

Supplementary materials for the paper
RESEARCH OF A COMPLEX FIRE-INDUCED POLLUTION ON THE MARBLE
RELIEF FROM THE PUSHKIN MUSEUM OF FINE ARTS COLLECTION

The results of testing different detergent compounds on the marble relief surface

“The Flagellation of Christ” from Pushkin Museum of Fine Arts

Clearing compounds:

1. EDTA (protocol from the paper Julie A. Lauffenburger, Carol A. Grissom and A. Elena Charola. Changes in gloss of marble surfaces as a result of methylcellulose poulticing. *Studies in Conservation* 37 (1992) 155-164)

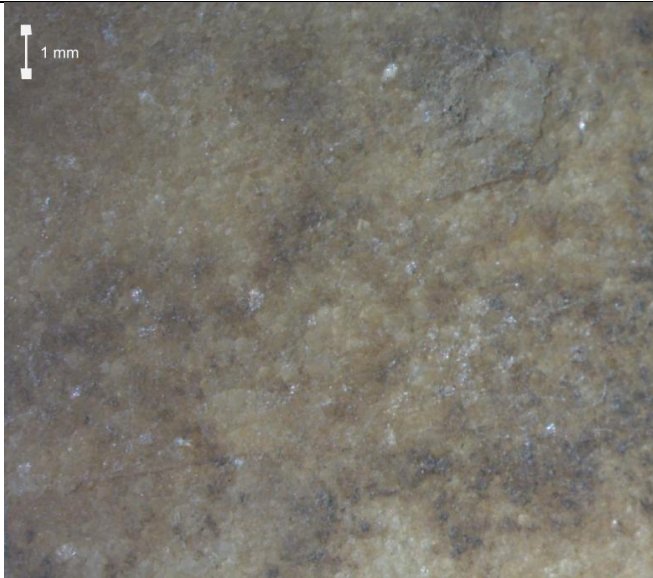
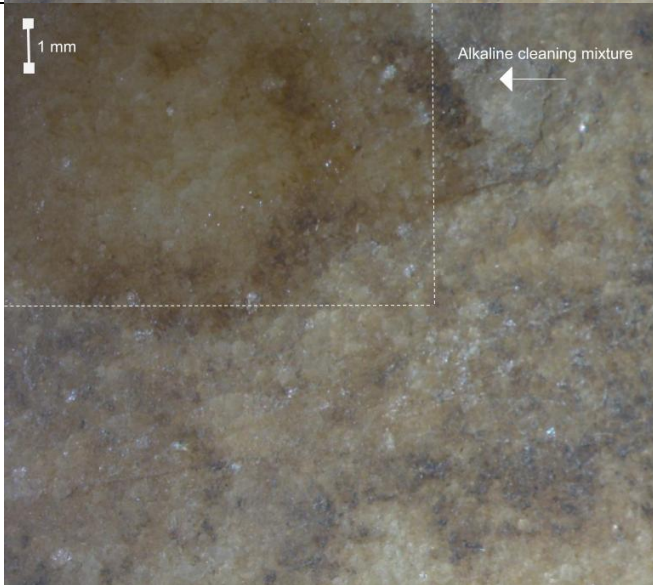
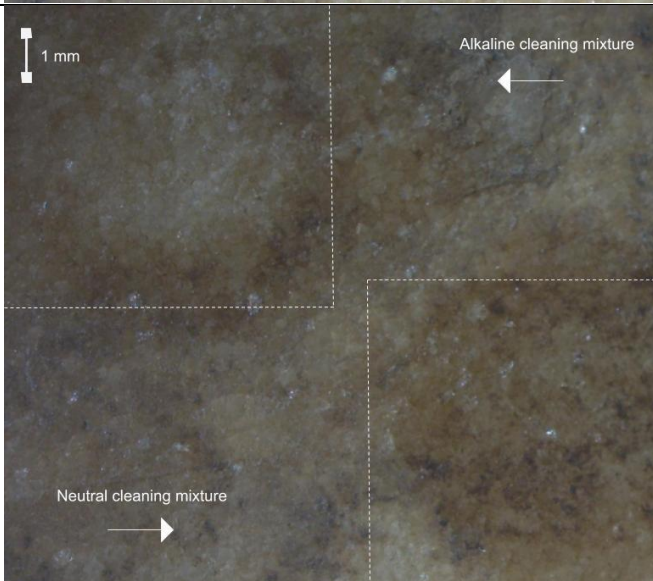
2. targeted developing mixture SMS-2A* (alkali)

