**ABSTRACT**

Leaf is an important organ of the plant. It is widely used for many purposes such as in medical field, chemical and other research purposes. Now it becomes active area for analysis of plants as most of the plant species are at the risk of extinction. Most of the leaves cannot be analyzed easily since some are not flat (e.g. succulent leaves and conifers), some does not grow above ground (e.g. bulb scales), and some does not undergo photosynthetic function (e.g. cataphylls, spines, and cotyledons).In this paper, we mainly focused on tea leaves to identify the leaf type for improving tea leaf classification. Tea leaf images are loaded from digital cameras or scanners in the system. This proposed approach consists of three phases such as preprocessing, feature extraction, selection and finally clustering of leaves. The tea leaf images are first preprocessed to remove the noise and enhanced by fuzzy denoising using Dual Tree Discrete Wavelet Transform (DT-DWT and boundary enhancement to obtain the shape of leaf accurately. In the feature extraction phase, Digital Morphological Features (DMFs) and Geometrical features are extracted and from that main features are selected. They are given to the clustering process which is done by using Fuzzy C-Means algorithm, it clearly cluster different type of tea leaves. The Fuzzy C-Means is trained by 60 tea leaves to classify them into 6 types. Experimental results proved that the proposed method clustered the tea leaves with more accuracy in less time. Thus, the proposed method achieves more accuracy in clustering the leaf type.