Lezione 56: escursione lichenologica nel Carso

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1) Ambienti primordiali

2) I ladri di alghe

3) Le pietre viventi

The lichens of the Classical Karst (NE Italy-SW Slovenia): an interactive guide

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Curator of the apparatus of images: Andrea Moro

This is a key to all lichens hitherto known from the Classical Karst Region (604 infrageneric taxa, including a few non- or doubtfully lichenized species traditionally treated by lichenologists). The key, which has been primarily prepared as a tool for lichenology labs at the University of Trieste, could be useful also outside the survey area, as it includes many widespread and common species.

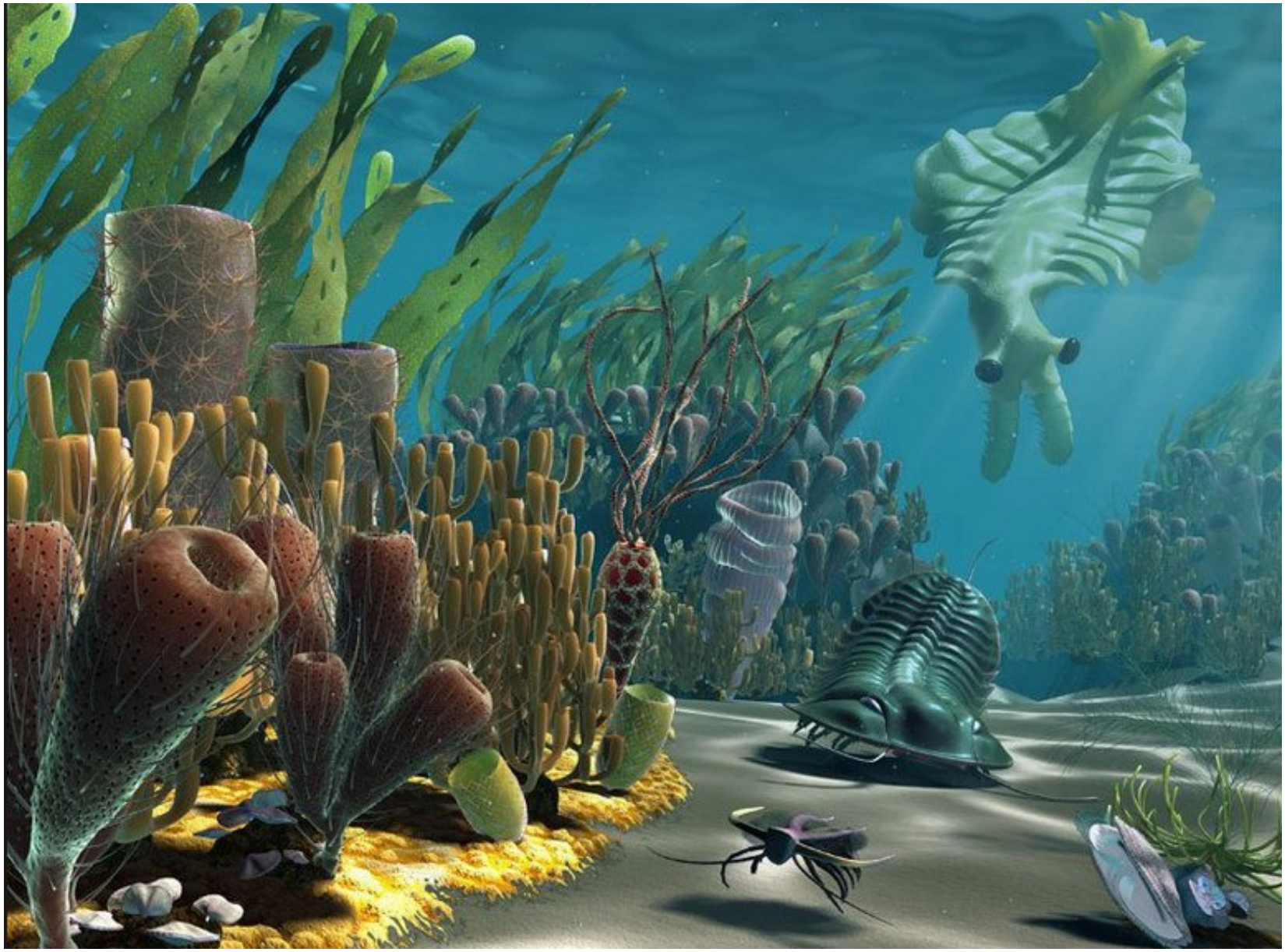
The 'Classical Karst' (Italian: Carso; Slovenian: Kras) is a limestone plateau stretching NW to SE above the Gulf of Trieste, in the northernmost part of the Adriatic Sea, which is c. 40 Km long and up to 13 km wide, covering c. 440 Km2. Located part in Italy, part in Slovenia, it is delimited by the Adriatic Sea to the SW, the Friulian plain (river Soca/Isonzo) to the NW, the Vipava/Vipacco valley to the NE and by the Brkini hills (Flysch) and the Reka river valley to the SE, the SE limit being rather arbitrary. Although, strictly speaking, the Karst should be limited to areas with limestone, we have included in the study area the whole Province of Trieste, parts of which have Flysch as the main geological substrate.

Limestones and dolomites of cretaceous and tertiary origin predominate on the Plateau, reaching sea level in the northern part of the Province of Trieste, whereas the flanks of the Plateau are often covered with Flysch, an Eocenic alternation of sandstones and marl. Typical for the Plateau are the high rock solubility and the well-developed secondary porosity. Three main types of soils are present: Terra Rossa, Rendzina and Brown Cambisols. The climate is typically transitional between the Mediterranean type and the Central European type, with hot, rather dry summers and cold, rather rainy winters. Average annual precipitation ranges from c. 1000 mm along the coast to c. 1400 mm in the interior, with two maxima in June and November. Average annual temperatures range between 10.6 and 11.7°C. A very strong, cold wind from the NE, called Bora/Burja is rather frequent especially during winter, when the temperature difference between the coast and the interior are highest. The climatically transitional character of the Karst is reflected in sharp changes in flora and vegetation, corresponding to slight changes in microclimatic conditions, which explains the relatively high biodiversity of the area.

With the exception of a relict Mediterranean maquis in the northern part of the Province of Trieste, the potential vegetation is a temperate deciduous forest

