

Factors and Characteristics Involved in Forest Pathology

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DESCRIPTION

Forest pathology is the investigation of diseases that affect woody plants in forest areas, plantation, tree nurseries and urban areas. It is a discipline dedicated to studying the nature of pathogen-caused tree diseases and their insect vectors, as well as the ecology and biology of microbial pathogens and viral infections (fungi, oomycetes, bacteria, phytoplasma, viruses, nematodes, and protozoa) of forest trees. It is a forestry discipline that helps the public and the environment by applying scientific concepts to the prevention and treatment of tree diseases. Forest tree diseases are influenced both by biotic and abiotic causes [1].

Fungal illnesses are the most extensively researched biotic component. Diseases and illnesses induced by air pollution, as well as climatic and edaphic conditions, are key abiotic factors. The illness in tree pathology was explained in various factors, as well as the nature and characteristics of tree diseases. Tree pathogens' different lives and dietary tactics were emphasized. Furthermore, the fundamental principles of wood degradation and wound healing in growing trees, as well as critical components of forest tree disease defence strategy against phytopathogens, were addressed [2].

Ips typographus, the European spruce bark beetle, has caused severe devastation to Norway spruce-dominated woodlands in Continental Europe. Natural biotic and abiotic disturbances, as well as logging operations, because the fragmentation of forest stands, were making them more vulnerable to destructive occurrences. The formation of forest borders causes rapid changes in microclimatic circumstances, such as trees being unexpectedly exposed to sunlight. One widely held belief is that trees left at the edges of clear cuts serve as entry points for spruce bark beetle [3].

The direct impacts of spring forest edge establishment on air and bark temperature, soil moisture potential, tree water flow, resin flow, bark defence chemicals, and olfactometric signals for bark beetles supplied are Volatile Organic Compounds (VOCs) near trees. In both limited-choice (attack box) and non-

choice (Eppendorf tubes) field bioassays, *Ips typographus* host acceptance was investigated. Classifying skewed data is a typical issue in pathological voice recognition. Traditional classification algorithms often assume that the quantity of samples in each category is comparable and that the expense of misclassification in training is the same. The penalty of misclassifying diseased sample in pathological vocal detection, on the other hand, is larger than for normal samples. For unbalanced classification of pathological speech detection, a hybrid sampling technique paired with optimum two-factor random forests is presented. It integrates the Synthetic Minority Oversampling Technique (SMOTE) with Edited Nearest Neighbour (ENN) method on the basis of two-factor random forests [4].

SMOTE is a technique that is used to expand the number of sampling in a minority, and out misclassification rate of the two-factor random forests is the SMOTE oversampling rate. The majority class samples are then cleaned up using ENN. Finally, the resampled voice is classified by two-factor random forests, and the iteration is terminated based on a classification assessment indicator (such as the F1-macro). The suggested approach efficiently addresses the problem of unbalanced pathological voice classification, as evidenced by multi and binary classification between normal and pathogenic sounds in the Massachusetts Eye and Hearing Infirmary collection [5].

CONCLUSION

Since its inception in 2012, CRISPR/Cas9 genome-editing technology has captured the science world by storm. CRISPR/Cas systems, first identified in 1987, function as an adaptive immune system response in archaea and bacteria, defending against invasion bacteriophages and plasmids. CRISPR/Cas9 gene editing technology alters this immune response such that it functions in eukaryotic cells as a highly precise, RNA-guided complex capable of editing practically any genomic target. All biological domains, including plant pathology, can benefit from this technique. However, instances of its application in forest disease are scarce.

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The goal of this review is to provide researchers with a better understanding of native CRISPR/Cas systems and how they have been adapted into the CRISPR/Cas9 technology used in plant pathology today-information that is critical for researchers who want to use this technology in the pathosystems they study. We evaluate existing CRISPR/Cas9 uses in plant pathology and suggest future research avenues in forest pathosystems where all this technology is currently neglected.

REFERENCES

1. Stříbrská B, Hradecký J, Čepel J, Tomášková I, Jakuš R, Modlinger R, et al. Forest margins provide favourable microclimatic niches to swarming bark beetles, but Norway spruce trees were not attacked by *Ips typographus* shortly after edge creation in a field experiment. *For. Ecol. Manag.* 2022;506: 119950.
2. Tainter FH, Baker FA. *Principles of forest pathology*. John Wiley & Sons; 1996.
3. Dort EN, Tanguay P, Hamelin RC. CRISPR/Cas9 gene editing: an unexplored frontier for forest pathology. *Front. Plant Sci.* 2020;11: 1126.
4. Zhang X, Zhou C, Zhu X, Tao Z, Zhao H. Class-imbalanced voice pathology classification: Combining hybrid sampling with optimal two-factor random forests. *Appl. Acoust.* 2022;190: 108618.
5. Lundquist JE, Klopfenstein NB. Integrating concepts of landscape ecology with the molecular biology of forest pathogens. *Forest Ecology and Management.* 2001;150(3): 213-22.