PRASIOLITE WITH INCLUSION INFLUENCED BY BRAZIL-LAW TWINNING

Meenakshi Chauhan

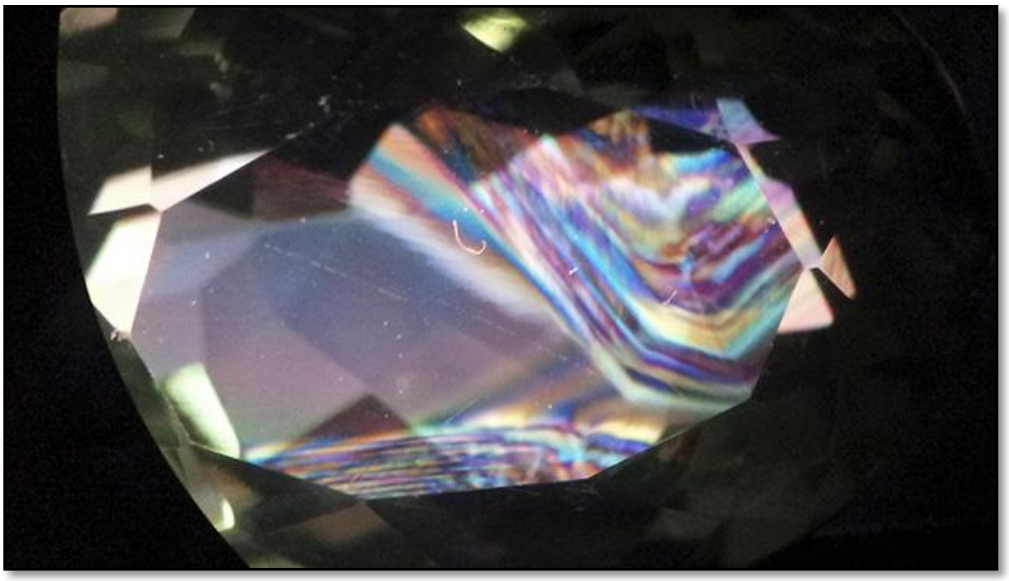

Figure 1. Between crossed polarizers, the prasiolite showed two sections of Brazil-law twinning in the optic-axis direction. Photo by Meenakshi Chauhan, magnified 15×.

The Indian Gemological Institute Gem Testing Laboratory recently examined a 6.43 ct transparent grayish yellowish green oval mixed-cut specimen. Standard gemological examination gave an RI of 1.545–1.553 with a uniaxial positive optic sign and a birefringence of 0.008, and a hydrostatic SG of 2.65. These readings readily identified the stone as prasiolite, a green variety of quartz.

The prasiolite displayed prominent Brazil-law twinning, with very sharp twinning planes when the sample was observed parallel to the optic axis between crossed polarizing filters, though only two sections of twinning were clearly visible in the stone (figure 1). The presence of such sharp and prominent Brazil-law twinning confirmed the sample's natural origin. When synthetics do exhibit such patterns, it has a flame-like or irregular shape (J.I. Koivula and E. Fritsch, "The growth of Brazil-twinned synthetic quartz and the potential for synthetic amethyst twinned on the Brazil law," Fall 1989 G&G, pp. 159–164).

Magnification showed no inclusions, but illumination from the side using a fiber-optic light source revealed minute white particles that scattered the light (figure 2). These pinpoint inclusions followed the pattern of the Brazil-law twinning, which was apparent

without the aid of polarized filters (E.J. Gübelin and J.I. Koivula, Photoatlas of Inclusions in Gemstones Volume 2, Opinio Verlag, Basel, Switzerland, 2005, p. 573).

