

## ANTIMICROBIAL EFFICACY OF FEMININE HYGIENE WASH AGAINST *CANDIDA ALBICANS*

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### ABSTRACT

Recent FMCG market focuses on new category products which is beneficial to the customer in terms of hygiene. One such product is Feminine intimate hygiene wash. This product gives protection against pathogens in the vaginal area which causes infection and malodor. To evaluate *in vitro*, efficacy of a Feminine hygiene wash formulation compared with benchmark brands against *Candida albicans*, the normal flora turned into opportunistic pathogens. The in-house product with market samples viz., V-wash and Fair beat were tested for its efficacy against the test organisms. The in-house formulation was effective against *C. albicans* inhibiting at 2 mg/ml, showing ZOI of 12 mm dia. Study reveals that the in-house formulation was effective against the organism *C. albicans*.

**KEYWORDS:** Feminine Intimate hygiene wash, *Candida albicans*, Antimicrobial product, Antifungal activity.

**KEYMESSAGES:** Ayurvedic products are safer choice.

### INTRODUCTION

Vaginal ecosystem is an ecological niche in which microorganisms, physical characteristics (pH, mucus viscosity, etc) and biochemical processes are in balance. The vaginal environment often contains microorganisms that become pathogens only due to changes in the ecosystem favoured by the anatomical proximity to the rectum and bladder, organs that can contaminate the vaginal habitat. Among these, the most represented germs are *Candida*, *Mycoplasma* and *Gardnerella vaginalis*.

Natural protection of the vagina is known to be provided by Lactobacilli. Lactobacilli produce lactic acid from glycogen in the vaginal wall and create an acidic medium with a pH of about 3.8. Shifts towards the neutral state inevitably lead to the colonization of facultative pathogenic agents, which latter are almost always present in the vagina.<sup>[1]</sup>

In addition to the natural deterioration caused by ageing of the genital organs and by various gynaecological diseases, a number of modern products, for instance antibiotics, chemotherapeutics, hormonal contraceptives, intrauterine devices, disinfectants, traditional soaps and shampoos, and the water of swimming pools with basic pH values have side effects that decrease the efficiency of the vaginal protective mechanism. Due to the combined effect of the above mentioned factors, about a half of all patients consult gynaecologists because of vaginitis, or get hospitalized because of the consequences thereof.<sup>[2]</sup>

Maintaining a healthy vaginal ecosystem and recovering it from mild/moderate inflammatory/ infectious conditions, concomitantly, if needed, with a pharmacological therapy, can prevent the complications of bacterial vaginosis that even it is not a life threatening disease, is recognized as a contributory cause of premature membrane rupture, premature birth and low birth weight.<sup>[3]</sup> The feminine hygiene wash market is now growing well for women's care. Hence we have initiated a study to evaluate in-house made Feminine hygiene wash and the same compared with market available brands viz., V-Wash and Fair Beat. *Citrus aurantifolia* juice, *Rosmarinus officinalis* leaf oil, *Azadirachta indica* leaf extract, *Salvia officinalis* oil, *Aloe barbadensis* leaf juice powder, *Thymus zygis* oil, *Vetiveria zizanioides* root oil were the ayurvedic ingredients used in the formulation.

## SUBJECTS AND METHODS

### Test organism

*Candida albicans* MTCC 3017 was procured from IMTECH, Chandigarh. Cultures were then subcultured and maintained Sabouraud's dextrose broth (Himedia).

### Inoculum preparation

Inoculum of *Candida albicans* MTCC 3017 was prepared by inoculating in five ml of Sabouraud dextrose broth (Himedia, Mumbai, India). The inoculum size was adjusted to 0.5 MacFarland standard measuring  $10^8$  cfu/ml.

### Minimum Inhibitory Concentration (MIC) Test

MIC was determined by incorporating various concentrations (5-100 mg) of the formulation and market samples in ten ml of SDA. The medium with formulation was mixed thoroughly and was allowed to solidify at room temperature. 100 µl of the inoculum was inoculated on each plate. The plates were incubated for 5 days at 28°C for *C. albicans*. Negative control with solvents (Sterile distilled water) was maintained. The platings were done in triplicates and the mean values were taken.<sup>[4]</sup>

### Agar well diffusion method

SDA plate was inoculated with *C. albicans* culture by spreading on the surface of the media. A well was made in the center of the medium and from the formulation stock (100 milli gram dissolved in one ml of sterile distilled water) 100 µl was loaded in the well. Comparison of formulation was made with market available sample, V-Wash and Fair Beat. Ketoconazole (10 µg) (Himedia) was maintained as positive control. The plates were incubated at 28°C for 5 days. The antibacterial activity was assessed by measuring the diameter of the zone of inhibition (in mm), and the platings were done in triplicates. Their mean values with standard deviation was taken.<sup>[4]</sup>

## RESULT AND DISCUSSION

The Intimate hygiene wash developed was showing inhibition against *C. albicans* at 2 mg/ml. The ZOI was 12 mm dia. The Market sample V-Wash was showing MIC of 10 mg/ml and ZOI of 5 mm dia. Fairbeat was showing MIC of 4-5 mg/ml and ZOI was with 8 mm dia against *C. albicans*. The results were tabulated in Table 1. Ketoconazole was showing 35±4 mm diameter against *C. albicans*.

Salvia officinalis extract containing active principles such as salviol, pricosalvin and pinene, responsible for the antibacterial, Antimycotic, antioxidant and antiviral activities. Thymus extract contains thymol and carvacrol, active phenolic derivatives endowed with a marked and selective antibacterial, antimycotic, antioxidant and anti-inflammatory activity.<sup>[5]</sup> Thymol, a monoterpene affects the envelop of *Candida* and induces morpho-structural damages.<sup>[6]</sup>

The acid pH of feminine hygiene wash product is always favourable in preventing or treating infections, even in mycoses as acid pH counteracts the very frequent bacterial superinfections.<sup>[3]</sup>

**Table 1: Minimum inhibitory concentration and Zone of inhibition values for Feminine intimate hygiene wash against *Candida albicans*.**

S.No	Product Name	MIC values	ZOI (dia)
1	In-house product base	2-4 mg/ml	10 mm
2	In-house product with lactic acid	2-4 mg/ml	11 mm
3	In-house product with actives	1-2 mg/ml	12 mm
4	V-Wash	10 mg/ml	5 mm
5	Fair Beat	4-5 mg/ml	8 mm

**CONCLUSION:** The hygiene wash formulation was effective against *C. albicans*.

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