

Photosynthetic performance, cell wall composition, and contaminant dynamics in intertidal *Fucus vesiculosus*

Presented by Carme Pacín

Intertidal habitats



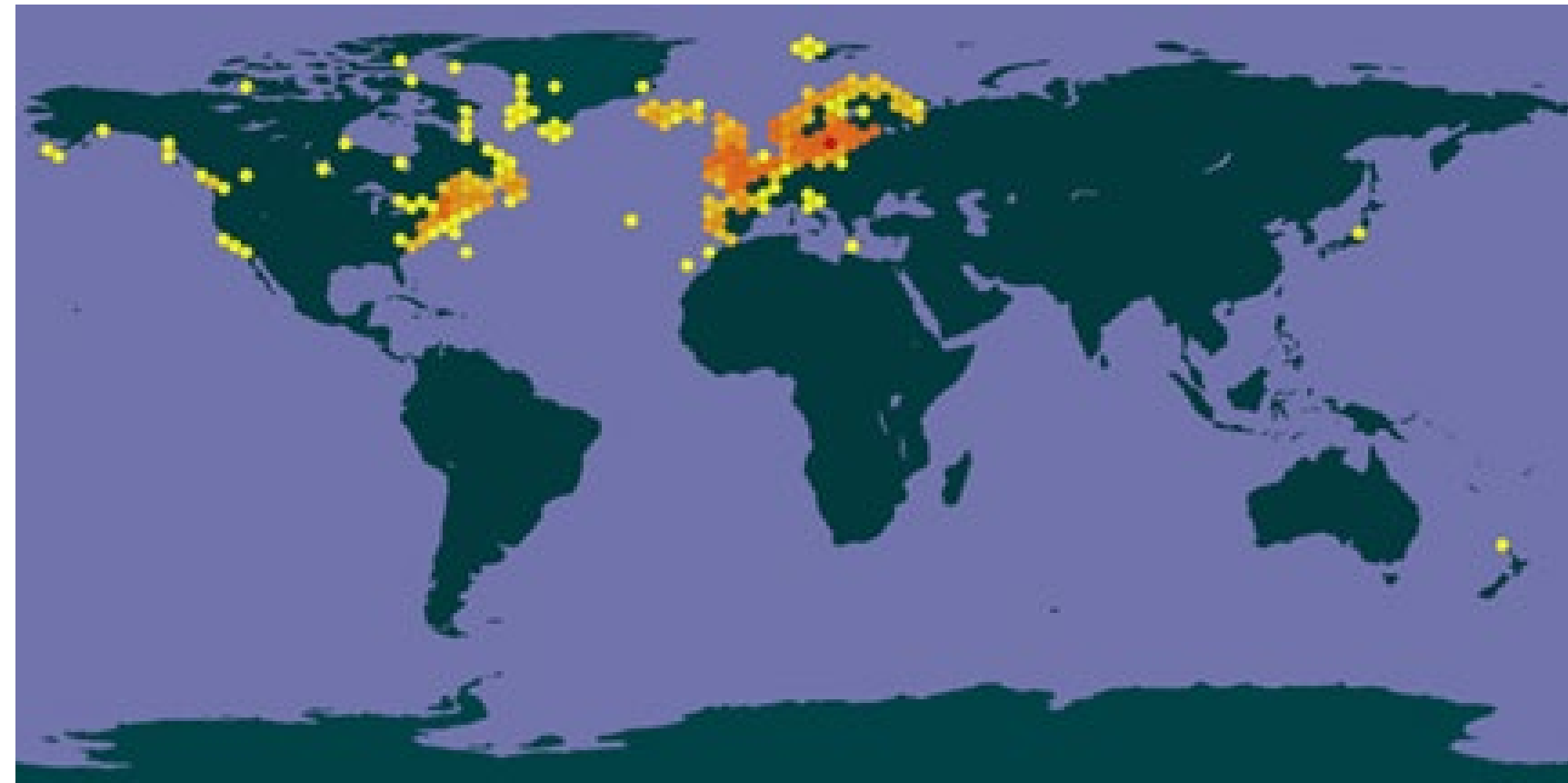
Intertidal habitats



Increased hydric stress



Fucus vesiculosus



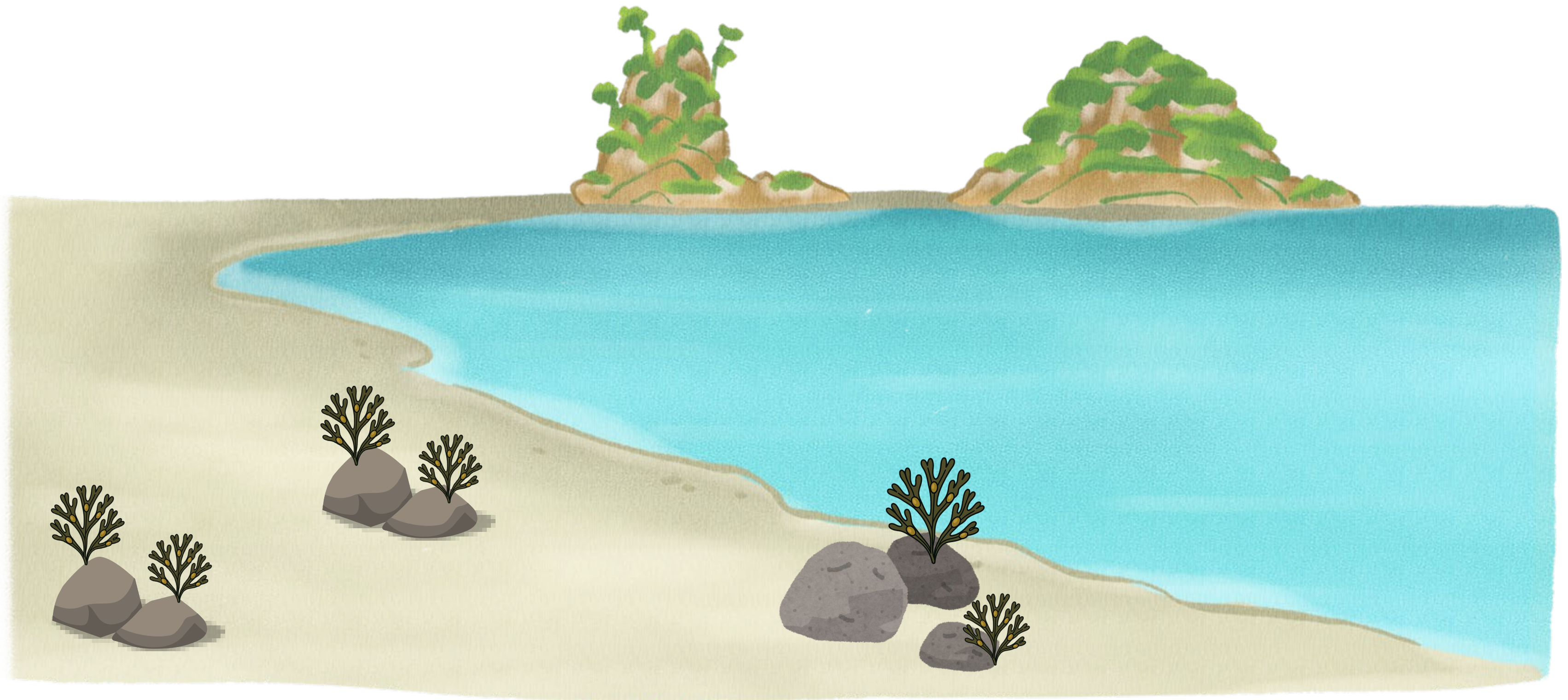
Fucus vesiculosus L. distribution (GBIF.org)