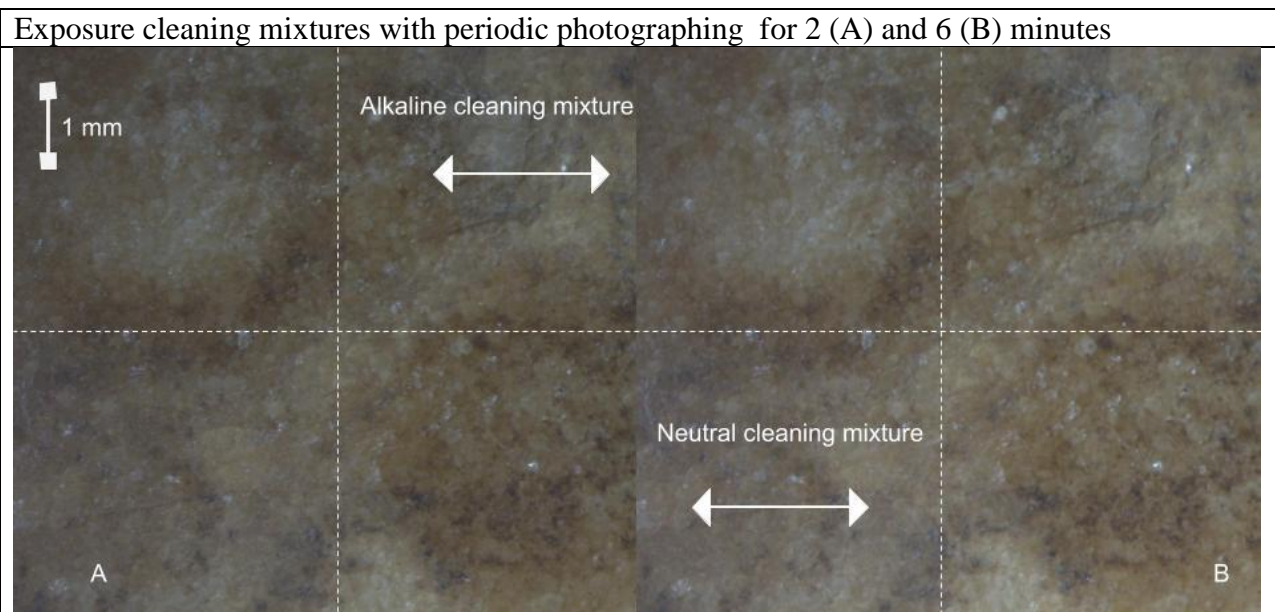
3. targeted developing mixture SMS-2N* (neutral).

*The mixtures were diluted with water in the volume ratio of 1/5.

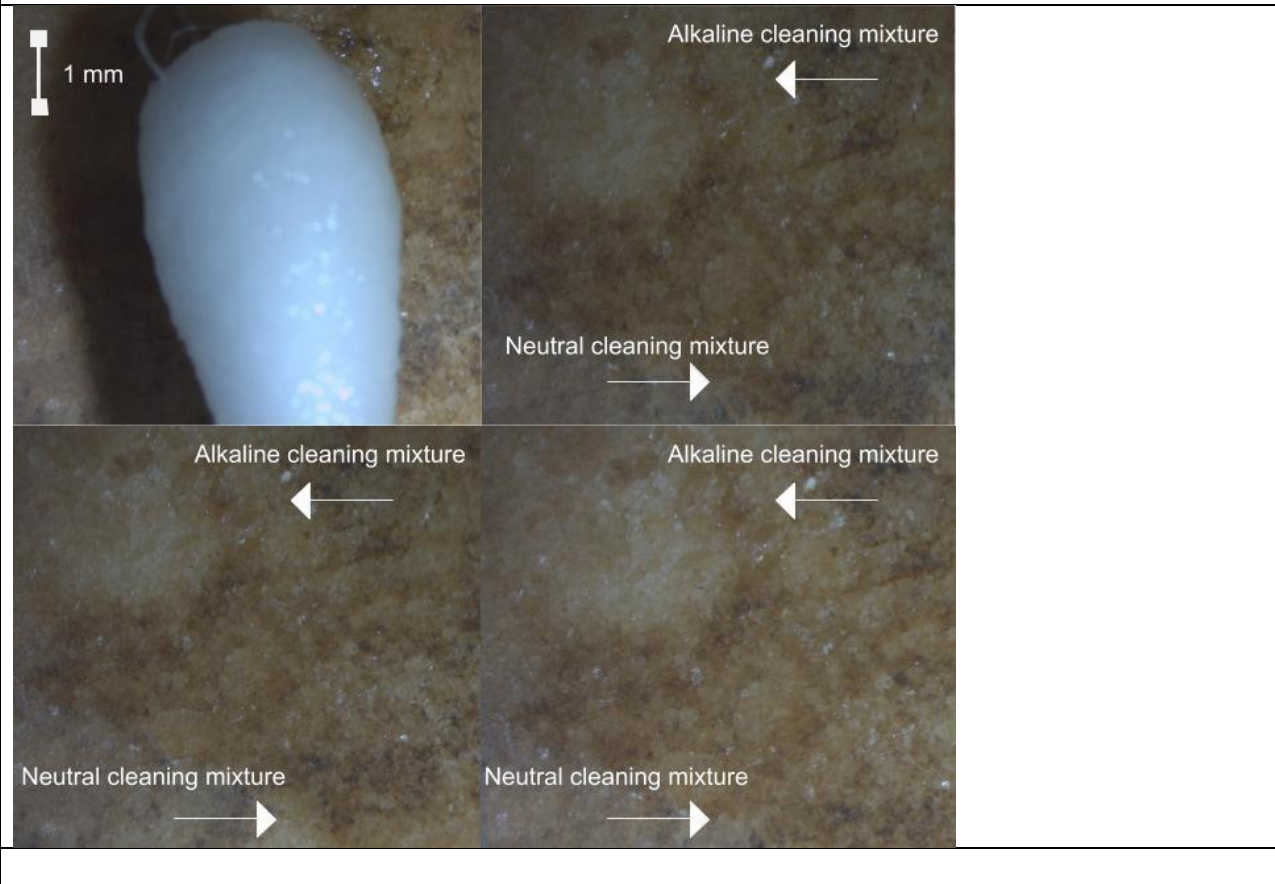
The protocol of cleaning: all compounds was applied to the surface (yellow square) with a fully soaked cotton swab and held for 6 minutes. Then they removed by dry swab and cleaned by swab with distilled water.





