KING'S THRONE

Report of the Institute of Conservation (IoC), University of Applied Arts Vienna

Fig. 1: Overview of the King's Throne, 2018

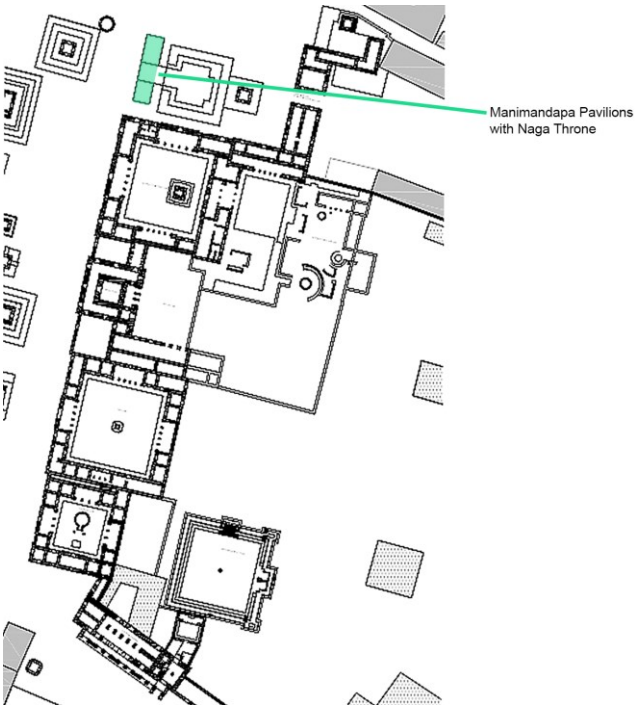

Fig. 2: Location within the Darbar Square

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Data Sheet

Description

The so-called King's Throne was originally located in one of the Manimandapa pavilions at the Patan Darbar Square. It is believed that the Throne dates back to the beginning of the 18th century.
The two mandapas mark the entrance to the steps leading to Manga Hiti. The Throne was probably erected in 1701 when the Bhimsen Temple and the two mandapas (rest places) were renovated by the order of King Yoganarendra Malla. While the South Manimandapa had been used as municipal weighing house, the North served as place for astrologers and priests for initiating festival dates, as coronation site for Patan's kings and as venue for general audiences for the people of Patan. The mandapas are today still a common meeting place and the King's Throne is regularly worshipped. During the earthquake in 2015 both pavilions collapsed. The Throne, which was buried under the debris, was damaged. Only shortly after the quake, parts of the throne were brought into the museum's courtyard to store them safely and prevent further damage.

Names	Naga Throne (IoC intern)	
Dated	1701 (North) South probably older	
Measurements (H x W x D)	Backrest	110 x 60 x 10 cm
	Backrest´s back	100 x 27 x 10 cm
	Seat	20 x 70 x 55 cm
	Base	25 x 70 x 20 cm
Materials/Technology	Stone, iron	
Interventions (IoC)	Survey	2015
	Mapping	-
	Sampling	-
	Analyses	-
	Conservation	2015-2016
	Maintenance	-
Team (IoC)	Gabriela Krist, Marija Milchin, Martina Haselberger	
Academic Research (IoC)	-	

Survey: Materials and Technology

- Composed of four different stone parts: the two-part backrest, a base to mount the backrest and the seat
- Base made out of local sediment stone [1], all other parts are made of calcitic schist [2]
- Backrest is basically a rectangular plate which is rounded at its top and a dowel formed end, which fits into the throne's base
- Backrest's front with an inscription in an old Newari dialect, framed by seven snakes (nagas) forming an interwoven structure and seven heads at the rounded top
- Front and back of the backrest are joined by an iron dowel inserted through rectangular holes in the middle of both parts
- Base made out of a rectangular block with a central rectangular slot, where the backrest's front is inserted
- Seat ornamented with relief decorations on three of four sides, whereas the front shows an ornamental decoration framed by two lions and the other two sides bear a simple motive; all unornamented surfaces are polished

Fig. 3: Front of the backrest, 2015

Fig. 4: Back of the backrest, 2015

Fig. 5: Seat and base in mandapa, 2015

Fig. 6: Dismantled base of the throne, 2016

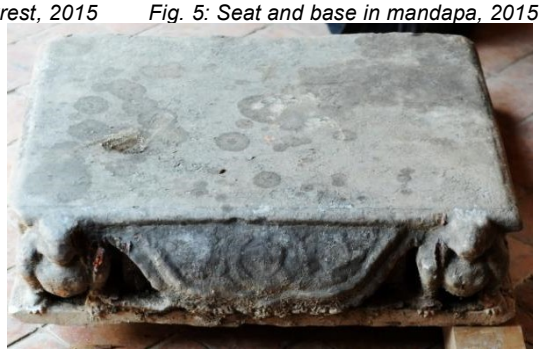


Fig. 7: Dismantled seat of the throne, 2016

Previous (Conservation) Interventions

1975	Minor repairs at the occasion of the coronation of King Birendra; old timber flooring replaced with stone slabs after the filling of the plinth with rubble
2010	Repair of the plinth during renovation of walls of Manga Hiti (Kathmandu Valley Preservation Trust. 2016. *Nepal Patan Darbar. Earthquake Response Campaign.* N.p.: Kathmandu Valley Preservation Trust)

