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**POTENTIAL PITFALL IN CYTOLOGICAL DIAGNOSIS:
CYTOMORPHOLOGY OF TROPICAL FRUITS AND LOCAL GRAINS IN
MALAYSIA**

By

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DECLARATION

I hereby declare that this thesis is my original work and has not been submitted previously on currently for other degree at UiTM or any other institution.

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(Nur Sakinah Binti Harun)

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ABSTRACT

POTENTIAL PITFALL IN CYTOLOGICAL DIAGNOSIS: CYTOMORPHOLOGY OF TROPICAL FRUITS AND LOCAL GRAINS IN MALAYSIA

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Introduction: Pitfall is known as misdiagnosing or misinterpretation that can lead to whether false positive or false negative result, and may affect treatment, thus lead to morbidity. Error in misdiagnosis can contribute to false treatment and may lead to death. Possible contaminants in cytomorphological study, including food particles such as fruits and grains may cause pitfall by mimicking certain human cells or fungal element that present in human, and staining background.
Objectives: Purposes of this study are to identify cytomorphology of tropical fruits and local grains, which may cause pitfalls in cytological diagnosis, and to compare and recognize the mimicking morphological characteristics of the selected fruits and grains cells to cells in cytology.
Method: Random tropical fruits and local grains were selected as samples. The samples were homogenized using mortar and pestle, and smeared onto glass slides. For each sample, two slides were prepared, one slide was fixed into 95% alcohol, and another one was air-dried. The slides were then stained using Papanicolaou and May Grunwald's Giemsa respectively. Stained slides were observed for cells morphologies and background. Selected cells morphologies were then captured using Leica DM750 Microscope with ICC 50HD camera.
Results: Dragon fruit cells showed resembling criteria of benign lipoma and squamous epithelial cell, where mango fruit cells resemble cryptococcosis and fat droplet in adipocyte tissue. Ambarella fruit cells showed 'honeycomb' characteristics of endocervical cell. Starfruit cells and watermelon fruit cells showed resemblances to squamous epithelial cell and hyperkeratosis respectively, where maize cells resemble haematoxylin scum.
Conclusion: The morphological characteristics of tropical fruits and local grains can resemble morphology of human cells and staining background. These findings can be used as references in cytological diagnosis, thus avoiding the potential pitfalls.

Keyword: Pitfall, cytological diagnosis, tropical fruit, local grain, cytomorphology

CHAPTER 1

INTRODUCTION

1.1 Background

In diagnosing patients, pitfalls always present and this will contribute to misdiagnose and complication when giving treatment and may results death. Pitfalls mean hidden or unknown difficulty, and in cytology, pitfall means as misdiagnosis of cells and may cause false-positive or false-negative result. The National Patient Safety Foundation reported that one in six cytologist had an involvement in misdiagnosis (Golodner, 2004). The study in medical error showed that 10% to 30% (range= 0.6%-56.8%) of error due to misdiagnosis such as diagnosis of breast cancer, for example inaccurately reported to have benign lesions which are; 21/435 (5%); 14 (3%) misinterpretion of mammogram, four (1%) misinterpretion of pathologic finding, five (1%) missed by poor fine-needle biopsy (Goodson, 2002).

In cytology diagnosis or evaluation, many contaminants may contribute to whether false-positive or false-negative diagnosis, which then will affect treatment given to patients or delayed in receiving treatment, rise in hospital budget, and in severe cases, this problem can result in death (Idowu & Power, 2010). Pitfalls in cytology slide screening always present, where fruits and vegetables contaminants can be misinterpreted to resemble normal cells, benign changes, microorganisms, viral changes or malignant cells (Chang et al., 2013). Food contaminants can come from other material of cells, such as grains and vegetables. According to the Chang et al. (2013), fruits and vegetables can cause mimicking to cells in cytology. Broccoli for example, appears to mimic *Trichomonas vaginalis*.