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| NUMBER OF PARTNER: | P3 Cesmar7, P4 An.t.a.res srl |
| TYPE OF WORK: | Mural painting |
| COUNTRY: | Italy |
| CITY: | Milan |
| ADDRESS: | Via Giulio Cesare Procaccini, 4 |
| OWNER / CUSTODIAN: | Fabbrica del Vapore, Municipality of Milan |
| ARTIST: | Ivan, Nais, Orticanoodles, Pao |
| TITLE OF THE WORK: | Ubuntu (Mandela) |
| YEAR OF EXECUTION: | 2014 |
| MATERIALS: | Housepaint acrylic (Sikkens) and spray (Montana) |

| | Name of the sample | Original materials | No original materials | Pigments / dyes | | Organic binders | | Type of support* | | Other** | |
|---|--------------------|--------------------|-----------------------|------------------------|---------|------------------------|---------|------------------------|---------|------------------------|--|
| | | | | Identification methods | Results |
| 1 | 1 M | X | | | | | | | | Stereomicroscopy | Stratigraphy: a.White-grey plaster b.Brown ground layer; c.Grey primer ; d.Black paint layer |
| 2 | 2 M | X | | | | | | | | Stereomicroscopy | Stratigraphy: a.Brown plaster of the support; b.White-grey plaster of the support; |

| | | | | | | | | | | | |
|---|-----|---|--|--|---|----------|--|---|--|------------------|---|
| | | | | | | | | | | | c.Light brown-grey ground layer; d.Grey primer; e.Thin black paint layer; f.White paint layer; |
| 3 | 3 M | X | | | | | | | | Stereomicroscopy | Stratigraphy: a.Brown plaster of the support; b.White-grey plaster of the support ; c.brown-grey ground layer; d. chromatically altered pink-brownish paint layer |
| 4 | 4 M | X | | | | | | | | Stereomicroscopy | Stratigraphy: a.White-grey plaster of the support; b. brown-grey ground layer; c.Grey primer; d.Red-brownish paint layer; |
| 5 | 5 M | X | | μ - Raman Spectroscopy on the cross-section sample | Yellow azo pigment PY 74, Hostasol Green, Calcite | FTIR-ATR | a styrene modified alkyd resin (green) alkyd resin (yellow) | - | | | |

| | | | | | | | | | | | |
|---|------|---|--|--|--|--------------|--|--|--|---|---|
| 6 | 6 M | X | | | | | | | | Stereomicroscope | Stratigraphy: a.Plaster of the support ; b.Light brown-grey ground layer; c.Red paint layer; |
| 7 | 9 M | X | | | | Py- GC/MS | Styrene- Acrylic resin PVAc- VeOVA | | | Optical microscopy on the cross-section sample | stratigraphy: a.Plaster of the support ; b.Light brown-grey ground layer; c.Yellow paint layer (prime coating); d.Orange paint layer d.Very thin whitish patina |
| 8 | 10 M | X | | | | | | | | Optical microscopy on the cross-section sample | Stratigraphy: a.Plaster of the support ; b.Light brown-grey ground layer; c.Yellow paint layer (prime coating); d.Orange paint layer d.Very thin whitish patina |

* mortars, stone, metal ect.

** Additional research or analyzes, for example: aging tests, colorimetry, pH...

Sample 1 M was collected along a lacuna in a black area painted by brush (**fig.1**). Artist Ivan. The study of the 1 sample has shown the following structure (**fig.2**):

- a)* White-grey plaster of the support at low quality;
- b)* Brown ground layer;
- c)* Grey paint layer (prime coating);
- d)* Black paint layer; the surface appears porous, scabrous and matt.

Sample 2 M was collected along a lacuna in a white area painted by spray (**fig.1**).

The study of the 2 sample has shown the following structure (**fig.3**):

- a)* Brown plaster of the support, fine particles;
- b)* White-grey plaster of the support at low quality;
- c)* Light brown-grey ground layer;
- d)* Grey paint layer (prime coating);
- e)* Thin black paint layer;
- f)* White paint layer; the surface appears porous due to spray technique, flat and matt.

Sample 3 M was collected along a lacuna in a brownish area painted by brush (**fig.1**).

