

NATIONAL STANDARD METHOD

IDENTIFICATION OF *YERSINIA* SPECIES FROM FAECES

BSOP ID 21

Issued by Standards Unit, Evaluations and Standards Laboratory
Centre for Infections



Association of Medical Microbiologists
Association of Medical Microbiologists



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STATUS OF NATIONAL STANDARD METHODS

National Standard Methods, which include standard operating procedures (SOPs), algorithms and guidance notes, promote high quality practices and help to assure the comparability of diagnostic information obtained in different laboratories. This in turn facilitates standardisation of surveillance underpinned by research, development and audit and promotes public health and patient confidence in their healthcare services. The methods are well referenced and represent a good minimum standard for clinical and public health microbiology. However, in using National Standard Methods, laboratories should take account of local requirements and may need to undertake additional investigations. The methods also provide a reference point for method development.

National Standard Methods are developed, reviewed and updated through an open and wide consultation process where the views of all participants are considered and the resulting documents reflect the majority agreement of contributors.

Representatives of several professional organisations, including those whose logos appear on the front cover, are members of the working groups which develop National Standard Methods. Inclusion of an organisation's logo on the front cover implies support for the objectives and process of preparing standard methods. The representatives participate in the development of the National Standard Methods but their views are not necessarily those of the entire organisation of which they are a member. The current list of participating organisations can be obtained by emailing standards@hpa.org.uk.

The performance of standard methods depends on the quality of reagents, equipment, commercial and in-house test procedures. Laboratories should ensure that these have been validated and shown to be fit for purpose. Internal and external quality assurance procedures should also be in place.

Whereas every care has been taken in the preparation of this publication, the Health Protection Agency or any supporting organisation cannot be responsible for the accuracy of any statement or representation made or the consequences arising from the use of or alteration to any information contained in it. These procedures are intended solely as a general resource for practising professionals in the field, operating in the UK, and specialist advice should be obtained where necessary. If you make any changes to this publication, it must be made clear where changes have been made to the original document. The Health Protection Agency (HPA) should at all times be acknowledged.

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The HPA aims to be a fully Caldicott compliant organisation. It seeks to take every possible precaution to prevent unauthorised disclosure of patient details and to ensure that patient-related records are kept under secure conditions¹.

More details can be found on the website at www.evaluations-standards.org.uk. Contributions to the development of the documents can be made by contacting standards@hpa.org.uk.

Please note the references are now formatted using Reference Manager software. If you alter or delete text without Reference Manager installed on your computer, the references will not be updated automatically.

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AMENDMENT PROCEDURE

Controlled document reference	BSOP ID 21
Controlled document title	Identification of <i>Yersinia</i> species from faeces

Each National Standard Method has an individual record of amendments. The current amendments are listed on this page. The amendment history is available from standards@hpa.org.uk.

On issue of revised or new pages each controlled document should be updated by the copyholder in the laboratory.

Amendment Number/ Date	Issue no. Discarded	Insert Issue no.	Page	Section(s) involved	Amendment
2/ 09/11/07	1.1	2	1	Front Page	Northern Ireland logo added
			7	Flow chart	Title changed and flowchart put in to Visio format. Contents of flow chart updated.
			9	6 Referrals	Links to reference laboratory user manuals inserted.
			9	References	References reviewed and updated
			All	All	PDF links inserted to cross-reference NSM documents

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IDENTIFICATION OF *YERSINIA* SPECIES FROM FAECES

SCOPE OF DOCUMENT

This National Standard Method (NSM) describes the identification of *Yersinia enterocolitica* and *Yersinia pseudotuberculosis* isolated from faeces. The organisms may also be isolated from other specimens such as blood, lymph nodes and abscesses.

INTRODUCTION

Taxonomy

The genus *Yersinia* belongs to the family Enterobacteriaceae and contains 11 species.

Characteristics

Yersinia species are Gram-negative rods. *Y. enterocolitica* colonies give a “bulls-eye” appearance on CIN (cefsulodin, Irgasan, novobiocin) medium. *Y. pseudotuberculosis* colonies on CIN medium are smaller with a deep-red centre with a sharp border surrounded by a translucent zone. *Yersinia* species are facultative anaerobes, oxidase-negative and ferment glucose with little or no gas production. They are non-motile at 37°C, but, with the exception of *Y. pestis*, are motile at 22 - 29°C. Phenotypic characteristics are often temperature dependent and more are expressed by cultures at 22 – 29°C rather than 35 - 37°C².

