

An underwater photograph of a coral reef. The scene is filled with various types of marine plants and coral. In the foreground, there are large, brownish, leafy plants. In the background, there are purple and blue coral structures. The water is clear and blue. The overall scene is a vibrant and diverse marine ecosystem.

Marine Plants

BI 103 Marine Biology
Laboratory Notes 02

- Marine plants include photosynthesizing organisms that tolerate the salty environment of the sea

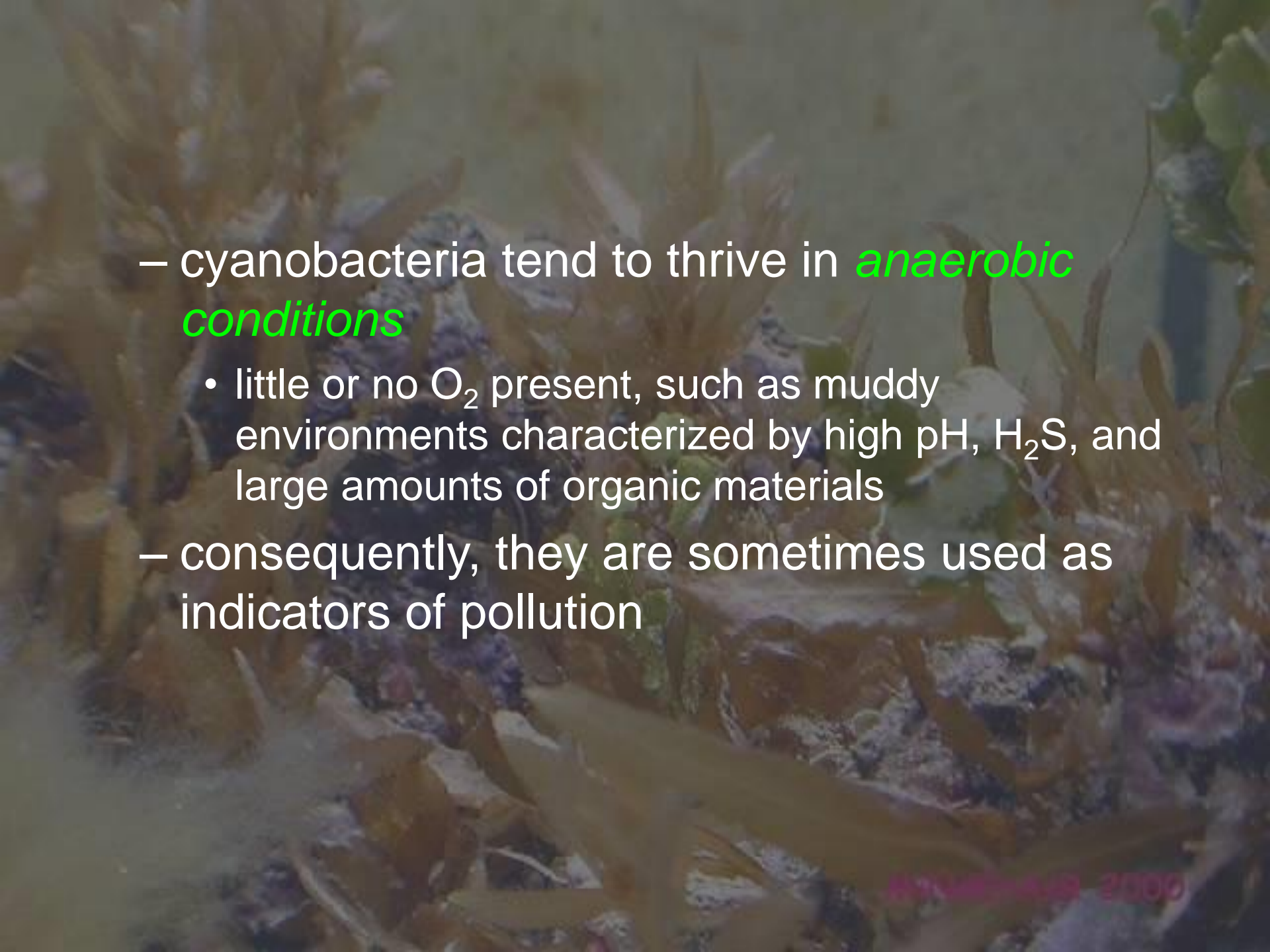
Microscopic marine plants

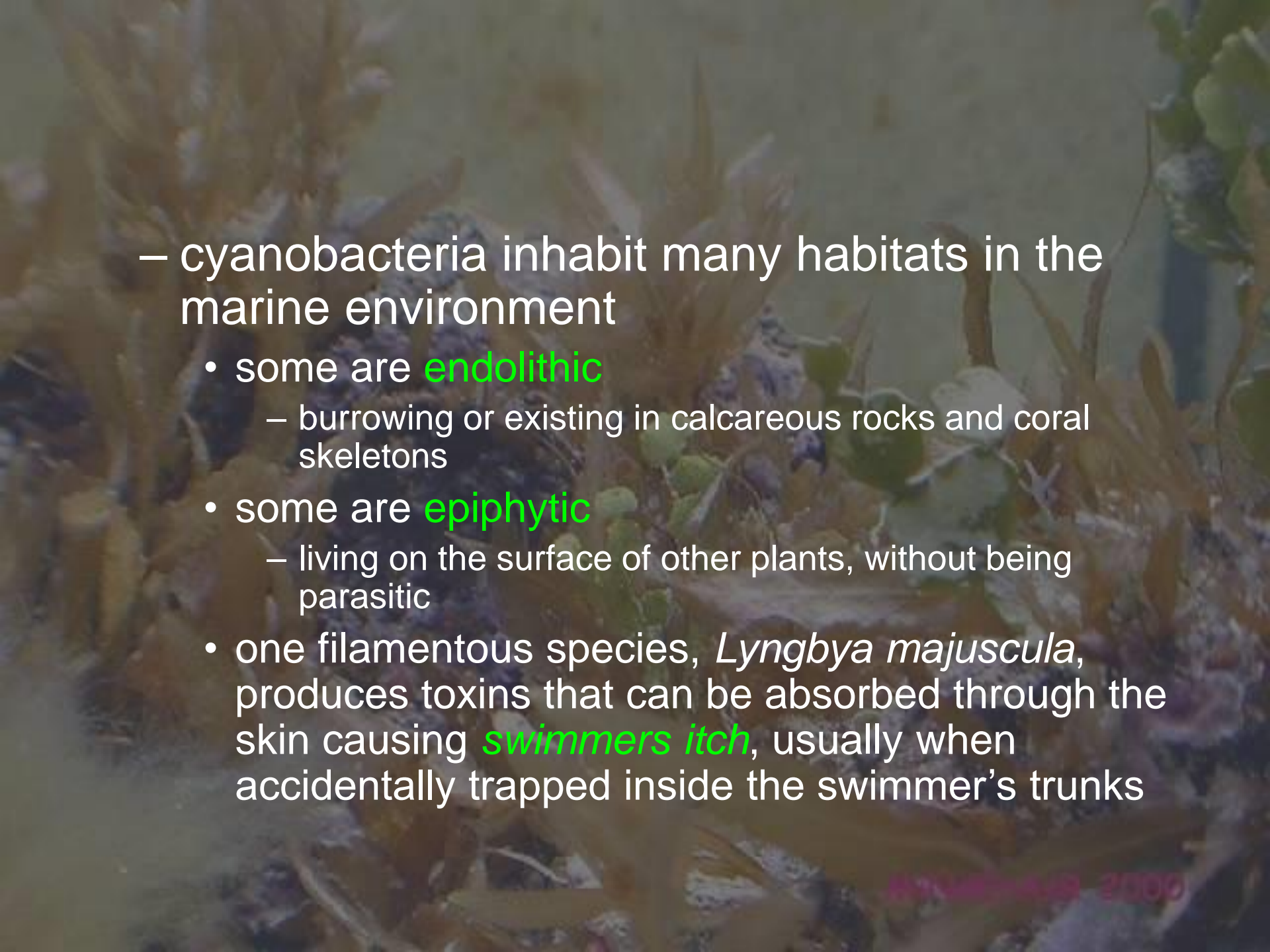
Kingdom Eubacteria

- Division Cyanobacteria
 - formerly called bluegreen algae and placed in the Division Cyanophyta of the Kingdom Protista
 - most are unicellular and microscopic, although some species form long filaments or algal mats

- known as bluegreen algae because many species contain **phycocyanin**
 - a bluish pigment
- however, many marine species contain **phycoerythrin**, which gives them a reddish appearance
- cyanobacteria may have been the first photosynthesizing organisms that evolved
 - some highly calcified cyanobacteria, known as **stromatolites**, have fossils dating back as far as 3 Mybp

- cyanobacteria are surrounded by a **gelatinous sheath**, giving them a slimy feel
 - the gelatinous sheath functions to reduce O_2 diffusion into the cell
 - low O_2 concentrations are important in **nitrogen fixation**
 - conversion of gaseous nitrogen (N_2) into nitrogen compounds ($-NH_3$ & $-NO_3$) that can be used by other photosynthesizers
 - nitrogen fixation occurs in special structures called **heterocysts**, which can be observed under high magnification

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- cyanobacteria tend to thrive in *anaerobic conditions*
 - little or no O₂ present, such as muddy environments characterized by high pH, H₂S, and large amounts of organic materials
 - consequently, they are sometimes used as indicators of pollution

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- cyanobacteria inhabit many habitats in the marine environment
 - some are **endolithic**
 - burrowing or existing in calcareous rocks and coral skeletons
 - some are **epiphytic**
 - living on the surface of other plants, without being parasitic
 - one filamentous species, *Lyngbya majuscula*, produces toxins that can be absorbed through the skin causing **swimmers itch**, usually when accidentally trapped inside the swimmer's trunks

Kingdom Eucarya
Subkingdom Plantae

- Division Chrysophyta [= Bacillariophyta]
 - commonly called **diatoms**
 - all are unicellular and microscopic
 - diatoms are enclosed by a strong, transparent case composed of silica (SiO_2)
 - therefore, they are designed like a miniature greenhouse