The study of the 3 sample has shown the following structure (**fig.4**):

- a)* Brown plaster of the support, fine particles;
- b)* White-grey plaster of the support at low quality;
- c)* Light brown-grey ground layer;
- d)* Pink-brownish paint layer orange former; the surface appears matt, scabrous and grains belonging to the support have been observed.

Sample 4 M was collected along a lacuna in a brown-red area painted by brush (**fig.1**). Artist Ivan,

The study of the 4 sample has shown the following structure (**fig.5**):

- a)* White-grey plaster of the support at low quality;
- b)* Light brown-grey ground layer;
- c)* Grey paint layer (prime coating);
- d)* Red-brownish paint layer; the surface appears matt, scabrous and a sort of white patina has been observed.

Sample 5 M was collected along a lacuna in a green area spray painted (**fig.1**) by Nais.

The study of the 5 sample has shown the following structure and composition (**fig.6**):

- a)* Plaster of the support > 600 μ m thick;

- b)* Light brown-grey ground layer, irregular thickness of about 200 μm ;
- c)* White paint layer (prime coating) composed of Calcite from preliminary Raman data. Regular feature, irregular thickness, average thickness of 50 μm ;
- d)* Yellow paint layer containing azo pigment PY74 and a binding medium quite similar to that found in the layer *e*. Regular feature, average thickness of 50 μm ;
- e)* Green paint layer containing Hostasol Green and a styrene modified alkyd resin (to be confirmed) and Calcite. Regular feature, average thickness of 25 μm ;
- f)* Traces of a yellow thin layer < 10 μm thick.

Sample 6 M was collected along a lacuna in a chromatically altered red area spray paint (**fig.1**).

The study of the 6 sample has shown the following structure (**fig.7**):

- a)* Plaster of the support ;
- b)* Light brown-grey ground layer;
- c)* White paint layer (prime coating);
- d)* Red paint layer with porous surface, cracking, black particles and small white stains. Fading phenomenon has been observed on the top of the sample.

Sample 9 M was collected from a purple area (dark orange former) of Mandela's face applied by brush (**fig.1**).

The study of the 9 sample has shown the following structure (**fig.8**):

- a)* Plaster of the support ;
- b)* Light brown-grey ground layer;
- c)* Yellow paint layer (prime coating);
- d)* Orange paint layer

Very thin whitish patina that causes superficial purple and matt color. Py-GC-MS confirmed the presence of Styrene-Acrylic resin and PVAc-VeoVA

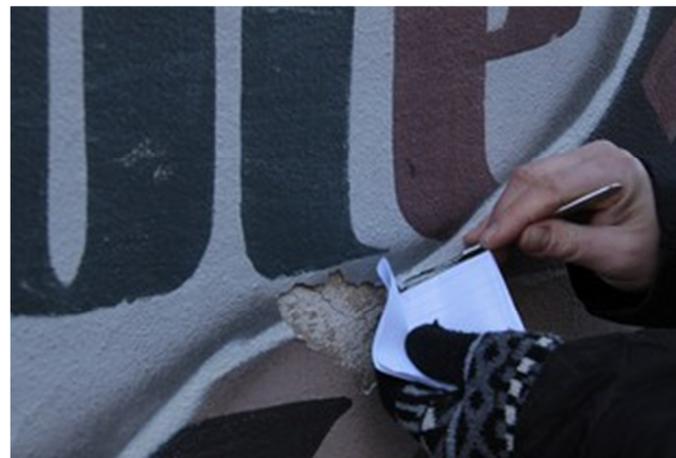
Sample 10 M was collected from a purple paint layer applied by brush (dark orange former), covered with a very thin orange paint layer, of Mandela's face (**fig.1**).

The study of the 10 sample has shown the following structure (**fig. 9-10**):

- a)* Plaster of the support > 500 μm thick;
- b)* Light brown-grey ground layer, irregular thickness up to 250 μm ;
- g)* Yellow paint layer (prime coating). Regular feature, average thickness of 30 μm ;
- c)* Orange paint layer. Irregular feature, average thickness of 50 μm ;
- d)* Very thin (5 μm) grey-whitish layer (color less, a sort of patina) at regular thickness; this layer causes superficial purple and matt color.



