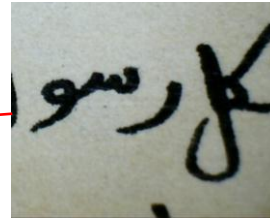
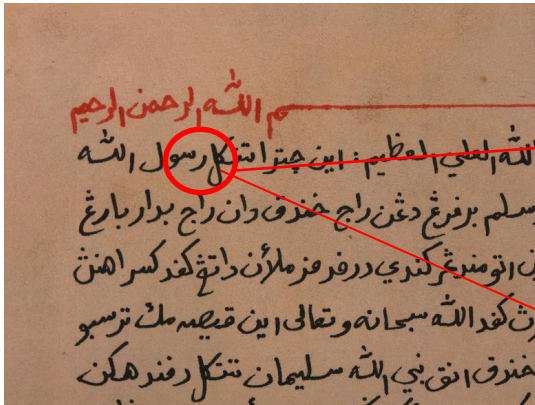


Report of Ink analyses

Hikayat Raja Khandak and Raja Badar, Patani (Or.16128)

Date: 9 Rabiulawal 1224 AH/ 1809 AD

Black Ink



Sample was analysed by using USB Digital Microscope with magnification x40. From the observation, the black ink is dense and does not spread and stick into the paper fiber.

Multi-spectra imaging for MS Or.16128

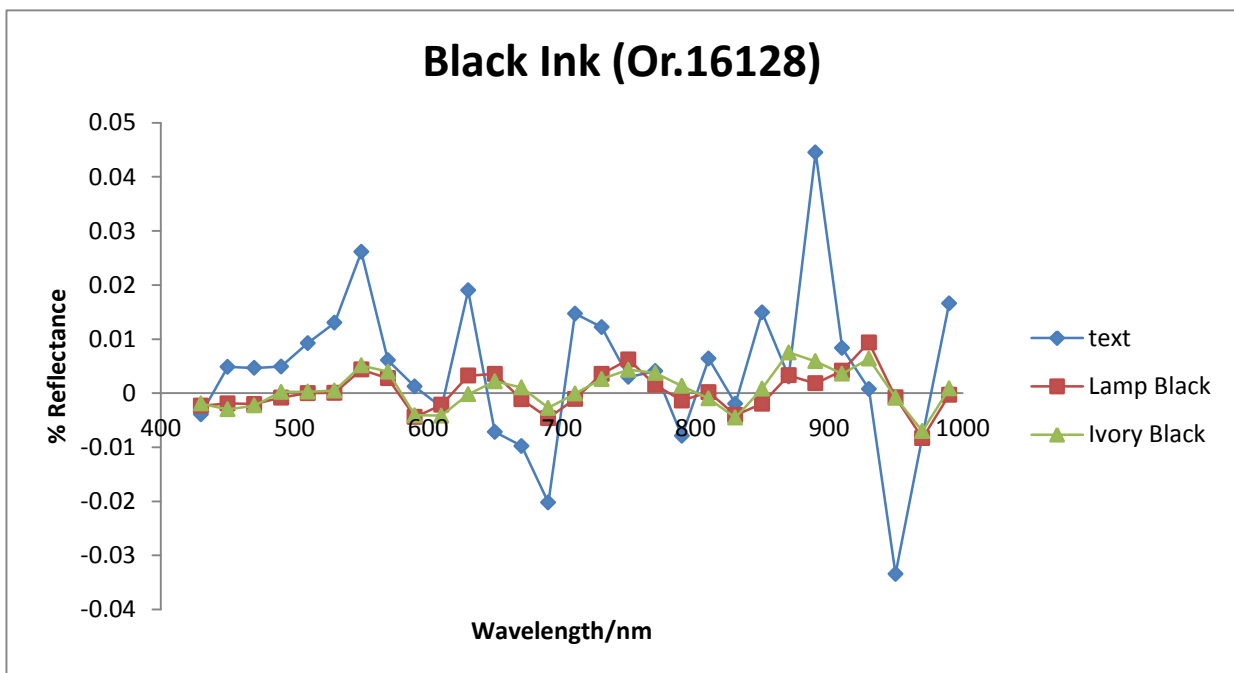
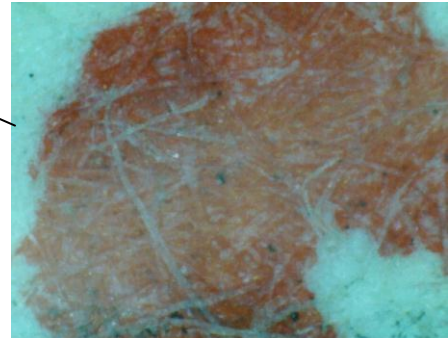
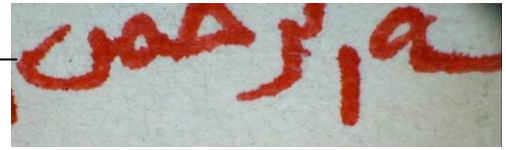
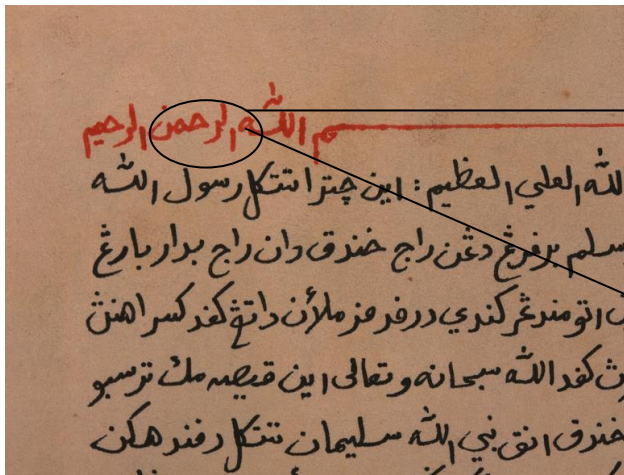


