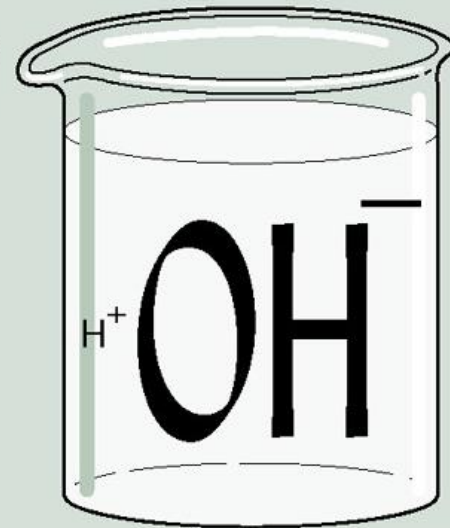
$$\text{pH} = -\log[\text{H}^+]$$



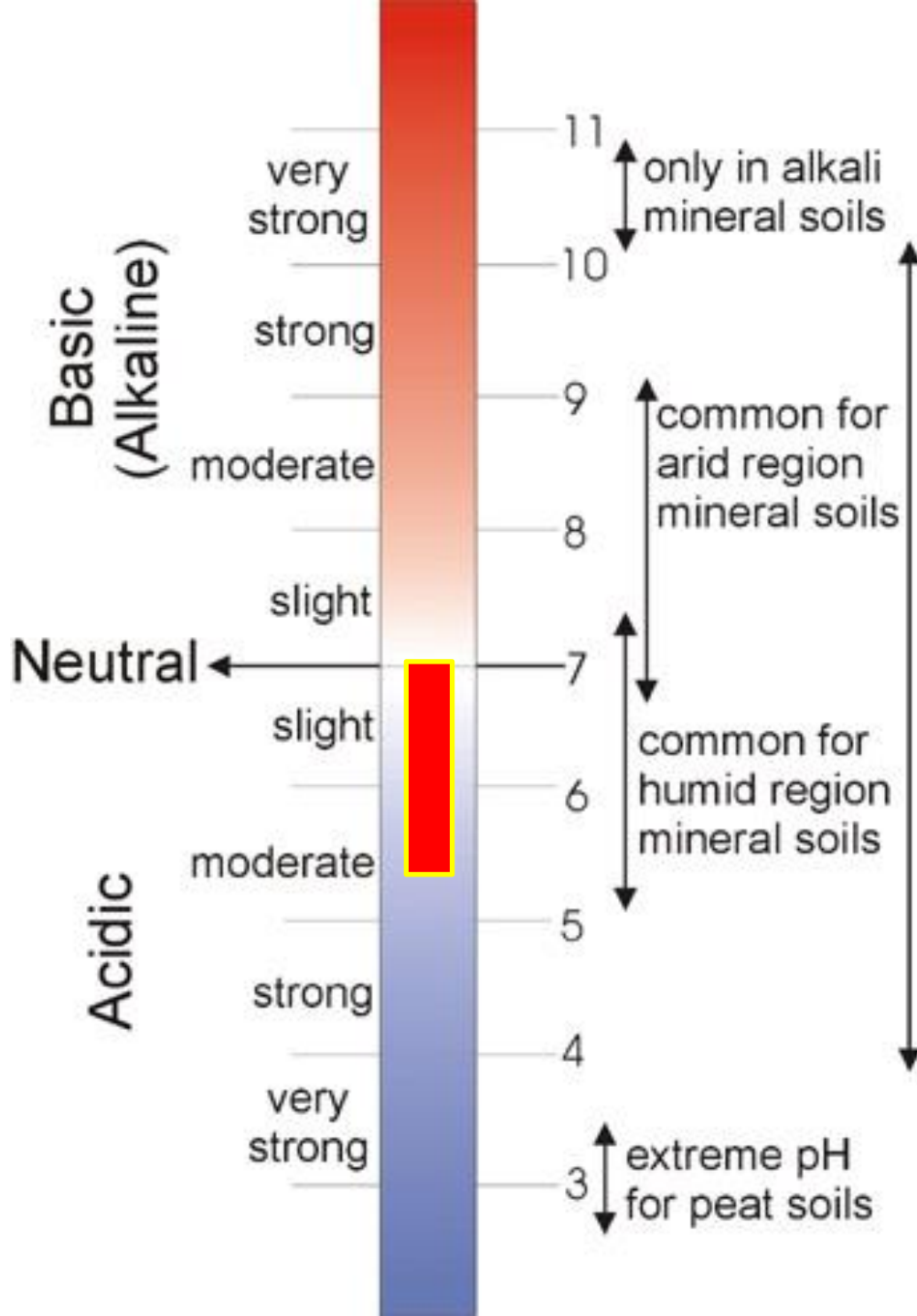
Acid
pH = 6.0



Neutral
pH = 7.0



Alkaline
pH = 8.0

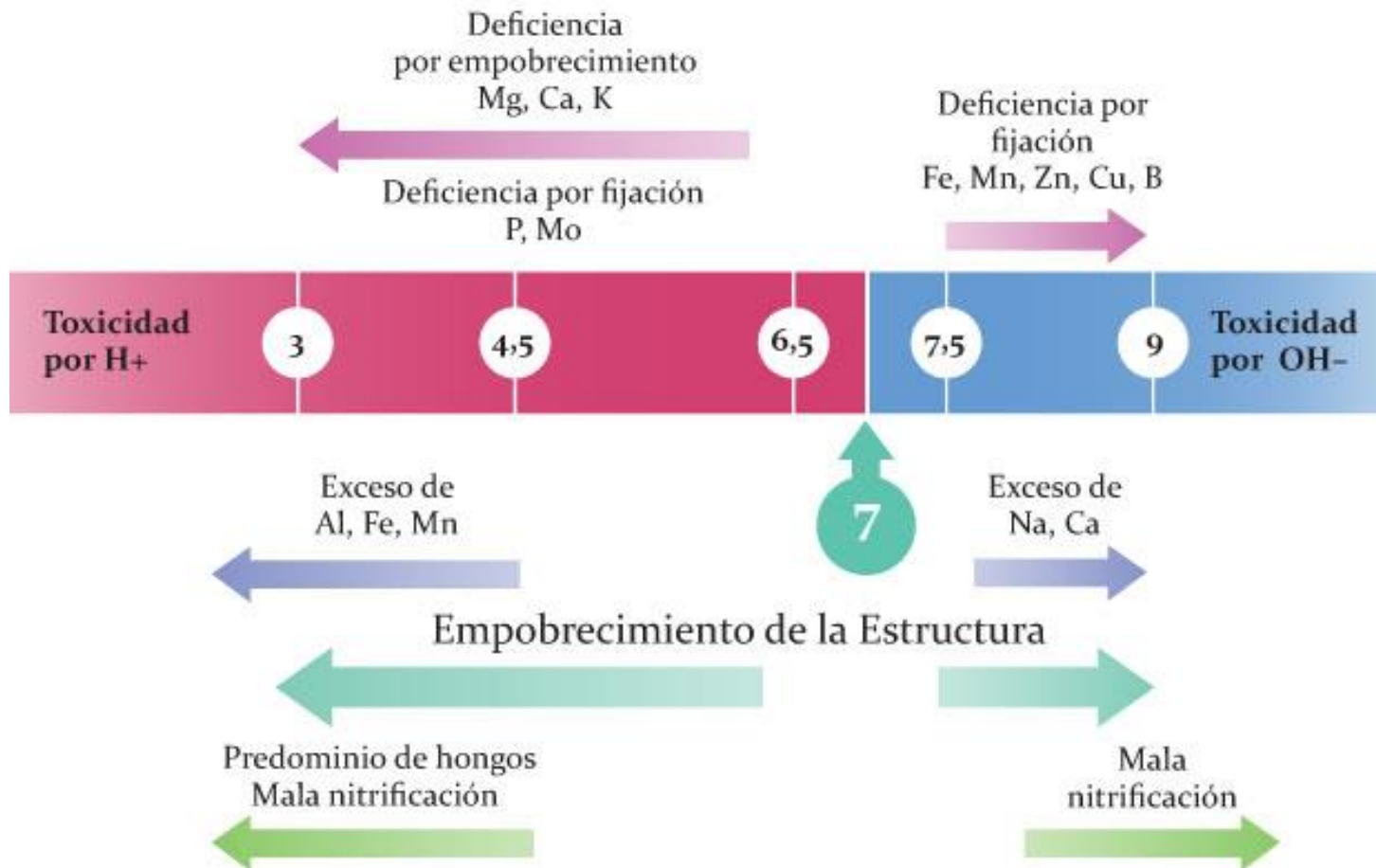


Rochas carbonatadas
(calizas)

extreme range
in pH for most
mineral soils

Rochas acedadas
(granitos, gneises, ...)

DISPOÑIBILIDADE NUTRINTES EFECTOS SOBRE MICROBIOTA



Hydrangea

pH	Flower Color
4.5	deep, vivid blue
5.0	medium blue
5.5	lavender-purple
6.0	purplish-pink
6.5	mauve-pink
6.8	medium pink
7.0	deep, vivid pink