“ Ubuntu (Mandela) ” – sample 1 M- after sampling



“ Ubuntu (Mandela) ” – sample 2 M- during sampling



“ Ubuntu (Mandela) ” – sample 3 M- during sampling



“ Ubuntu (Mandela) ” – sample 4 M- before sampling



“ Ubuntu (Mandela)” – sample 5 M– before sampling



“ Ubuntu (Mandela)” – sample 6 M– before sampling



“ Ubuntu (Mandela)” – sample 9 M e 10 M – points of sampling



“ Ubuntu (Mandela) ” side M sampling

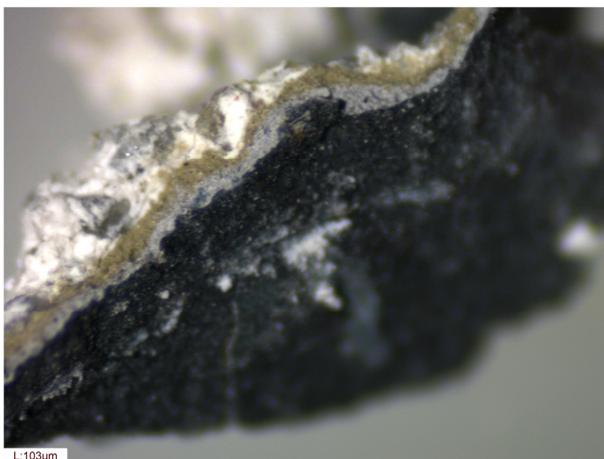


Fig.2 "Ubuntu" – sample 1 M– reflected Visible light –SM- magnification 40 x



Fig.3 "Ubuntu" – sample 2 M – reflected Visible light –SM- magnification 20 x

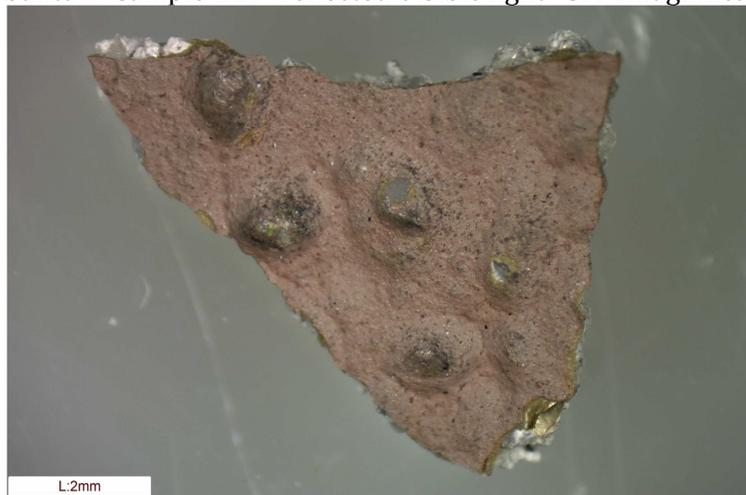


Fig.4 "Ubuntu" – sample 3 M – reflected Visible light –SM- magnification 10 x

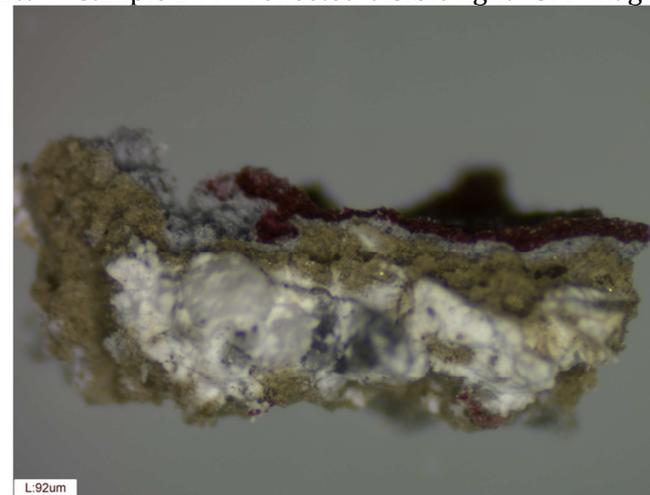


Fig.5 "Ubuntu" – sample 4 M – reflected Visible light –SM- magnification 40x (right, support)

