FISH PATHOLOGY In PERSPECTIVE



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FISH PATHOLOGY

IN

PERSPECTIVE

FOR

Lecturers, Fish Farmers and Students of Polytechnics and Universities Pursuing Courses in OND, HND, B.Sc, M.Sc and Ph.D in Fish Pathology.

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CHAPTER ONE

1.1 INTRODUCTION

Fish Pathology is a branch of Ichthyology that use the principles and methods of microbiology, mycology, virology, bacteriology, toxicology, pharmacology, biochemistry, anatomy and physiology, hematology and histopathology. It is a multidimensional discipline.

Pathology is the study of disease "Patho" (disease) and "logy" (study). It is devoted to the study of the structural, biochemical and functional changes in cells, tissues and organs that underlie disease by the use of molecular, microscopic, immunologic and morphologic techniques. Pathology attempts to explain the ways and wherefores of the signs and symptoms manifested by morbid organism while providing a rational basis for treatment and therapy.

Pathology is divided into general and systemic pathology. The former is concerned with the reactions of cells and tissues to abnormal stimuli and inherited defects, which are the main causes of diseases. The latter (Systemic)

examines the alterations in specialized organs and tissues that are responsible for disorders that involve the disease/organs.

The history of pathology can be traced back to the period of antiquity when people began examining bodies. The oldest civilized people (Chinese, India and Egyptians) were under the impression that disease occurred when demons or evil spirits were displeased. The medicine men were concerned with appeasing these evil spirits. The Egyptians began to influence medicine around 4000BC. The Greek Culture had a profound effect on the scientific approach to medicine. Greek physicians elucidated the principles of exact and careful clinical observations.

Pathology began to develop as a subject during the 19th century through teachers and physicians that studied related disciplines. They referred to it as "Pathological anatomy" or "Morbid anatomy". However, pathology as a field of medicine was not recognized until the late 19th and early 20th century. Pathology has found its root extended to the Ichthyology with introduction of "Fish Pathology" as a course of study. There is however, paucity of information in fish pathology, useful information is obtained from allied areas and published journals which are greatly inadequate.

CHAPTER TWO

2.0 ISOLATION OF MICRO-ORGANISMS

When a micro-organism grows in the laboratory medium it is referred to as a culture. Different organisms growing on the same kind of medium may appear quite different thus knowledge of the appearance or the cultural characteristics of a species is useful for the recognition of types of organism and may also serve as an aid in the identification of species. However, organisms must be obtained in a pure culture before the cultural morphological characteristics of a species can be determined. A pure culture consists of a population of cells all derived from a single parent cell. Micro-organisms inhabit various parts of the body e.g. fin, gills, intestinal tract and the skin.

2.1 ISOLATION OF FUNGI

Fungi are isolated from fish substrates by techniques that vary in complexity. Generally, media are used to culture fungi meant for isolation and/or identification. Reagents

are used for preparing materials for microscopic examination while stains are used to aid vision.

2.2 WATER AGAR (WA)

This is a simple culture medium. It is not very rich hence it only supports limited mycelia growth. It is useful when limited mycelia growth is desired to reduce contamination thereby enhancing isolation from plates. It is useful for isolating fungi from infected fish tissues.

Agar 15 – 20g
Distilled water 1 litre

The quantity of agar depends on brand, purity and intended used, based on past experience.

2.3 CZAPEK-DOX AGAR (CZA)

This synthetic medium is often compounded as follows:

$NaNo_3$	3.0g
K_2HPO_2	1.0g
$MgSO_4.7H_2D$	0.5g
Kcl	0.5g
$FeSO_4.7H_2O$	0.01g
Sucrose	30.0g
Agar	15.0g
Distilled Water	1 litre

This medium is essentially used for the culture of species of *Aspergillus* and *penicillum.*

CHAPTER THREE

3.1 OPERATING THE MICROSCOPE

The proper way to operate the microscope is to start
with the lowest power objective lens (OB) while you
through the side and move the lens down as close to
slide without touching it. Next, you look through
eyepiece lens and focus upward only until the image
sharp. If you cannot get it in focus, repeat the proc
over. When you have a sharp image at low power
You turn the revolving noise piece (RN) to click the
higher power lens and do a minor adjustments with
fine focus knob. Continue with subsequent objec
lenses and fine focusing each time (Fig 1).

