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Anti-inflammatory and anti-diabetic activities with their other ethnomedicinal properties of the plants.

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Medicinal plants cure many diseases associated with inflammation like cardiovascular diseases, diabetes, cancer and rheumatoid arthritis. In recent years, natural compounds such as phenolic acids, flavonoids, triterpenes and alkaloids present in various plants, act as potential anti diabetic and anti-inflammatory agents. The main difficulties in using natural products as a source for pharmaceutical lead compounds involve separating the compounds from the crude extracts. In search for novel anti-inflammatory and anti-diabetic plants are still intensifying. This study, confirms different plant species revealing anti-inflammatory and anti-diabetic capabilities along with their other medicinal activities.

Keyword: Anti-inflammatory, Anti-diabetic, Medicinal properties.

1. Introduction

This world gifted with medicinal plants for various diseases and these are found to be grown in different climatic conditions. Many rural areas depend on medicinal plants for their drug source as well as livelihood. The chemical compound present in all medicinal plants confers their therapeutic potency.

Inflammation is mainly depends upon the disease clinically defined as a pathophysiological process characterized by edema and pain. Mainly occurs in response to injury, lipid peroxidation, or by an infection. The signs and symptoms of inflammation include redness, swelling, heat, pain and loss of function of the affected area [1]. These foreign bodies or invaders causes tissue damage and it leads to release of vasoactive and

chemotactic factors which attracts blood towards site of invasion and process of exudate, diapedesis, phagocytosis will occurs. Sometimes due to over reaction of this process not only causes damage to invaders but also to the organ or tissue nearby the site of invasion. To protect an organ or cells due to overreaction we majorly depends on an anti-inflammatory drugs which mainly works against opioids. At present there are so many artificial anti-inflammatory drugs were available in market with some side effects. So it is essential to search for anti-inflammatory drugs from natural source and with less number of side effects. Plants are free gifted natural source and these plant molecules like flavonoids are broadly distributed in them and have been reported to display marked *in vitro* and *in vivo*

anti-inflammatory properties [2,3]. From the past ancient times India is well known due to availability of several thousands of medicinal plants in the different bioclimatic zones [4]. Recent research suggests that inflammation is the main gateway for many diseases like diabetes rheumatoid arthritis, cardiovascular diseases and cancer etc. Diabetes people can't control their sugar levels in their blood but an anti-inflammatory drug diet can helpful in prevent and treat diabetes. Rheumatoid arthritis represents the familiar form of chronic inflammatory joint disease [5] an estimated 1-2% of adult population is affected [6]. The present review is aimed at compiling data based on reported works on promising phytochemicals from medicinal plants. Phytochemicals have the protective or disease preventing property which not only useful to

them but also useful to mankind. They have wide stream of activities like anti-inflammatory, anti-diabetic, antioxidant, hormonal action, and stimulation of enzymes, interference with DNA replication, anti-bacterial effect and physical adhesion to cells. The aim of this study is to find endangered medicinal plants which show anti-inflammatory activity. *Entada pursaetha* and *Strychnos colubrina* are identified in Eastern Ghats of Andhra Pradesh. These two plants are used to treat inflammation by local people. So this study is more useful to focus on those two plants because there was a very little information regarding those plants. Phytochemical and antioxidant properties were analyzed. *In vitro* and *In vivo* analysis is to be done by using the isolated active compounds from those plants.

Table: 1 Plants reporting anti-diabetic activity and other medicinal uses.

