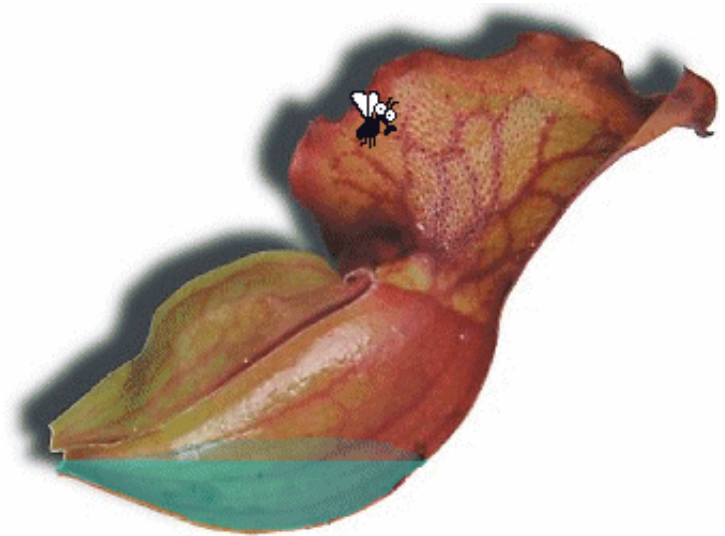


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-- OliverVoigt - 25 Feb 2013

Assignment 5: Evolution of carnivorous plants

Carnivorous plants developed traps to capture and digest mostly small invertebrates. This provides them with an additional nitrogen source and allows their growth in environments with very low nutrient supply like peat bogs. Several different types of traps have evolved, ranging from passive traps like the sticky tentacles of *Drosera* or the pitcher traps of *Sarracenia*, to the active trap of the Venus flytrap (*Dionaea*). Carnivorous plants require certain adaptations, e.g., the development of glands to excrete digestive enzymes.



The provided **dataset** comprises sequences of a chloroplast gene involved in CO₂-fixation (**RuBisCO**, rbcL).

Transversial section through the pitcher of *Sarracenia purpurea*

Analyse this dataset using with Maximum Likelihood methods (**PhyML**) to answer the question whether carnivory in plants evolved once or several times (if so, how often?). Align the data, choose sites to include to generate a dataset. Find a fitting model with jModelTest (for **PhyML**) and include bootstrap analyses (mind. 100 replicates) to evaluate the support for nodes in the trees.



Sundew (*Drosera aliciae*)

What can you say about the evolution of different types of traps? Before starting, formulate alternative hypotheses to test.

Data:

[Carnivore_plants_rbcL2.fas](#)

Abbreviations in the dataset:

CARN: carnivorous plant

PCARN: plant shows some, but not all criteria of carnivorous plants

OUT: outgroup

[topic actions](#)

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