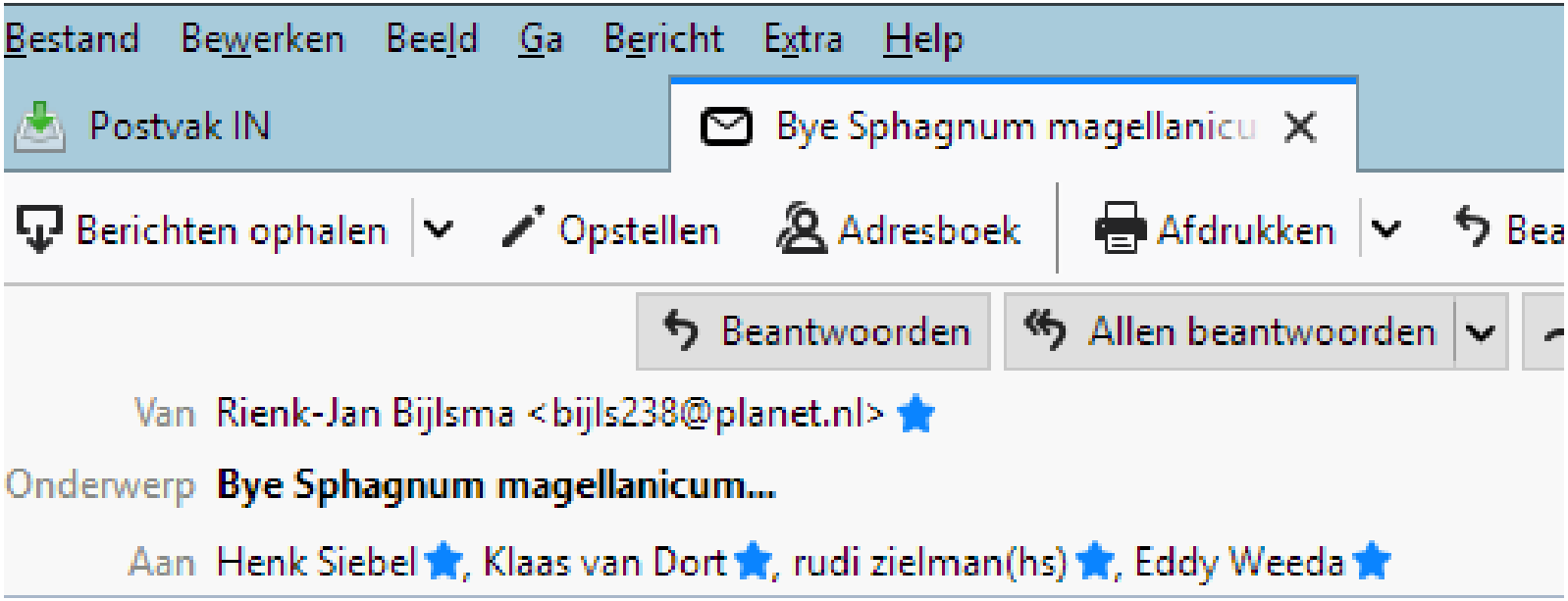
Op zoek naar het echte hoogveen Veenmos

Rudi Zielman

2 feb 2019

Hoogveenveenmos, toen nog wel

Zó begon het, voor mij



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Dát was slikken

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chappen | Spatial_Genetic_Str... | Sphagnum divinum...
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Sphagnum divinum (*sp. nov.*) and *S. medium* Limpr. and their relationship to *S. magellanicum* Brid.

Kristian Hassel, Magni O. Kyrkjeeide, Narjes Yousefi, Tommy Prestø, Hans K. Stenøien, Jonathan A. Shaw & Kjell Ivar Flatberg

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To link to this article: https://doi.org/10.1080/03736687.2018.1474424

De “onderlegger”

Spatial_Genetic_Structure_of_the_Abundant_and_Wide.pdf - Adobe Acrobat Reader DC

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Start Gereedschappen Spatial_Genetic_Str... Aanmelden

2 / 20 167% Delen

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RESEARCH ARTICLE

Spatial Genetic Structure of the Abundant and Widespread Peatmoss *Sphagnum magellanicum* Brid.

Magni Olsen Kyrkjeeide[1,2], Kristian Hassel[1], Kjell Ivar Flatberg[1], A. Jonathan Shaw[3], Narjes Yousefi[1], Hans K. Stenøien[4]*

1 NTNU University Museum, Norwegian University of Science and Technology, NO-7491, Trondheim, Norway, **2** Norwegian Institute for Nature Research, N-7485, Trondheim, Norway, **3** Duke University, Department of Biology, Durham, North Carolina, 27708, United States of America, **4** Centre for Biodiversity Dynamics, NTNU University Museum, Norwegian University of Science and Technology, NO-7491, Trondheim, Norway

* stenoien@ntnu.no

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OPEN ACCESS

Abstract

Spore-producing organisms have small dispersal units enabling them to become wide-spread across continents. However, barriers to gene flow and cryptic speciation may exist.

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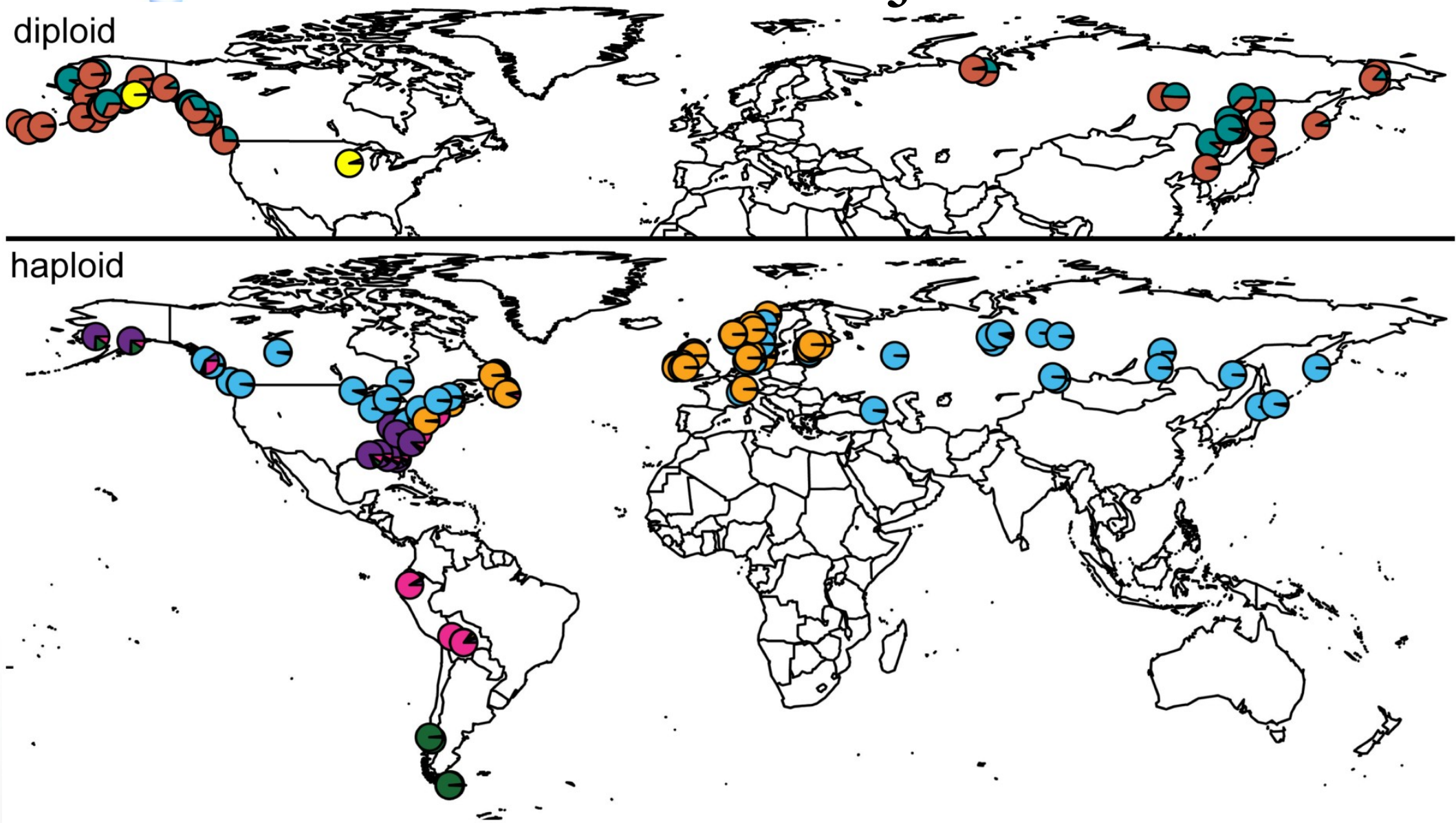
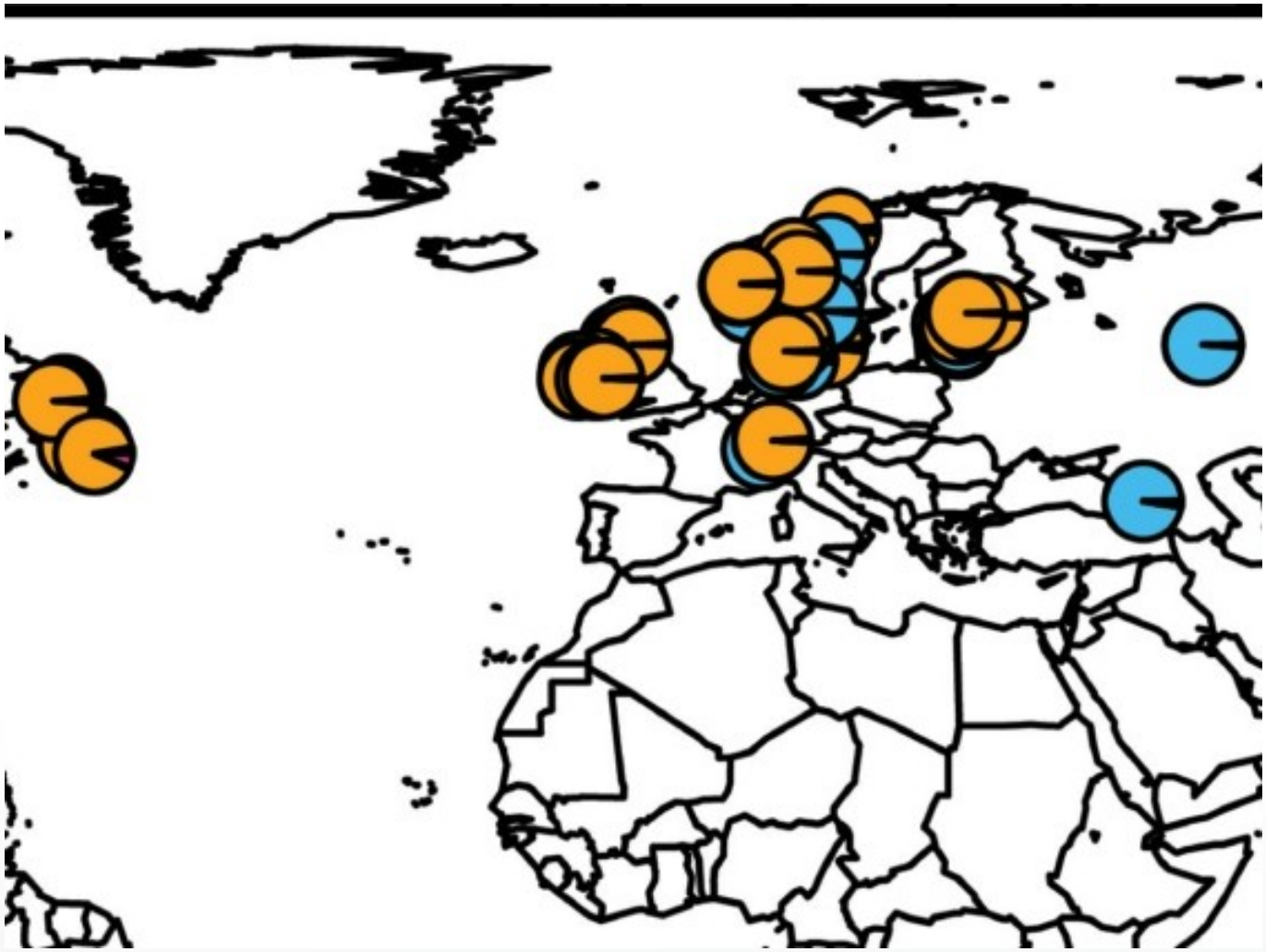
Wat is wereldwijd het beeld



Kyrkjeede e.a. 2016

amphi-atlantisch: “oranje”
holarctis: “blauw”



Nog meer “indirect bewijs”

Perspectives in Plant Ecology, Evolution and Systematics 26 (2017) 14–27

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Perspectives in Plant Ecology, Evolution and Systematics

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Research article

Parallel adaptive responses to abiotic but not biotic conditions after cryptic speciation in European peat moss *Sphagnum magellanicum* Brid.

