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PLASTINATION OF ARTHROPODS USING S10 TECHNIQUE

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ABSTRACT

Plastination is a modern technique used for tissue preservation. This study conducted for the first time in Iraq on arthropods. The study uses samples consist of different arthropoda species. The results revealed a clear arthropoda in color, with clear morphological features like, wings, legs, tegument, respiratory pores and external genital organs. Preservation with this technique gave a great benefit for long time preservation and to make further studies about the morphology and general characteristic of those animals.

INTRODUCTION

Plastination is a technique invented by Gunther von Hagens in 1977, initially as part of his work as a scientific assistant at the Anatomical Institute of Heidelberg University, so, Plastination is a technique of body tissue preservation and many applications for plastinated tissues, organs and sections of bodies, prepared by the standard techniques of plastination (1).

In plastination technique a curable polymers replace water and lipids in biological tissues (plants and animals) and the polymer is subsequently hardened, which resulting in dry, odorless and durable specimens (2).

(3;4) found that the materials for preparing the specimens to plastination are safe and hazardless like S10 silicone, S6 gas cure and S3 catalyst and not toxic. In recent years there is a growing

tendency toward plastinated products and this growing reflected in articles which highlight the primary role and importance of the plastinated specimens as important educational, research and cultural tools in the medical and biological world, although there are still arguments on the usefulness of these tools among anatomists (5).

(6) record that plastination has been promoted as a method for permanent conservation of samples, which are not toxic. In the same time, this method allows keeping samples in original form, size and improved cellular level view.

In Iraq this technique reveled as a first one and it's begins in Basrah governorate and there are fewer studies depend on use this technique in histology and anatomy. (7) used plastination technique to prepared some microscopic parasitic specimens (trematoda, cestoda and nematoda).

The aim of this work is to examine the environmental factor like room temperature and periods on plastination technique by demonstrating morphological features and general characters to different arthropods as models.

MATERIALS AND METHODS

A different arthropods some with medical and veterinary important, other useful for human agricultures, while, some neither harm nor benefit which collected and isolated from different region at Basrah city related to: fly of *Calliphora sp.,* beetles of Coleoptera order, *Perilanta americana*, hard and soft ticks, lice, different larvae, Scorpion of Scorpionidae order, honeybee and grasshopper.

Each one were collected and put in clean vials till die, then, the procedure of (8) with silicon - S10 was used to fix and prepares arthropods in different shapes and models.

RESULTS

The result after plastination of arthropods make all the samples dry but unbroken, harmless and can kept for long time and the most important it can studied by postgraduate students as a morphological features and can make a whole measurement for both (length and width), furthermore, these samples not toxic for both environment and students as compared in the past when the samples put on 10% formalin which make the samples curved, darkness and hard like a stone.

The most important things for these samples it can be study the morphological features; legs as in Figs.(1) with clear legs and external genital organs, while, *Perilanta americana* and beetles of Coleoptera with clear legs and color, Grasshopper with clear feature after plastination. (Fig. 2) Scorpion with clear segments, features, wings and color.

In Fig. (3) a honeybee with clear wings, features and color, while, Fig. (4) larvae after plastination with clear segments and color. Fig. (5) Honeybees with clear antenna and wings. In Fig.(6) Lice and Ticks aggregate in one slid of S10 plastination, Lice and Ticks and Fly of *Calliphora sp.,* aggregate in petri dish of S10 plastination (Figs. 7,8). Furthermore, It could be put the samples in glass container (Fig. 9)which clear that larvae and arthropoda after plastination.

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(A)

(B)

(C)

(D)

Figs. (1): A: arthropoda with clear legs and external genital organs, B: *Perilanta americana* with clear legs, color C: beetles of order Coleoptera with clear legs, color segments (D): Grasshopper with

Fig. (2): Scorpion of order Scorpionidae with clear segments, features and color after plastination

Fig. (3): Honeybee with clear wings, features and color after plastination

Figs. (4): A, B Larvae with plastination with clear segments and color

Fig. (5): Honeybees with clear antenna and wings

Fig. (6): Lice and Ticks aggregate in one slid of S10 plastination

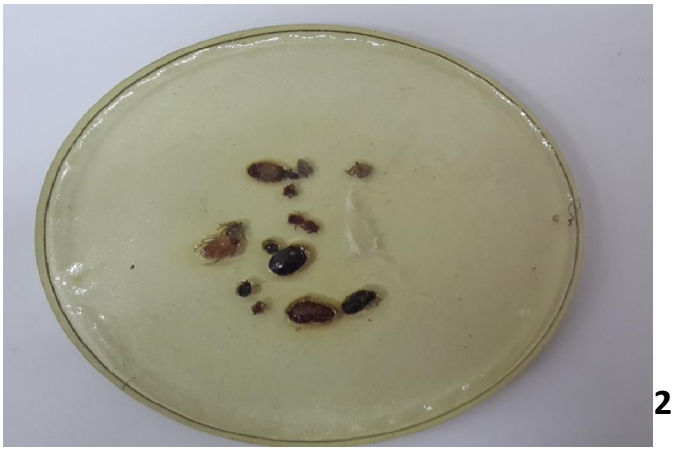

Fig. (7): Lice and Ticks aggregate in petri dish of S10 plastination

Fig. (8): Fly of *Calliphora sp.*, aggregate in petri dish of S10 plastination

Fig. (9): Larvae and arthropoda after S10 plastination in clean glass container

DISCUSSION

Plastinated parasitological and biological samples have huge advantage over those persevered in alcohol or formaldehyde, because they are characterized as being less permanent, having regularly needs of changing the immersion, the unpleasant smell and having hardly recognizable parts of them, furthermore, students can't manipulate with the fixated samples, so, plastinated

educative samples are: always available, palpable, with clearly visible structure, can be observed from every perspective, have grand permanence, and can be storage on room temperature (9).

The specimens under this work found as an good educative tools for both student and researchers, it could be study the morphological features, like, length, width, antenna, eyes, wings, external genital organs, color, respiratory pores (shape and location), and it can be kept for a long periods in clean containers or slides.

The same results found in (10) when they used a C 10 procedure to plastinated human *Ascaris lumbricoides* and (7) when used a S10 procedure to plastinated different parasitic worms. While, (11) used polyester plastination P40 to plastinated a brain tissue slices as a biological tissue and found it's a good way for deep studying.

In conclusion plastination seems to have a great future in all scientific and non scientific fields of training, and it will be benefit for researchers and students, research and also public culture and instruction throughout the world. New fast and hazardless techniques with modern material and modification methods make it available in any fields, furthermore, cheaper costs and also vivid appearance of the specimens make the plastination a unique window to the world of biology, histology, anatomy and other sciences.

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