Automatic classification of Sri Lankan lichen families using deep learning technique

R. Sribavatharani[1*], T. Jeyamugan[1] and T. Keerthanaram[2]

[1] *Department of Physical Science, Faculty of Applied Science, University of Vavuniya, Sri Lanka*

[2] *Department of Bio Science, Faculty of Applied Science, University of Vavuniya, Sri Lanka*

Abstract: Lichen species play an important role in ecosystems, acting as bio indicators and contributing to biodiversity. Traditionally, identifying lichen families requires a great deal of expertise and is time-consuming, prone to human error. To overcome these challenges, this study introduces an automated classification method for Sri Lankan lichen families using deep learning methods. This study investigates the performance of three well-established convolutional neural network architectures: MobileNet, NASNetMobile, and DenseNet. Despite Sri Lanka producing a wide range of lichen species, few studies have focused on automated classification of lichen families. 464 images, representing different Sri Lankan lichen families, was used to train and test the models The DenseNet121 model achieved the highest accuracy of 83%, followed by MobileNetV2 with 81% , followed by MobileNet with 80% and NASNetMobile with 74% . These results demonstrate the potential of deep learning in accurate and efficient identification of lichen families, and provide a valuable resource for biodiversity research and conservation efforts in Sri Lanka.