Principles of identification

Isolates from primary faecal culture are identified by colonial appearance on selective media and biochemical tests. If confirmation of identification is required, isolates should be sent to the Reference Laboratory. All identification tests should ideally be performed from non-selective agar.

TECHNICAL INFORMATION

N/A

1 SAFETY CONSIDERATIONS³⁻¹³

Hazard Group 2 organisms.

Refer to current guidance on the safe handling of all Hazard Group 2 organisms documented in this NSM.

Laboratory procedures that give rise to infectious aerosols must be conducted in a microbiological safety cabinet.

The above guidance should be supplemented with local COSHH and risk assessments.

Compliance with postal and transport regulations is essential.

2 TARGET ORGANISMS²

***Yersinia* species isolated from faeces reported to have caused human infection**

Yersinia pseudotuberculosis

Yersinia enterocolitica

3 IDENTIFICATION

3.1 MICROSCOPIC APPEARANCE

Gram stain

(see [BSOPTP 39 - Staining Procedures](#))

Gram-negative rods

3.2 PRIMARY ISOLATION MEDIA

Cefsulodin, irgasan (triclosan), novobiocin (CIN) agar incubated in air at 28°C - 30°C for 24 - 48 h.

3.3 COLONIAL APPEARANCE

Typical *Y. enterocolitica* colonies on CIN agar will have a deep-red centre surrounded by a transparent border giving the appearance of a "bull's-eye". *Y. pseudotuberculosis* colonies are smaller, deep-red with a sharp border surrounded by a translucent zone.

