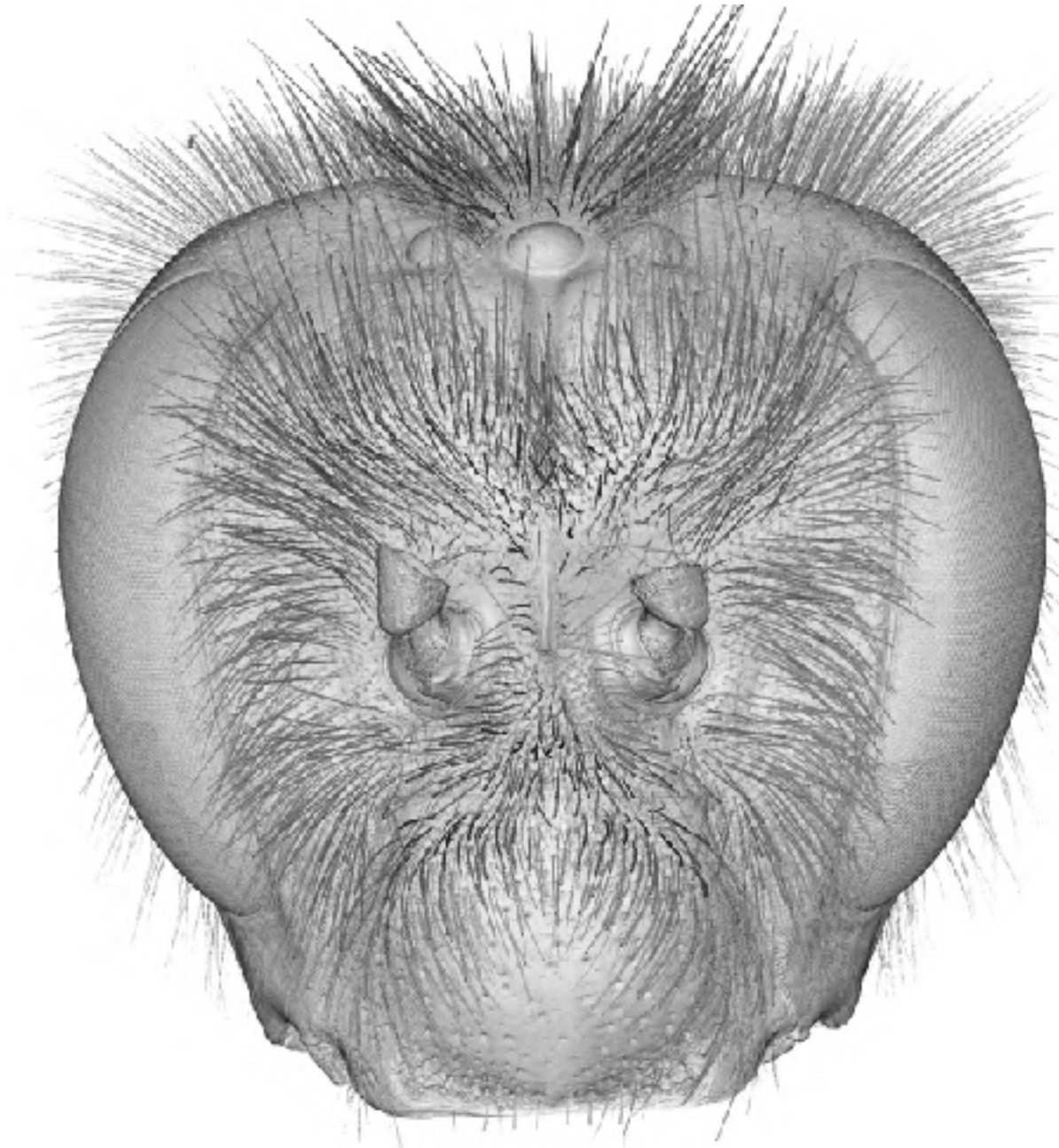


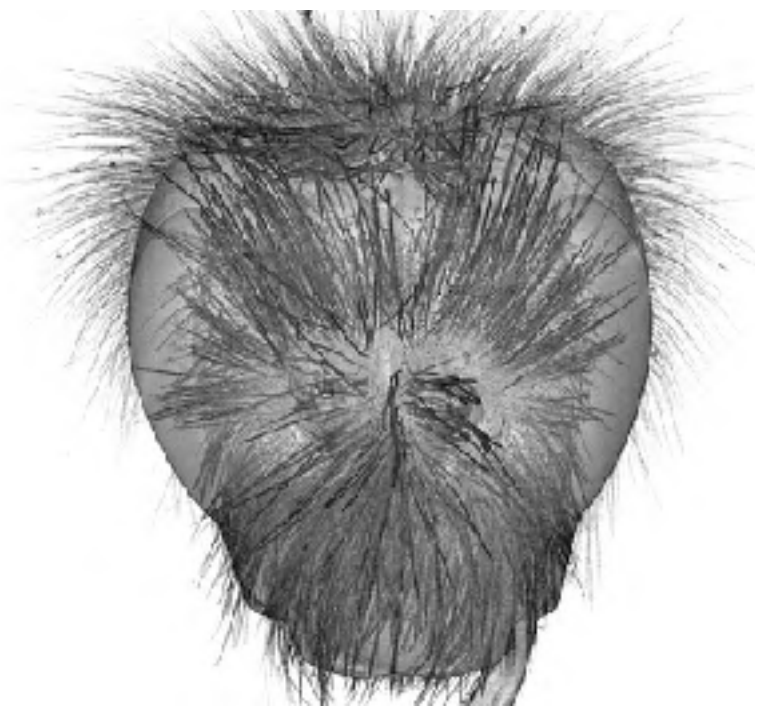


Using micro-CT to explore the visual ecology of insects

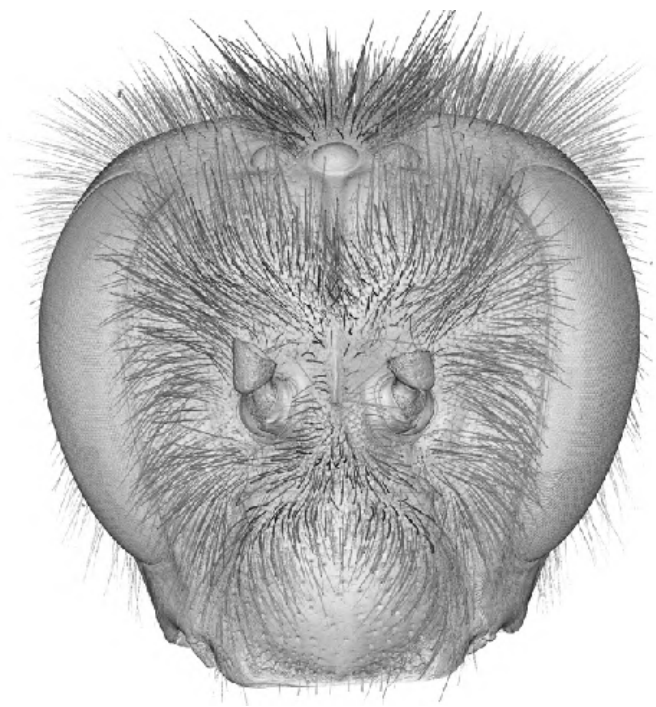
Emily Baird

INsect Sensory Ecology and CogniTion lab
Department of Zoology
Stockholm University

