Evaluation of the Nutritive and Organoleptic Values of Food Products Developed by Incorporating Catharanthus roseus (Sadabahar) Fresh Leaves and Exploring Their Hypoglycemic Potential

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Abstract- The increasing prevalence of diabetes mellitus and lifestyle-related metabolic disorders has created a demand for functional foods with hypoglycemic potential. Catharanthus roseus (Sadabahar), widely known for its antidiabetic phytoconstituents, has traditionally been used in herbal remedies. This study aimed to develop food products incorporated with fresh C. roseus leaves, evaluate their nutritive and sensory (organoleptic) qualities, and explore their hypoglycemic potential. Standard recipes were modified by adding varying proportions of C. roseus leaves. Nutritional analysis included proximate composition, vitamin and mineral content, while sensory attributes were assessed using a 9-point hedonic scale. Preliminary screening of hypoglycemic activity was conducted through in vitro glucose diffusion assay. Results indicated that incorporation of fresh leaves improved dietary fiber, vitamin C, and mineral (iron, calcium, magnesium) content, with minimal adverse effects on sensory properties at lower inclusion levels (5–10%). In vitro assays suggested a promising reduction in glucose diffusion, highlighting potential hypoglycemic benefits. Thus, C. roseus-fortified food products may serve as cost-effective functional foods for dietary management of diabetes and related disorders.

Keywords: Catharanthus roseus, Sadabahar, functional foods, hypoglycemic potential, organoleptic evaluation, nutritive value.

1. INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder characterized by hyperglycemia resulting from impaired insulin secretion or action. Globally, its prevalence is increasing, making dietary interventions and functional foods a critical research priority. Catharanthus roseus (Sadabahar), belonging to the Apocynaceae family, is an ornamental plant with high medicinal value. Its leaves contain alkaloids, flavonoids, tannins, and phenolics, many of which demonstrate hypoglycemic and antioxidant properties. While traditionally consumed in herbal medicine, its incorporation into regular diets as a functional food ingredient has been underexplored. This study was designed to: (i) develop food products enriched with C. roseus leaves, (ii) evaluate their nutritive and organoleptic values, and (iii) explore their hypoglycemic potential.

2. MATERIALS AND METHODS

2.1 Raw Material Procurement: Fresh C. roseus leaves were collected from pesticide-free gardens, thoroughly washed, blanched, and chopped.

2.2 Product Development: Selected food items (chapati, thepla, soup, cutlets) were prepared with C. roseus leaf incorporation at 5%, 10%, and 15% (w/w basis), along with controls.

2.3 Nutritional Analysis: Proximate composition (carbohydrate, protein, fat, ash, moisture, fiber) was estimated using AOAC methods. Vitamins and minerals were assessed through titrimetric and spectrophotometric techniques.

2.4 Organoleptic Evaluation: A semi-trained panel of 30 participants evaluated products using the 9-point hedonic scale for color, texture, flavor, taste, and overall acceptability.

2.5 In vitro Hypoglycemic Activity: A glucose diffusion assay was performed using dialysis membranes. The retardation of glucose movement was

measured spectrophotometrically, reflecting hypoglycemic potential.

2.6 Statistical Analysis: ANOVA was applied, with significance set at $p < 0.05$.

3. RESULTS

3.1 Nutritional Composition: Leaf incorporation increased fiber (by 12–18%), vitamin C, calcium, and iron content compared to controls.

3.2 Organoleptic Evaluation: Products with 5–10% incorporation scored well (7–8/9) for acceptability. Higher inclusion (15%) reduced palatability due to bitterness.

3.3 Hypoglycemic Potential: In vitro analysis revealed a significant reduction in glucose diffusion in samples containing C. roseus compared to control, indicating hypoglycemic potential.

4. Discussion

Results show that C. roseus enhances the nutritive value of foods while maintaining acceptable sensory qualities at 5–10% incorporation. These findings support earlier reports of its hypoglycemic and antioxidant activity. Excessive incorporation, however, compromises taste, limiting application at higher levels. Future in vivo studies are recommended to validate its role in diabetes management.

5. CONCLUSION

Catharanthus roseus leaves can be incorporated into common food products to enhance nutrition and provide functional benefits. Optimal incorporation (5–10%) results in acceptable sensory properties and promising hypoglycemic activity, making it a potential dietary adjunct in managing diabetes.

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