Survey: Condition and Causes of Decay (2015-16)

- Due to the collapse of the mandapa in 2015, formerly housing the King's Throne, the object suffered damage
- Back of the backrest broke, whereby the fracture runs horizontally through the rectangular hole
- At the base a piece broke apart, probably due to the strong movement of the backrest during the earthquake
- All stone surface (especially at the inscription and detail carvings) covered with layers of ritual offerings (ghee, tikka paste, etc), dust and dirt deposits

Fig.8: Backrest's front covered with layers of dirt, 2015

Fig. 9: Seat covered with layers of dirt, 2016

Fig. 10: Broken part at the base element, 2016

Conservation (IoC)

- Transfer of backrest (2015) and dismantling of the of the base and seat (2016, done by the KVPT)
- Mechanical removing of thick layers of dirt and worshipping residues with scalpel and spatulas
- Remaining thin layers on the stone surfaces were reduced by using chemical agents, as ethanol and a weak solution of tenside (dish detergent) in water in addition to cotton swabs and brushes;
- Final cleaning with pure water (rain or drinking water)
- Re-adhering of broken back of backrest; two holes were drilled vertically into the upper and lower part; carbon fibre pins were then glued to both sides with an epoxy resin (Akepox 2020); additionally, dashes of epoxy resin were applied to the fractured surface
- Re-adhering the broken part of the base; reinforcements with carbon fibre pins glued with epoxy resin (Akepox 2020®)
- Pointing the joint of the fractured base with mortar

Conservation Materials* and Recipes used:
- Akepox 2020 (Akemi)
- Carbon fibre rod

Mortar: 2 vol. parts lime : ½ vol. part cement : 6 vol. part sand : ½ vol. part pigment
- slaked lime
- grey cement
- local sand
- ochre pigment

* Product / technical data sheets can be found in the supplement [A]

Fig. 11: Dismantling of all parts, 2016

Fig. 12: Mechanical removal, 2016

Fig. 13: Applying of ethanol with cotton balls, 2016

Fig. 14: Final cleaning with scalpel, 2016

Fig. 15: Partly uncovered floral motif (right), 2015

Fig. 16: Interim state, half cleaned (left), 2015

Fig. 17: Drilling holes for carbon fibre pins, 2016

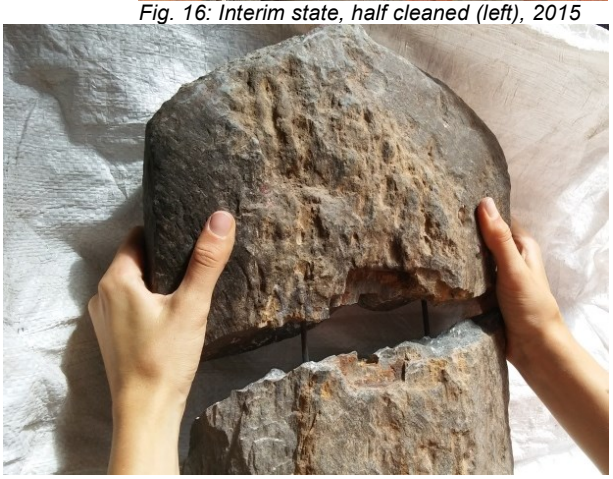


Fig. 18: Carbon fibre pins fixed with epoxy resin, 2016

Fig. 19: Pointing the joint of the fracture with mortar, 2016

Before and after Conservation

Fig. 20: Throne before conservation 2015

Fig. 21: Throne after conservation, 2016

Fig. 22: Front of seat after cleaning, 2016

Fig. 23: Side-view of seat after cleaning, 2016

Fig. 24: Base after conservation, 2016

Fig. 25: Back part of backrest after conservation, 2016

List of Publications / Reports (IoC)

Krist, Gabriela, Milchin, Marija and Martina Haselberger. 2016. "The Durbar Square and the Royal Palace of Patan, Nepal – Stone Conservation before and after the Great Earthquake of April 2015." *In Science and Art: A Future for Stone: Proceedings of the 13th International Congress on the Deterioration and Conservation of Stone*, Volume II, edited by John Hughes and Torsten Howind, 1171-1180. Paisley: University of the West of Scotland.

Supplements

[A] All product / technical data sheets can be found in this additional document.

