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Official control on imported honey in north-eastern Italy

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INTRODUCTION

The use of antibiotic drugs in the control of American foul brood (AFB) and other honeybee diseases, is still a common practice. Two type of drugs, tetracyclines (TCs) and sulphonamides (SPs), are frequently used, although during the last years other antibiotics like chloramphenicol (CAF), streptomycin (ST) and nitrofurantoin have been recognised to be administered to colonies by beekeepers. The use of these drugs is illegal because no maximum residue limits (MRL's) have been established, whereas only OTC is approved in USA. Since antibiotics are active against the vegetative form of bacteria, in the case of AFB the drug administration to infected colonies suppress bacterial replication, but the symptoms readily reappear once the drug is discontinued (Ratnieks, 1992). As a consequence, beekeepers have to repeat drug treatments as preventive method to control of the diseases. This uncontrolled drugs administration determines both an increase of resistant bacteria and the contamination of honey. According to Council Directive 96/23/EC laying down measures to monitor certain substances and residues thereof in live animals and animals residues, honey imported from third countries has to be investigated for antibacterial substances. Honey samples analysed for antibiotics residues from 2001 to 2003 were considered in our laboratory.

MATERIALS AND METHODS

88 honey samples were investigated and more precisely, four honey samples in 2001, 35 in 2002 and 49 in 2003, imported from Romania, Moldova, Bulgaria and Slovakia. Samples were analysed for tetracyclines, sulphonamides, and chloramphenicol. The methods applied were those validated and routinely used in our laboratory.

TCs were extracted from honey by a metal chelate affinity column (MCAC) technique. The instrumental analysis was performed with a HPLC system equipped with a C18 columns (250 x 4.6 mm 5 µm) and a UV-DAD detector operating at 365 nm.

SPs were extracted from honey by liquid-liquid technique. They were quantified by HPLC with a pre-column derivatization with fluorescamine to increase the sensitivity of the method.

The HPLC system was equipped with a C8 Columns (150 x 4.6 mm 3 µm) and a fluorimetric detector operating at 400 nm in excitation and 490 nm in lecture.

CF was extracted from honey by ethyl acetate. Immunoassay test were applied to carried out the analysis (Chloramphenicol EIA, Euro-Diagnostica).

RESULTS AND DISCUSSION

The results obtained were as follows:

- 2001: all samples analysed for TCs were negative.
- 2002: 4 out of 17 samples were positive for TCs, 2 out of 16 for SPs and none of 2 for CAF.
- 2003: 1 out of 16 positive for TCs, 7 out of 16 positive for SPs and none of 17 for CAF.

Furthermore, at the end of 2003, a method for the determination of streptomycin (ST) residues in honey was validated and routinely applied. The only sample analysed with this new protocol was found.

The percentage of positive samples distinguished by country of origin is reported in Table 1.

Among TCs and SPs investigated, oxytetracycline and sulphathiazole were the only antibiotics identified. Their content ranged from 18 to 193 ng/g and from 3 to 67 ng/g, respectively. Concerning ST, the only sample analysed was from Bulgaria and was positive for 220 ng/g.

The results obtained are indicative of a rather frequent presence of residues of antibacterial drugs in honey imported from eastern Europe. Among honey samples analysed, the imported ones accounted for 38% of the total, 79% of which were positive for antibiotics residues (Figure 1). These data remark the origin of honey imported to Italy through the north-eastern border and suggest the need for a continuous monitoring programme. Furthermore, an increase in the educational activity to the beekeepers on hive management is strongly recommended to avoid any improper use of drugs and honey contamination.

REFERENCES

Ratnieks F. L. W. 1992. American foulbrood: the spread and control of an important disease of the honey bee. *Bee World* 73: 1777-791.

Table 1: Percentage of positive samples distinguished by year of collection, type of investigated antibiotics and country of origin

Year	Antibiotics	% samples positive	Origin country
2001	TCs	-	-
2002	TCs	17.6	Romania
		5.9	Moldova
	SPs	6.2	Romania
		6.2	Moldova
CAF	-	-	
2003	TCs	6.2	Bulgaria
	SPs	43.7	Bulgaria
	CAF	-	-

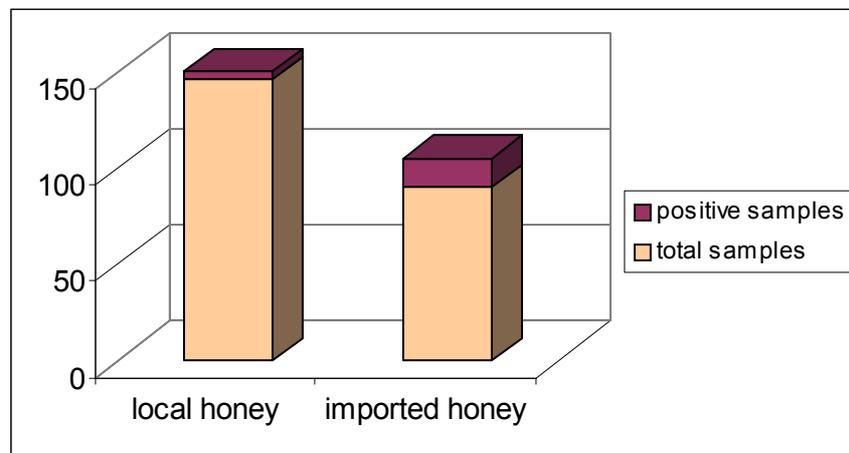


Figure 1: Figure 1. Number of total and positive imported honey samples analysed compared to those collected from local beekeepers