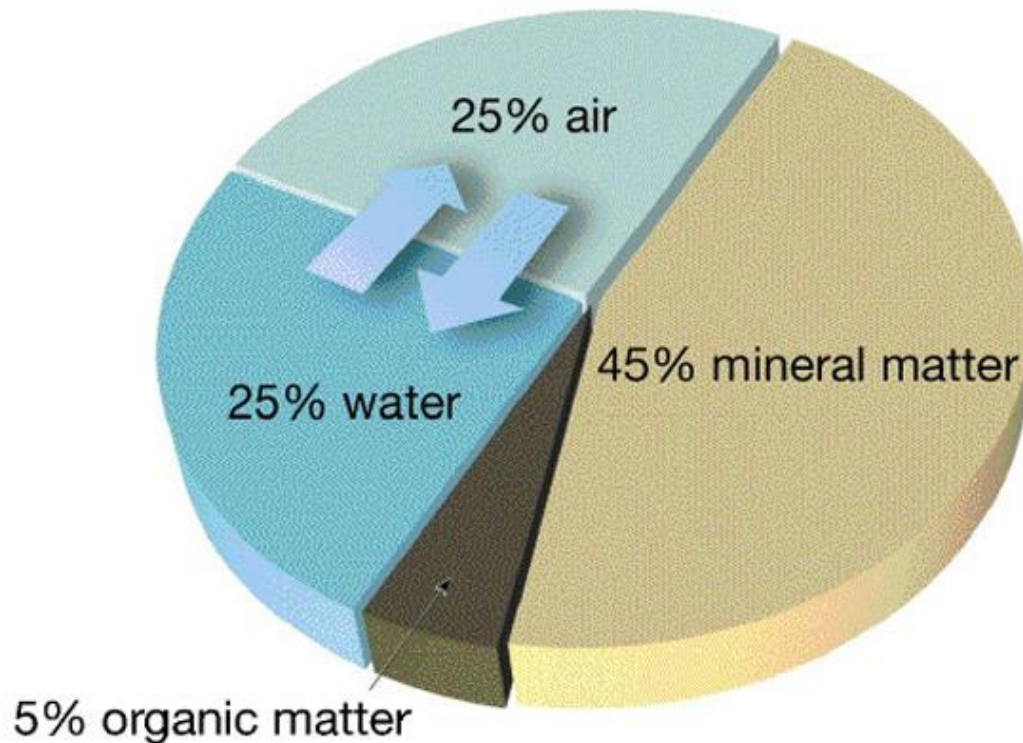


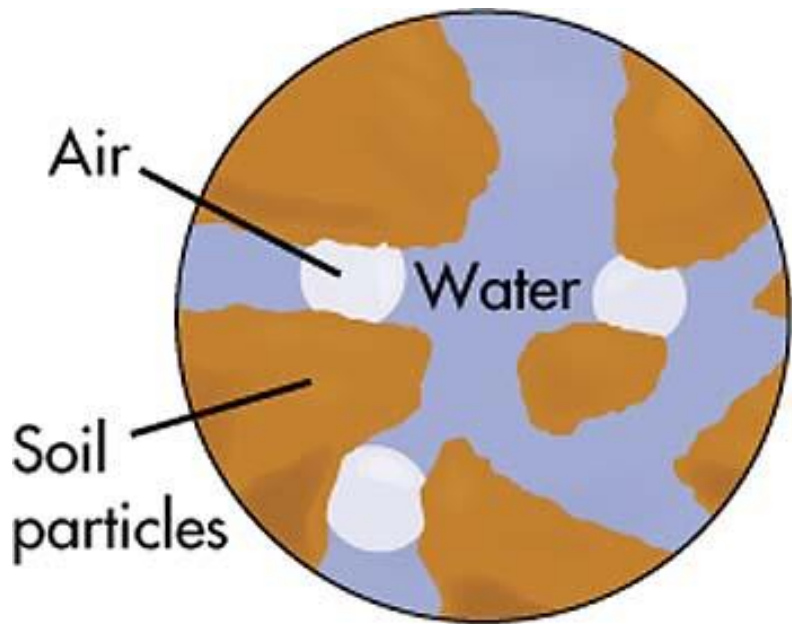
ATMOSFERA DO SOLO

MESTURA DE GASES EN EQUILIBRIO CA ATMOSFERA.

O₂ PARA A RESPIRACIÓN CELULAR

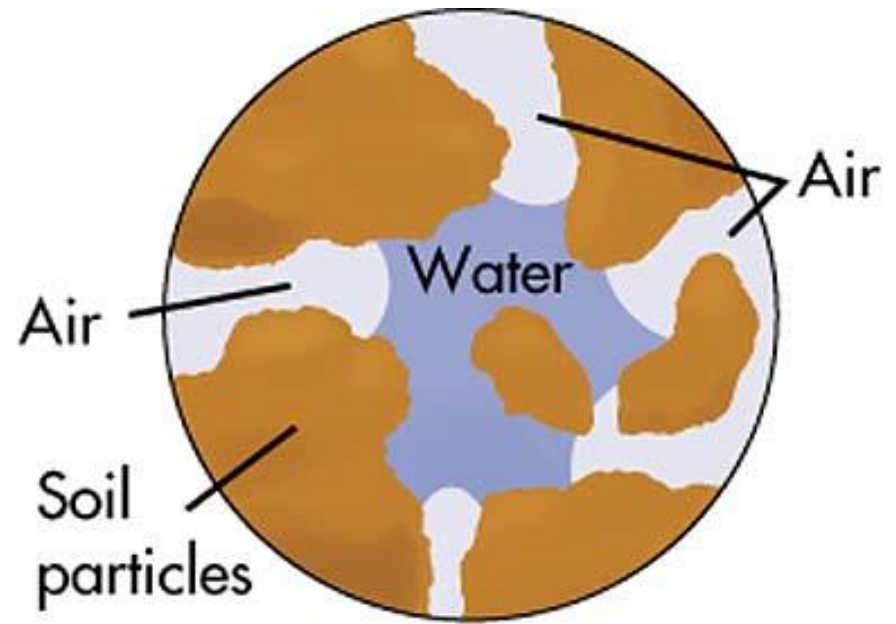
N₂ PARA BACTERIAS FIXADORAS





(a) Wet (saturated) soil

SOLOS SATURADOS
(ENCHARCADOS)