How does *Fucus vesiculosus* responds to emersion stress?



Shore gradient



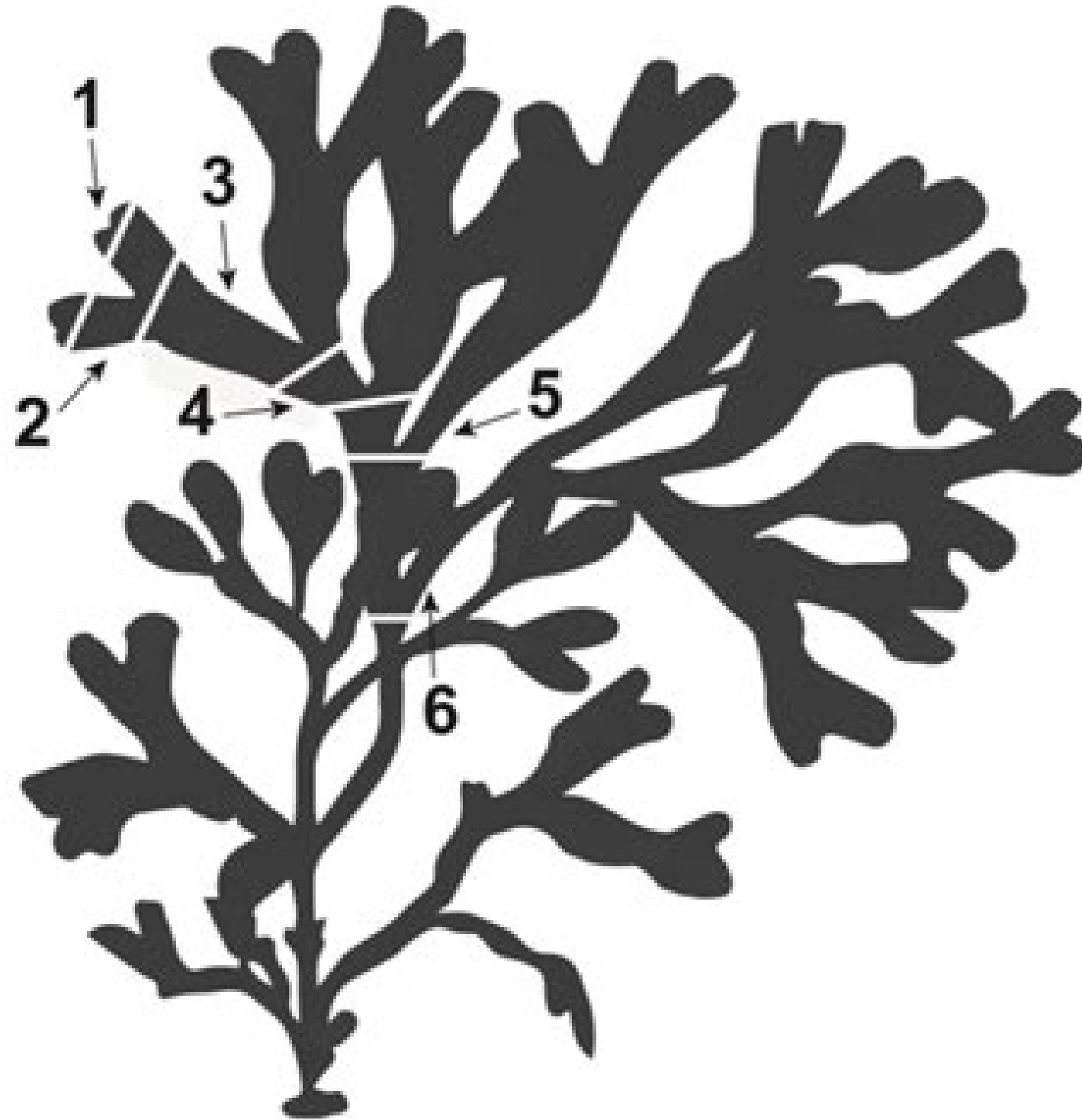
Topography



Vertical micro -topography
matters!