S. No	Scientific Name	Medicinal Use
A		
1.	<i>Acacia benthami</i>	Anti-inflammatory, Chronic diarrhea, Cough, Anti – Diabetic [7]
2.	<i>Aconitum carmichaeli</i>	Anti-inflammatory, Narcotic, Diuretic, Anodyne, Diaphoretic, Anti – Diabetic [8]
3.	<i>Acacia catechu</i>	Anti-inflammatory, Ripe in constipation, Diarrhea, Wounds, Ulcers, Anti – Diabetic [9]
4.	<i>Aconitum ferox</i>	Anti-inflammatory, Neuralgia, Leprosy, Cholera, Rheumatism, Diuretic, Diaphoretic, Anti – Diabetic [10]
5.	<i>Acrocomia mexicana</i>	Anti-inflammatory, Fragrant, Dye color, Anti – Diabetic [11]
B		
6.	<i>Bauhinia forficata</i>	Anti-inflammatory, Renal problems, Asthma, Anti – Diabetic [12]
7.	<i>Berberis aristata</i>	Anti-inflammatory, Eye disorders, Liver disorders, Skin infections, Obesity, Anti – Diabetic [13]
8.	<i>Beta vulgaris</i>	Anti-inflammatory, Anti tumor, Emmenagogue, Anti – Diabetic [14]
9.	<i>Butea monosperma</i>	Anti-inflammatory, Pthisis, Haemorrhage, Erysipalous, Ring worms, Wounds, Diarrhea, Intestinal worms, Anti – Diabetic [15]
10.	<i>Berberis vulgaris</i>	Anti-inflammatory, Anti bacterial, Anti pruritic, Ophthalmic, Anti septic, Stomachic, Anti – Diabetic [16]
C		
11.	<i>Caesalpinia bonducella</i>	Anti-inflammatory, Anti periodic, Anti spasmodic, Anthelmintic, Febrifuge, Asthma, Emmenagogue, Anti – Diabetic [17]

12.	<i>Capsicum annuum</i>	Anti-inflammatory, Carminative , Stimulant, Counter irritant, Throat diseases, Toothaches, Anti – Diabetic ^[18]
13.	<i>Cassia occidentalis</i>	Anti-inflammatory, Purgative, Febrifuge, Diuretic, Anti periodic, Cough, Skin diseases, Anti – Diabetic ^[19]
14.	<i>Caralluma edulis</i>	Anti-inflammatory, Anti oxidant, Anti – Diabetic ^[20]
15.	<i>Caesalpinia bonducella</i>	Anti-inflammatory, Anti periodic, Anti spasmodic, Anthelmintic, Febrifuge, Anti inflammatory, Intermittent fevers, Anti – Diabetic ^[21]
D		
16.	<i>Dioscorea dumetorum tuber</i>	Anti-inflammatory, Hyper lipidaemia, Anti inflammatory, Hyper ketonaemia, Hyper cholesterolaemia, Anti – Diabetic ^[22]
17.	<i>Dioscorea gracillima</i>	Anti-inflammatory, Hyper lipidaemia, Malaria, Anti – Diabetic ^[23]
18.	<i>Diospyros peregrina gurke</i>	Anti-inflammatory, Anti diarrhea, Anti stress activity, Anti oxidant, Anti microbial, Anti – Diabetic ^[23]
19.	<i>Dolichos biflorus</i>	Anti-inflammatory, Anti oxidant, Induced oxidative stress, Anti hepatotoxic activity, Anti lithiatic activity, Anti – Diabetic ^[23]
20.	<i>Dolichos lablab</i>	Anti-inflammatory, Aphrodisiac, Flatulent, Biliou, Febrifuge, Stomachic, Anti spasmodic, Phlegmatic dis orders, Anti – Diabetic ^[24]
E		
21.	<i>Entada pursaetha</i>	used in curing liver troubles, allaying body pains, in warding off cold, curing eye diseases, arthritis, and paralysis ^[25]
22.	<i>Eriobotrya japonica</i>	Anti-inflammatory, Anti oxidant, Anti viral, Anti – Diabetic ^[26]
23.	<i>Eucalyptus globulus</i>	Anti-inflammatory, Carminative, Stimulant, Expectorant, Anti septic, Respiratory infections, Diphtheria, Anti – Diabetic ^[27]
24.	<i>Eugenia jambolana</i>	Anti-inflammatory, Astringent , Diuretic , Sorethroat, Diarrhea, Anti – Diabetic ^[28]
25.	<i>Eugenia uniflora</i>	Anti-inflammatory, Anti microbial, Febrifuge, Astringent, Stomach problems, Anti – Diabetic ^[29]
26.	<i>Euonymus alatus</i>	Anti-inflammatory, Anodyne, Anti pruritic, Cancer, Carminative, Anti – Diabetic ^[30]
F		
27.	<i>Fenugreek</i>	Anti-inflammatory, Carminative, Anti tumor, Restorative, Laxative, Hypotensive, Diuretic, Anti – Diabetic ^[31]
28.	<i>Ficus bengalensis</i>	Anti-inflammatory, Blood purifier, Heart ailments, Anti – Diabetic ^[32]
29.	<i>Ficus carica</i>	Anti-inflammatory, Demulcent, Aperient, Emollient, Destroy worms, Anti – Diabetic ^[33]
30.	<i>Ficus glomerata</i>	Anti-inflammatory, Respiratory dis orders, Galactogauge , Astringent , Carminative , Wormicide, Anti – Diabetic ^[32]
31.	<i>Ficus racemosa</i>	Anti-inflammatory, Astringent , Promotes healing, Edema , Anti - Diabetic Traumatic swelling and toothache ^[34]