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[a] University of Potsdam, Biodiversity Research/Systematic Botany, Maulbeerallee 1, 14469 Potsdam, Germany
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ABSTRACT

Sphagnum magellanicum Brid. is a worldwide distributed peat moss and an ecosystem-engineer in temperate and boreal bog ecosystems suggesting a great adaptive potential to different environmental conditions. Phenotypes of *S. magellanicum* have been described as one species so far, although this has been questioned by the detection of several genetic groups in a recent global study. Concordant with morphological uniformity, our analyses of Mid- to Northern European plants revealed only minimal variation in nuclear nrITS and plastid rps4 sequences. However, we detected two distinct genetic groups within

Op basis van veel Europees materiaal ook 2 genetische groepen

Zelfde verdeling: ‘west & zuid’ van Berlijn / ‘oost & noord’ van Berlijn

Vinden geen morfologisch verschil
(beperkt onderzoek, maar wél naar chlorocyten gekeken)

ALS ER GENETISCH ONDERSCHEID IS ...

- … en er is sprake van reproductieve isolatie
- … dus “soorten”

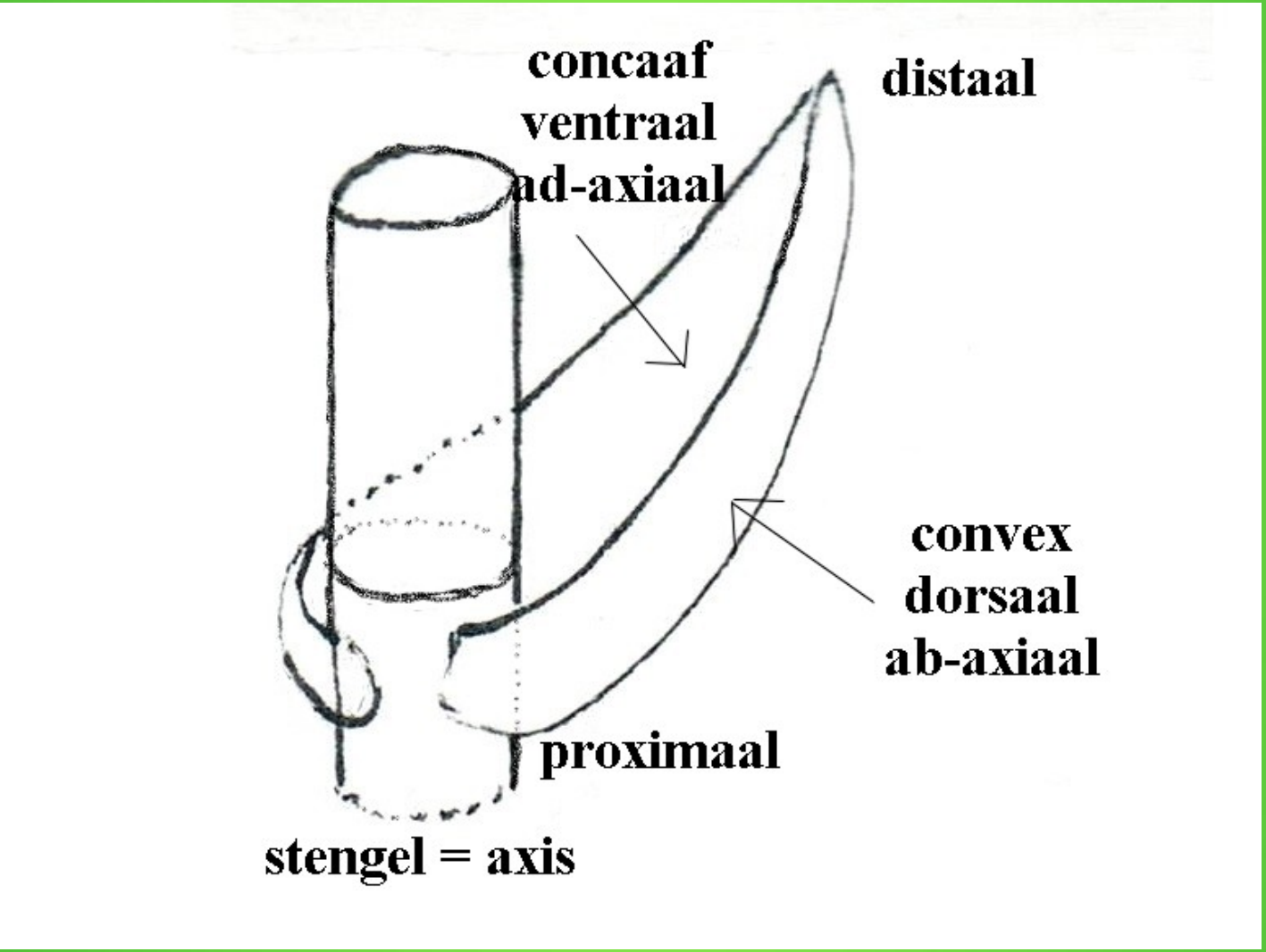
- Waar zit dan het morfologische onderscheid
- Of niet → cryptische soorten

- “Pooling them together in for example ecological or genomic studies could give misleading results if they indeed belong to different taxa”

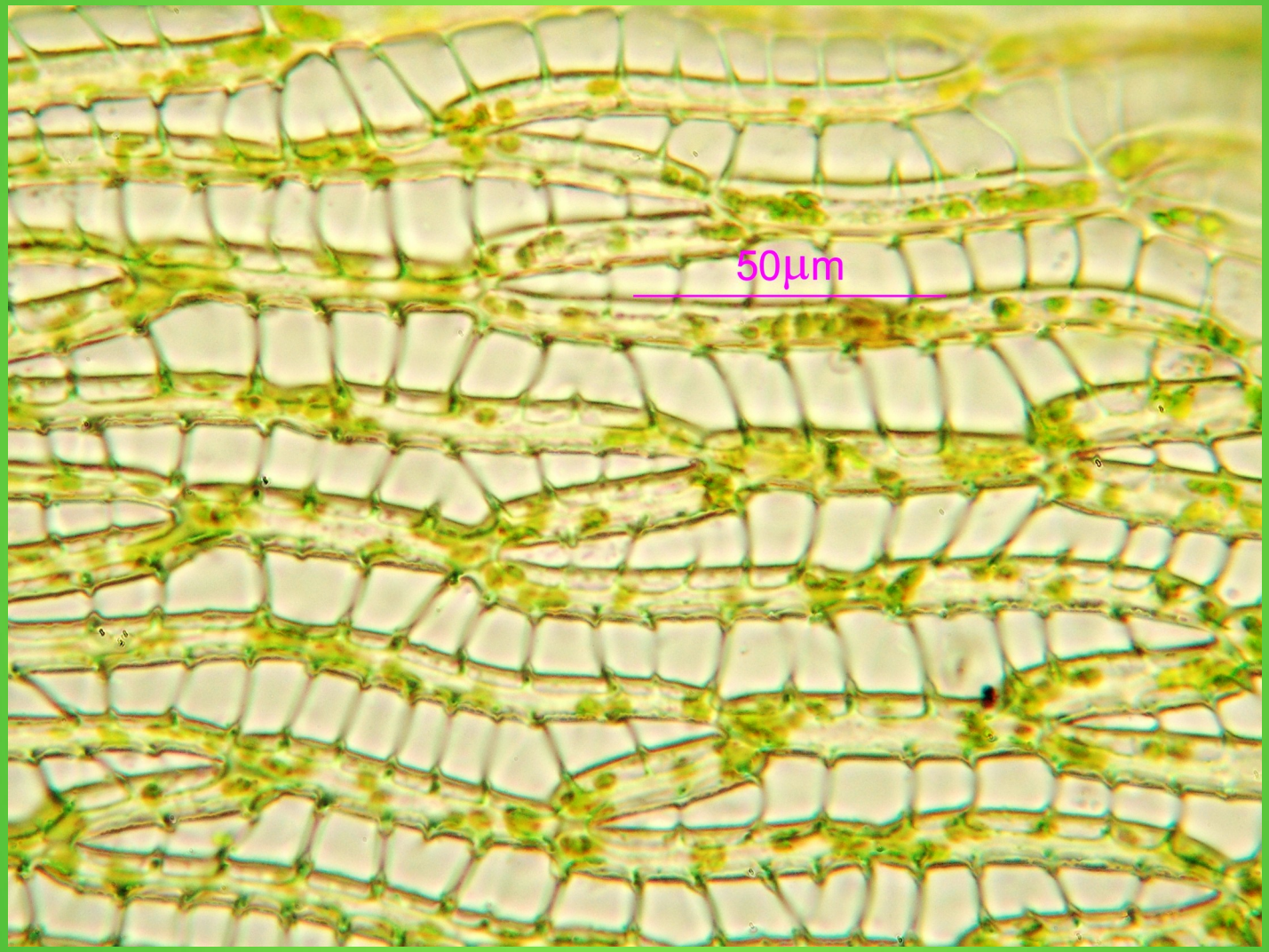
Uitstapje Sphagnum

- Ingedeeld op :
- ➔ Plaats groene cellen t.o.v. ‘witte’
- ➔ Positie fibrillen en poriën
- ➔ Vorm van het stengelblad