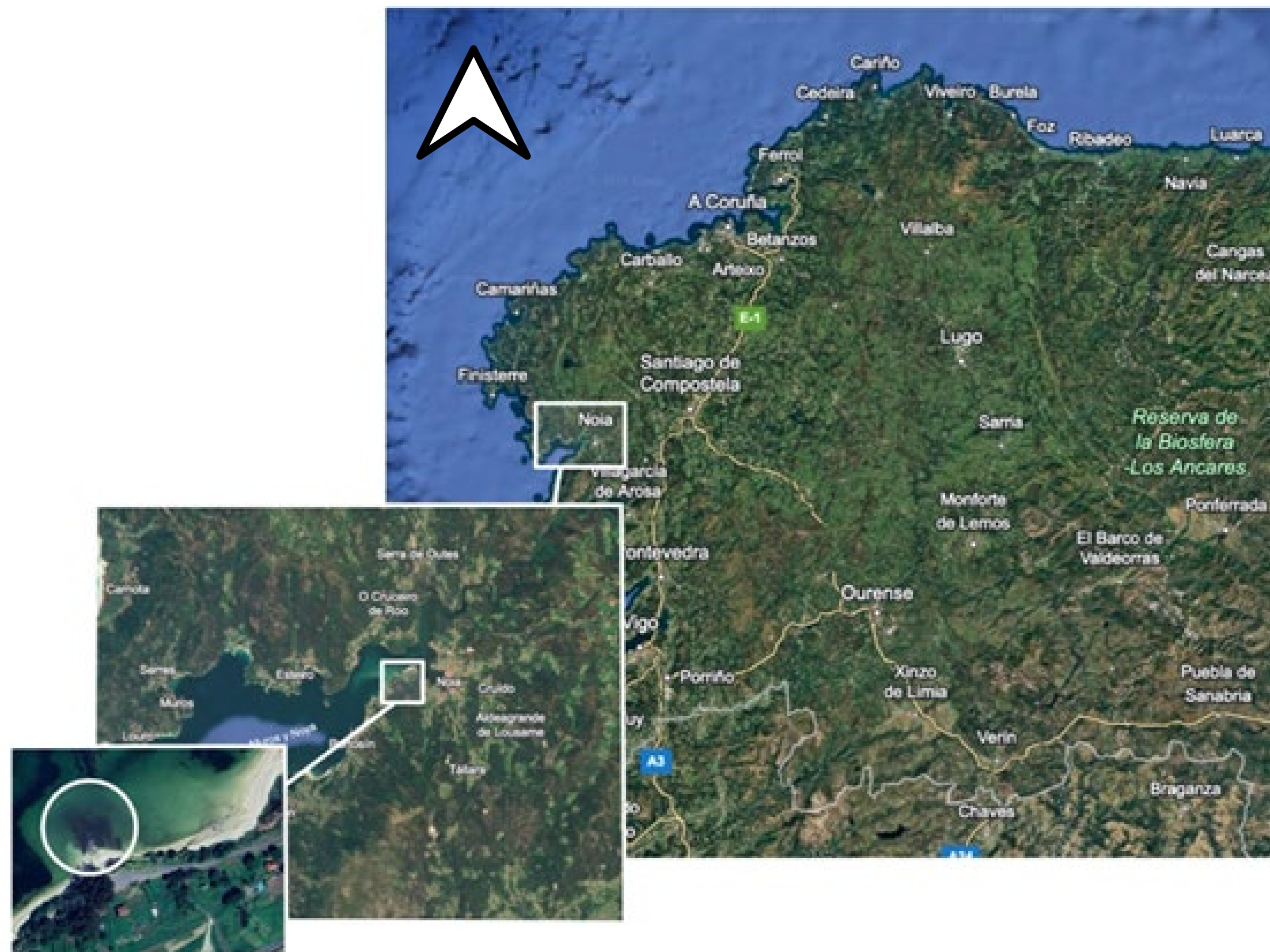
Dichotomies



Thallus as an homegeneized
structure?



Field work



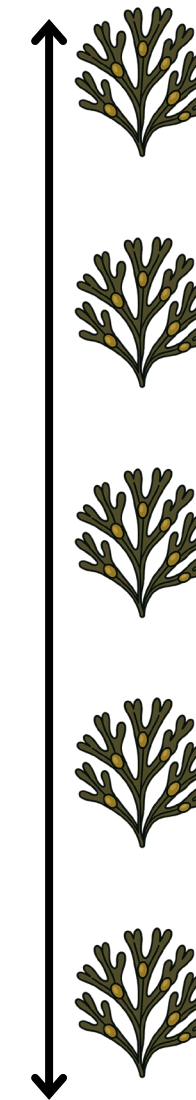
Galicia
(NW Spain)



