# A NOVEL METHOD FOR DISEASE DIAGNOSIS BY PLANTS USING ASSOCIATION RULE

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**Abstract:** *Data mining is the process of selecting and exploring large amounts of data. This process has become an increasingly invasive action in all areas of medical science research. Data mining has paved way for the discovery of useful unseen patterns from considerable databases. Now-a -days many common diseases are increasing and that can be overcome by using the medicinal uses of plants. Information related to medicinal plants, available in the world a lot but they are scattered .This paper presents an innovative idea about medicinal plants. This idea provides better choice for every class of people therapeutically instead of using synthetic medicine. With the help of data mining pharmaceutical value of plants and its parts are utilized in this paper. Different characteristics of plants are grouped by an "associative rule mining" .From the mining technique, the better outcome has been deduced for medicinal plants.*

*Keywords:* Data mining Association rule, medicinal plants, treatment.

## 1. INTRODUCTION

Mining process is more than the data scrutiny which in addition spans additional disciplines like Data Warehousing, Statistics, Machine learning and Artificial Intelligence [5]. Significantly useful patterns or meaning in raw data has earlier been called KDD (knowledge discovery in databases), data mining, and knowledge discovery [3] Knowledge discovery is the "non-trivial process of identifying ultimately understandable patterns in data." Data mining "consists of applying data Analysis and discovery algorithms that produce particular patterns over the data". Data mining is typically a bottom-up knowledge engineering strategy, Knowledge discovery involves the additional steps of target data set selection, data pre processing, and data reduction, which occur prior to data mining. In the following, the performance view about data mining proposed by agarwal et.al and the association rules classification predicted for medical data mining given by deepika et.al, along with uniqueness of data mining is being presented. Agarwal et al. [2] proposed three basic classes of data mining problems. Association rules are used to spot relationships among a set of items in databases. These relationships are not based on natural properties of the data themselves, but rather depend on co-occurrence of the data items. Each and every data mining method serves a different reason depending on the modeling purpose. They are divided into two types namely classification and prediction. Classification models predict definite labels, while prediction models predict continuous-valued functions. Decision Trees and Neural Net works use classification algorithms while Regression, Association Rules and Clustering use prediction algorithms. [4].

## 2. REVIEW OF LITERATURE

Hian Chye Koh and Gerald Tan, explain about the data mining applications in healthcare management. In particular, discusses data mining and its applications within healthcare in major areas such as the evaluation of treatment effectiveness, management of healthcare, customer relationship management, and the detection of fraud and abuse along with an illustrative example of a healthcare data mining application involving the identification of risk factors associated with the onset of diabetes [4].states that Data mining techniques have been used in medical research for many years and have been known to be effective in extracting information from medicinal data [7]. A Hybrid Data Mining Method has helped, for example, with a medical classification of chest pain. A hybrid methodology that combined data mining techniques (such as association rules and classification trees) was used in order to solve problems faced by emergency departments such as long waiting time, congestion, and delayed patient care. The methodology has also been applied to analyze emergency data collected from a hospital. The results are expected to help physicians make more accurate classification of chest pain diseases. Abdullah, Ahmad and Ahmed [8] demonstrate that association techniques can be used to yield association rules in medical billing data. Their motivation in this research work is to uncover patterns of resemblance between medical bill and purchase bills. The Association technique in particular, has been applied through the apriori algorithm, in numerous medical projects. A research by [9] studies how data mining techniques are used for the data analysis and knowledge discovery in medical sciences using the apriori algorithm and a self developed algorithm. The author claims to have used realistic values from a medical database which makes their output reliable, efficient and precise for decision making. Specifically results may be used for analyzing and improving performance by the medical staff.[10] stated that so many medicinal plants are available and used by mankind from the time immemorial. But many of the medicinal plant species are facing threats of extinction due to over and improper exploitation, habitat loss, degradation of land, urbanization, *etc*. In this study, the hierarchical clustering technique of data mining was

applied on the herbal gardens of India and classified in order to discover meaningful patterns such as what type of habit of medicinal plant species is present in which location of India.

## 3. ASSOCIATION RULE MINING ALGORITHM

Association rule mining one of the most significant and well researched techniques in data mining was introduced by R. Agarwal [1].The problem of association rule mining can be decomposed into two sub problems.

• Discovering frequent item sets
• Generating rules from frequent item sets.

Association rules are in no way different from classification rules except that does not predict only predict some other attribute. It has freedom to make a combination of attributes. Different association rules express different regularities. The association rule is the number of instances for which it predicts suitably this is often called its support.