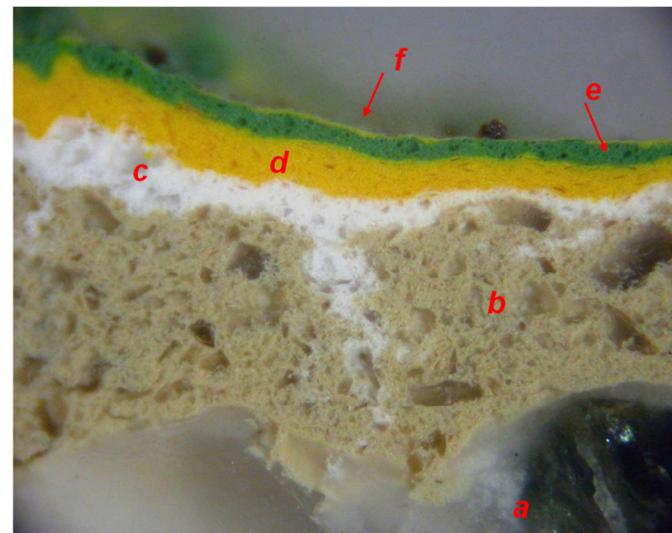
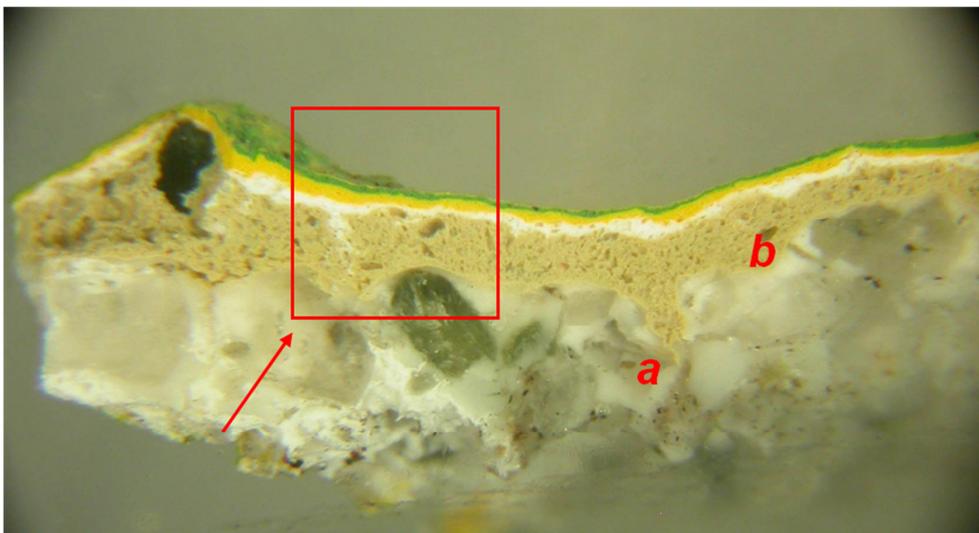


Fig.6 "Ubuntu" – sample 5M – cross section – reflected Visible light – magnification 40 x (left) and 180 x (right)

