

Where does the carbon go?

Carbon allocation patterns for *Vaccinium myrtillus* and *Vaccinium vitis-idaea* in forested- and open habitats in Norway

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1. Carbon allocation patterns

Carbon produced through photosynthesis, supports various plant structures and reflects how plants store energy [1] (Figure 1). Understanding how species allocate carbon can strengthen our knowledge of their resilience to climate change and change in their habitat.

2. The study

This study examines how *Vaccinium myrtillus* and *Vaccinium vitis-idaea* exhibit different patterns of carbon allocation across four locations in Norway, covering open and forested habitats.

3. Forest vs. open

▲ The locations are: Senja, Kautokeino, Lygra and Sogndal (Figure 2) Forested habitats provide a stable microclimate and milder seasons, while open habitats expose plants to weather extremes but offer more sunlight [2].

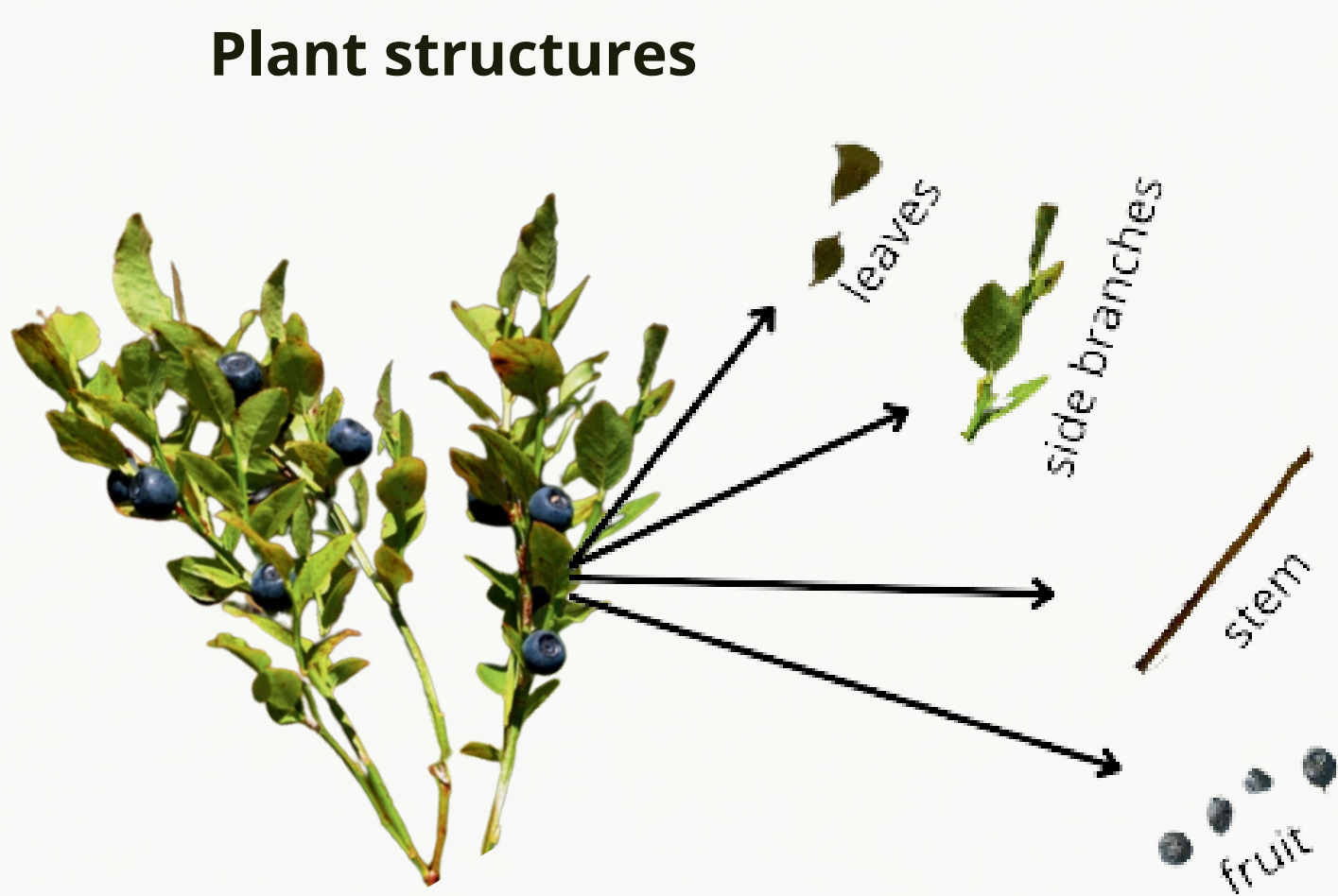
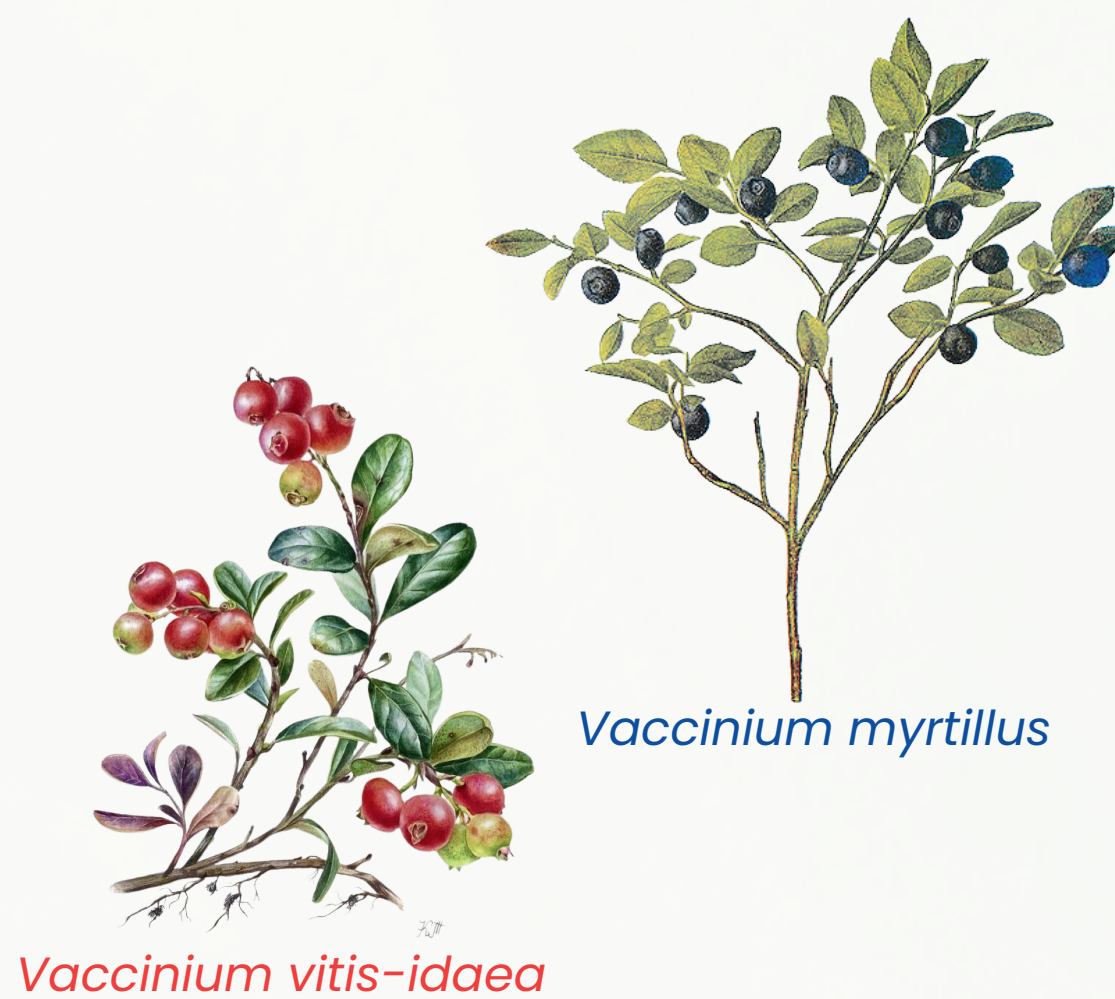


Figure 1: Plant structures above ground



Macro-climatic conditions

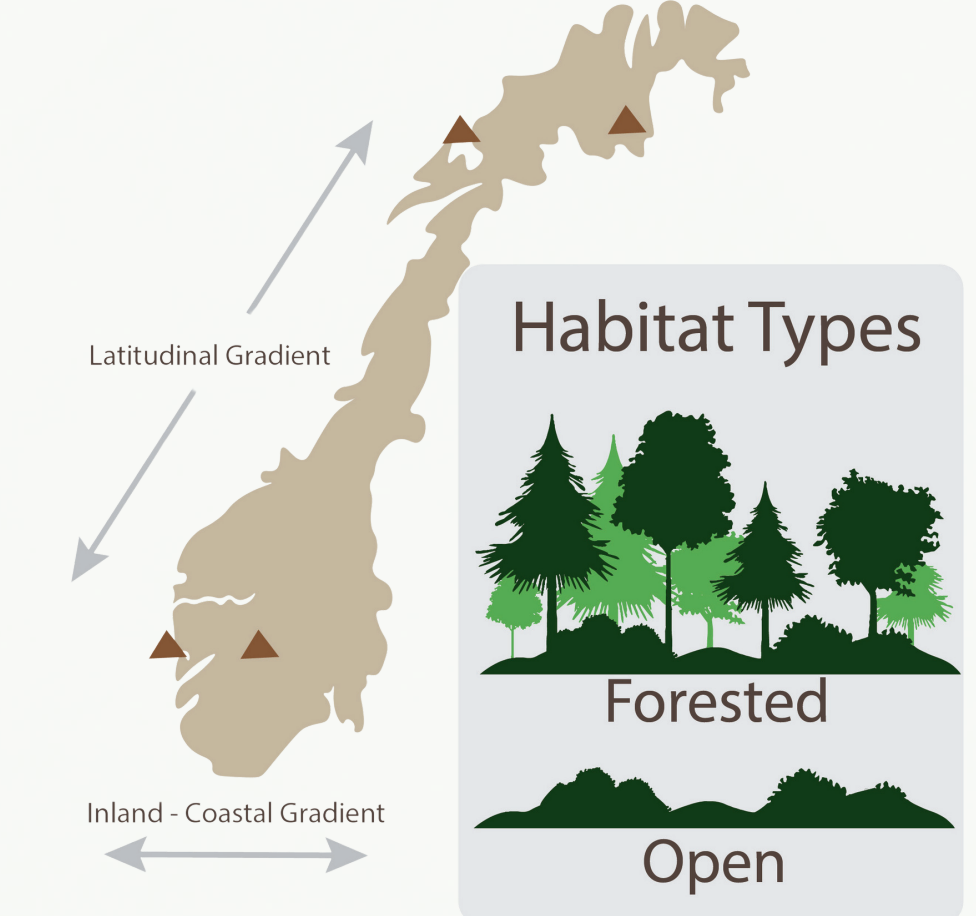


Figure 2: Locations of the samples, and illustration of open and forested habitat types.

4. Plant into biomass weight

The plant was measured, and divided into three segments, representing the growth from the past three years (Figure 3). The different segments were then dried and weighed.