Its exactness often called confidence is the number of instances that it predicts appropriately, expressed as proportion of all instances to which it applies. The user has to specify the minimum coverage and accuracy values and look for only those rules whose values are at least of the specified minimum value.

An association rule (AR) is a pair (X, Y) of sets of attributes, denoted by $X \rightarrow Y$. X is the antecedent and Y is the consequent of the rule $X \rightarrow Y$. The simplest parameters associated to an AR are its support and confidence. The support of a rule $X \rightarrow Y$ is the number of records that contain all items of X. Clearly, the confidence of $X \longrightarrow Y$ is an estimation of the probability that a record that contains the items of X, chosen at random, will contain the items of Y.

Association rules can be classified based on the type of vales, dimensions of data, and levels of abstractions involved in the rule. If a rule concerns associations between the presence or absence of items, it is called Boolean association rule and the dataset consisting of attributes which can assume only binary (0-absent, 1-present) values is called Boolean database.

## 4. PROPOSED METHODOLOGY

In the below section we presented the origin of major patterns. The data warehouse consists of the information about the plants and their medicinal values. Primarily, the data warehouse is preprocessed to make mining process more competent. In the proposed study, we used the association rule mining algorithm for the classification of data.

### 4.1 DATA SET

The data set holds the atributes like name of the plant, the part used,the medicinal value of the plant, the disease it can cure and the minerals present in the plant. The first one is the Amla tree, in which the amla fruit has a medicinal property. The fruit amla is rich in Vitamin-C which can cure "cough, diabetes, cold, laxity, hyper

acidity. The second one is the Ashok tree in which the flower and bark has the medicinal property to cure the disease like menstrual pain, uterine disorder and diabetes. The third one is Aswagantha, it is considered as an herb, where its roots and leaves are used to cure restorative tonic, stress, nerves disorder, aphrod. The fourth one is Beal tree also known as Bilva tree, where its fruits and bark are used to cure diarrhea, dysentery and constipation. The next one is Bhumi Amla which is an herb, where its whole part holds the medicinal values to cure disease like Jaundice, Aenimic, Dropsy. The next one is Brahmi which is also a herb, where its whole part possess the medicinal property. It acts as a memory enhancer, cures nervous and mental disorder. The next one is Chiraita, which is also an herb, where its whole part possesses medicinal value. The chiraita is used to cure skin disease, burns, sensation and fever. Gudmar also known as madhunasini, is a climber where its leaves are used to cure hydrophil, diabetes and asthma.

In Guggul tree, the gun rasine are used to cure rheumatised, arthritis, paralysis, laxative. Guluchi also known as Giloe is a climber the stems are used to cure the diseases like gout, pile, general debility, fever and jaundice. Kalmegh also known as Bhui is an herb, where its whole part is used to cure fever, weekness and release of gas. Long pepper also known as pippali is a climber , the fruit and root possesses a medicinal properties which can able to cure Appetizer, enlarged spleen, bronchitis, cold and antidote.

Makoi is an herb where its fruit and whole plant has medicinal values, which is used to cure dropsy, general debility, diuretic and dysenteric. Pashan Bheda also known as pathar chur is an herb where its roots are used to cure kidney stone and calculus. In Sandal wood tree, the heart wood and oil has a medicinal property which can cure skin disorder, burns, sensation, jaundice and cold. Sarpagandha is an herb where the root of sarpagandha is used to cure hypertension and insomnia.

Satavari is a climber where the tuber and root are used to enhance lactation, general weakness, fatigue and cold. Senna is a shrub where its dry tubers are used to cure Rheumatism, general debility tonic, aphrodisiac. Tulsi is a perennial plant where the roots and seeds are used to cure cough, cold, bronchitis, expectorant. Vaividanka is a climber where its roots, fruits and leaves are used to cure skin disease, snake bites, and helminthiasis. Peppermint is an herb where its leaves and flower oil is used to cure digestive disorder and acts as a pain killer

Henna is a shrub where the flower, seed and leaves are used to cure burnings and also acts as anti inflammatory. Gritkumari (Aloevera) is an herb where the leaves are used to cure Laxative, wound healing, skin burns and ulcer. Sada Bahar is an herb where the whole part of sada bahar is used to cure leukemia, hypotension, antisp asmodic, atidot. Vringraj is a herb where the seed as well as the whole part is used to cure digestive disorder, and also acts as a inflammatory and hair tonic. Swet chitrat/perennial is a herb where the root and the root bar are used as a appetizer, and also acts as a anti bacterial and anti cancer. Rakta chitrak is a herb where its root and root

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bar are used to cure inflammation, cough and colic. The seeds of kochila acquire medicinal value which can cure nervous disorder, paralysis and also it helps in healing the wound. In haride tree the seed holds the medicinal value, the harida seeds are used to cure wound, ulcer, inflammation, leprosy and cough.