Field work

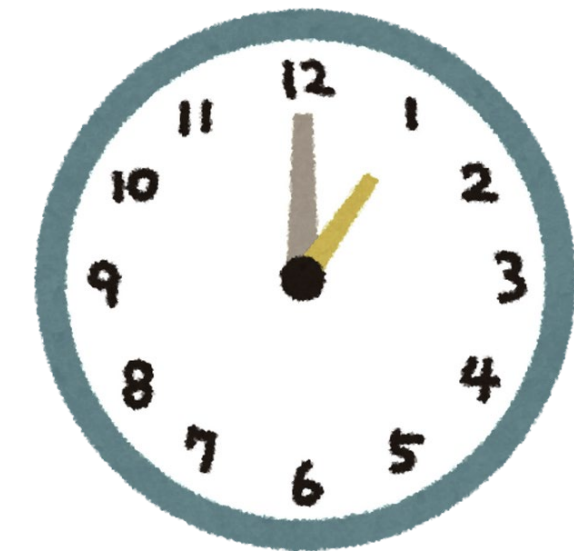


Sea

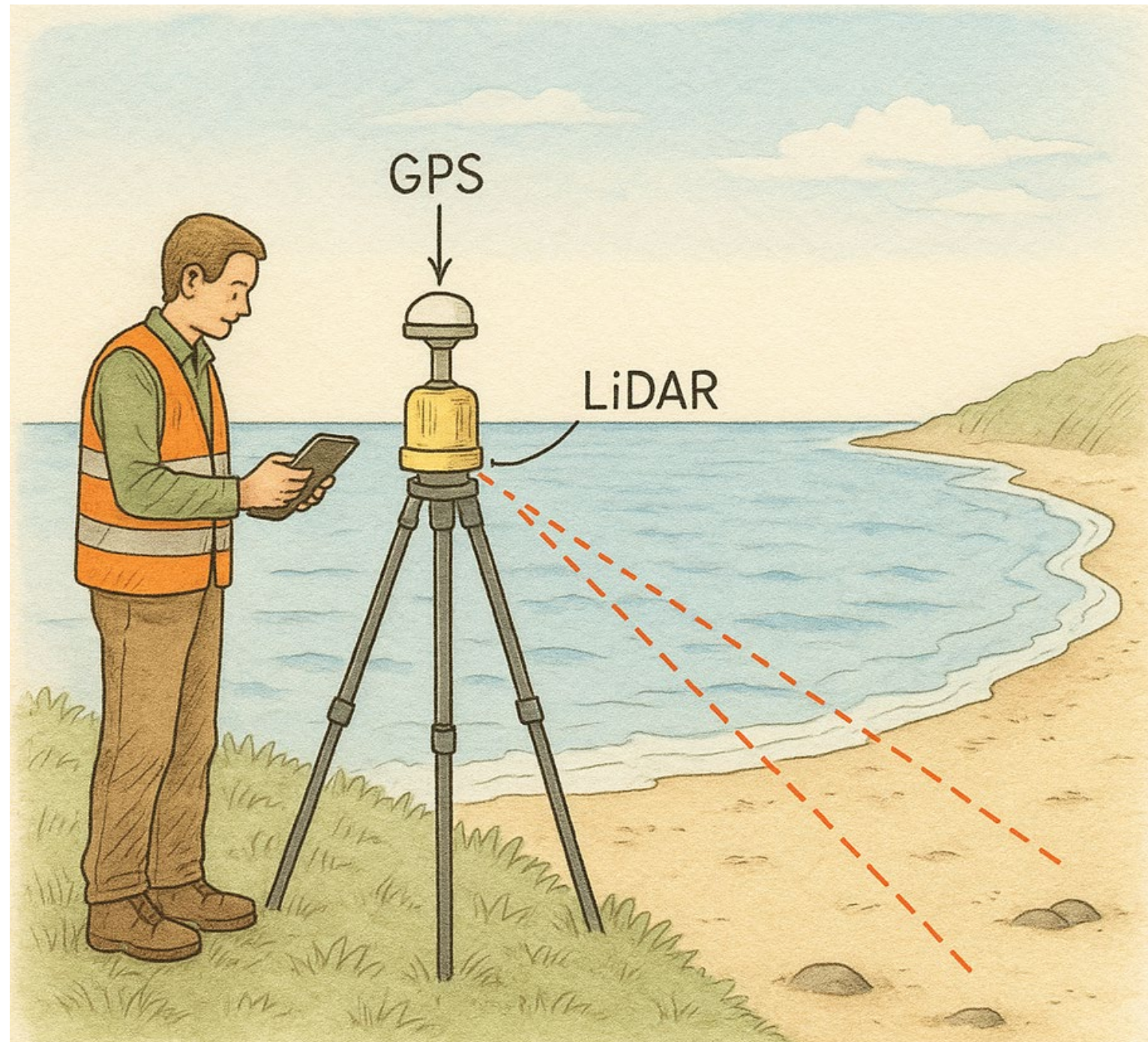


Land

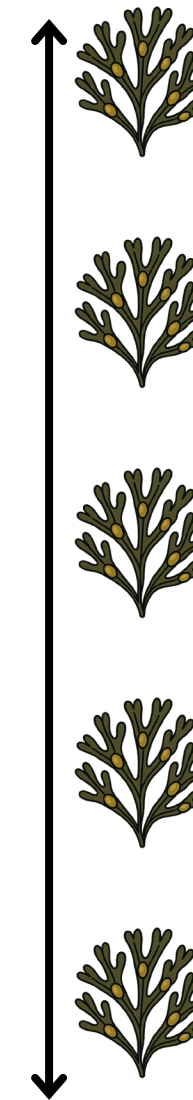
Tidal cycle



Field work

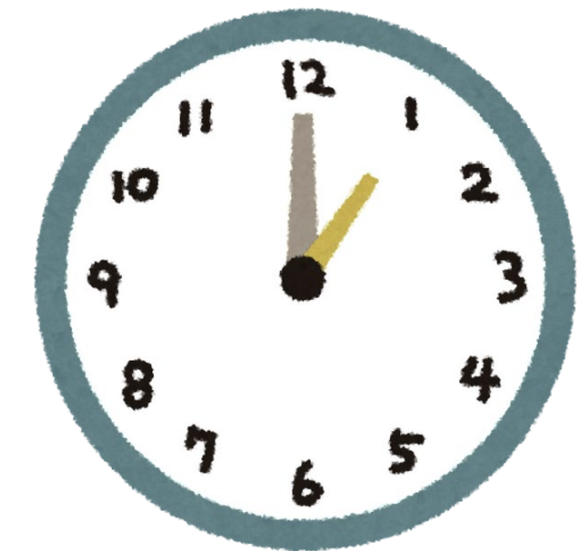


Sea



Land

Tidal cycle



Laboratory work



- 3 positions (shore gradient)
- 3, 6 hours simulating low tide
- 12 hours recovery



Emersion stress

Chlorophyll
fluorescence



F_v/F_m

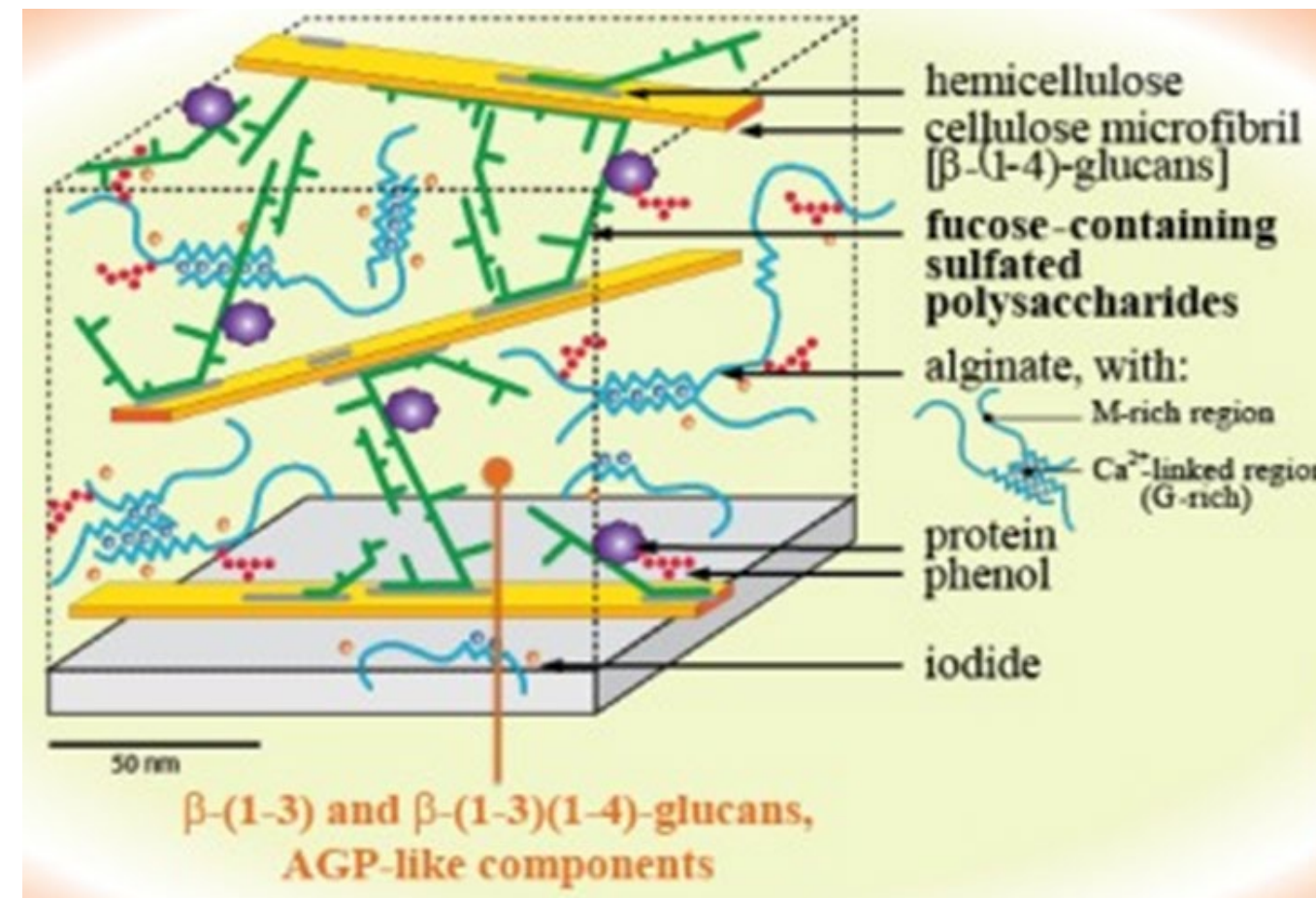


Emersion stress

Cell wall composition



FTIR-ATR



(Deniaud -Bouët et al., 2017)