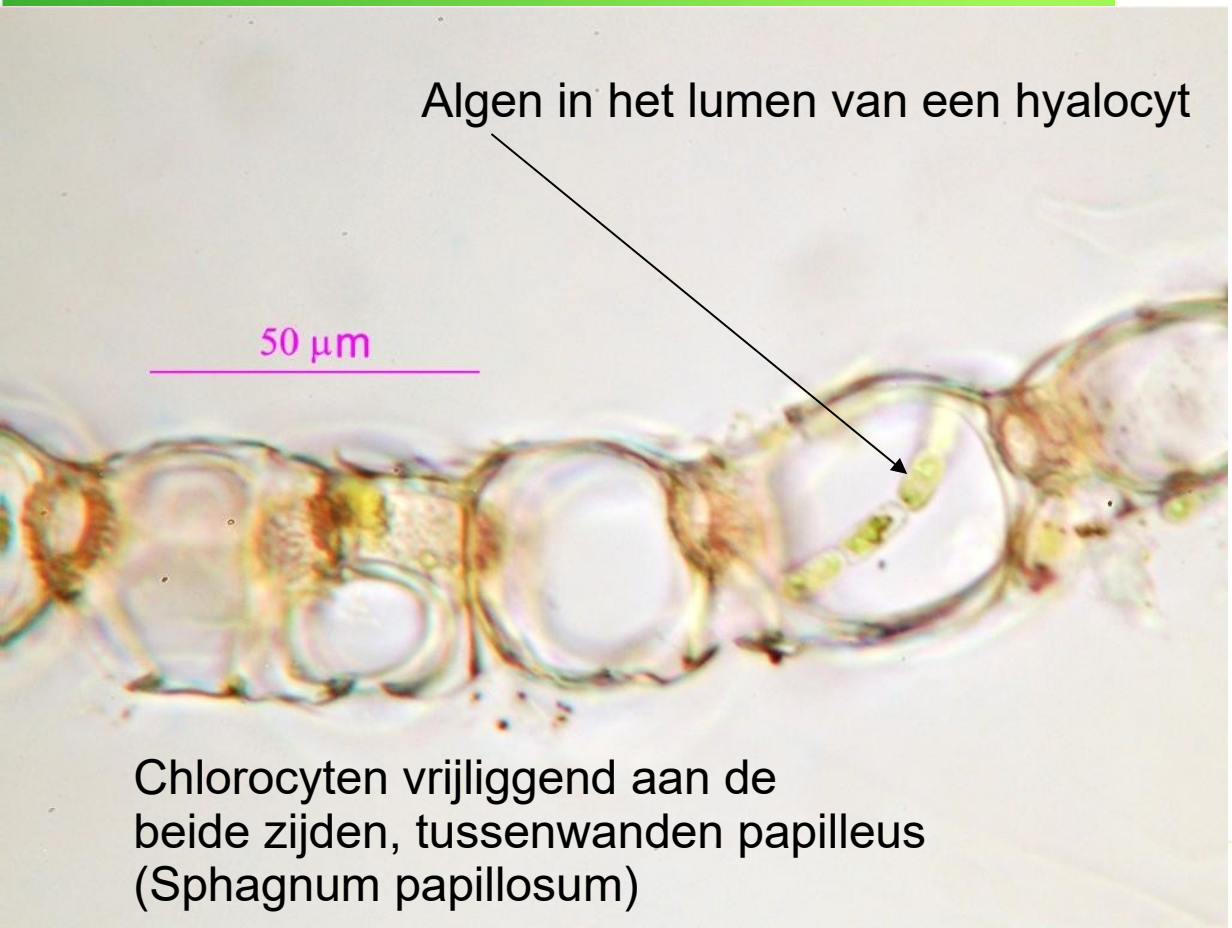
Hoe praten we over het blad



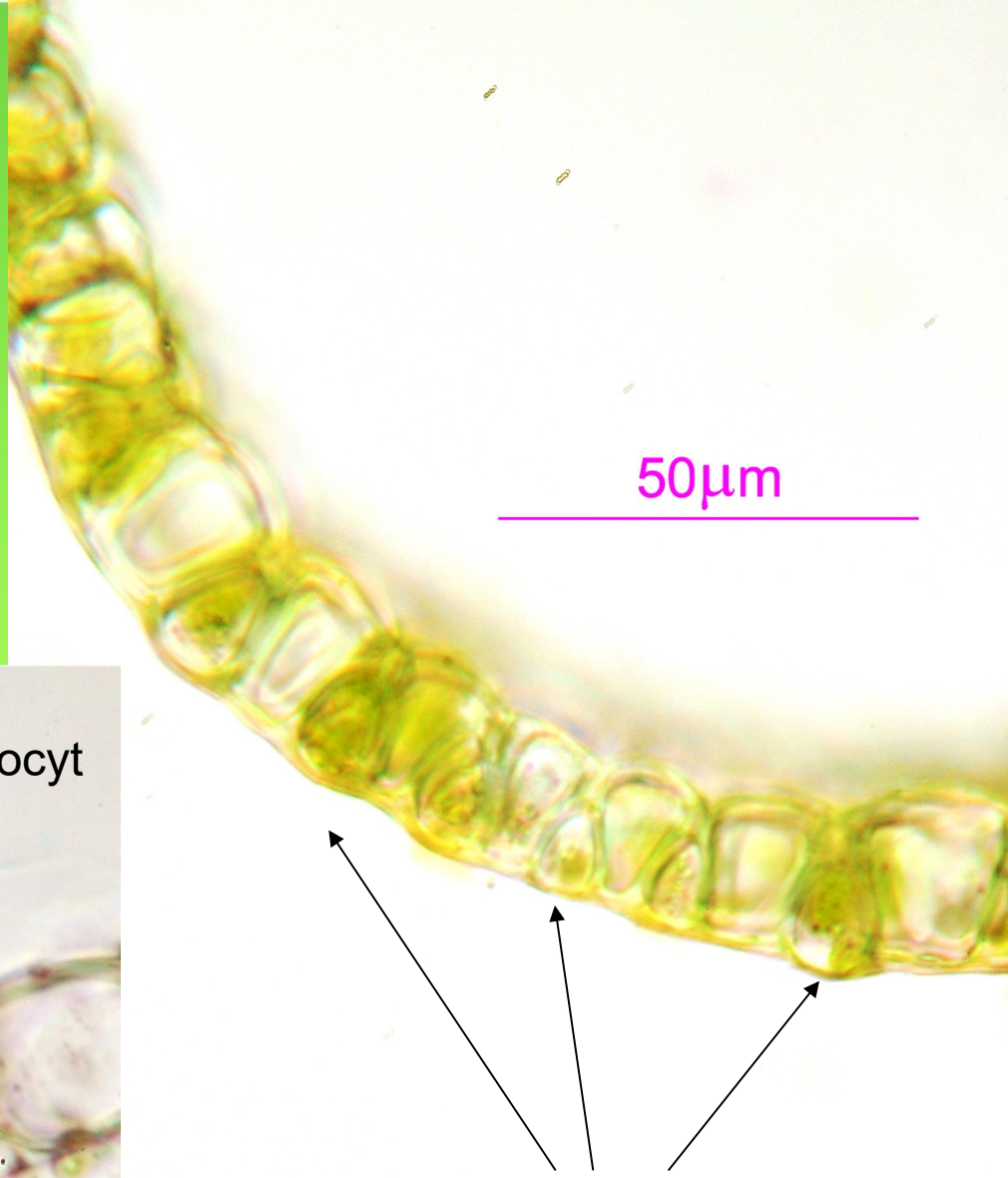
Hyalocyten met fibrillen, chlorocyten met chlorofyl



Doorsnede, waar liggen “chlorocyten” ?



Chlorocyten vrijliggend aan de beide zijden, tussenwanden papilleus (Sphagnum papillosum)



Chlorocyten vrijliggend aan de Dorsale (= convexe) zijde (Sphagnum fallax)

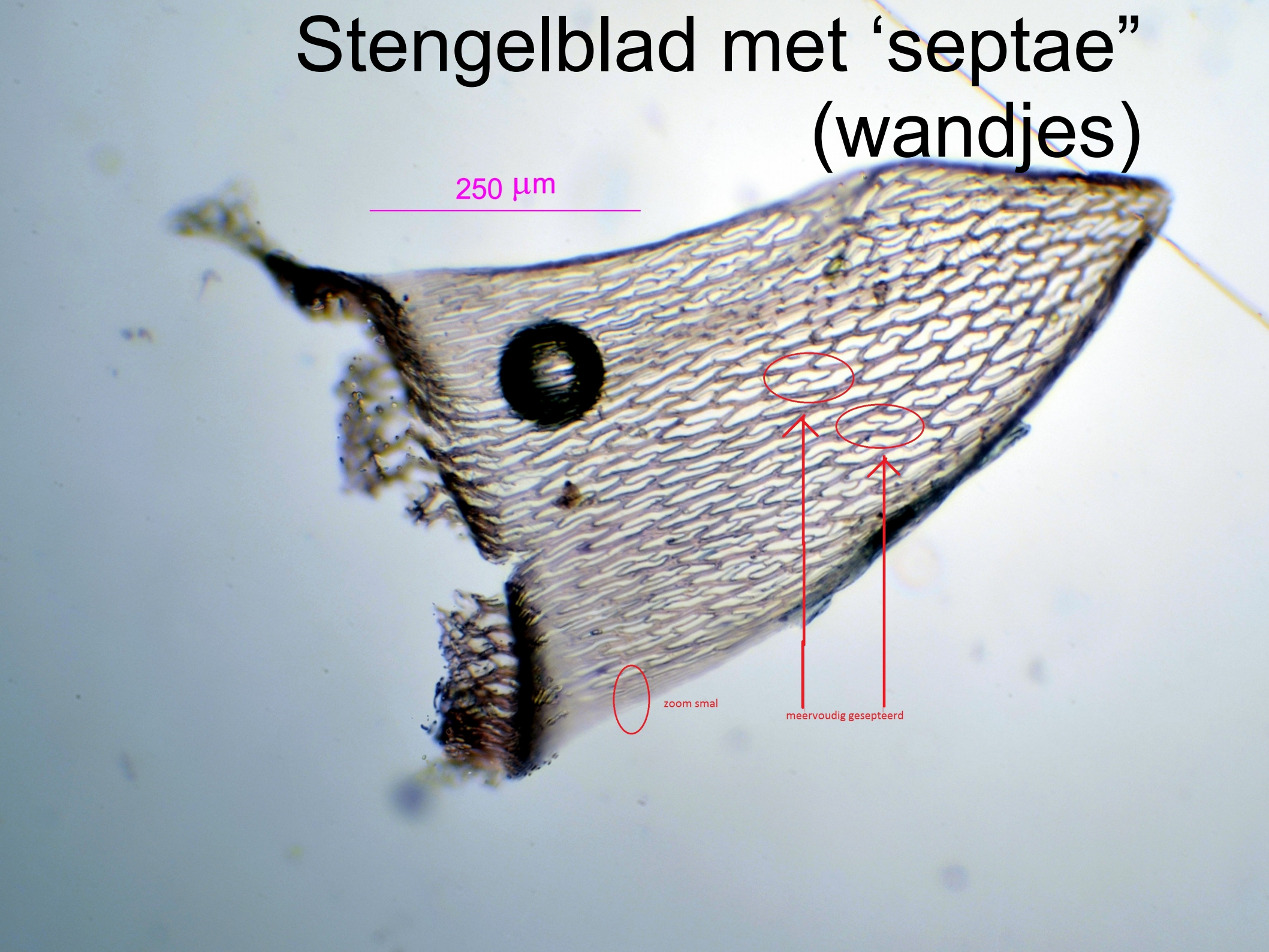
Groepen

- Sphagnum: cortex stengel en tak met fibrillen
  - S. palustre / S.papillosum / S.magellanicum / S. affine

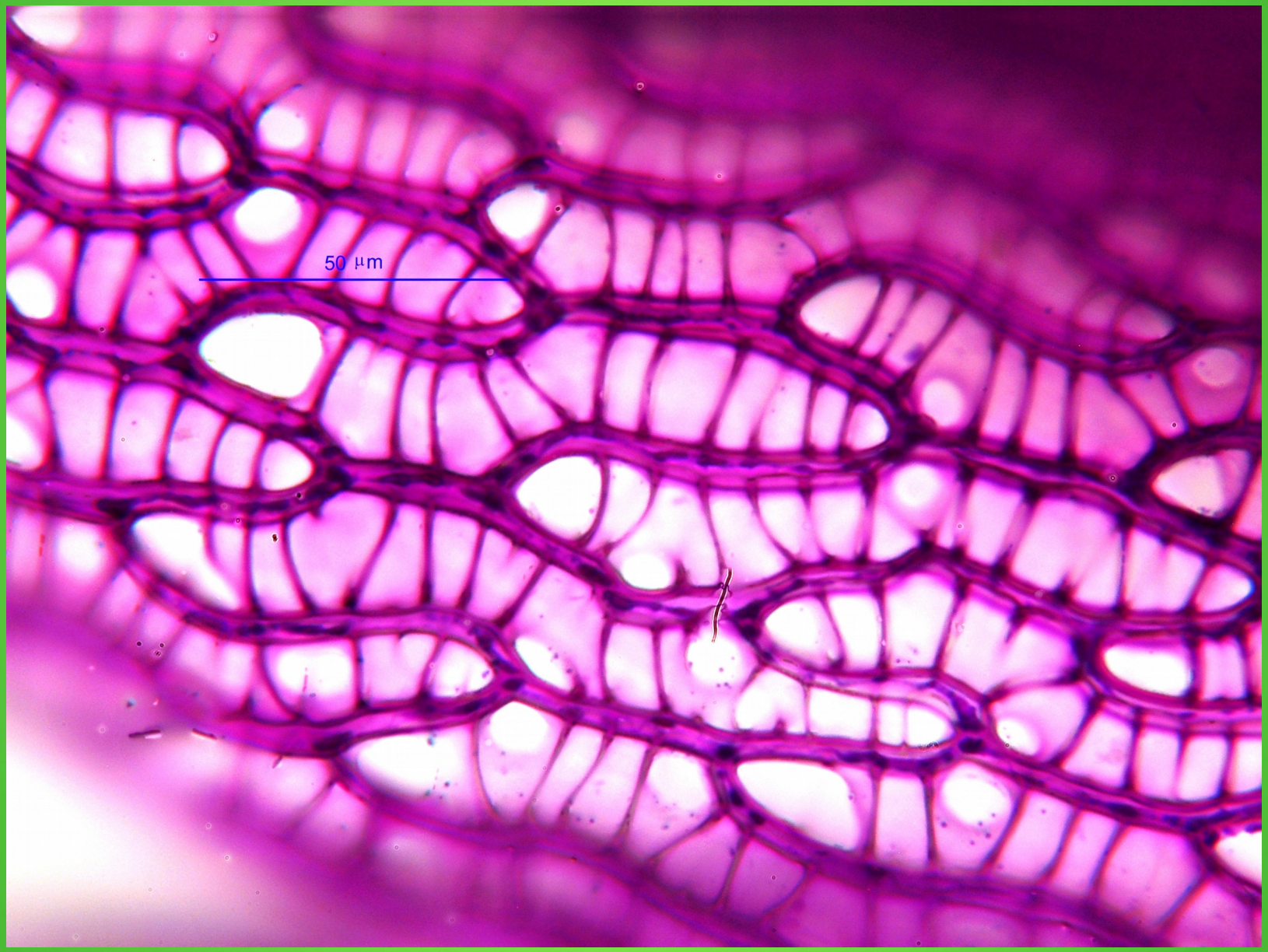
- Acutifolia: hyalocyten ventraal breder
  - S. fimbriatum / S.capillifolium
- Subsecunda: rijtjes poriën
  - S. denticulatum / S. contortum
- Rigida: stengelblad zeer klein, schubvormig
  - S. compactum
- Cuspidata: hyalocyten dorsaal breder
  - S. cuspidatum / S. fallax / S. riparium

