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Asteraceae species as growth inhibitor of Aspergillus flavus.

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Introduction

Asteraceae species has shown activity against a variety of pathogenic and toxigenic fungi. The toxigenic fungi can cause a lot of damage the food commodities, including the mycotoxin production. The presence of molds and mycotoxin in food commodities is a potential health threat to humans and livestock. The aflatoxins, mutagenic and carcinogenic substances, are mycotoxins produced especially by *Aspergillus flavus, A. parasiticus*. The species *Ageratum conyzoides, Artemisia vulgaris* and *Porophyllum ruderale* (Asteraceae species) were evaluated in A. flavus culture, in earlier time, in our laboratory[1, 2], but no comparative study was carried out between them. This work reports the comparative effects of the three essential oils leaves on growth of A. flavus and their chemical constitutions.

Result and Discussion

Aerial parts of *A. vulgaris* and *P. ruderale* were collected in Instituto Biológico São Paulo/SP and aerial parts of *A. conyzoides* were collected in Ibiúna/SP. All were collected in June/2013. The essential oils were obtained by hydrodistillation and analyzed by GC-MS. The *A. flavus* growth was evaluated by disk diffusion assay. Filter paper disks containing 0.0; 2.5; 5.0; 7.5µL of essential oils were used and commercial fungicide was the positive control.

All treatments consisted of three replicates. All volumes of the three essential oils reduced the fungal growth when compared with control ($p<0.01$) (Table 1). The essential oil of *P. ruderale* showed greater fungicidal effect, the inhibition was more than 100% (Table 1 and Figure 1). *A. vulgaris* essential oil showed fungicidal effect greater than the essential oil of *A. conyzoides* ($p <0.05$), (Figure 1). The volume of essential oil of *P. ruderale*, *A. vulgaris* and *A. conyzoides* which inhibited 50% of *A. flavus* growth was 1.05; 4.17 and 4.09 µL respectively (Figure 1).

The main chemical constituents were hydrocarbon, n-pentadecane (34.43%), the monoterpene, α-thujone (58.61%) and the chromene, precocene I (76.53%) to the *P. ruderale*, *A. vulgaris* and *A. conyzoides* essential oils respectively.

Table 1. Essential oil volumes, size of inhibition zone, and *A. flavus* growth inhibition

Essential oil volumes (µL)	Size of inhibition zone (cm)		
	P. ruderale	*A. vulgaris*	*A. conyzoides*
(control -)	0.00	0.00	0.00
(control+)	2.20	2.20	2.20
2.5	2.25	1.10	0.91
5.0	3.91	1.48	1.22
7.5	4.11	1.69	1.47

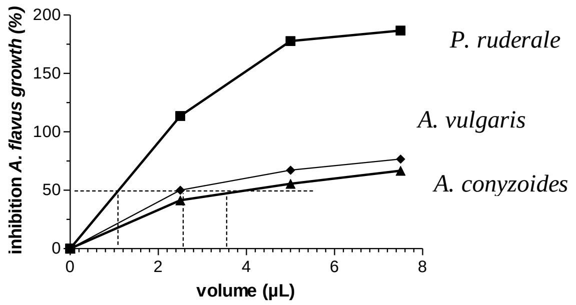

Figure 1: Curve of volumes of essential oil versus percentage of inhibition to *P. ruderale*, *A.vulgaris* e *A. conyzoides*

Conclusion

The results showed that the essential oils of these three species can be an alternative to control of *A. flavus* growth, but *P. ruderale* essential oil is more efficient. These essential oils can aid in the prevention of aflatoxin contamination.

Acknowledgment

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[1] Nogueira, J.H.C; Gonçalez, E; Galetti, S.S.R; Facalani, R.; Marques, M.O.M; Felicio J.D. Int. J. Food Microbiol. **2010**,137,55.

[2] Soares, L.B.; Tucci, E.C.;, Gonçalez, E.; Felicio, R.C.; Felício J.D. Annual Research & Review in Biology, **2015**, 5, 285.