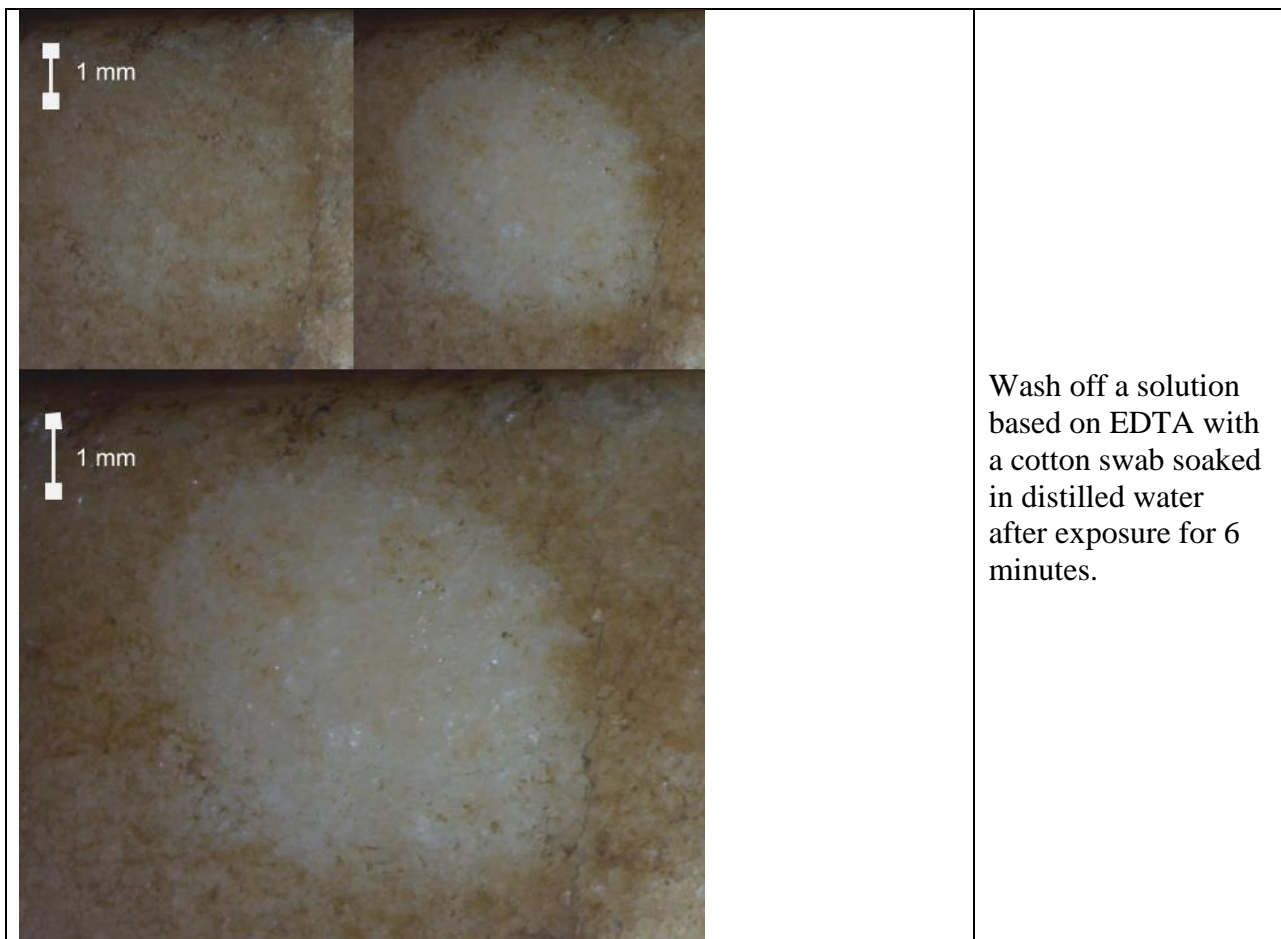
		<p>The initial view of marble relief's surface on the tested area before treatment</p>
		<p>Application of a alkaline agent SMS-2N</p>
		<p>Application of a neutral agent SMS-2A</p>