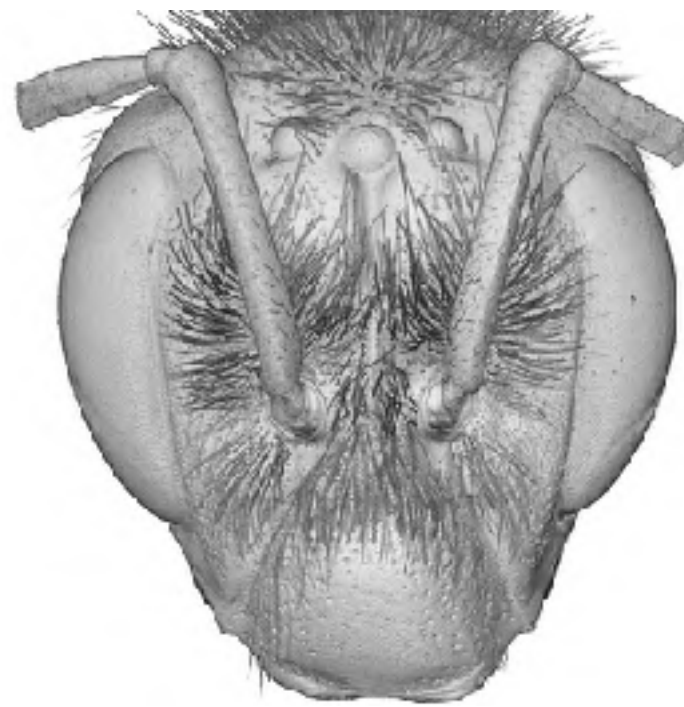
Insect visual habitats



Bombus alpinus
Arctic



Bombus terrestris
Meadowland



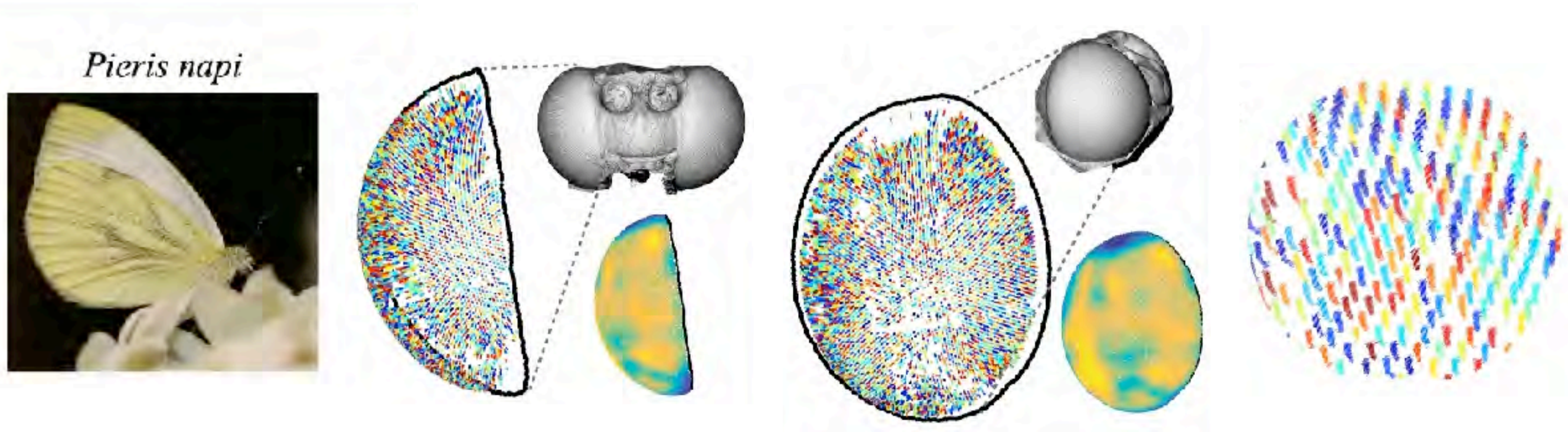
Bombus transversalis
Amazon



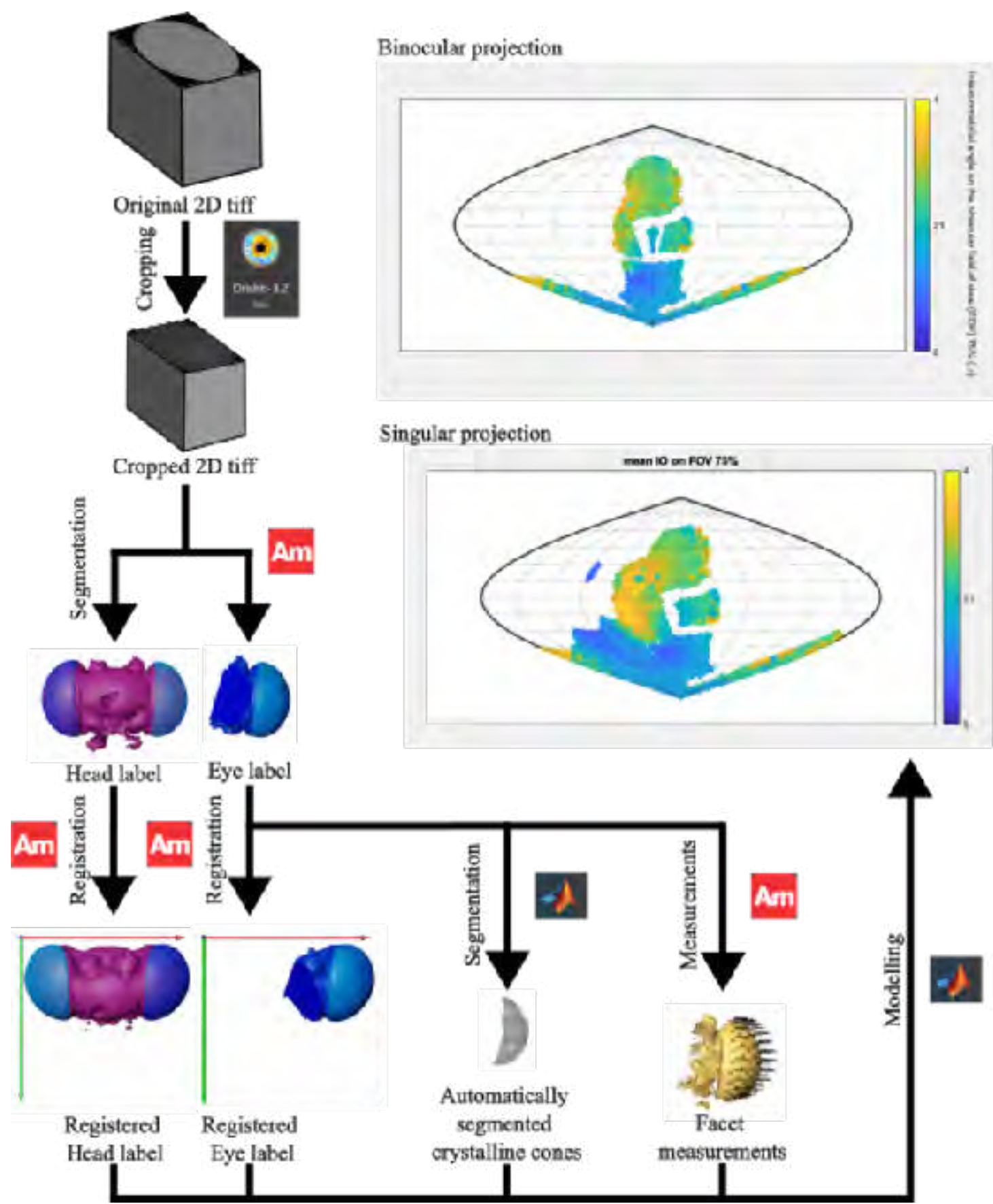
