Electronic Supplementary Material (ESI) for Analytical Methods.


# An accurate and sensitive determination of selected pesticides in mixed fruit juice samples using the combination of a simple and efficient microextraction method and GC-MS with matrix matching calibration strategy

## Supplementary Material

**Table S1.** The optimum conditions for the developed VA-SFDF-LPME method.

| Parameter | Optimum condition |
|---|---|
| Spraying number | 1 |
| Extraction Solvent | 1,2-dichloroethane |
| Sample volume | 12.0 mL |
| Mixing type | Vortex |
| Mixing period | 30 s |

**Table S2.** %RSD values belonging to low, medium and high concentration in calibration plot levels for the analytes.

| **Analyte** | **Low Concentration Level, µg/kg** | **%RSD** |
|---|---|---|
| Chlorbenside | 4.93 | 4.0 (n=6) |
| Mepanipyrim | 0.11 | 5.9 (n=6) |
| Hexaconazole | 4.91 | 5.5 (n=6) |
| Norflurazon | 0.58 | 3.4 (n=6) |
| Fenhexamid | 5.06 | 6.7 (n=6) |
| Ipconazole | 4.88 | 5.2 (n=6) |
| Fluridone | 0.57 | 6.7 (n=6) |
| Indoxacarb | 4.91 | 3.3 (n=6) |
| **Analyte** | **Medium Concentration Level, µg/kg** | **RSD%** |
| Chlorbenside | 26.17 | 5.3 (n=3) |
| Mepanipyrim | 1.11 | 5.0 (n=6) |
| Hexaconazole | 26.10 | 6.6 (n=3) |
| Norflurazon | 10.04 | 4.9 (n=3) |
| Fenhexamid | 26.89 | 9.2 (n=3) |
| Ipconazole | 25.92 | 14.2 (n=3) |
| Fluridone | 2.62 | 10.0 (n=6) |
| Indoxacarb | 26.11 | 3.3 (n=3) |
| **Analyte** | **High Concentration Level, µg/kg** | **RSD%** |
| Chlorbenside | 100.94 | 6.2 (n=3) |
| Mepanipyrim | 4.93 | 3.1 (n=3) |
| Hexaconazole | 100.65 | 5.9 (n=3) |
| Norflurazon | 103.42 | 3.9 (n=3) |
| Fenhexamid | 103.68 | 5.3 (n=3) |
| Ipconazole | 99.97 | 3.3 (n=3) |
| Fluridone | 4.94 | 4.2 (n=3) |
| Indoxacarb | 100.68 | 0.4 (n=3) |

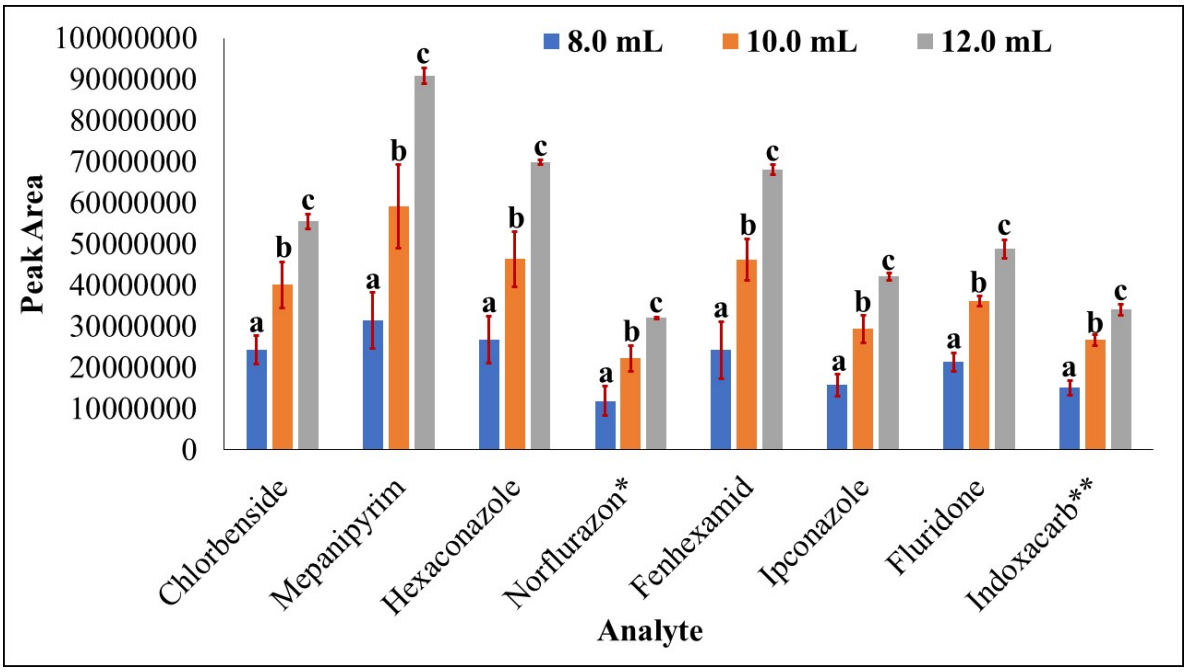


**Figure S1.** Sample volume optimization (* and ** indicates 2 and 10 times scaled up peak areas and their standard deviations, respectively, n=3). The concentrations of chlorbenside, mepanipyrim, hexaconazole, norflurazon, fenhexamid, ipconazole, fluridone, indoxacarb were 50.01 µg/kg, 49.23 µg/kg, 49.87 µg/kg, 51.24 µg/kg, 51.37 µg/kg, 49.53 µg/kg, 50.14 µg/kg, 49.88 µg/kg, respectively. Constant parameters: 1,2-dichloroethane as the extraction solvent, one spraying, and 30 s of vortex mixing.

