How do fish and allochthonous subsidies simultaneously control food-webs?

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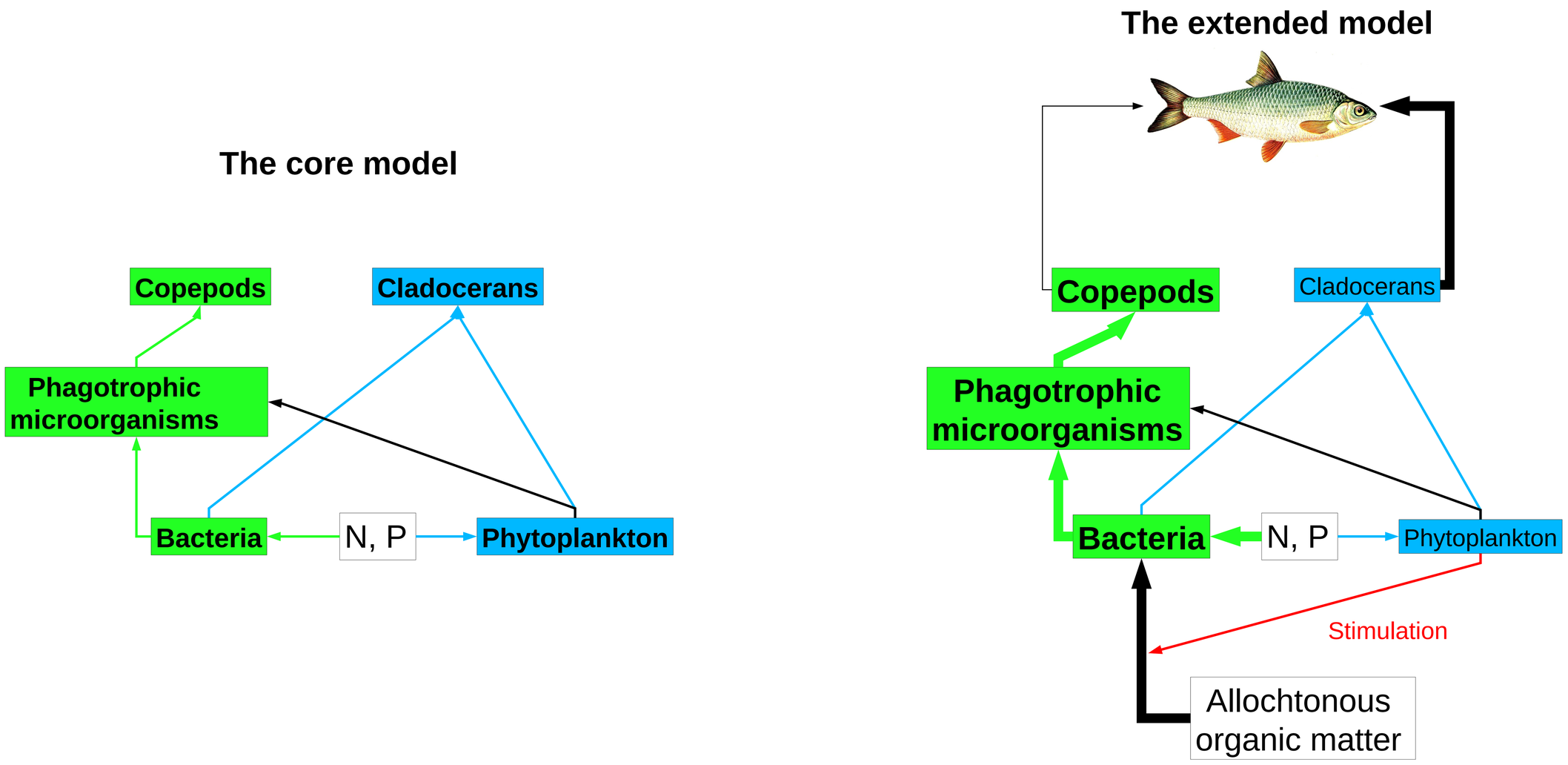
How do top-down and bottom-up interactions control food-webs? (Eric Edeline and Gerard Lacroix)

1. Autotrophic and heterotrophic pathways for energy transfer in aquatic food webs



GREEN: **heterotrophic pathway,** bacteria are the main energy mobilizers, energy transfer efficiency to higher levels is low.
BLUE: **autotrophic pathway**, phytoplankton is the main energy mobilizer, energy transfer efficiency to higher levels is high.

2. Predictions to be tested

The core model of aquatic food webs responds simultaneously to bottom-up (allochtonous organic matter) and top-down (fish) control.

Allochtonous organic matter and fish will both favor the heterotrophic pathway (extended model).

Exudates from the phytoplankton favors organic matter mineralization by bacteria.

The autotrophic pathway maximizes production of zooplankton and fish.

3. The experimental setup

12 experimental tanks located at the biological station of Foljuif, 4 treatments in triplicate (1: no fish, no allchotonous input; 2: no fish, allchotonous input; 3: fish, no allchotonous input; 4: fish + allochtonous input, extended model) during 1 year.

Variables to be measured:

- ► water physics (temperature, pH) and chemistry (N, P concentrations)
- ► chemical nature of the dissolved and sedimented organic matter
- ► concentrations in bacteria, ciliates, flagellates, phyto- and zooplankton
- ► fish survival, somatic growth and fecundity

4. Collaborations