

**TITLE:** EFFECT OF ATRAZINE ON FUNGAL COMMUNITIES IN AGRICULTURAL SOIL FROM PARANÁ BASIN 3, BRAZIL

**AUTHORS:** SILVA, G.F.; MOREIRA, J.V.F.; CHIBA DE CASTRO, W.A.; BONUGLI-SANTOS, R.C.

**INSTITUTION:** UNIVERSIDADE FEDERAL DA INTEGRAÇÃO LATINO AMERICANA (UNILA), FOZ DO IGUAÇU, PR (AV. TARQUÍNIO JOSLIN DOS SANTOS, 1000 - LOT. UNIVERSITARIO DAS AMERICAS, 85870-650, FOZ DO IGUAÇU – PR, BRAZIL)

**ABSTRACT:**

Atrazine (ATZ) is an herbicide of large application in Brazilian agriculture, although this agrochemical can affect the ecosystem stability and human health. The degradation of this herbicide occurs naturally in soil by abiotic factors and biotic, as microbiota. While we have made some great progress towards the knowledge between bacterial and ATZ degradation, many questions remain unanswered about this herbicide and fungal community *in situ*. We aimed to evaluate the fungal community of agricultural soil (from Paraná Basin 3, Brazil) under ATZ. Nine microcosms were prepared with 500 g of soil (soil of 10 different agriculture sites, mixed for composite sampling). The treatments were: control (soil without addition of ATZ), T1 (soil + 300 ng of ATZ/kg) and T2 (soil + 3000 ng of ATZ/kg) in triplicate. We incubated the microcosms at 28 °C and in each experimental day (0, 7, 14, 21, 28), we extracted 10 g of each microcosm soil for fungal isolation (by serial dilution) in Malt Extract 2% medium supplemented or not with guaiacol (to ligninolytic isolations). We characterized the isolates morphologically to obtain the number of morphotypes in each treatment over time. To verify differences between treatments, we used a Generalized Linear Mixed Models (GLMM) with Poisson distribution and temporal pseudo replication. A total of 114 morphotypes were isolated. We did not find significance differences between control treatment and T1 (GLMM;  $z = -1.259$ ;  $p = 0.208$ ) and T2 (GLMM;  $z = -1.268$ ;  $p = 0.205$ ). Our results corroborate other studies about richness of soil bacteria community being stabilized by the continuous use of atrazine over time. This increased exposure of ATZ can promote a gradual resistance of the fungi groups or a degradation improvement of this herbicide by the community. We found a higher number of morphotypes than expected for impacted soils. These results will be confirmed by molecular characterization and will support further studies about fungal community composition and ATZ resistance or degradation.

**Keywords:** agricultural soil, filamentous fungi, morphotypes, resistance.

**Development Agency:** UNILA, Itaipu Binacional e Fundação Parque Tecnológico de Itaipu.