

## 6.4 Beeswax residue analysis points to an alarming contamination: a Belgian case study

Jorgen Ravoet<sup>1</sup>, Wim Reybroeck<sup>2</sup>, Lina De Smet<sup>3</sup>, Dirk C. de Graaf<sup>1,3</sup>

<sup>1</sup> Laboratory of Zoophysiology, Ghent University, Krijgslaan 281 S2, B-9000 Ghent, Belgium

<sup>2</sup> Institute for Agricultural and Fisheries Research (ILVO), Technology and Food Science Unit, Brusselsesteenweg 370, B-9090 Melle, Belgium

<sup>3</sup> Presenting author, Laboratory of Zoophysiology, Ghent University, Krijgslaan 281 S2, B-9000 Ghent, Belgium, e-mail: Dirk.deGraaf@UGent.be

### Abstract

Beeswax from ten Belgian hives was analyzed for the presence of more than 300 organochlorine and organophosphorous compounds by LC-MS/MS and GC-MS/MS. Traces of 18 pesticides were found and not a single sample was free of residues. The number of residues found per sample ranged from 3 to 13, and the pesticides found could be categorized as i) pesticides solely for agricultural (crop protection) application, ii) pesticides for mixed agricultural and apicultural (veterinary) application.

The frequencies and quantities of some environmental pollutants are reason for high concerns. Most alarming was the detection of lindane (gamma-HCH) and dichlorodiphenyltrichloroethane (DDT; including its breakdown product dichlorodiphenyldichloroethylene, DDE), two insecticides that are banned in Europe for several years or even decades. The present comprehensive residue analysis, however, also reveals residues of pesticides never found in beeswax before, i.e. DEET, propargite and bromophos.