Example: compound eye analyses



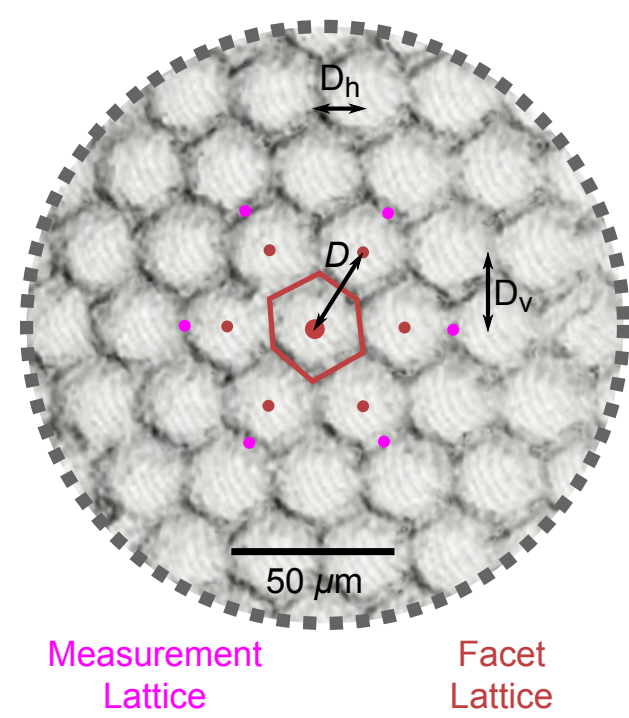
Compound eye analysis automation



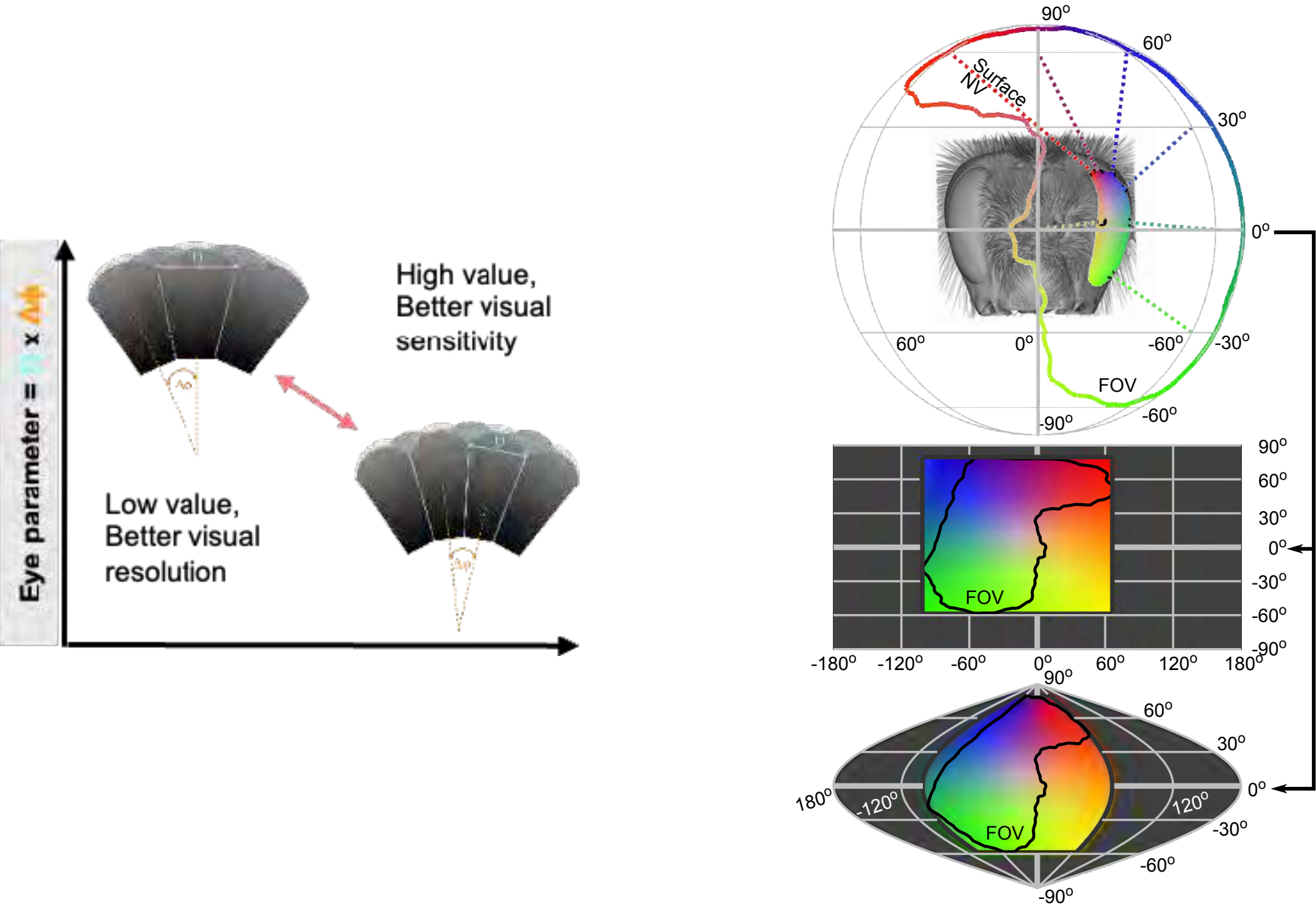
Example: compound eye analysis latest pipeline