Figure 1: Reflectance spectral of black ink

Red Ink



Sample was analysed under magnification x40 by using digital microscope. Certain parts are faded and dispersion of ink also can be seen. Splash of black ink found on top of red ink probably due to unskilled work by inexperienced calligrapher.

Multi-spectral Imaging for MS Or. 16128

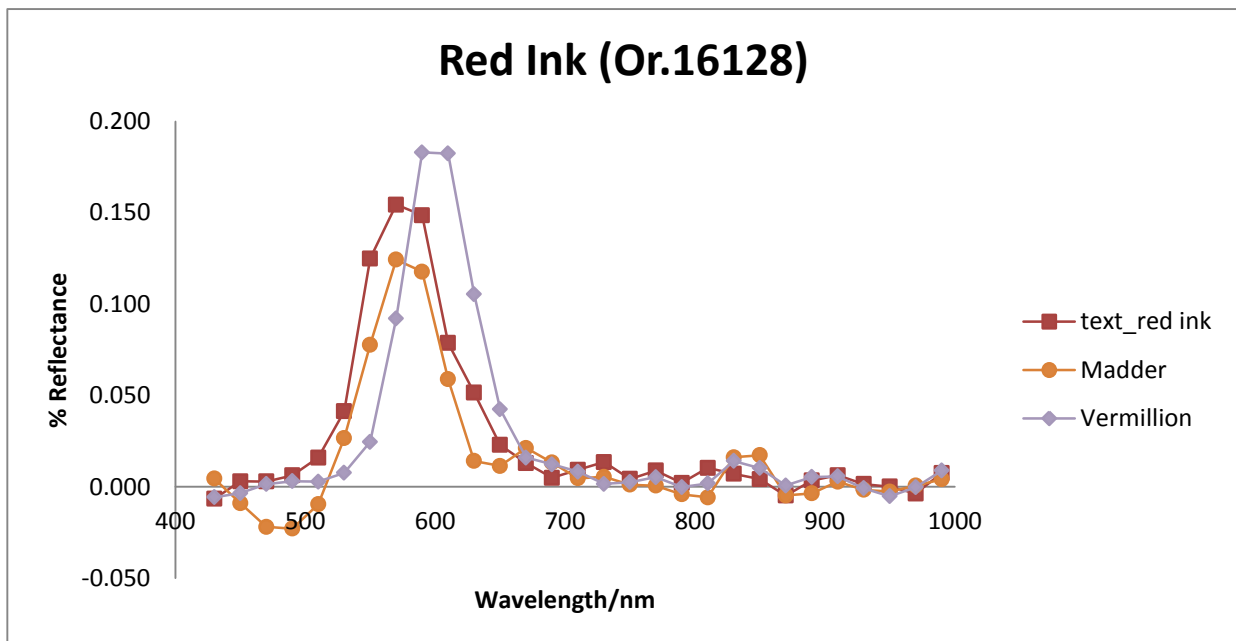


Figure 2: Reflectance spectral of red ink

Summary

There are two types of ink identified from this MS Or.16128. Both are black and red ink. Red ink generally used to highlight areas of the text. While, black ink prominently used for writing text. The ink samples were measured by using Multi-spectral imaging system (non-destructive analysis in order to characterise and identify pigment. For black ink sample, the reflectance spectral shows similar characteristic as lamp black and ivory black (Figure 1). Technically, both inks contain different properties; therefore require other method of analysis to confirm it. Although, it is difficult to distinguish black ink sample through only single instrumentation analysis, colour appearance; dense dark black through naked eye observation suggest the black ink used is lamp black. This type of ink has been used since ancient time and describe as a 'beautiful black' (Tingry, 1804).

As for red ink, the reflectance spectral of sample showed slightly close to standard pigments; madder and vermilion characteristic (Figure 2). However, the spectrum is more similar to that of vermilion (mercuric sulphide, HgS) than madder. Besides, the colour of the ink also similar to vermilion (orange-dark red) but the appearance will be affected by particle size and the thickness of the ink. Overall, the palettes used for written text of this manuscript are made of organic and synthetic composition. However, both inks are in a good and stable condition.