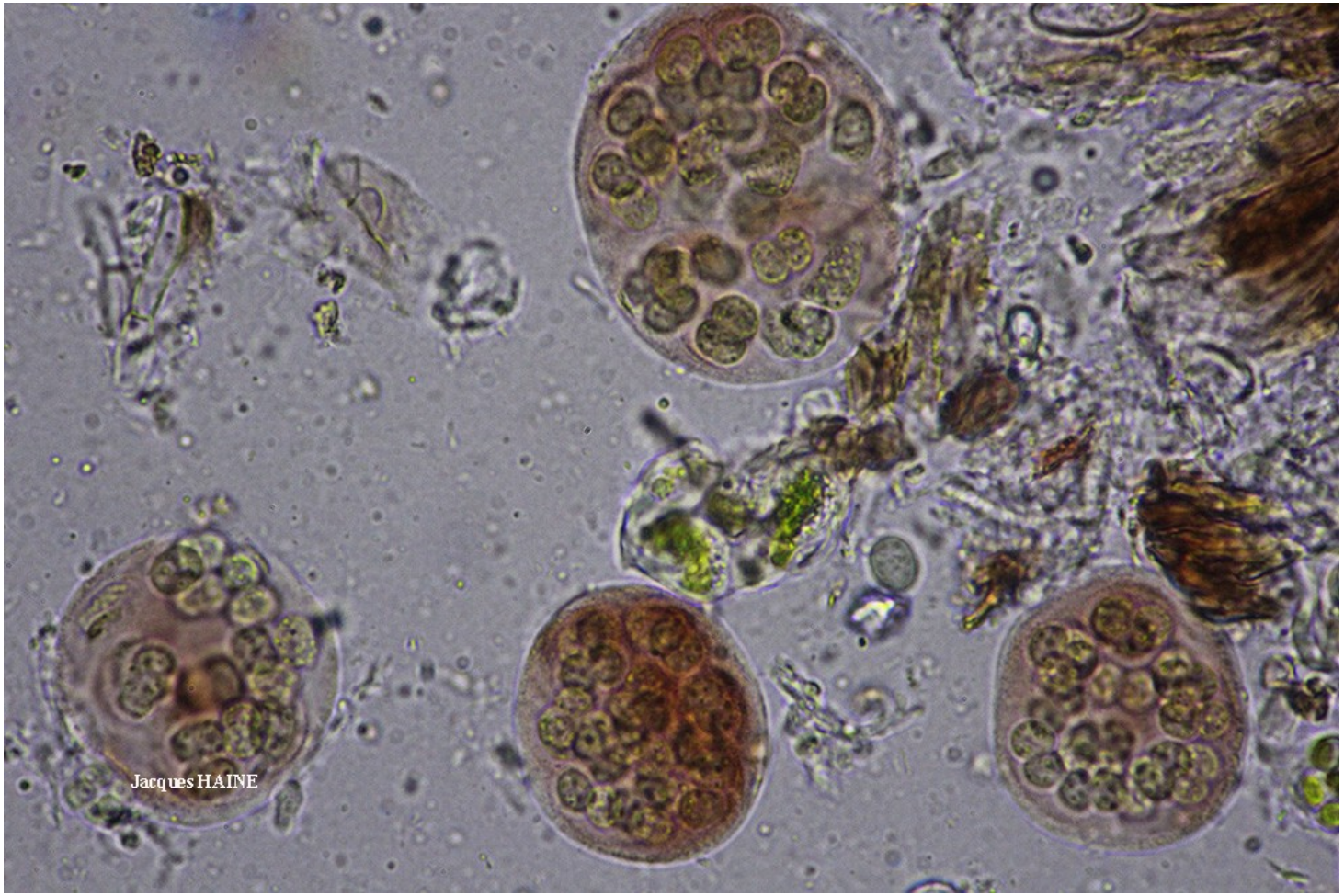
Ambienti primordiali

Stromatoliti

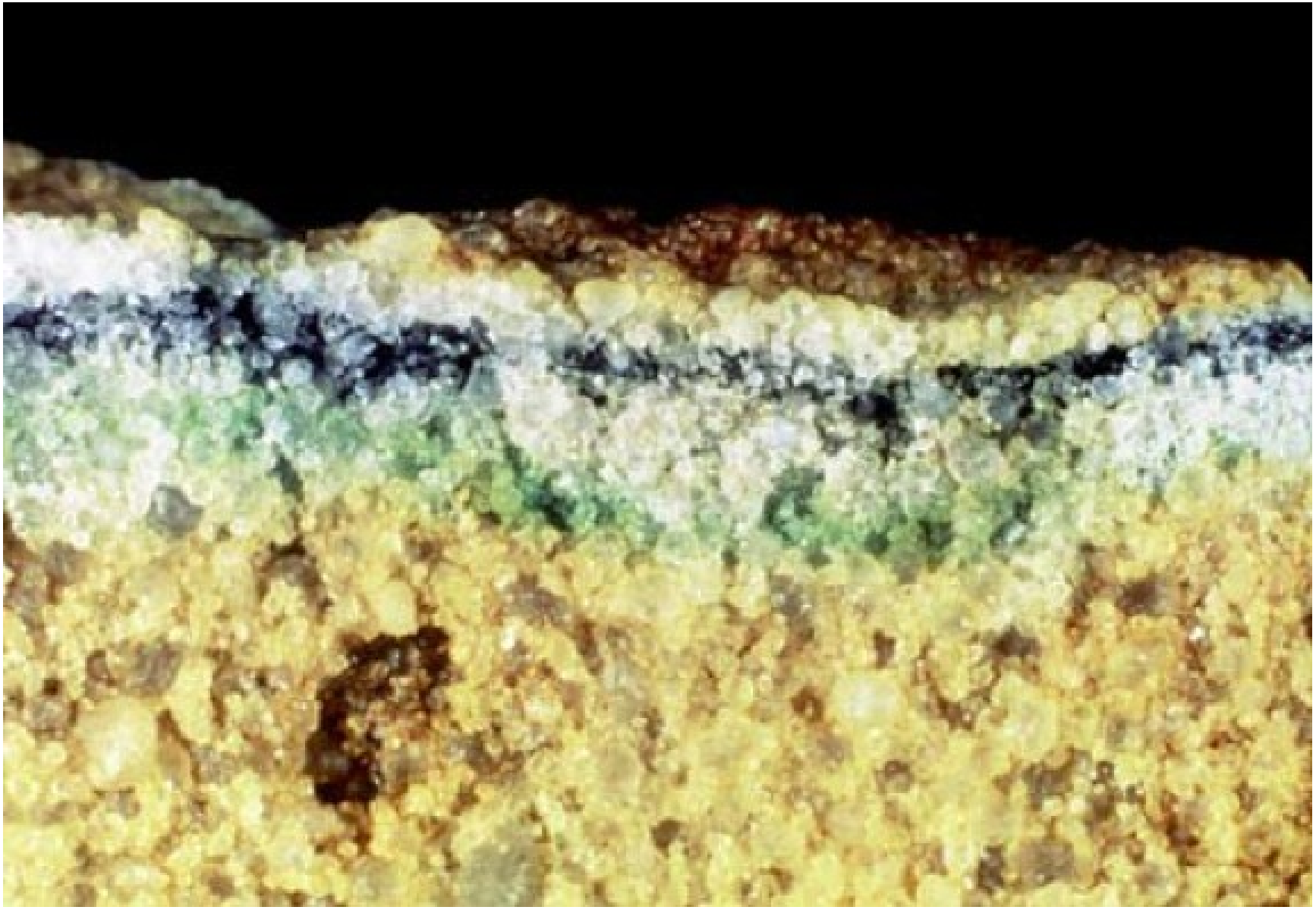



WIDEWALLPAPERS.NET

“Tintenstriche” in Val Rosandra



Ciabniobatteri coccali

