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PREPARATION OF SOME MICROSCOPIC PARASITES BY USING PLASTINATION TECHNIQUE AT BASRAH GOVERNORAT

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ABSTRACT

Plastination is a technique of body tissue preservation with a great variety in its processes and development which is originally introduced to the medical world by Von Hagens (1977). A parasites adult worms from three different classes (Trematoda, Cestoda and Nematoda) were use it under this study; Fasciola hepatica, Diphylobothrium latum, Toxocara canis and Toxascaris leonina to make a plastination for each one as a first time in Basrah governorate and Iraq. The result after plastination make all the samples under this study dry, harmless and can studied by postgraduate students as a morphological features and can make a whole measurement for both (length and width), and the most important things these samples not toxic for both environment and students. Plastination seems to have a great future in all fields of training, research and public culture and instruction throughout the world.

INTRODUCTION

Parasitic diseases in animals are usually acquired through contaminated food and water, unhygienic conditions, crowded farms, inadequate dehelminthisation and food imbalance (Maske et. al., 1990; Chakraborty et. al., 1994), furthermore, most parasitic diseases in animals are caused by parasites from the genus of protozoa, trematoda, nematoda, cestoda and arthropoda (Kashid et. al., 2002).

The liver fluke Fasciola sp. is an invasive parasitic trematoda causing both acute and chronic disease (Bory, 1997). Fascioliasis, caused by the digenetic trematodes of the genus Fasciola, is one of the most important plant borne helminth infections of human and livestock in many parts of the world. Annual economic loss caused by the disease is estimated to be US$2 billion mainly due to condemned livers, reduced milk yield, fertility disorders and reduced meat production. Two species of F. hepatica and F. gigantica were recognized in humans and domestic farm animals (Mas-Coma et al., 2005, and Roknil et al., 2010).

The most common tapeworms of dogs are: Diphylobothrium latum, Dipylidium caninum, Taenia spp. and Echinococcus granulosus. Most of them are not highly pathogenic to dogs, but they may cause debilitation and weight loss when they occur in large numbers (Al-Azizz,

2005). While, Toxocariasis of dogs caused by Toxocara canis and Toxascaris leonina has been reported in nearly all parts of the world with infection rates approaching 100% in some populations of puppies (Overgaauw, 1997). Unfortunately, this parasite is common in most domestic and pre-domestic dogs particularly young ones because of their life cycle which makes puppies acquire Toxocara larvae transplacentally from the infected mother (Despommier, 2003).

The adult parasites which isolated from animals and in order to keep their natural color and form are often kept in 10% formalin or 70% ethyl alcohol (Al-Azizz, 2005), these two materials work as fixative, but working with formalin fixed preparations are very unpleasant because of the toxic steam which can harm the respiratory system, eyes and they also require special room for storage (Fischer, 1905).

Plastination was a promoted as a method for permanent conservation of parasitic samples which are not toxic, also, plastination a method allows keeping samples in original form, size and improved cellular level view (Zoran et. al., 2010).

Plastination is a technique of body tissue preservation with a great variety in its processes and development which is originally introduced to the medical world by Von Hagens (1977), in this processes, water and lipids in biological tissues are replaced by curable polymers mostly silicone, epoxy and polyester which then will harden and finally result in natural looking, dry, odorless and durable specimens (Von Hagens, 1986).

The aim of this study was using plastination a silicon procedure- C10 for preparation some parasites samples Fasciola hepatica (flukes) (freshly samples) and Diphylobothrium latum (cestodes) (fixed in 10% formalin for 14 years), Toxocara canis and Toxascaris leonina (nematodes) (fixed in 10% formalin for 6 years).

Materials and Methods

A parasites from three different classes (Trematoda, Cestoda and Nematoda) were use it under this study. The trematoda samples F. hepatica were take it freshly from liver of sheep and caw infected with liver flukes which slaughter in slaughter house at Basrah city. The infected liver were bring to the parasitology laboratory at Veterinary Medicine College/ Basrah University, then all the flukes were isolated by fine needle, washing many time by distill water and prepare for plastination.

D. latum and T. canis and T. leonina adult worms were taken from samples with 10% formalin after 14 and 6 years later, the worms were isolated from stray dogs at Basrah city.

The procedure of Von Hagens (1986) with silicon - C10 was used to fix and prepares a microscopic F. hepatica, D. latum, T. canis and T. leonina as adult worms.

Results

The result after plastination make all the samples under this study dry, harmless and can studied by postgraduate students as a morphological features and can make a whole measurement for both (length and width), and the most important things these samples not toxic for both environment and students. Furthermore, in the past when the samples in formalin can't study otherwise because it was curved, darkness and hard like a stone.

In Pictures (1, 2, 3, 4) adult worms of F. hepatica after plastination which isolated from infected cattle livers, a clear body, normal color, the reproductive system and vitelline glands brown in color (like a normal one) with slides of silicon. While, Pictures (5,6,7) adult worms of D. latum which isolated from intestine of stray dogs and kept in 10%formaline for 14 years, it can be seen a clear color like in fresh samples, the uterus brown and like a flower in the center of the gravid segment, it can be diagnosis between immature, mature and gravid segments by size and content and color, the whole samples was bright and can make a measurement for each segment. In Pictures (8, 9, 10, 11) the male and female of T. canis and T. leonina as adult worms after plastination, a white bodies but the content didn't clear but can be diagnose between both sex by the posterior parts.

(1)

(2)

(3)

(4)

Pictures(1, 2, 3, 4): Adult fluke F. hepatica with slide of silicon, plate of silicon and slide of silicon with many worms

(5) **(6)**

(7)

Picture (5, 6, 7): Adult cestoda D. latum segments (immature, mature and gravid) with bright, brown color, clear uterus in the center of segment after plastination.

(8) **(9)**

(10) **(11)**

Pictures (8, 9, 10, 11): adult nematoda T. canis and T. leonina after plastination with white color, curved ventrally and a clear posterior parts for both male and female.

Discussion

Plastination is a combination of science, technological phenomenon and artistic events in association with cultural aspects of life and death. Deep analysis of the artistic and cultural exhibitions of Von Hagens all around the world which may appear at first sight as a similar and integral exhibition (Pashaei, 2010).

Under this study, the parasites after plastination make a good tool for teaching, studying and learning because it's looks like a fresh samples with a clear features for both trematoda and cestoda samples but nematoda samples just only a morphological features these may be related to the thick tegument of nematoda as compared with others which have a thin tegument make it clear.

Plastination of animals and fish are reported in some researches like (Asadi, 1998; Zhong et al., 2000), but as I know the current research was the first one about plastination of parasites samples.

Zoran et al., (2010) reported that plastinated parasitological samples with huge advantage over those preserved in alcohol or formaldehyde because of they are characterized as being less permanent, so, it was an educative samples because always available, palpable, with clearly visible structure and can be observed from every perspective and can be storage at room temperature.

Plastination seems to have a great future in all fields of training, teaching, research and public culture and instruction throughout the world and new fast and hazardless techniques make it available to many department of anatomy and histology for both human and veterinary, cheaper costs and vivid appearance of the specimens make the plastination a unique window to the world for learners in any fields (Pashaei, 2010).

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