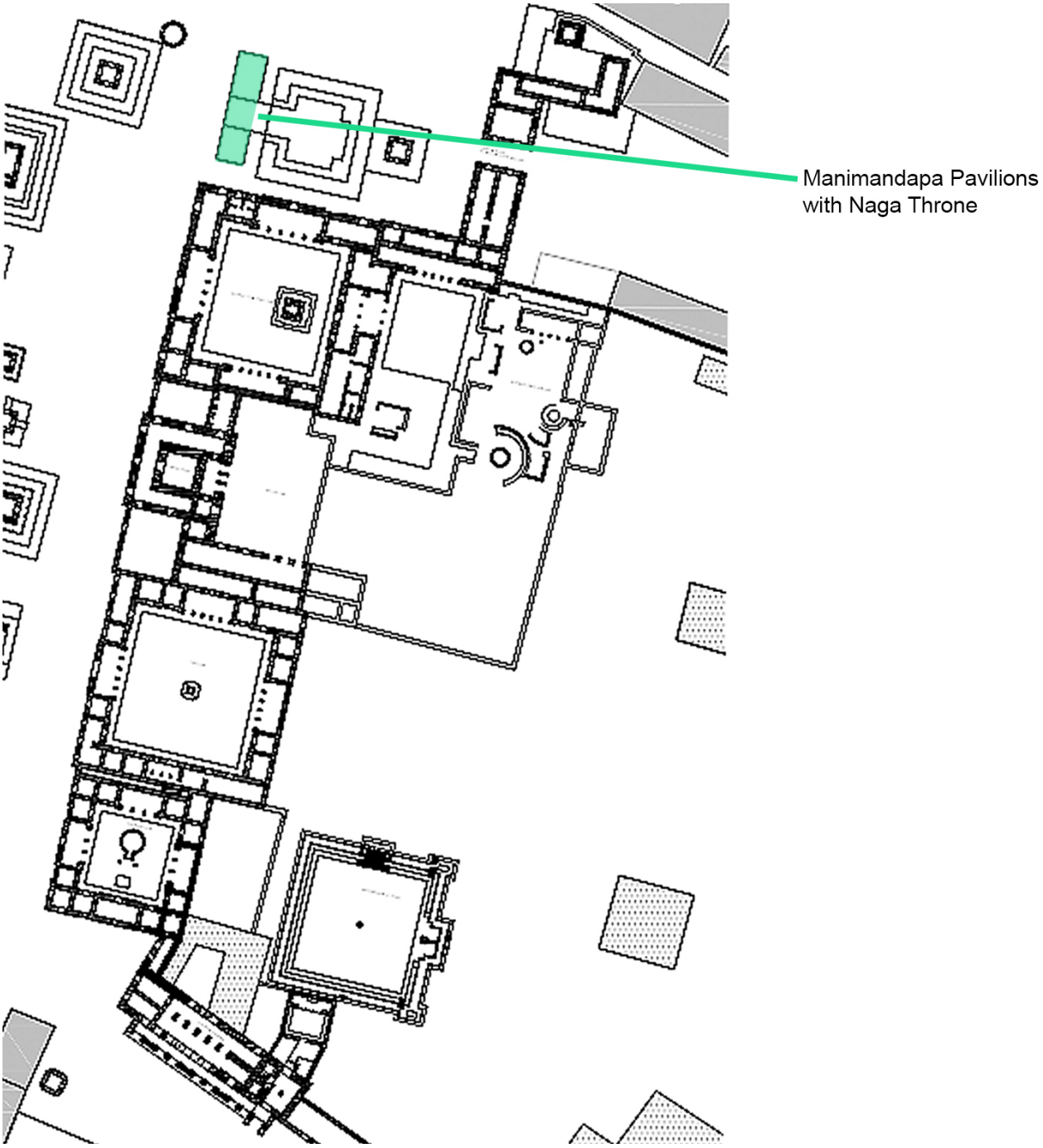
[1] Detailed material characterisation - sandstone

[2] Detailed material characterisation - calcitic schist

Photo Credits

Unless otherwise stated, all photographs © Institute of Conservation, University of Applied Arts Vienna

GENERAL INFORMATION		
Monument King's Throne (Naga Throne)	**Orientation** -	**Size (H x L x W)** 675 x 688 cm
Date of Production Ca. 1700, partially before		**Location** Manimandapa Pavilions
Date of the last Treatment Conservation 2015-2016		**Institutions of the last Treatment** IoC