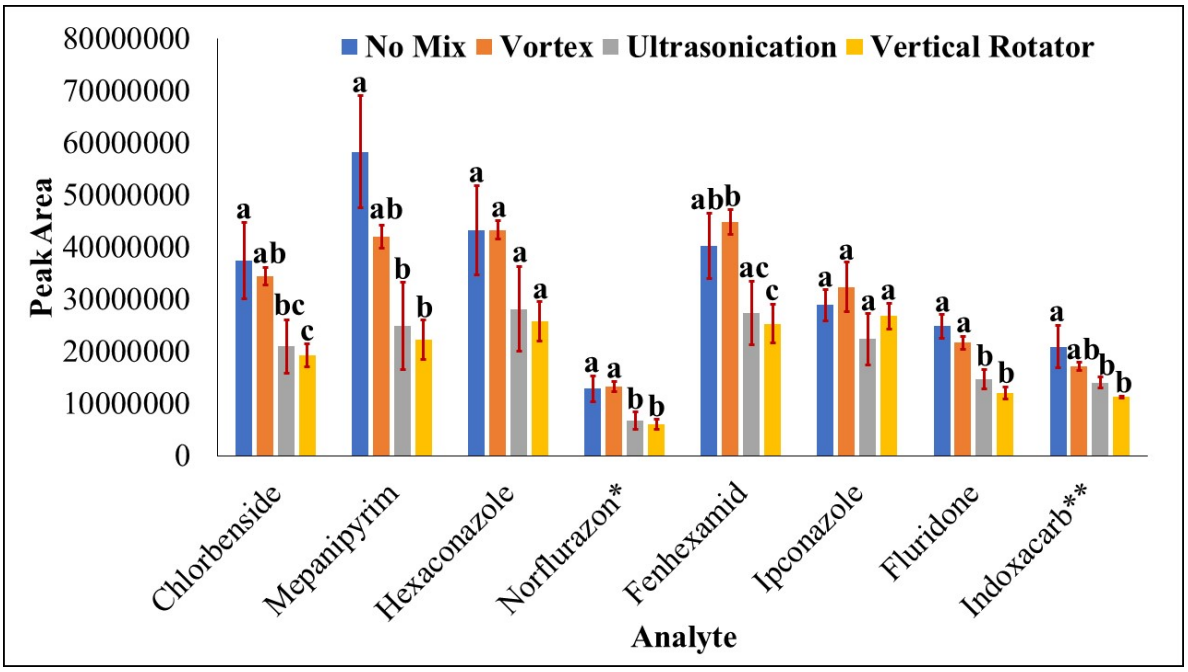


**Figure S2.** Mixing type optimization (* and ** indicates 2 and 10 times scaled up peak areas and their standard deviations, respectively, n=3). The concentrations of chlorbenside, mepanipyrim, hexaconazole, norflurazon, fenhexamid, ipconazole, fluridone, indoxacarb were 40.63 µg/kg, 40.00 µg/kg, 40.51 µg/kg, 41.63 µg/kg, 41.73 µg/kg, 40.24 µg/kg, 40.73 µg/kg, 40.52 µg/kg, respectively. Constant parameters: 1,2-dichloroethane as the extraction solvent, 12.0 mL of sample volume, one spraying, and 30 s of each mixing process.