Pollution patterns

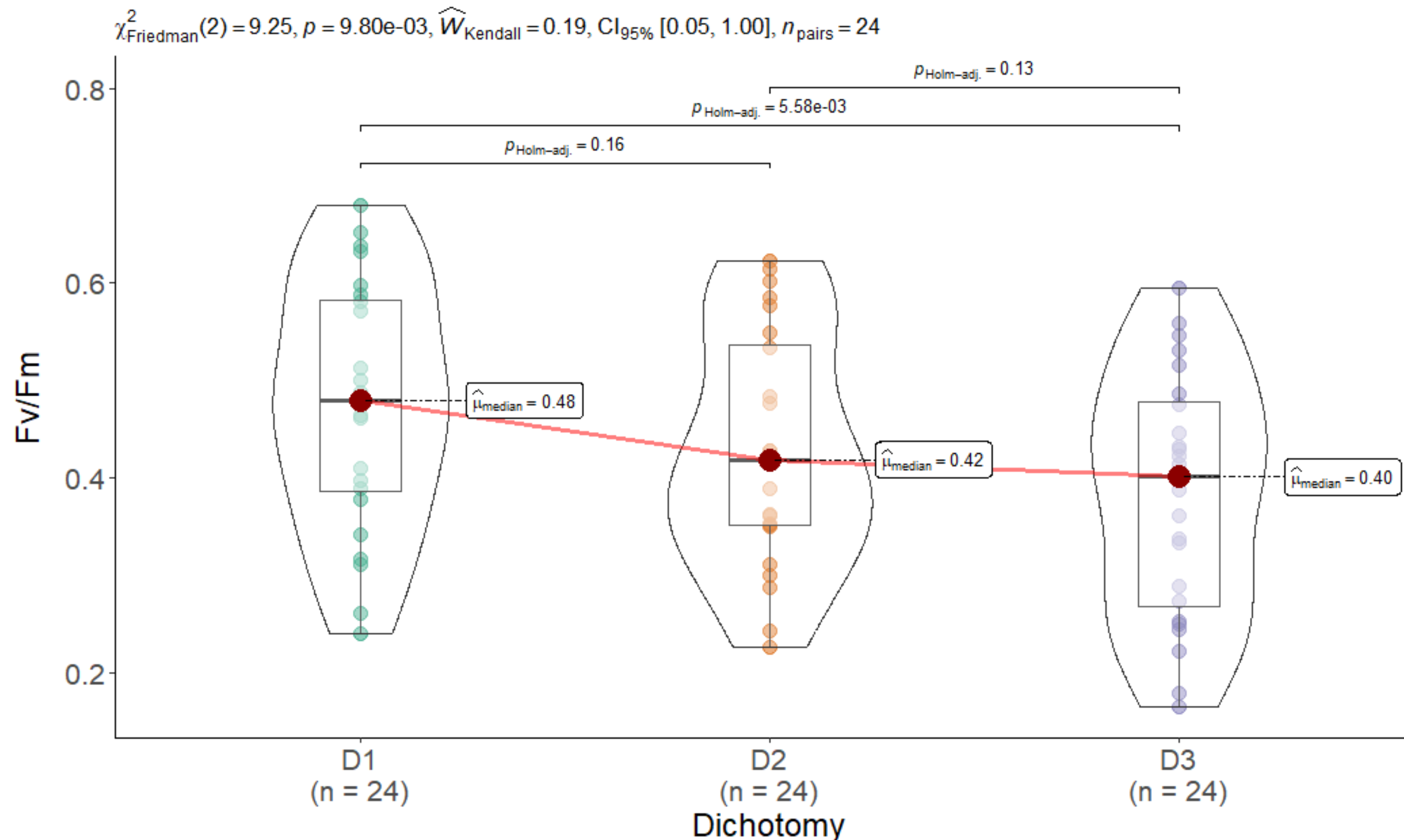
hydrogen 1 H 1.0079												helium 2 He 4.0026																							
lithium 3 Li 6.941		beryllium 4 Be 9.0122														boron 5 B 10.811		carbon 6 C 12.011		nitrogen 7 N 14.007		oxygen 8 O 15.999		fluorine 9 F 18.998		neon 10 Ne 20.180									
sodium 11 Na 22.990		magnesium 12 Mg 24.305														aluminum 13 Al 26.982		silicon 14 Si 28.086		phosphorus 15 P 30.974		sulfur 16 S 32.065		chlorine 17 Cl 35.453		argon 18 Ar 39.948									
potassium 19 K 39.098		calcium 20 Ca 40.078		scandium 21 Sc 44.956		titanium 22 Ti 47.867		vanadium 23 V 50.942		chromium 24 Cr 51.996		manganese 25 Mn 54.938		iron 26 Fe 55.845		cobalt 27 Co 58.933		nickel 28 Ni 58.693		copper 29 Cu 63.546		zinc 30 Zn 65.38		gallium 31 Ga 69.723		germanium 32 Ge 72.64		arsenic 33 As 74.922		selenium 34 Se 78.96		bromine 35 Br 79.904		krypton 36 Kr 83.798	
rubidium 37 Rb 85.468		strontium 38 Sr 87.62		yttrium 39 Y 88.906		zirconium 40 Zr 91.224		niobium 41 Nb 92.906		molybdenum 42 Mo 95.96		technetium 43 Tc [98]		ruthenium 44 Ru 101.07		rhodium 45 Rh 102.91		palladium 46 Pd 106.42		silver 47 Ag 107.87		cadmium 48 Cd 112.41		indium 49 In 114.82		tin 50 Sn 118.71		antimony 51 Sb 121.76		tellurium 52 Te 127.60		iodine 53 I 126.90		xenon 54 Xe 131.29	
caesium 55 Cs 132.91		barium 56 Ba 137.33														thallium 81 Tl 204.38		lead 82 Pb 207.2		bismuth 83 Bi 208.98		polonium 84 Po [209]		astatine 85 At [210]		radon 86 Rn [222]									
francium 87 Fr [223]		radium 88 Ra [226]																																	
						hafnium 72 Hf 178.49		tantalum 73 Ta 180.95		tungsten 74 W 183.84		rhenium 75 Re 186.21		osmium 76 Os 190.23		iridium 77 Ir 192.22		platinum 78 Pt 195.08		gold 79 Au 196.97		mercury 80 Hg 200.59													
						rutherfordium 104 Rf [261]		dubnium 105 Db [262]		seaborgium 106 Sg [266]		bohrium 107 Bh [264]		hassium 108 Hs [277]		meitnerium 109 Mt [268]		darmstadtium 110 Ds [271]		roentgenium 111 Rg [272]															

lanthanum 57 La 138.91		cerium 58 Ce 140.12		praseodymium 59 Pr 140.91		neodymium 60 Nd 144.24		promethium 61 Pm [145]		samarium 62 Sm 150.36		europium 63 Eu 151.96		gadolinium 64 Gd 157.25		terbium 65 Tb 158.93		dysprosium 66 Dy 162.50		holmium 67 Ho 164.93		erbium 68 Er 167.26		thulium 69 Tm 168.93		ytterbium 70 Yb 173.05		lutetium 71 Lu 174.97	
actinium 89 Ac [227]		thorium 90 Th 232.04		protactinium 91 Pa 231.04		uranium 92 U 238.03		neptunium 93 Np [237]		plutonium 94 Pu [244]		americium 95 Am [243]		curium 96 Cm [247]		berkelium 97 Bk [247]		californium 98 Cf [251]		einsteinium 99 Es [252]		fermium 100 Fm [257]		mendelevium 101 Md [258]		nobelium 102 No [259]		lawrencium 103 Lr [262]	

Emerssion stress, cell wall
composition and PTEs
content.

(Pourret & Hursthouse, 2019)

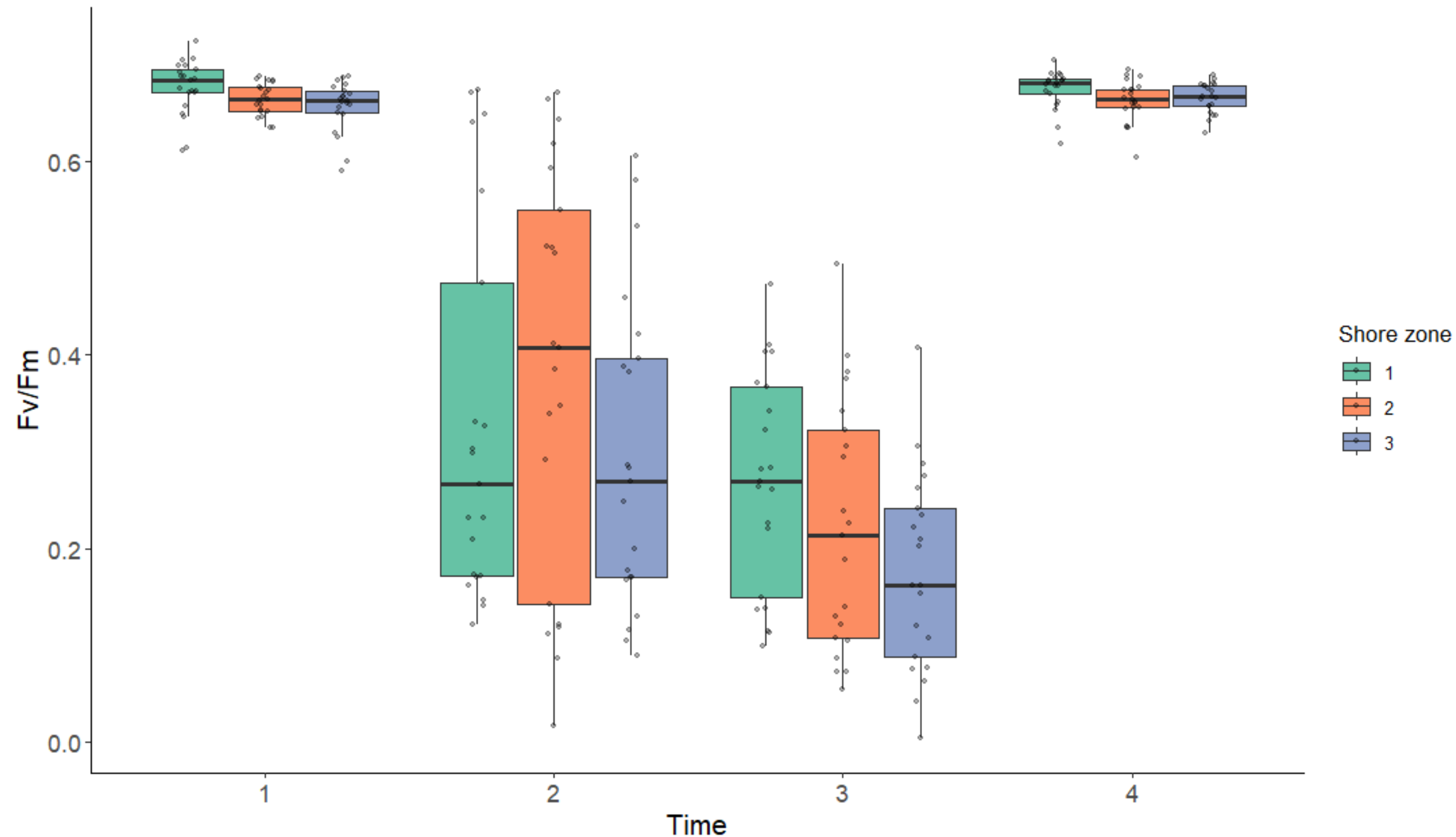
Photosynthetic efficiency: Dichotomies



Functional
heterogeneity
within an individual.