Zonder bladdoorsnede niet te onderscheiden

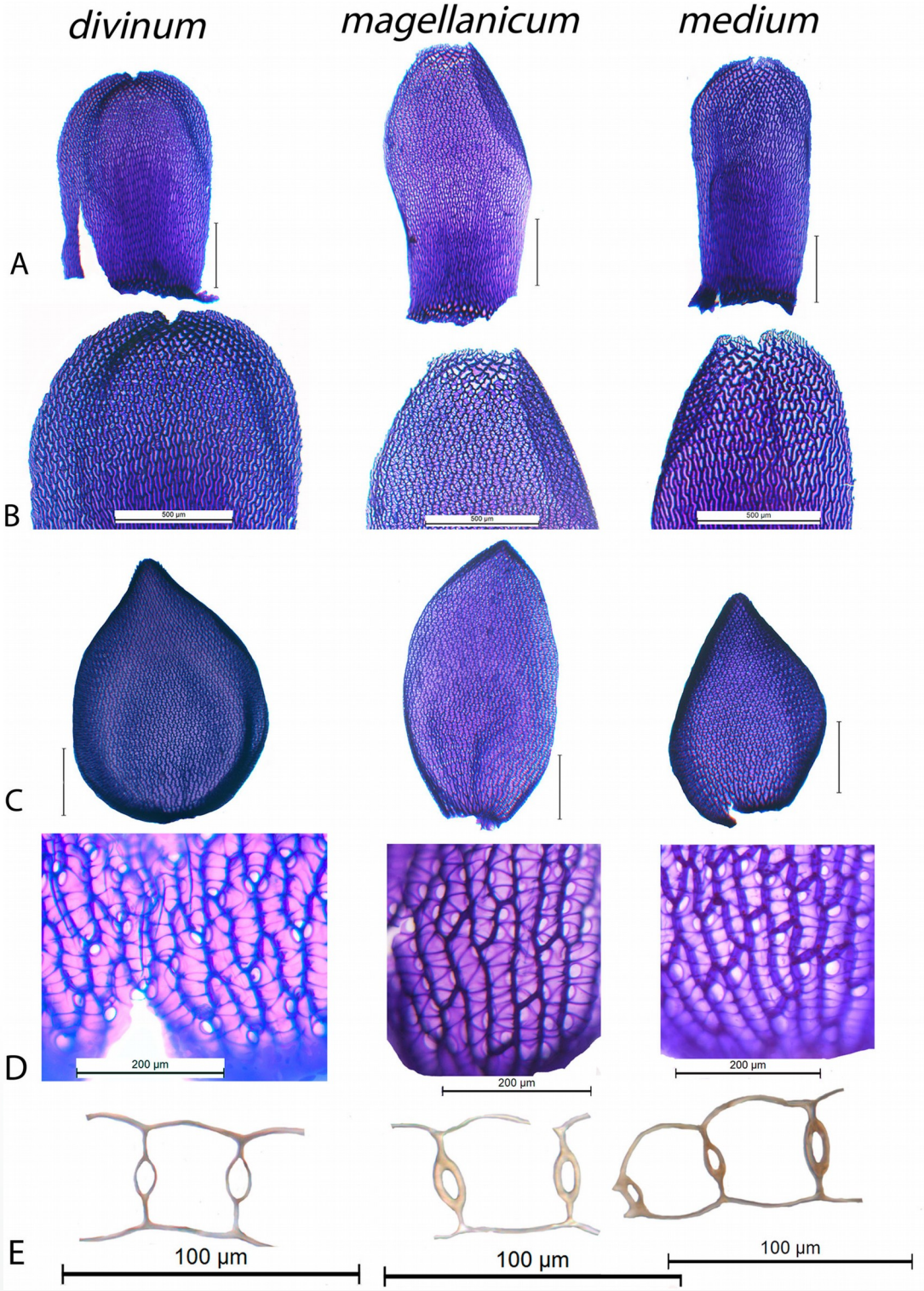
Stengelblad met ‘septae” (wandjes)



Cel-wanden, fibrillen, poriën

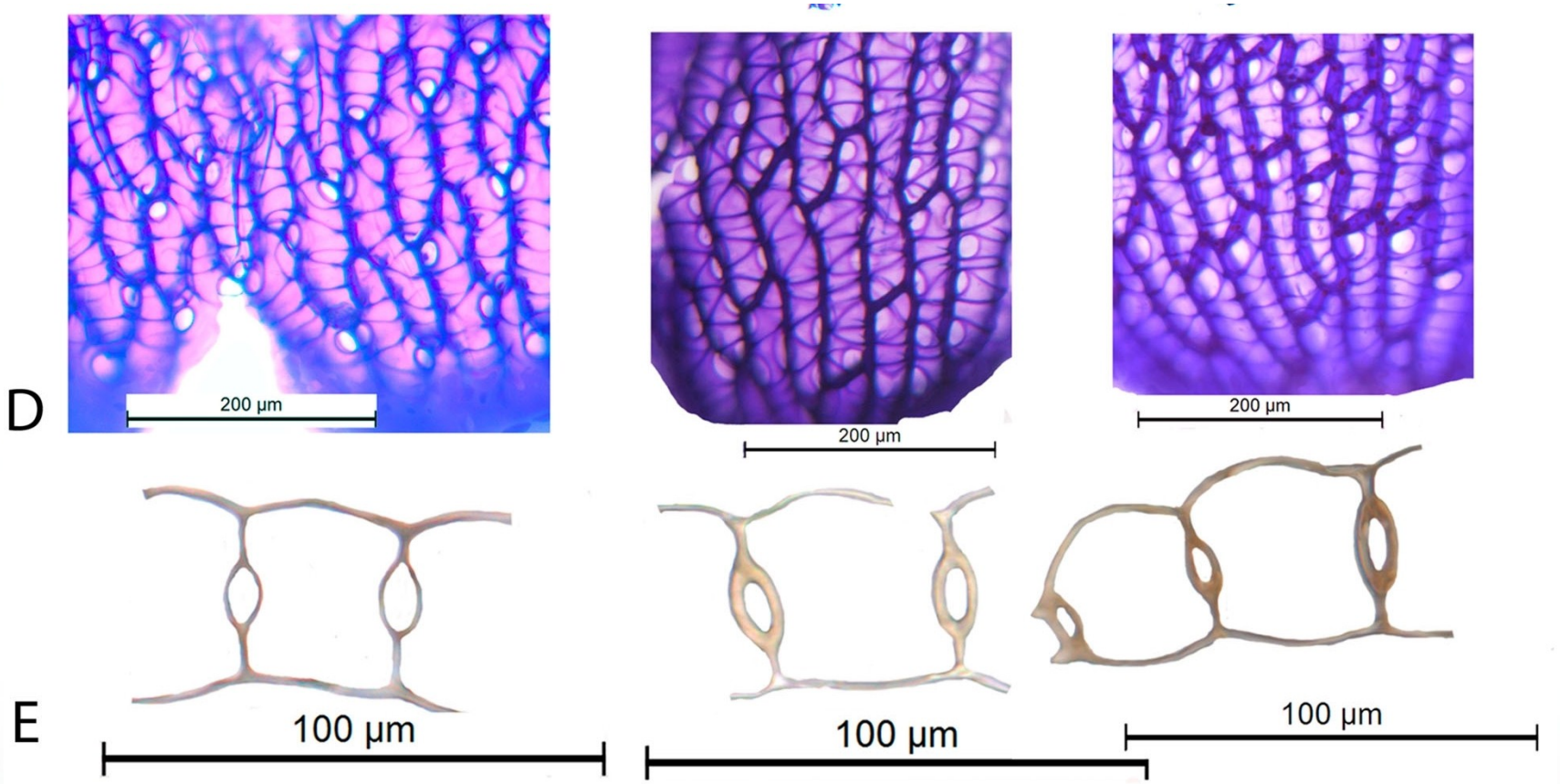


Sphagnum magellanicum agg.



Hassel e.a. 2018

De verschillen, in theorie ...



Hassel e.a. 2018

S. divinum vs S. medium

(img.: Artsdatabanken.no)

S. divinum vs S. medium

(img.: Artsdatabanken.no)

- Duidelijk …
- Toch ? ...

Verschillen om op te letten

Kenmerk	S. divinum	S. medium
Kleur	Rood tot groen	Diep rood
Takjes	10 – 20 mm spits Blad aanliggend	5 -10 mm stomp Blad afstaand
St blad	Rechthoekig – spatelvormig	Smal rechthoekig
St blad gaten	Verspreid – algemeen	Verspreid – soms algemeen
St blad porien	Verspreid – algemeen	Afwezig – soms aanwezig
Tak blad top	Recht tot concaaf	Recht tot convex
Tak blad breedte	1.2 – 1.6 mm	1.0 – 1.25 mm
Hyalocyt porien proximaal	< ½ cel breedte 1 – 5	> ½ cel breedte 1-2
Chlorocyt celwand	Dun	Dik

Wat komen wij dan tegen ???

Op zoek ...

HBV#23
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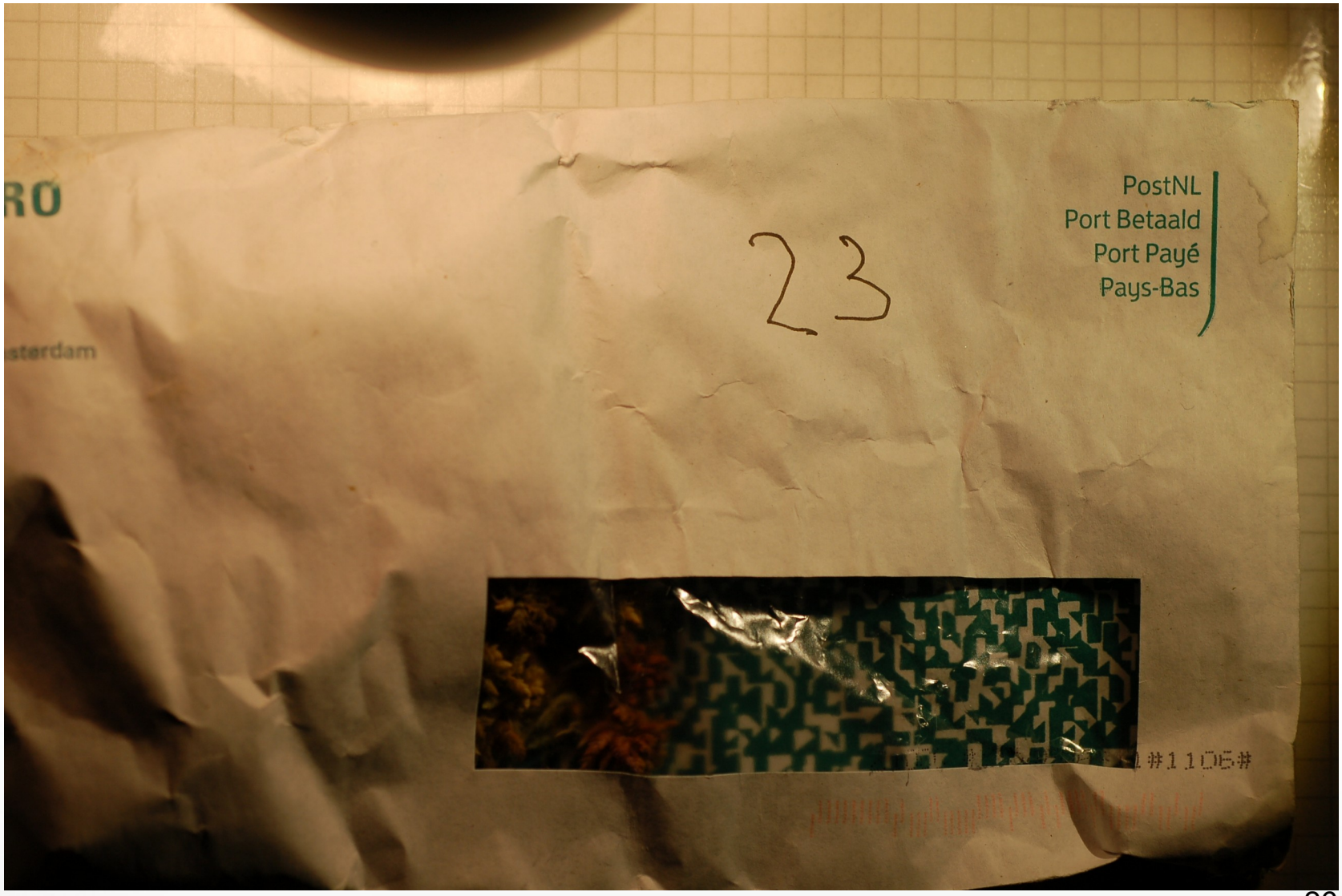
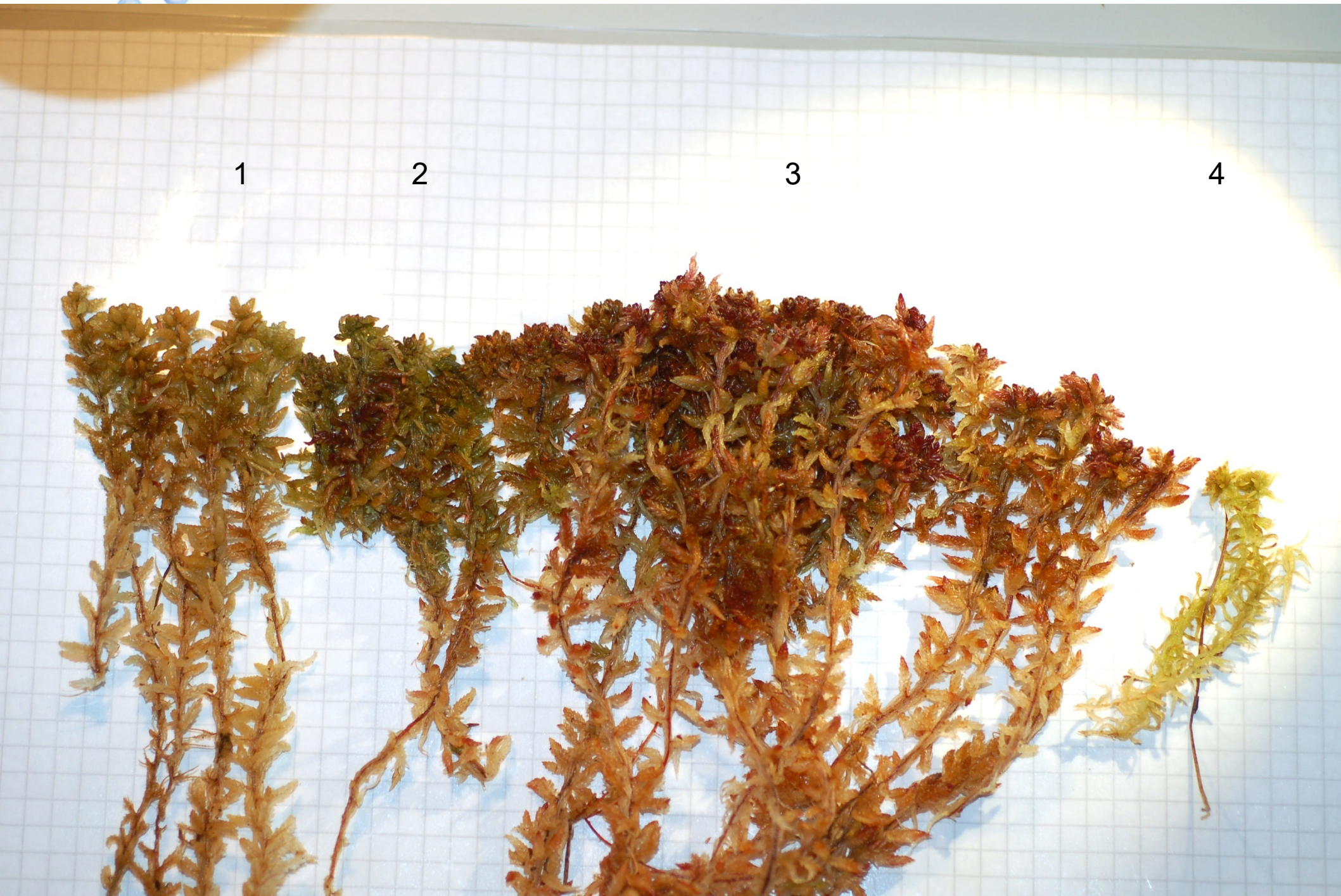
De ontleding