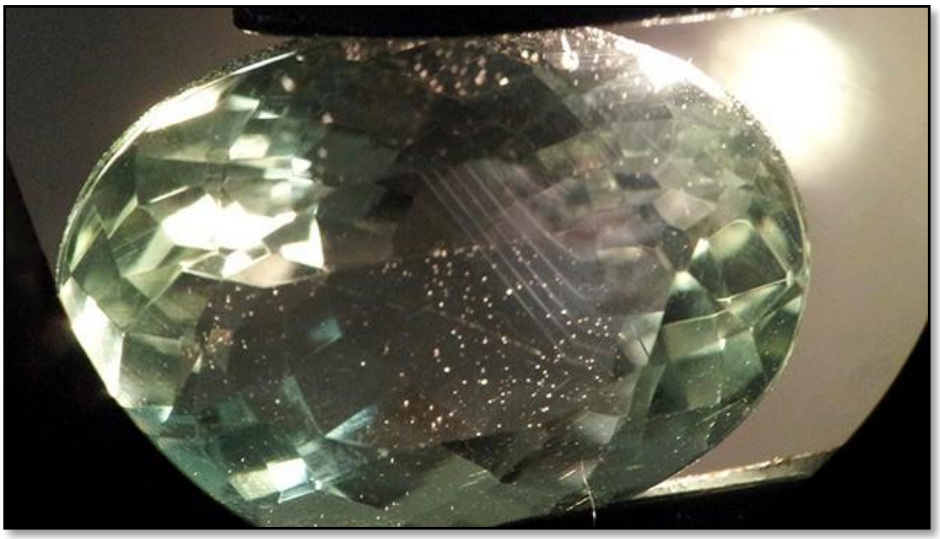

Figure 2. Fine dotted inclusions demonstrated a Brazil-law twinning pattern along the optic axis, exactly where this twinning was visible under polarized filters. Photo by Meenakshi Chauhan, magnified 10×.

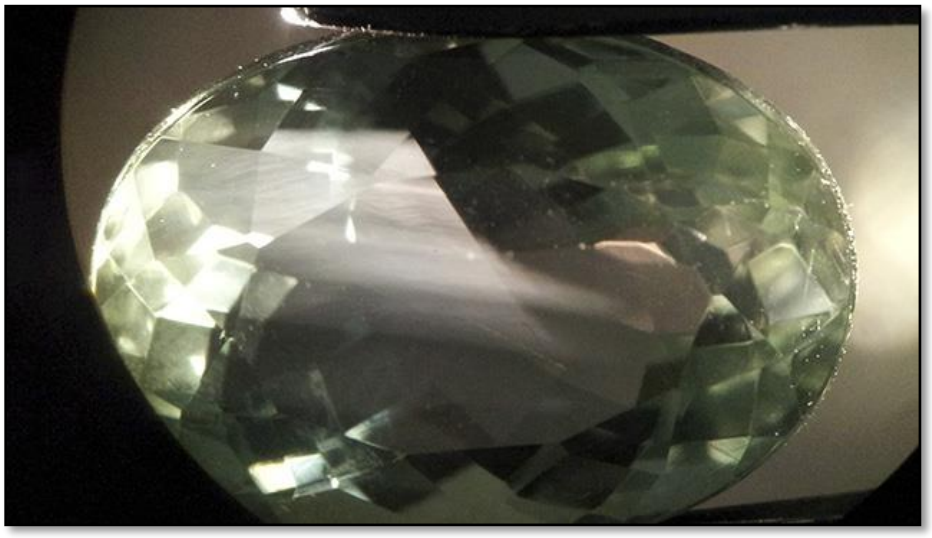

Figure 3. Fine dotted inclusions were visible in this minor rhombohedral face where Brazil-law twinning was absent. Photo by Meenakshi Chauhan, magnified 10×.

Minor rhombohedron faces that did not feature Brazil-law twinning were filled with these minute light-scattering particles. These inclusions were visible on the faces with

some tilting of the fiber-optic light source but did not show any pattern (figure 3). The minute particles were not visible in both zones simultaneously.

In diffused transmitted light, the minor rhombohedron faces displayed a slightly darker shade of the grayish yellowish green color seen in prasiolite. These faces also showed a wavy internal growth structure between crossed polarizers. The major rhombohedron faces were even lighter in color. No color bands were observed in the stone.

Although the owner claimed the stone's color was natural, the presence of Brazil-law twinning raised suspicion, since this twinning has only been associated with the amethyst variety of quartz. There is still no way to separate naturally heated from heat-treated prasiolite.

_____

Article originally published in Gems & Gemology, Summer 2014, Vol. 50, No. 2