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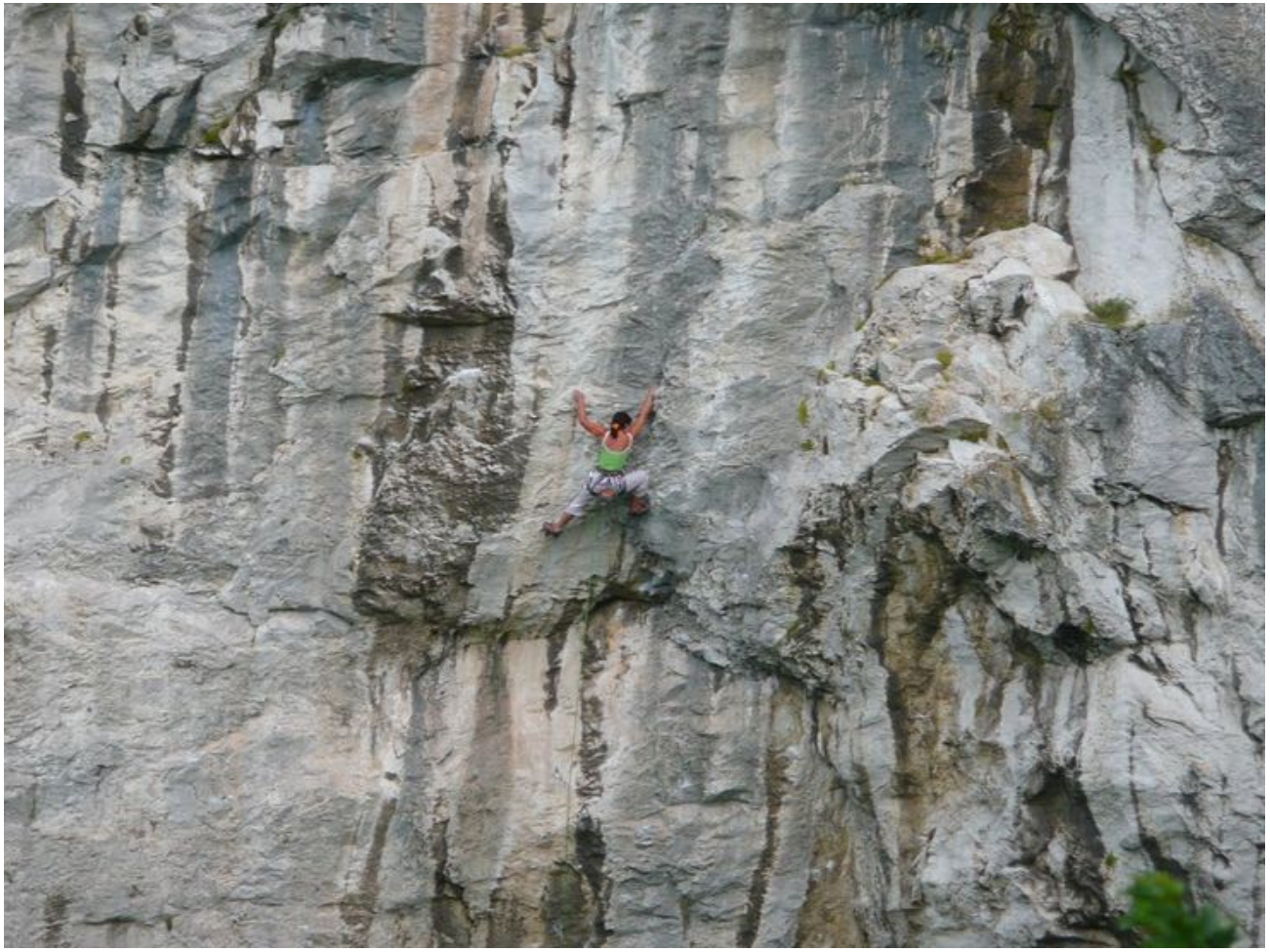
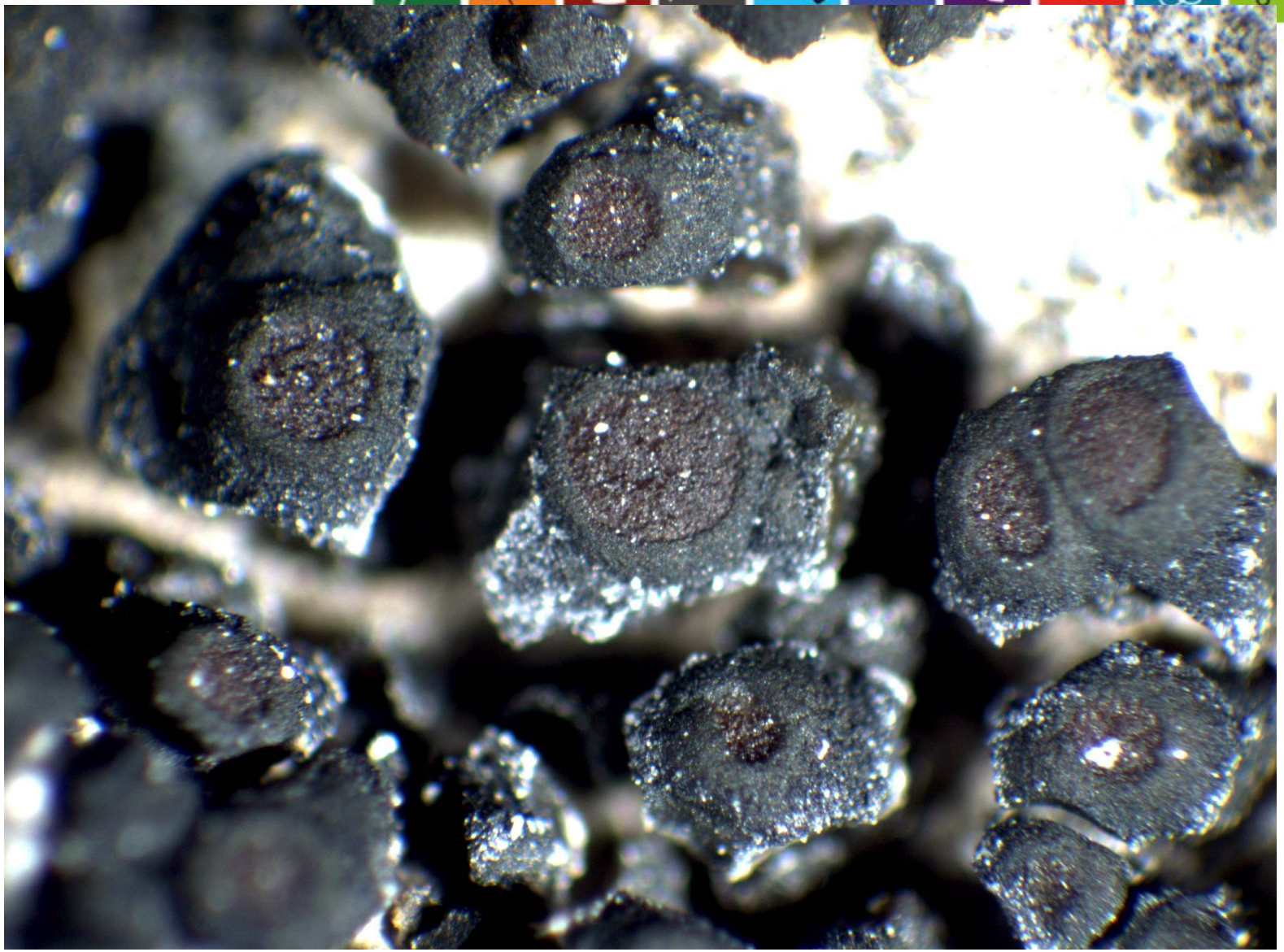
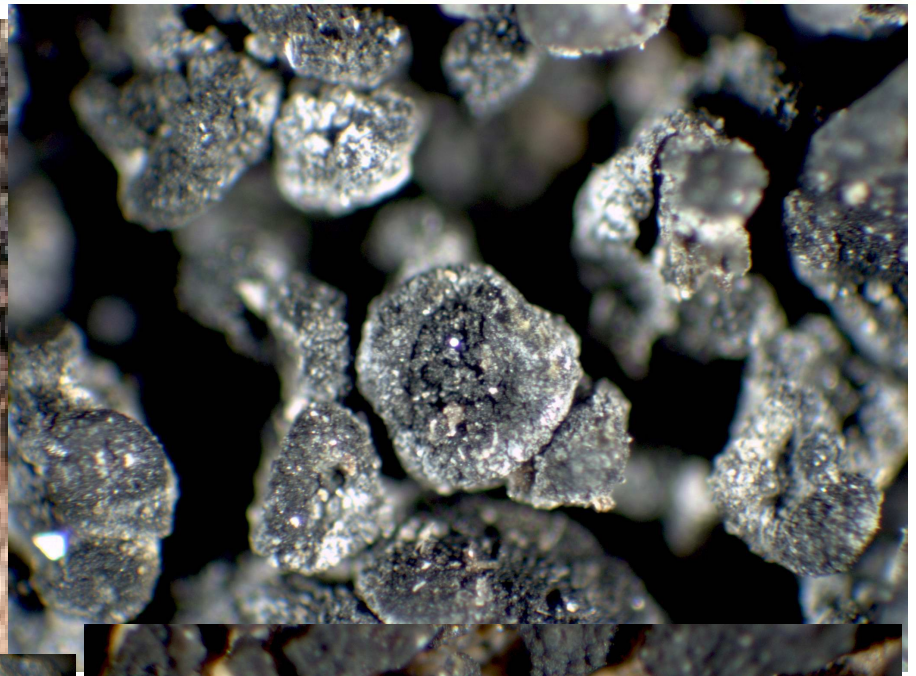
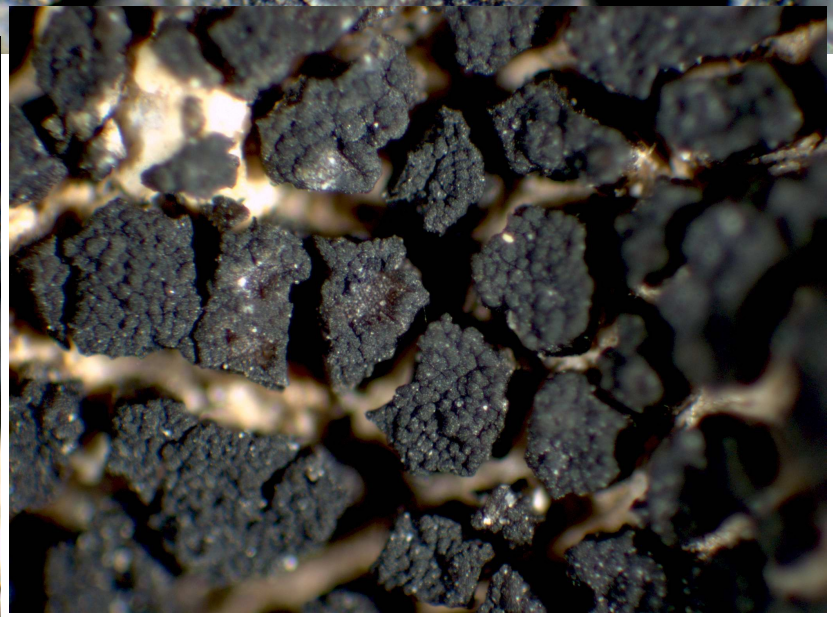
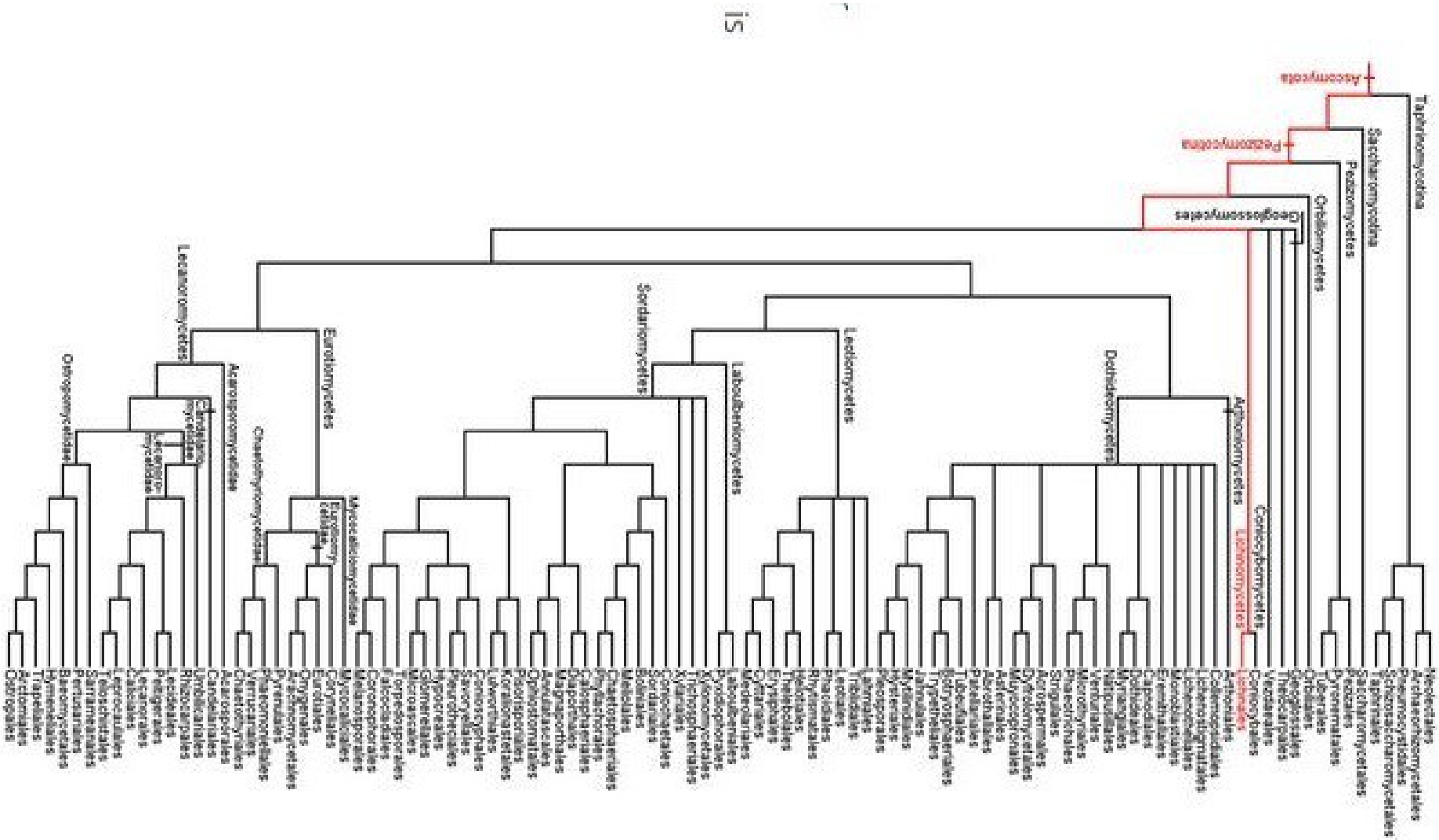




