CARY-BLAIR TRANSPORT MEDIUM

Dehydrated culture medium

1 - INTENDED USE

Medium for collection and transport of samples for microbiological analysis of enteric pathogens.

2 - COMPOSITION - TYPICAL FORMULA * (AFTER RECONSTITUTION WITH 1 L OF WATER)

Disodium hydrogen phosphate	1.1 g
Sodium thioglycollate	1.5 g
Sodium chloride	5.0 g
Calcium chloride	0.09 g
Agar	5.6 g

*The formula may be adjusted and/or supplemented to meet the required performances criteria.

3 - PRINCIPLE OF THE METHOD AND EXPLANATION OF THE PROCEDURE

Cary-Blair Transport Medium, prepared according to the formulation described by Cary and Blair,[1] is a medium with a defined composition intended for the storage and shipmemt of samples for microbiological analysis of enteric pathogens.
The sodium glycerophosphate present in Stuart's medium is replaced in the Cary-Blair formulation with a phosphate buffer to prevent overgrowth in the medium of contaminating bacteria possessing the enzyme glycerophosphate dehydrogenase (*Escherichia coli*, *Citrobacter freundii* or *Klebsiella aerogenes*). The medium is particularly suitable for shipment faecal samples for the detection of *Salmonella, Shigella, Vibrio* and *Campylobacter*.[2]
Cary and Blair report recovery of *Vibrio cholerae* up to 22 days of storage, of *Salmonella* and *Shigella* after 48 days and of *Yersinia pestis* up to 75 days with storage at 28°C.[1]
Neumann reports a survival in Cary Blair Medium of *Vibrio parahaemolyticus* of up to 35 days, with storage at 15-21°C.[3] Studies by Wells and Morris showed that recovery of *Shigella* is higher at 4°C or -20°C, especially when held longer than 3 days.[4]
The medium can also be used to transport anaerobic bacteria: in this case Cary Blair Medium must be prepared as sterilised, pre-reduced (PRAS) medium. PRAS medium production methods are described by Holdeman and Moore.[6]

4- DIRECTIONS FOR MEDIUM PREPARATION

Suspend 13.3 g in 1000 ml of cold purified water. Bring slowly to the boil and dispense into test tubes or vials with screw caps. Sterilise by flowing steam for 15 minutes. Allow to solidify and close the caps tightly.

5 - PHYSICAL CHARACTERISTICS

Dehydrated medium appearance	grey, fine, homogeneous, free-flowing powder
Solution and prepared tubes appearance	light yellow, opaque
Final pH at 20-25 °C	8.0 ± 0.5

6 - MATERIALS PROVIDED - PACKAGING

Product	Type	REF	Pack
Cary-Blair Transport Medium	Dehydrated medium	4012872	500 g (37.6 L)

7 - MATERIALS REQUIRED BUT NOT PROVIDED

Autoclave, water-bath, sterile swabs, Erlenmeyer flasks, screw-cap tubes.

8 - SPECIMENS

Cary-Blair Transport Medium is suitable for collection and transport of faecal samples containing enteric pathogens.

9 - TEST PROCEDURE

- Insert the swab into the medium to one-third of the medium depth.
- Cut or break the swab stick if longer than the tube.
- Screw the cap firmly.
- Transport to the laboratory as soon as possible or preferably within 24 hours.
- Transfer to appropriate isolation media depending on specimen source.
- Incubate plated media using proper microbiological procedures for cultivation of the suspected pathogens.

10 - READING AND INTERPRETATION

The presence of microorganisms is indicated by the appearance of colonies of varying morphology and size on the isolation media. The characteristics of the growths are closely related to the type or types of cultivated microorganisms.

11 - USER QUALITY CONTROL

All manufactured lots of the product are released for sale after the Quality Control has been performed to check the compliance with the specifications. However, it is responsibility of the end-user to perform Quality Control testing in accordance with the local applicable regulations, in compliance with accreditation requirements and the experience of the Laboratory. Here below are listed some test strains useful for the quality control.

CONTROL STRAINS	INCUBATION T°/ T / ATM	EXPECTED RESULTS
S.flexneri ATCC 12022	20-25°C / 24h	good recovery after subculture to Blood Agar

ATCC is a trademark of American Type Culture Collection

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12 - PERFORMANCES CHARACTERISTICS

Prior to release for sale a representative sample of all lots of dehydrated Cary Blair Transport Medium is tested for organisms' recovery by comparing the results with a previously approved Reference Batch.
Recovery is tested by incubating at 20-25°C for 18-24 hours the inoculated tubes with the following strains: *S.flexneri* ATCC 12022, *S.*Typhimurium ATCC 14028, *V.parahaeomyticus* ATCC 17802, *C.jejuni* ATCC 29428. The inoculated tubes are sub-cultured on appropriate plating media by a semi-quantitative ecometric technique and incubated at 35-37°C for 18-24 hours with the appropriate atmosphere (aerobic, microareobic). The bacterial recovery on plating media is observed and recorded. All inoculated Cary Blair Transport Medium tubes, maintained at 20-25°C for 24 hours, originate a good growth on sub-cultured plated media.

