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Silicone Resin Plastination of Helminth Parasites for Preservation

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Abstract

Helminth parasites *viz,* flukes (*Fasciola gigantica*), tapeworms (*Moniezia sp.*), round worms (*Parascaris equorum, Toxocara canis, Setaria digitata*) and *Cysticercus tenuicollis* cysts were subjected to silicone resin plastination. Formalinized specimens were briefly pre-cooled at 4ºC for 24 h followed by alcohol dehydration, silicone resin impregnation and curing. Plastinated helminths were sturdy and retained the natural colour. Handling of plastinated specimens was easy with aesthetic superiority compared to conventional formalin preserved specimens. The technique was found to be effective in preserving helminth parasites.

Key words: plastination, silicone resin, helminths, preservation

The observation of parasites and associated lesions are integral part of learning and teaching Veterinary Parasitology. Conventional preservation using 10% formalin causes unpleasant smell and irritation to eye, skin and respiratory system and handling such specimens by students is not comfortable. One of the ecofriendly alternatives to formalin preservation is "plastination" where lipid from tissues is removed and replaced by a curable polymer. A study was undertaken to plastinate common helminth parasites using silicone resin plastination technique.

Materials and Methods

Intact specimens stored in 10% formalin were chosen for plastination. Formalinized flukes (*Fasciola gigantica*), tapeworms (*Moniezia sp.*), round worms (*Parascaris equorum, Toxocara canis, Setaria digitata*) and cysts (*Cysticercus tenuicollis*) were precooled at 4ºC for 24 h. Dehydration was then done by several changes of ethanol (30% ethanol – 3 times- 1 hour each, 50% ethanol – 3 times- 1 hour each, 70% ethanol – over night, 90% ethanol – 3 times- 1 hour each and 100% ethanol – 3 times- 1 hour each). Dehydrated specimens were then transferred to a mixture of 70% silicone resin (Murtisil 1010, Aditya Silicone, New Delhi) and 30% xylene (Himedia) in a long rectangular glass lid vacuum chamber (Fig I) at room temperature in vacuum (negative pressure) of 20 mm Hg and kept for 3 to 5 days for resin impregnation. Excess resin was drained and specimens were then placed over thermocol or foam sheet inside an aluminium box fitted with a small fan inside. Curing liquid (s6) was kept in a bottle into which outside air was pumped and the released air bubbles were allowed to spread and circulate inside the box for 3-7 days depending on the size of the worms in order to facilitate slow and steady curing of specimens and to avoid excess hardening and breakage.

Results and Discussion

The silicone resin plastinated helminth parasites, *Fasciola gigantica* (Fig II), *Moniezia*

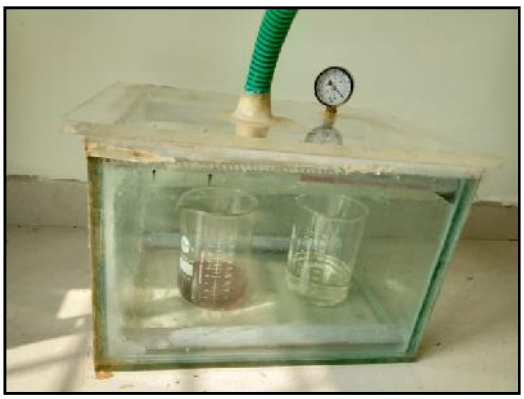

Fig I. Vacuum chamber used for resin impregnation into helminths

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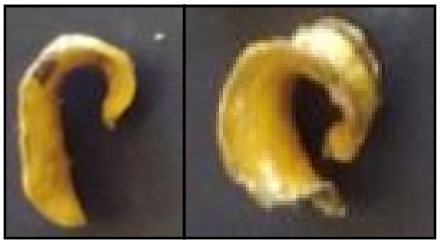

Fig II. Plastinated *Fasciola gigantica*

Fig III. Plastinated segments of *Moniezia* sp.

Fig IV. Plastinated *Parascaris equorum*

Fig V. Plastinated *Toxocara canis*

Fig VI. Plastinated *Setaria digitata*

Fig VII. Plastinated *Cysticercus tenuicollis* cyst

sp. tapeworms (Fig III), *Parascaris equorum* (Fig IV), *Toxocara canis* (Fig V), *Setaria digitata (*Fig VI) and *Cysticercus tenuicollis* cysts (Fig VII) were sturdy and retained the natural colour. Plastination also enabled easy, safe handling of specimens and hazzle free display when compared to the conventional formalin preservation. Plastination is an alternate ecofriendly technique to preserve helminth parasites. This technique was first developed by Von Hagens *et al.,* (1987) to preserve biological specimens. Plastination is done using silicone resin, epoxy resin and polymer, out of which silicone plastination is superior in creating opaque and natural looking specimens. Ramakrishna *et al.,* (2010a and b) preserved ecto and endo parasites by plastination technique by recycling environmental pollutants. The first helminth to be plastinated was *Ascaris lumbricoides* by Asadi and Mahmodzaeh (2004) using S10 technique. Kumar *et al.,* (2017) plastinated *Fasciolopsis buski, Moniezia sp., Ascaris suum, Parascaris equorum, Toxocara vitulorum,* larvae of *Oestrus ovis, Ornithodoros moubata* and *Rhipicephalus (Boophilus) microplus* ticks by melamine polymer plastination and it was observed that the plastinated parasites were dry, non-sticky, glossy, odorless and harmless, to some extent flexible, with detectable morphological structures and retained their natural form but lost their natural color. However in

the present study, plastination of helminths using silicone resin preserved the colour of all the specimens. The plastinated helminths did not cause any respiratory irritation or allergy to the person handling as observed by Menaka *et al.,* (2010). Based on the present study, silicone resin plastination can be effectively used to preserve trematodes, cestodes (adult and larval stages) and nematodes.

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A Rare Case of Cutaneous Angiofibroma in a Cow and its Surgical Treatment

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Abstract

A 3 years old, primiparous, Jersey cross bred cow was brought with a large growth on the caudal aspect of right hind limb below the hock joint since four months. Under sedation and local infiltration anaesthesia, the growth was removed surgically and it was confirmed as angiofibroma on histopathological examination.

Key words: Heifer, cutaneous, angiofibroma, surgical management

Angiofibroma is a relatively rare, highly vascular, nonencapsulated, locally invasive tumour with typical histological pattern composed of angiomatous and fibrous components. Angiofibromas usually appear as small, red bumps on the face, especially on the nose and cheeks (Janecka and Kapadia, 2012). The present report records a rare case of cutaneous angiofibroma on the right hind limb below the hock joint of a cow and its successful surgical management.

Case History and Observations

A 3 years old, primiparous, Jersey cross bred cow was presented with a large growth on the right hind limb and it was insidious in onset and slowly progressing for the past four months. Clinical examination revealed a firm, invasive, ulcerated growth on the caudal aspect of right limb below the hock joint (Fig.). The animal was having normal feeding habits and all physiological parameters were in normal range. Radiological examination revealed no osseous involvement. Based on the examinations it was diagnosed as cutaneous tumour and surgical excision was decided upon and the animal was prepared for aseptic surgery.

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