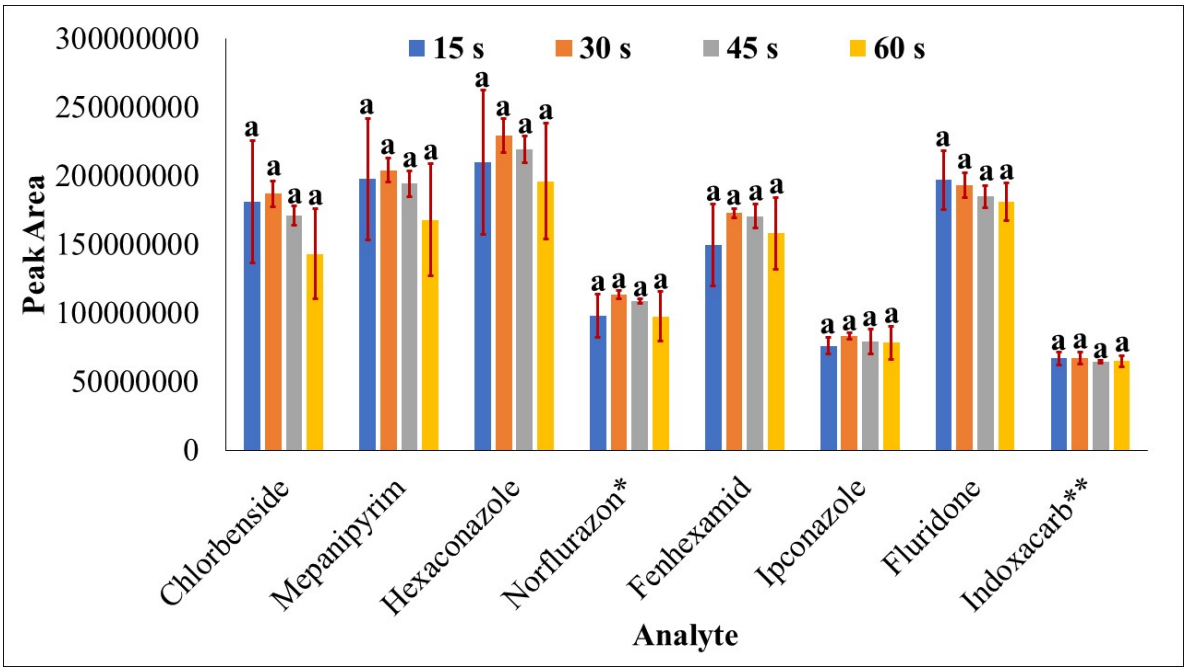


**Figure S3.** Mixing period optimization (* and ** indicates 2 and 10 times scaled up peak areas and their standard deviations, respectively, n=3). The concentrations of chlorbenside, mepanipyrim, hexaconazole, norflurazon, fenhexamid, ipconazole, fluridone, indoxacarb were 37.14 µg/kg, 36.57 µg/kg, 37.04 µg/kg, 38.05 µg/kg, 38.15 µg/kg, 36.79 µg/kg, 37.24 µg/kg, 37.05 µg/kg, respectively. Constant parameters: 1,2-dichloroethane as the extraction solvent, 12.0 mL of sample volume, one spraying, and vortex mixing.

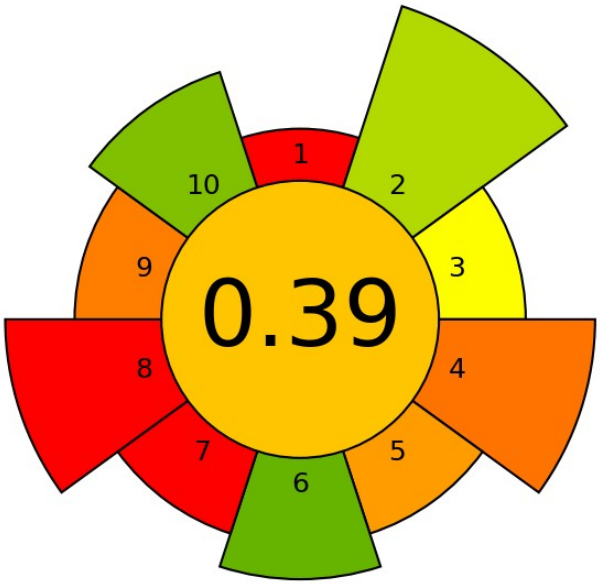


**Figure S4.** The pictogram generated from the AGREEprep software for the developed VA-SFDF-LPME-GC-MS method.

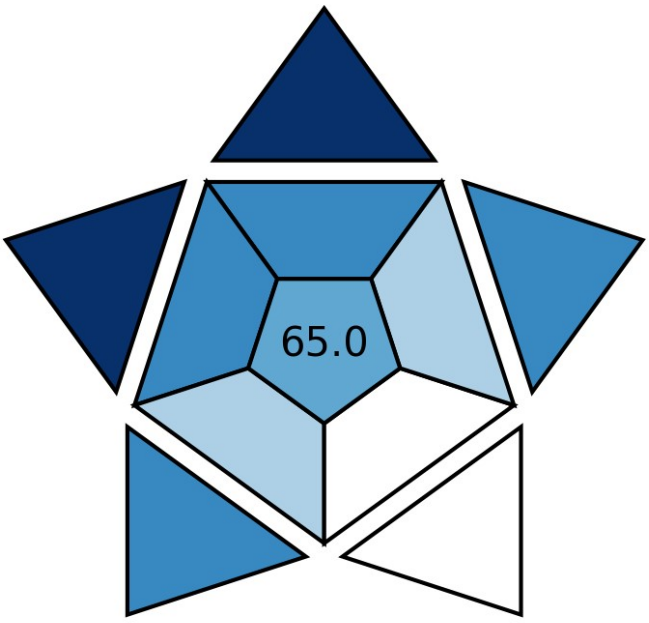


**Figure S5.** The pictogram produced from the BAGI software for the developed VA-SFDF-LPME-GC-MS method.