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Ring Test
Polar pesticides and contaminants in black tea
P2001-RT

Summary

The entire report is made available to participants only.

Designed, realised and evaluated by

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The proficiency test evaluates the performances of laboratories with respect to their ability to quantify polar pesticides and contaminants in black tea. Fourteen laboratories across five countries (Germany, Italy, Spain, Taiwan, Vietnam) 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 trace levels of incurred residues of anthraquinone, biphenyl, chlorate and perchlorate (all < 0.01 mg/kg). Incurred residues were also detected in the raw material of nicotine at a concentration level of about 0.080 mg/kg.

The milled and homogenised raw material was provided to all participants as blank material. In order to prepare the test material, the raw material was spiked with anthraquinone, biphenyl, nicotine, chlorate, perchlorate, glyphosate, AMPA, diquat and paraquat. It was up to the laboratories to quantify the full set of nine parameters or a selection of it. The laboratories were asked to mark parameters, which they did not analyse as n.a. (not analysed).

13 out of 14 labs kept the term of submission of results, while the deadline was extended for one of the labs due to a long delay in the shipment of the test material. The results of all labs 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. Due to the incurred residues in the raw material, the evaluation of nicotine with respect to the trueness criterion is provided for information purpose only. The incurred residues of anthraquinone and biphenyl are considered during evaluation if relevant for the outcome.
- the *comparability* of the results. The evaluation of the comparability is based on the z-score model. The z-score should be at least ≤ |2|. The comparability criterion is applied to all nine parameters.

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	0.045	0.0475	106	13	13	12
Biphenyl	0.045	0.0446	99	11	10	10
Chlorate	0.11	0.110	100	11	10	9
Perchlorate	0.25	0.250	100	11	10	10
Nicotine	0.21*	0.253	120	10	10	Not evaluated
Glyphosate	0.085	0.0859	101	11	11	11
AMPA	0.055	0.0593	108	10	9	7
Diquat	0.070	0.0701	100	7	7	5
Paraquat	0.080	0.0867	108	7	7	3

* The spiked level related to nicotine is provided for information purposes only. The blank material contains nicotine at a concentration level of about 0.080 mg/kg.

To summarise:

- Fourteen laboratories took part in the tests. The laboratories were free to choose if they report results related to all nine parameters or a selection of it.
- Thirteen laboratories reported results related to anthraquinone, eleven labs reported results related to biphenyl, chlorate, perchlorate and glyphosate, ten labs related to AMPA and nicotine and seven labs related to diquat and paraquat. Four labs analysed the test material for all nine parameters.
- Comparability:

  All parameters were evaluated with respect to the comparability criterion. The overall performance of the labs is satisfying. ≥ 90 % of the labs pass the comparability criterion with respect to each of the parameters.
- Trueness:

  All parameters except nicotine are evaluated with respect to the trueness criterion. The evaluation nicotine with respect to the trueness is provided for information purposes only due to incurred residues in the blank material. The performance of the labs with respect to anthraquinone, biphenyl, chlorate, perchlorate, and glyphosate is satisfying. > 80 % of the labs pass the trueness criterion with respect to the parameters mentioned before. ≥ 70 % of the labs pass the trueness criterion with respect to AMPA and diquat, while 43 % pass the trueness criterion with respect to diquat.