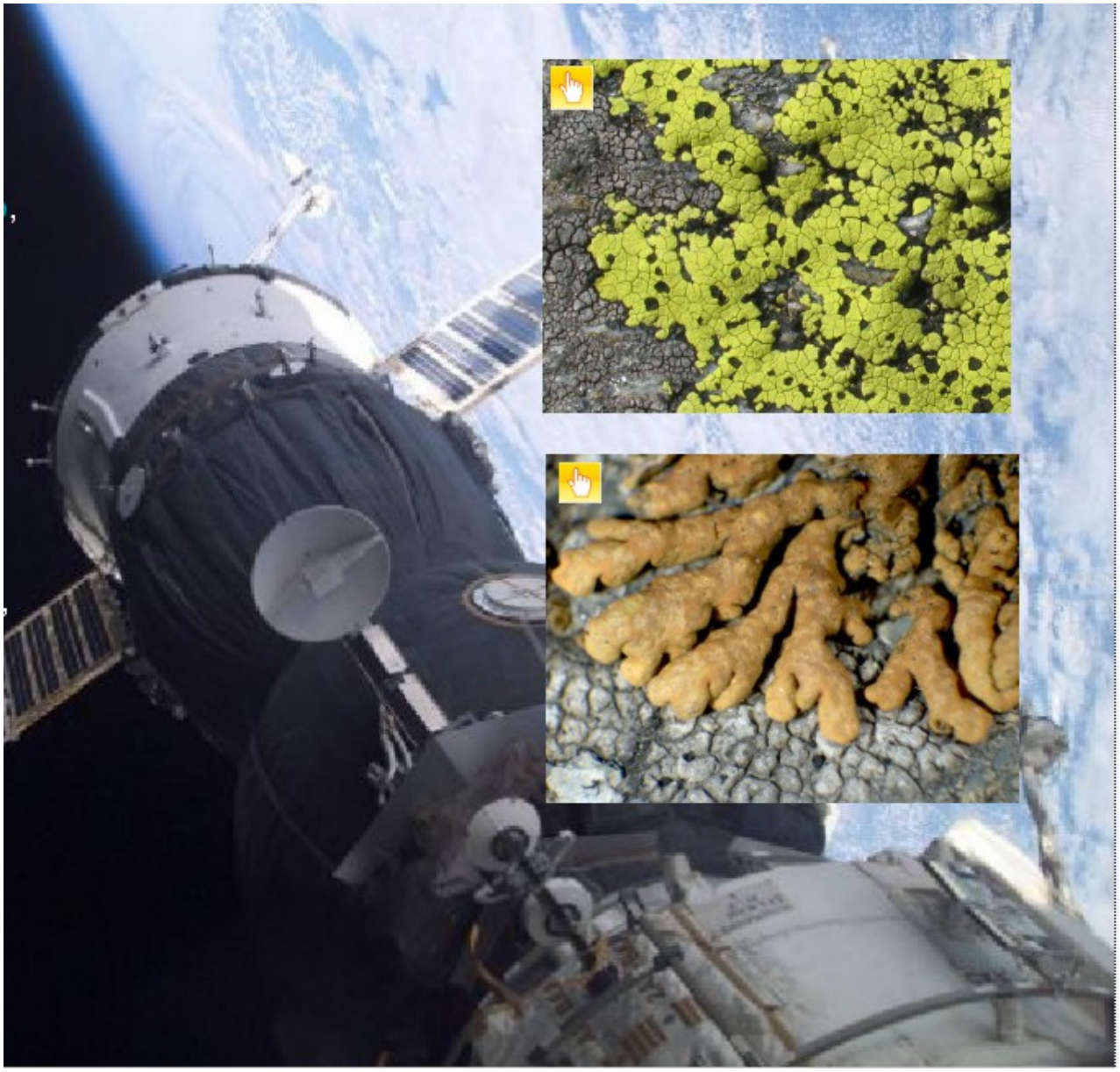
Licheni primitivi (Lichinaceae)






Ascomycota
Taphrinomycotina
Pezizomycotina
Saccharomycotina
Geoglossomycetes
Orbiliomycetes
Pezizomycetes
Saccharomycetales
Taphrinales
Schizosaccharomycetales
Archaeorhizomycetales
Pneumocystidales
Neolectales
Pezizales
Tuberales
Pyronemales
Orbiliales
Geoglossales
Thelocarpales
Umbilicariales
Verrucariales
Trichotheliales
Strigulales
Phaeothecales
Acrospermales
Dothideomycetes
Arthoniomycetes
Lichinomycetes
Eurotiomycetes
Sordariomycetes
Laboulbeniomycetes
Leotiomycetes
Lecanoromycetes
Orbiliomycetes
Pezizomycetes
Geoglossomycetes
Taphrinomycotina
Saccharomycotina
Pezizomycotina
Ascomycota

Cianotrofia di *Thalloidima toniniamum*



Ladri di alghe

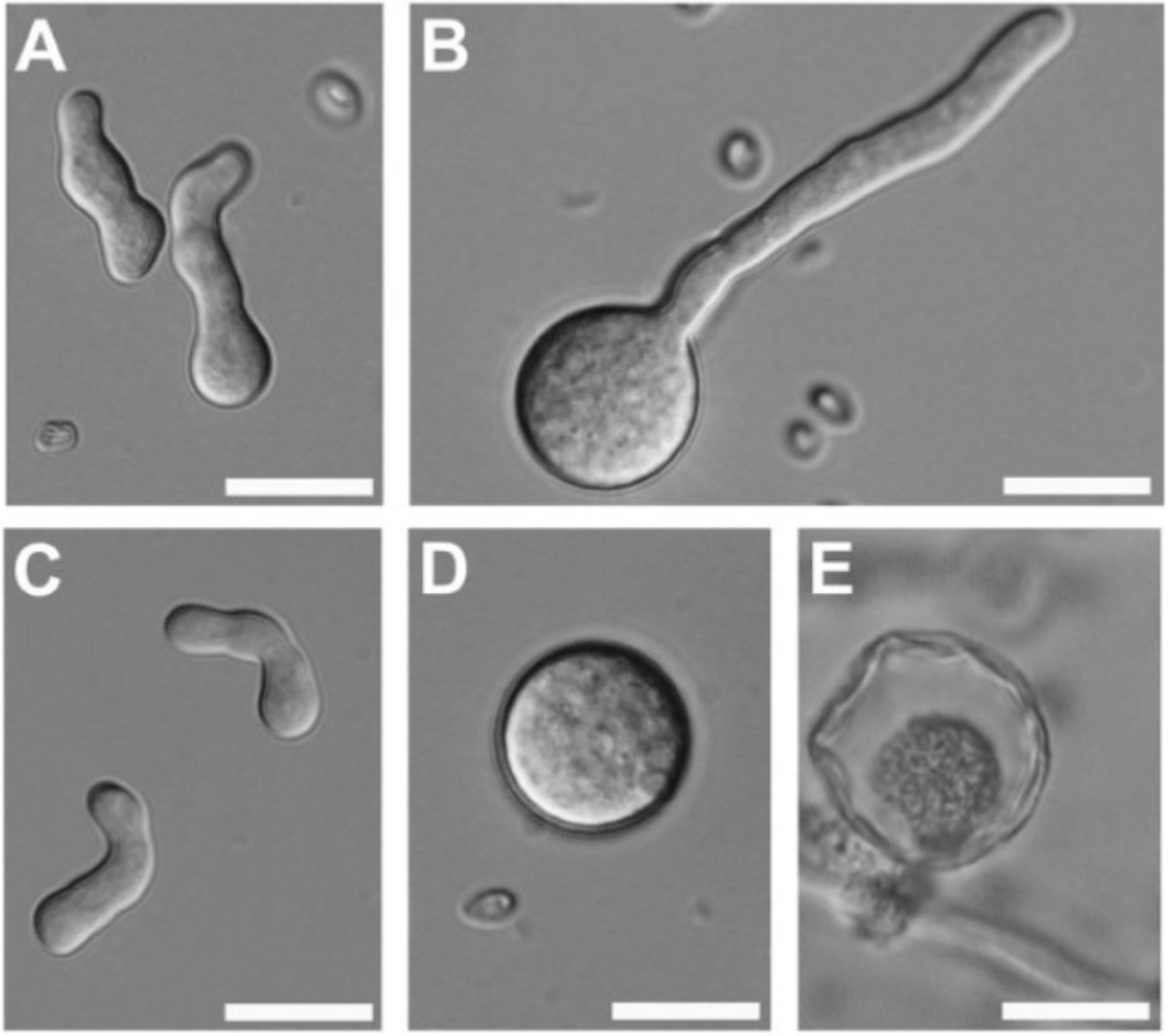
The symbiosis...