G		
32.	<i>Ginkgo biloba</i>	Anti-inflammatory, Asthma, Sputum and coughing, Palpitation, Leukorrhea, Anti – Diabetic ^[35]
33.	<i>Glycine max messill</i>	Anti-inflammatory, Antidote, Astringent, Laxative, Resolvent, Ophthalmic, Anti – Diabetic ^[36]
34.	<i>Glycyrrhiza glabra</i>	Anti-inflammatory, Constipation , Stomachic , Muscular pains, Corns , Rejuvenator , Demulcent , Expectorant , Mouth ulcers, Anti – Diabetic ^[37]
35.	<i>Glycyrrhizae radix</i>	Anti-inflammatory, Anti oxidant, Immuno modulatory effects, Anti – Diabetic ^[38]
36.	<i>Gymnema sylvestre</i>	Anti-inflammatory, Diarrhea , Anti sweet activity, Stimulant, Laxative, Weight control, Stomachic, Cough, Anti – Diabetic ^[39]
37.	<i>Gynostemma pentaphyllum</i>	Anti-inflammatory, Hepato protective, Anti gastric ulcer, Anti – Diabetic ^[40]
H		
38.	<i>Helichrysum plicatum</i>	Anti-inflammatory, Antinociceptive, Anti bacterial, Anti oxidant, Anti inflammatory, Anti – Diabetic ^[41]
39.	<i>Helicteres isora</i>	Anti-inflammatory, Hypo lipidemic, Anti spasmodic, Anti – Diabetic ^[36]
40.	<i>Hemidesmus indicus</i>	Anti-inflammatory, Anti microbial, Anti oxidant, Anti – Diabetic ^[42]
41.	<i>Hexa chlamys edulis</i>	Anti-inflammatory, Astringent, Anti – Diabetic ^[43]
42.	<i>Hibiscus rosa-sinensis</i>	Anti-inflammatory, Aphrodisiac, Anodyne, Laxative, Anti – Diabetic, Refrigerant ^[44]
I		
43.	<i>Inula britannica</i>	Anti-inflammatory, Anti bacterial, Cancer, Vulnerary, Depurative, Carminative, Laxative, Expectorant, Anti – Diabetic ^[45]
44.	<i>Ipomoea aquatica Forssk</i>	Anti-inflammatory, Purgative, Blood purifier, Emetic, Antidote for opium, Anti – Diabetic ^[46]
45.	<i>Ipomoea batatas</i>	Anti-inflammatory, Nutritive , Useful in scorpion bites, Anti – Diabetic ^[47]
J		
46.	<i>Juglans regia L</i>	Anti-inflammatory, Anti septic, Stimulant , Brain tonic, Expectorant, Anti – Diabetic ^[48]
47.	<i>Juniperus communis Thumb</i>	Anti-inflammatory, Diuretic , Carminative , Stimulant , Dropsy , Anti – Diabetic ^[49]
K		
48.	<i>Kandelia rheedii wight</i>	Anti-inflammatory, Fragrance, Anti – Diabetic ^[23]
49.	<i>Kickxia ramosissima</i>	Anti-inflammatory, Febrifuge, Anti leishmanial, Immuno stimulating activities, Anti – Diabetic ^[23]
50.	<i>Krameria triandra (ruiz&pav)</i>	Anti-inflammatory, Used for stones in the bladder, Cardiac stimulant, Liver disorders, Anti – Diabetic ^[23]
51.	<i>Kyllinga triceps</i>	Anti-inflammatory, Improves hair growth, Anti – Diabetic ^[23]
L		
52.	<i>Lablab purpureus</i>	Anti-inflammatory, Febrifuge, Stomachic, Anti spasmodic, Laxative, Diuretic, Anti – Diabetic ^[50]