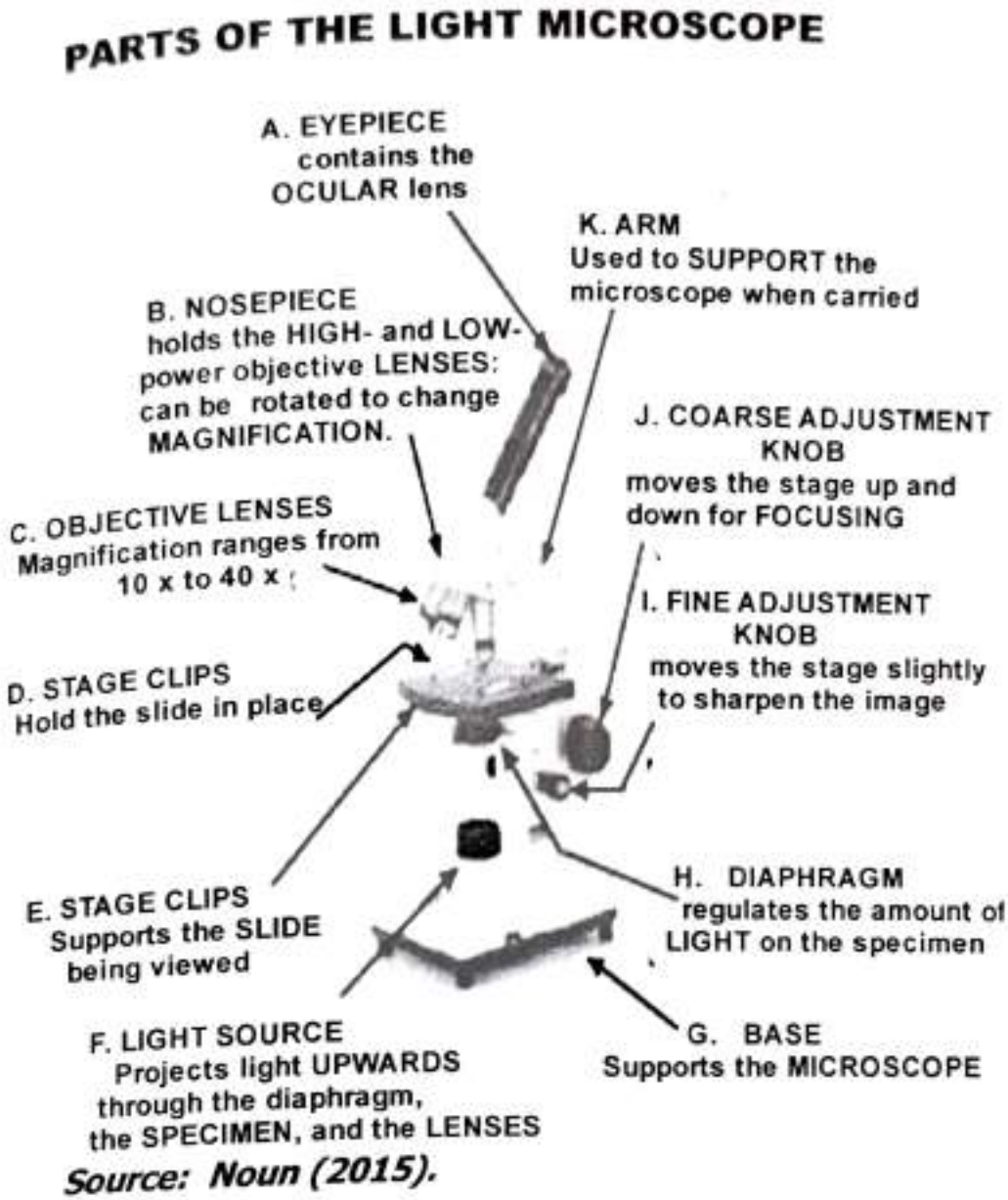


Fig. 1: Light Microscope.

The light microscope is made up basically of a stand which is composed of the arm and the base or foot. It is to this stand that the other parts of the microscope are attached:

CHAPTER FOUR

4.0 BIOCHEMICAL TESTS FOR BACTERIAL

The ability of bacterial to change specific substrates and synthesize diverse products is essential when characterizing bacterial species. Bacterial cultures may appear similar in their morphological and cultural characteristics, but may exhibit dramatic differences in their metabolic reactions.

Qualitative tests, generally consisting of a nutrient medium plus a substrate in which the organism is cultured, are designed to easily detect important bio-chemical features. An "indicator" is often added to show the accumulation of a metabolic product. Often changes in the physical nature of the medium itself are adequate evidence of a substrate (e.g., liquefaction of gelatin).

More definitive measurements of metabolic products may be desired, establishing better criteria for a taxonomic group. In the routine test to determine the ability of two

CHAPTER FIVE

5.0 Sample Collection to Detect Bacteria infection

If bacteria are suspected as the cause of a disease outbreak, a number of similarly affected fish should be examined. Although the commonly recommended number of fish to examine is 5–10 fish, there are many factors that may determine the size of the sample, these include the disease history of the fish stock, the signs of infection, the number of fish available for sampling, the value of the fish, and the workload the diagnostic laboratory is able to handle.

Fish that are alive, but with signs of the suspected disease (moribund fish), are the most useful specimens to sample. If the disease is being caused by bacteria, these fish tend to harbor large numbers of this disease – causing bacteria. Samples should be taken from all damaged or affected tissues.

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