THE PHOTOBIONT

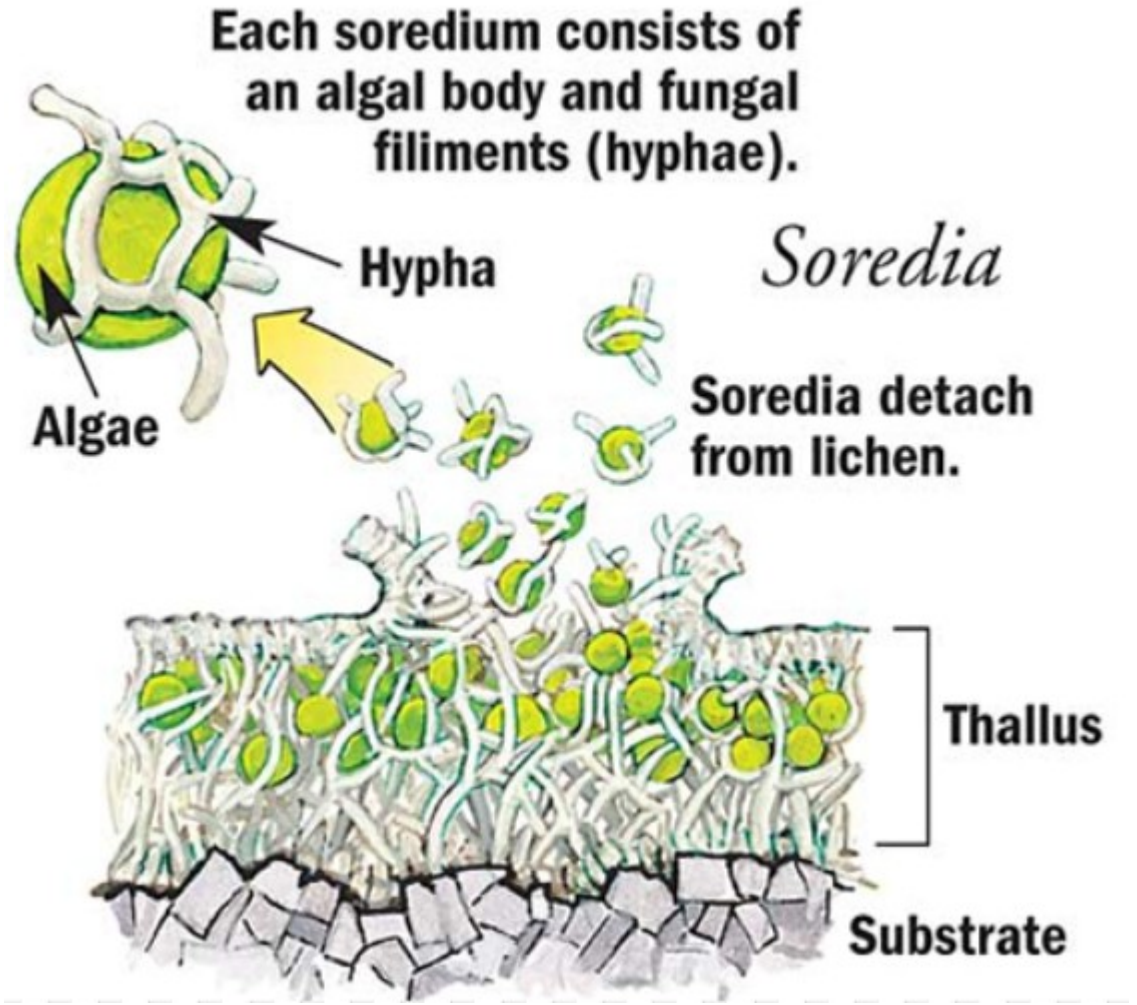
THE MYCOBIONT

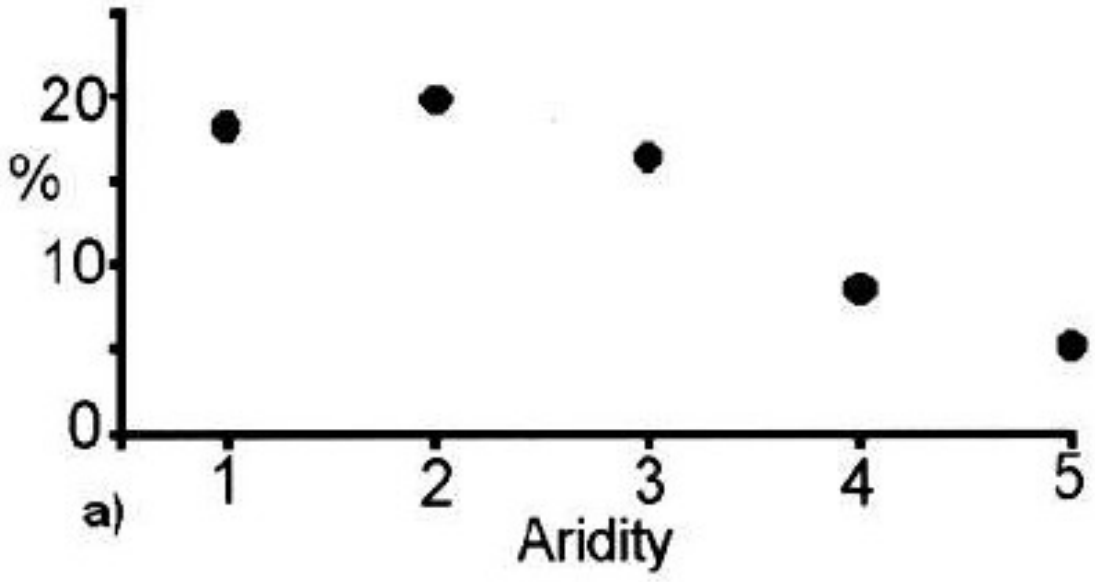
THE LICHEN


1mm

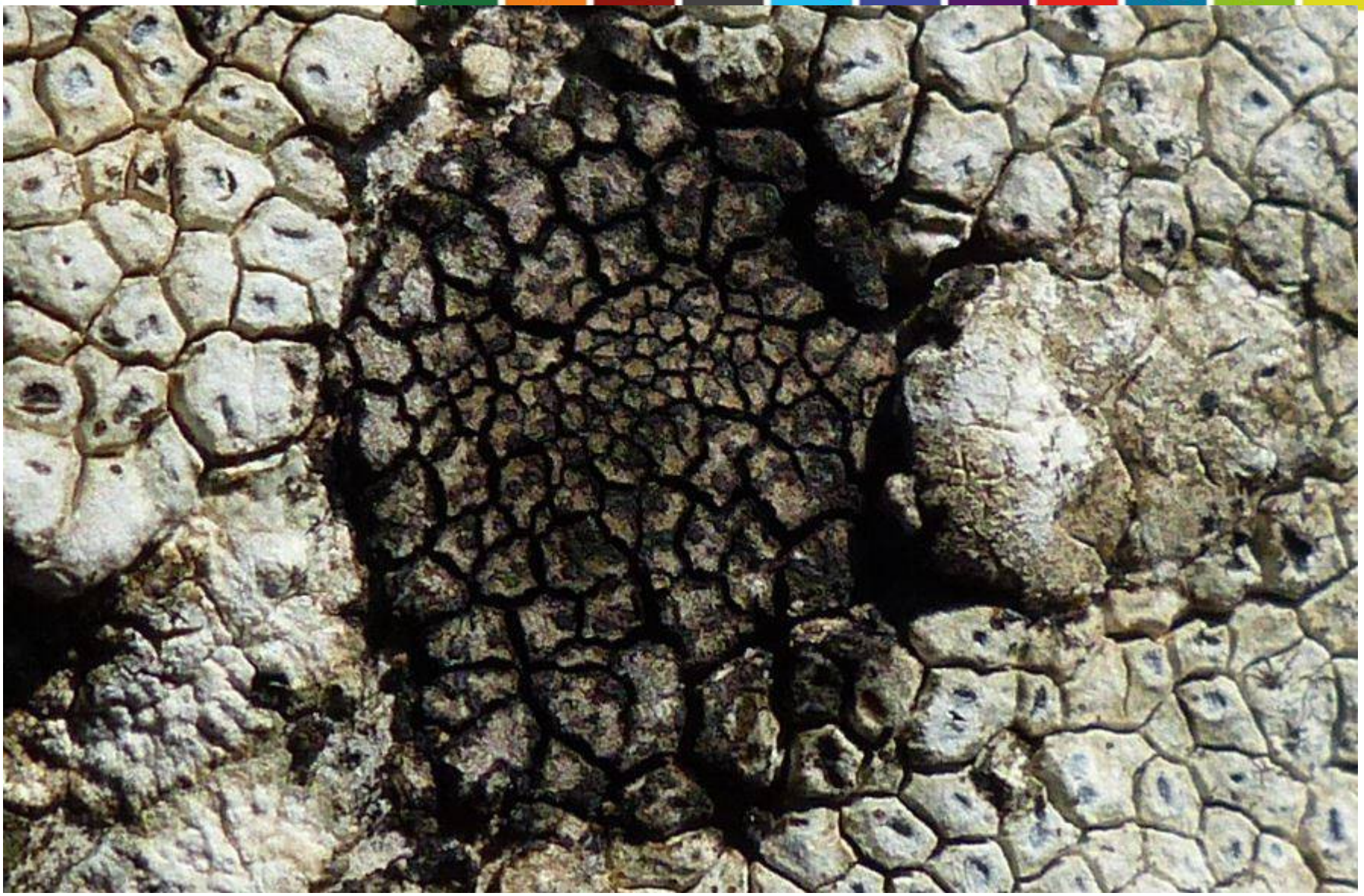

A
B
C
D
E

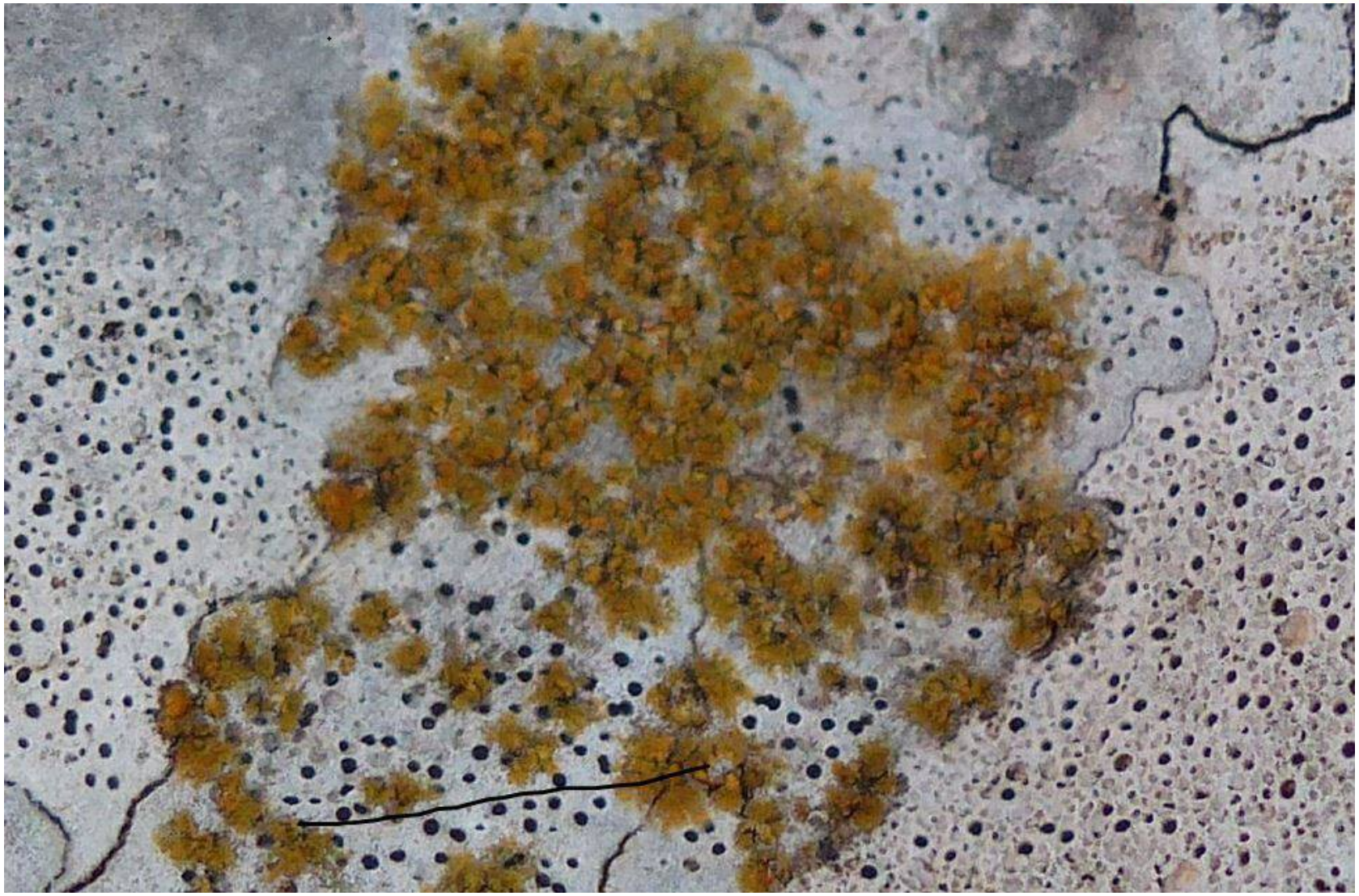
Riproduzione vegetativa tramite soredi