Condition Assessment		
Date of Evaluation May 2024		**Evaluation done by** Martina Haselberger Sarah Moyschewitz
Recent Damages:		
☐ Stability Problems ☒Not detected	☐ Major ☐ Medium ☐ Minor	
Comment:		
☐Broken / - into several Pieces ☒Not detected	☐ Many ☐ Some ☐ Few	
Comment:		
☐ Lose / Missing Parts ☒Not detected	☐ Many ☐ Some ☐ Few	
Comment:		
☐ Joints ☒Not detected	☐ Open ☐ Cracked	☐ Many ☐ Some ☐ Few ☐ Many ☐ Some ☐ Few
Comment:		
☐Scaling, Sanding or Powdering ☒Not detected	☐ Major ☐ Medium ☐ Minor	
Comment:		
☐ Biological Colonization ☒Not detected	☐ Microbiological Growth	☐ Major ☐Medium

		☐ Minor
	☐ Mosses	☐ Major
		☐Medium
		☐ Minor
	☐ Higher Plants	☐ Major
		☐Medium
		☐ Minor
Comment:		
☐ Mechanical Damage ☒Not detected	☐ Abrasion	☐ Major
		☐Medium
		☐ Minor
	☐ Other	☐ Major
		☐Medium
		☐ Minor
Comment:		
☐ Salt Deterioration ☒Not detected	☐ Efflorescence	☐ Major
		☐Medium
		☐ Minor
	☐ Subflorescense	☐ Major
		☐Medium
		☐ Minor
Comment:		
☒Soiling ☐Not detected	☒ Heavy	Tikka, pigeon droppings, oil, greasy substances and dust.
	☐ Medium	
	☐ Light	
Comment:		
☐ Other	Comment:	

Evaluation of the Condition

☐ good (no need for treatment)

☒ satisfactory (some minor treatments necessary)

☐ unsatisfactory (major conservation measures necessary)

Conclusion

All surfaces have been found heavily soiled, but the inscription is still readable, also the fine carvings around the inscription.

The Heads of snakes show a thicker soiling layer, the front part of the seat was also covered with a thicker soiling layer.

The roof construction of Manimandapa allow pigeons to perch; in contrast, the other manimandapa has no horizontal beams why less soiling through pigeons is present.

The Manimandapa is highly frequented by locals as a resting area and for social interaction (chatting, etc).

PHOTO DOCUMENTATION

Condition at Evaluation Date

Fig. 1: Kings throne, front, condition 2024.

Fig. 2: Kings throne, back, condition 2024.

[A] Product Data Sheets – Links[1] to Suppliers/Manufacturers

AEROSIL® 200
https://products.evonik.com/assets/or/ld/AEROSIL_200_TDS_DE_DE_TDS_PV_52043839_de_DE_WORLD.pdf

Aviva Silikat Grundierung
https://www.adler-lacke.com/Canto/tmb/aviva-silikat-grundierung_tmb_4079_de.pdfA
Alkylbenzyldimethylammonium chloride
https://www.sigmaaldrich.com/AT/en/sds/mm/8.14858?userType=anonymous

Klucel™ EF
https://www.kremer-pigmente.com/elements/resources/products/files/63701-63713.pdf

Aviva Tirokat-Color, Adler
https://www.adler-lacke.com/Canto/tmb/aviva-tirokat-color_tmb_4087_de.pdf

Mixtion Le Franc, Kremer
https://shop.kremerpigments.com/elements/resources/products/files/98000e.pdf

Waxes, Deffner und Johann
https://deffner-johann.de/media/datasheets/4186000/EN/Zusatzinformation_Wachse_DE_DJ.PDF

Injection mortar HFX
https://productdata.hilti.com/APQ_HC_RAW/ASSET_DOC_7567931.pdf

Kölner Classic Ölmixtion 3h; 12h; 24h
https://www.kolner-vergolderprodukte.de/produkte/koelner-oelmixtion/

KSE 500 E
https://media.remmers.com/celum/export/documents/Remmers_0715_KSE-500-E-_Technisches-Merkblatt_de_DE_26355.pdf

Lascaux 498 20 X acrylic adhesive
https://deffner-johann.de/media/datasheets/2051100/DE/2051100_Technisches%20Datenblatt_Lascaux%20Acrylkleber%20498%2020%20X_DE_DJ.pdf

Marble dust
https://www.kremer-pigmente.com/elements/resources/products/files/58500-58580_59001-59690.pdf

Natural hydraulic lime
https://www.preservationworks.us/wp-content/uploads/2019/10/NHL-Datasheet-Lafarge-23.5.pdf

Plextol B-500 (acrylic dispersion)
https://deffner-johann.de/media/datasheets/2556500/DE/2556500_Technical%20Data%20Sheet_Acrylic%20Dispersion%20B%20500_EN_DJ.pdf

Primal® SF 016
https://deffner-johann.de/media/datasheets/2543001/DE/2543001_Technical_Data_Sheet_Primal_SF_016_DJ_EN.pdf

AKEPOX® 2010
https://data.akemi.de/fileadmin/user_upload/products/productdocuments/TMB/Akepox_2010_TMB_D.pdf

[1] All links were last accessed on 13 May 2025.