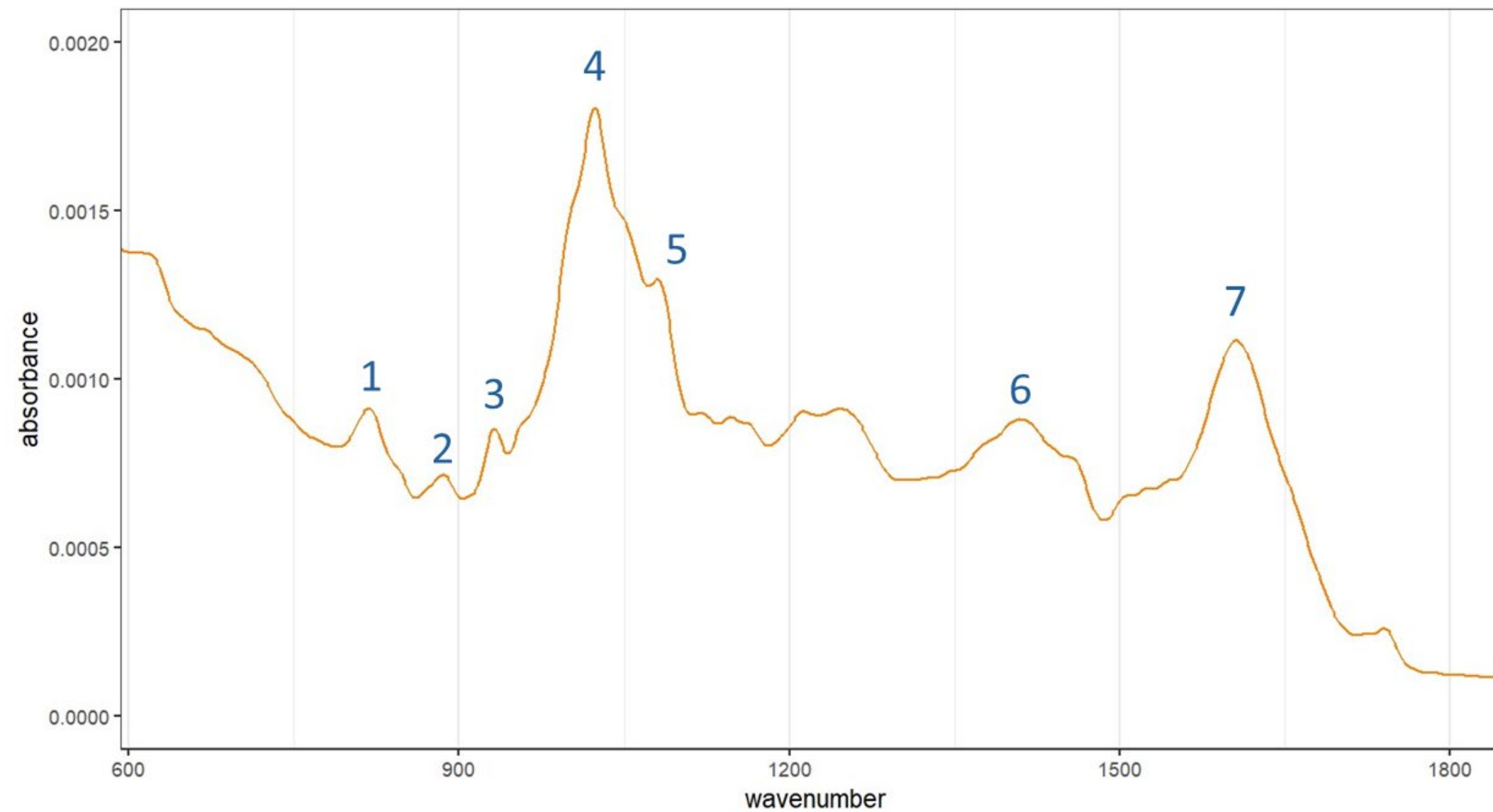


Photosynthetic efficiency: Shore gradient

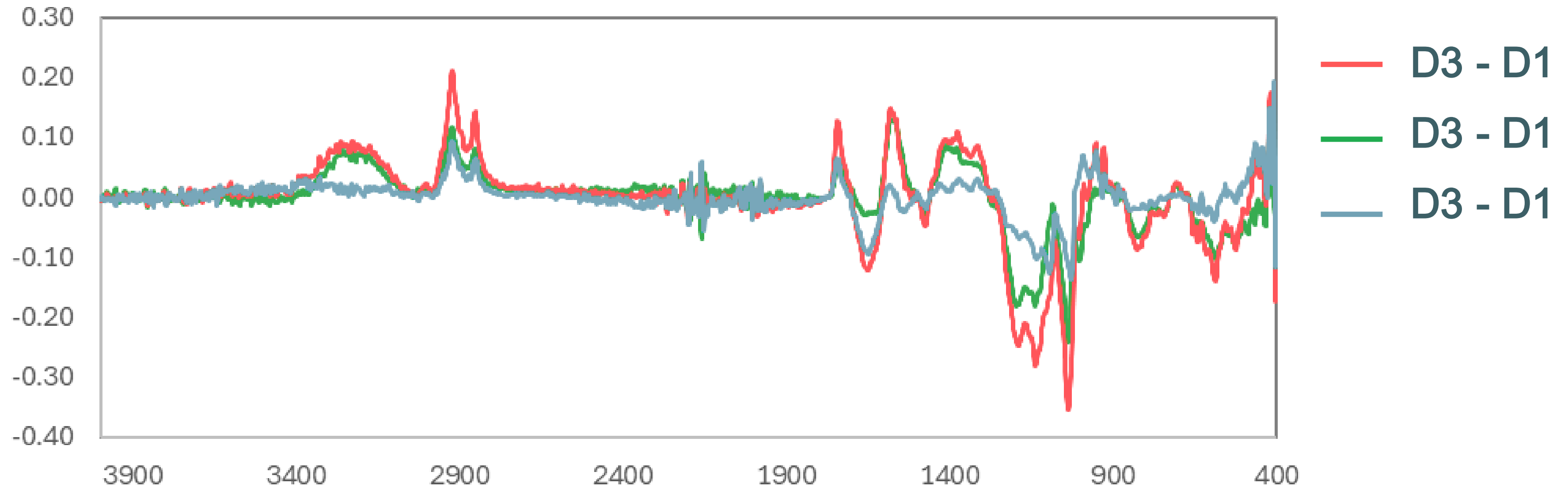


Higher Fv/Fm in
the lower
intertidal.

