

# PEZZOTTAITE FROM AMBATOVITA, MADAGASCAR: A NEW GEM MINERAL

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Pezzottaite, ideally  $\text{Cs}(\text{Be}_2\text{Li})\text{Al}_2\text{Si}_6\text{O}_{18}$ , is a new gem mineral that is the Cs, Li-rich member of the beryl group. It was discovered in November 2002 in a granitic pegmatite near Ambatovita in central Madagascar. Only a few dozen kilograms of gem rough were mined, and the deposit appears nearly exhausted. The limited number of transparent faceted stones and cat's-eye cabochons that have been cut usually show a deep purplish pink color. Pezzottaite is distinguished from beryl by its higher refractive indices (typically  $n_o=1.615-1.619$  and  $n_e=1.607-1.610$ ) and specific gravity values (typically 3.09–3.11). In addition, the new mineral's infrared and Raman spectra, as well as its X-ray diffraction pattern, are distinctive, while the visible spectrum recorded with the spectrophotometer is similar to that of morganite. The color is probably caused by radiation-induced color centers involving  $\text{Mn}^{3+}$ .

Beginning with the 2003 Tucson gem shows, cesium-rich "beryl" from Ambatovita, Madagascar, created excitement among gem collectors and connoisseurs due to its deep purplish pink color (figure 1) and the attractive chatoyancy displayed by some of the material. Although it was sold during and after the Tucson gem shows as "raspberyl," "red beryl," "pink beryl," "hot pink-red beryl," and especially "raspberry beryl," subsequent examinations (see, e.g., Simmons et al., 2003) revealed properties that were anomalous for beryl and were associated with very high concentrations of cesium (Cs). In September 2003, the International Mineralogical Association approved the name *pezzottaite* (pe-zó-ta-ite) for this new species of the beryl group. It is named after Dr. Federico Pezzotta (Natural History Museum, Milan, Italy), who was among the first to investigate this new mineral, in recognition of his scientific contributions to the mineralogy of Madagascar (Hawthorne et al., 2003).

With the addition of pezzottaite—ideally  $\text{Cs}(\text{Be}_2\text{Li})\text{Al}_2\text{Si}_6\text{O}_{18}$ —the beryl group consists of four members. The other three (all hexagonal) are: beryl ( $\text{Be}_3\text{Al}_2\text{Si}_6\text{O}_{18}$ ; Aurisicchio et al., 1988), bazzite

( $\text{Be}_3\text{Sc}_2\text{Si}_6\text{O}_{18}$ ; Armbruster et al., 1995), and stoppaniite ( $\text{Be}_3\text{Fe}_2\text{Si}_6\text{O}_{18}$ ; Ferraris et al., 1998; Della Ventura et al., 2000). Pezzottaite, which is rhombohedral, is not a Cs-rich beryl but rather a new mineral species that is closely related to beryl. Another mineral, indialite ( $[\text{Al}_2\text{Si}]\text{Mg}_2[\text{Al}_2\text{Si}_4]\text{O}_{18}$ ; Meagher and Gibbs, 1977), is also sometimes included in the beryl group. Of these, only beryl and pezzottaite have been found in gem quality. (Note: In this article, "beryl" refers to the mineral species, rather than the group, unless otherwise specified.)

Pezzottaite has been confirmed from just one deposit in Madagascar, the Sakavalana granitic pegmatite located near Ambatovita in a remote area of the central highlands. In addition to material from this locality, a sample of Cs-rich "morganite" from Afghanistan described by Hänni and Krzemnicki (2003) has now been recognized as pezzottaite (H. Hänni, pers. comm., 2003). Observations of the crystal morphology of pezzottaite from Madagascar

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