IDENTIFICATION OF FUNGI SPECIES FROM MUSEUM LEATHER OBJECT

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ABSTRACT *Fungi infection in any field is deemed trouble. These infections are harmful to all the living organisms' regular contact with the causing host. In museums, museum staffs are regularly associated with museum objects, which are old and deteriorating. The museum objects could be infected and this could be harmful to personnel handling them. In this study a sample test was conducted from a very small piece of leather belt to check the fungi species present in small region of object and in collection of a museum. The fungi were found to be dormant but in favourable condition the fungi could spread anytime and create further problems.*

Keywords: *Museum; Fungi; Leather.*

1. INTRODUCTION

The tough yet flexible, thin still resistant to tearing, good heat insulator and water vapour transmission is what makes Leather a wonder object. In use from time unknown, Leather is considered to be the product of man's first manufacturing process (Forbes, 1957). The term leather incites numerous of fields like fashion, upholstery, book binding, shoe making, etc. Leather should be considered a broader term, that accommodates a number of allied materials like fur, parchment, vellum, vegetable tanned leather, chrome tanned leather, etc. All of these allied materials have their own unique methods of manufacturing and are used appropriately in relation to their unique physical and chemical properties, in different fields (Kite & Thomson, 2006). Property is what makes leather special and these properties are attained when the collagen (structural protein of skin) combines with the appropriate manufacturing technique. Leather artefact is as unique as any other museum object. Being an organic material conserving leather made object is a challenge. It is vulnerable and prone to be attacked by a plethora of problems, under favourable conditions. One such problem is that of Fungi.

The presence of Fungi is global and all the continents have their own share of diverse and unique functional fungi. Fungus is associated with almost all of organic world and the resultant of fungi impact is both from malevolent to benevolent (Sterflinger, 2010). At one place where it is edible as mushroom on other side it is also responsible for rots in crop; it is also used in the form of yeast in food industry and can be harmful as well, causing aspergillosis. It has always been a challenge for the museum personnel to evade from fungi in the museums and when it comes to the life of remains of human civilisations, the removal of fungi becomes topic of utmost importance.

2. MATERIALS AND METHODS

2.1. Collection of Museum Leather Sample

Leather sample (Figure 1) was collected from H.H. Maharaja Sir Jiwajirao Scindia Museum, Gwalior, Madhya Pradesh, India. A vegetable tanned leather horse belt was sorted out from the storage of the museum. A small broken piece was collected appropriately from the belt and stored, without scope of further contamination from external sources. The sample was then used accordingly for further tests and experiments.

Figure 1 leather belt from H.H. Maharaja Sir Jiwajirao Scindia Museum

2.2. Culture of Fungi

Sterile 55 mm contact plates with Malt Extract Agar (MEA) media were used to pick spores from the grain and flesh side of the leather sample. The Contact Plates are designed for microbial monitoring of dry surfaces, e.g. floors, walls, textiles and working garments of personnel in controlled areas. The plates were incubated at room temperatures. Any growth during the observation period was recorded.

2.3. Media Preparation

MEA based media was prepared, and the recipe followed was 20 gm malt extract, 20 gm glucose, 1 gm peptone and 20 gm agar were mixed in 1000 ml of distilled water. The mixture was autoclaved at 121° C for 15 minutes. The prepared mixture was left to cool down to luke warm and was poured carefully in 100 mm dia × 15 mm deep petridish, under laminar flow chamber. The prepared MEA petridish were stored appropriately, avoiding contamination and used as and when required.

2.4. Isolation of Fungi Species

After the matured growth of colonies, the growth from the contact plates were observed and isolated. The funguses were cultured individually on MEA media and identified to up to the species level as per the laid keys (Domsch, Gams, & Anderson, 2007; Hoog, 2000), under Leica made DM 750/DM 1000 microscope, after matured growth of the colonies.

3. RESULTS AND DISCUSSIONS

From the culture of fungi from the leather belt, it was found that *Aspergillus sp., Chaetomium sp. Penicillium sp., Cladosporium sp.,* and *Alternaria sp.* spores and fruiting body were present on the surface of the belt in dormant form. Rathore and Chauhan, (2009), Florian (2002) have reported that *Aspergillus sp., Penicillium sp., Cladosporium sp., Chaetomium sp.* and *Alternaria sp.* are most commonly found on leather.

Fungal degradation of library materials like leather bindings and parchment causes different kinds of damage depending on the species of organism responsible for the attack and the characteristics of the substratum. Damage can occur because of mechanical stress, production of staining compounds or enzymatic action (Sterflinger, 2010). It has been reported by many that the identified fungi cause diseases and infection in humans, like *Aspergillus sp.* is responsible for causing aspergillosis, the most common mold infection worldwide. Over the past 10 years, *Aspergillus* has become the most prevalent airborne fungal pathogen, causing severe and usually fatal invasive infections in immunocompromised hosts in developed countries (Latgé, 1999).

It is important in first hand to know the condition of the museum objects before handling. During this small test it was found that, a small leather belt in storage had many spores of fungi associated with it. During favourable conditions the spores could become problem for museum staff.

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