13 - LIMITATIONS OF THE METHOD

- The survival of bacteria in a transport medium depends on many factors, including the type and concentration of bacteria in the sample and the temperature during the transport. Optimal growth and typical morphology can only be predicted following direct inoculation of the specimen and the use of an adequate isolation medium. Amies Transport medium, however, provides an adequate level of microbial survival in specimens that cannot be immediately forwarded to the laboratory.
- Cell viability may decrease during the storage period and some degree of multiplication of contaminating microorganisms may occur, especially for faecal specimens that contain a considerable number of coliforms.
- The condition of the sample received by the laboratory for culture is a significant variable in the recovery and final identification of the suspected pathogen. An unsatisfactory sample (invaded by contaminants, containing non-viable organisms or with a significantly reduced number of pathogens) may lead to incorrect or inconclusive results.

14 - PRECAUTIONS AND WARNINGS

- This product is for professional use only; it is to be used by adequately trained and qualified laboratory personnel, observing approved biohazard precautions and aseptic techniques.
- Dehydrated media must be handled with suitable protection. Before use, consult the Safety Data Sheet.
- Apply Good Manufacturing Practice in the production process of prepared media.
- All laboratory specimens should be considered infectious.
- The laboratory area must be controlled to avoid contaminants such as culture medium or microbial agents.
- Sterilize all biohazard waste before disposal. Dispose the unused medium and the sterilized plates inoculated with samples or microbial strains in accordance with current local legislation.
- Do not use the culture medium as active ingredient for pharmaceutical preparations or as production material intended for human and animal consumption.
- The Certificates of Analysis and the Safety Data Sheet of the product are available on the website www.biolifeitaliana.it.
- The information provided in this document has been defined to the best of our knowledge and ability and represents a guideline for the proper use of the product but without obligation or liability. In all cases existing local laws, regulations and standard procedures must be observed for the examination of samples collected from human and animal organic districts, for environmental samples and for products intended for human or animal consumption. Our information does not relieve our customers from their responsibility for checking the suitability of our product for the intended purpose.

15 - STORAGE CONDITIONS AND SHELF LIFE

Upon receipt, store at +10°C /+30°C away from direct light in a dry place. If properly stored, it may be used up to the expiration date. Do not use beyond this date. Avoid opening the bottle in humid places. After use, the container must be tightly closed. Discard the product if the container and/or the cap are damaged, or if the container is not well closed, or in case of evident deterioration of the powder (colour changes, hardening, large lumps). The user is responsible for the manufacturing and quality control processes of prepared media and for the validation of the shelf life of the finished products, according to the type (tubes/bottles) and the storage method (temperature and packaging).

16 - REFERENCES

1. Cary, S.G., Blair, E.B. New transport medium for ship,ment of clinical specimens. I Feacal specimen. J Bact 1964; 88: 96-98
2. MacFaddin JF. Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria. Baltimore: Williams & Wilkins; 1985.
3. Neumann DA, Benenson MW, Hubster E,Tuan NTN. Cary-Blair, a transport medium for Vibrio parahemolyticus Am J Clin Pathol 1972 Jan;57(1):33-4
4. Wells JG and Morris GK. Evaluation of transport methods for isolating Shigella spp. J Clin Microbiol. 1981 Apr;13(4):789-90.
5. Barry A.L., Fay G.D., Sauer R.L. Efficiency of a transport medium for the recovery of aerobic and anaerobic bacteria from applicator swabs Appl Microbiol. 1972 Jul;24(1):31-3.
6. Holdeman LV and Moore WEC. Anaerobe Laboratory Manual, Virginia Polytechnic Institute, Anaerobe Laboratory, 3rd Ed.1975

TABLE OF APPLICABLE SYMBOLS

REF or REF Catalogue number	LOT Batch code	Manufacturer	Store in a dry place	Use by
Temperature limitation	Contents sufficient for <n> tests	Consult Instructions for Use	Keep away from direct light	

REVISION HISTORY

Version	Description of changes	Date
Revision 4	Updated layout and content	2022/05

Note: minor typographical, grammatical, and formatting changes are not included in the revision history.

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