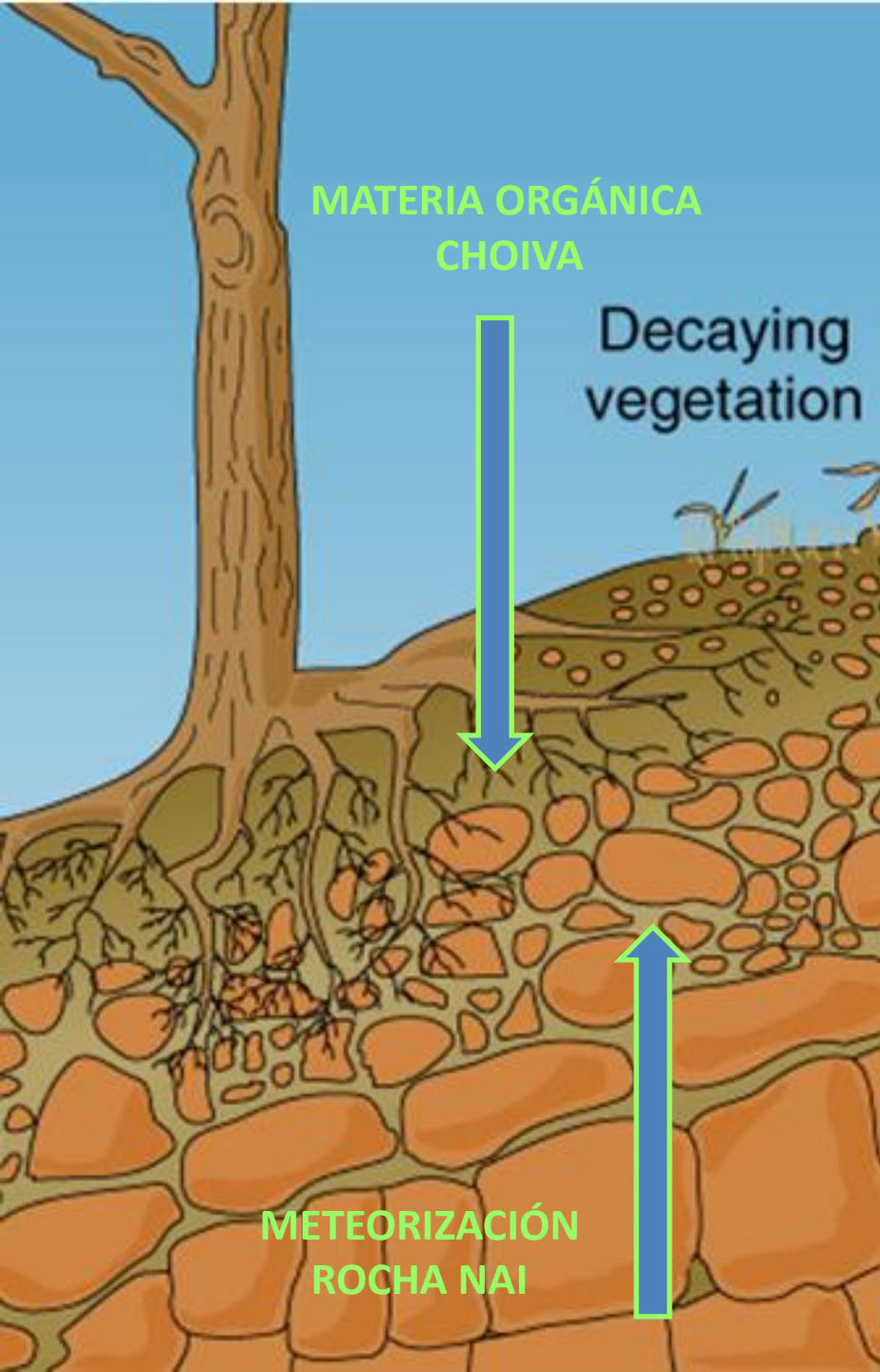


(b) Dry soil

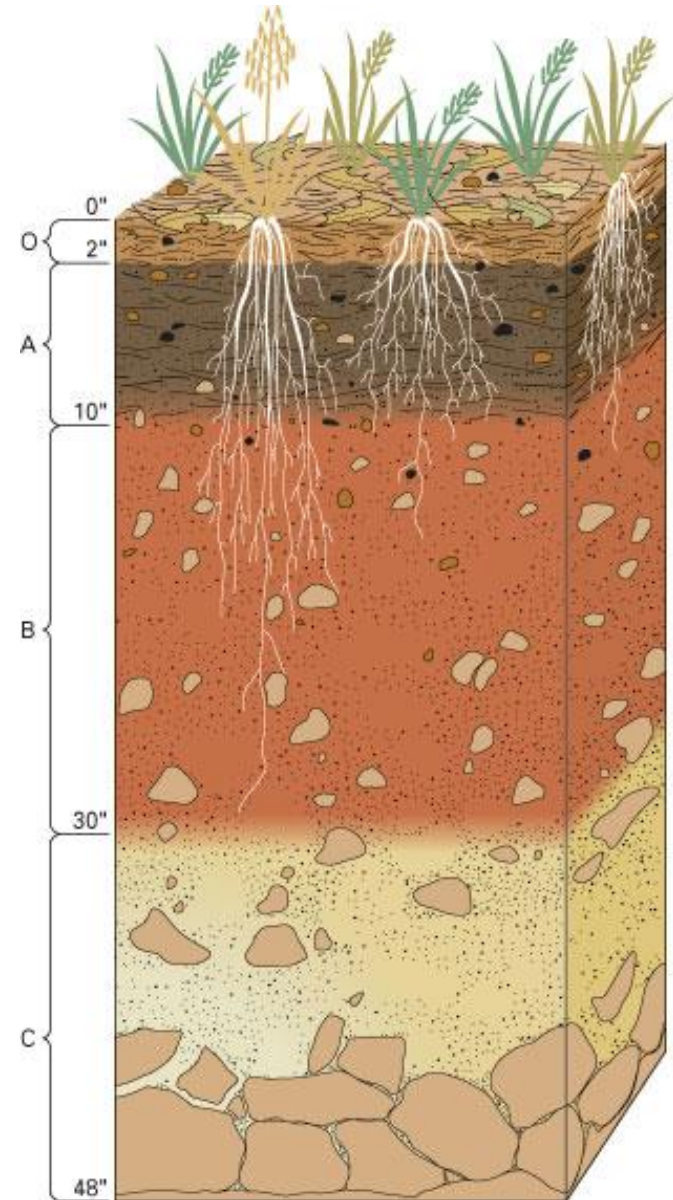
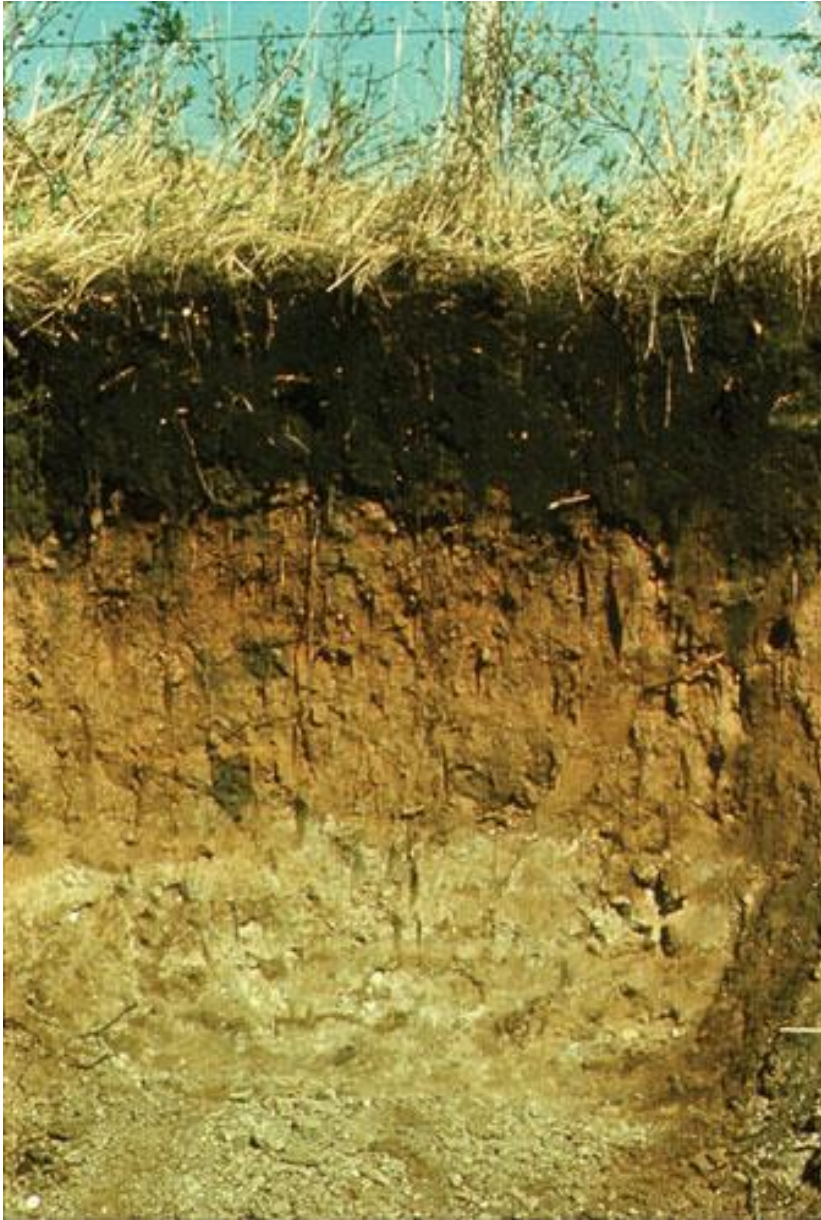
SOLOS SECOS

PERFIL DO SOLO

HORIZONTES DO SOLO

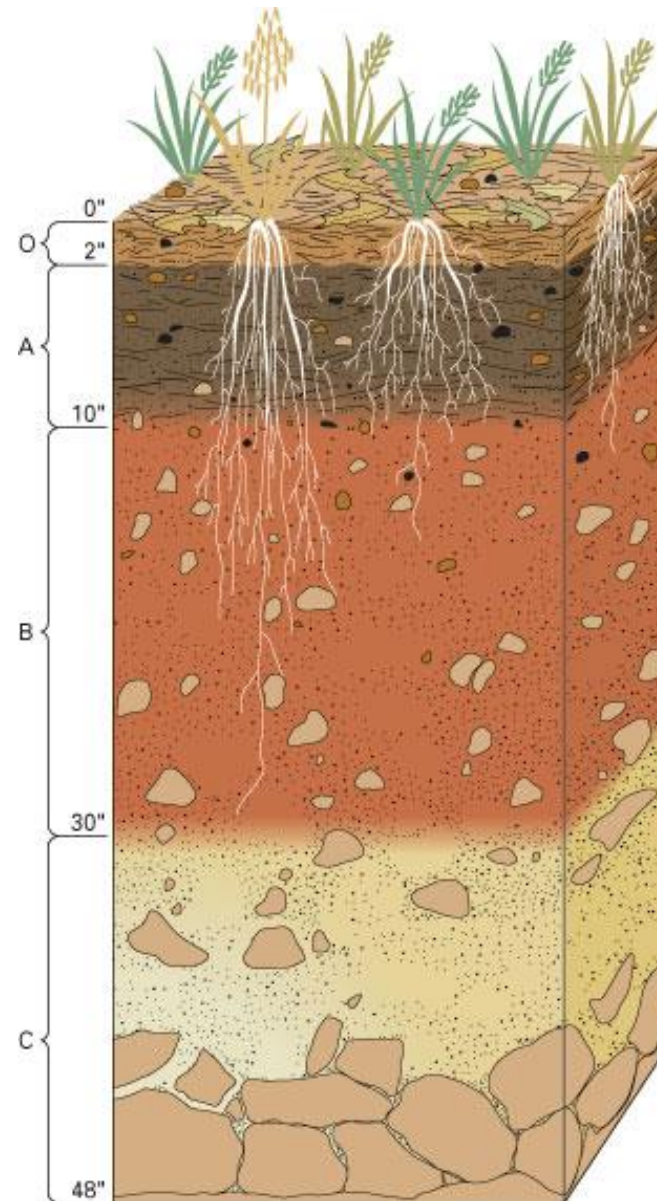


PERFIL DUN SOLO MADURO E COMPLETO



HORIZONTE O

MOITA MATERIA ORGÁNICA
FOLLATO E HUMUS
COR ESCURA NEGRA



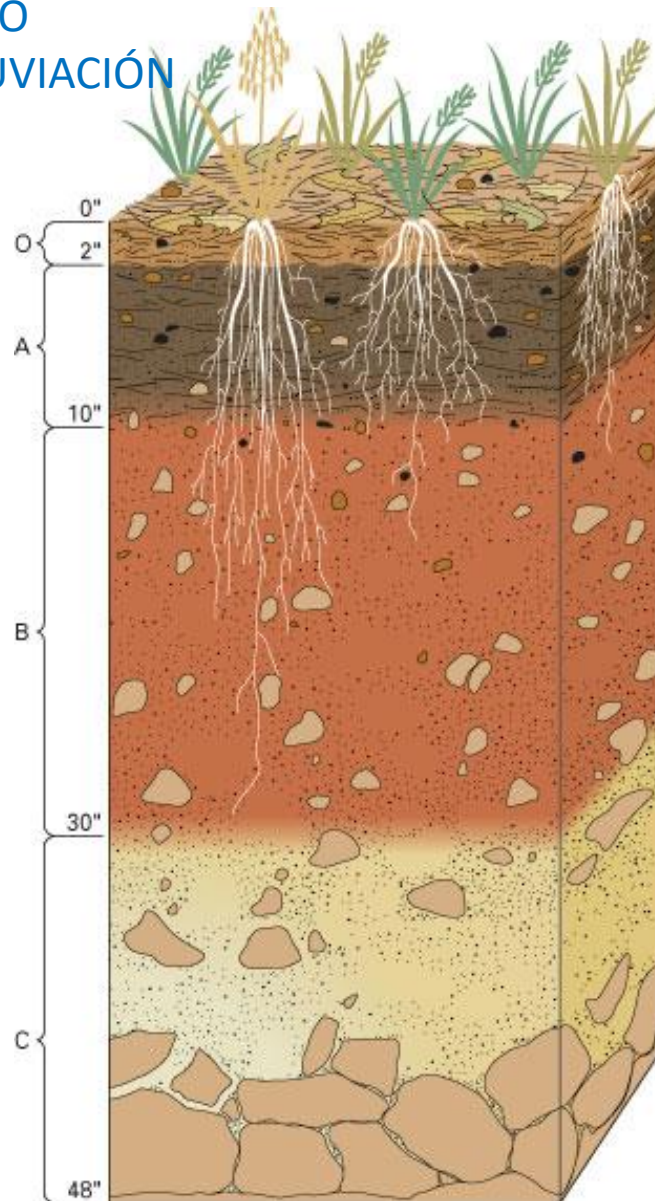
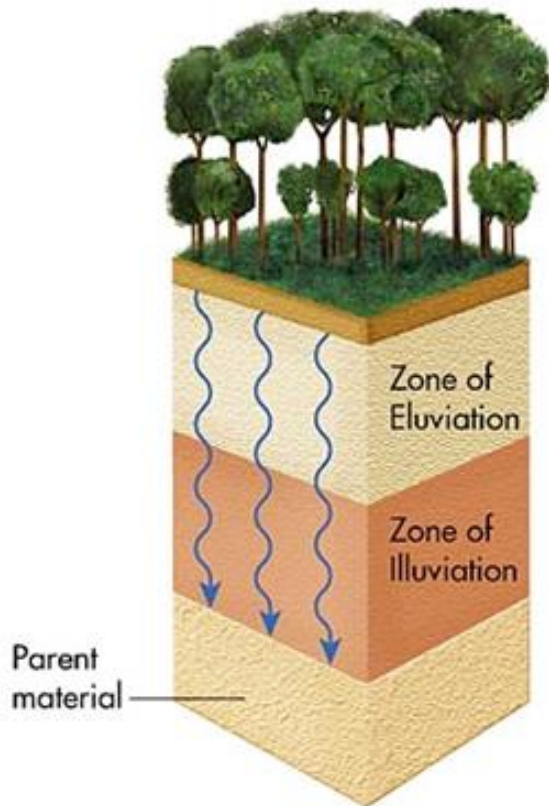
HORIZONTE A