EPO-TEK® 301-1
https://www.epotek.com/docs/en/Datasheet/301-1.pdf

Titebond Wood Glue
http://sds.franklini.com/msds/1411.042k0nmo0020.pdf

Paraloid™ B-72, Kremer
https://www.kremer-pigmente.com/elements/resources/products/files/67400-67409.pdf

Keim Granital®
https://www.keim.com/documents/de-AT/723/TM_Granital_DE-AT.pdf

[2]“Calcitic schist”

Description of visual characteristics	- light grey to almost black colour - occasional white inclusions with reddish center - characteristic schist surface with homogeneous foliation and inclusions
Samples taken (sample name and origin)	- **KAT1** (Leiner 2010), Bhandarkhal Tank Pavilion Base (upper covering) (Fig. 3, 4) - **P06, P07** (Kaipf 2017), Yoganarendra Pillar (Fig. 5–16) - **NEP_ST_1** (Haselberger/Fuchs 2023), loose material around Royal Garden workshop (Fig. 17–22) Cross and thin sections of the samples were prepared and examined with light microscopy and SEM. **Sources**: Leiner, Susanne. 2010. “Der Pavillon am Bhandarkhal-Tank. Palastkomplex Patan, Nepal.” Pre-thesis, University of Applied Arts Vienna. Kaipf, Luis. 2017. “The Pillar of Yoganarendra Malla. Condition Survey, Conservation Treatment and Re-erection.” Pre-thesis, University of Applied Arts Vienna. Johannes Weber, Katharina Fuchs, Martina Haselberger. 2023. Scientific investigation of the stone sample NEP_ST_1 from Patan Royal Garden Workshop. Unpublished report, Institute of Conservation, University of Applied Arts Vienna.
Petrographic/geological characterization	- weakly metamorphic schist, predominantly calcareous - high concentration of silicates arranged in foliations, surrounded by a very fine-grained siliceous marble - homogenous matrix and slight banding - average grain size of major calcite crystals between 0.03–0.05 mm; 0.05–0.25mm for silicate crystals - minor components of Phlogopite mica (grain size 0.1–0.2mm) - grain borders linear or curved - analyzed sample displays shear zone of ore minerals or graphite
Pyhsical properties	- relatively dense and heavy material - almost no water absorption
Damage patterns	- (hair) cracks and loss of material due to mechanical stress – probably stone intrinsic due to metamorphosis - almost no water related damage
	Scientifically confirmed: - Pillar Yoganarendra Malla - Bhandarkhal Tank Pavilion Base (upper covering)

Use at Patan Darbar Square:	By visual inspection only: - Lion Pillar - Garuda Pillar - Harishankara Temple Base (cornerstones with lion protomes, inner threshold) - Kings Throne - Stone Gates (inner profile) - Tusha Hiti - Visveshvara Temple Base (cornerstones with lion protomes, inner threshold)
Probable origin of material:	- Probably mined in the Kathmandu Valley – the alluvium filled Kathmandu Valley is bordered by a sequence of unmetamorphosed to slightly metamorphosed sedimentary rock in the east, south and west - Most probably from the southern part of the Kathmandu Valley, according to the geological map (Himalayan Maphouse [Ed.] Comprehensive Geological Map, GL701), possibly associated with the Chandragiri Formation. - According to the map, the stone from the Chandragiri Formation is defined as following: *"light fine grained crystalline limestones partly siliceaus thick to massively bedded white quartzites in upper parts. Wavy limestones contain late ordovician schinoderms."*

Fig. 1: Upper stone covering of Bhandarkhal Tank Pavilion Base, © IoC, 2010.

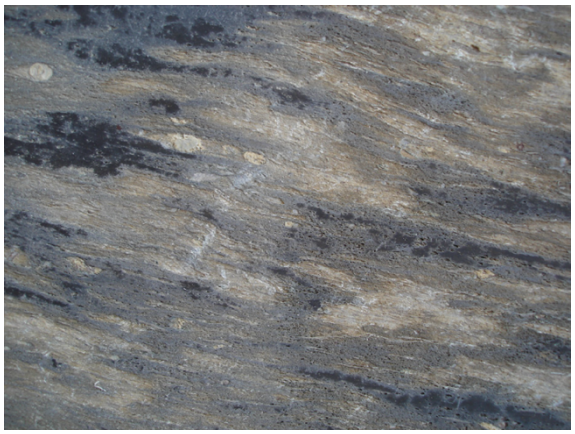


Fig. 2: Visual inspection of stone from Yoganarendra Malla Pillar, © IoC, Kaipf, 2017.