Cell wall composition



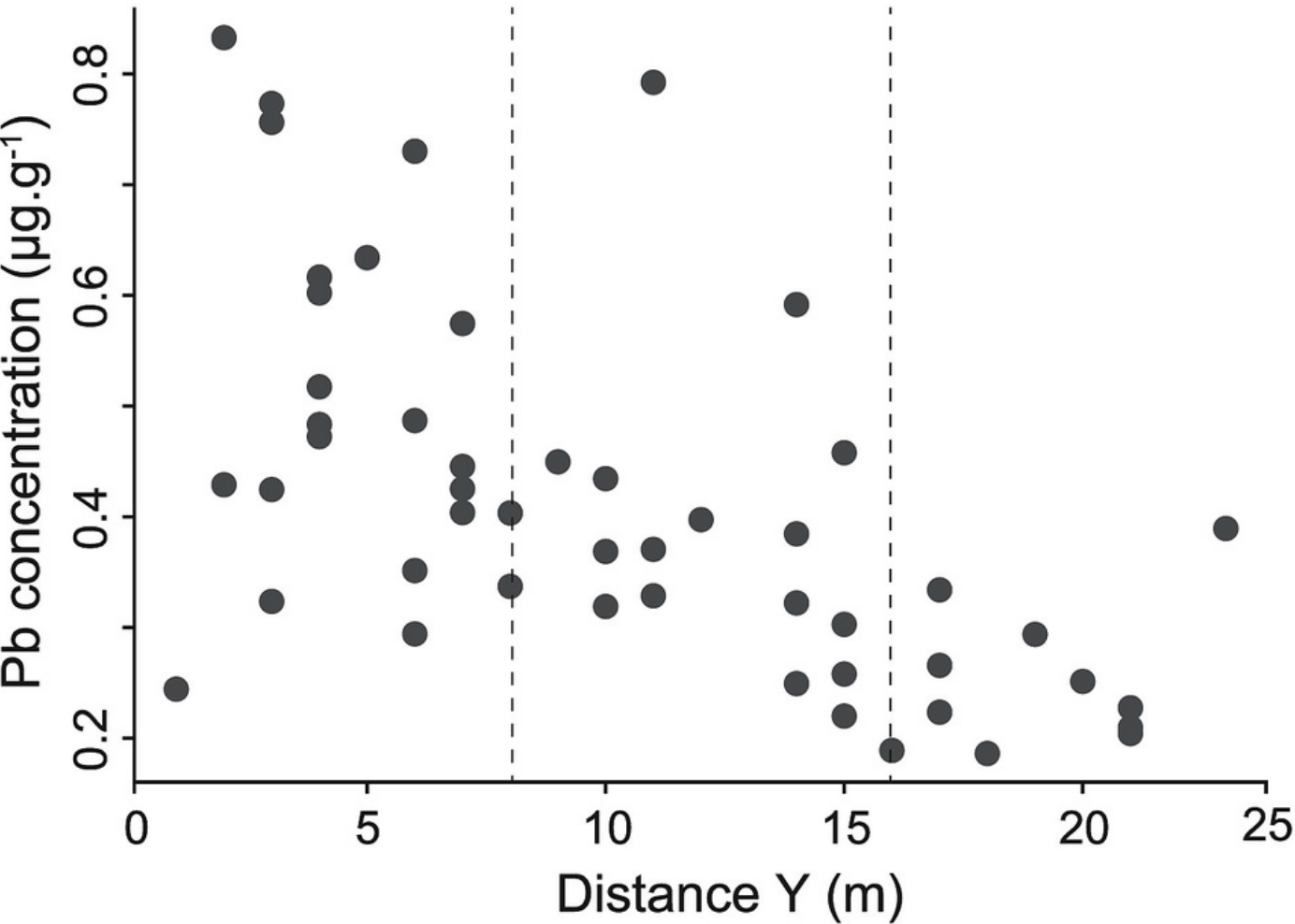
Cell wall composition



Still working on shore gradients

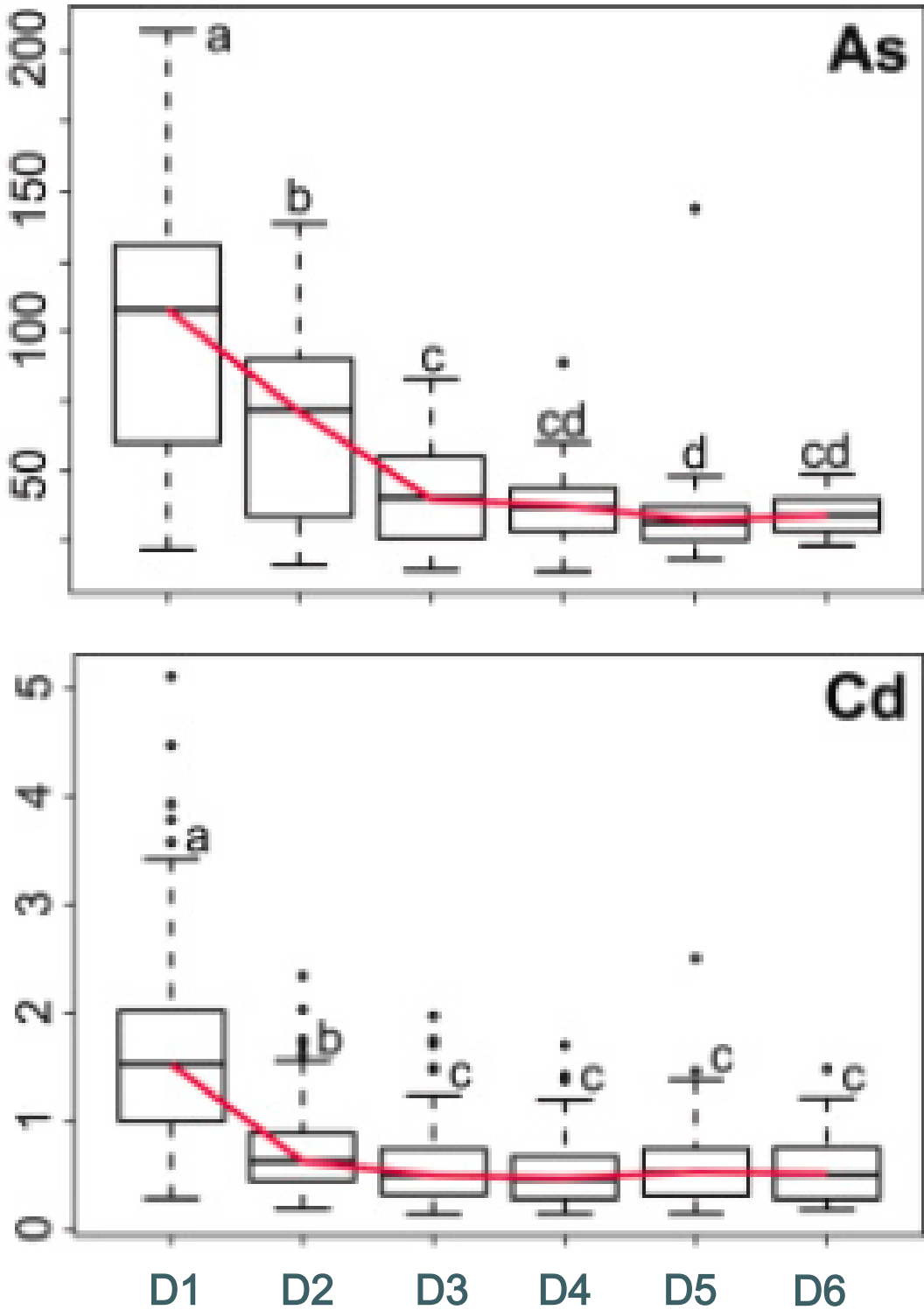


Pollution dynamics



(García-Seoane et al., 2019)

(García-Seoane et al., 2019)



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Thanks!

Funding:



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