**ABSTRACT**

A leaf is an organ of a vascular plant, as identified in botanical terms, and in particular in plant morphology. Naturally a leaf is a thin, flattened organ bear above the ground and it is mainly used for photosynthesis. Recognition of plants has become an active area of research as most of the plant species are at the risk of extinction. Most of the leaves cannot be recognized 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 have attempted to identify tea plant cultivars using classification techniques. 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 and classification to process the loaded image. The tea leaf images can be identified accurately in the preprocessing phase by fuzzy denoising using Dual Tree Discrete Wavelet Transform (DT-DWT) in order to remove the noisy features and boundary enhancement to obtain the shape of leaf accurately. In the feature extraction phase, Digital Morphological Features (DMFs) are derived to improve the classification accuracy. Improved Adaptive Neuro-Fuzzy Inference System (ANFIS) is used for efficient classification. The ANFIS is trained by 60 tea leaves to classify them into 6 types. Experimental results proved that the proposed method classifies the tea leaves with more accuracy in less time. Thus, the proposed method achieves more accuracy in identifying the leaf type.