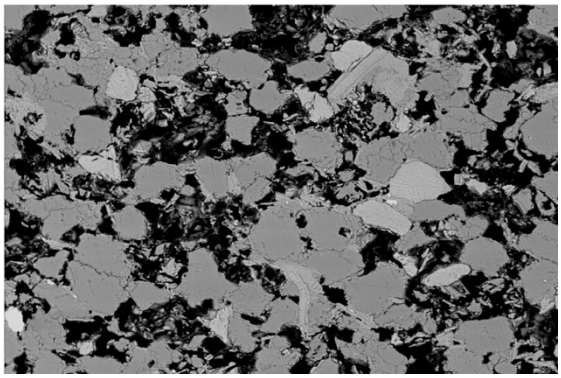


Fig. 3: Sample KAT1BS1, thin Section, SEM BSE.

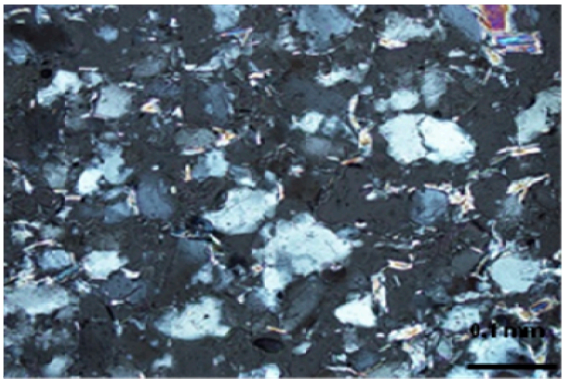


Fig. 4: Sample KAT1, thin section, optical microscopy, x200.

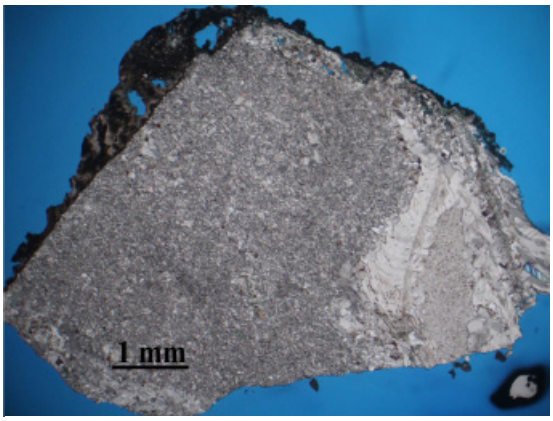


Fig. 5: Sample P06, thin section, optical microscopy, x24.

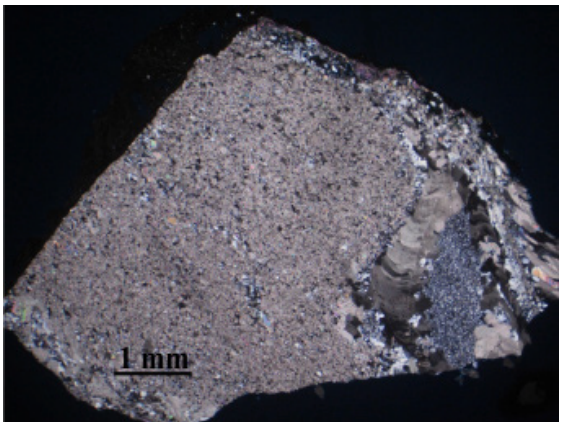


Fig. 6: Sample P06, thin section, optical microscopy, x24.

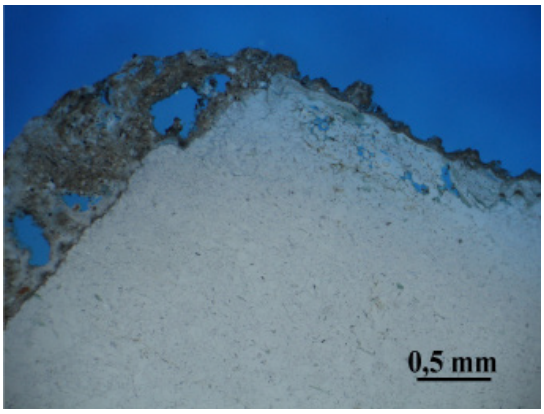


Fig. 7: Sample P06, thin section, optical microscopy, x48.

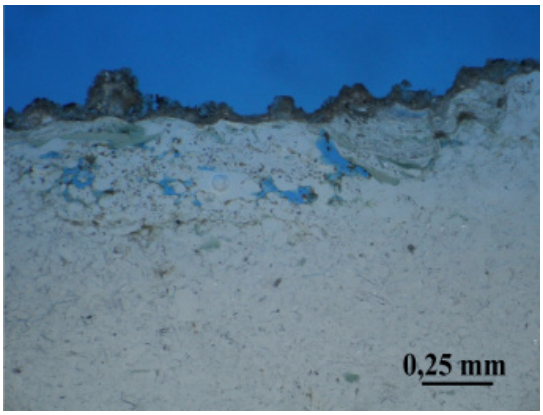


Fig. 8: Sample P06, thin section, optical microscopy, x48.

