

Ring test
Polar pesticides and contaminants
in green tea
P2314-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

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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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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. 17 laboratories across six countries (Belgium, Germany, Greece, France, Netherlands, 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 perchlorate and trimesium. The incurred residues are considered for evaluation.

The milled and homogenised raw material was provided to all participants as blank material. To prepare the test material, the raw material was spiked with anthraquinone, biphenyl, chlorate, nicotine, glyphosate, AMPA, diquat, paraquat, matrine, oxymatrine, and 2-chloroethanol in addition to the incurred residues of perchlorate and trimesium. 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 kept the term of submission of 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 perchlorate and trimesium (incurred residues).
- the *comparability* of the results. The evaluation of the comparability is based on the z-score model. The z-score should be at least $\leq |2|$. The comparability criterion is applied to all parameters except AMPA, diquat, paraquat, and oxymatrine. The comparability criterion is not applicable to the parameters mentioned before 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 $\leq 2 $	No. of results within 70-120 % of the spiked level
Anthraquinone	0.035	0.0337	96	14	12	11
Biphenyl	0.025	0.0243	97	14	10	10
Chlorate	0.038	0.0397	105	15	14	11
Perchlorate	incurred	0.0527	-	15	15	Not applicable
Nicotine	0.31	0.283	91	14	13	13
Glyphosate	0.062	0.0575	93	9	8	8
AMPA	0.025	-	-	7	Not applicable	4
Trimesium	incurred	0.118	-	7	7	Not applicable
Diquat	0.064	-	-	7	Not applicable	4
Paraquat	0.045	-	-	7	Not applicable	3
Matrine	0.062	0.0609	98	7	7	7
Oxymatrine	0.048	-	-	6	Not applicable	5
2-Chloroethanol	0.16	0.150	94	10	9	8

To summarise:

- 17 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. Two labs reported results related to all 13 parameters.
- 14 labs reported results related to anthraquinone, biphenyl, and nicotine, 15 labs reported chlorate and perchlorate, 9 labs reported glyphosate, 7 labs reported AMPA, trimesium, diquat, paraquat and matrine, 6 labs reported oxymatrine, and 10 labs reported 2-chloroethanol.
- Perchlorate and trimesium are incurred residues, while all other parameters are spiked to the material.
- Comparability:
Anthraquinone, biphenyl, chlorate, perchlorate, nicotine, glyphosate, trimesium, matrine and 2-chloroethanol are evaluated with respect to the comparability criterion.
- Trueness:
Anthraquinone, biphenyl, chlorate, nicotine, glyphosate, AMPA, diquat, paraquat, matrine, oxymatrine, and 2-chloroethanol are evaluated with respect to the trueness criterion.
- The overall performance of the labs is good, even though the quantification of polar pesticides is challenging in complex matrices like green tea.