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RIBOFLAVIN PRODUCTION BY MOLDS

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Very little information is at hand regarding the ability of molds to synthesize riboflavin. Few citations pertaining directly to riboflavin production by true molds are available.[2] Pontovich (1943) found as much as 2 mg riboflavin per g of *Aspergillus flavus* mycelium. Tanner *et al.* (1945) determined the quantity of riboflavin in the submerged fermentation media of *Penicillium chrysogenum.* The highest value found was 1.36 mg per ml. The primary purpose of this study was to screen several hundred isolates, recently obtained from soil, crop residues, and composts, for their ability to produce riboflavin on a wheat bran substrate.

METHODS

Preparation and inoculation of wheat bran. Ten grams of wheat bran and 10 ml of water were thoroughly mixed in 12-oz French squares. The bottles were then plugged with cotton and autoclaved for 60 minutes at 121 C.

The mold isolates were carried on potato glucose slants, and the inoculum was prepared as follows: Several grams of sterile, moistened wheat bran (in test tubes) were inoculated directly from the agar slants and allowed to sporulate well. Approximately 0.5 g of this dried mold bran served as the inoculum for each bottle. The bottles were incubated horizontally at 30 C until good mycelial growth was obtained (72 to 96 hours).

Riboflavin assay. The dry mold bran was assayed for riboflavin by the *Lactobacillus casei* acid production method of Snell and Strong (1939) as modified by Strong and Carpenter (1942).

RESULTS

The results of the screening tests are presented in table 1. Of the 240 isolates, all were capable of riboflavin synthesis. As will be noted, however, some genera are better able to produce riboflavin than others. The isolates of the genus *Fusarium* are rather outstanding in this respect, as well as are certain of the aspergilli. The most outstanding isolate was a "gold" *Aspergillus* which yielded a value of 5.8 mg riboflavin per 100 g of mold bran.

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[2] The commercial applications of the so-called *Eremothecium ashbyii* and *Ashbya gossypii* in riboflavin production and the patent literature pertaining thereto are not considered in this discussion.

TABLE 1

Riboflavin production by molds

GENUS	NUMBER OF ISOLATES	RIBOFLAVIN PER 100 G MOLD BRAN*			
		0.40–0.49 mg	0.50–0.99 mg	1.00–1.99 mg	2.00+ mg
Aspergillus					
black	47	0	2	39	6
green	19	0	2	17	0
tan	27	0	10	8	9
gold	16	0	2	9	5
misc	4	0	1	2	1
Penicillium					
blue-green	27	0	11	14	2
gray-green	19	0	10	7	2
yellow-green	11	2	5	4	0
compact raised	15	2	5	7	1
Alternaria	4	0	2	2	0
Fusarium	26	0	3	7	16
Hormodendrum	9	1	5	3	0
Rhizopus-Mucors	11	0	6	4	1
Trichoderma	5	0	0	3	2
Total	240	5	64	126	45

* From 0.25 to 0.35 mg riboflavin per 100 g wheat bran before molding.

SUMMARY

Of the 240 fungal isolates grown on a wheat bran substrate, all were capable of producing some riboflavin. Forty-five isolates gave values in excess of 2 mg per 100 g of mold bran. Certain isolates of the genera *Fusarium* and *Aspergillus* were particularly outstanding. The highest yield of riboflavin, 5.8 mg per 100 g of mold bran, was obtained from a "gold" *Aspergillus*. It can be concluded that riboflavin synthesis is rather common, at least in the molds studied, and that certain isolates produce riboflavin in amounts sufficient to warrant further study as a biological source of riboflavin.

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