

Histological Evaluation of Tissues Using Helianthus Annuus (Sunflower) Oil as a Clearing Agent as Compared to Traditional Xylene to Find out Which Gives a Better Resolution

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Abstract

Background: Clearing is an essential step in histopathology processing for light microscopy. The purpose of clearing is to remove dehydration agents from tissues and to prepare tissues for impregnation with the embedding material and xylene do this excellently. The clearing and dewaxing capabilities of xylene contribute to brilliantly stained slides but xylene is very toxic, due to the toxic nature of xylene, a more bio-friendly substance that is Helianthus annuus oil was used to substitute xylene in order to reduce health hazards and also since sunflower has a similar refractive index in relation to xylene, sunflower can equally give a better resolution.

Aim: This present study had tried to compare the efficacy of sunflower oil to that of xylene as a clearing agent as it is readily available for use, less expensive and a safer alternative.

Method: Manual tissue processing method was used in this study. Four tissue organs specimens were considered and further studied, that is the heart, the lungs, the liver and kidney tissues. Each of the tissues was cut transversely and four representative portion was cut from each tissue to obtain 16 tissue blocks. Eight of the tissues was processed in xylene and the other eight was processed simultaneously in Helianthus annuus oil that is sunflower oil. The tissue was observed visually before and after clearing. After dealcoholization the tissues were tested for gross changes, then placed in molten paraffin wax and kept until embedded. Tissue sections were obtained and stained with H&E to permit evaluation of histological details. Results: Descriptive analysis that is morphological features of nuclei-cytoplasm features pictorial images of tissue sections obtained from tissues cleared with Helianthus annuus and stained with Haematoxylin and Eosin showed no significant difference in staining quality in tissue architecture in both kinds of specimen.

Conclusion: Sunflower oil is an effectual replacement for xylene as it is very non perilous, bio- friendly, more common on the market than xylene therefore readily available, do not solidified at room temperature, inexpensive and causes less shrinkage of the tissue, and therefore can be used as a dealcoholization/clearing agent in the histopathological laboratory without losing the quality of the histological details.