Practical Vaginal Microecology

First Edition, 2025

Yongmei Jiang , PhD
Zhengqiang Hu , MD

Global Reach Series
The Legacy of Outstanding Chinese Culture

Macao Scientific Publishers

Practical Vaginal Microecology

First Edition, 2025

EDITED BY

Yongmei Jiang , PhD

Director of the Department of Laboratory Medicine
West China Second University Hospital, Sichuan University
Sichuan, China.

Zhengqiang Hu , MD

Chief Technologist
West China Second University Hospital, Sichuan University
Sichuan, China.

Macao Scientific Publishers

www.mospbs.com

Macao Scientific Publishers

Address: Block 11/F, Hengchang Building, Nanwan Avenue, Macao, 999078, China
Website: www.mospbs.com | moaj.mospbs.com
For more information, contact ***book@mospbs.com***

Practical Vaginal Microecology

Hardcover
Word Count: 88,374 words
First Edition: May 2025
Published by Macao Scientific Publishers (MOSP)
Printed by HanLin Publishing Group, Macao, China
Print Date: May 2025
ISBN: 978-99981-10-60-1

Any quality issue with this book, please contact book@mospbs.com.

CONTENTS

EDITORIAL BOARD

TRANSLATING COMMITTEE

Chief Translator

Zhengqiang Hu

West China Second University Hospital,
Sichuan University
Sichuan, China.

Translation Instructor

Yongmei Jiang

West China Second University Hospital,
Sichuan University
Sichuan, China.

Members of Translating Committee

Xin-ai Yue

West China Second University Hospital,
Sichuan University
Sichuan, China.

Tingting Zhu

West China Second University Hospital,
Sichuan University
Sichuan, China.

Yiduo Zhang

West China Second University Hospital,
Sichuan University
Sichuan, China.

Yunxia Li

363 Hospital
Sichuan, China.

ABOUT THE AUTHOR

Dr. Yongmei Jiang is a director technician and a doctoral supervisor. She is also the director of the Department of Laboratory Medicine, West China Second University Hospital, Sichuan University; The 11th academic and technical leaders of Sichuan province; The health family planning talents of Sichuan province; The Women's and children's clinical inspection quality control center director of Sichuan province; The deputy director of the 11th Laboratory professional committee of Sichuan Provincial Medical Association; The deputy director of the fifth committee of the physicians association first branch of blood transfusion; The deputy director of of the Laboratory Medicine Special Committee of Sichuan Rehabilitation Medical Association. The director of the Inspection Professional Committee of Sichuan Sex Society.

Mr. Zhengqiang Hu is a Master and a director technician of the West China Second University Hospital, Sichuan University. He is also an academic and technical leader of the 12th batch of Health and Family Planning Commission of Sichuan Province; A committee member of Reproductive Inspection Committee of Sichuan Sexual Society; A New Era "Health Guard" of Sichuan Province; A medical appraisal expert of Chengdu Medical Association; A project evaluation expert of Sichuan Science and Technology Department; A Science and Technology evaluation expert of Chengdu Science and Technology Bureau. A review expert of the Journal of "Modern Clinical Medicine"; A Sichuan Province special care medical and health service expert.

PREFACE

Female's vagina is a unique and dynamic changing microecological system. There are a variety of normal microbial communities, which constitute a mutual restriction and coordination between the host and the environment, and plays an important role in maintaining a healthy vaginal microecological environment. With the application of non-culture methods in the study of vaginal microecosystem, people have a more new understanding of the vaginal microbiota.

As a part of the human microecosystem, the vaginal microecosystem is closely related to the pathogenesis of reproductive tract infections.Vaginal microecological evaluation provides a detection means for the analysis and understanding of vaginal microecological changes, including morphological diagnosis and functional diagnosis. Among them, morphological diagnosis includes the evaluation of bacterial flora, the detection of pathogenic microorganisms and the assessment of disease status; functional diagnosis includes the assessment of the function of vaginal *Lactobaccilus* species, the detection of microbial metabolites and inflammatory reactions of the body.

