



RASEQA 2022

LIBRO DE RESÚMENES



Grupo Regional Andaluz
Sociedad Española de Química Analítica



XVII Reunión del Grupo Regional Andaluz de la Sociedad Española de Química Analítica



Libro de resúmenes



Sevilla, 6 y 7 de octubre de 2022



GRUPO REGIONAL ANDALUZ
SOCIEDAD ESPAÑOLA DE QUÍMICA ANALÍTICA



El Comité Organizador de la XVII Reunión del Grupo Regional Andaluz de la Sociedad Española de Química Analítica (GRASEQA 2022) CERTIFICA que:

D/D^a Jesús Marín Sáez

Ha asistido a esta reunión, celebrada los días 6 y 7 de octubre de 2022 en Sevilla (España).

En Sevilla a 7 de octubre de 2022

Profesor Dr. Fernando de Pablos Pons
Coordinador del GRASEQA 2022



GRUPO REGIONAL ANDALUZ
SOCIEDAD ESPAÑOLA DE QUÍMICA ANALÍTICA



El Comité Organizador de la XVII Reunión del Grupo Regional Andaluz de la Sociedad Española de Química Analítica (GRASEQA 2022) CERTIFICA que el trabajo:

NEEM OIL DEGRADATION IN THE PRESENCE OF BACILLUS THURINGIENSIS: IDENTIFICATION OF UNKNOWN METABOLITES

J. Marín-Sáez, R. López-Ruiz, R. Romero-González, A. Garrido Frenich.

Ha sido presentado a esta reunión en modalidad de **COMUNICACIÓN ORAL**.

En Sevilla a 7 de octubre de 2022

Profesor Dr. Fernando de Pablos Pons
Coordinador del GRASEQA 2022

NEEM OIL DEGRADATION IN THE PRESENCE OF BACILLUS THURINGIENSIS: IDENTIFICATION OF UNKNOWN METABOLITES

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Neem oil (composed mainly by Azadirachtin A (AzA)) is a biopesticide widely employed for the treatment of tomato and grape moth. However, when the plague is established in the plants, neem oil is not enough to eliminate it. In these cases, neem oil together with *Bacillus Thuringiensis* (*Bt*), a gram-positive bacterium with insecticidal action, are simultaneously applied [1]. It has been demonstrated that *Bt* is capable of degrading other pesticides [2], although no studies are available about neem oil compounds degradation due to *Bt* influence, despite the fact that these compounds are normally applied together.

For that, in this study the degradation of neem oil under the influence of *Bt* was studied, employing an ultrahigh performance liquid chromatography instrument coupled to high resolution mass spectrometry. Tomato and grape samples were applied with neem oil alone and together with *Bt*. Samples were kept at 22°C and in a lit-up place, and at 3°C in a dark place for more than 60 days. Dissipation study showed that AzA has a residual lifetime (RL₅₀) lower than 25 days in all cases, being degradation slightly faster when neem oil was applied together with *Bt* (RL₅₀ neem=14-25 days and RL₅₀ neem+*Bt*=12-21 days) (*p*-values=0.076-0.302) and faster at 22°C (RL₅₀ 22°C=12-20 days and RL₅₀ 3°C=21-25 days).

After dissipation studies, suspect and unknown metabolites were searched in the samples employing different software platforms (Compound Discoverer, MassChemSite and MassFrontier). Seven suspect compounds (azadirachtin B (AzB), azadirachtin I, azadirachtin D, azadirachtin N, azadirachtin F, 6-desacetyl-nimbin, salannin, 3-desacetyl-salannin, ohchinolide B and 11-Hydroxyazadirachtin B) were detected, and all of them follow the same trend than AzA, except for 11-hydroxyazadirachtin B who slightly increased its concentration, probably because it is the degradation product of AzB. Five unknown metabolites were tentatively identified, corresponding to dehydration and demethylation forms of AzA and AzB. Their behaviour is different than suspect compounds: their concentrations increased and then they were kept constant.

This study provides a wide and comprehensive vision of neem oil compounds degradation and the influence of storage conditions and *Bt* application.

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References:

- [1] J. Y. Roh, J. Y. Choi, M. S. Li, B. R. Jin, Y. H. Je, *Bacillus thuringiensis* as a specific, safe, and effective tool for insect pest control, *Journal of Microbiology and Biotechnology*. 17 (2007).
- [2] L. Ferreira, E. Rosales, A. S. Danko, M. A. Sanromán, M. M. Pazos, *Bacillus thuringiensis* a promising bacterium for degrading emerging pollutants, *Process Safety and Environmental Protection*. 101 (2016).