Biomass production for one year

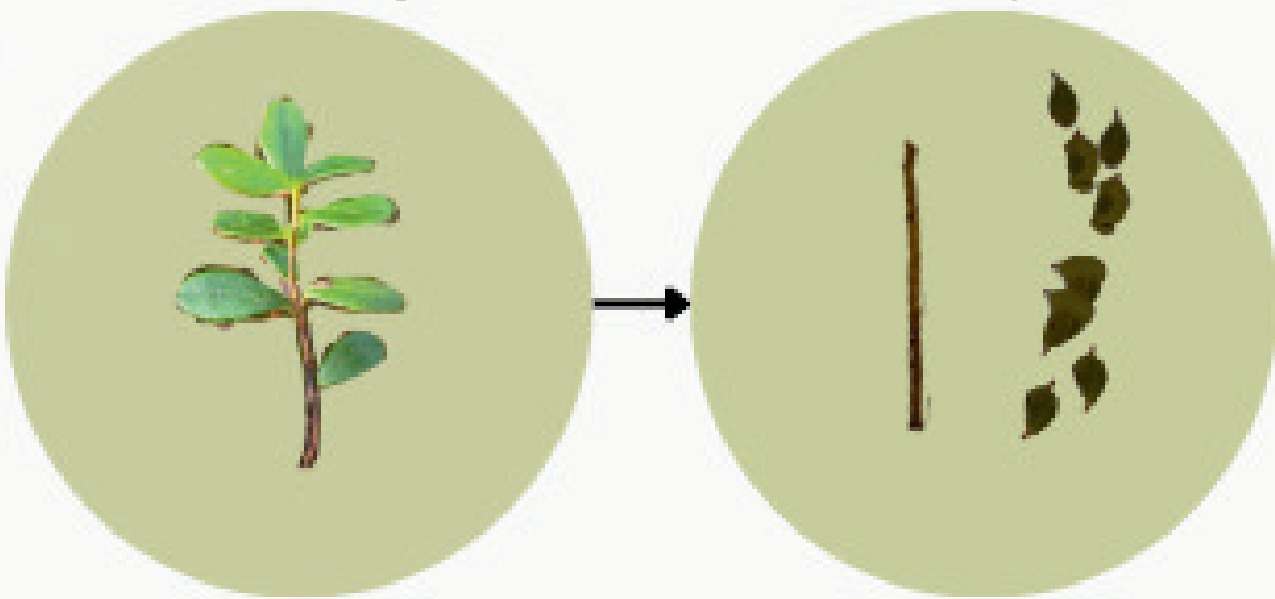


Figure 3: *Vaccinium vitis-idaea* separated into stem and leaves for one year's growth.

5. Leaf or stem investment?

- *V. myrtillus* suggests a higher investment in stem, especially for Lygra and Sogndal (Figure 4).
- Leaf investment is higher than stem for multiple samples of *V. vitis-idaea*.
- Forest in Senja shows a lower investment in leaves for *V. vitis-idaea* than other locations.

6. Future perspectives

Where does the carbon go? The results from Figure 4 indicates that *V. vitis-idaea* focus on photosynthesis, while *V. myrtillus* emphasize structural growth. An additional factor to consider is that *V. myrtillus* can photosynthesize in the stem, and not only grow taller or thicker.

Does *Vaccinium myrtillus* and *Vaccinium vitis-idaea* exhibit different patterns of carbon allocation?

- Yes, the two species invests carbon in different structures

Future perspectives include studying how carbon allocation in the species impacts resilience to climate change, as shifting temperatures and precipitation alter Norway's habitats. Long-term research could show how these changes affect growth, reproduction, and competitiveness in various environments.