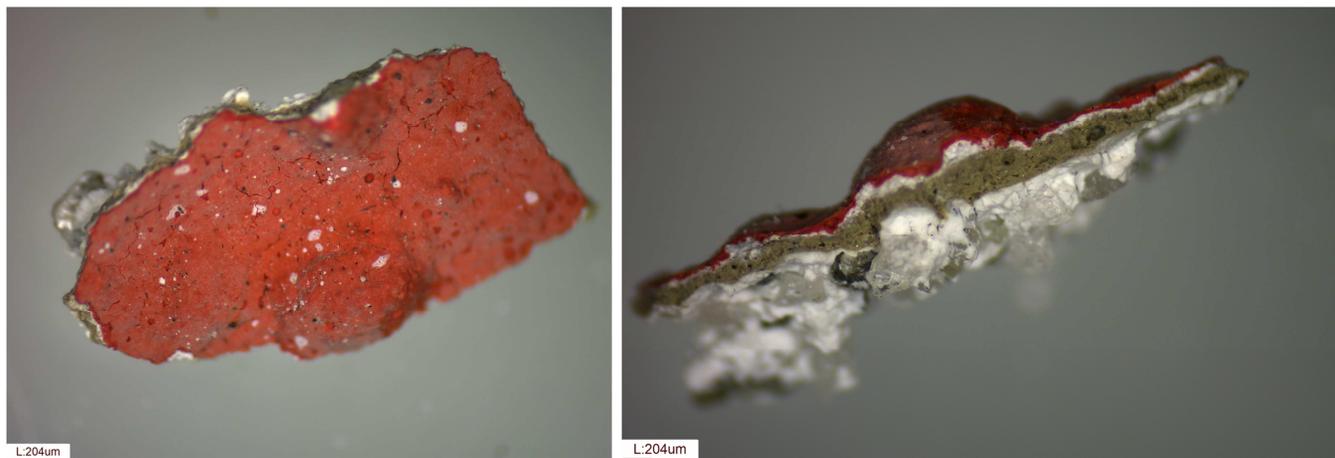


Fig.7 "Ubuntu" – sample 6 M – reflected Visible light –SM- magnification 20 x

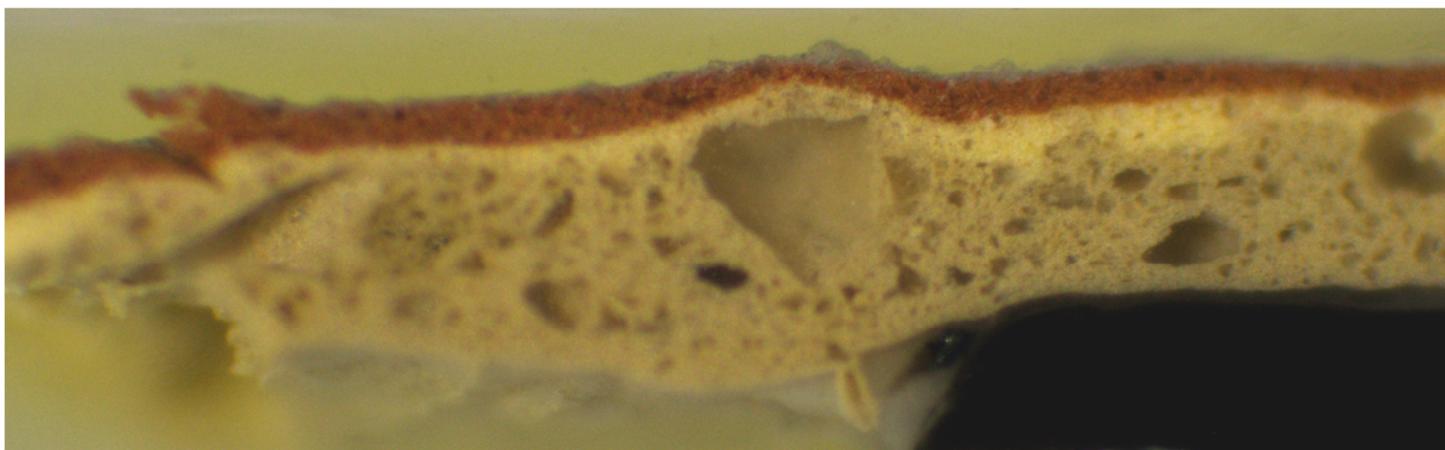


Fig.8 "Ubuntu" – sample 9 M – reflected Visible light –OM- magnification 100 x

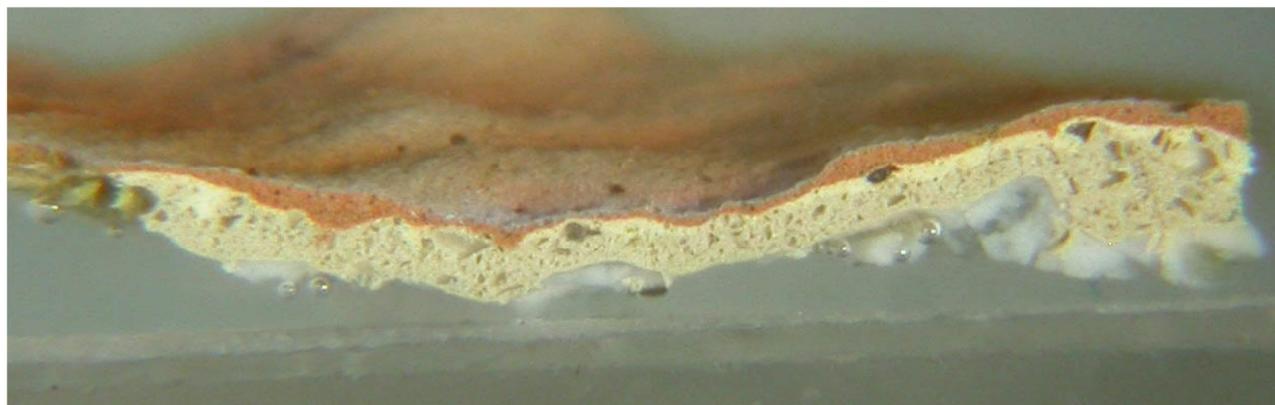


