

Natural Red Andesine from Tibet: Real or Rumor ?

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3 November, 2010

Andesine is one member of the plagioclase feldspar solid solution series which contains between 30-50 % anorthite component. Andesine is rarely found as gem-quality stone, as compared with the more common species such as albite, oligoclase (sunstone) and labradorite, which have been discovered and mined for long time from various sources.

The first discovery of gem quality red andesine was reported from the Democratic Republic of Congo in 2002 (Krzemnicki, 2004). The first article of andesine from Tibet was reported by B.M. Laurs in 2005. Later, large amount of red andesine stone from Tibet was introduced to the gem market by some Chinese dealers under the trade-name of “Tibetan sunstone” or “Tibet-nite”, nonetheless the source where this gem material originates from has still been doubtful. In the meantime, the rumor of treated red andesine had spread out through the whole gem market which created a big controversial and confusion among gem traders worldwide. In 2008, the copper-diffusion treatment of this gemstone was proved experimentally (Emmett et al., 2009) and the report of such treatment was published. Later the technique was confirmed by other study (Milisenda et al., 2008). After the disclosure of such treatment technique then the important questions were arisen among the gem dealers whether the red andesine sold in the markets are the natural or treated ones, and the location or deposit where the natural red andesine was found and supplied to the trade is really existing in Tibet.

In order to prove the existence of this gem locality, the group of international team consisting of representatives from LMHC member institutes, i.e., Ahmadjan Abduriyim (GAAJ), Brendan Laurs (GIA) and Thanong Leelawatanasuk (GIT) together with independent experts, i.e., Richard W. Hughes (a well-known gemologist), Flavie Isatelle (research geologist) and Young Sze Man (Jewellery News Asia, Hong Kong) with the support from Christina Lu (M.P. Gem Corp.), Li Thong and Lou Li Ping (Tibet Andesine Co.) had made a field trip to the mining area in Tibet during 26th September - 2nd October 2010. The expedition began in Lhasa the capital of Tibet. The red andesine mines are located in Zha Lin and Yu Lin Gu areas near the border of Bainang and Gyanze counties, about 55 road-km southeast of the Xigaze (Shigatse) city and around 300 road-km southwest of Lhasa city (see Figure 1).



Figure 1: A map showing the location of the andesine mines of Zha Lin and Yu Lin Gu areas (modified from Richard W. Hughes)

According to the headman of the Zha Lin village (age about 50+), who had heard about the presence of red stone in this area since he was just a young boy, however during that time he and other villagers did not know what this kind of gemstone was. Until 2005, after the news of the red andesine mining in Nai Sa, Bainang was spreaded out the whole counties then many villagers began digging and collecting those red stones for commercial purpose. (See Figure 2)



Figure 2: Headman of Zha Lin village told the story of red gemstone to the group (left) and shows his own collection samples (right).

Our team found that andesine in this area occurs in secondary deposits of alluvial material and alluvial fan debris (see Figure 3). We don't know where the andesine within these sediments was derived. It is possible that the andesine-bearing soil at Zha Lin could have originated from the weathering of rocks that have been tectonically displaced.



Figure 3: Overview of Yu Lin Gu valley where the red andesine samples have been found. (left photo: a shot from valley to Zha Lin village, right photo: a shot in Zha Lin village about 1 km from the left photo)

At the Zha Lin village, the sediments consist mainly of silts, sands and gravels of shale and slate. The red andesine samples can be found scattered on ground surface to about 1 m. depth in the digging pit (see Figure 4).



Figure 4: The digging pit near Zha Lin village (left), and red andesine collected from the pit (right).

In order to be sure that these gemstones do occur naturally, our group has attempted to randomly select the digging sites around the area without assistance from any local villager in order to rule out the possibility of intentionally dropping stones or “salting” the deposit. During our excavations, we discovered that the stones were found even under the bushes (see Figure 5).



Figure 5: One of the member (Flavie Isatelle) digging (left), and red andesine from this randomly selected site (right).

Furthermore, as we climbed up into the valley until we reached the Yu Lin Gu alluvial fan, the stones were found only on or near the surface at Yu Lin Gu (see Figure 6).



Figure 6: Red andesine samples found on the ground in Yu Lin Gu valley (left), and hand-picked samples from the ground in the same area (right).

Even though, the host rock or primary source of these andesine samples could not be found during our expedition, our investigation proved that red andesine does occur naturally at Zha Lin. We could not verify the authenticity of the Yu Lin Gu occurrence because the stones could not be found in pits dug below the surface. Unfortunately, because of a religious dispute, permission to access the mining area above Nai Sa village in Bainang county was denied. Bainang county was previously reported to be the first Tibetan mining area of this gemstone (Abduriyim, 2009).

The quality of andesine roughs found in this area varies from translucent to transparent with rounded edge and colours range from deep red, orange-red to pale reddish orange (see Figure 7). Of course, a few pieces show greenish core with red rim or red zoning. The size of crystal rarely exceeds a cm in length and very few over 2 cms. The crystal surface commonly shows

etched features which seem to be more pronounced in samples collected from the Yu Lin Gu area as compared with those of the Zha Lin samples.



Figure 7: Red andesine samples found in Zha Lin and Yu Lin Gu (deep red on the left, orange-red in the middle and pale reddish orange on the right)

Even though this expedition to Tibet could prove that red andesines do occur naturally, the crucial question in the trade is how the gem testing laboratory can distinguish these natural materials from their treated counterparts. Further analyses of samples from this source will be conducted by various techniques and compared with the treated samples in order to be able to separate the natural from the treated ones.

Finally it is also worthwhile to emphasize here that the joint expedition and the co-operative research team among each member laboratories are the key factors for the success of this project. The research results will therefore be discussed, concluded and published in the international gemological journals soon.

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