

Short Communication

Hair Dye as a choice of Laboratory Rodent Animal Identification Method in Experimental Research

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ABSTRACT

Laboratory animal identification is a routine, but an important aspect in experimental research. To study the efficiency of a commercial human hair dye as a choice of animal identification method, twenty female Wistar albino rats in the breeding unit of Laboratory Animal Medicine unit were used. Ten rats were identified with conventional potassium permanganate dye and another ten were identified using commercially available hair dye and the persistence of dye was observed for a period of three months. Potassium permanganate dye persisted for a period of only four weeks whereas commercial hair dye persisted for a period of 12 weeks. In both the groups, no adverse effect towards the dye was observed. From this observation, it shall be concluded that commercial hair dye can be used as easy, cost effective, single application and long-standing identification method in animal research lasting up to 3 months period.

Key Words: Lab Animal – identification– hair dye

INTRODUCTION

In experimental research using laboratory animals, animal identification is done routinely. Animal identification is an important measure for maintaining accurate production records of the mischief/nest (group of rats/mice). Animal identification allows us to keep records on numerous parameters such as animal's parentage, birth date, litter records, health history and

a host of other important managerial information (Neary and Yager, 2012). Laboratory animal identification is generally carried out with minimum invasive and cost-effective techniques like colouring dyes, tags, bands, removing fur, etc.

Invasive and costly techniques like tattooing, radio telemetry transmitters and passive integrated transponders are also being used as animal identification methods (Cameron *et al.*, 2007). Each technique has its own advantage and disadvantage and in recent times researchers are sensitized on the issues of animal ethics. Hence, an animal

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identification method that would have minimum handling and stress to the animals will be ideal. It should be easy for researcher and should stay for long duration so that animals need not be handled frequently should also be cost effective. In this study, an attempt is made to evaluate the efficacy of hair dye as an identification tool against conventional potassium permanganate dye in laboratory animals.

MATERIALS AND METHODS

Commercial hair dye, Potassium permanganate (KMnO_4) and application brush were procured for the study from local vendors. Laboratory Animal Medicine Unit, Directorate of Centre for Animal Health Studies, TANUVAS is a breeding unit of laboratory animals like rat, mice and guinea pigs. Trio-mating is being followed in the unit with the ratio of one male rat to 2 female rats. As male rat in each cage is easily identified by the presence of testicles beneath the tail, there is need to identify the females in each cage to maintain breeding record of rats. One of the female rats in each cage was marked with either the conventional KMnO_4 dye or commercial hair dye and other female rat was left unmarked in every cage. Twenty female Wistar Albino Rats were used for the study. Cage numbers from 1 to 10 were marked as KMnO_4 identified cages and cage numbers from 11 to 20 were labeled as commercial hair dye identified cages.

Potassium permanganate dye was prepared as per the standards for usage as topical agent (Goodman and Gilman, 1975). One sachet of commercial hair dye was prepared for application as per the

procedure of the manufacturer (Chemical - p-Phenylenediamine). The rat which has to be identified was taken to separate sample collection room. Hair dye or KMnO_4 dye was applied swiftly over hair coat on the scruff region of each rat using a brush. The dye was allowed to dry for 10 minutes and the animals were brought back to their respective cages.

The animals were observed daily to evaluate the persistency of the commercial hair dye in comparison with KMnO_4 .

RESULTS AND DISCUSSION

The animals in both the groups were watched periodically for the persistence of colour for a period of three months. The animals were observed for adverse reactions on the day of application at frequent intervals. As both the agents were applied only on the hair coat of animal, no adverse skin reactions were observed in neither of the groups.

Potassium permanganate dye stained the hair coat with brown colour and was visible as an identification mark up to 4 weeks with minimum paleness and thereafter the intensity started to reduce and was difficult to be identified by 8th week of the observation period. KMnO_4 colour completely became invisible during 12th week of observation as shown in the figure 1-4. Similar observation was recorded in all the animals of KMnO_4 identified group.

Commercial hair dye stained the hair coat with black colour and was present prominently with little fading till 12 weeks of study and after that it started to fade

and only by week 15 the dye disappeared completely (figure 5-8). Similarly, all animals showed the same observation in hair dye identified group.

Tonguc Isken *et al.*, (2008) recorded that hair dye as an animal identification method on different anatomical regions persisted with minimum paleness till eleventh week of the study. As grooming behaviour is well established in rats, there are increased chances of licking the dye and fading of colour if sites chosen are easily groomed. Therefore, in this study the scruff region is being chosen for identification which is not readily accessible for grooming. This prevents the intake of dye

orally and also avoids fading of colour by grooming. The dark black colour of the dye is also advantageous owing to the contrast that it gives on an albino coat.

With minimum handling stress to animals and researcher and in short time, animals can be identified using freshly prepared hair dye. In studies involving multiple groups, different anatomical locations can be chosen to identify the animal provided for better differentiation and less accessible to grooming. Hence, hair dye will be an easy, cost effective, single application and long standing (period of 12 weeks) identification method in long term experimental research using animals.

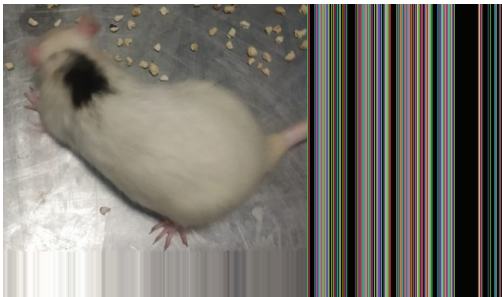


Fig – 1 KMnO4 Day 1



Fig – 5 Commercial hair dye Day 1



Fig – 2 KMnO4 Week 4



Fig – 6 Commercial hair dye Week 4



Fig – 3 KMnO₄ Week 8

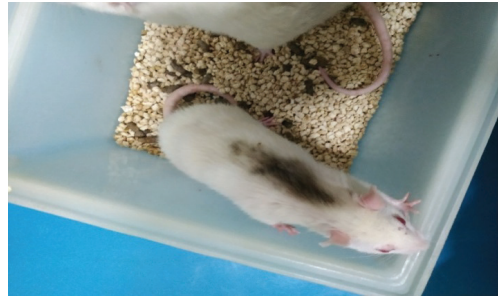


Fig – 7 Commercial hair dye Week 8

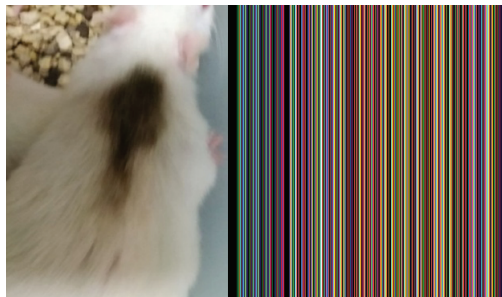


Fig – 4 KMnO₄ Week 12

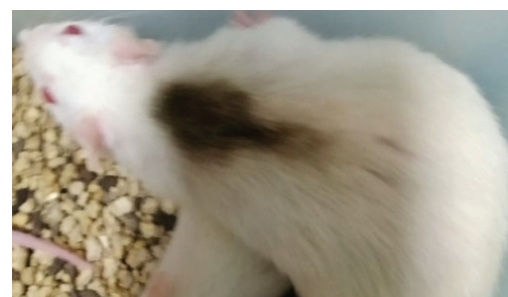


Fig – 8 Commercial hair dye Week 12

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