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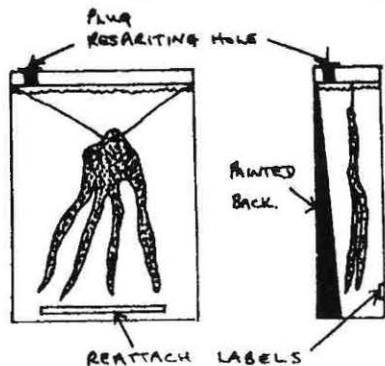
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hypodermic needle fill jar up with preservative to just below the sealed edge, so when jar stands the preservative is not against the seal. For larger jars, an airline of aquarium hose can be fitted to a 5mm hypodermic needle and preservative



can be added from a holding tank. Then plug respirating hole with silicon and leave for another 4-8 hours before moving.

If so required, the jar can now be repainted and any outside labels reattached. It is good conservation practise to note down, for future reference, exactly which sealant and methods have been used for each jar.

A COMPARISON OF TWO PAPERS AND TWO INKS FOR USE AS COMPUTER GENERATED LABELS IN FLUID PRESERVED COLLECTIONS

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Introduction

With the possible discontinuation of Resistall paper (supplied by Preservation Equipment Ltd in the UK) which the National Museum of Wales (NMW) Zoology Department currently uses in producing labels for use in fluid preserved material, a possible replacement was required. Work done by other workers (Crawford Ross, 1961; Pettitt, 1975; Lambiris, 1990) suggest a number of possible alternatives which included the 100% rag paper Goatskin Parchment produced by Wiggins Teape (now Arjo Wiggins). Goatskin Parchment had been used previously by the department and is commonly used in natural history collections but had lost favour at NMW when the last batch purchased in the late 1980's disintegrated on immersion in fluid. This was apparently due to a change in production methods. However Goatskin Parchment is still manufactured and is being used by other institutions. As a result it was decided to compare the Goatskin Parchment currently manufactured with the Resistall paper.

In conjunction with these papers it was decided to look once again at computer generated labels for use in fluid preserved material. This is an area that continues to be unclear, although Pitkin (1995) provides a good overview. Looking at the available data two inks were chosen to look at, both of which are for use in deskjet printers, which are reasonably cheap and easily available. The two inks are both manufactured by Graphic Utilities and are available through

Misco Computer Supplies. These were the black indelible ink and the PermaDri™ black pigmented ink. Both inks are available as refill kits for the deskjet cartridges.

Test Procedures

Labels were produced on a PC using Filemaker Pro. The labels were printed on the papers Resistall and Goatskin Parchment using a HP 500 deskjet printer. The labels were printed using the two graphic utilities inks; indelible black and PermaDri black. Once printed the labels were allowed to dry overnight. Labels printed on Resistall paper in the usual manner were used as the control. These were printed using a hand operated printing press and carbon black ink, with information hand-written on using a Rotring pen with Indian Ink

The fluids for use in the testing procedures was as follows:

- 0.1 Molar Hydrochloric acid (HCl).
- 80% IMS
- 4% formaldehyde
- De-ionised water

Before any label was placed in the test fluids the label details were written on using a Rotring pen with Indian ink and then it was rinsed in water to remove any 'excess' ink which would otherwise run. This has been recommended specifically when using the indelible ink (Pitkin), but was done as standard with all the labels.

On removal from the test fluid the label was placed on a flat glass surface and a scalpel blade lightly stroked across the print image to assess the robustness of the image from abrasion and the wet strength of the paper.

Two tests were then carried out. One to induced immediate changes and the other to look at longer term storage in the test fluids. Both tests used heat to accelerating the ageing effects.

1. Boiling Test

The test fluids were brought to boiling point, using an electric laboratory heater in a fume cupboard, and the labels immersed (with great care) into the fluid for a period of 60 minutes.

2. Storage test

The labels were placed in fluid storage jars of each of the test fluids and placed in a glass fronted heated cabinet at a temperature of 50 to 60°C for a period of three weeks.

Results

The results have been summarised in Table 1. In all cases the PermaDri ink kept a better image than the indelible ink, whilst the Resistall paper had better image abrasion resistance.

Discussion

1. The Papers

During the running of these tests it was reported from the USA that Resistall paper was to be manufactured once again removing the immediate need to find a replacement. However it is interesting to note that the current Goatskin Parchment that is available is suitable for use in fluid collections, more so in alcoholic collections, but is not as good as Resistall. The more waterbased the solution the softer the Goatskin becomes and the more easily the print is abraded from the surface, although provided the paper is handled reasonably carefully this should not be a problem.