Example: compound eye analyses



Example: compound eye analyses



Example: ancient fungus gnat vision

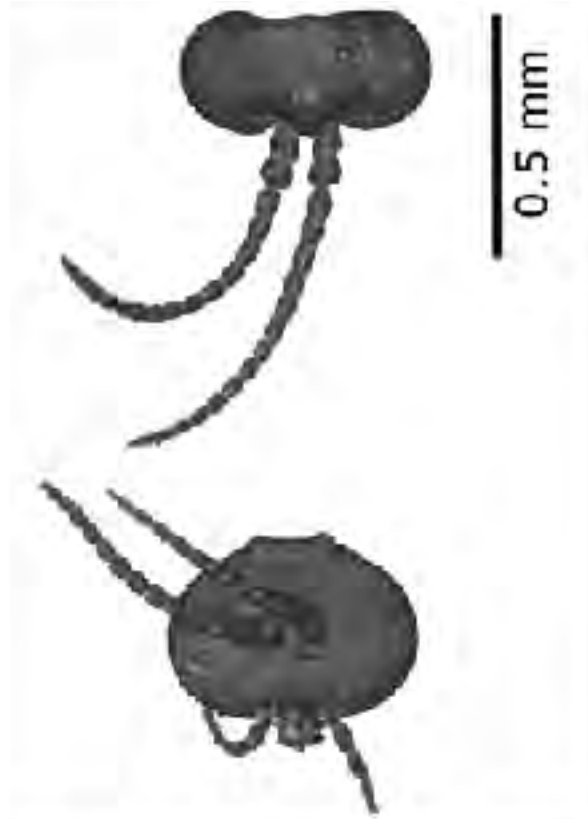
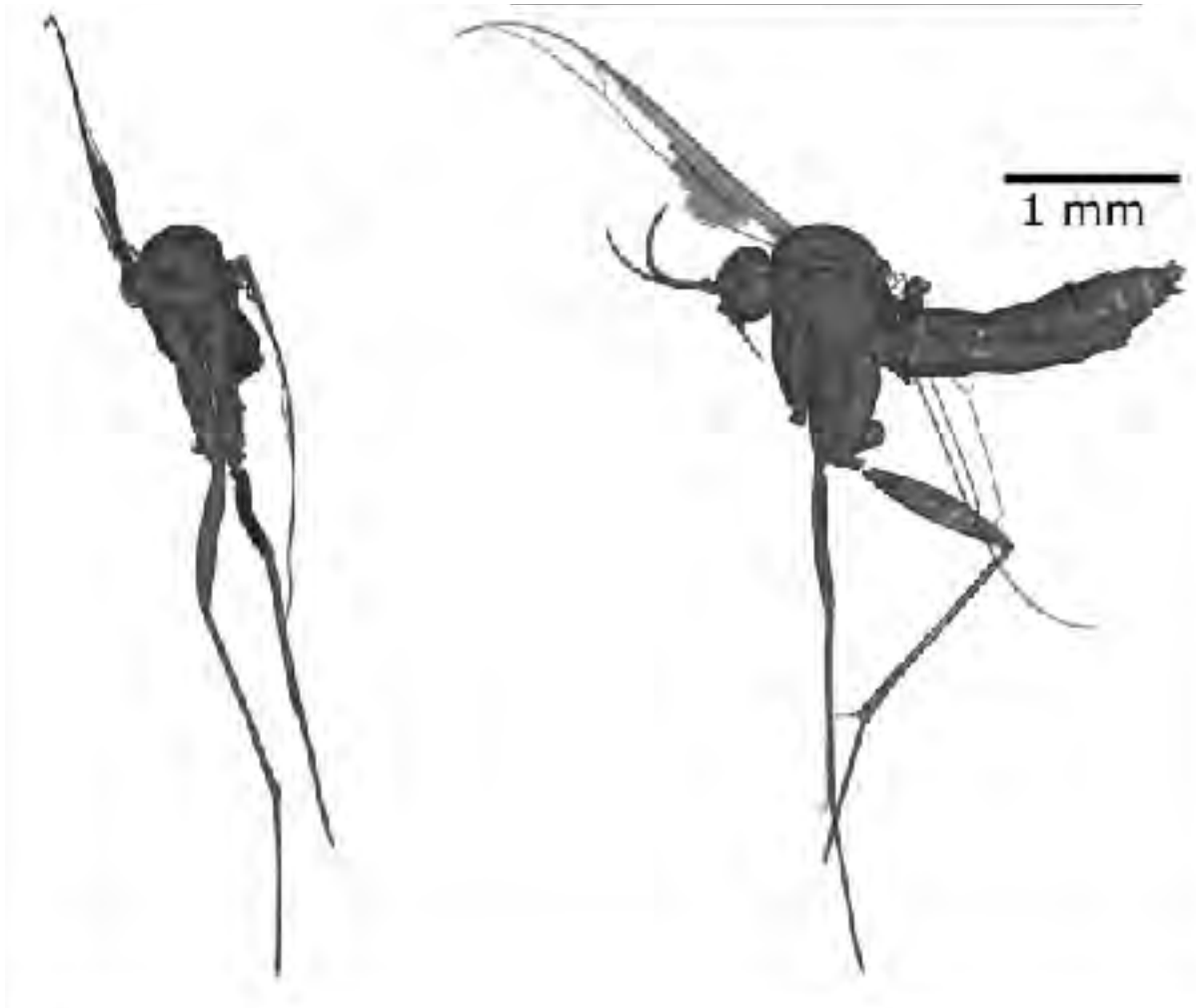
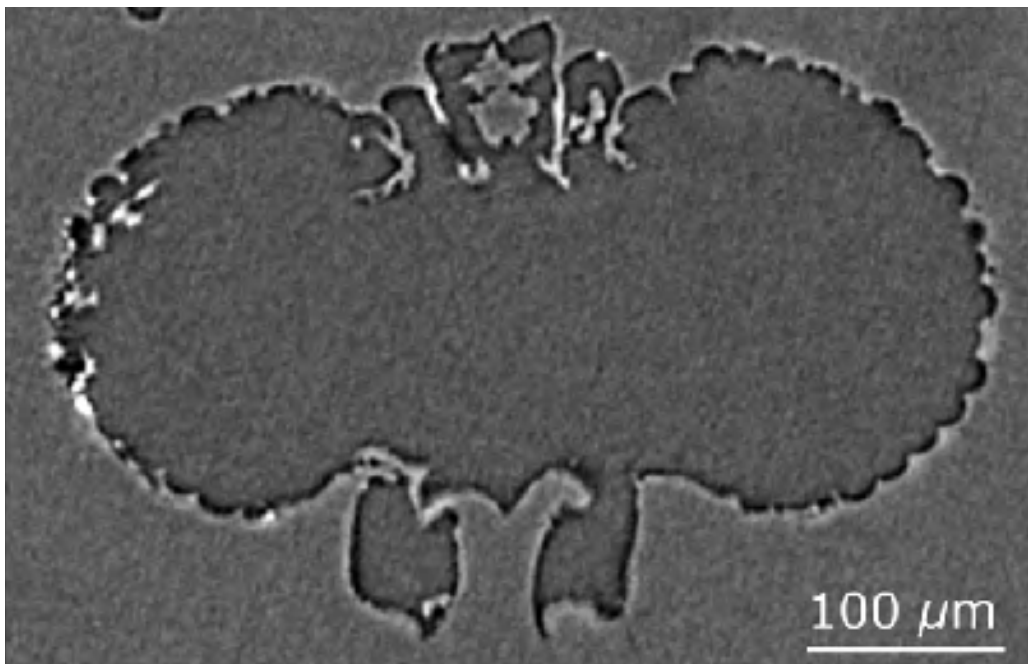
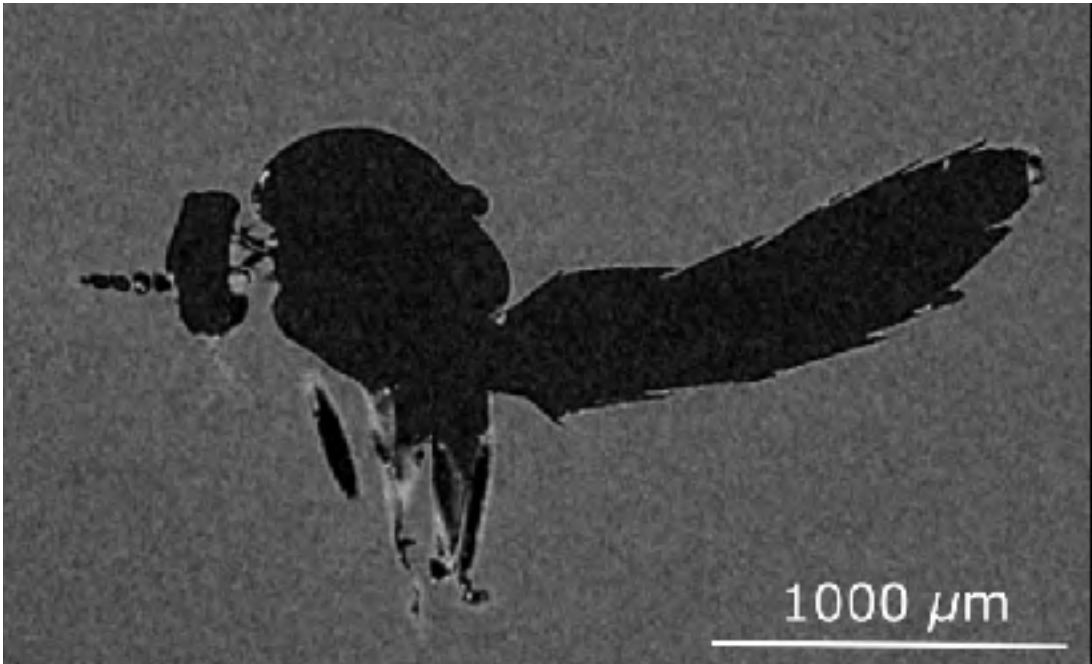