Fig. 9: Sample P07 taken in 2016, Lotus ring, Pillar of Yoganarendra Malla, Kaipf 2017.

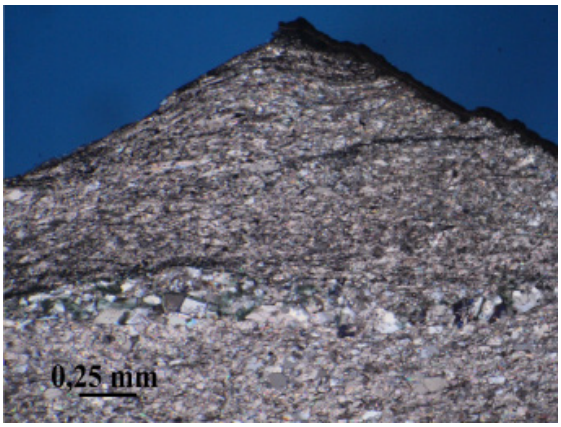


Fig. 10: Sample P07, thin section, x72. Fabric with relatively homogenous matrix and slightly developed banding.

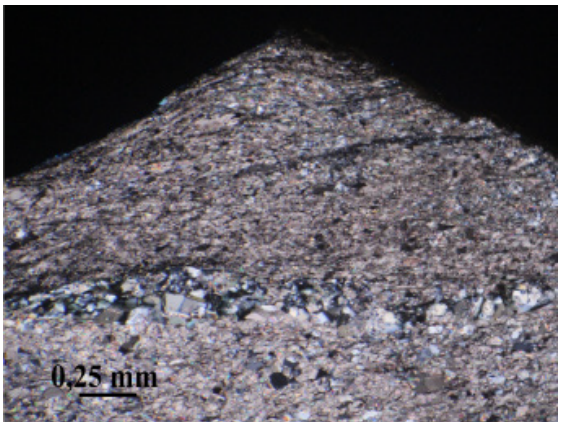


Fig. 11: Sample P07, thin section, x72.

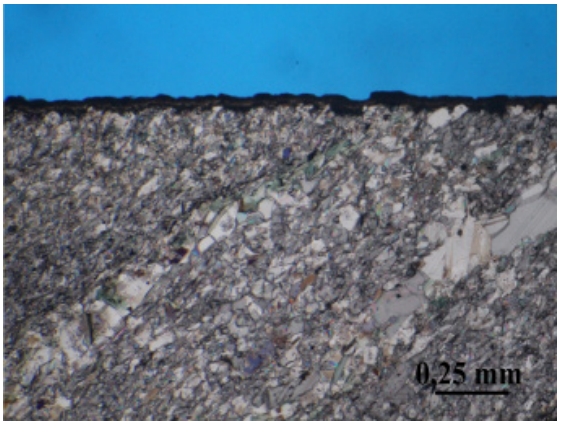


Fig. 12: Sample P07, thin section, x90.

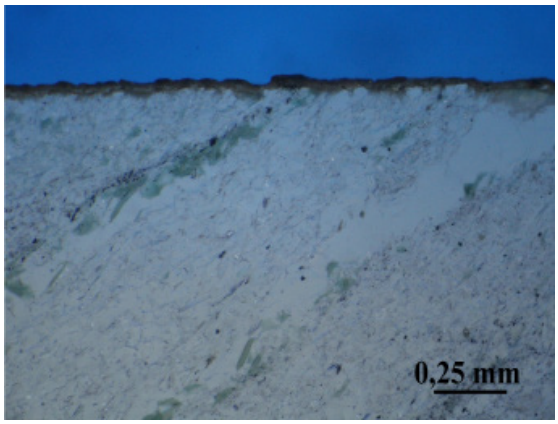


Fig. 13: Sample P07. thin section, x90.

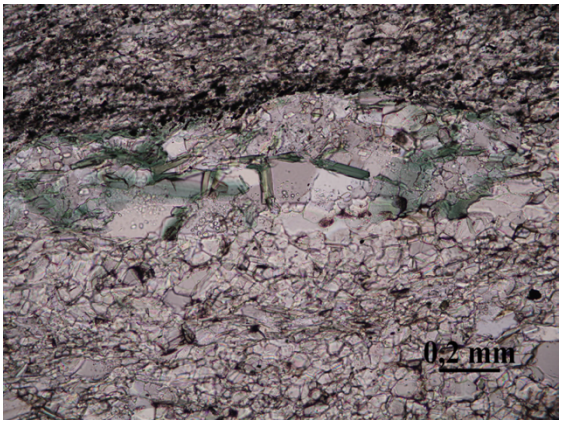


Fig. 14: Sample P07, thin section, x100; Phlogopite.