Hm, gevarieerd beeld

Yep, gevarieerd ...

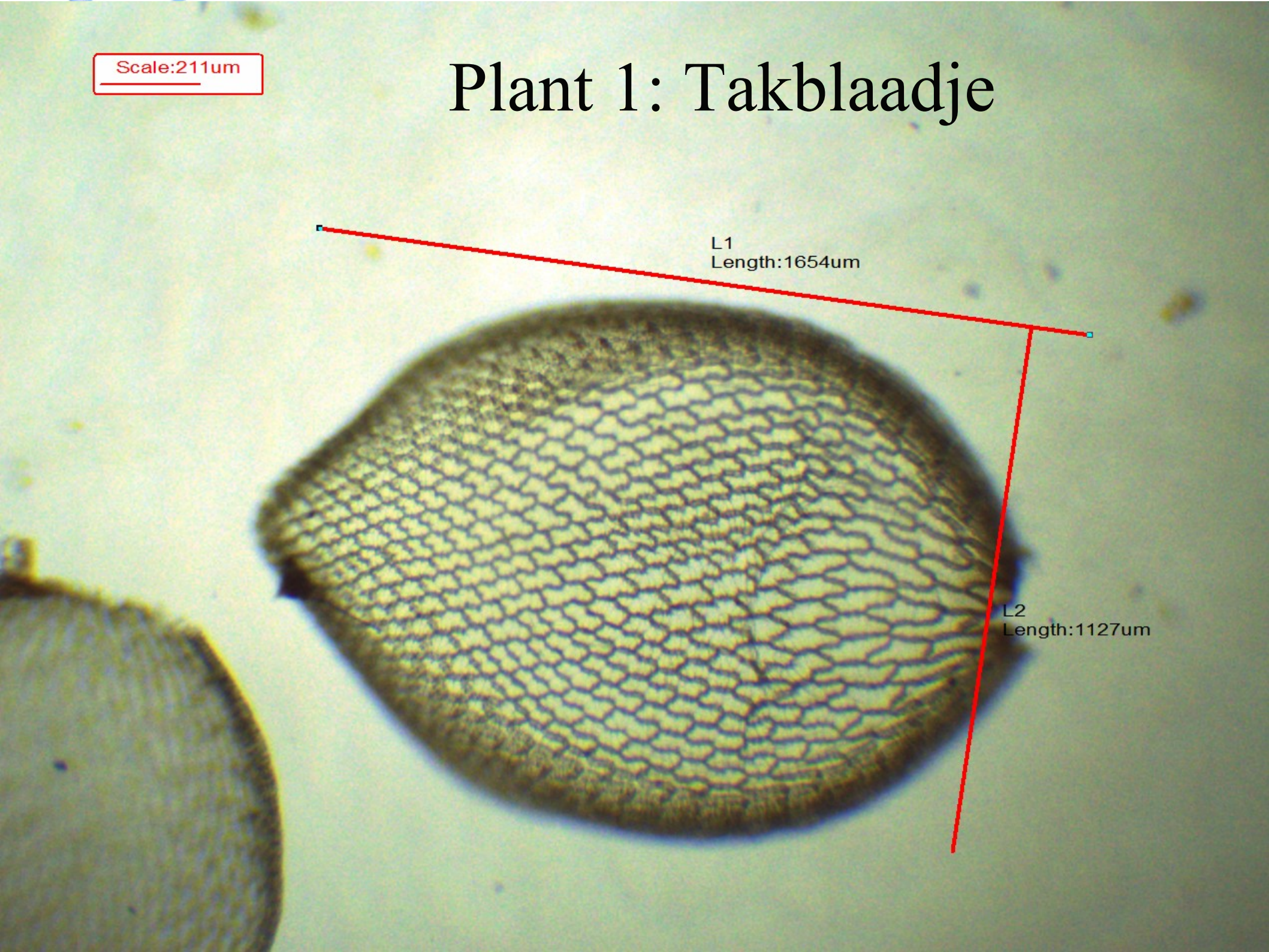


Plant 4:

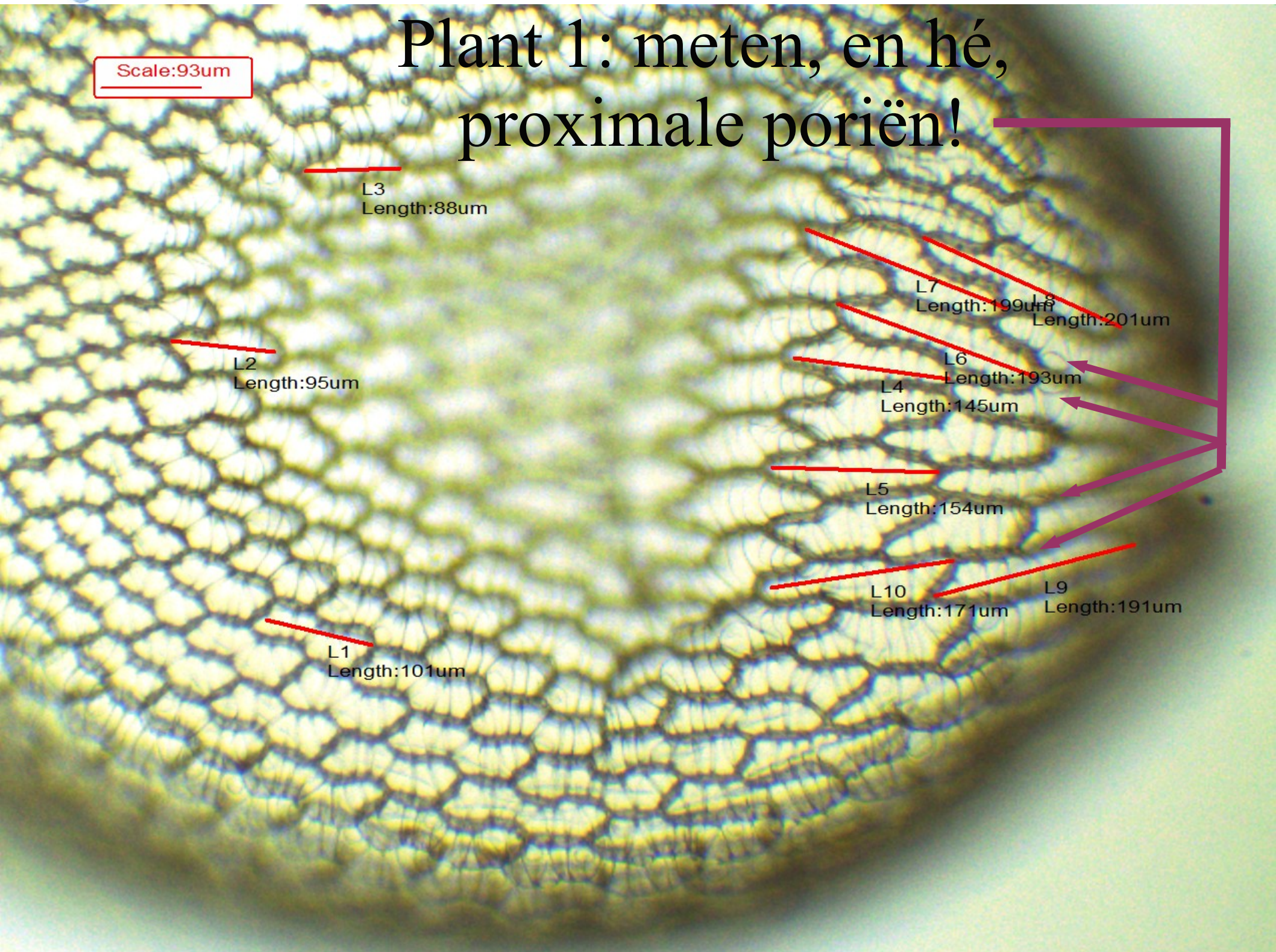
Sphagnum fallax

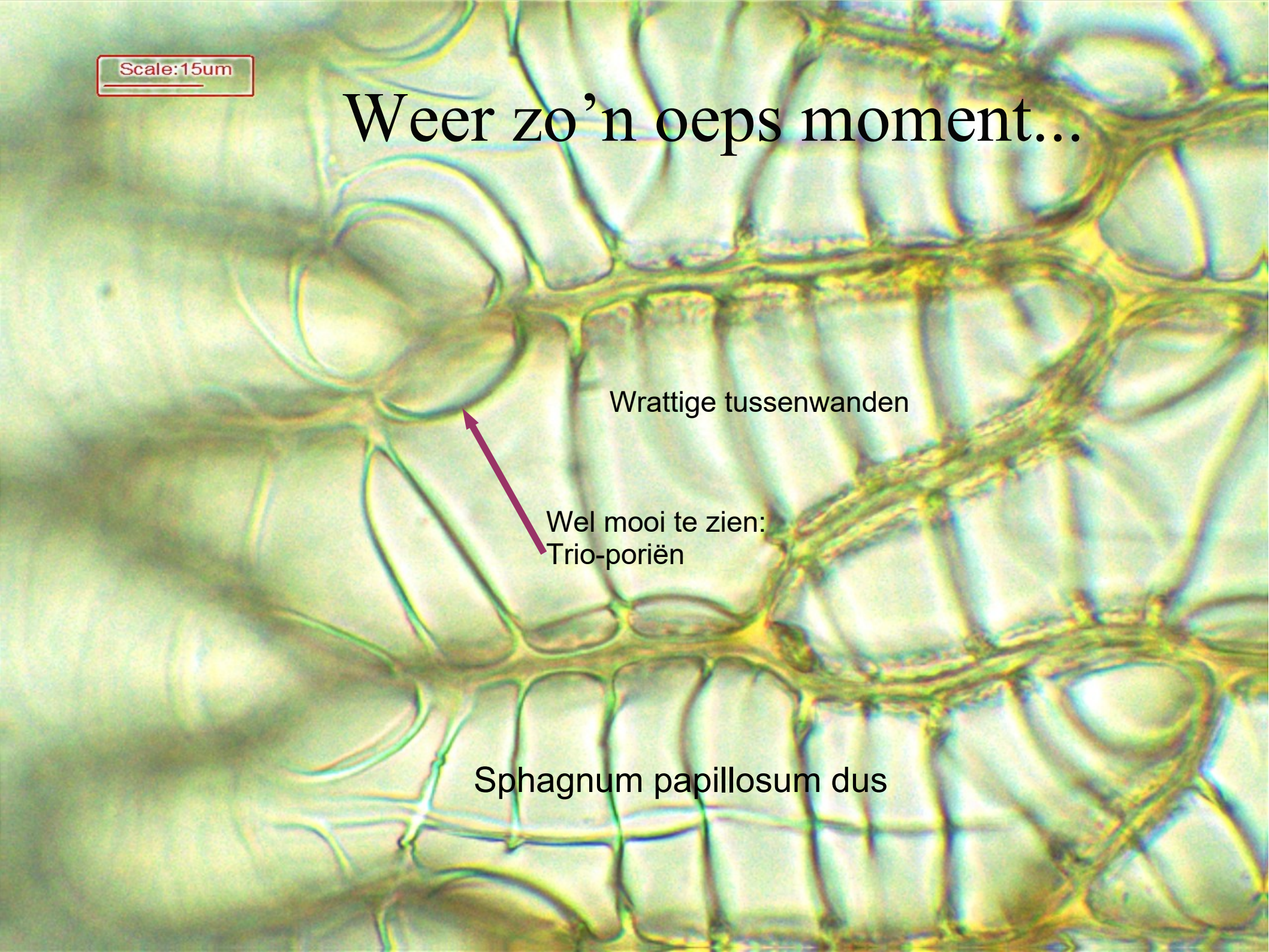
Plant 1: uitstaande blaadjes, leuk

Plant 1: Takblaadje



Plant 1: meten, en hé, proximale poriën!