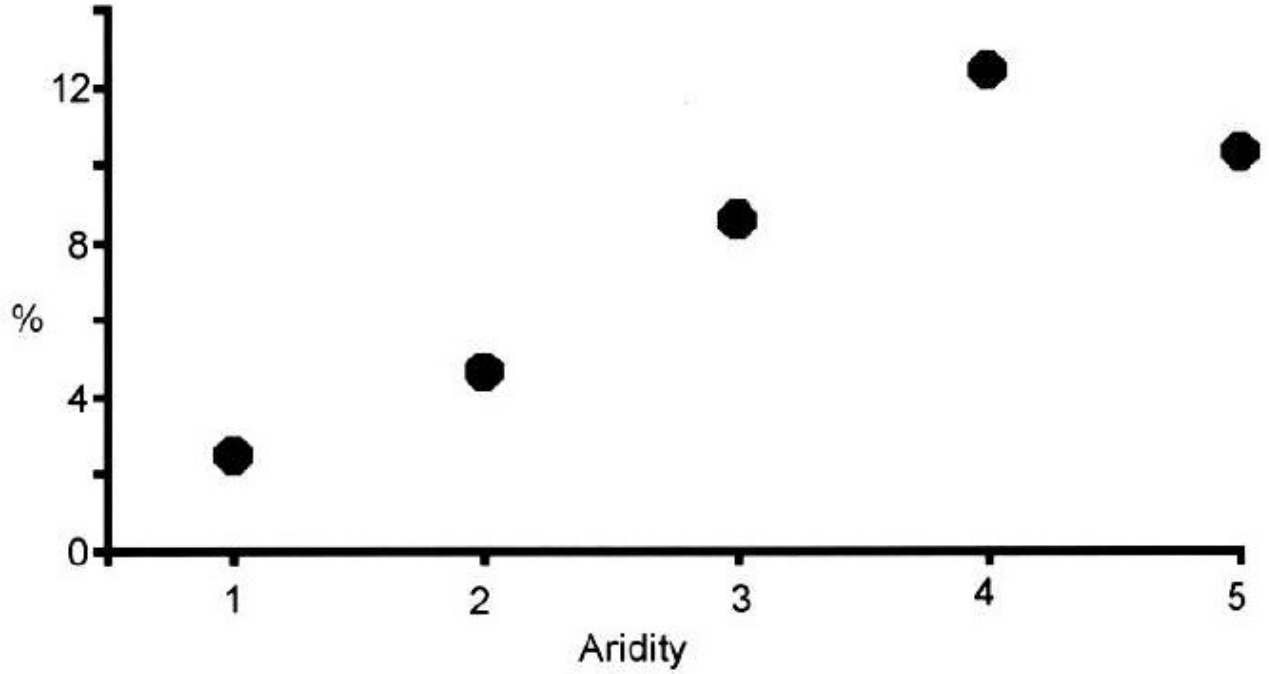

Each soredium consists of an algal body and fungal filiments (hyphae).
Hypha
Soredia
Algae
Soredia detach from lichen.
Thallus
Substrate



Percentuale di specie sorediate lungo un gradiente di aridità crescente (tutti i licheni d'Italia)

