

**Evaluating the Antimicrobial Activity of Hand Sanitizers
against Bacterial and Fungal pathogens.
Jignasa Student Study Project 2021-22**

To



**Commissionerate of Collegiate Education
Telangana State**



By
Department of Microbiology
TARA Government Degree & PG (A) College
Sangareddy

EVALUATING THE ANTIMICROBIAL ACTIVITY OF HAND SANITIZERS
AGAINST BACTERIAL AND FUNGAL PATHOGENS.
JIGNASA STUDENT STUDY PROJECT 2021-22

To
COMMISSIONERATE OF COLLEGIATE EDUCATION
TELANGANA STATE



By

- 1.P. Madhavi ,MZC III Year
- 2.K.Shalini, MZC III Year
- 3.N.Anitha, MZC III Year
- 4.P.Prashanth Kumar, MZC III Year
- 5.T.Ambika Madhu Shalini, MBCBTII Year

Guide
Dr.K.Jyothi
Asst.Prof. Of Microbiology
TARA Govt.Degree Cllege
Sangareddy



**TARA Government College
Sangareddy(Autonomous)**
(Re-Accredited with 'B' Grade by NAAC)



Sangareddy (Dist), Telangana-502001, India

Ms. M.Praveena M.A., B.C.J., PGDTE
Principal (FAC)

Mobile: 9154806841
Mail : tara.sangareddy@gmail.com

CERTIFICATE

This is to certify that the project work entitled with the "*Evaluating the Antimicrobial Activity of Hand Sanitizers against Bacterial and Fungal Pathogens*" submitted to Commissionerate of Collegiate Education is a original work done by 1.P. Madhavi ,MZC III Year, 2.K.Shalini, MZC III Year, 3.N.Anitha, MZC III Year, 4.P.Prashanth Kumar, MZC III Year, 5.T.Ambika Madhu Shalini , MBCBT II Year under the guidance & supervision of Dr.K.Jyothi, Asst. Prof. of Microbiology of Tara Govt. College (A), Sangareddy.

Principal.
Tara Govt. College (A).
Sangareddy



**TARA Government College
Sangareddy(Autonomous)**
(Re-Accredited with 'B' Grade by NAAC)



Sangareddy (Dist), Telangana-502001, India

Dr.K.Jyothi
M.Sc, PhD
Assistant Professor of Microbiology
Chairman, Board of Studies,
Department of Microbiology

Department of Microbiology

Mobile No: 7569350325
College: 08455 -276507
jyothitaragdc@gmail.com

CERTIFICATE

This is to certify that the project work entitled with the "*Evaluating the Antimicrobial Activity of Hand Sanitizers against Bacterial and Fungal Pathogens*" submitted to Commissionerate of Collegiate Education is bonafide record of work done by 1.P. Madhavi ,MZC III Year, 2.K.Shalini, MZC III Year, 3.N.Anitha, MZC III Year, 4.P.Prashanth Kumar, MZC III Year, 5.T.Ambika Madhu Shalini , MBCBT II Year BMZ under my guidance and supervision and the student study project has been prepared based on their original research work.

PLACE: *Sangareddy*
DATE: *16/4/2022*

Dr.K.Jyothi
Dr.K.Jyothi,
Asst.Prof.of Microbiology,
TARA College (A)
Sangareddy



DECLARATION

We declare that the student study project in Zoology subject entitled *Evaluating the Antimicrobial Activity of Hand Sanitizers against Bacterial and Fungal Pathogens* is the result of a Research study originally carried out by us under the guidance and supervision of Dr.K.Jyothi, Asst. Prof. of Microbiology of Tara Govt. College (A), Sangareddy

We also declare that no part of this Jignasa student study project is a reproduction from any other source, published or unpublished, without acknowledgement.

Place: Sangareddy

Date: 16/04/2022

- 1.P. Madhavi ,MZC III Year P.Madhavi
- 2.K.Shalini, MZC III Year K.Shalini
- 3.N.Anitha, MZC III Year N.Anitha
- 4.P.Prashanth Kumar, MZC III Year P.Prashanth Kumar .
- 5.T.Ambika Madhu, Shalini MBCBTII Year Amshalini