1000 μm

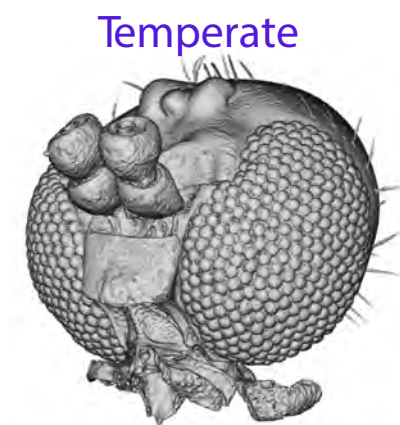
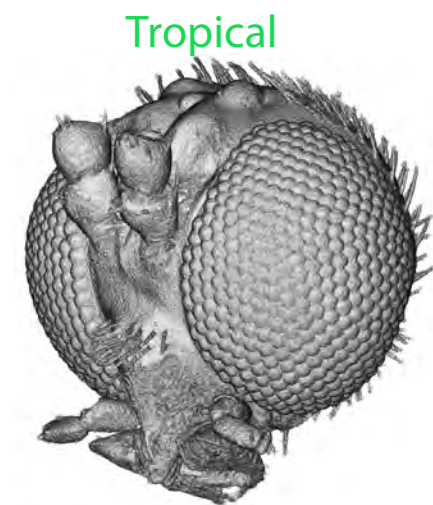
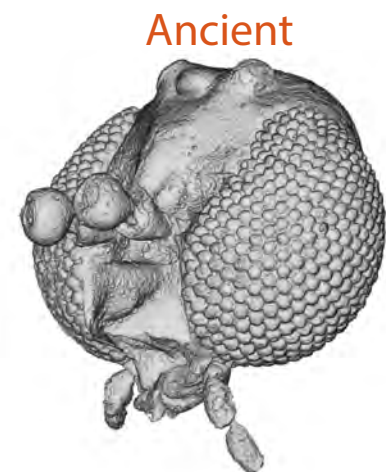


