Processing of foods, especially dehydration is known to result in alteration of sensory and nutritional qualities. Cowpea leaves is one of the common leafy vegetables consumed in Kenya that contain high levels of pro-vitamin A compounds and has good carotene retention during processing. A tasting panel was trained using a quantitative descriptive analysis (QDA) test that was developed and used to characterize the sensory properties of dehydrated cowpea leaves. The panel identified sensory attributes in dehydrated cowpea leaves that were important in discriminating the dehydrated samples from the fresh material. Principal component analysis (PCA) was used to analyze the QDA scores. The first principal component (PC1) which accounted for 85% of the variance was an index of the interrelationship among variables in differentiating the samples while PC2, which accounted for the remaining variance measured the attributes influence in discriminating samples. The results of the sensory attributes mean scores showed that aroma, texture and appearance had high influence in discriminating between the fresh, the sun-dried and the solar-dried samples. The solar dried products were close to the fresh material, which was characterized, as soft and tender with an appealing dark green color, than the sun dried product. The sun dried products differed from the other products more on appearance.