ELUVIAL

MATERIA ORGANICA VAI DIMINUINDO

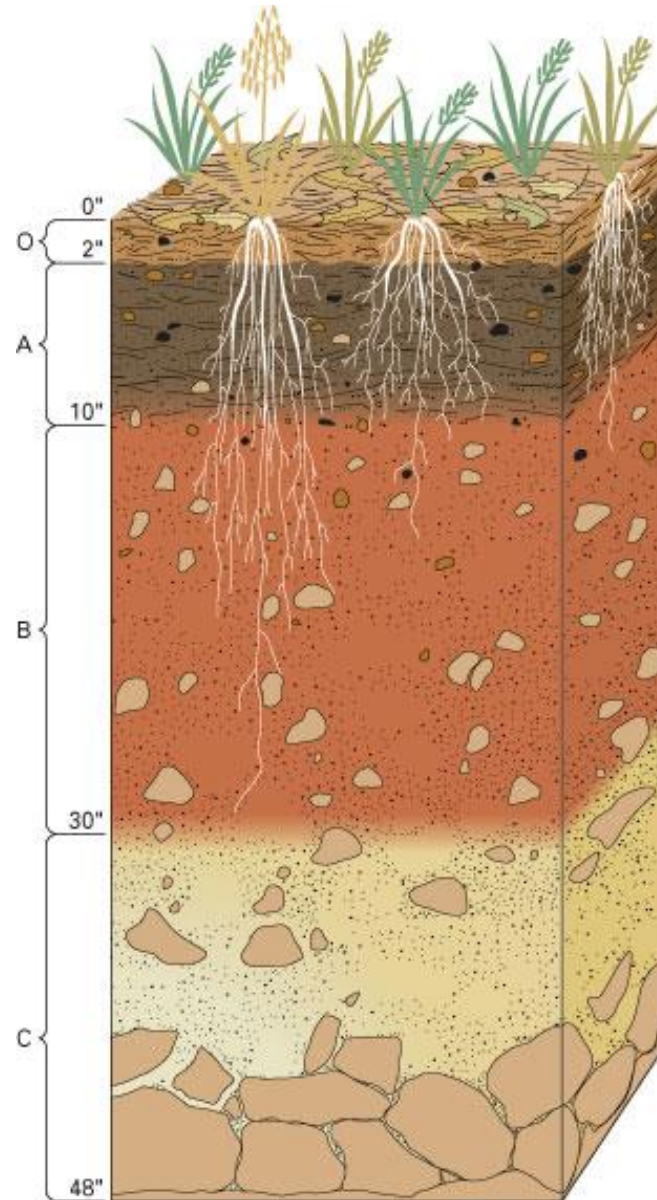
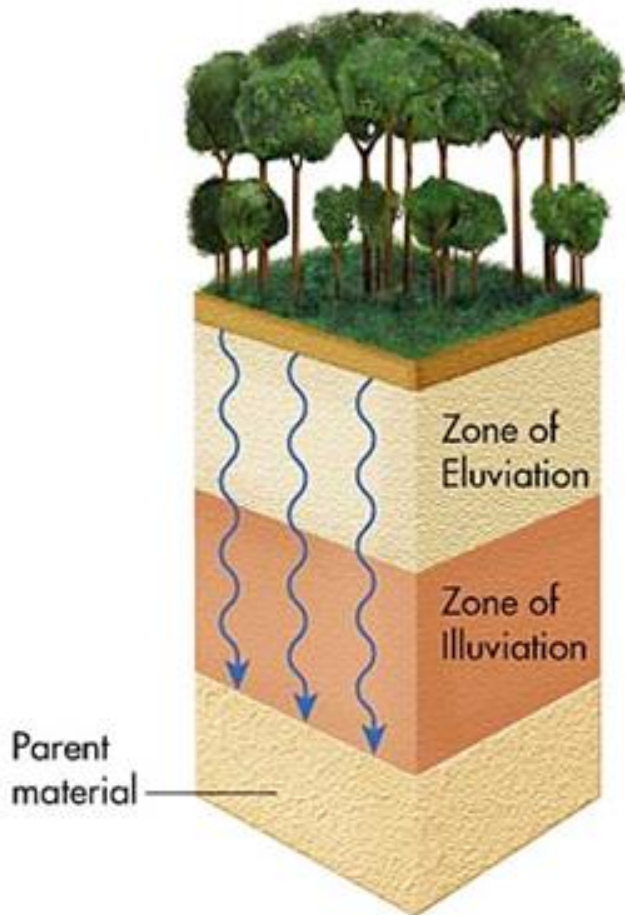
ARRASTRE IÓNS: LIXIVIACIÓN OU ELUVIACIÓN