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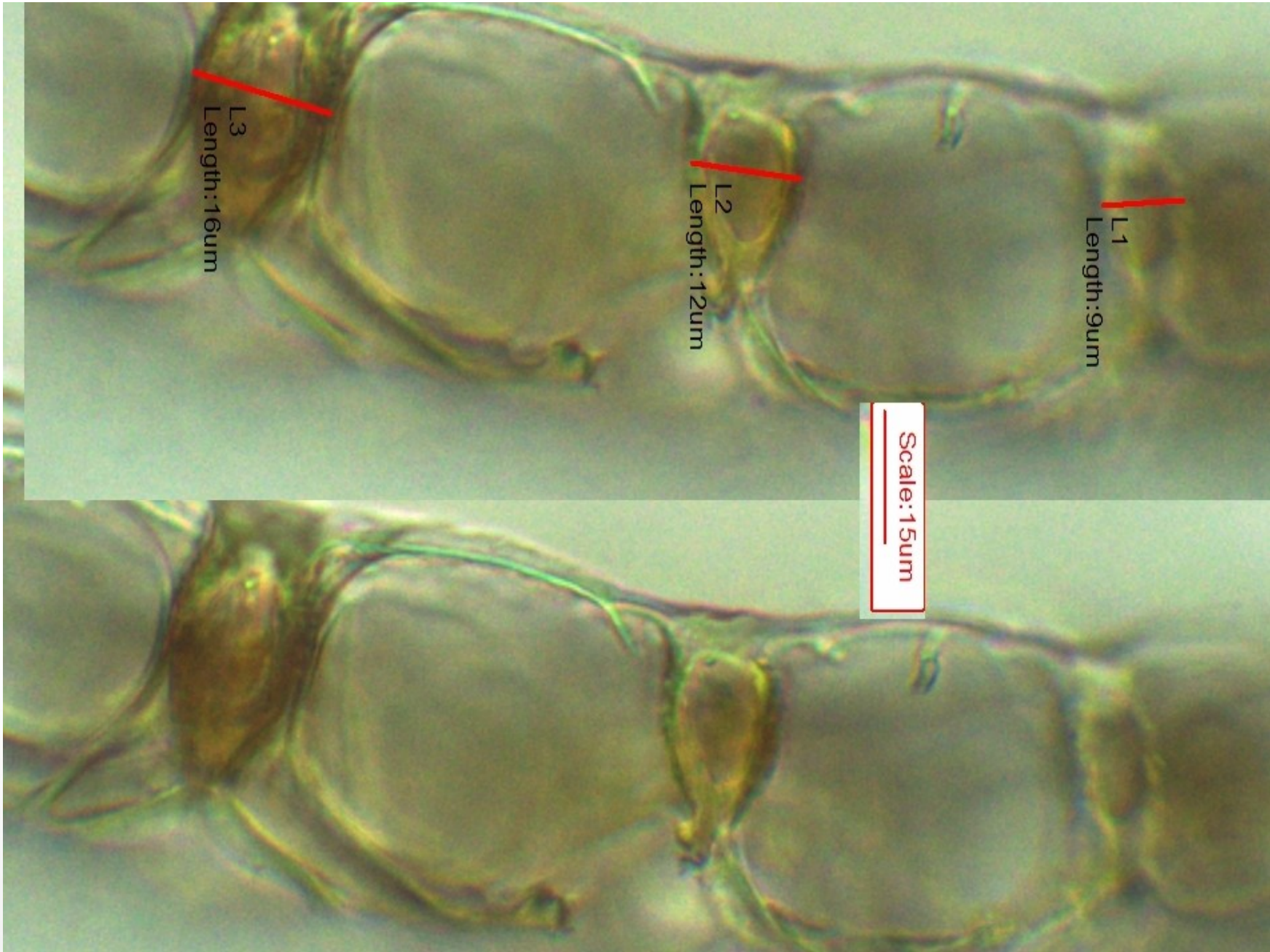
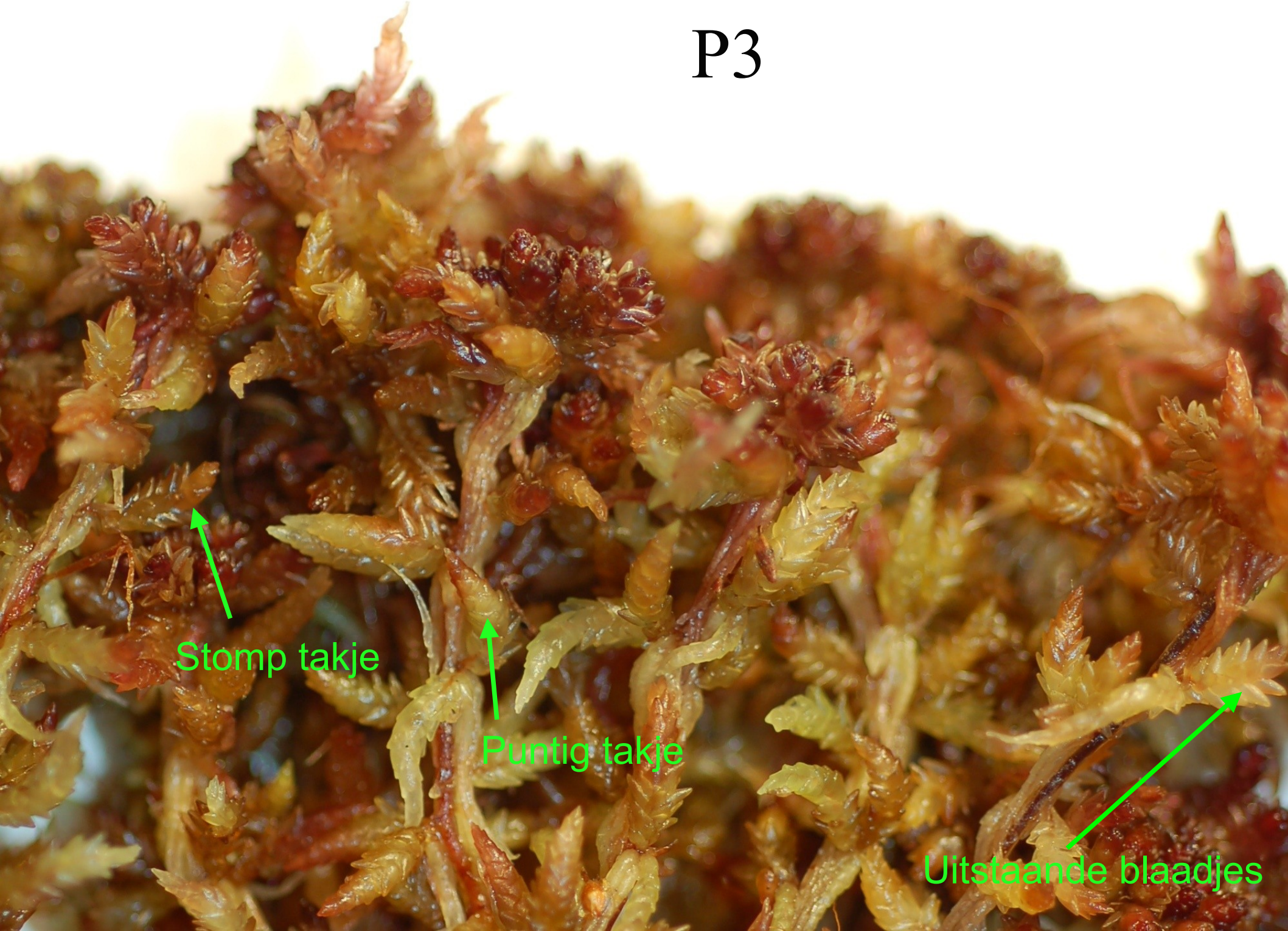
Weer zo’n oeps moment...
Wrattige tussenwanden
Wel mooi te zien:
Trio-poriën
Sphagnum papillosum dus

