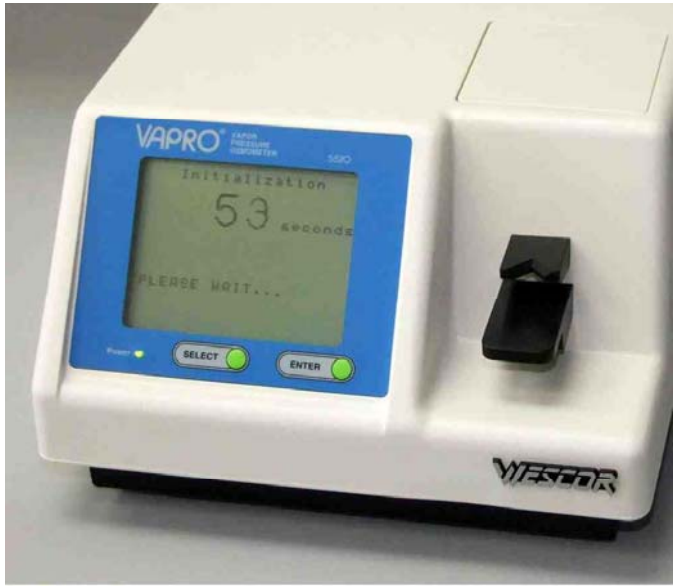
Osmometer VAPRO 5520 (Wescor)

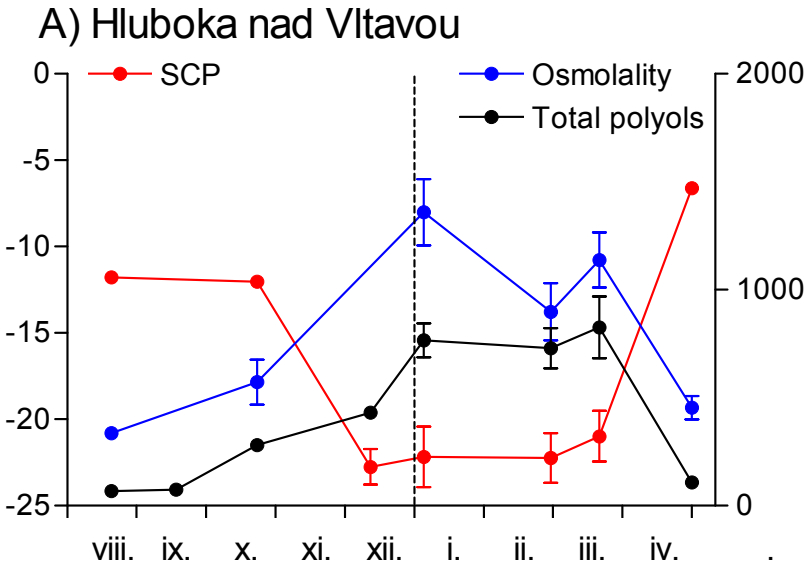


- **The Vapour Pressure Osmometer VAPRO 5520** serves us to record seasonal changes in the osmolality of body fluids in various insect pests

- the osmolality is an important physiological parameter that is directly linked to water relations, temperatures of water phase-transitions, supercooling, accumulation of biological cryoprotectants, and, consequently, to capacity for survival at low temperatures (and overwintering success)

Case study:

Overwintering adults of the Spruce Bark Beetle survive winter months in a supercooled state. Their capacity for supercooling seasonally increases as a result of polyol accumulation, which is also reflected in the increase of osmolality of their body fluids.
(PI: Vladimír Koštál)



The Vapour Pressure Osmometer VAPRO 5520 was acquired through **MOBITAG project** (FP7-REGPOT-2008-1, GA 229518)

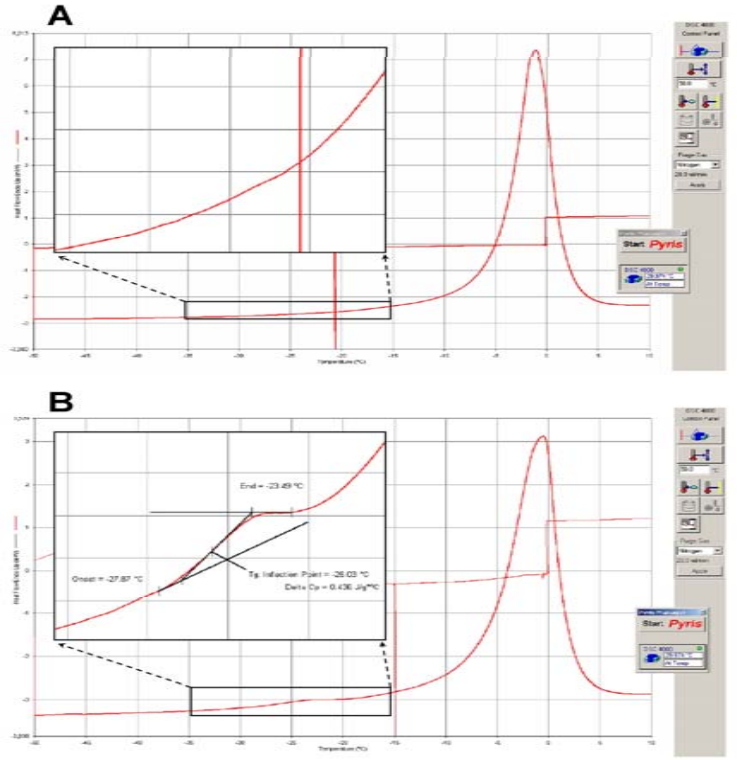
Calorimeter DSC 4000 (Perkin Elmer)

- **The Differential Scanning Calorimeter DSC 4000** helps us to assay the water phase-transitions in overwintering and/or cryo-preserved insects

- using this instrument, we can measure the temperatures of freezing- and melting-events, quantify the amounts of water involved in them, determine the proportion of osmotically inactive (bound) water, and reveal the presence of glass-transition events, *i.e.* vitrification

Case study:

Larvae of drosophilid fly, *Chymomyza costata*, can survive at temperatures of liquid nitrogen, *i.e.* -196°C. We found that they can do so only after specific acclimation process, which alters their metabolom and causes that a certain part of their body water vitrifies. (PI: Vladimír Košťál)



The DSC 4000 Calorimeter was acquired through **MOBITAG project** (FP7-REGPOT-2008-1, GA 229518)