COR GRIS CLARO A NEGRO



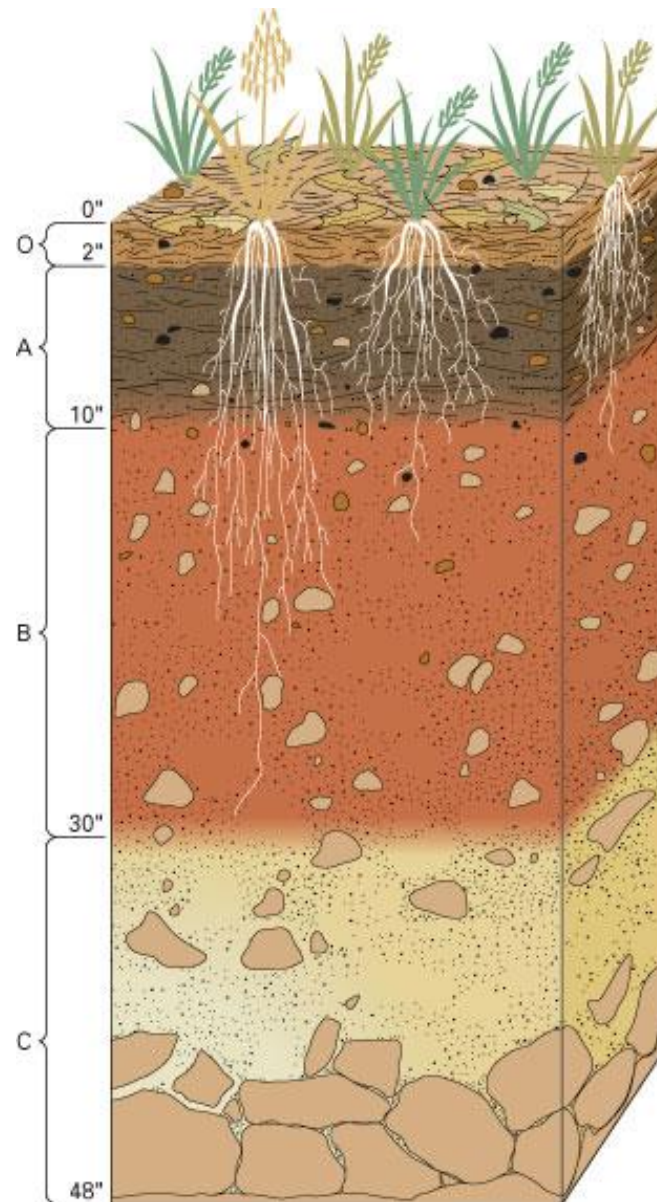
HORIZONTE B

ILUVIAL
POUCA MATERIA ORGÁNICA
ACUMULACIÓN IÓNS E ARXILAS
COR MARRÓN A VERMELLO



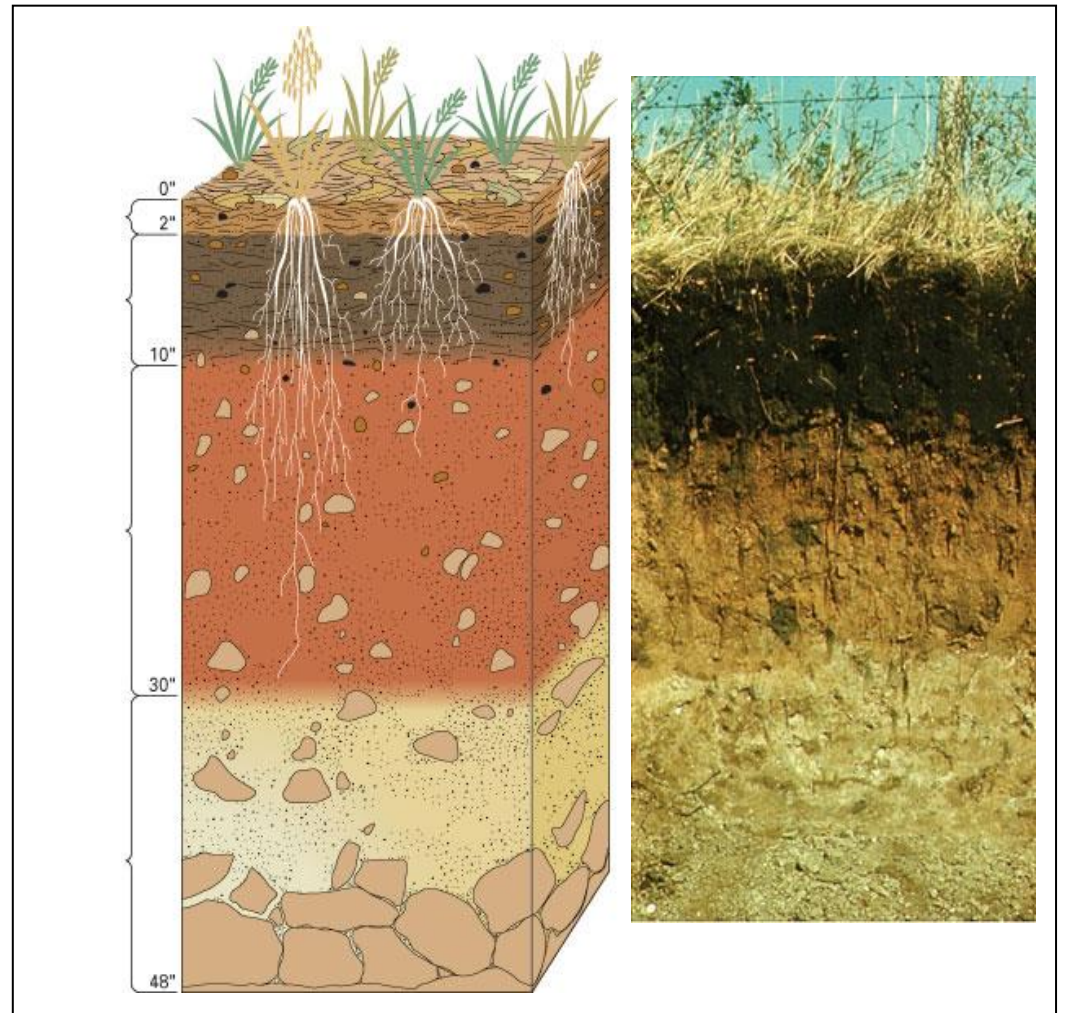
HORIZONTE C

ROCHA NAI METEORIZADA



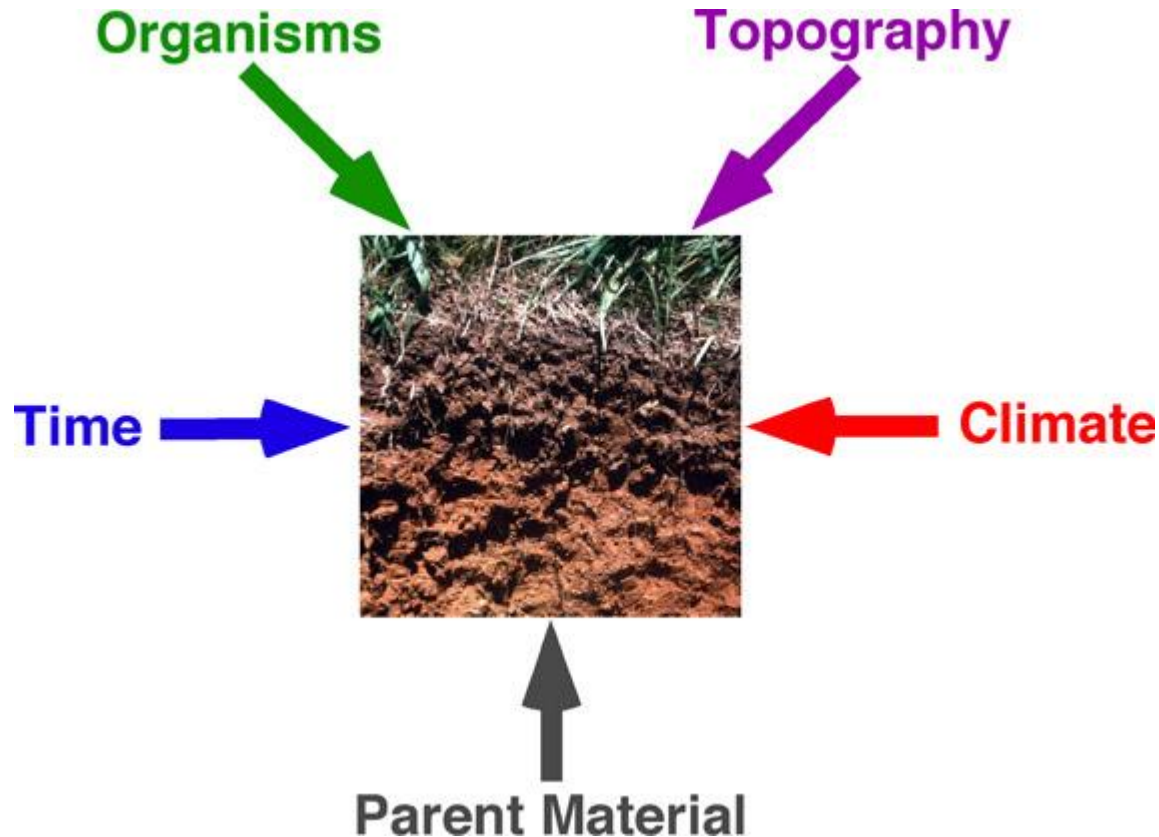
EXERCICIO 2

2. Que representa a figura da direita? Nomea os elementos delimitados pelas chaves e define brevemente as súas características.



