

# **Summary and Conclusion**

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## 5. SUMMARY AND CONCLUSION

Herbal remedies are gaining popularity as the public became disenchanted with orthodox medicine and resorts to remedies with reputation of being safe and efficacious. The use of herbal remedies throughout the world exceeds that of conventional drugs by two to three times. Scientific evidence validates the pharmacological action of medicinal plants. Medicinal plants might represent an alternative treatment in non-severe cases of infectious diseases and they can also be a possible source for new potent antibiotics to which pathogen strains are not resistant. Many indigenous medicinal plants have been reported by various authors to have antidiabetic properties and plant products investigated have extensively reviewed. In large number of cases, treatments with traditional medicines in the form of the plant extracts have been reported to give remarkably good results. Although synthetic drugs are available, the search for indigenous natural antidiabetic agent is still on going.

The present study has been formulated with an objective to establish the antioxidant potential, antimicrobial activity and antidiabetic effect of two different medicinal plants namely *Syzygium cumini* and *Momordica charantia*. The plant parts such as leaves and seeds were collected, washed and air dried in room temperature. Dried leaves and seeds were taken separately and powdered. The leaf powder and seed powder of the two different plants were mixed separately to prepare the herbal seed and leaf mixture.

The herbal mixture, leaf and seed powder obtained from the plants were extracted with different buffers and the extracts were analyzed for the various Enzymic antioxidants (Catalase, Peroxidase, Superoxide Dismutase, Polyphenol Oxidase, Glutathione-S-transferase, Glutathione peroxidase and Glutathione reductase) and Non-enzymic antioxidants (Ascorbic acid,  $\alpha$ -Tocopherol, Reduced Glutathione, Polyphenol, Carotenoid and Lycopene). The content of Protein and Carbohydrate was also estimated in the plant

samples. In addition, the free radical scavenging potential of the plants was evaluated in terms of inhibition of *in vitro* lipid peroxidation, superoxide generation and nitric oxide generation. The alcoholic extract of the plant samples was tested for antibacterial activity. The antidiabetic effect of the selected medicinal plants was determined by supplementing diabetic patients with seed powder of the two selected plants.

### **The findings of the study are summarized below**

The seed extract of *Syzygium cumini* exhibited maximum activity of Catalase, Superoxide Dismutase, Glutathione-S-transferase and Glutathione peroxidase. The seed extract of *Momordica charantia* showed the greatest activity for peroxidase and the leaf extract for Glutathione reductase. The highest polyphenol activity was observed in the extract of leaf mixture. The seed extract of *Momordica charantia* was found to be the poorest source of the above mentioned enzymes except peroxidase and Glutathione-S-transferase.

Analysis of various non-enzymic antioxidants revealed *Syzygium cumini* as the richest source of Ascorbate,  $\alpha$ -Tocopherol, Reduced Glutathione and Lycopene and *Momordica charantia* as the richest source of Polyphenol and Carotenoid. The seed extract of *Momordica charantia* and seed mixture was found to be the poorest source of all the non-enzymic antioxidants analyzed except polyphenol which was present in the lowest concentration in the leaf extract of *Momordica charantia*.

Comparison of the protein content of various extracts of the two different plants suggests that both the leaf and the seed of *Syzygium cumini* as the good source of protein. But the Carbohydrate content was found to be maximum only in the seeds of *Syzygium cumini* and the leaf of the same plant recorded the lowest value for carbohydrate.

*Syzygium cumini* was superior in inhibiting lipid peroxidation and nitric oxide generation than *Momordica charantia* which inhibited only superoxide generation to a greater extent.

The antimicrobial activity of the plant extracts revealed that either the leaf or the seed mixture inhibited the growth of *Escherichia coli*, *Bacillus subtilis*, *Pseudomonas aeruginosa* to a greater extent at the concentration of 400µg and 800µg and at higher concentration (1200µg) the leaf and seed extract of *Momordica charantia*. At high concentration (1200µg) *Momordica charantia* exhibited maximum zone of inhibition against *Escherichia coli* and the seed extract against *Bacillus subtilis* and *Pseudomonas aeruginosa*. Of the two different plants studied *Momordica charantia* was found to be more effective in inhibiting the bacterial growth than *Syzygium cumini* at various concentrations.

Supplementation of diabetic patients with the seed powder of *Syzygium cumini* and *Momordica charantia* for a period of 40 days revealed that the blood glucose level was found to be significantly reduced in diabetics who were in the age group of 50-60 and 60-70. In the case of other diabetics whose age ranged from 40-50 the decrease in the blood glucose level was statistically insignificant.

The findings suggest that the antioxidant potential of the plant extracts could be exploited for preparation of nutraceuticals with potent antioxidant activity. The antibacterial activity of the extracts open the possibility of finding new clinically effective antibacterial compounds which have enormous therapeutic potential as they can serve the purpose without any side effects. The hypoglycemic effect of the seed powders of the selected plants could be considered for their potential and promising use in treating diabetics.

## **FUTURE RECOMMENDATIONS**

1. The plants can be used to discover bioactive natural products that may serve as leads for the development of new pharmaceuticals that address hither to unmet therapeutic needs.
2. Purification and Characterization of the active components in the plants may be explored for their efficacy.