

Pesticide residue monitoring in rice grains as basis for certification under Integrated Rice Production

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The monitoring of pesticide residues in rice grain is a mandatory requirement under the Integrated Rice Production (PIA), the official instrument of the Brazilian Government for certification of this cereal. This study aimed to determine the concentration of pesticides in grain, husk and rice bran produced in three PIA areas in the states of Rio Grande do Sul and Tocantins. Monitoring was performed in seasons 2011/12 and 2012/13. Sixteen samples of polished grains, whole grains, meal, grits and rice husk were analyzed. The study investigated the presence of 61 residual active ingredients and two metabolites. The analysis employed a liquid chromatograph coupled to mass/mass spectrometry (LC/MS/MS) and a gas chromatograph with ECD detector for quantitative analysis. Residues of fungicides belonging to the chemical group triazol were detected in polished rice samples (0.09 mg kg⁻¹), whole grains (<0.01; 0.03; 0.14; and 0.21 mg kg⁻¹), bran (0.14; and 1.27 mg kg⁻¹), grits (<0.01; and 0.10 mg kg⁻¹) and rice husks (0.12; and 1.49 mg kg⁻¹) in quantities above the Acceptable Daily Intake Value (ADI=0.03 mg kg⁻¹) and the Maximum Residue Limit (MRL=0.1 mg kg⁻¹). Cypermethrin, a pyrethroid insecticide, was detected (0.12 mg kg⁻¹) above the MRL and ADI (0.05 mg kg⁻¹) in a sample of husked rice intended for canine consumption. In monitoring conducted by Mattos et al. [1] on grain and rice husk collected from PIA partner companies, tebuconazole residues were detected at levels below the MRL for human consumption. The presence of high concentrations of tebuconazole residual is indicative of the increasing in the use of this fungicide for the control of foliar diseases in rice crop. This trend reinforces the need for implementation of Integrated Pest Management (IPM) to rationalize the application of pesticides and to conform to the residual levels allowed by Brazilian legislation on consumer safety, through certification and traceability of the cereal.

[1] Mattos, M. L. T.; Martins, J. F. da S.; Nunes, C. D. M.; Afonso, A. P. S. (2009) Monitoramento de agrotóxicos e micotoxinas em grãos de arroz produzidos em áreas piloto da produção integrada de arroz irrigado na fronteira oeste do Rio Grande do Sul (Comunicado Técnico, 218).

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