

18th Global Summit on

ENVIRONMENTAL TOXICOLOGY AND PHARMACOLOGY

September 17-18, 2018 Singapore

Post-harvest evaluation of dimethoate, chlorothalonil and chlorpyrifos by GC-ECD in Peruvian varieties of *Chenopodium quinoa* Willd**Fredy Enrique Quispe Jacobo, Carlos Medina Saldivar and Chirinos Pajuelo Diego**
National Institute of Agrarian Innovation, Peru

Chenopodium quinoa is an important nutritional Andean grain produced by farmers in Peruvian highlands and Plateau. In the last years, new crops like *quinoa* in Peruvian coast have been cultivated due to increasing of worldwide demand of *quinoa*. However, the growing under this agro climatic condition, *quinoa* was more sensitive to plague attacks and fungus infection, for those reasons farmers increasing the use of pesticides, which in many cases exceeded the maximum residue limits established by international organizations in food and feed. The purpose of this study was the post-harvest evaluation of dimethoate, chlorothalonil and chlorpyrifos by Gas Chromatography coupled with Electron Capture Detector (GC-ECD) using a solid phase extraction in seeds of four varieties of Peruvian *quinoa*. The study began with the development, optimization and validation of the method for determining the levels of dimethoate, chlorothalonil and chlorpyrifos in the post-harvest stage of Salcedo, Quillahuaman, Santa Ana and Altiplano *quinoa* varieties, which were harvested in conventional and organic field at the central coast of Peru (Lima). Validation by GC-ECD shows pesticides recovery percentages between 98.98 and 118.44% with relative standard deviation up to 10.5%, significant correlation coefficients (≥ 0.9979) and limits of quantification (≥ 5.402 ppb) were observed in the *quinoa* seeds, which meet the standard validation parameters of the European commission. The evaluation of chlorothalonil in Quillahuaman and Santa Ana at conventional field exceeded the maximum residue level allowed, however three months later the concentration of the pesticides used in the culture decreased significantly. In the case of organic field the pesticides were not observed. The gas chromatography coupled with electron capture detector can be used to determine the levels of dimethoate, chlorothalonil and chlorpyrifos in *quinoa* seeds. Recommendations are to determine the levels of these pesticides in the Peruvian market.

References

1. Liu Z, Qi P, Wang X, Wang Z, Xu X, Chen W, et al. (2017) Multi-pesticides residue analysis of grains using modified magnetic nanoparticle adsorbent for facile and efficient cleanup. Food Chemistry; 230: 423-431.
2. Ortega Barriga R E, Zamallora Cuba W A, Tornisiello V L, Zirena Vilca F (2016) Determination of organo-chlorine pesticides in organic *quinoa* grains (*Chenopodium quinoa* Willd) by GC- μ ECD, using the QuEChERS method. Revista de Investigación Altoandina; 18 (1): 19-26.

Biography

Fredy Enrique Quispe Jacobo is a researcher from National Institute of Agrarian Innovation (INIA). He has expertise in Researching and Technological Development (RTD) of Natural and Agro industrial products. He is a leader of Nutritional Area from Genetic Resources and Biotechnology Division at INIA, and with his team executes Projects to know the nutritional contents, minerals, and functional properties of genetic resources, likewise pesticide residuals used in the production at field.

equispe@inia.gob.pe

Notes: