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Review Article

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Siddha Herbo- Metallic Formulation Kushtakajakesari - A Scientific Review

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Introduction

Siddha medicine is one of the oldest traditional healing systems, originating from South India, particularly Tamil Nadu. It is based on ancient texts attributed to Siddhars, who were both spiritual and medical practitioners. The system emphasizes the balance of the body's three humors*(Vata, Pitta, and Kapha)* and the five elements (earth, water, fire, air, and space). Siddha incorporates herbal remedies, minerals, and even animal products, focusing on holistic health by addressing physical, mental, and spiritual well-being[1].

Treatments often include lifestyle modifications, dietary recommendations, and therapies like yoga

and meditation. The philosophy behind Siddha medicine revolves around the idea of achieving harmony with nature and oneself. [2]

Many medications had been indicated for several ailments where skin diseases and veneral diseases plays a predominant role. The Siddha herbo-metallic formulation *Kushtakajakesari* (KGK) is one among them mentioned in the Siddha Classical literature "*Siddha Vaidhya Thirattu".* The drug comprises of *Abraga Parpam, Rasa Parpam, Aya chendooram , Kaanthachendooram* blended together and grinded with the juice of *Savuripazham (Tricosanthestricus pidata).*[3]

This review mainly focuses on gathering the scientific evidence of the previous research studies conducted on this drug and gives us valid insight of this drug related to its literature and previous studies conducted.

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2. Materials and Methods

The drug profile and previous scientific tudies been reviewed in classical Siddha literature and several publications from online databases like Google Scholar, PubMed, Research Gate, Scopus, Web of Science, Science Direct, etc.

3. Results

Drug profile –KGK

Ingredients of KGK[4]:

- அப்ரகபற்பம் *Abraga parpam*
- இரசபற்பம் *Rasa parpam*
- அயச்செந்தூரம் *Aya chendooram*
- காந்தச்செந்தூரம் *Kaantha chendooram*
- சவுரி பழச்சாரு *Savuripazhacharu*

Method of preparation:

The above ingredients are blended together and grinded with the juice of *Tricosanthestricus pidata* and rolled into small pellets similar to the size of the green gram *(payarazhavu)* and consumed along with adjuvants like palm jaggery or honey.

Dosage: 130 mg BD *(payaralavu)*

Adjuvant: Honey or Palm jaggery.

Indications: [4]

- *Kushtam* (Several skin diseases)
- *Mega noigal*(Veneral diseases)

Ingredients	Dose	Indications	Adjuvant	Duration	Pathiyam
Abraga Parpam	1/2 to 1gram	*Pramegham, jwaram, unmadam, mahodaram, marbunoi, pilavai and virai-vatham*. (Diabetes, low fevers, mental diseases, ascities, carbuncle etc.)	sugar, ghee or betel leaf juice	45days	Tamarind, tobacco, mustard, alcoholic drinks and *agathikeerai* are to be avoided. During the period *brahmacharyam* should be followed.

Rasa parpam	¼ to 1gr	*Megham, megha-vranam, gunmam, soolai, kushtam* and *vatha*diseases. (gonorrhoea and syphilitic ulcers, peptic ulcers, leprosy and certain nervous disorders)	palm jaggery.		Salt- free diet, milk and rice, rice porridge
Aya chendooram	100-200 mg twice or thrice a day	Insufficiency of seminal secretions, spermatorrhoea and premature ejaculation. also in anaemia, ascites and rheumatism	honey or ghee.		
Kaanthachendooram	50 to 100mg twice a day	Microcytic anaemia, anaemia, chlorosis, obesity, oedema, scrotal swelling, rheumatic diseases, enlargement of liver and spleen and abdominal tumors.	*Thayirchundichooranam*	48days	

Scientific review of kushtakajakesari:

- Saranya Priya et al. investigated the antibacterial and antifungal properties of Kusta Gaja Kesari (KGK). Their findings indicate that KGK is effective in killing Staphylococcus aureus at a dosage of 500 µg. The minimum inhibitory concentration (MIC) for E. coli is 250 µg, while for Pseudomonas aeruginosa, the MIC is 500 µg. For Candida albicans, the observed MIC is 200 µg, and for Aspergillus, it is also 500 µg. Additionally, the MIC for Streptococcus pyogenes is 1000 µg[5]

- Sureka et.al investigated the In-Vitro Anti Inflammatory activity of Kusta Gaja Kesari - against Albumin Protein Denaturation. Maximum percentage inhibition of about 51.21 % was observed at 500 µg/ml of the test drug Kusta Gaja Kesari when compared to that of the Diclofenac sodium, a standard anti-inflammatory agent with the maximum inhibition 91.93 % at the concentration of 100 µg/ml.[6]

- Sureka et al. conducted an in vitro evaluation of the antioxidant activity of Kusta Gaja Kesari (KGK). Their results indicated that at varying concentration levels, KGK exhibited a percentage inhibition ranging from 6.17% to 58.33% in the DPPH assay, 20.96% to 75.08% in the NO radical scavenging assay, and 30.04% to 76.42% in the ABTS radical scavenging assay. In the hydrogen peroxide radical scavenging assay, the inhibition ranged from 11.06% to 59.95%. The IC50 values for KGK in these assays were found to be 84.28 µg/mL, 64.61 µg/mL, 43.72 µg/mL, and 78.47 µg/mL, respectively. [7]

- Neethi Raja et al. investigated the in vitro anti-diabetic activity of Kusta Gaja Kesari Mathirai. The study revealed that this Siddha formulation significantly inhibited the alpha-amylase enzyme, achieving a maximum inhibition of approximately 70.74 ± 0.919%, with a corresponding IC50 value of 629.4 ± 4.184 µg/mL. Additionally, it demonstrated significant inhibition of the alpha-glucosidase enzyme, with a maximum inhibition of about 44.46 ± 0.965% and an IC50 of 112.6 ± 2.688 µg/mL. These results indicate the formulation's potential anti-diabetic properties.[8]

4. Discussion

This review provides the evidence of the multifaceted therapeutic potential of Kusta Gaja Kesari (KGK), particularly highlighting its antibacterial, antifungal, anti-inflammatory, antioxidant, and anti-diabetic activities.

a. Antibacterial and Antifungal Properties:

Saranya Priya et al.'s findings demonstrate KGK's effectiveness against several pathogenic bacteria and fungi. The minimum inhibitory concentrations (MIC) for Staphylococcus aureus, E. coli, Pseudomonas aeruginosa, Candida albicans, and Aspergillus indicate that KGK could be a valuable natural agent in managing infections, particularly given its potency at relatively low dosages. Notably, the MIC values suggest that KGK could be particularly effective in treating infections caused by resistant strains, considering the rising concern of antibiotic resistance.

b.Anti-Inflammatory Activity:

The research by Sureka et al. on the anti-inflammatory effects of KGK reveals a significant capacity to inhibit albumin protein denaturation, an important factor in inflammation. While KGK achieved a maximum inhibition of 51.21% at 500 µg/mL, it still shows potential as a complementary therapy, especially when compared to standard treatments like Diclofenac sodium. This points to KGK's potential use in inflammatory conditions, supporting the idea that traditional formulations can provide effective alternatives to synthetic drugs.

c. Antioxidant Activity:

Sureka et al.'s evaluation of antioxidant properties demonstrates that KGK effectively scavenges free radicals across various assays (DPPH, NO, ABTS,

and hydrogen peroxide). The IC50 values suggest that KGK is a potent antioxidant, which is vital in combating oxidative stress-related diseases, including diabetes. The range of inhibition percentages indicates that KGK has significant protective effects, which could be beneficial in holistic approaches to disease management.

d. Anti-Diabetic Activity:

Neethi Raja et al.'s investigation into KGK's anti-diabetic properties shows promising results, particularly in inhibiting alpha-amylase and alpha-glucosidase enzymes. The observed maximum inhibition percentages (70.74% for alpha-amylase and 44.46% for alpha-glucosidase) indicate that KGK may help regulate blood glucose levels by slowing carbohydrate digestion and absorption. The IC50 values further establish KGK as a potential candidate for managing diabetes, suggesting that its active components could be explored for their pharmacological effects.

5. Conclusion

Overall, the body of evidence supports the therapeutic potential of Kusta Gaja Kesari Mathirai across multiple health domains. Its antibacterial, antifungal, anti-inflammatory, antioxidant, and anti-diabetic activities underscore its relevance in modern healthcare, especially in contexts where conventional treatments may be limited by resistance or side effects. Future research could focus on isolating active compounds within KGK and conducting clinical trials to better understand its efficacy and safety in diverse populations. Additionally, exploring the synergistic effects of KGK when combined with conventional treatments may provide a more holistic approach to disease management.

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