100 μm

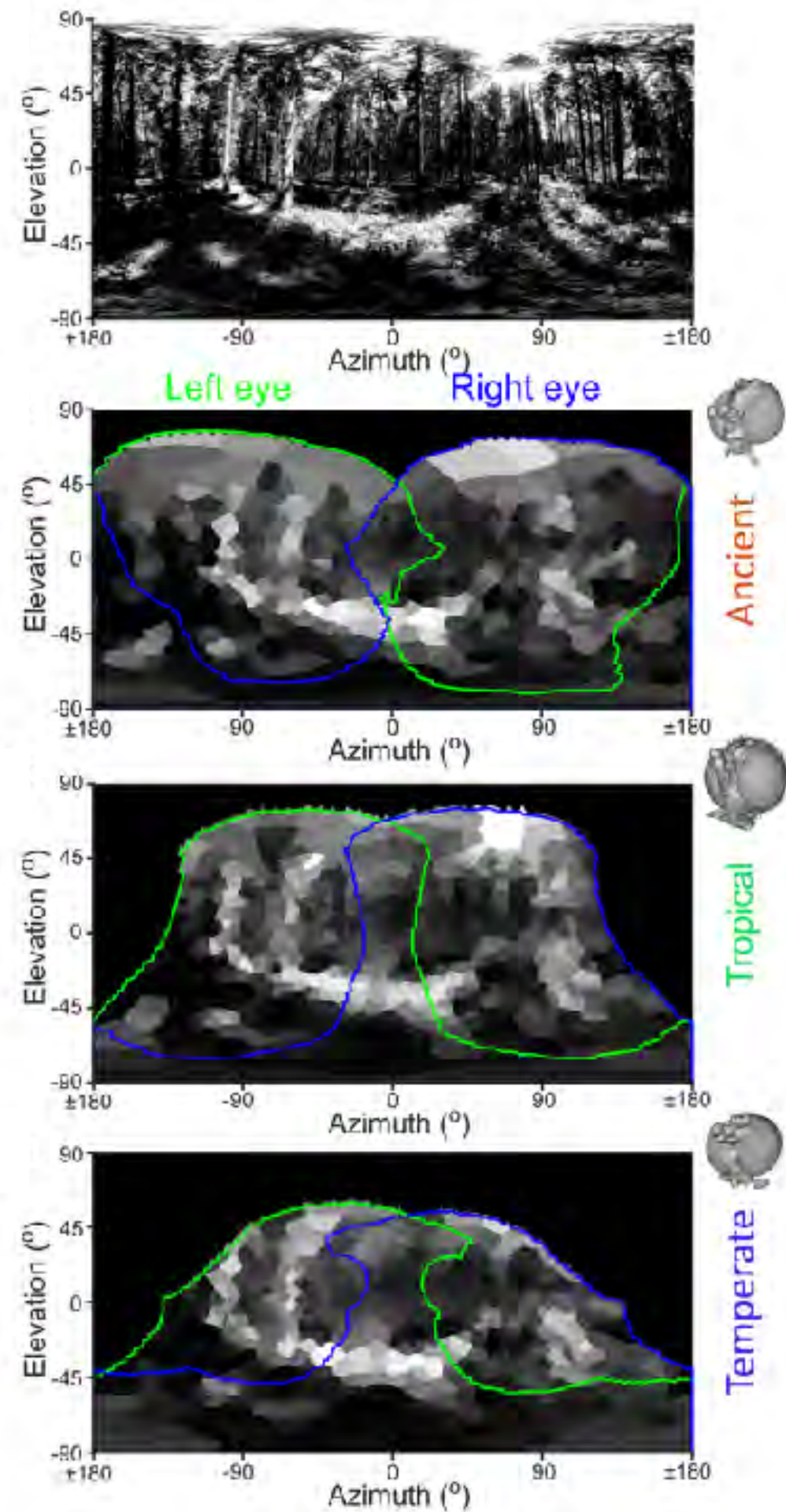
Example: ancient fungus gnat vision



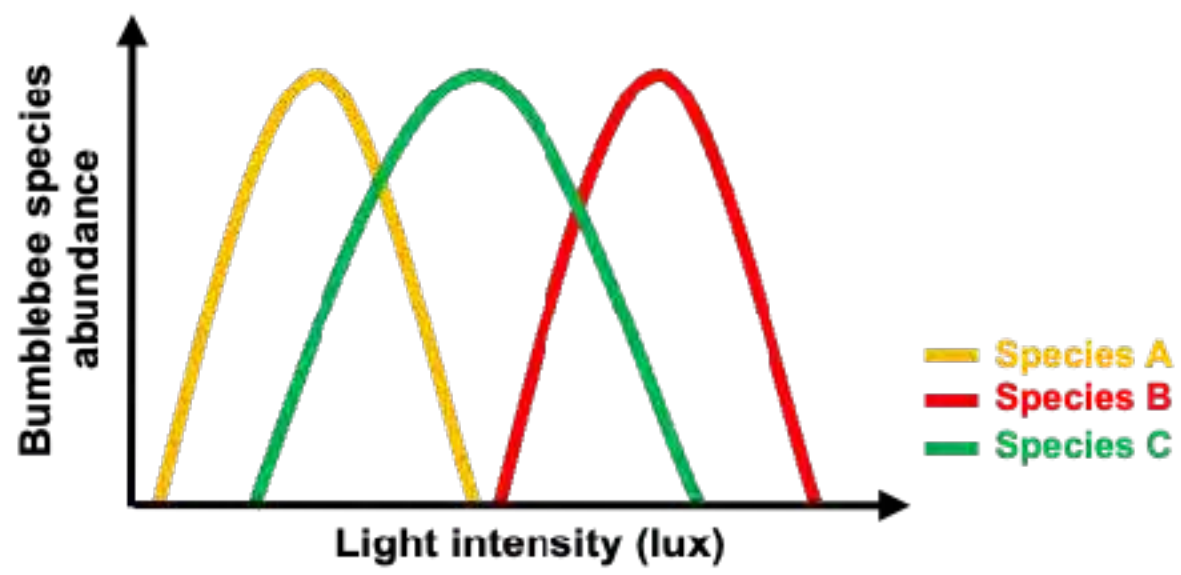
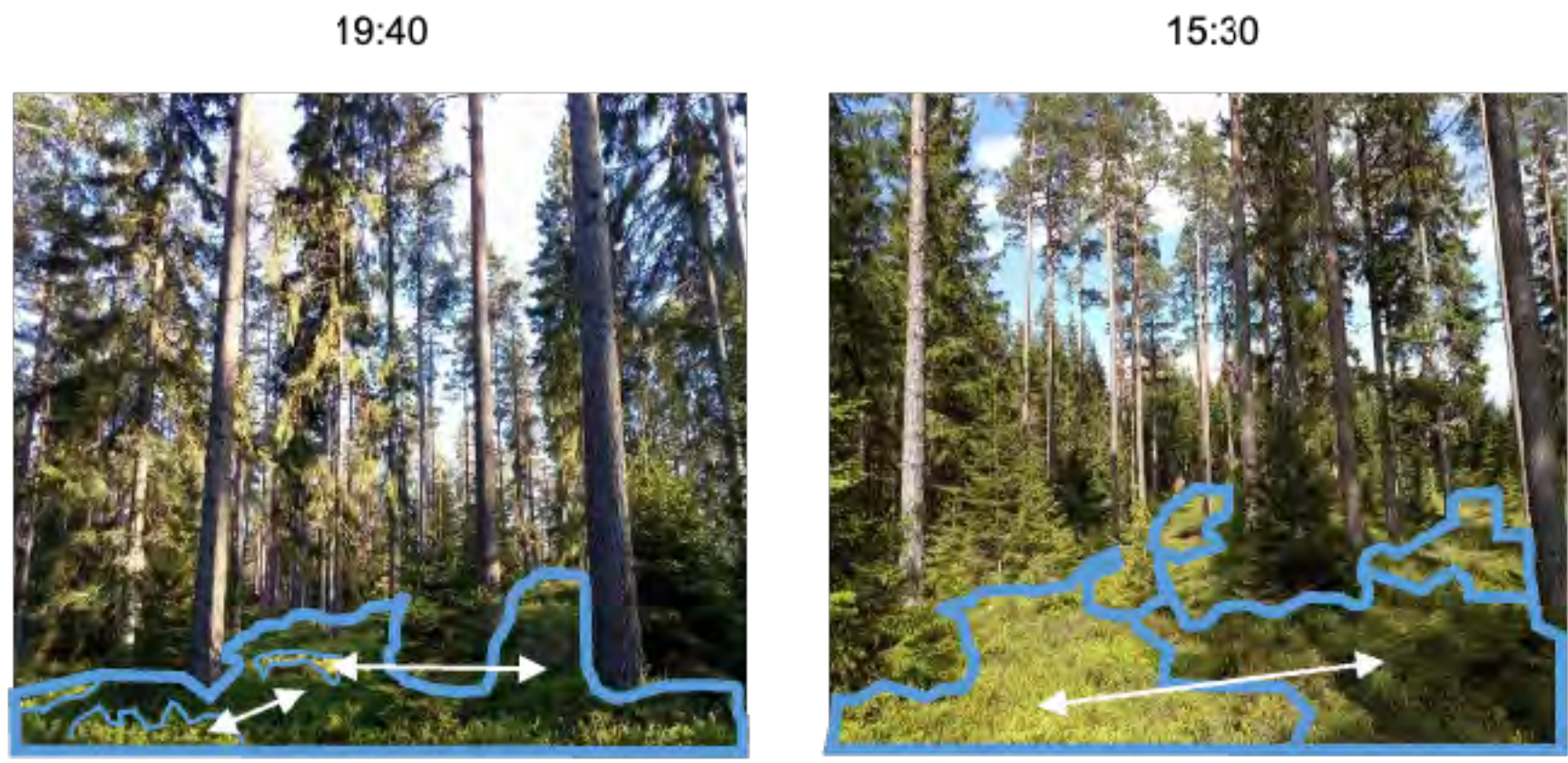
Example: ancient fungus gnat vision