The seed and bark of Bahada tree has a medicinal value, the bahada bark and seed are used to cure cough, insomnia, vomiting, dropsy and ulcer. Gokhur or crawling puncture is an herb where the whole plant possesses medicinal importance, the whole part of crawling puncture is used to cure aphrodisiac, digestive disorder, urinary problems, and also acts as an appetizer. In Neem tree the rhizome is used to cure sedative, analgesic, epilepsy and hypertension. Anantomool or Indian sarap is a shrub, where its root and leaf are used to cure caraminative, aphrodisiac, astringent and also it acts as a appetizer. Bach also known as sweet flag is an herb where its rhizome are used as sedative, analgesic and also it cures hypertension.

Vasa is a herb where the whole part of the plant possesses medicinal properties and are used as antispasmodic, respite and stimulant. Nageswar champ is a herb where its bark, leaf and flower holds medicinal value and used in the treatment of asthma, skin, burns, vomit, dysentery and piles. Benachar is a shrub where its roots are used in the treatment of hyperdisia, burns, ulcer, skin and vomiting. Mandukparni also known as Indian pennywort is an herb where the whole part of the plant is used in the treatment of anti inflammatory, jaundice, diuretic, diarrhea.

Kainchal creeperbai danka's root hair, seed and leaf are used in the treatment of nervous disorder, constipation, nephrophy, strangury and dropsy. Dalchini is a perennial shrub where the bark and oil are used in the treatment of bronchitis, asthma, cardiac disorder and fever. Kurai is a shrub where the bark and seed are used in the treatment of scabies, antipyretic, amoebioc dysentery. Kandakatri is a akranti perennial, whewr the whole plent ea well as the fruit and seed are used in the treatment of diureti, anti inflammatory, appetizer, stomachic.

Rule 1:
IF (Plant = Amla AND Medicine = Chlorpropamids) THEN Diseases to be cured = Diabeties

Rule 2:
IF (Plant = Ashoka AND Medicine = Dgsmenorrhae) Diseases that can be cured = Mensural pain.

Rule 3:
IF (Plant = Aswagandha AND Medicine = Bismuth) Diseases that can be cured = Stress

Rule 4:
IF (Plant = Brahmi AND Medicine = Benzodiazepines ) Diseases that can be cured = nervousness

Rule 5:
IF (Plant = Senna AND Medicine = Cobadex Forte ) Diseases that can be cured = rheumatism.

Rule 6:
IF (Plant = Sandal wood AND Medicine = Zevit) Diseases that can be cured = Burnings and wounds

Rule 7:
IF (Plant = Henna AND Medicine = Retinyl Palmitate ) Diseases that can be cured = Inflammation.

Rule 8:
IF (Plant = Tulsi AND Medicine = Acroplex Forte) Diseases that can be cured = Cough, cold,bronchitis

Rule 9:
IF (Plant = Guggul AND Medicine = Carotenoids ) Diseases that can be cured = laxative.

Rule 10:
IF (Plant = Guluchi AND Medicine = Beta Carotine ) Diseases that can be cured = cancer.

**Table 1.**DATA SET

| Plant | Minerals present | Curable Disease | Medicine |
|---|---|---|---|
| Amla | Iron, zinc, antioxidants | Diabetics | Chlorpropamids |
| Ashoka | Bioflavonoids,amino acids, methnol | Mensturral pain | Dgsmenorrhea |
| Aswagandha | Calcium,magnesium,copper, zinc iron | Stress | Bismuth,Subsalicy |
| Brahmi | Zinc, selenium, antioxidant | Nervous | |
| Senna | Potassium | Rheumatism | Cobadex Forte |
| Sandal wood | Potassium, Zinc, copper, sodium | Burning | Zevit |
| Henna | Gallic acid, tannin, hydroxyl napthoquinone | Inflammation | Reninol, palmitate. |
| Tulsi | Calcium, iron, manganese, potassium,magnesium | Cough, cold,bronchitis | Acroplex Forte. |
| Guggul | Resin,sterones,ethyl acetate | Reduces laxative | Carotenoids |
| Guluchi | Phosporous, calcium, zinc, iron,mangane | Cancer | Beta Carotine |

## 5. CONCLUSION

The proposed work contains diverse of plants with different medicinal uses which can help the user to recover from the disease it contains the useful information about the plants, trees, shrubs, climbers and creepers. And the part that holds variety of medicinal uses to cure disease. Plants are the naturally available resources and this can be referred for pharmaceutical industry in the manufacture of tablets, ointments and tonics.

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