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INTRODUCTION

Cell Wall preparations of *Saccharomyces cerevisiae* were shown capable to bind several major mycotoxins in vitro. Most in vivo studies have evaluated the efficacy of the detoxifiers on the basis of animal performances and/or absence of toxicity, but there is scarce information on how they impair absorption. Comparing excretion of mycotoxins in different biological fluids with and without detoxifier administration is a direct way to assess their efficacy. The objective of this study was to evaluate the effect of a commercial yeast cell wall preparation (YCW) on aflatoxin B1 (AFB1) and ochratoxin A (OTA) pharmacokinetic and balance excretion (faeces vs urine) in rats.

MATERIALS AND METHODS

- Rats (Sprague-Dawley, 265± 30 g) were housed in a controlled room and had free access to water and feeds. Radiolabelled AFB1 (0.716 µg/kg BW) and OTA (3.22 µg/kg BW) were orally administered alone or with YCW equivalent to 0.025% in diet.
- The absorption and excretion of toxins was monitored by radioactivity measurements using a liquid scintillation counter in two different studies.
  - *Pharmacokinetic study*: The pharmacokinetic parameters were determined in plasma using three rats per treatment group, sacrificed at 1, 2, 4, 5, 6, 8, 10,14, 24, 36, 48 and 72 h post gavage (n=117).
  - *Excretion study*: five rats per group were randomly and individually placed in metabolism cages. Samples of urines and faeces were collected at 6, 12, 24, 36, 48 h, and then every 24 h after dose.

RESULTS

Table 1. Mean pharmacokinetic parameters in plasma after a single dose of AFB1 and OTA with and without co-administration of a YCW preparation in rats

	Aflatoxin B1		Ochratoxin A	
Parameters	Control	YCW	Control	YCW
Cmax (ng/ml/kg BW)	0.72	0.27	28.78	20.84
Tmax (h)	4	5	5	5
$t_{1/2}$ (h)	63.6	65.4	63.6	65.4
AUC 0-$^{\infty}$(ng/ml/kg BW)	32.9	20.1	1758.5	1279.8
ΔAUC 0-$^{\infty}$(%)		38.9		27.2

YCW reduced the absorption of AFB1. Area under the curve extrapolated to infinity (*AUC0-∞*) and maximal concentration (*Cmax*) increased without change in the elimination half life (t*1/2*). In contrast, YCW had no effect on ochratoxin A absorption.

Table 2. Cumulative excretion of mycotoxins after a single dose of aflatoxin B1 and ochratoxin A with and without co-administration of a yeast cell wall preparation in rats

Experiment[a]		Urines[b]	Faeces[b]	Total excreted[c]
Aflatoxin B1 (0.716 µg/kg BW)				
	Control	6.1±2.0	39.0±3.4	45.1
	YCW	2.9±1.1 *	59.6±18.2 *	62.5
Ochratoxin A (3.22 µg/kg BW)				
	Control	5.6±1.3	16.3±2.6	44.1
	YCW	6.5±2.3	23.8±4.9 *	49.3

[A] Cumulative excretion (%, mean±SD, n=5) of radioactivity, [b] Excreted at 72 h, [c] Sum of urines and faeces at the end of the collection period that was 3 and 10 days for aflatoxin B1 and ochratoxin A, respectively

Co-administration of YCW and AFB1 increased, up to 55%, radioactivity excretion in faeces as compared to AFB1 alone, while the rate in urines decreased.

YCW effect on OTA was less marked. The radioactivity in faeces was increased up to 16% (P<0,05) but without modification of urinary excretion.

CONCLUSIONS AND PERSPECTIVES

- These results indicate that YCW has the potential to protect animals against exposure to low dietary level of selected mycotoxins.
- Detoxification of aflatoxin B1 appears to be most efficient than for ochratoxin A.
- Evaluation of the protective action of YWC in ruminants is under way.

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