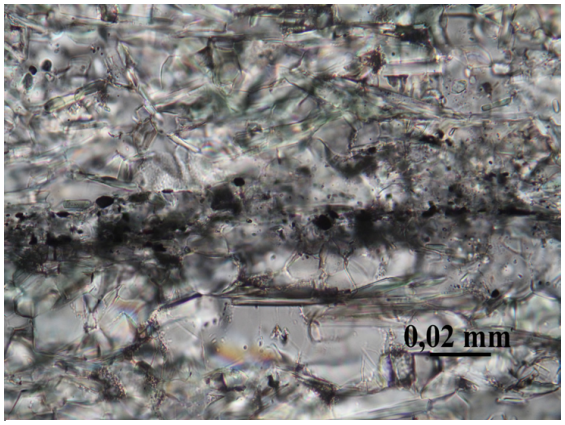


Fig. 15: Sample P07, thin section, x1000; Shear zone.

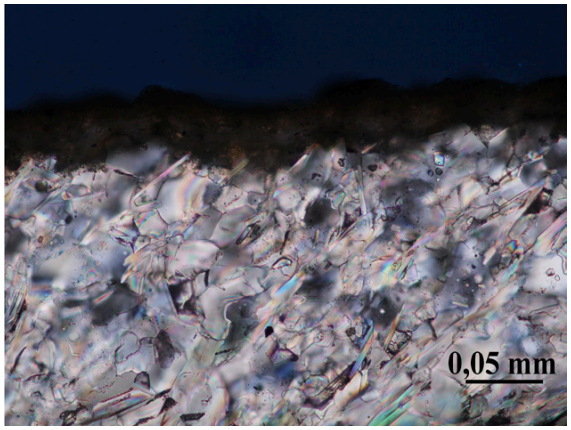


Fig. 16: Sample P07, thin section, x500. Equigranular grain aggregate with mainly polygonal grain forms.

Fig. 17: Sample NEP_ST_1.

Fig. 18: Sample NEP_ST_1.

Fig. 19: Sample NEP_ST_1, Nikon SMZ 500, transmitted light, crossed polarizers. Overview of the rock matrix with coarser and finer layers.

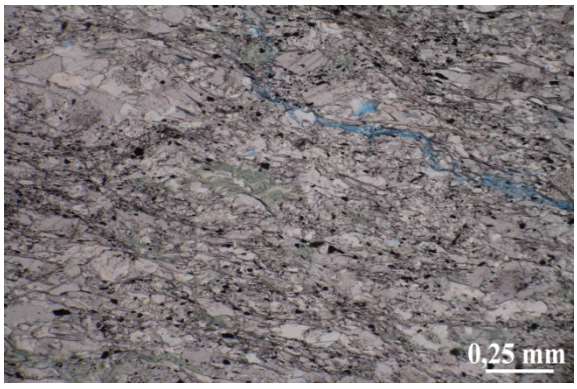


Fig. 20: Sample NEP_ST_1, Nikon SMZ 500, transmitted light, parallel polarizers. Detailed view of the matrix.

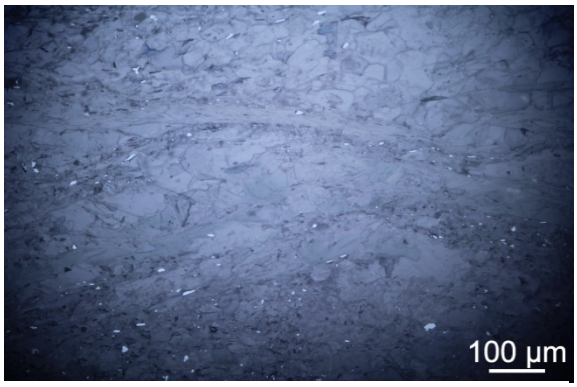


Fig. 21: Sample NEP_ST_1, Olympus BX40, incident light, bright field. Overview of mica inclusions (whitish spots).

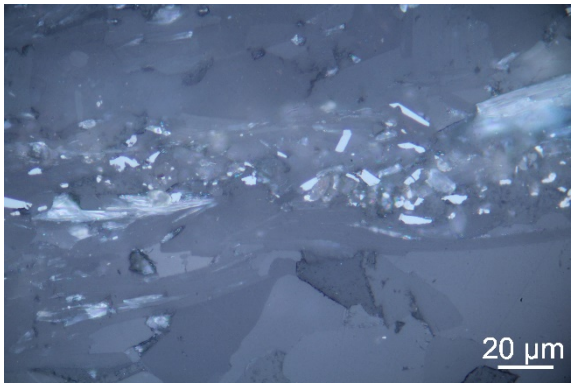


Fig. 22: Sample NEP_ST_1, Olympus BX40, incident light, bright field. Detail of a fine layer with mica flakes.