NATURAL CONTENT OF FORMIC AND OXALIC ACIDS IN HONEYS

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Formic and oxalic acids were recommended as effective active substances against varroa mites. Formic acid is allowed for use against varroa in Germany and at EU-level. Concepts for oxalic treatment were developed for putting into practice. They are allowed for use in some European countries but not in Germany. If these components are used as acaricides for Varroa treatment in practical beekeeping possible residue problems for honey may occur. For beeing able to assess any residues in honey, one must know the natural content of formic and oxalic acids of honeys of various botanical origins.

During former years the content of formic acid of honeys of various botanical origins were determined routinely by enzymatic assays (Boehringer, Mannheim). Since 2001 there is available an enzymatic assay which allowes the simultaneous determination of formic and oxalic acids. The test was adapted for honey. Formic and oxalic contents of 23 honeydew honeys, 16 Tilia honeys, 6 Rape honeys and 6 Calluna honeys of non-treated bee hives were dertermined. The botanical origin was analyzed by electrical conductivity, sugar analysis and pollen analysis.

The investigations showed specific differences between the contents of both organic acids for honeys of different botanical origin. The average natural content of formic acid of honeydew honeys was 22,7 (± 3,1) mg/kg, of lime honeys 132,6 (± 18,4) mg/kg, of rape honeys 28,5 (± 3,8) mg/kg and of heather honeys 206,2 (± 89,7) mg/kg. For natural oxalic acid content we found mean values of 46,8 (± 9,2) mg/kg for honeydew honeys, 11,1 (± 4,9) mg/kg for lime honeys, 16,6 (± 3,8) mg/kg for rape honeys and 60,7 (± 3,7) mg/kg for heather honeys.