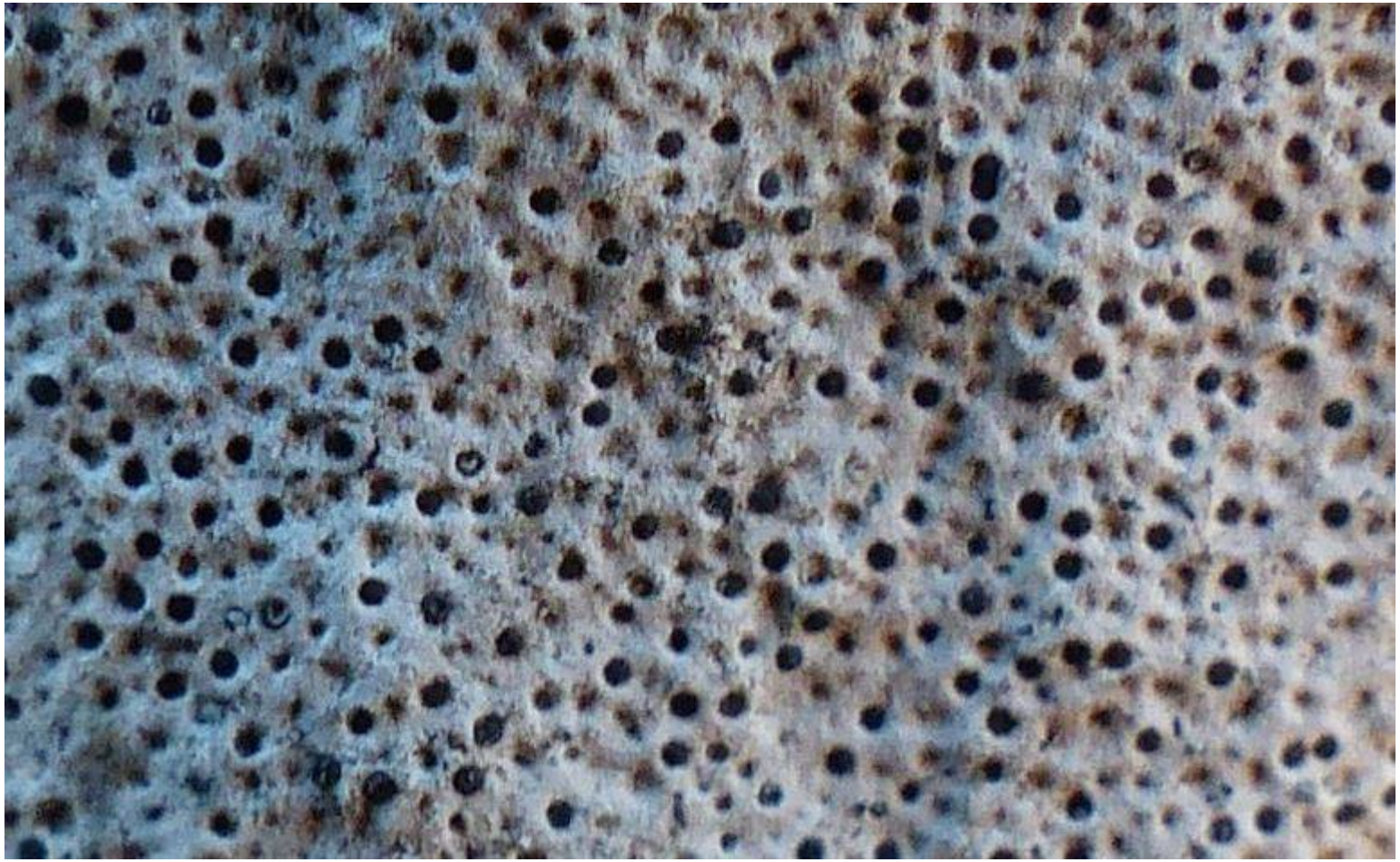


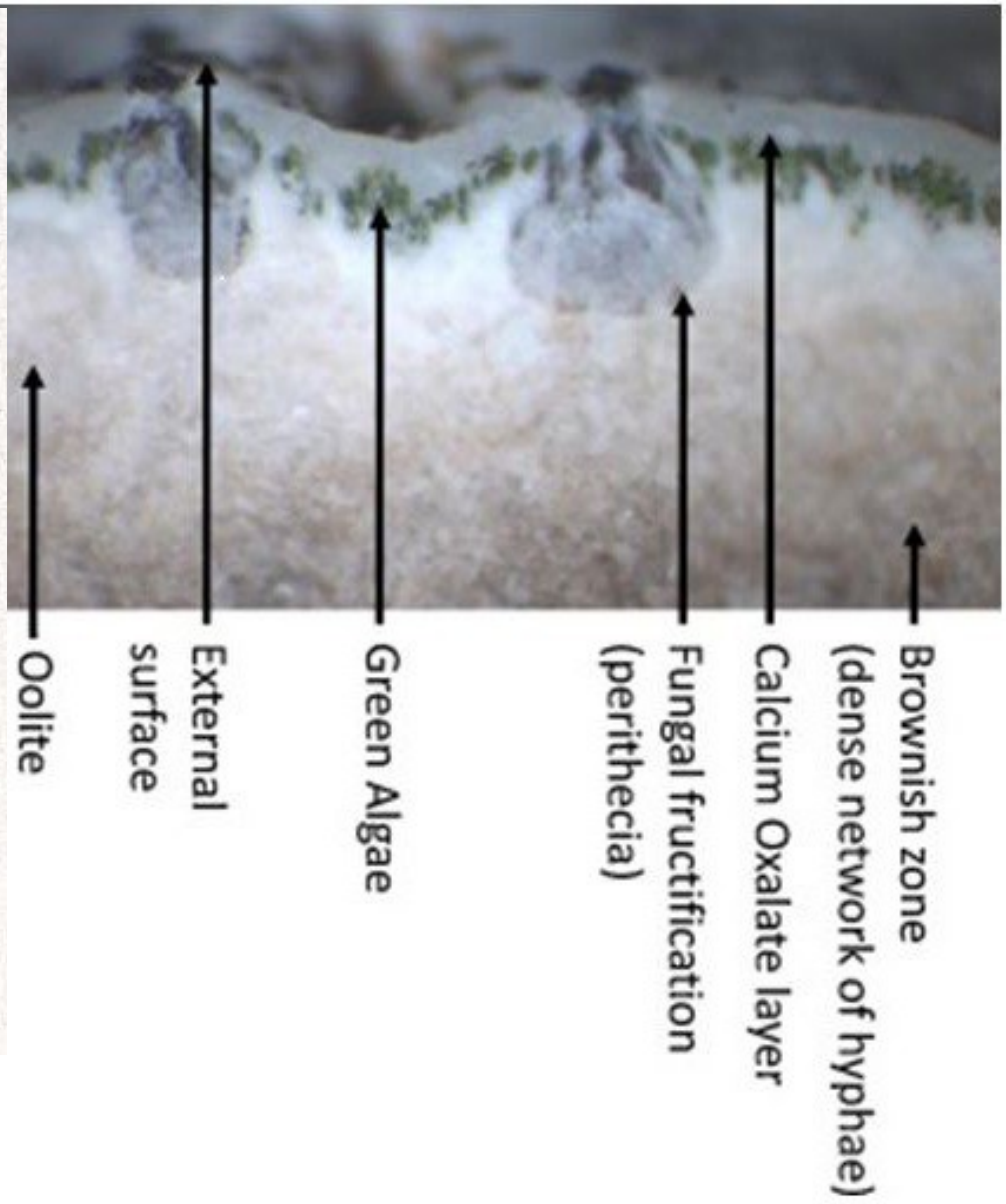


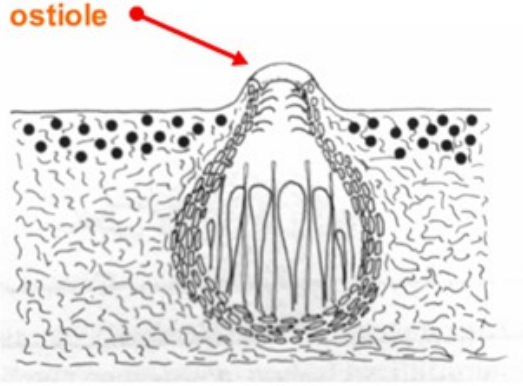


Percentuale di licheni “parassiti” lungo un gradiente di aridità crescente

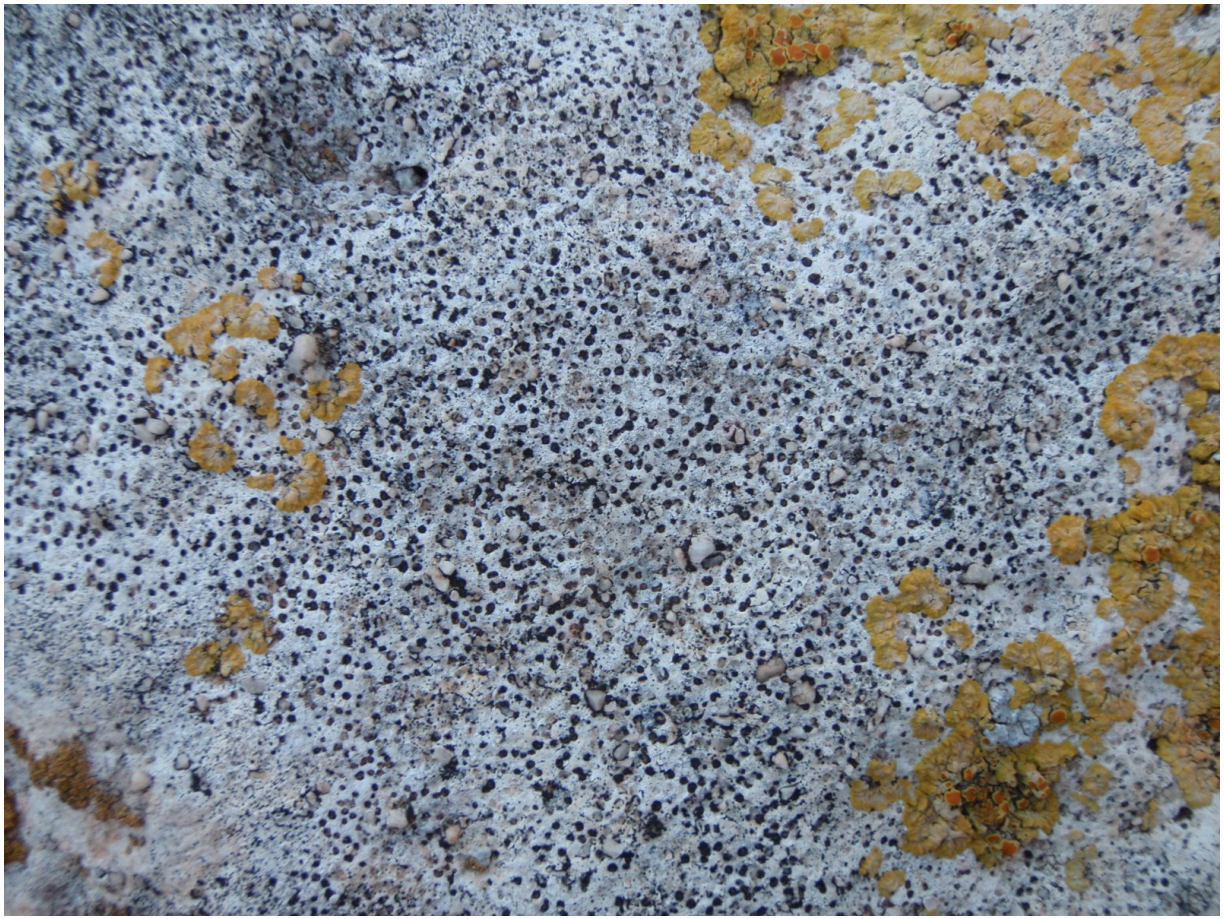
3) Le pietre viventi

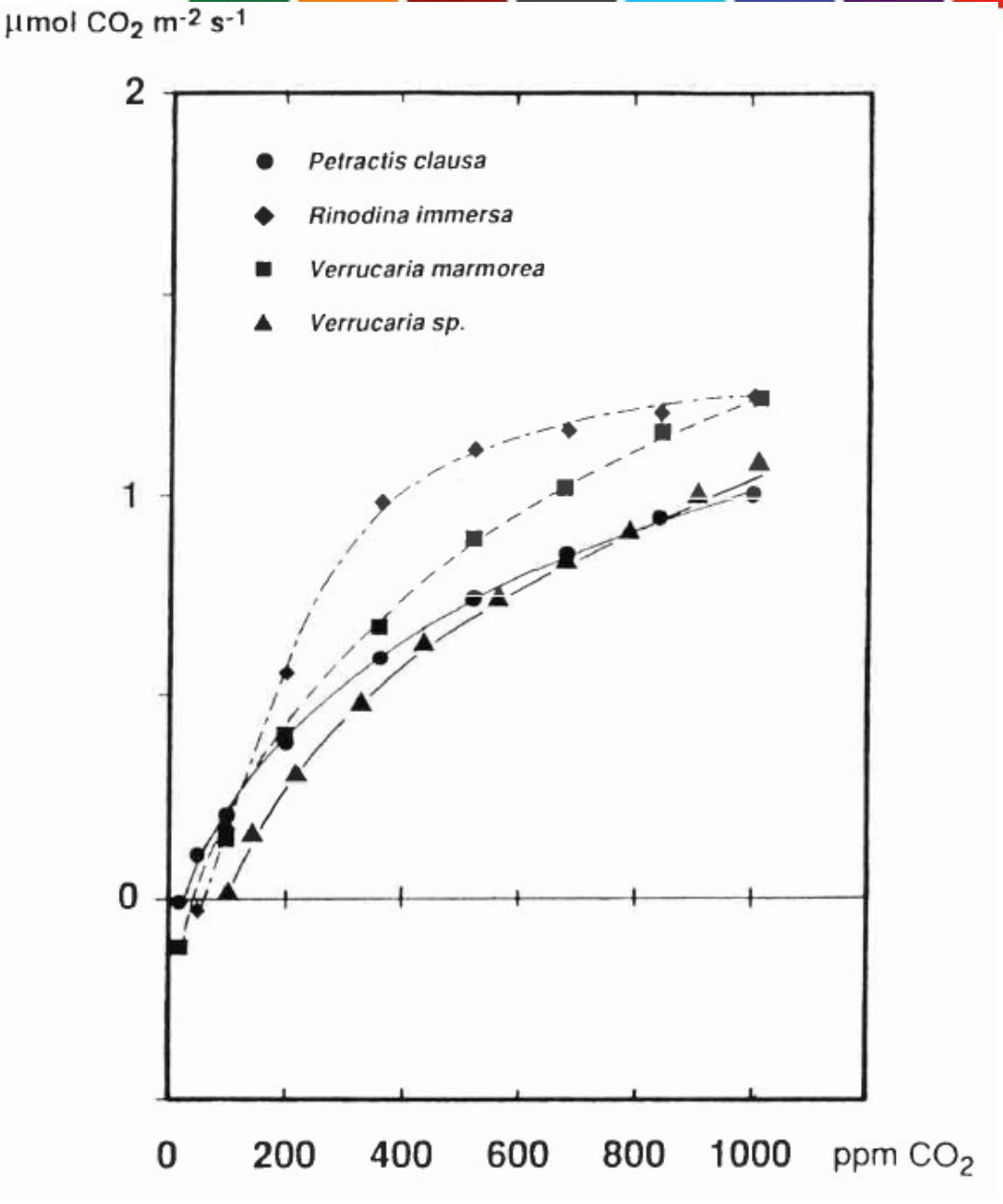






Section of a perithecium




µmol CO_2 m^{-2} s^{-1}
2
1
0
Petractis clausa
Rinodina immersa
Verrucaria marmorea
Verrucaria sp.
0
200
400
600
800
1000
ppm CO_2

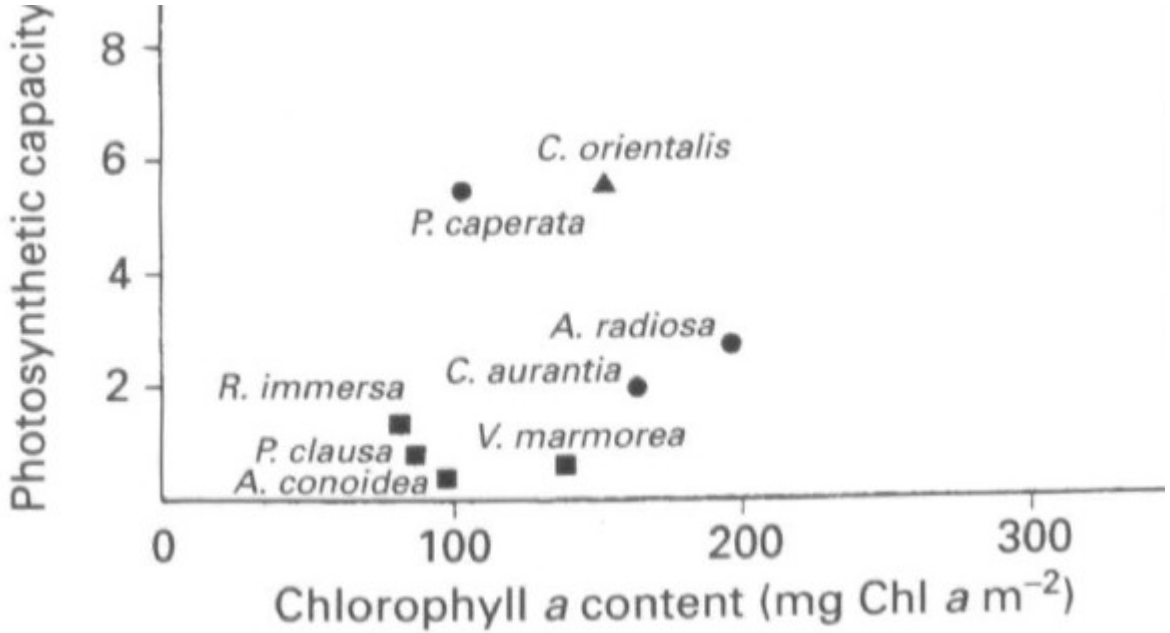
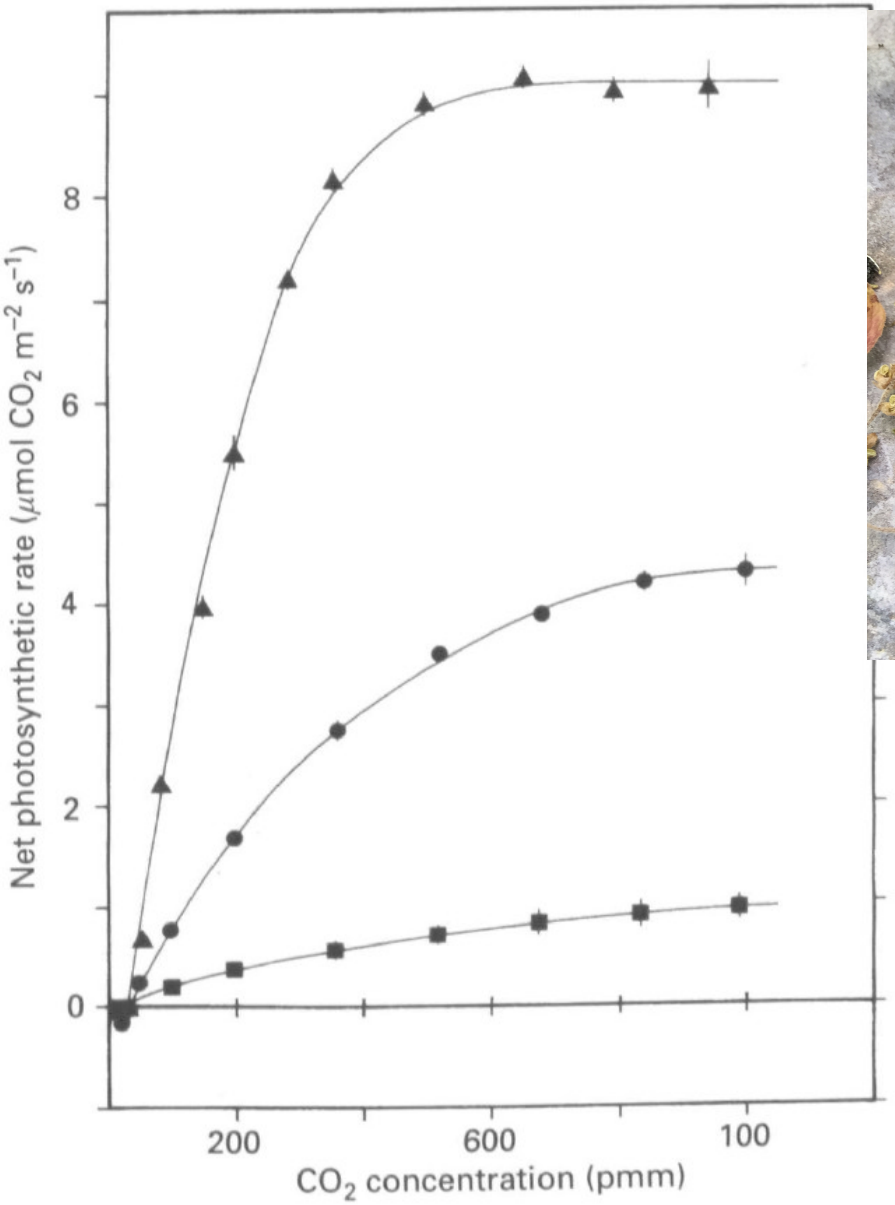


Table 1. *Chlorophyll content (mg Chl m^{-2}), of endolithic (○) and epilithic (●) crustose lichens ; solvent : acetone 80 % (v/v) ; equations according to Lichtenthaler (1987)*

	Species	Photobiont	Chl *a*	Chl *b*	Chl *a*+*b*	Chl *a*/Chl *b*