53.	<i>Lycoris radiata</i>	Anti-inflammatory, Cancer, Emetic, Poulitice, Expectorant, Anti – Diabetic ^[51]
54.	<i>Loranthus microrathus</i>	Anti-inflammatory, Emmenagogue, Anti – Diabetic ^[52]
55.	<i>Lupinus albus</i>	Anti-inflammatory, Diuretic, Emmenagogue, Vermifuge, Anti – Diabetic ^[53]
56.	<i>Lupinus termis forssk</i>	Anti-inflammatory, Anti tumors, Anti – Diabetic ^[54]
M		
57.	<i>Medicago sativa</i>	Anti-inflammatory, Haemostatic, Anodyne, Anti bacterial, Aperieant , Emetic, Diuretic, Febrifuge, Anti – Diabetic ^[55]
58.	<i>Memecylon umbellatum</i>	Anti-inflammatory, Gonorrhoea, Anti – Diabetic ^[56]
59.	<i>Mentha longifolia</i>	Anti-inflammatory, Anti asthmatic, Anti septic, Anti spasmodic, Carminative, Stimulant, Anti – Diabetic ^[57]
60.	<i>Morus indica</i>	Anti-inflammatory, Liver diseases, Lung diseases, Fevers, Stomach bleeding, Anti – Diabetic ^[58]
61.	<i>Momordica charantia</i>	Anti-inflammatory, Stomachic, Stimulant, Emetic, Anti bilious, Laxative, Anthelmintic, Anti tumor, Anti - Diabetic Actimic ^[59]
N		
62.	<i>Naurolaena lobata</i>	Anti-inflammatory, Microfilaricidal, Anti plasmodic, Anti – Diabetic ^[60]
63.	<i>Nigella sativa</i>	Anti-inflammatory, Anthelmintic, Carminative, Stimulant, Diuretic, Digestive, Diaphoretic, Anti – Diabetic ^[61]
64.	<i>Nymphaea stellata</i>	Anti-inflammatory, Fragrance, Dye colour, Anti hepato toxic, Anti – Diabetic ^[62]
O		
65.	<i>Ocimum tenuiflorum</i>	Anti-inflammatory, Digestive disorders, Anti – Diabetic ^[63]
66.	<i>Olive leaf</i>	Anti-inflammatory, Anti oxidant, Anti viral, Anti – Diabetic ^[64]
67.	<i>Opuntia lindheimeri</i>	Anti-inflammatory, Anti oxidents, Diarrhoea, Stomach ache, Hair conditioner, Anti – Diabetic ^[65]
68.	<i>Opuntia streptacantha</i>	Anti-inflammatory, Dye production, Fragrance, Preservative, Anti – Diabetic ^[66]
69.	<i>Origanum syriacum</i>	Anti-inflammatory, Anti ulcerogenic, Anti microbial activity, Anti – Diabetic ^[67]
P		
70.	<i>Panax ginseng</i>	Anti-inflammatory, Adaptogens, Aphrodisiacs, Stimulants, Anti-Diabetic ^[68]
71.	<i>Parthenium hysterophorus</i>	Anti-inflammatory, Reckoned tonic, Stimulator, Anti hysteric , Febrifuge, Anti – Diabetic ^[69]
72.	<i>Persea americana</i>	Anti-inflammatory, Hepato protective, Anti – Diabetic ^[70]
73.	<i>Phaseolus vulgaris</i>	Anti-inflammatory, Cardiotonic, Carminative, Depurulative, Digestive, Diuretic, Cutaneous leishmanial lesions, Anti – Diabetic ^[71]
74.	<i>Phaseolus mungo</i>	Anti-inflammatory, Fevers, Relieving the heat and burning of the eyes, Anti – Diabetic ^[72]
75.	<i>Plumeria rubra</i>	ulcers, leprosy, inflammations and rubefacient ^[73]
Q		
76.	<i>Quercus lamellosa</i>	Anti-inflammatory, Astringent, Fuel, Haemorrhages, Diarrhoea, Dysentery, Anti – Diabetic ^[23]

