

Examination of pigments and materials used by the Romanian painter Nicolae Grigorescu

Data on natural or artificial pigments, main components of a painter's palette, are significant when offering information on the understanding of an artist's technique. Under the influence of the surrounding conditions or due to the interactions between pigments and media, most of the old oil paintings suffer more or less visible deterioration processes. The identification of the constitutive elements is of great importance when dealing with the artwork's future restoration.

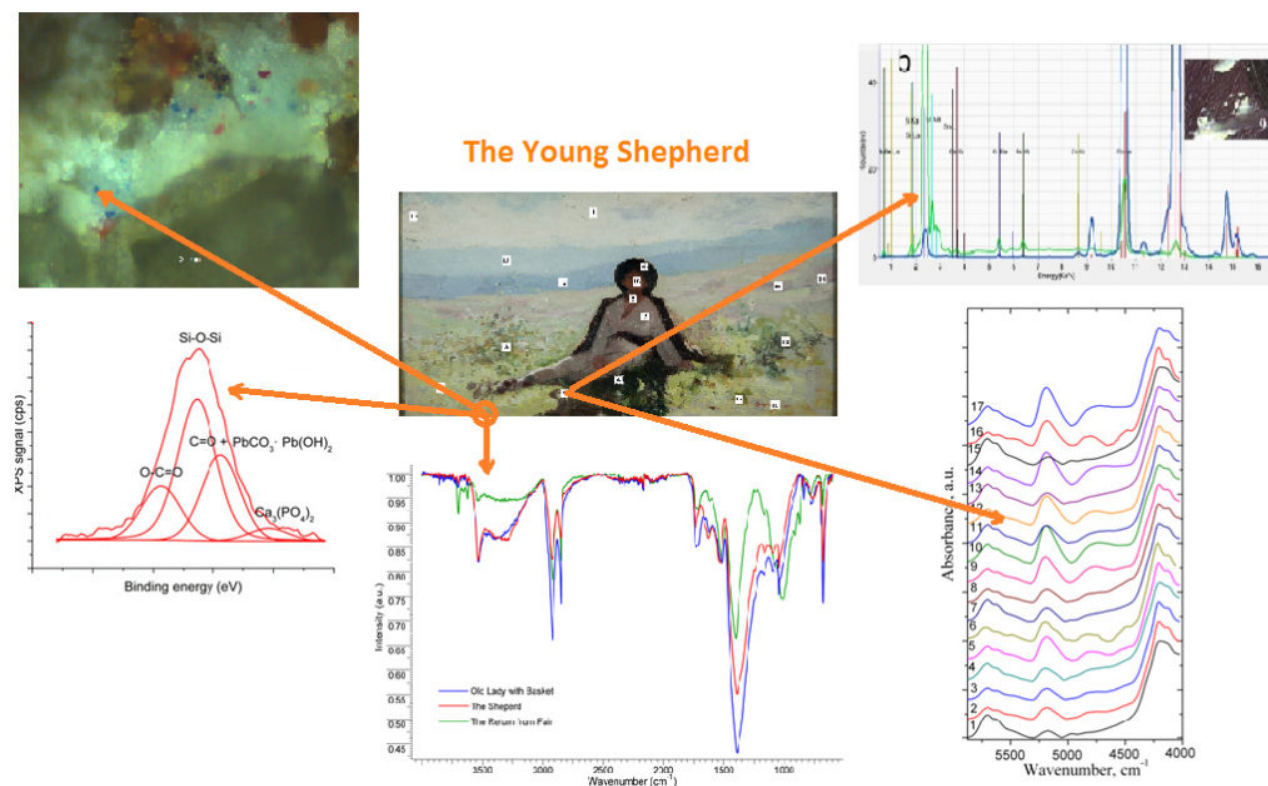


Fig. 1.

The combination of several non-invasive (Raman, NIR and XRF spectroscopies, IR reflectography) and invasive techniques (XPS and ATR-FTIR spectroscopies, SEM-EDX microscopy) allowed the first thorough examination of pigments and materials used by the famous Romanian artist Nicolae Grigorescu, the most representative Romanian impressionist, in three cultural heritage paintings. Structural characterization and identification of pigments and materials used by Nicolae Grigorescu showed the painter's preference for a small number of pigments, a common feature of the impressionist artists. The investigation of several microscopic fragments sampled from under the picture's frames proved that each hue is the outcome of mixing several pigments in different

proportions. Furthermore, the attendance of carboxylic acids and lead carboxylates showed the existence of a deterioration process in the examined paintings. This study proved the preference of Nicolae Grigorescu for natural ultramarine – in a historical time when its cheaper synthetic substitute was already available – most likely due to its remarkable mixing ability and brilliance, in addition to its uncommon optical properties. To our knowledge, this scientific paper is the first one proving the usage of natural ultramarine by an artist belonging to the impressionist school. The lack of information aiming at the usage of natural ultramarine by other impressionist painters does not necessarily mean that these ones did not use this pigment. This feature rather seems to be related to the employment of examination techniques that did not afford discrimination between synthetic and natural ultramarine or to the impossibility of performing invasive investigation. The identification of natural ultramarine was performed through XPS, ATR-FTIR and NIR spectroscopies, as well as by SEM-EDX and optical microscopies. Discrepancy between the obtained results, i.e., identification of natural ultramarine in one (through ATR-FTIR spectroscopy), two (through XPS spectroscopy) or in all three analyzed heritage paintings (through NIR spectroscopy) can be correlated with the author's technique and to the characteristics of each examination method, i.e., ATR-FTIR and XPS spectroscopies provided information only in the analyzed contact points, while NIR technique was able to prove the pigment presence in the painting layers depth.

Mihaela Olaru¹, Bogdana Simionescu^{2,3}, Radu Dan Rusu¹, Andrei Victor Oancea¹

¹*“Petru Poni” Institute of Macromolecular Chemistry, Iasi, Romania*

²*“Costin D. Nenitescu” Centre of Organic Chemistry, Bucharest, Romania*

³*“Moldova” National Museum Complex, Iasi, Romania*

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Rusu RD, Simionescu B, Oancea AV, Geba M, Stratulat L, Salajan D, Ursu LE, Popescu MC, Dobromir M, Murariu M, Cotofana C, Olaru M

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