Radhika, V., Kost, S., Bartram, S., Heil, M. & Boland, W. (2008) Testing the optimal defence hypothesis for two indirect defences: secretion of extrafloral nectar and emission of volatile organic compounds. Planta 228, 449-457

**Abstract.** Many plants respond to herbivory with an increased production of extraXoral nectar (EFN) and/or volatile organic compounds (VOCs) to attract predatory arthropods as an indirect defensive strategy. In this study, we tested whether these two indirect defences Wt the optimal defence hypothesis (ODH), which predicts the withinplant allocation of anti-herbivore defences according to trade-oVs between growth and defence. Using jasmonic acid-induced plants of Phaseolus lunatus and Ricinus communis, we tested whether the within-plant distribution pattern of these two indirect defences reXects the Wtness value of the respective plant parts. Furthermore, we quantiWed photosynthetic rates and followed the within-plant transport of assimilates with 13C labelling experiments. EFN secretion and VOC emission were highest in younger leaves. Moreover, the photosynthetic rate increased with leaf age, and pulse-labelling experiments suggested transport of carbon to younger leaves. Our results demonstrate that the ODH can explain the within-plant allocation pattern of both indirect defences studied.