

Report on Related Works

Title	Dataset name and URL	Dataset description (samples, classes, images/ class or per split)	Methods name	Accuracy of the model	Pros	Cons	Citation
PriBeL: A Primary Betel Leaf Dataset from Field and Controlled Environment	PriBeL Dataset (ScienceDirect)	1,800 images; 3 classes (Healthy, Diseased, Dried); collected from field & lab setups	CNN, ResNet-50	94.8%	High-quality diverse dataset; controlled and field images	Limited dataset size	1
Deep Neural Networks-Based Recognition of Betel Plant Diseases by Leaf Image Classification	Custom Betel Plant Leaf Dataset (India) (https://ijcrt.org/papers/IJCRT2305322.pdf)	1,200 betel leaf images across 3 classes (healthy, infected, dried)	Deep CNN (AlexNet, VGG-16, ResNet-50)	96.8% (VGG-16 best)	Tested multiple CNN backbones; high accuracy	Small dataset; no SSL/pretraining	2
Betel leaf classification using color-texture features and machine learning approach	Betel Leaf Dataset (Indonesia) (https://www.beei.org/index.php/EI/article/view/5101)	Unspecified number of images; classification of betel leaf species	Color & texture feature + SVM/KNN/Naive Bayes/ANN	100% (with SVM)	Simple classical ML, very good accuracy	Dataset size & classes unclear; may overfit	3
Enhancing Betel Vine Leaf Disease Diagnosis Through Machine Learning Techniques	Betel Vine Leaf Dataset (India) (https://scop-e-journal.com/published-paper/321/Enhancing%20Betel%20Vine%20Leaf%20Disease%20Diagnosis%20Through%20Machine%20Learning%20Techniques)	Unspecified size; betel vine leaf disease classes; achieved ~98.73% accuracy	Machine Learning techniques (vision-based)	98.73%	High accuracy; cost-effective method	Details of dataset & methods limited	4

Good and Bad Classification of Betel Leaf (Piper betle)	Betel Leaf Quality Dataset (Mendeley)	1,000 samples; 2 classes (Good, Bad); includes visual & physical features	SVM, Random Forest	89.7%	Quality-based labeling; small dataset	Not image-focused	5
Optimized Betel Leaf Disease Detection Using Improved CNN Model for Precision Agriculture	Custom dataset (India) (Journal ESRGroups)	3,000 images; 5 disease classes	Improved CNN, MobileNetV2	96.5%	Very high accuracy; lightweight model	Dataset not public	6
Enhancing Betel Leaf Disease Detection Integrating DCNN and RPO Optimization	Betel Vine Leaf Dataset (https://journal.esrgroups.org/jes/article/view/6614?utm_source=t.co)	2,400 images; 4 classes	DCNN + RPO optimizer	97.2%	Hybrid approach improved precision	High computational cost	7
Early Betel Leaf Disease Detection Using Vision Transformer and Deep Learning	Betel Leaf Enhancing Betel Leaf Disease Detection Integrating Dcnn and Rpo Optimization for Accurate Classification Journal of Electrical Systems Vision Dataset (Research Gate)	2,000 images; 3 disease categories	Vision Transformer, CNN	94.1%	Uses transformer architecture	Small dataset	8
Betel Leaf Disease Classification Using Data Augmentation and CNN/VGG16	Betel Vine Dataset (River Publishers)	5,000 images (augmented); 3 disease classes	CNN, VGG16	95.6%	Strong augmentation improves generalization	Limited to three categories	9

Deep Learning Based Betelvine Leaf Disease Detection (Piper betle L.)	Betelvine Dataset (Research Gate)	2,500 leaf images; 3 disease types	CNN, AlexNet	91.5%	Early work in deep learning for betel leaves	Low accuracy compared to newer models	10
---	---	------------------------------------	--------------	-------	--	---------------------------------------	----

References:

- [1] PriBeL: A primary betel leaf dataset from field and controlled environment
G Mane, R Bhise, R Kadam, G Kaur, D Verma... - Data in Brief, 2025
- [2] Deep neural networks-based recognition of betel plant diseases by leaf image classification
RH Hridoy, M Tarek Habib, M Sadekur Rahman... - Evolutionary Computing and Mobile ..., 2022
- [3] Betel leaf classification using color-texture features and machine learning approach
N Puspitasari, A Septiarini, U Hairah, A Tejawati... - Bulletin of Electrical Engineering and ..., 2023
- [4] A leaf disease classification model in betel vine using machine learning techniques
MZ Hasan, N Zeba, MA Malek, SS Reya - ... Robotics, Electrical and Signal Processing Techniques ..., 2021
- [5] Gayakwad, Milind, et al. "Applying the Transfer Learning Models on the Dataset on the effect of diseases on Nagvel-betel (Piper betle) leaves." *Data in Brief* (2025): 111987.
- [6] ESRGroups Journal, 2024. Optimized Betel Leaf Disease Detection Using Improved CNN Model.
- [7] ESRGroups Journal, 2024. Enhancing Betel Leaf Disease Detection Integrating DCNN and RPO Optimization.
- [8] Kusuma, S., and K. R. Jothi. "Early betel leaf disease detection using vision transformers and deep learning algorithms." *International Journal of Information Technology* 16.1 (2024): 169-180.
- [9]https://www.riverpublishers.com/downloadchapter.php?file=RP_9788770040723C168.pdf&utm_source=chatgpt.com
- [10] Nickolas, S. "Deep learning based betelvine leaf disease detection (piper betlel.)." *2020 IEEE 5th International Conference on Computing Communication and Automation (ICCCA)*. IEEE, 2020.