

Ring test

Polar pesticides and contaminants in black tea

P2217-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
Managing Director PROOF-ACS GmbH
Project coordinator

The report was approved by

A handwritten signature in blue ink that reads 'Schindler'.

Dr. Birgit Schindler
17 November 2022

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 black tea. Nine laboratories across four European countries (Croatia, Germany, Italy, and Netherlands) took part in the proficiency test.

The test material is prepared of organic black tea. The raw material is milled in small portions in a Retsch cutting mill pulverisette 15. The resulting powder is homogenised intensively and tested for incurred residues thereafter. The raw material contains incurred residues of nicotine and trimesium (each > 0.01 mg/kg). The incurred residues of nicotine and trimesium 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, perchlorate, nicotine, glyphosate, AMPA, diquat, paraquat, matrine, and oxymatrine in addition to the incurred residues of nicotine and trimesium. It was up to the laboratories to quantify the full set of twelve 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 nine 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 nicotine 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 anthraquinone, biphenyl, chlorate, perchlorate, and nicotine. It is not applicable to the 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 $\leq 2 $	No. of results within 70-120 % of the spiked level
Anthraquinone	0.055	0.0504	92	7	7	7
Biphenyl	0.045	0.0446	99	7	5	5
Chlorate	0.028	0.0286	102	7	6	5
Perchlorate	0.12	0.119	100	7	6	6
Nicotine	0.062*	0.0797	129	7	7	Not applicable
Glyphosate	0.12	-	-	6	Not applicable	4
AMPA	0.080	-	-	5	Not applicable	4
Trimesium	incurred	-	-	3	Not applicable	Not applicable
Diquat	0.078	-	-	3	Not applicable	2
Paraquat	0.065	-	-	3	Not applicable	2
Matrine	0.089	-	-	4	Not applicable	4
Oxymatrine	0.069	-	-	4	Not applicable	2

* The spiked level of nicotine is provided for information only. The raw material contains incurred residues of nicotine.

** Trimesium is an incurred residue. An evaluation is not possible due to the limited number of results.

To summarise:

- Nine laboratories took part in the tests. The laboratories were free to choose if they report results related to all twelve parameters or a selection of it. Two labs reported results related to all twelve parameters.
- Seven labs reported results related to anthraquinone, biphenyl, chlorate, perchlorate, and nicotine. Six labs reported glyphosate, five labs AMPA and three labs trimesium, diquat, and paraquat. Four labs reported matrine and oxymatrine.
- Trimesium is an incurred residue and was not considered for evaluation due to the limited number of reported results.
- Comparability:
Anthraquinone, biphenyl, chlorate, perchlorate, and nicotine are evaluated with respect to the comparability criterion. The overall performance of the labs is satisfying. All labs pass the comparability criterion related to anthraquinone, and nicotine, while 86 % of the labs pass the criterion related to chlorate and perchlorate and 71 % of the labs related to biphenyl.
- Trueness:
All parameters except nicotine and trimesium (incurred residues) are evaluated with respect to the trueness criterion. The performance of the labs is satisfying. All labs which provided results pass the trueness criterion related to anthraquinone and matrine. 86 % of the labs pass the criterion related to perchlorate, while 71 % of the labs pass the criterion related to biphenyl and chlorate. 67 % of the labs pass the criterion related to glyphosate, diquat and paraquat and only 50 % of the labs pass the criterion related to oxymatrine.
- One lab reported results related to all parameter and passes the trueness criterion as well as the comparability criterion (as far as applicable) for all parameters.