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A study on nitrogen fixation related proteins

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Abstract

Nitrogen fixation is the process of conversion of free nitrogen (molecular and elemental) into nitrogenous compounds and to make it available for plants absorption. The main objective of this work is to collect nitrogen fixation related genes from the public databases and to discriminate nitrogen fixation genes from non-nitrogen fixation genes through computational approach. The nitrogen fixation genes were collected from IMG/M database and the non-nitrogen fixation genes were retrieved randomly from UniProt online server. To classify both nitrogen fixation and non-nitrogen fixation gene, Support Vector Machine (SVM) was used and a model was developed. The SVM predicted with 0.9886364 sensitivity and 0.9090909 specificity from total dataset which means 98% and 90% of true positive and true negative results. These SVM result indicates that the predicted model is very good. This model would be helpful for understanding the role of genes involved in nitrogen fixation and the scientist who were worked in this area.

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