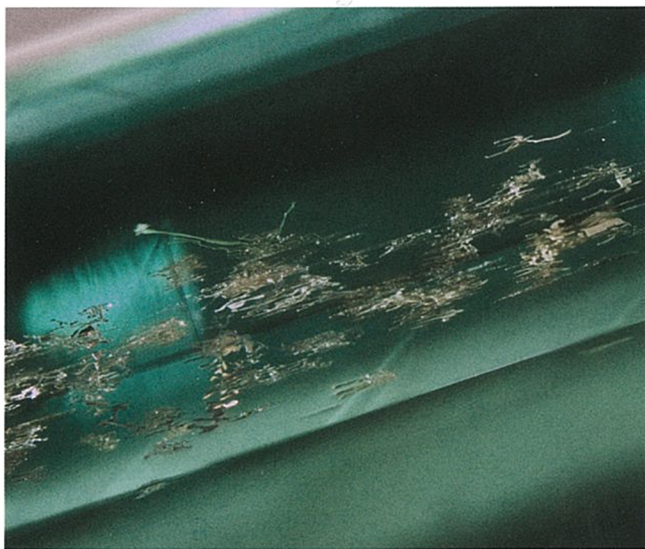


## Native Copper Inclusions in a Cu-bearing Tourmaline

Since the 1989 discovery of bright blue-to-green Cu-bearing tourmaline in Brazil's Paraíba State (Fritsch et al., 1990), these gems have completely changed how the global marketplace appreciates and values tourmaline as a gemstone. In addition to the array of 'electric' colours that have been seen in Cu-bearing tourmaline from Brazil (and subsequently from Nigeria and Mozambique), some intriguing new inclusion features have also come to light.



**Figure 29:** Dendritic platelets of native copper are oriented primarily along the c-axis of this Cu-bearing tourmaline. Photomicrograph by Bilal Mahmood; magnified 58x.

Recently, the American Gemological Laboratories received a 1.35 ct Cu-bearing tourmaline for identification and enhancement determination. The moderately saturated blue-green colour of the stone was not typical of the intensely coloured Paraíba-type tourmalines revered by the industry. Gemmologically, however, the stone was of much greater importance. Orientated primarily along the c-axis were numerous skeletal clusters of native copper inclusions (Figure 29).

Early publications on Cu-bearing tourmaline from Brazil make reference to native copper inclusions (e.g. Brandstätter and Neidermayr, 1994), however, they are only very rarely observed in cut stones found on the market. For gemmologists and mineralogists, inclusions such as these are paramount to understanding the environment in which minerals and gems form, particularly when chromophores are involved.

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