Fluid	Paper	Ink	Boiling Test	Storage Test
80% IMS	Control – (Resistall)	Indian Ink	No change	No change
	Resistall	Indelible	Fading of print but remained readable.	Fading of print but remained readable. Became smudgy due to ink running.
		PermaDri	No change; surface image resistant to abrasion.	No change; surface image resistant to abrasion.
	Goatskin Parchment	Indelible	Fading of print but remained readable.	Labels less 'smudgy' than Resistall, but more faded.
		PermaDri	No change; surface image resistant to abrasion.	No change; surface image resistant to abrasion (IMS sample stronger).
	0.1 M HCl	Control – (Resistall)	Indian Ink	No change in image, although paper more easily damaged.
Resistall		Indelible	Paper becomes softer, surface damages more easily but image only slightly faded.	Label slightly faded and 'smudgy'. Paper easily torn.
		PermaDri	Print image remained strong but easily abraided. Paper much weaker.	Image remained good but the paper disintegrated on handling.
Goatskin Parchment		Indelible	Paper becomes softer, surface damages more easily but image only slightly faded.	Label slightly faded and 'smudgy'. Paper easily torn.
		PermaDri	Print image remained strong but easily abraided. Paper much weaker.	Image remained good but the paper disintegrated on handling.
Deion. water		Control – (Resistall)	Indian Ink	No change
	Resistall	Indelible	Image fades almost completely.	Label very faded.
		PermaDri	No fading, image robust. Paper still strong.	No fading but image easy to abrade off.
	Goatskin Parchment	Indelible	Image fades almost completely. Paper weaker than Resistall sample.	Label very faded.
		PermaDri	No fading of image but paper weaker than Resistall sample.	No fading but image very easily abraided off.
	4% form.	Control – (Resistall)	Indian Ink	No change
Resistall		Indelible	Image fades almost completely.	Image fades almost completely.
		PermaDri	No change in image.	No fading of image although it can be abraided off more easily than the IMS sample. Image fades almost completely.
Goatskin Parchment		Indelible	Image fades almost completely.	Image fades almost completely.
		PermaDri	No change in image though less robust than Resistall sample.	No fading, but image very easily abraided off.

2. The Inks

The first of the two inks to come to note was the indelible ink which was being used by certain departments at the Natural History Museum (Pitkin, 1995). However this is considerably inferior to the NMW's current system of handprinting labels and cannot be recommended. It appears with alcoholic collections the image will initially fade but remain readable. However in increasingly waterbased fluids the ink continues to run causing a smudgy appearance and eventually becomes very faint, despite the fact this is advertised as a waterproof ink! However the PermaDri ink proves to be very different giving a non fading image in both alcohol and formaldehyde based preserving fluids. This probably relates to the fact that this a pigment based ink. This thus allows computer generated labels to be produced for fluid collection specimens greatly improving the use of the curator or conservators time in collection based work.

Conclusion

Resistall paper would still be the preferred choice for fluid collection labelling. However if this paper does become unavailable then the Goatskin Parchment would be usable, especially with alcohol based fluid collections.

The Indelible ink is however unsuitable for use in fluid collection labelling although it will retain a readable image in alcoholic fluids (stability probably relates to the water content of the fluid). The PermaDri ink however has proved very satisfactory for used in fluid collection labelling and as a result can be recommended.

Note on deskjet refill systems

Both of the inks tested are available as refill packs for the inkjet cartridges. Despite manufacturers instructions this always seems to be a messy business so care is advised to prevent black fingers or splodges on your clothing! Problems can occur with the refilled cartridges depositing drops of ink on the paper. If this happens block the breather hole on the top of the cartridge with some sticky tape over the top. If the jets on the cartridge remain or become blocked then wiping carefully with a dilute detergent solution such as Decon 90 will help clear the jets.

References

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Suppliers

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UK Systematics Forum, Insect Collections Group

In *The Biology Curator*, No. 5 Mark Shaw described the recently formed group of collection managers of the major insect collections in the British Isles, which is operating under the auspices of the UK Systematics Forum. The group held its third meeting at the National Museum of Ireland, Dublin on 22nd March and some points of general interest are briefly summarised below.

Storage Systems. Insect cabinets of the design recently developed by the Natural History Museum, London have now been ordered by two other member collections of the group and they are being considered by other museums. Pending publication of more details of these metal, pest-proof cabinets anyone interested should contact Nigel Fergusson (0171 938 8919 or email ndmf@nhm.ac.uk) for more information. Drawer sizes regarded as standard and likely to be purchased in the future are being investigated with a view to developing common specifications and co-ordinating ordering.

Pest Control. The two-day courses on pest control in museums held at the NHM are now open to outsiders. Details from Phil Ackery (0171 938 9346 or email pra@nhm.ac.uk). The cost is £100.

Charging Policies. The group identified benefits of realistic standardised charges for commercial enquiries, etc. It is also clear that as a result of pressure from curators, particularly those in university and national museums, provision for 'bench fees' is now included in many research grant applications for projects involving collections. However, grant giving bodies varied considerably in their willingness to fund such expenses. An item for future discussion by the group is charging for certain kinds of loans.

Databases/checklists/the British fauna. Mark Shaw reported that his article in the January *Antenna* (The Royal Entomological Society's bulletin) had stimulated a good response. The RES has established a standing committee to identify the society's rôle and