Chlorocyten: dikwandig, 9 – 12 mu

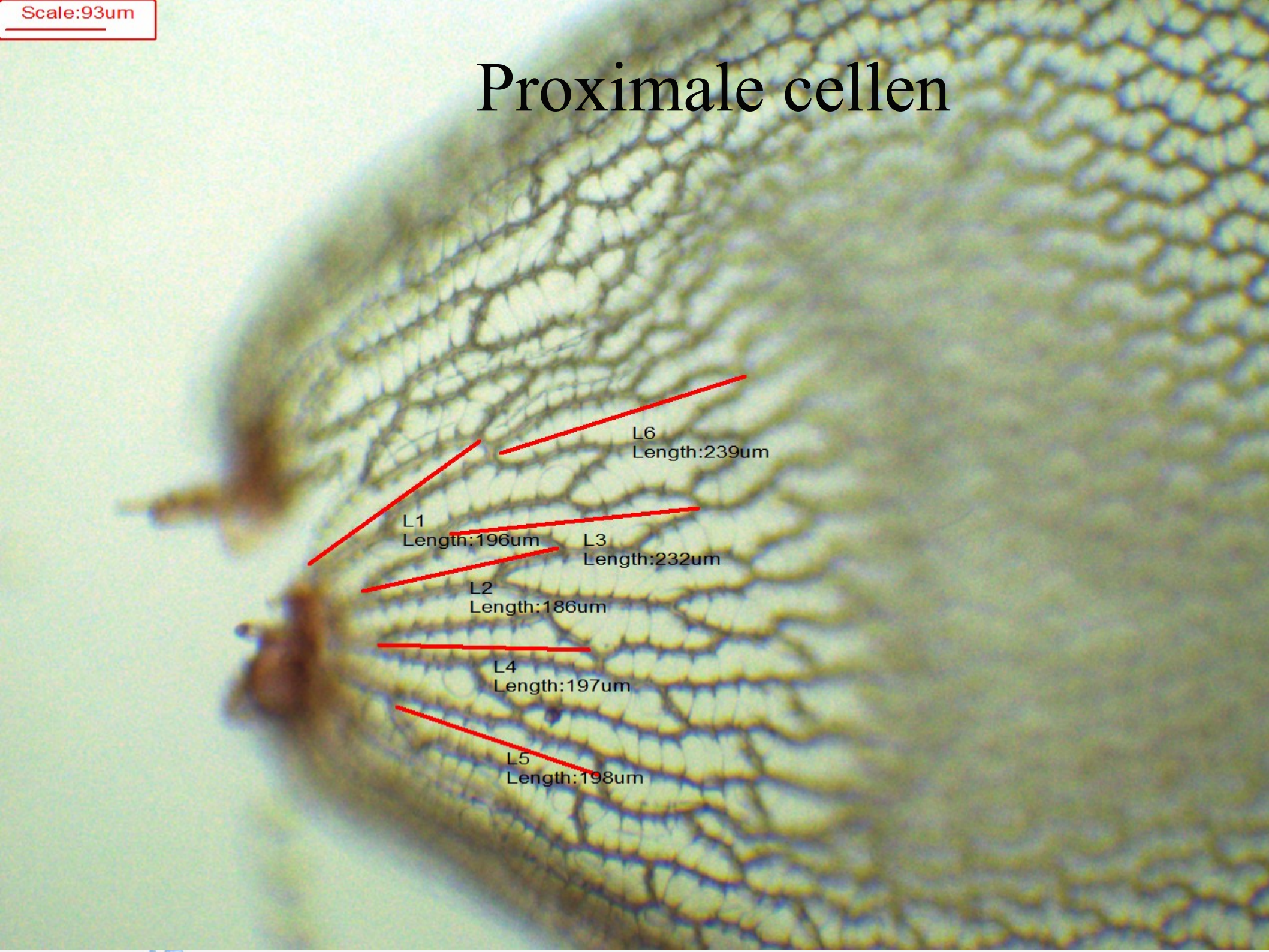


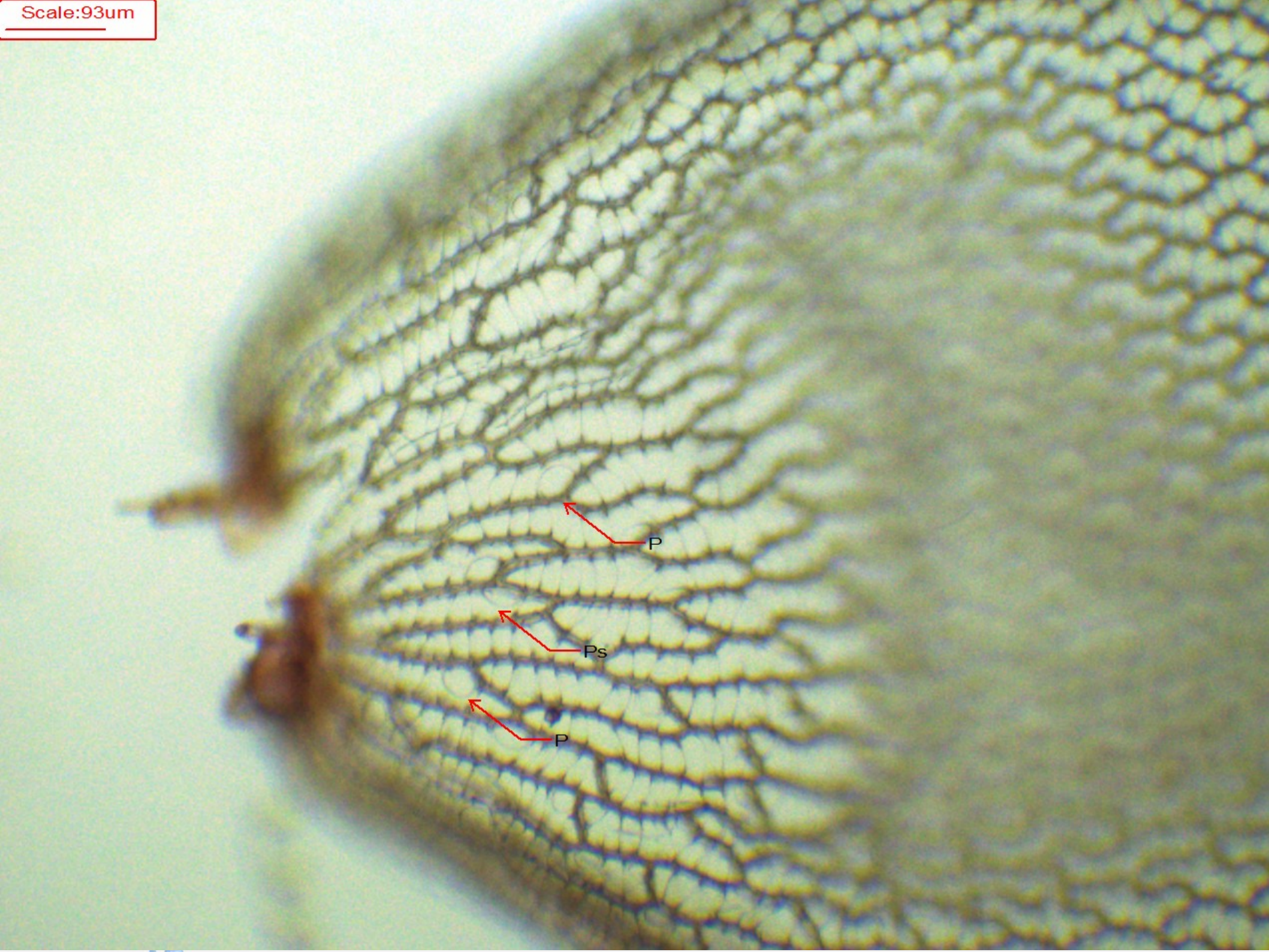
P3 typisch ‘LageLanden’ beeld

P3



Proximale cellen

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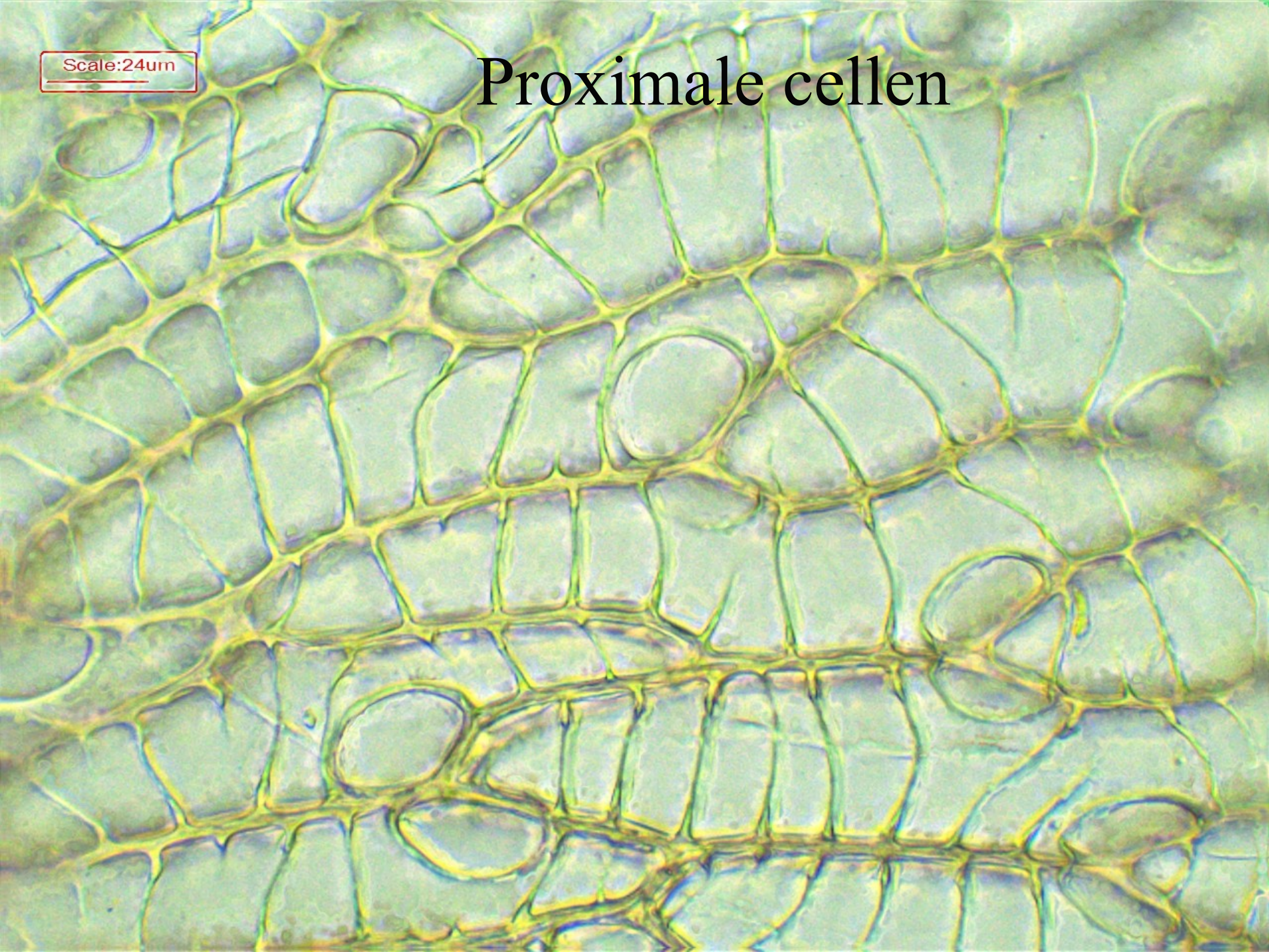
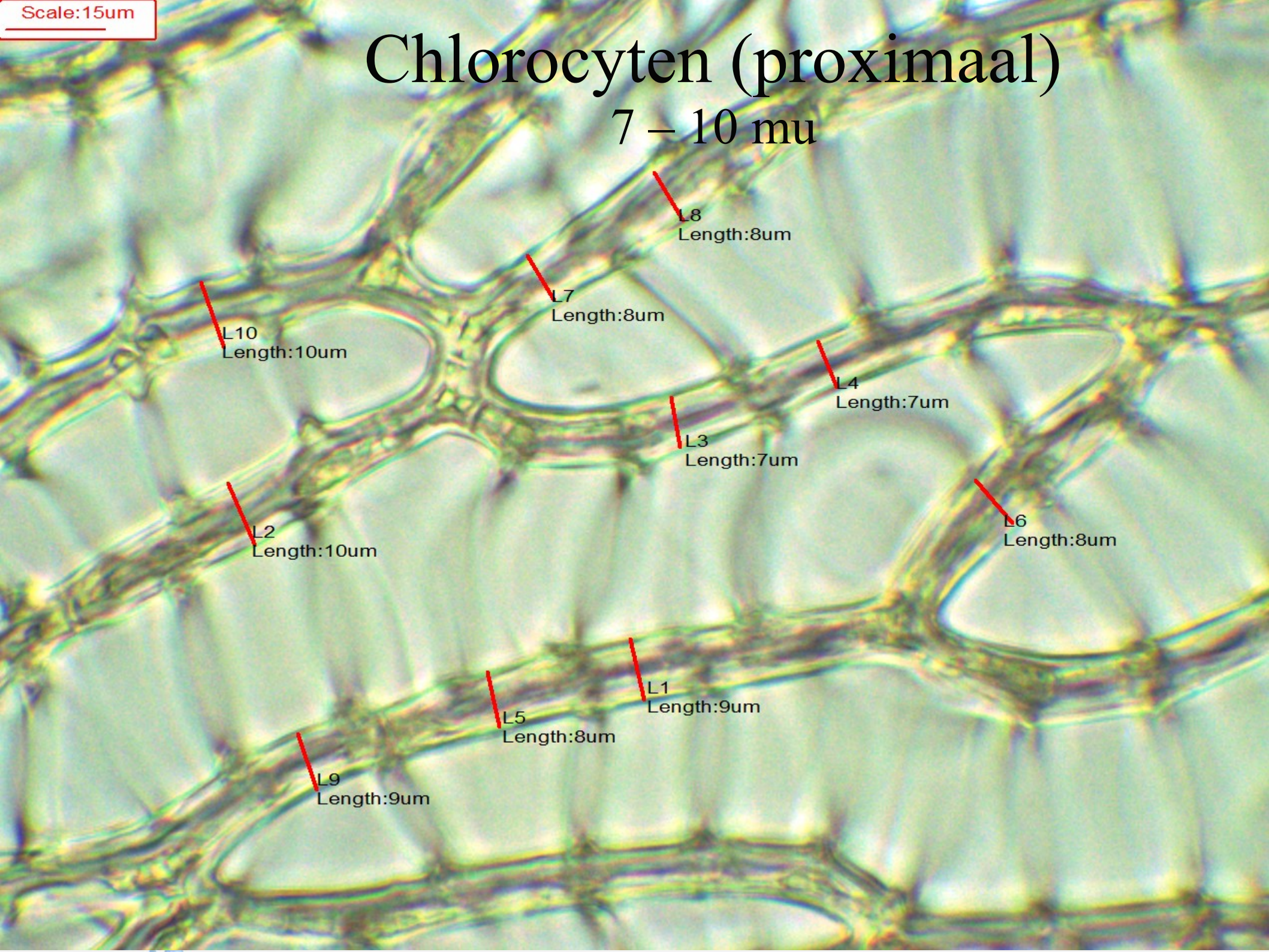


