Changes in painting techniques at Nako – are there any?

A technical examination of artistic decoration from the Buddhist temple complex at Nako, North India.

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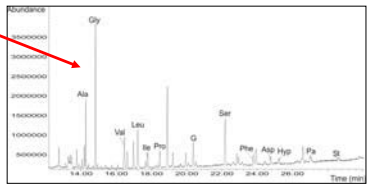
The Buddhist temple complex in Nako (North India, Western Himalaya) consists of four earthen temples originating probably from the same period – from the 11th to 12th centuries. Due to the beautiful interior decoration, comprising of polychrome clay sculptures, decorated wooden elements and wall paintings expressing the earliest Tibetan Buddhist artistic iconography, the complex has become one of the most important art works of its kind.

Material analyses were focused on the examination of earthen plaster, pigments, dyes, binding media, metals, layers´ stratigraphy

Methodology
Light microscopy in reflected and transmitted light, scanning electron microscopy with energy-dispersive X-ray analysis, X-ray diffraction, micro-Raman-spectrometry, microchemical tests, gas chromatography-mass spectrometry, high performance liquid chromatography, high performance liquid chromatography-mass spectrometry

Original wall paintings (late 11th/12th century) – Lotsawa Lhakhang, Lhakhang Gongma



TIC-chromatogram of the binding medium after hydrolysis

Lotsawa Lhakhang, north wall

Lotsawa Lhakhang, apsis, Infrared reflectography (IRR)

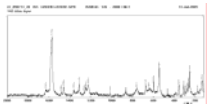
No substantial findings regarding underdrawings.
No visualisation of original layers under overpaintings.
Partial visualisation of the inscriptions that most probably belong to the oldest period of the decoration.

Support
Earthen structure from the unfired earthen bricks / Adobe held with earthen mortar (or without), thickness of walls approx. 60cm.
The support is very similar in all four temples.
Plaster
A two-layer plaster system with burnished surface: a coarser, several cm thick lower plaster and a finer upper c.1cm thin plaster layer. Both plasters consist of locally available soils known as Thawa and Tua admixed in variable ratios with added vegetal fibres of barley in different sizes. Tua, rich in clay and calcite is used as a "binder" for the sandy Thawa soil.
Ground
White gypsum ground bound with animal glue.
Paint layers
Pigments, dyes and extenders: azurite, indigo, lac, vermilion, red ochre, orpiment, gamboge, realgar, gypsum, calcite, carbon black.
Binding medium: bovine glue.
Metal applications
Gold, lead-tin alloy.

Secondary wall paintings (16th century) – Gyapagpa Lhakhang

Cross section of the secondary plaster (2) and secondary painting (3) with rests of the older paint layer (1)

Gyapagpa Lhakhang, east wall



Raman spectrum of indigo from the green layer on the west wall

Cross section of the secondary plaster and the paint layer containing malachite

Plaster
The secondary plaster is applied as a single very thin (c. 2mm) plaster layer with poorly burnished surface. The plaster is fine graded and consists of a mixture of the local soils Tua and Thawa in the ratio of 1:6; thin straw fibres cut in 6mm length were added.
Ground
White gypsum ground containing polysaccharides (still under investigation), in some places no ground at all.
Paint layers
Pigments, dyes and extenders: azurite, indigo, vermilion, red ochre, red dye, yellow ochre, gypsum, carbon black, charcoal black, malachite.
Binding medium: currently under investigation.
No metal applications.

Sculptures – Lhakhang Gongma

Lhakhang Gongma, east wall — Occurrence of the oldest gilding (marked with the white points)

The sculptures from the Lhakhang Gongma are today overworked and heavily overpainted. The primary goal of the study was to reveal the appearance and material composition of the oldest preserved polychromy and to characterise the clay support. The oldest preserved polychromy is based on the full-area gilding over the gypsum ground and thin size-layers of orpiment and vermilion. Two later remodelling phases were confirmed.

Sculptures – Lotsawa Lhakhang, apsis

Amoghasiddhi Ratnasambhava Vairocana Amitabha Aksobhya

Amoghasiddhi: today – green, the oldest body colour found – blue layer
Ratnasambhava: today – yellow, several older yellow layers as well as other colours
Vairocana: today – white, the oldest body „colour" – gilding
Amitabha: today – red, the oldest body colour found – red
Aksobhya: today – blue, the oldest layer body colour found is blue

The sculptures are overworked and overpainted. The oldest paintings were executed in different vivid colours. The artistic technique and materials used appear to be similar to those used in the original wall paintings.

Conclusions

- Locally available soils Thawa and Tua were used as earthen substrates for both original and later wall paintings and for the polychrome sculptures.
- The 16th century wall paintings in the Gyapagpa Lhakhang are much coarser than the originals with a limited accent to the detail. Colours are not bright and brilliant any more; warmer colours – earth-red, ochre shades and blue are dominating. No relief work, metal applications or dyes-based glazes are present.
- The oldest preserved surface decoration of nine sculptures from the Lhakhang Gongma is based on the full-area gilding.
- The oldest preserved polychromy of five sculptures from the Lotsawa Lhakhang shows that one statue was gilded, two were painted in characteristic colours, no conclusions about the remaining two might be done.

Acknowledgment
The financial support of the Austrian Science Fund (FWF-project No. L335-19) is gratefully acknowledged.
The authors wish to thank all institutions, colleagues and students without whom this work would not have been possible.