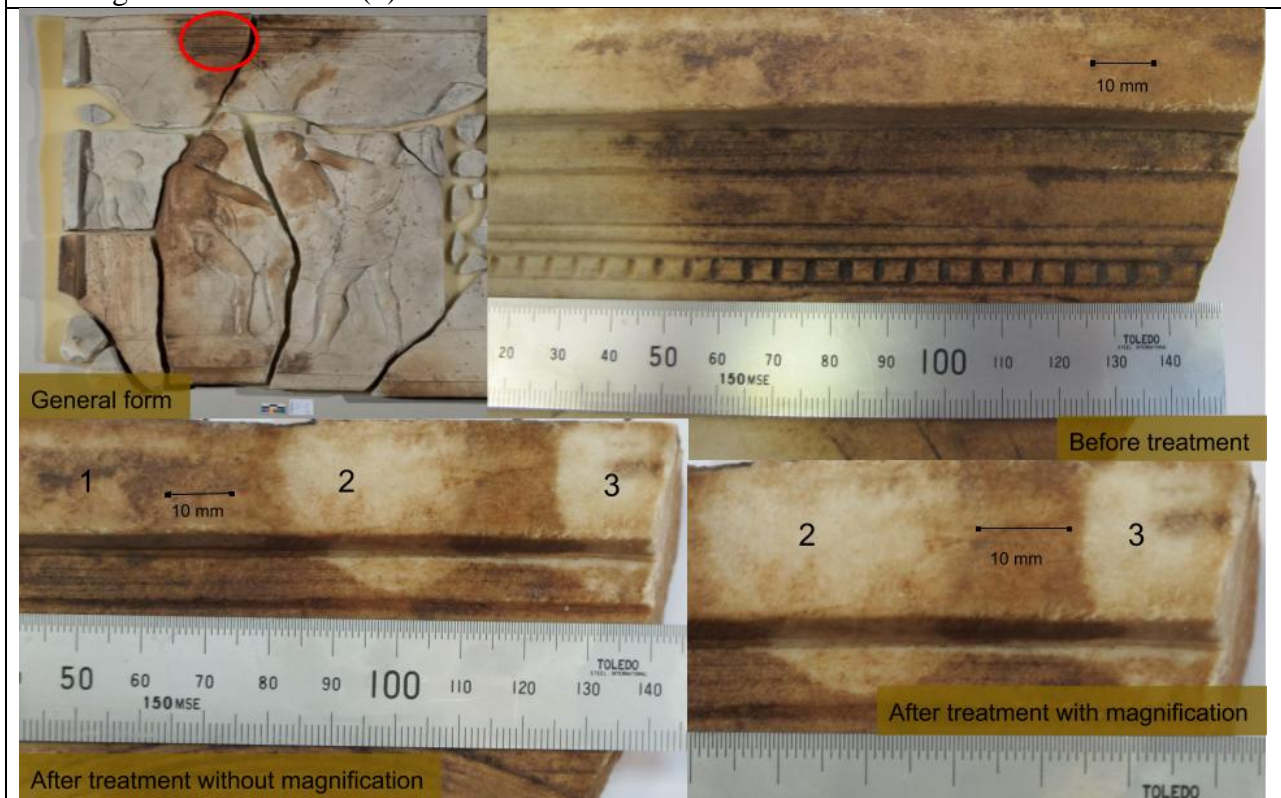
Wash off cleaning mixtures with a cotton swab soaked in distilled water after exposure for 6 minutes



		<p>The initial view of marble relief's surface on the tested area before treatment by EDTA (the protocol published in Lauffenburger, 1992).</p>
		<p>Application of EDTA based detergent. Time of holding is 6 min.</p>



The general view of marble relief. Cleaning by mixture of 4 solvents before studies - isopropanol, cyclohexane, methylene chloride, acetonitrile (1); neutral cleaning mixture SNS-2N (2); and alkaline cleaning mixture SNS-2A (3).



The safety of clearing by EDTA, SMS-2A and SMS-2N was estimate by scanning electron microscopy studies on the surface of test marble samples before and after treatment – see fig.6 in the paper.