200 μ m

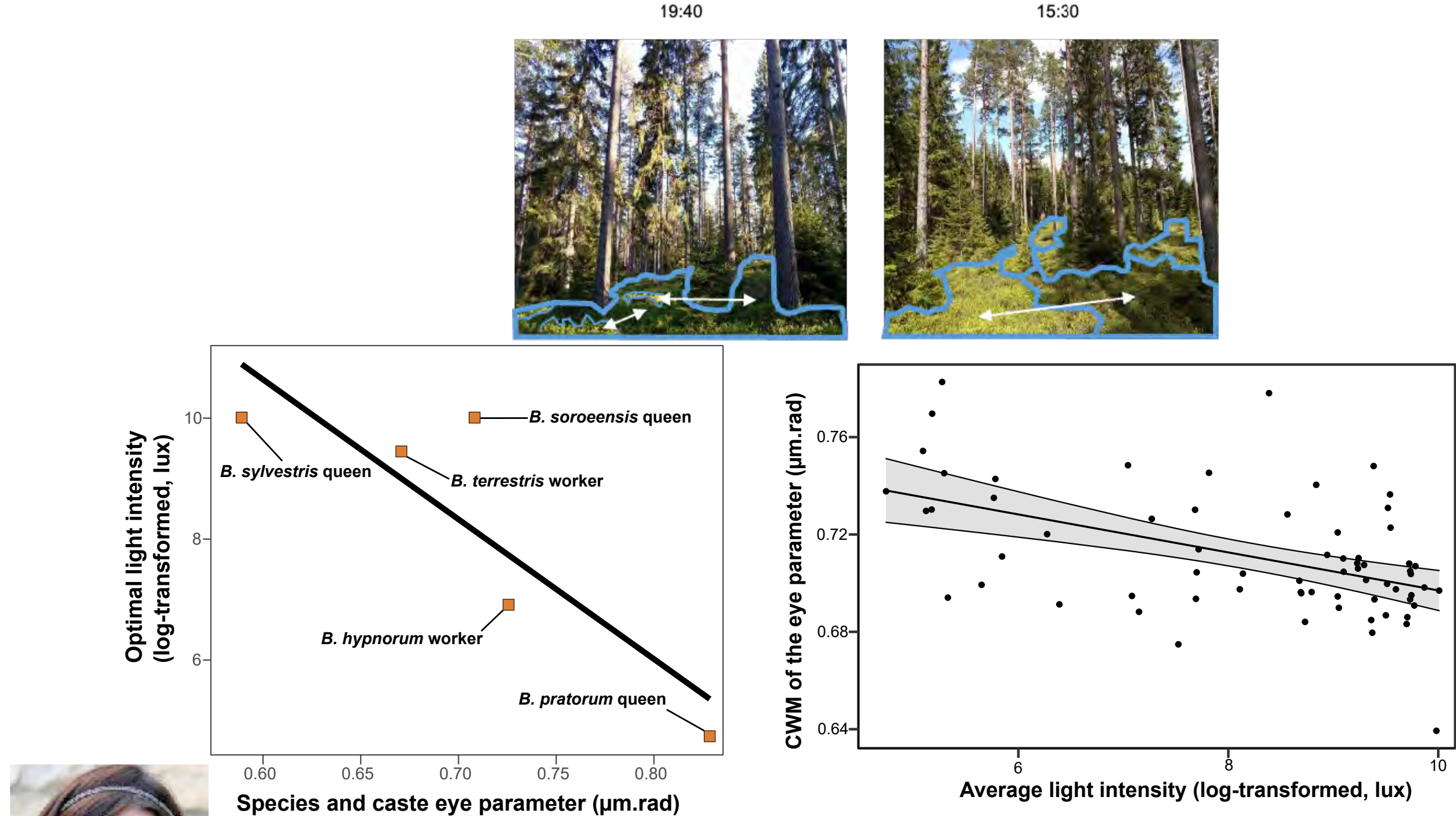


Example: The effect of light microhabitat on bumblebee eye traits



Océane
Bartholémée

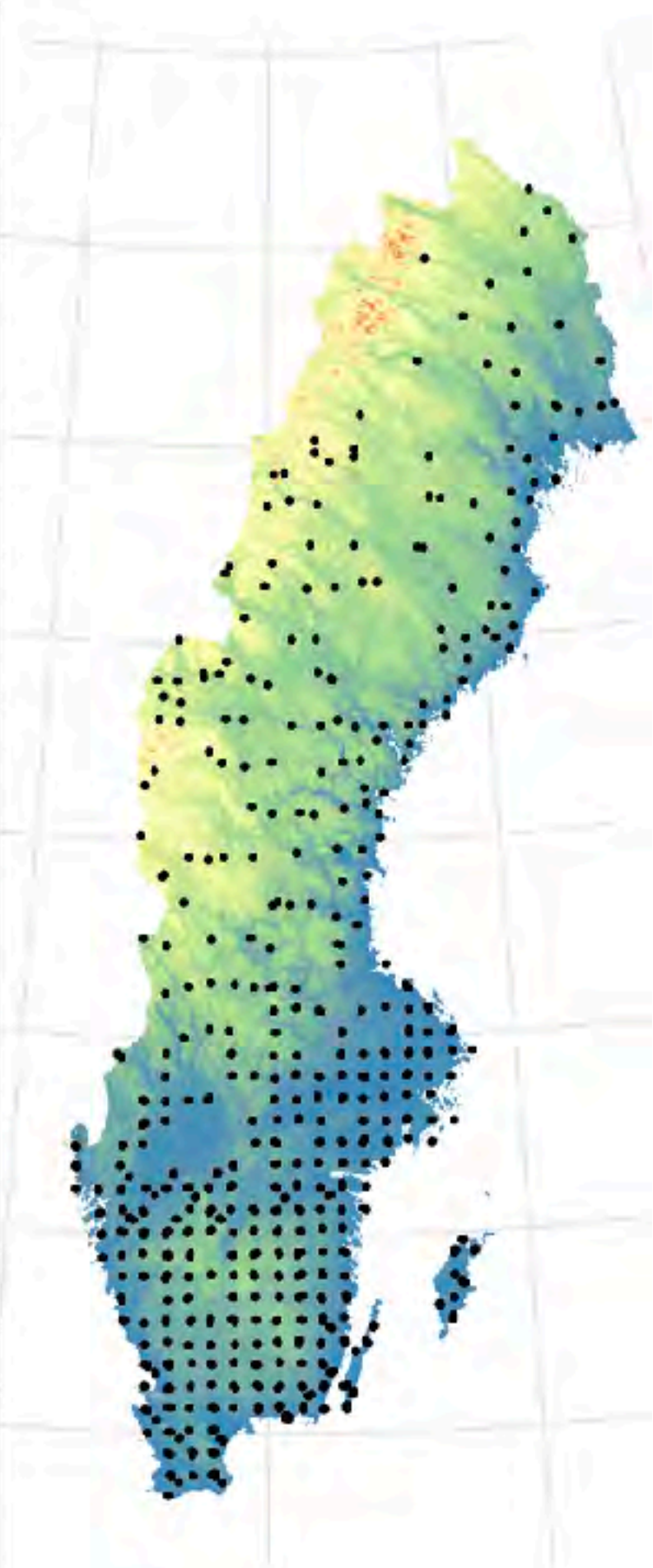
Example: The effect of light microhabitat on bumblebee eye traits



Océane
Bartholémée

Example: The interplay between visual traits and forest in bumblebee communities across Sweden