○	*Acrocordia conoidea*	*Trentepohlia*	97·1 ± 8·7	44·3 ± 4·8	141·5 ± 13·4	2·2 ± 0·06
○	*Caloplaca ochracea*	*Pseudotrebouxia*	141·5 ± 20·1	43·3 ± 8·7	184·9 ± 28·2	3·3 ± 0·3
○	*Clauzadea immersa*	*Trebouxia*	92·2 ± 11·7	39·1 ± 8·3	131·3 ± 20	2·4 ± 0·21
○	*Petractis clausa*	*Scytonema*	84·8 ± 7·6	—	—	—
○	*Rinodina immersa*	Trebouxioid	81·2 ± 5·1	23·1 ± 2	104·3 ± 6·8	3·50 ± 0·20
○	*Verrucaria marmorea*	?	137·9 ± 18·2	44·7 ± 10·1	182·7 ± 25·8	3·15 ± 0·44
○	*Verrucaria* cfr. *steineri*	?	71·2 ± 10·1	24·1 ± 6·0	95·3 ± 16·6	3·03 ± 0·45
●	*Aspicilia radiosa*	?	196·8 ± 27·4	106·8 ± 24·4	303·7 ± 49·7	1·89 ± 0·28
●	*Caloplaca aurantia*	*Pseudotrebouxia*	164·2 ± 20·5	51·5 ± 10·5	206·7 ± 31	3·26 ± 0·47


Net photosynthetic rate (μmol CO_2 m^{-2} s^{-1})
8
6
4
2
0
200
600
100
CO_2 concentration (pmm)

Grazie
per l'attenzione !