3.4 TEST PROCEDURES

Commercial identification kit

3.5 FURTHER IDENTIFICATION

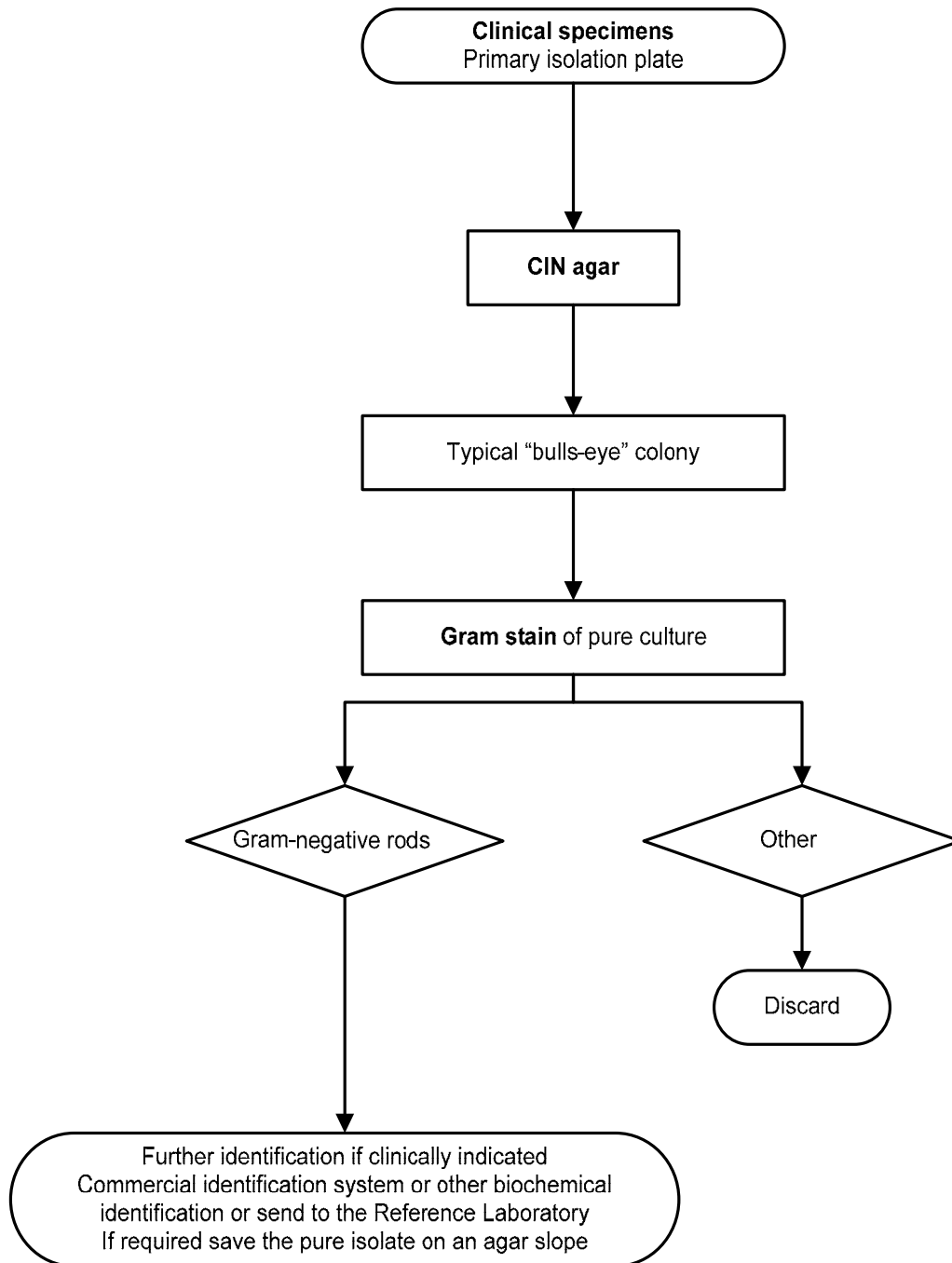
N/A

3.6 STORAGE AND REFERRAL

If required, save the pure isolate on a nutrient agar slope for referral to the Reference Laboratory.

IDENTIFICATION OF *YERSINIA* SPECIES FROM FAECES

4 IDENTIFICATION OF *YERSINIA* SPECIES FROM FAECES - FLOW CHART



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5 REPORTING

5.1 PRESUMPTIVE IDENTIFICATION

If appropriate growth characteristics, colonial appearance and Gram's stain of the culture are demonstrated.

5.2 CONFIRMATION OF IDENTIFICATION

Following commercial identification kit results

5.3 MEDICAL MICROBIOLOGIST

Inform the medical microbiologist of all positive cultures from normally sterile sites and of all presumptive and confirmed *Yersinia* species that are known to be pathogenic or potentially pathogenic.

According to local protocols, the medical microbiologist should be informed of a presumptive or confirmed *Y. enterocolitica* and *Y. pseudotuberculosis*, if the request card bears relevant information eg

- Enterocolitis or mesenteric adenitis
- Septicaemia
- Immunologically-mediated epiphenomena (i.e. erythema nodosum or reactive arthritis)
- Persons receiving blood or blood product transfusion, suffering from iron overload and/or receiving chelation therapy for same (eg haemoglobinopathy) with transfusion haemosiderosis or primary haemochromatosis
- Cases associated with farming, veterinary or laboratory work
- Food poisoning
- Investigation of outbreaks

Follow local protocols for reporting to clinician

5.4 CCDC

Refer to local Memorandum of Understanding.

5.5 CENTRE FOR INFECTIONS¹⁴

Refer to current guidelines on CDSC and COSURV reporting.

5.6 INFECTION CONTROL STAFF

Inform the infection control team of presumptive and confirmed cases of *Y. enterocolitica* and *Y. pseudotuberculosis*.

6 REFERRALS

6.1 REFERENCE LABORATORY

For information on the tests offered, turn around times, transport procedure and the other requirements of the reference laboratory refer to: <http://www.hpa.org.uk/cfi/lep/default.htm>

Laboratory of Enteric Pathogens
Centre for Infections
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7 ACKNOWLEDGEMENTS AND CONTACTS

This National Standard Method has been developed, reviewed and revised by the National Standard Methods Working Group for Clinical Bacteriology (http://www.hpa-standardmethods.org.uk/wg_bacteriology.asp). The contributions of many individuals in clinical bacteriology laboratories and specialist organisations who have provided information and comment during the development of this document, and final editing by the Medical Editor are acknowledged.

The National Standard Methods are issued by Standards Unit, Evaluations and Standards Laboratory, Centre for Infections, Health Protection Agency London.

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