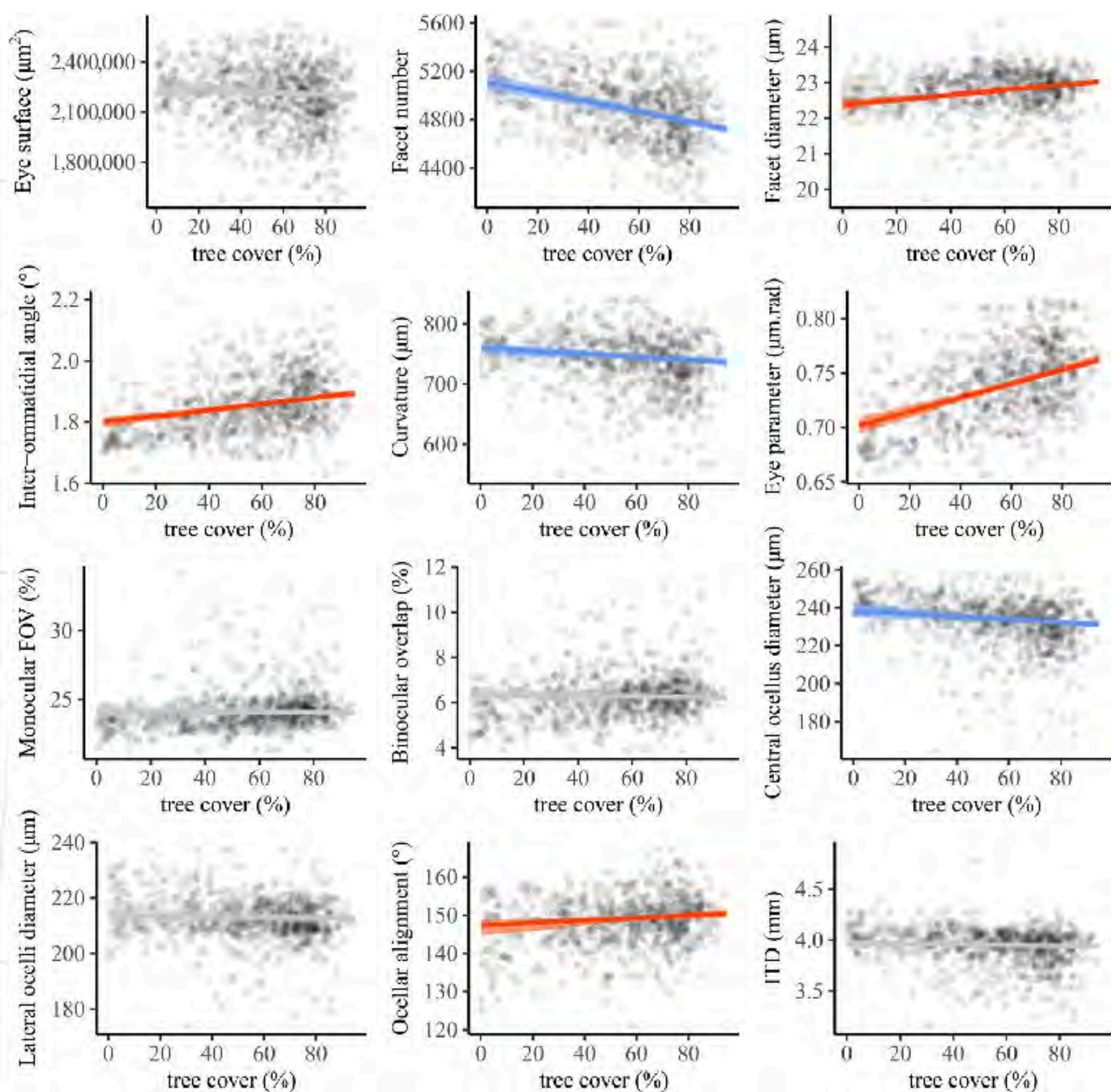
Visual trait		Prediction if increases...
Eye surface		Visual performance↑
Facet number		Spatial resolution↑ Light sensitivity↓
Facet diameter		Spatial resolution↓ Light sensitivity↑
Intra-ommatidial (IO) angle		Spatial resolution↓ Light sensitivity↑
Curvature		Spatial resolution↓ FOV↑
Eye perimeter		Spatial resolution↓ Light sensitivity↑
Monocular field of view (FOV)		Spatial resolution↓ FOV↑
Binocular overlap		Spatial resolution↓ FOV↑
Central ocellus diameter		Visual performance↑
Lateral ocelli diameter		Visual performance↑
Ocellar alignment		???



Pierre Tichit

Tichit P, Kendall L, Olsson P,
Taylor G, Rau C, Caplat P, Smith
HG Baird E *Ecol & Evol* 2024

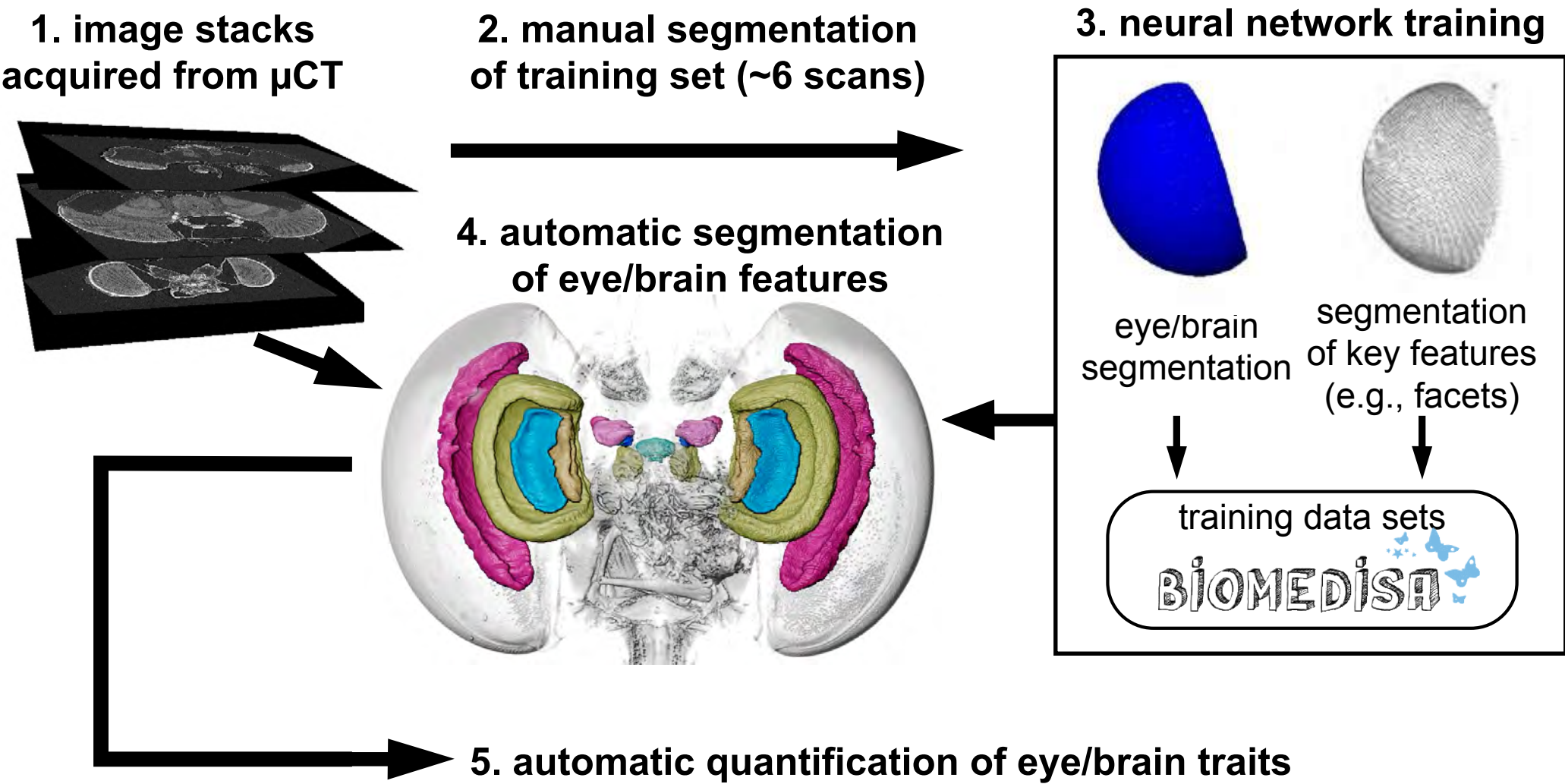
Visual trait	Prediction if increases...
Eye surface	Visual performance↑
Facet number	Spatial resolution↑ Light sensitivity↓
Facet diameter	Spatial resolution↓ Light sensitivity↑
Inter-ommatidial (IO) angle	Spatial resolution↓ Light sensitivity↑
Curvature	Spatial resolution↓ FOV↑
Eye parameter	Spatial resolution↓ Light sensitivity↑
Monocular field of view (FOV)	Spatial resolution↓ FOV↑
Binocular overlap	Spatial resolution↓ FOV↑
Central ocellus diameter	Visual performance↑
Lateral ocelli diameter	Visual performance↑
Ocellar alignment	???



Example: Brain analyses



Eye and brain analysis automation





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