

Identification of Unknown Bacteria: Lab Report

4 pages | 875 words

Abstract

Identifying unknown bacteria is a crucial task in microbiology. This laboratory report outlines the procedures and results of identifying two unknown bacteria, one gram-positive and one gram-negative, referred to as unknown A. The isolation of the bacteria, Gram staining, and a series of biochemical tests were performed to narrow down the possibilities. The results revealed that the gram-positive bacterium was *Staphylococcus aureus*, while the gram-negative bacterium was *Pseudomonas aeruginosa*.

Introduction

Identifying unknown bacteria is essential for various reasons, as different microorganisms possess distinct qualities and characteristics that set them apart. Throughout the semester in the laboratory, we encountered various microorganisms and gained knowledge about their properties. This knowledge is now applied to the process of identifying unknown bacteria, specifically, unknown A.

Materials and Methods

The identification process began with the professor providing the unknown specimens, including one gram-positive and one gram-negative bacterium from a predetermined list. Unknown A was assigned for identification. The procedures followed closely resembled those outlined in the lab manual (1). The initial step involved isolating each bacterium using the streak plate technique. Tryptic Soy Agar (TSA) plates and selective media like mannitol salt and Eosin Methylene Blue (EMB) were employed for isolation. The isolation step is critical as it separates the bacteria, allowing for individual identification. Gram staining was performed to understand the basic morphology of the bacteria. As the plates incubated, distinct colonies of the two bacteria were observed. Colonies from the mannitol salt plate were used to inoculate Tryptic Soy Broth (TSB) for gram-positive culture growth. The purity of this broth was verified using gram staining. Similarly, a circular colony from the TSA plate was used to inoculate TSB for gram-negative growth, and its purity was also tested through gram staining. Once the gram-positive and gram-negative bacteria from unknown A were isolated, specific biochemical tests were conducted for identification. The results of these tests, coupled with deductive reasoning and elimination, led to the identification of the unknown bacteria. The following tests were performed on the gram-positive bacterium: 1. Mannitol salt streaking, 2. Gram staining of the pure isolate, 3. Oxidase test, 4. Catalase test, and 5. Coagulase test. Similarly, the following tests were performed on the gram-negative bacterium: 1. Gram staining of the pure isolate, 2. Blood agar plate streaking, 3. SIM (Sulfide, Motility, Indole) test, and 4. Catalase test.

Results

Gram-Positive Bacterium (*Staphylococcus aureus*)

Test	Purpose	Reagents/Media	Observation	Results
Gram stain	To determine the gram reaction and morphology	Crystal violet, Iodine, Alcohol, Safranin	Purple cocci, connected	Gram positive purple cocci
Mannitol salt	Selective growth media for Staphylococci and Micrococcaceae	Mannitol salt plate and gram positive isolate broth	After incubation, media turned yellow	Bacterium is mannitol salt positive
Oxidase test	To determine if bacterium produces cytochrome c oxidase	No color change	Bacterium is oxidase negative	
Catalase test	To identify if bacterium produces catalase	Hydrogen peroxide	Bubbling is seen	Bacterium is catalase positive
Coagulase test	Used to identify if bacterium produces coagulase (enzyme that clots blood plasma)	Citrated rabbit plasma	Clouding and solidification of plasma is seen	Bacterium is coagulase positive

Sample Microbiology Unknown Paper

**Nkuchia M. M'ikanatha, Ruth
Lynfield, Chris A. Van
Beneden, Henriette de Valk**



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Analytical Microbiology Frederick Kavanagh, 2014-05-10 *Analytical Microbiology* Volume II is a six chapter work that covers the significant changes and improvements made in the theory and practice of analytical microbiology. The first chapter is devoted to the theoretical aspects of assaying of specific compounds. These topics are followed by discussions of the theoretical and practical aspects of diffusion assays as well as the theoretical developments of photometric methods of assay including their improvement resulting from automation. A chapter explores the assay methods for various antibiotic groups. Another chapter discusses the advances in assay technology and analytically important interrelations among the folic acid complex. The last chapter describes a simple diffusion method designed for the assay of certain amino acids in a wide variety of samples. This book will prove useful to analytical microbiologists.

Encyclopedia of Food Microbiology Carl A. Batt, 2014-04-02 Written by the world's leading scientists and spanning over 400 articles in three volumes, the *Encyclopedia of Food Microbiology* Second Edition is a complete, highly structured guide to current knowledge in the field. Fully revised and updated, this encyclopedia reflects the key advances in the field since the first edition was published in 1999. The articles in this key work are heavily illustrated and fully revised since the first edition in 1999, highlighting advances in areas such as genomics and food safety to bring users up to date on microorganisms in foods. Topics such as DNA sequencing and *E. coli* are particularly well covered. With lists of further reading to help users explore topics in depth, this resource will enrich scientists at every level in academia and industry, providing fundamental information as well as explaining the state of the art of scientific discoveries. This book is designed to allow disparate approaches from farmers to processors to food handlers and consumers and interests to access accurate and objective information about the microbiology of foods. Microbiology impacts the safe presentation of food. From harvest and storage to determination of shelf life to presentation and consumption, this work highlights the risks of microbial contamination and is an invaluable go-to guide for anyone working in Food Health and Safety. It has a two-fold industry appeal: 1) those developing new functional food products and 2) to all corporations concerned about the potential hazards of microbes in their food products.

Practical Microbiology Mr. Rohit Manglik, 2024-05-24 Offers practical exercises in microbiological methods including staining, culturing, and identifying microorganisms.

Microbiology David R. Wessner, Dave Wessner, Christine Dupont, Trevor Charles, Josh D. Neufeld, 2022 *Microbiology* is a comprehensive textbook that facilitates a thorough understanding of the scope, nature, and complexity of the science of microscopic organisms. It gives a balanced presentation of foundational concepts, real-world applications, and current research and experimentation. The text approaches the subject within the context of exploration and experimentation, integrating a wealth of classroom-tested pedagogical features. The material is organized around the three pillars of physiology, ecology, and genetics, helping students appreciate the interconnected and dynamic nature of microbiology and explore the relationship between different types of microbes, other organisms, and the environment. This international adaptation contains up-to-date

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solutions for technological problems *Manual of Procedures for the Seminar on the Laboratory Diagnosis and Monitoring of Disorders Caused by Drugs and Toxic Agents, November 7, 8, and 9, 1975*, 1975 Chromatography of Antibiotics M.J. Weinstein, G.H. Wagman, 2000-04-01 Chromatography of Antibiotics **Chromatography of Antibiotics**, 2011-08-26

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