Faecal Parasitology: Concentration methodology really does matter!

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Abstract
Since the establishment of UKNEQAS Faecal Parasitology, in 1986, failure to report the parasite stages present in EQA specimens has increased the detection of parasite stages in EQA specimens, with only 30% of laboratories reporting the parasites present in EQA specimens. This study has shown that the number of parasite stages recovered increases with centrifugal force and time, and the use of a solvent.

Introduction
The use of a faecal concentration method for the examination of faeces for parasitic diseases increases the likelihood of finding ova, cysts and larvae in faecal specimens, particularly in those individuals where they are present in too few numbers to be seen by direct microscopy.

Methods
618 participants subscribe to the UKNEQAS Parasitology scheme. A questionnaire was sent to all participants to establish their method for concentrating faecal samples for the examination of parasites. 200 laboratories responded and their results were analysed. Following the analysis, faecal concentrations using the Parasep® faecal concentration method were performed in UK NEQAS on specimens containing a range of ova and cysts incorporating the variation in centrifugal force and centrifugal time reported by the participants.

Results

- **Recovery of ova of Ascaris lumbricoides**
  - No. of ova detected
    - Centrifugal speed: 1000 rpm, 2000 rpm, 3000 rpm, 3500 rpm
    - Time: 1 minute, 2 minutes, 3 minutes, 4 minutes
  - Preservation used: formalin in water, formalin in saline, 10% formalin in water

- **Recovery of cysts of Entamoeba histolytica/dispar**
  - No. of cysts detected
    - Centrifugal speed: 1000 rpm, 2000 rpm, 3000 rpm, 3500 rpm
    - Time: 1 minute, 2 minutes, 3 minutes, 4 minutes
  - Preservation used: formalin in water, formalin in saline, 10% formalin in water

- **Recovery of ova of Taenia species**
  - No. of ova detected
    - Centrifugal speed: 1000 rpm, 2000 rpm, 3000 rpm, 3500 rpm
    - Time: 1 minute, 2 minutes, 3 minutes, 4 minutes
  - Preservation used: formalin in water, formalin in saline, 10% formalin in water

- **Recovery of ova of Trichuris**
  - No. of ova detected
    - Centrifugal speed: 1000 rpm, 2000 rpm, 3000 rpm, 3500 rpm
    - Time: 1 minute, 2 minutes, 3 minutes, 4 minutes
  - Preservation used: formalin in water, formalin in saline, 10% formalin in water

Discussion
Although 96% of participants use a concentration method to examine faecal samples for parasites and all use a method based on the Modified Ridley Atkin technique (1), there is variation in the recommended centrifugal force, centrifugal time, and the use of a solvent.

- Centrifugal force and time: all participants should use the recommended centrifugal force (3000 rpm) and time (3 minutes) when using the Parasep® faecal concentration method.
- Solvent: all laboratories should use 10% formalin in water.

Conclusions
- A faecal concentration method is essential to increase the sensitivity of finding parasite stages.
- Poor concentration technique leads to poor recovery of parasites.
- All laboratories should use the recommended centrifugal force (3000 rpm) and time (3 minutes) when using the technique to optimise diagnosis of faecal parasites by microscopy.

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- Poor concentration technique leads to poor recovery of parasites.
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