Fig.9 "Ubuntu" – sample 10 M – reflected Visible light –OM- magnification 40 x

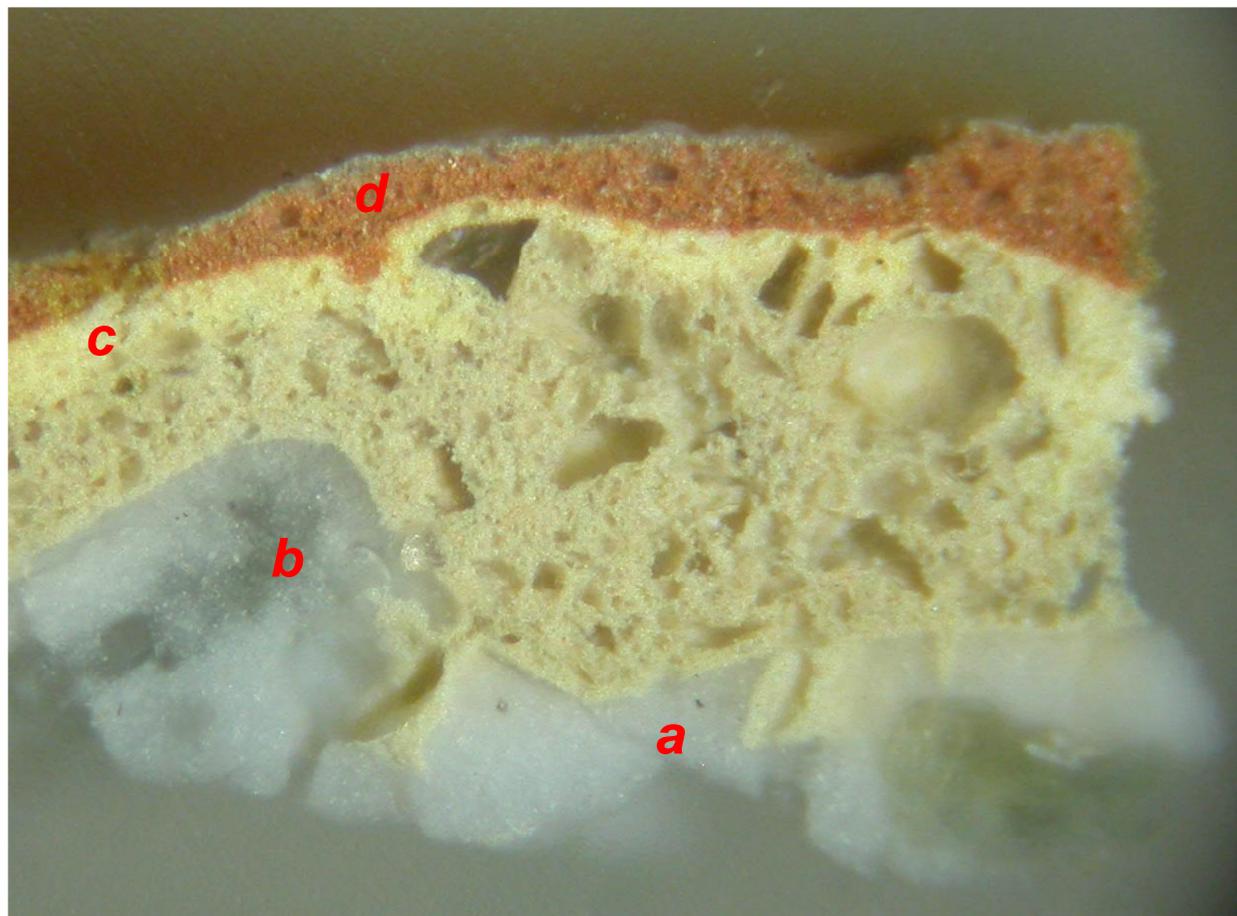


Fig.10 "Ubuntu" - sample 10 M - reflected Visible light -OM- magnification 170 x



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