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Ring test
Polar pesticides and contaminants in green tea
P2515-RT

Summary

The entire report is available to participants only.

The ring test was designed, realised, evaluated, and authorised on behalf of PROOF-ACS GmbH by

Dr. Birgit Schindler
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Project coordinator

The report was approved by

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Participants with any comments or concerns related to this ring test are invited to contact:

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DAkkS
Deutsche
Akkreditierungsstelle
D-EP-22211-01-00

PROOF-ACS is a DAkkS accredited proficiency testing provider according to DIN EN ISO 17043:2010 (D-EP-22211-01-00). This ring test is covered by the scope of accreditation.

PROOF-ACS GmbH does not have any analytical laboratory facilities of its own. Homogeneity testing and stability testing are subcontracted to laboratories, accredited according to DIN EN ISO 17025. The subcontracted laboratory may also participate in the ring tests. If so, the laboratory is treated in the same way as other participants and the same rules of confidentiality apply.

The proficiency test evaluates the performances of laboratories with respect to their ability to quantify polar pesticides and contaminants in green tea. 12 laboratories across six countries (Australia, Germany, France, Italy, Spain, and Vietnam) took part in the proficiency test.

The test material is prepared of organic green tea. The raw material is milled in a Retsch ultra-centrifugal mill ZM200. The resulting powder is homogenised intensively and tested for incurred residues thereafter. The raw material contains incurred residues of trimesium as well as trace levels of perchlorate.

The milled and homogenised raw material was provided to all participants as blank material. The raw material was spiked with anthraquinone, biphenyl, chlorate, perchlorate, glyphosate, AMPA, diquat, paraquat, matrine, oxymatrine, and 2-chloroethanol to prepare the test material. It was up to the laboratories to quantify the full set of 13 parameters or a selection of it. The laboratories were asked to analyse both materials, the test material, and the blank material and to mark parameters, which they did not analyse as “n.a.” (not analysed).

All labs submitted results and are considered for evaluation.

The report contains an assessment related to

- the *trueness* of the results. The trueness is expressed as the coverage of the spiked level in %. The coverage should be at least between 70 and 120 % of the spiked level. The trueness criterion is applied to all parameters except trimesium (incurred residue).
- the *comparability* of the results. The evaluation of the comparability is based on the z-score model. The absolute values of z-scores should be at least ≤ 2. The comparability criterion is applied to anthraquinone, chlorate, perchlorate, and nicotine. The comparability criterion is not applicable to all other parameters due to the limited number of reported results.

Results

Parameter	Spiked level [mg/kg]	Assigned value [mg/kg]	Assigned value in % of the spiked level	No. of results	No. of results with a |z-score| ≤ 2	No. of results within 70-120 % of the spiked level
Anthraquinone	0.072	0.0668	93	7	7	6
Biphenyl	0.034	-	-	6	Not applicable	6
Chlorate	0.089	0.0894	100	9	9	9
Perchlorate	0.13	0.138	106	9	9	9
Nicotine	0.12	0.119	99	8	6	6
Glyphosate	0.045	-	-	6	Not applicable	6
AMPA	0.083	-	-	6	Not applicable	4
Trimesium	incurred	-	-	4	Not applicable	Not applicable
Diquat	0.11	-	-	3	Not applicable	2
Paraquat	0.074	-	-	3	Not applicable	1
Matrine	0.088	-	-	4	Not applicable	4
Oxymatrine	0.067	-	-	4	Not applicable	3
Ethylene oxide (sum)	0.14	-	-	5	Not applicable	5

* The blank material contains incurred residues of perchlorate (about 0.01 mg/kg). The incurred residues are negligible compared to the spiked level.

To summarise:

- 12 laboratories took part in the tests. The laboratories were free to choose if they report results related to all 13 parameters or a selection of it. None of the labs reported results related to all 13 parameters.
- 12 labs ordered the basic module, while 7 labs ordered glyphosate, AMPA, and trimesium, 3 labs ordered diquat and paraquat, 4 labs ordered matrine and oxymatrine, and 5 labs ordered ethylene oxide.
- Trimesium is an incurred residue, while all other parameters are spiked to the material. Trimesium is not included in the evaluation of the performance of the labs due to the limited number of reported results.
- Comparability:

  Anthraquinone, chlorate, perchlorate, and nicotine oxide are evaluated with respect to the comparability criterion.
- Trueness:

  The trueness criterion is applied to all parameters except trimesium.
- The overall performance of the labs is good, even though the quantification of polar pesticides is challenging in complex matrices like green tea. Most of the labs are able to provide reliable results at least related to the more common parameters of the basic module.
- The most challenging parameters are diquat and paraquat.