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TITLE OF THE PROJECT

**EVALUATING THE ANTIMICROBIAL ACTIVITY OF HAND
SANITIZERS AGAINST BACTERIAL AND FUNGAL PATHOGENS.**

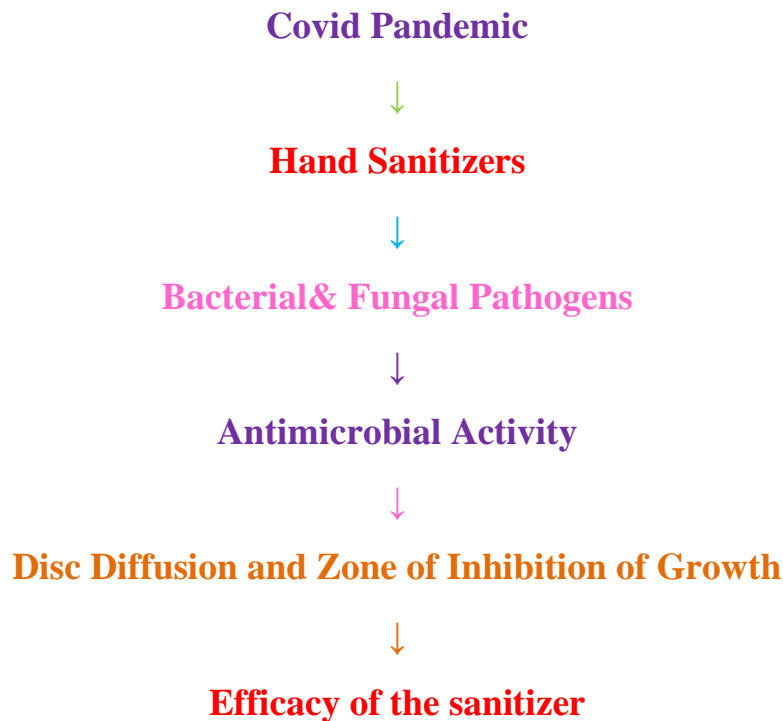
INTRODUCTION

During the year December 2019 several cases of pneumonia of unknown origin spread in China. Later in Jan 2021 it was announced as Corona Disease i.e. severe acute respiratory syndrome CoV-2 (SARS-CoV-2) caused by novel corona virus, which belongs to the Sub family Orthocoronaviridae (order: Nidovirales, subordination: Cornidovirineae, family: Coronaviridae). Corona viruses are enveloped viruses with lipid membrane derived from host cells. CoV includes four genera γ , β , α , δ , among the four CoV γ , β infect mammals where as α , δ infect birds. China reported the increasing occurrence of pneumonia in the city of Wuhan, during December 2019. In January 2020, a novel β -CoV was identified as the cause [1] the virus was given the official name of SARS-CoV-2 by the international Committee for Taxonomy of Viruses, while the WHO named the disease caused by the virus, COVID-19

In response to the corona virus disease 2019 pandemic (COVID-19) hand hygiene has taken a prominent role in effects to reduce SARS COV-2 transmission and infection. Hands are the primary mode of transmission of microbes and infection [2]. It is well recognized that hand hygiene is essential to reducing microbial burden, transmission, and infection. The density and species of bacteria that colonize the hands of individuals are highly variable and can be influenced by a number of factors including age, sex, ethnicity, and profession. Hand hygiene helps in preventing the spread of infectious diseases. In situations in which an individual does not have access to soap and water, the Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) have recommended the use of alcohol rubs (also known as hand sanitizers) to reduce microbial burden.

To evaluate the utility of sanitizers both the user acceptability and the efficacy need to be evaluated. Very few publications and a little research work available on the efficacy of hand sanitizers against circulating strains of CoV- 2 C. The purpose of this study was to evaluate the effect of antimicrobial activity of hand hygiene agents against Bacterial and Fungal pathogens.

Hypothesis



The emergence of novel pathogens, bacterial or viral, has always posed serious challenges to public health around the globe. One of these dangerous pathogens is “severe acute respiratory syndrome corona virus 2 or SARS-CoV-2, more commonly known for causing corona virus disease 2019 or COVID-19, which has been declared a global pandemic by the World Health Organization in early 2020.

An effective and simple method for reducing transmission of infections in public or healthcare settings is hand hygiene. A range of hand sanitizers are available with various combinations of ingredients and modes of delivery.

Hands are the main pathways of germ transmission during health care. Hand hygiene is therefore the most important measure to avoid the transmission of harmful germs. Hand Sanitizers are a type of disinfectant and antiseptic that is used to destroy microorganism (Pathogens) such as harmful viruses, Bacteria and Fungi. In 1938, Price⁶³ established that bacteria recovered from the hands could be divided into two categories, namely resident or transient.