Leaf to stem weight ratio in forested and open habitats

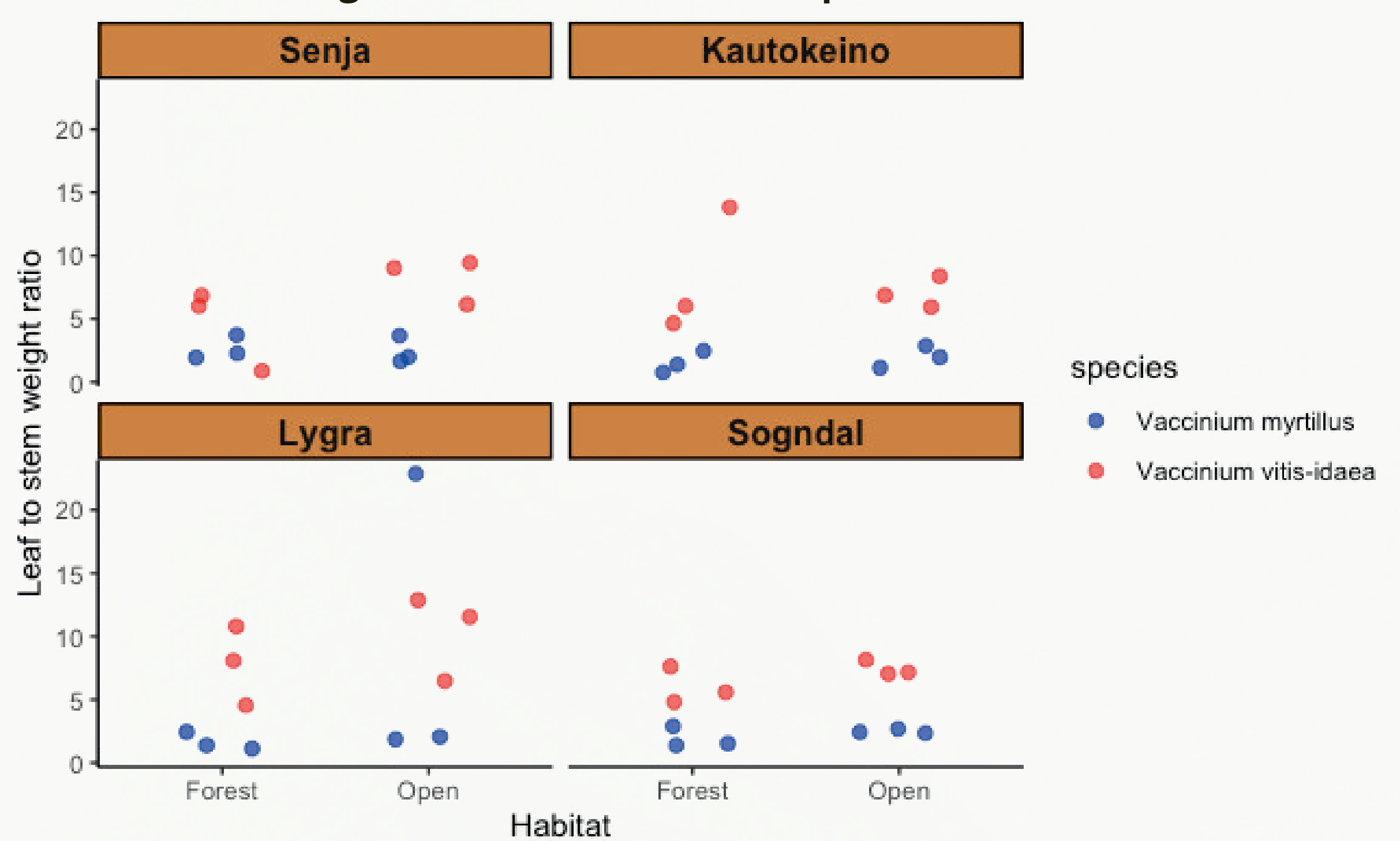


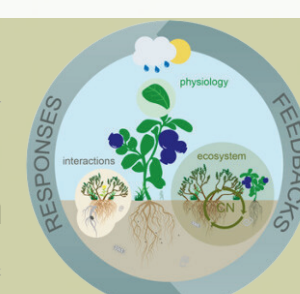
Figure 4: Shows how the plants allocate their carbon, with focus on leaf to stem ratio in two different habitats. Lower numbers indicate bigger investment in stem, higher numbers indicate bigger investment in leaves. One dot is one plant from the sample sites.

References:

- [1] Aarnes, H. (2012) 'Globalt CO₂- og H₂O-kretsløp via plantene'.
 [2] Chen, J. et al. (1999) 'Microclimate in Forest Ecosystem and Landscape Ecology: Variations in local climate can be used to monitor and compare the effects of different management regimes', *BioScience*, 49(4), pp. 288-297. Available at: <https://doi.org/10.2307/1313612>.

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BETWEEN THE FJORDS