R		
77.	<i>Rhamnus purshiana</i>	Anti-inflammatory, Laxative, Anti – Diabetic [74]
78.	<i>Rhazya stricta</i>	Anti-inflammatory, Anti oxidant, Anti – Diabetic [75]
79.	<i>Rheum officinale</i>	Anti-inflammatory, Antiseptic, Anti tumor, Aperient, Diuretic, Stomachic, Anti – Diabetic [76]
80.	<i>Rhus coriaria</i>	Anti-inflammatory, Astringent, Diuretic, Styptic, Dye, Anti – Diabetic [77]
81.	<i>Rhizophora mangle</i>	Anti-inflammatory, Throat cancer, Astringent, Expectorant, Emmenagogue , Diarrhea, Anti – Diabetic [78]
S		
82.	<i>Sambucus nigra</i>	Anti-inflammatory, Bronchitis, Cold, Coughing, Flu, Herpes , Mucous membrane infections, Anti – Diabetic, arthritis [79]
83.	<i>Saussurea costus</i>	Anti-inflammatory, Anodyne, Anti bacterial , Vermifuge, Carminative, Stimulant, Aphrodisiac, Anti – Diabetic [80]
84.	<i>Scoparia dulcis</i>	Anti-inflammatory, Fevers, Branchitis, Dental problems, Anti – Diabetic [81]
85.	<i>Securinega virosa</i>	Anti-inflammatory, Anti diarrhoeal, Anti – Diabetic [82]
86.	<i>Smallanthus sonchifolius</i>	Anti-inflammatory, Anti bacterial, Anti fungal, Fights free radicals, Liver disorders, Anti – Diabetic [83]
87.	<i>Strychnos colubrina</i>	Alleviates pain , removes swelling intermittent fevers, Dyspepsia and malarial cachexia [84]
T		
88.	<i>Taxus cuspidata</i>	Anti-inflammatory, Cancer, Ovarian cancer, Dye, Anti – Diabetic [85]
89.	<i>Teramnus labialis</i>	Anti-inflammatory, Anti inflammatory, Analgesic, Anti – Diabetic [86]
90.	<i>Terminalia pallida</i>	Anti-inflammatory, Diuretic, Anti bacterial, Anti ulcer, Antipyretic, Purgative, Cold, Diarrhoea, Cough, Anti – Diabetic [87]
91.	<i>Terminali arjuna</i>	Anti-inflammatory, Cardio tonic, Anti anginal, Asthma, Fractures, Dysentery, Anti – Diabetic [88]
92.	<i>Terminalia catappa</i>	Anti-inflammatory, Leprosy, Skin diseases, Asthma, Anti – Diabetic, Travel nausea, Rheumatic pains [89]
U		
93.	<i>Urtica urens</i>	Anti-inflammatory, Skin diseases, Uterine fevers, Gout, Anti - Diabetic Hemorrhage [23]
V		
94.	<i>Viscum album</i>	Anti-inflammatory, Emetic , Purgative , Anti – Diabetic, Hernia [90]
95.	<i>Verbesina persicifolia</i>	Anti-inflammatory, Analgesic, Anti bacterial, Anti coagulant, Anti tumor, Astringent, Vulnerary, Stimulant, Diuretic, Anti – Diabetic [91]
96.	<i>Vittadinia australis</i>	Anti-inflammatory, Emetic, Anti – Diabetic [23]
X		
97.	<i>Xanth oxalis corniculata</i>	Anti-inflammatory, Emmenagogue, Febrifuge, Stomachic, Styptic, Astringent, Anti scorbutic, Anti – Diabetic [23]
Z		
98.	<i>Zea mays</i>	Anti-inflammatory, Anti cancer, Demulcent, Cholagogue, Diuretic, Hypo tensive, Lithontripic, Vaso dilator, Warts, Anti – Diabetic [92]

99.	<i>Ziziphus sativa</i>	Anti-inflammatory, Mental retardation, Cold, Piles, Hair growth, Anti – Diabetic, Mouth ulcers, Sedative, Anodyne, Antidote, Astringent, Emollient, Hypnotic, Pectoral ^[93]
100.	<i>Zizyphus spina-christi</i>	Anti-inflammatory, Fragrance, Dye colour, Hepatic disorder, Anti – Diabetic ^[94]
101.	<i>Zyzyphus jujuba</i>	Anti-inflammatory, Anxiety, Mental retardation, Cold, Piles, Hair growth, Mouth ulcers, Anti – Diabetic ^[95]

2. Conclusion

Most research focused on the identification and characterization of active principle(s) from crude extracts of medicinal plants. However, many hidden therapeutic molecules are present in the crude plant drugs all of them should be brought into lime light. The occurrence of arthritis is increasing now day by day due to present living conditions. In this review article, an attempt has been made to aggregate the reported of anti-inflammatory and anti-diabetic plants along with several medicinal properties in consideration to the health aspects.

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