EDAFOXÉNESE

PROCESO DE FORMACIÓN DOS SOLOS



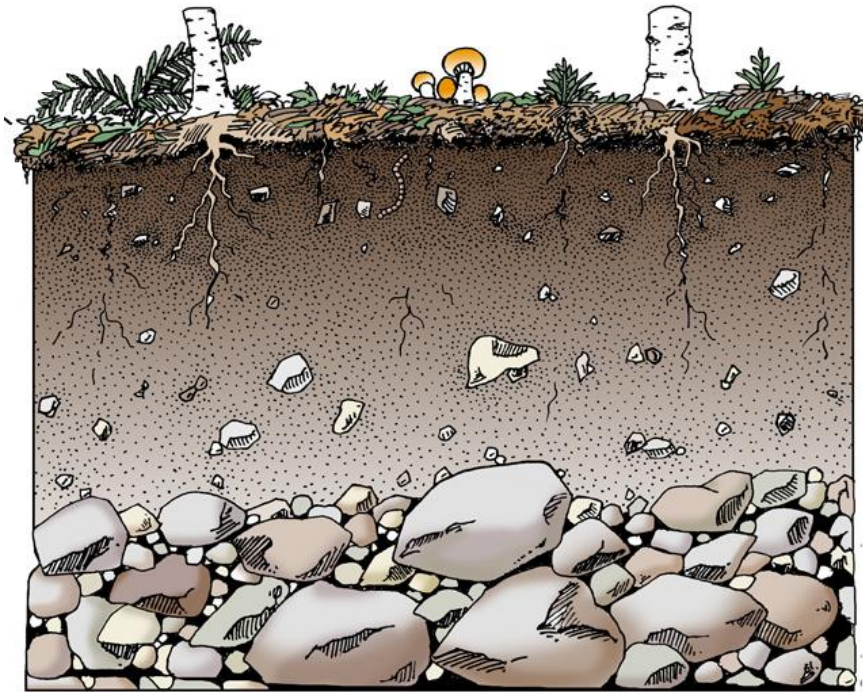
CLIMA: TEMPERATURA E PLUVIOSIDAD



PROCESOS DE METEORIZACIÓN

SERES VIVOS

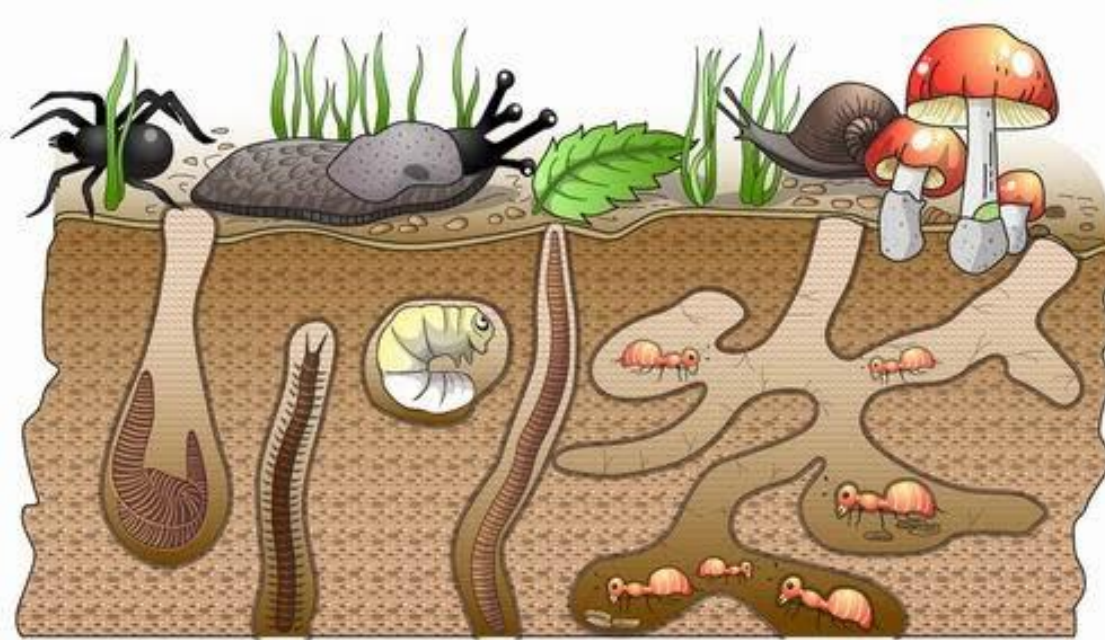
ROCHA NAI – MATERIAL PARENTAL



VELOCIDADE E
PRODUTOS DA
METERORIZAÇÃO

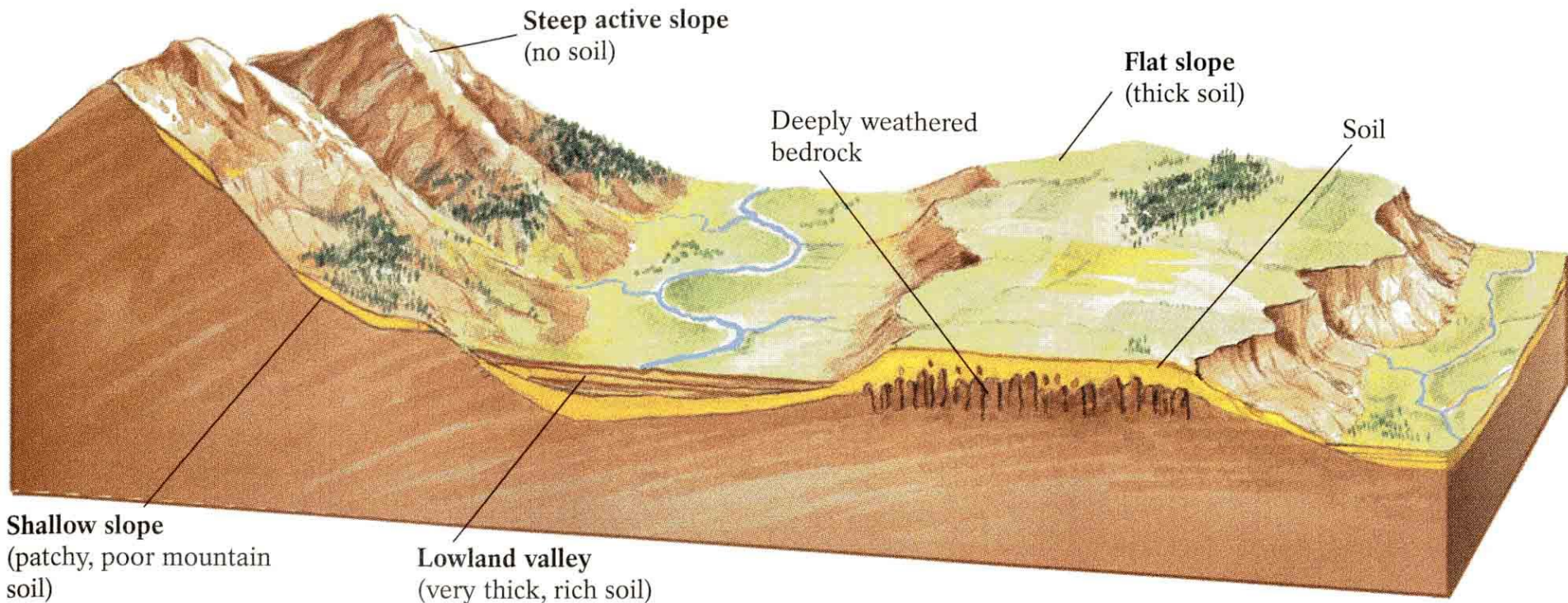
SERES VIVOS

APORTAN MATERIA ORGÁNICA
ACELERAN A EDAFOXÉNESE



TOPOGRAFÍA

MÁIS PENDENTE MENOR VELOCIDADE DE
EDAFOXÉNESE



TEMPO



Parent rock is weathered and fragments move upward.

Organic material accumulates as plants and other organisms die.

Greater amounts of organic material are present in a mature soil.