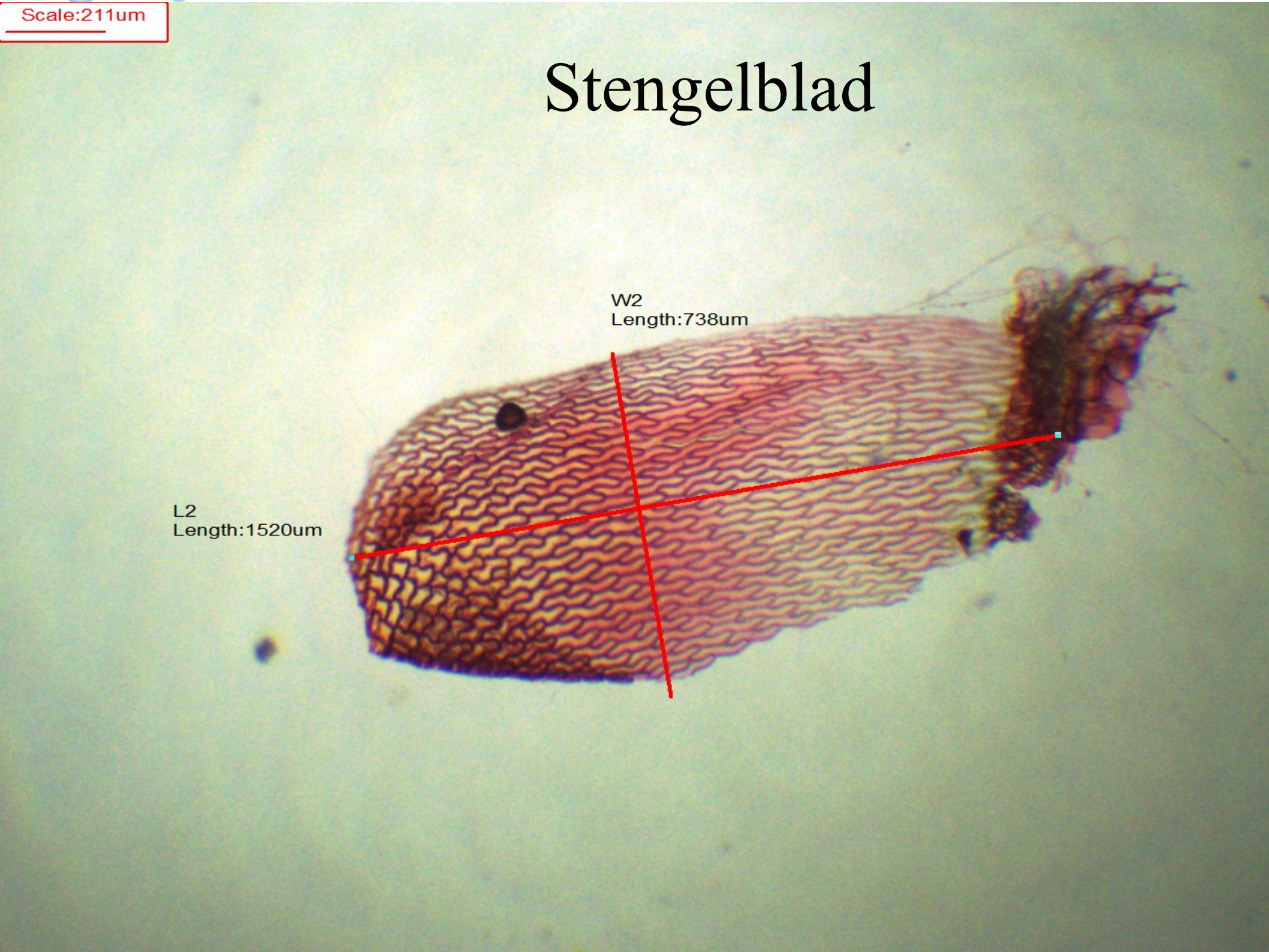
Proximale cellen

Chlorocyten (proximaal)

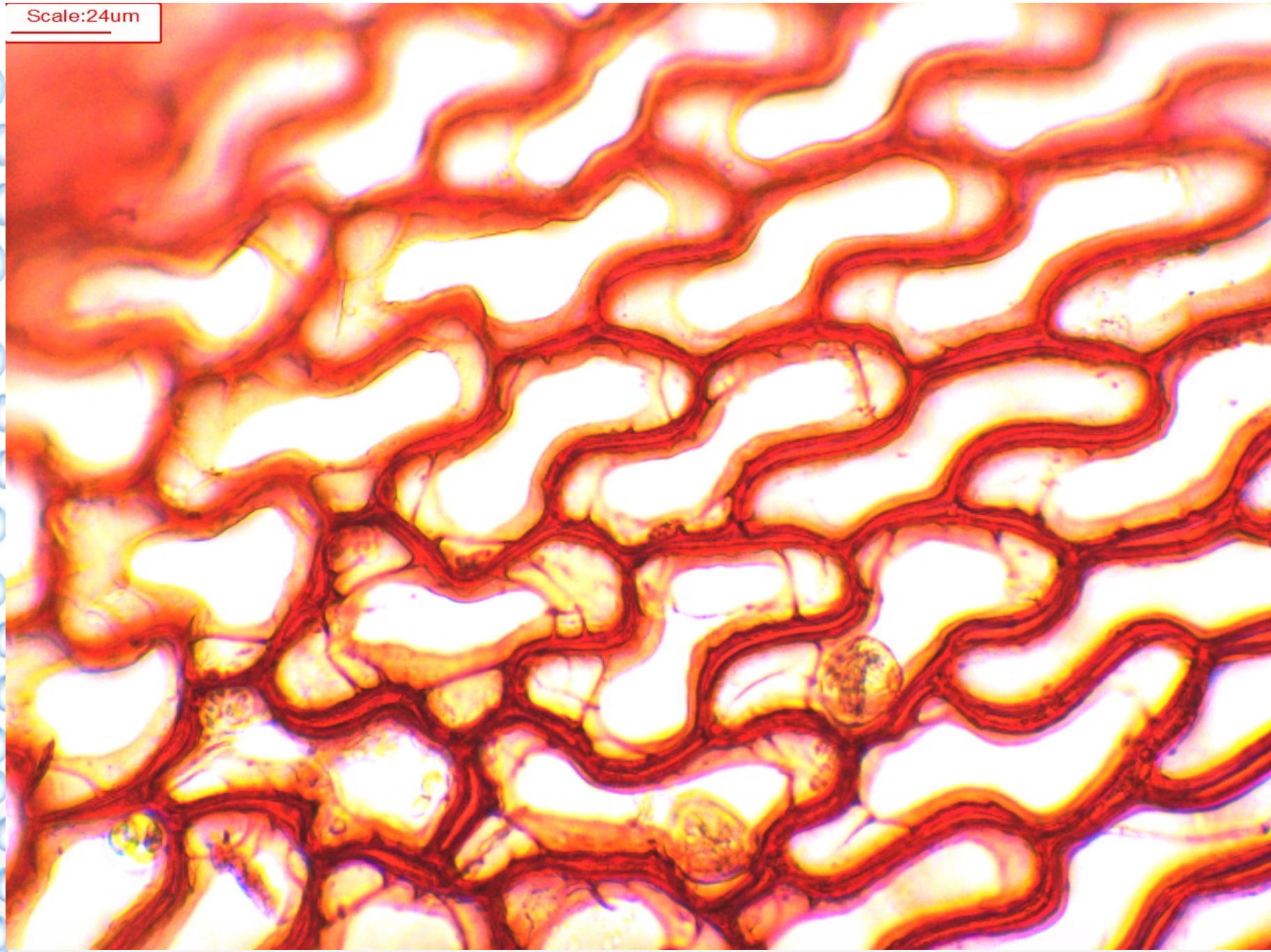
7 – 10 mu



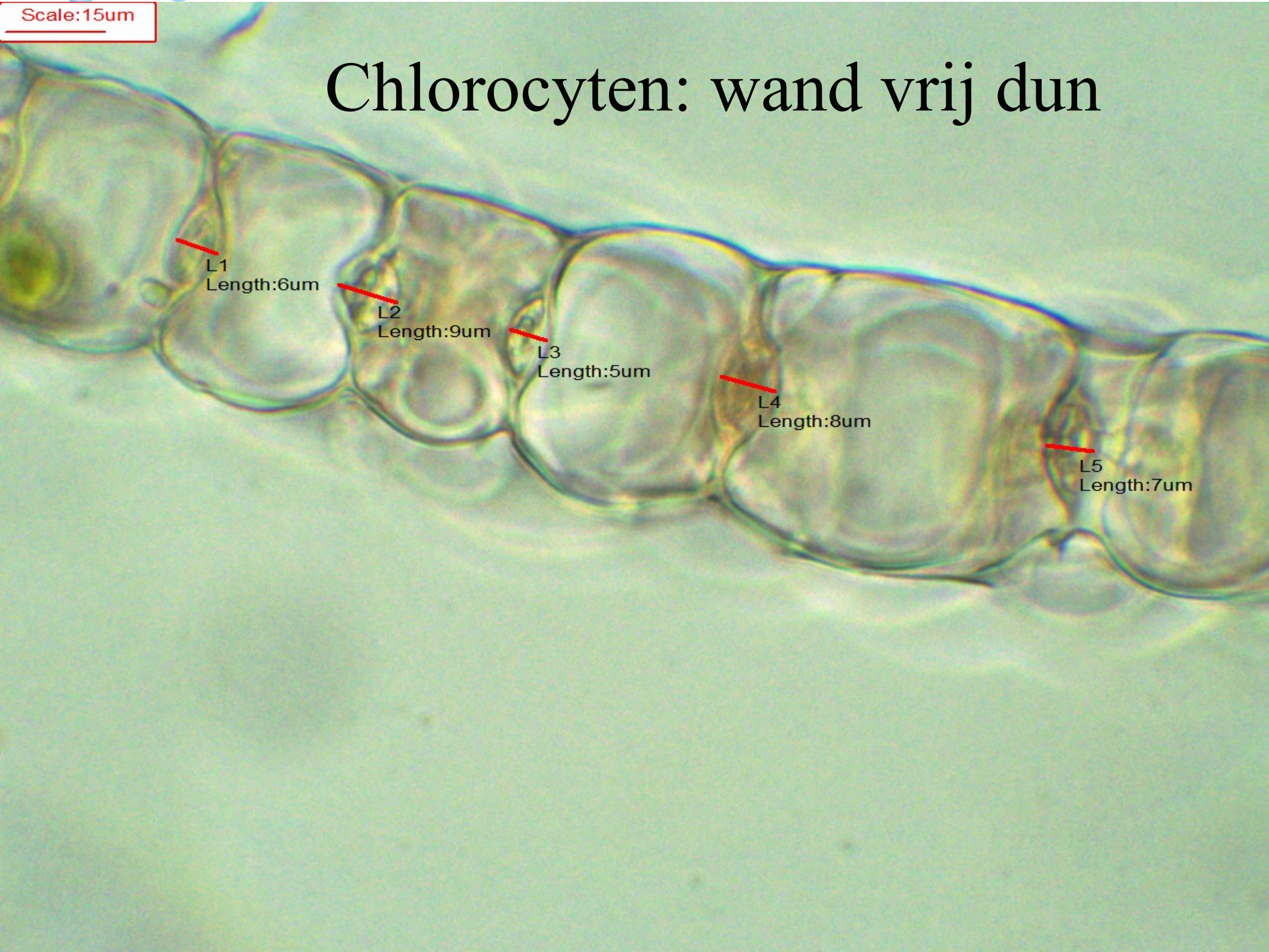
Stengelblad



St. Blad: grote ‘gaps’, vage fibrillen



Chlorocyten: wand vrij dun



Het overzicht
1 Habitus

Kenmerk	S. divinum	S. medium	S. “hierzo”
kleur	Rood tot groen	Diep rood	Rood tot groen
takjes	Sliertig, spits	Kort, stomp	Spits tot stomp
lengte	10 – 20 mm	5 – 10 mm	5 – 15 mm
takblad	Aanliggend	Afstaand	Meest afstaand

Het overzicht
2 St. blad

Kenmerk	S. divinum	S. medium	S. “hierzo”
Septae	niet	vaak	niet
Fibrillen + porien	Niet - wel	Niet – onduidelijk	vaak
gaps	Schaars – algemeen	Schaars – soms algemeen	meestal

Het overzicht
3 Takblad

Kenmerk	S. divinum	S. medium	S. “hierzo”
top	Concave curved	Convex curved	… curved
breedte	1.2 – 1.6 mm	1 – 1.2 mm	0.8 - 1.2 mm
hyalocyst poriën (proximaal)	1 – 5 smal	1 -2 groot	1 groot, 1-2 smal
chlorocysten	dunwandig	dikwandig	Dun – iets verdikt
chlorocysten			5 – 10 (-12) mu

Conclusie

- In Nederland
  - (voorlopig) (alleen)
  - Sphagnum medium
- Waar:
  - Oligotrofe situaties : hoogveen

?

- Ja, vast wel
- Antwoorden: hm, misschien

- Komt Sphagnum divinum dan echt niet voor?
  - Nou, voorlopig niet
- Hebben jullie dan alles al bekeken?
  - Nou, voorlopig niet
    - Nee, er staan nog een “paar” dozen
    - Nee, ik wil graag buiten kijken

ALS ER GENETISCH ONDERSCHEID IS ...

Waar zit dan het morfologische onderscheid?

"Pooling them together in for example ecological or genomic studies could give misleading results if they indeed belong to different taxa"

- BETROUWBAAR onderscheid op VELD kenmerken
- Sociologen willen bedekkingen schatten:
- S.papillosum <=> S. palustre <=> S. medium **c.s.**

PKN excursie Lengelermoor

Samenvatting

Er zijn in Europa 2 groepen planten

- Genetische verschillen
- Scheiding blijft bestaan in ‘common garden’ proeven

Nederlands materiaal, voorzover bekeken

- heeft (in dezelfde plant)
- Kenmerken van S. medium en S. divinum

Komt het meest overeen met S. medium

- Kenmerken
- Areaal

Sphagnum medium,
aangenaam kennis te maken.