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Gemological study of an emerald reportedly from Egypt in Paris School of Mines museum

Stefanos Karampelas^{1*}, Eloïse Gaillou², Annabelle Herreweghe¹, Farida Maouche², Ugo Hennebois¹, Sophie Leblan¹, Bérengère Meslin Sainte Beuve¹, Michel Lechartier², Didier Nectoux², Aurélien Delaunay¹

¹*LFG (Laboratoire Français de Gemmologie), Paris, France (*correspondance: s.karampelas@lfg.paris)*

²*Mines Paris, PSL Research University, Musée de Minéralogie, Paris, France*

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Paris School of Mines Mineralogy Museum holds a collection of about 2,000 gemstones on top of its extensive collection of minerals of almost 100,000 specimens, built over the last 230 years. Some gems have historical values, such as an emerald reportedly from Egypt (Figure 1, ENSMP 69845). The exact acquisition date of this gem is unknown, but regarding its label and catalog number, it is estimated at the mid- to late 19th century (Gaillou et al., 2022). At the same time, rough emeralds from Egypt arrive in the collection, coming from the great expeditions of French explorer Frédéric Cailliaud (1787 – 1869; Cailliaud, 1821, Mainterot, 2012). Four other rough Egyptian emeralds are bequested to the museum in 1910 by Emile Bertrand, reportedly collected from “the ruins of Alexandria”, which would represent the historic deposits mined until the fall of pharaoh Ptolemy IV in 145, and not the rediscovery of Cailliaud in the early 18th century. These different sets of rough material would therefore be reference samples for gemological research.

The purpose of this study is to compare the gem emerald with other samples in the collection, confirm or rebut its origin, characterizing at the same time all the samples from this historic and emblematic deposit. First, we investigated the gem, and we are now conducting analyzes on the rough samples. The gem emerald is a faceted deep green, highly included gem, weighing 3.19 ct. Under the microscope, the examination revealed indeed numerous inclusions, some of them multiphased with jagged outlines as well as goya de aceite patterns. Ultraviolet – visible spectroscopy revealed absorptions due to chromium and vanadium, without absorption bands related to iron. Fourier Transformed Infrared spectra present bands linked with low alkali content. Chemical analyses further confirmed the above observations. These data are similar to emeralds from Colombia and not to what is known about Egyptian emeralds (Saeseaw et al., 2014; Karampelas et al., 2019). We are currently studying the other rough Egyptian emeralds in the collection in order to compare them with this sample, especially the ones from the Cailliaud expeditions, which have not been studied until now.



Figure 1: Emerald ENSMP 69845, of deep green colour with numerous inclusions, reportedly from Egypt, with characteristics similar to emeralds from Colombia. © Musée de Minéralogie MINES Paris / Eloïse Gaillou.

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