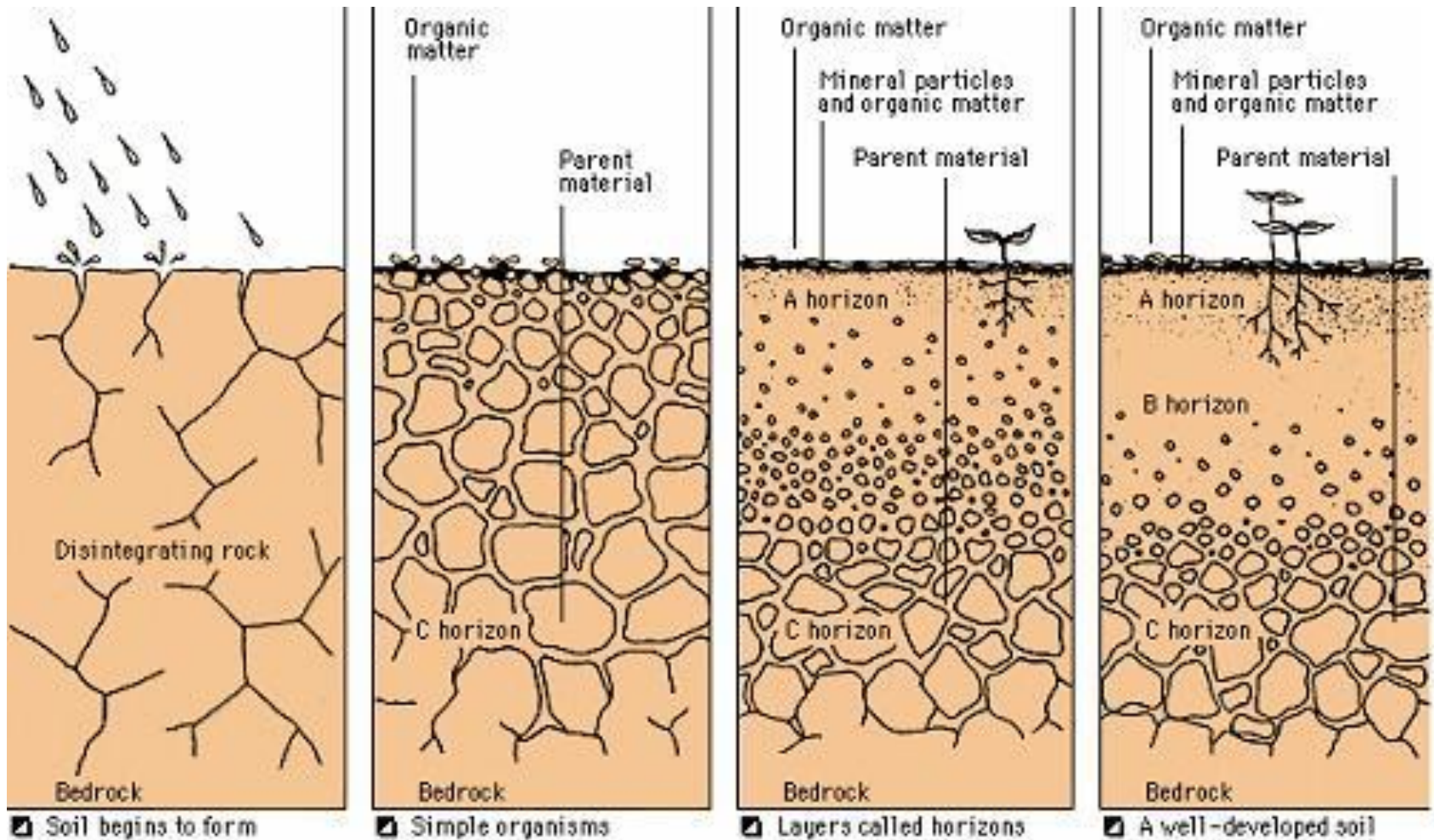
Immature soil

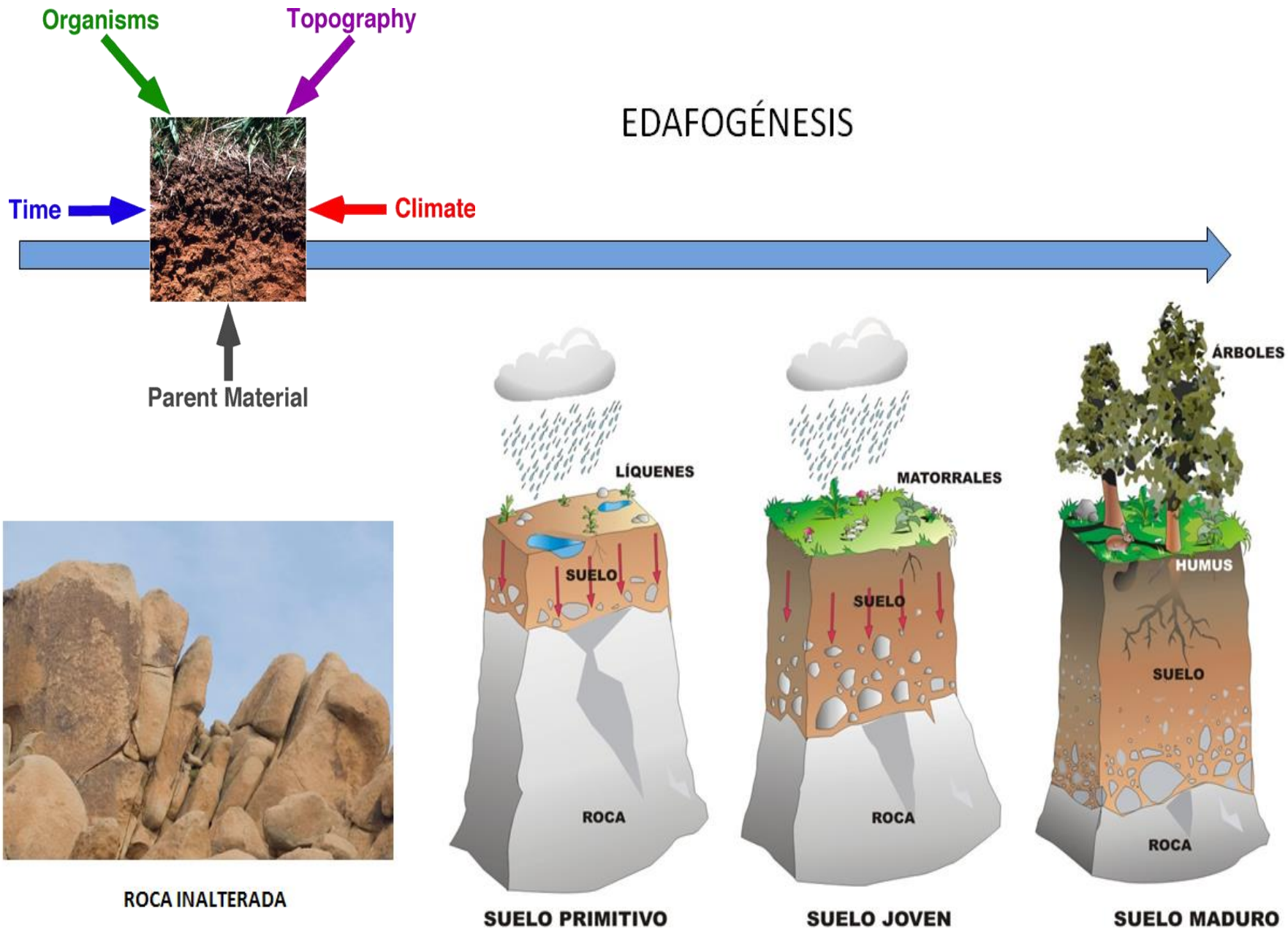
Young soil

Mature soil

Time

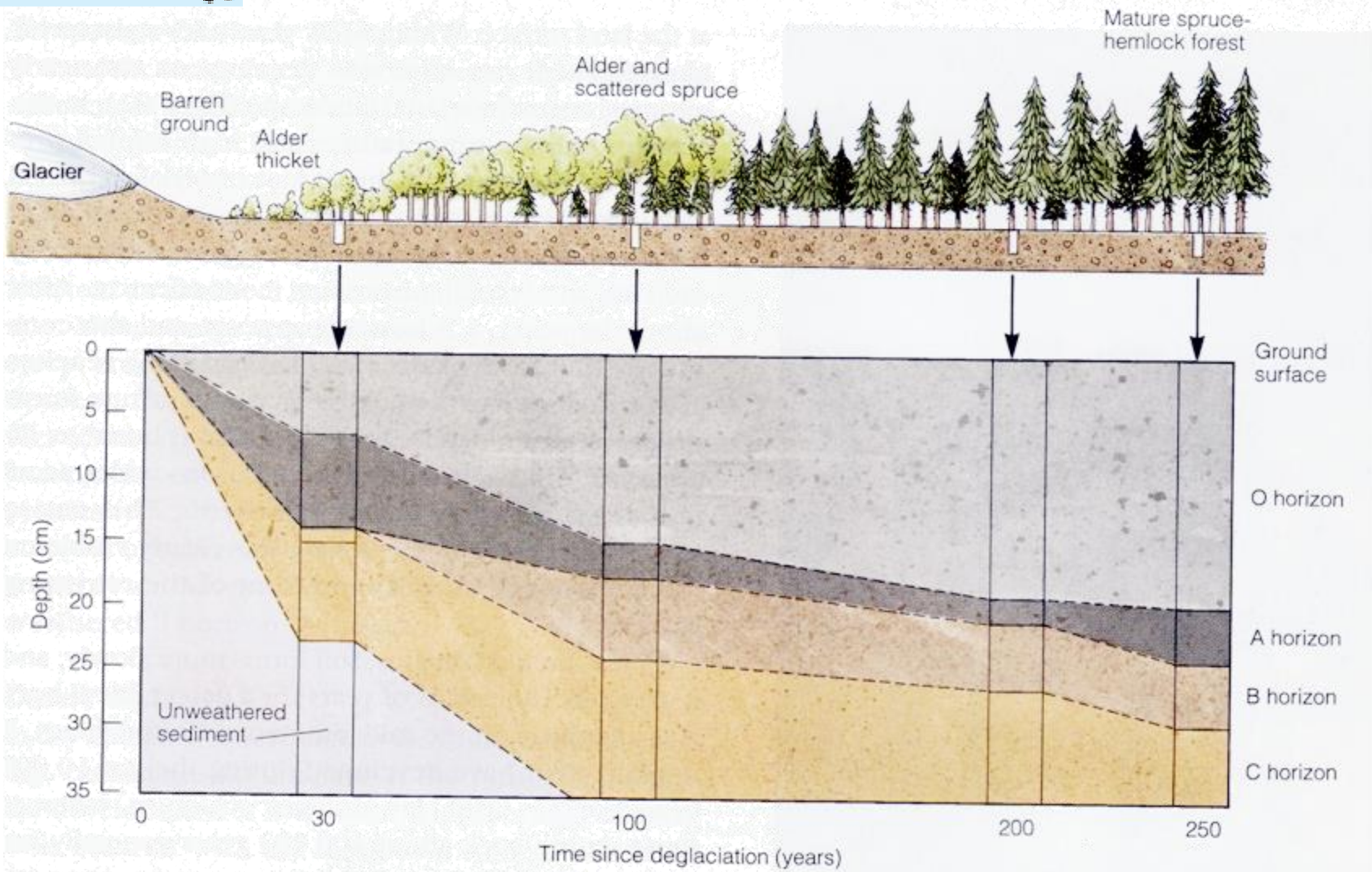
METEORIZACIÓN ROCHA NA VEXETACIÓN E DIFERENCIACIÓN DE HORIZONTES







ESTUDOS EN GLACIER BAY (ALASKA)





CLASIFICACIÓN E TIPOS DE SOLOS



LOS SUELOS EN ESPAÑA

Suelos en clima oceánico

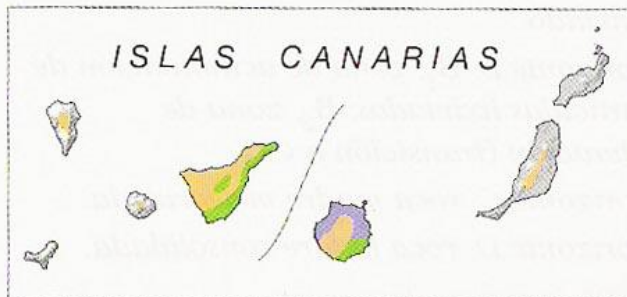
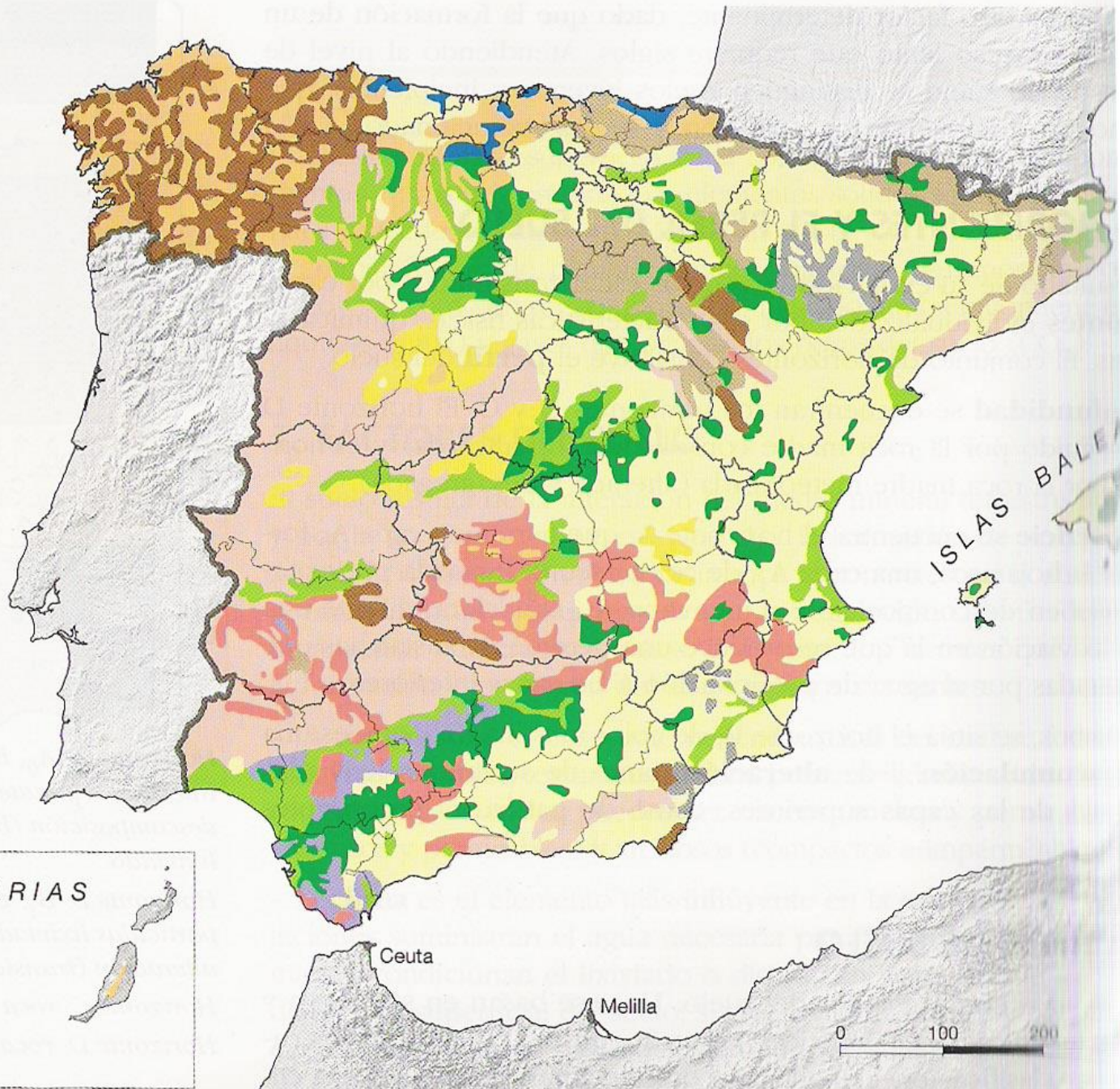
- Tierra parda húmeda
- Suelos *rankers*
- Tierra parda caliza
- Terra fusca*

Suelos en clima mediterráneo

- Suelos pardos no cálcicos
- Suelo rojo mediterráneo
- Tierra parda meridional
- Vertisuelos
- Suelo gris subdesértico estepario

