



'Hydrogels in Conservation'

ADFAS (Arts National) Armidale mid-career scholarship 2024

Report

Author: Harpreet Tanday, Delta Conservation - Melbourne
Date: 15.03.2024

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Introduction

The present report shows the outcome of a three-day workshop titled 'Hydrogels in Conservation' taught by Conservation Scientist Mathew Cushman, and organised by Cesmar7 (Centro per lo Studio dei Materiali per il Restauro). The workshop took place in the city of Reggio Emilia, Italy, from the 28th to 30th of September 2023. This was made possible by the generous scholarship provided by the Australian ArtsNational, Patricia Robertson Fund.

Professional background

I am an Australia ICOMOS member, and a committee member of the ISCMP – International Scientific Committee on Mural Painting, representing Australia at an international level in the heritage conservation community. I have 15 years of working experience in the field across Italy, Switzerland, India and Australia (VIC, NSW), on sites and collections such as The Vatican Museums, Palazzo del Te and Palazzo Ducale in Mantua, churches in Switzerland, heritage sites in India, the Royal Exhibition Building in Melbourne, Keith Haring Mural in Collingwood, the Melbourne Arts Centre and on several murals and wall paintings around Melbourne. I have had the privilege to work on heritage listed and UNESCO – world heritage listed sites.

I am currently working as a mural, stone and built heritage conservator in Melbourne, where alongside my partner Peter Dellas, I have co-founded a private art conservation business, which is a collaboration between two interdisciplinary conservators with national and international portfolios. Peter Dellas is a Melbourne born and trained painting conservator with experience at the NGV and in private practice in Melbourne, Switzerland and India.

We specialise in the care and treatment of cultural heritage materials, with a particular focus on built heritage, historic decorated surfaces, murals, paintings, stucco and stone objects. Alongside hands-on work on the objects, we also provide consultancy services as well as documentation services such as photography, digitization and specialised examination of art and heritage materials. We also promote and take part in public engagement events on heritage materials, art history, and conservation through public presentations in Melbourne. We also promote active advocacy as part of national and international non-for-profit institutions active in the field of heritage preservation.

Scope behind the workshop

Melbourne is renowned for its active street art scenario, which attracts thousands of tourists every year. Given the cultural, social, and economic value of these mural paintings, where possible the local councils seek their conservation as they often get tagged. Our team is often called to perform cleaning treatment involving the selective removal of the new spray paints with complex formulation without damaging paint layers underneath, which is a challenge that we face in our daily conservation practice. The purpose behind attending this workshop was

to get to know new materials applied in conservation which would help me and my team to face these new and ongoing issues.

Description of the workshop

Mornings were dedicated to the theoretical lectures, and the afternoons to the preparation of all the different gels at different percentages, following different methodologies (Bain-marie, oven). A number of artworks such as oil paintings or tempera or paperwork covered in layers of dirt, varnish and other suit particles were provided by Cesmar⁷ research centre as mock up for the testing as well brought along by some participants. Each practical session was characterised by critical discussion on material behaviour and their performance over time.

Learning outcomes

These materials were also prepared and tested on some surfaces in our studio in Melbourne. This first use and experimentation showed some interesting properties needed in conservation, both as working properties as well as performance criteria over time.

Overall, the workshop provided me with the following notions on hydrogels:

- They can be used on a wide range of historical artworks: paintings, mural paintings, paperwork, wooden objects, plaster and stone surfaces, covering most of the surfaces that we work on.
- Some hydrogels are relatively expensive (Agarose), but some varieties (Xanthan gum, Agar-Agar, Curdlan) can be found locally therefore do not need international shipping.
- Depending on their different origin (polysaccharide, protein, synthetic), each gel comes with slightly different properties in terms of transparency, purity, preparation methodology, viscosity.
- Use in cleaning procedures as they are used as gelling media for solvents. It reduces solvent evaporation optimising solvent action of the surface; improves moisture retention as well as gradual action on a painted surface.
- Can be potentially used for salt extraction on porous materials such as historical plaster, brickwork, stone surfaces and metal surfaces.
- Easy preparation, application, removal and disposal
- Safe for conservators and for the environment

Conclusions

The opportunity to take part in the workshop has not only allowed me to get to know these new materials, but also to meet up with international conservators who faced similar issues to mine. Talking to them and sharing different methodologies has been priceless. At present, I am pleased to have expanded my professional network with colleagues from Italy, Germany, Belgium, and America. These connections afford a continuous exchange of ideas, as

brainstorming is something fundamental for a conservator in order to be always up to date and to provide the best conservation practice to our clients.

APPENDIX 1: Workshop & material use



Figure 1 Morning theoretical lecture on hydrogels, 28th September 2024. (Photo courtesy: H. M. Cushman.)



Figure 2 Preparation of hydrogels with lecturer M. Cushman. (Photo courtesy: H. Tandy)



Figure 3 Different types of gels used (gellan gum, gelatine). (Photo courtesy: H. Tandy)



Figure 4 New Nanorestore Gel: Peggy gum 6. (Photo courtesy: H. Tandy)



Figure 5 Hydrogel preparation methods: bain-marie, microwave, hand mixing. (Photo courtesy: H. Tandy)



Figure 6 Final appearance of hydrogels such as Borax gel and mixture of PVA/Agar/Borax. (Photo courtesy: H. Tandy)



Figure 7 Final appearance of hydrogels such as Agar-Agar, Gellan gum, pure Borax, and Konjac.
(Photo courtesy: H. Tandy)



Figure 8 Konjac with soft and spongy properties, ideal for soft cleaning of the surfaces. (Photo courtesy: H. Tandy)



Figure 9-11 Hydrogels application on wall painting fragments, oil painting on canvas, and paperwork.
(Photo courtesy: H. Tandy)