An antimicrobial is an agent that destroys or prevents the growth of microorganisms. Antimicrobial activity can be defined as a collective term for all active principles or agents that inhibit the growth of microorganisms prevent the formation of microbial colonies and may destroy microorganisms

Infectious diseases caused by bacteria, Viruses and fungi are the major cause of morbidity and mortality across the globe. Cholera, tuberculosis, diphtheria, typhoid are some of the infectious diseases caused by bacteria. Corona viruses are a family of viruses that can cause illnesses such as the common cold, severe acute respiratory syndrome (SARS).

Disc Diffusion method is most common method used routinely for determination of antibiotic sensitivity of bacteria by measuring zone of inhibition of growth.

Efficacy of a hand sanitizer can be demonstrated as the effect of the application of a hand hygiene formulation when tested in laboratory or in vivo situations. Determination of the Zone of inhibition of growth by Disc diffusion method to such formulations against bacteria and fungi can be done to estimate the efficacy of hand sanitizer.

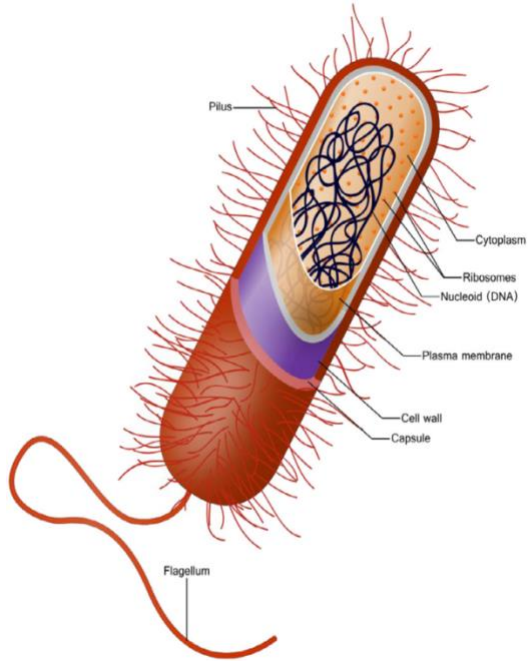


Fig1. Generic structure of a gram-negative bacterium.
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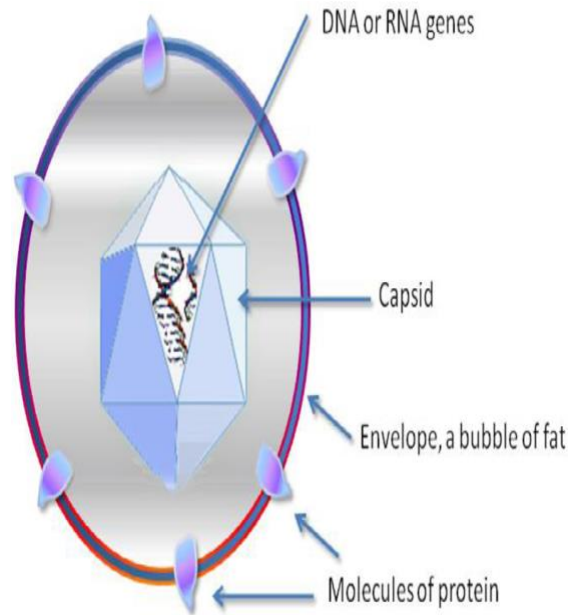


Fig 2. Generic structure of a virus with a lipid envelope.
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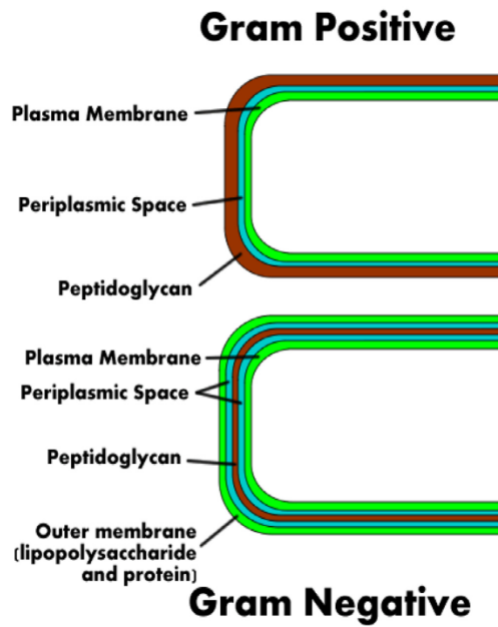


Fig 3. Gram-positive versus gram-negative bacteria. Image by Julian Onions, Wikimedia Commons, Public Domain.