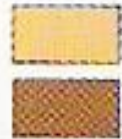
Suelos intrazonales

- Suelos rendziniiformes
- Suelos pardos calizos
- Suelos azonales



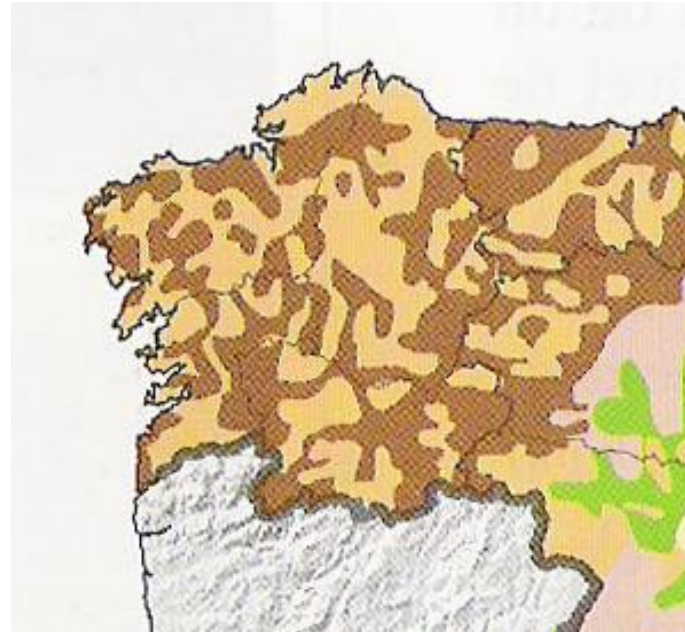
PRINCIPAIS SOLOS DE GALICIA

Suelos en clima oceánico



Tierra parda húmeda

Suelos *rankers*



RÁNKER

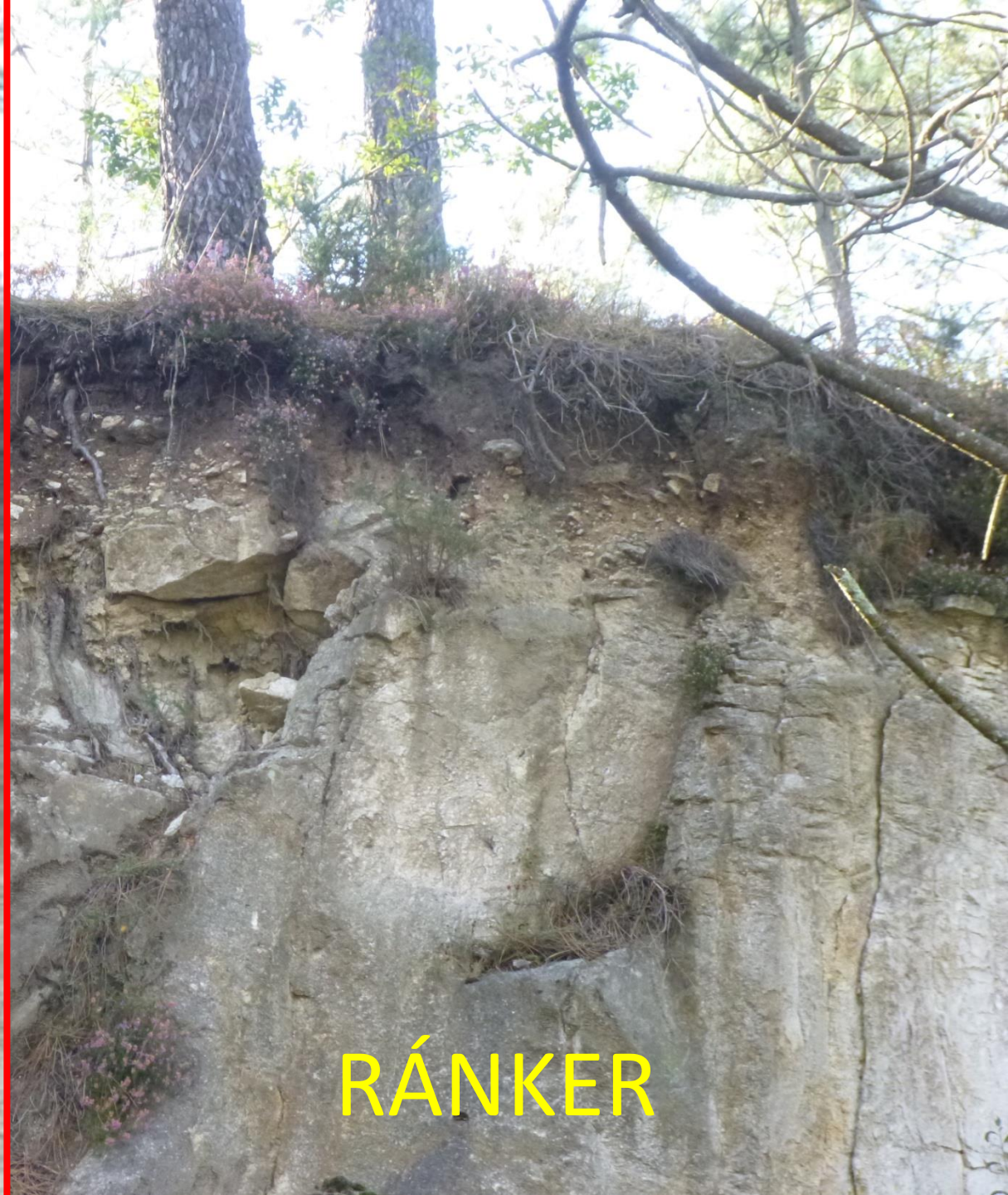
SOLOS POUCO EVOLUCIONADOS, DELGADOS
(HORIZONTE O, A E C)
EN SOLOS DE MONTAÑA
SOBRE ROCHAS SILÍCEAS, ÁCEDAS



CAMBISOL HÚMICO

ZONAS HÚMIDAS SOBRE ROCHAS SILÍCEAS
COMPLEXO ARCILLO FERROHÚMICO
MODERADAMENTE ÁCIDO
MOITA MATERIA ORGÁNICA

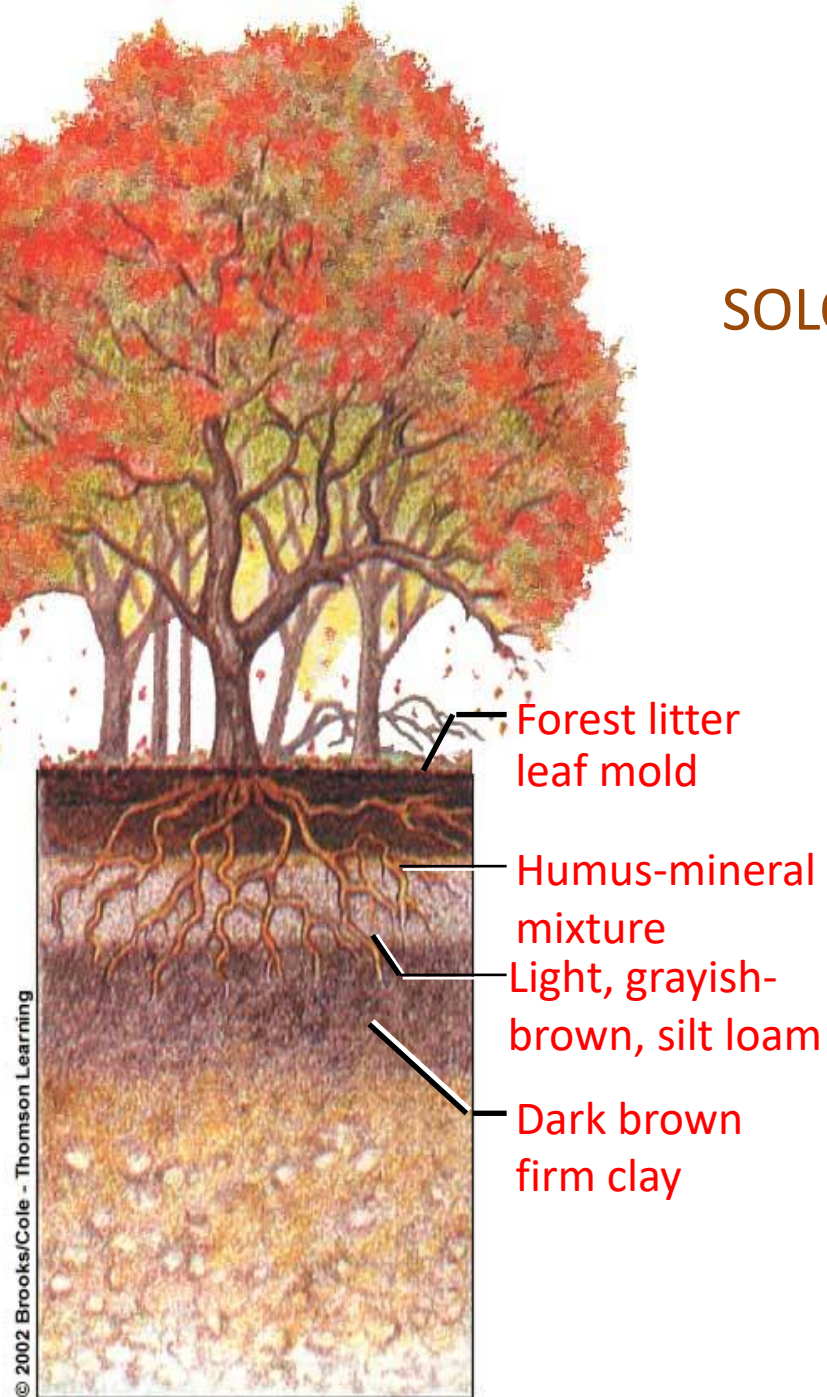


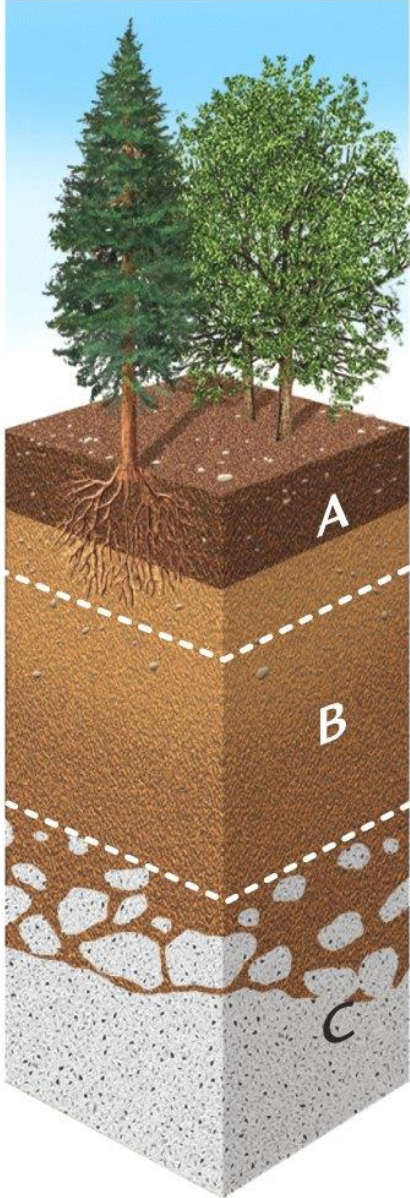


RÁNKER

Deciduous Forest Soil (humid, mild climate)

SOLOS PARDOS / CAMBISOLES HÚMICOS





Temperate climate

PEDALFER

Humus and leached soil
(quartz and clay minerals
present)

Some iron and aluminum
oxides precipitated; all
soluble materials, such as
carbonates, leached away

Granite bedrock