Vaginal microecological examination can not only accurately and quickly diagnose various single vaginal inflammation and mixed infections, reduce the rate of missed diagnosis and misdiagnosis, but also evaluate the prognosis, and also have guiding significance for applying vaginal microecological regulators after treatment. Finally, a good quality control is needed in the whole process of vaginal microecological examination.

The **"Practical Vaginal Microecology"** has accumulated the Laboratory and Clinical Team of the West China Second University hospital, Sichuan University for nearly 20 years of clinical experiences, and combines the vaginal microecological evaluation and the latest progress of clinical diagnosis and treatment. It is a rare and excellent book to promote the diagnosis and treatment specification and key technology of female reproductive tract infection, training primary doctors and examiners and inspection personnel technical level and service ability. I hope the publication of this book can play a certain role in helping Chinese obstetrician, gynecologists and clinical examiners in the diagnosis and treatment of female reproductive tract infections. The writing of

this book has been strongly supported by the Infectious Diseases Cooperative Group of Obstetrics and Gynecology Branch of Chinese Medical Association and Professor Mingyuan Li of West China School of Basic and Legal Medicine, Sichuan University. I would like to thank them for their hard guidance and dedication in the field of vaginal microecology and medical microbiology over the years.

This book was translated by our Translating Committee on the basis of the original book **"Practical Vaginal Microecology"**. In the process of translation, the translators found the deficiencies of chapter 3 and Chapter 7 of the original book, and made some beneficial modifications and supplements (for example, "7.7.2 Gram staining of smear combined with clinical features of AV combination diagnostic criteria" was added in of Chapter 7). This makes the book more substantial and complete.

Due to the limited level of editors and the short time, there are some shortcomings in the book. Welcome obstetricians and laboratory colleagues to criticize and correct this book.

Yongmei Jiang, Zhengqiang Hu

Translator: Zhengqiang Hu, January, 2025

CHAPTER-1

Overview of the Vaginal Microecology

Zhengqiang Hu, Yongmei Jiang, Hongwei Liu
Translator: Zhengqiang Hu

Microrobes that often live in the body surface and the cavity connected to the outside world, commonly known as normal microbiota or normal flora. It is necessary for the human body, and it is usually beneficial and harmless. A healthy adult has about 1×10^{13} human body cells, and the total number of normal microorganisms as high as 1×10^{14}, mainly distributed in the skin and oral cavity, digestive tract, respiratory tract, urinary tract and reproductive tract and other viscera mucosal surface. These microorganisms like the "guard" of these open cavity and skin, resist the invasion of exogenous pathogenic microorganisms. In the long-term evolution process of the human body, through mutual adaptation and natural selection between species, different species, normal flora and hosts, and the environment are in a dynamic balance, forming an interdependent and mutually restricted human microecosystem. The female lower reproductive tract is an important part of the human microecosystem, and the microecosystem of female reproductive tract is composed of normal vaginal anatomy, endocrine regulatory system, the local vaginal immune system, and various vaginal microbiota. Various vaginal microbiomes influence and interact with each other, forming the microecological environment of the vagina.

1.1 Normal Vaginal Anatomy

Volvo-vaginal anatomy is the first line of defense against exogenous genital tract infection. The labium majus on both sides of the vulva naturally is closed and cover the vaginal and urethral entrance. The anterior and posterior walls of the vagina are close to a potential lumen in the natural state. Histologically, the vaginal epithelial lining is covered by intact stratified squamous epithelial cells. Squamous epithelial cells in childbearing age can proliferate and thicken with the rise of estrogen levels in the body, and also fall off periodically with the cycle change of estrogen. The vaginal epithelial cells of healthy women of childbearing age are rich in glycogen. Through the action of *Lactobaccilus*