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RESEARCH ARTICLE

POLYESTER RESIN PLASTINATION FOR LIGHT WEIGHT POULTRY SPECIMENS

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ABSTRACT

Plastinated specimens make significant and quick references for the understanding of Gross Anatomy. The birds were collected from the Institute of Poultry Production and Management, Nandanam, Chennai. The birds were sacrificed in humane method and are fixed in Keiserling I solution and the body cavity was dissected to show the visceral organs *in situ.* Dehydration was done by a number of changes in acetone followed by xylene. The air drying of the specimen in the following step permits substitution of xylene by air. The dissected surface is treated with polyester resin followed by curing with a mixture of resin and catalyst. The completely cured specimens are labeled and the labels are again coated with resin catalyst mixture, so as to make the labels permanent. Thus, the resulting specimens become a three dimensional model of original which do not require wet preservation.

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INTRODUCTION

Plastinated specimens make significant and quick references for the understanding of Gross Anatomy. The exotic method of plastination using Silicone resins are very expensive. So indigenous plastination technique using general purpose Polyester resin was done in the dissected poultry specimens. This indigenous plastination process is cheaper and resulted in good quality dry, odourless and solid specimens which can be used for teaching. In addition, the specimens are light weighted, nearly identical to their state prior to preservation. The completely cured specimens are labeled and the labels are again coated with resin catalyst mixture, so as to make the labels permanent. Thus, the resulting specimens become a three dimensional model of original which do not require wet preservation. The class of polymer used determines the mechanical and optical properties of the preserved specimen (Hagens et. al., 1987). Plastination technology has obtained great acceptance, particularly because of the high quality of the preservation as well as the durability and the teaching value of the specimens.

MATERIALS AND METHODS

The birds were collected from the Institute of Poultry Production and Management, Nandanam, Chennai. The birds were sacrificed by humane method. Left side body wall along with left wing and left limb are removed and are fixed in Keiserling I solution and the body cavity was dissected to show the visceral organs *in situ.* The right side body wall, head, neck and tail are kept intact with their original feathers, so as to identify the species with ease. Dehydration was done by a number of changes in acetone. The following treatment with xylene makes the specimens firm, thereby stopping future shrinkage (Tiedemann 1987). The air drying of the specimen in the following step permits substitution of xylene by air. The dissected surface is treated with polyester resin. Curing was done by coating a mixture of general-purpose polyester resin, 5% catalyst and 2% accelerator.

RESULTS AND DISCUSSION

After plastination, the resulting tissue is safe to handle (i.e., toxic fixatives are eliminated), the tissue has no odour and it is extremely durable (Hagens et al., 1987). Keiserling solution is found to be the best fixative for plastination process (Oostrom 1987) because it maintains the original colour of the organ. The plastination process involves three exchange phases. In the first exchange phase, acetone replaces bodily fluids and fat through diffusion. In the second exchange phase, the acetone is replaced with xylene. In the third exchange phase, the xylene is replaced with air. Henry (1992) used "BIODUR" S-10 curable polyester resin for plastination. Since such special quality resins are not available in India, this study was conducted by using indigenous polyester resin and catalyst which are less expensive. The dissected surface is treated with polyester resin for three to four times because of the extended time taken for hardening of the resin mixture. Curing was done by coating a mixture of general-purpose polyester resin, 5%

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POLYESTER PLASTINATE OF A TURKEY

POLYESTER PLASTINATE OF A DOMESTIC FOWL

catalyst and 2% accelerator. In this study it took only six hours for complete curing. According to Hagens et al. (1987) the silicone resin impregnated specimen is hardened by exposing it to a gaseous hardener and polyester or epoxy resin impregnated specimen is hardened by exposing it to light and heat. In this study the specimen was cured with the commercially available catalyst and the process is fastened by the addition of accelerator. Hardening was done successfully by coating with a mixture of general-purpose resin, 5%catalyst and 2%accelerator, which completed the curing process within a day. Plastination is carried out in many institutions worldwide and has obtained great acceptance particularly because of the durability, the possibility for direct comparison to CT- and MR-images. Plastinated specimens can be repeatedly handled by students without causing any body reactions of chemicals (Ramakrishna et al., 2002) and can be stored as would any inert object.

Conclusions

This study has established the fact that we can produce indigenous plastinates of cheaper cost which are highly durable and user friendly, requires no wet preservation and can be best used for teaching gross anatomy.

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