

Analysis of Gul Component (Tobacco Product) by UV Spectrophotometer and its Effects on Human Beings

Vibha Verma Deshmukh
Department of Chemical Engineering, GGV
Bilaspur Chhattisgarh, INDIA

Praveena Rajput
Department of Electronics Engineering, GGV
Bilaspur Chhattisgarh, INDIA

Abstract—Gul or Gudhaku is a paste made of tobacco and molasses. It is available commercially and is carried in a metal container. Gudhaku is applied to the teeth and gums with a finger, predominantly by women. Besides tobacco, it contains molasses, lime, red soil and water. It is manufactured by the dry mixture of tobacco, lime, red soil and molasses followed by fermentation for more than 24hrs. Commercially manufacturing since 1986, gul has been machine produced and sold in toothpaste-like tubes.⁵

Gudhaku (paste of tobacco and molasses) used commonly in Bihar, Orissa, Uttar Pradesh, and Uttaranchal. It is made manually by users themselves and also marketed in different brands. In Eastern India (Singhbhum district, Jharkhand) 1% of the men and 16% of the women used gudhaku. In India tobacco is used mainly for smoking and oral use while nasal use is relatively infrequent. The term, smokeless tobacco (SLT) is used to describe tobacco that is not burned before or at the time of use as opposed to cigarettes or *bidis* that are burned to liberate smoke. SLT products contain a number of toxic, mutagenic or carcinogenic chemicals that can contribute to the onset of non-communicable diseases.

This article specifically deals with the manufacturing, analysis of gudhaku components by UV spectrophotometer using dimethyl formaamide (DMF) and methanol, Effects of smokeless tobacco products in human beings and its control.

Keywords: *Gudhaku, SLT, DMF, Methanol, UV spectrophotometer.*

I. INTRODUCTION

They are some smokeless tobacco (SLT):

Smokeless tobacco products

Smokeless tobacco products can be grouped into those used for chewing, sucking, gargling, sniffing, and as dentifrice. Some products are commercially available or a user can prepare the desired product from ingredients.

Products chewed and sucked

- Orally used products are chewed and placed in the space between the lower lip and gums or in the space between the gums and the cheek.
- Khaini* prepared from sun-dried tobacco and slaked lime is commonly used in the states of Gujarat and Maharashtra.

- Zarda*, a mixture of tobacco, lime, spices, and occasionally, silver flakes is also added to *pan* and chewed
- Khiwam*, a mixture of tobacco extract, spices, and additives is a paste-like preparation that may be added to *pan* or chewed as it is
- Betel quid or pan* contains four main ingredients, betel leaf (*Piper betel*), areca nut, catechu, slaked lime, and tobacco. Spices and flavoring agents may also be added
- Kharra* is a combination of tobacco, areca nut, lime, and catechu that is chewed in some parts of Maharashtra
- Mainpuri* tobacco preparation named after the Mainpuri district of Uttar Pradesh contains tobacco, slaked lime, areca nut, camphor, and cloves⁸
- Mawa*, a mixture of thin shavings of areca nut, tobacco, and slaked lime is widely preferred in Gujarat state
- Gutka or pan masala* with tobacco is a ready-to-eat tobacco product has become extremely popular in all parts of India due to its user friendly packaging. It contains areca nut, slaked lime, catechu, and tobacco as well as flavoring agents and sweeteners that are added to improve taste.⁹

Products used as dentifrice

- Gudakhu or gul* is a paste prepared from powdered tobacco and molasses. It is applied to the gums and teeth with a finger.
- Masheri*, also called *mishri*, is made at home by roasting tobacco flakes on a hot griddle until it turns brown or black. It is applied to gums and teeth and retained in the mouth for variable time period.
- Bajjar* (dry snuff) is another tobacco product used mainly by women for cleaning teeth and gums.
- Lal dantamanjan* (red tooth powder) is a commercially available tooth powder, while creamy snuff is a tobacco-containing tooth paste.

Product used for sipping

- Tuibur* is actually water through which tobacco smoke is passed. The water containing chemicals present in tobacco smoke is used for sipping or gargling in the northeastern states of India.

Products used for inhalation

- Nasal snuff is finely ground flavored tobacco that is placed in the nostrils and sniffed.
- *Bidi* tobacco is prepared from sun-dried *Nicotiana tabacum* leaves which are manually shredded, pounded and sieved to obtain flakes of desired size. In the work situation, *bidi tobacco* dust and volatile compounds are inhaled by tobacco processors and *bidi* rollers, inadvertently. These workers also absorb tobacco constituents via the cutaneous route. ¹⁰Tobacco used for *bidi* manufacture is also chewed by the workers. Hence available information on *bidi* tobacco is included here.

II. MATERIAL AND METHOD

A. Material:

Gudhaku is taken from bilaspur plant, DMF for UV spectroscopy HPLC is from HIMEDIA Company, Mumbai, India, and Methanol is also used to analyses of sample.

B. Method:

For complete analysis of gudhaku sample UV-Photo spectrometer was used. Initially the pure solvent sample (DMF and Methanol) were analyzed and corrects the base line. Now the DMF and Methanol were used as a reference solvent and gudhaku samples were analyzed with the reference material. One cuvette contain pure DMF or

Methanol where as another contain mixture of gudhaku and DMF or Methanol. Depending upon peaks of graph we can assume the components of gudhaku.

III. RESULT AND DISCUSSION

A. Result:

Gudhaku is a mixture of tobacco, lime, red soil and molasses. In graph we got lots of peaks of different wave length with DMF and methanol solvents. With the help of solvent we can analysis the different component of gul using UV spectrophotometer. Firstly our aim is to find out the component present in gul by using the solvents then compare the component found by both the solvent. If the component found same in both the cases that means they are really present in the gul and depending upon the wave length cutoff we can analyze the components and its harmful effects on human beings.

Different peaks are found in both the figures we analyze it by using two different solvent DMF and methanol, the component are assumed by its wave length cutoff.

A. Effect of gudhaku with DMF:

DMF+ gudhaku: are 325 is a peak of nicotine, 308-1,2,4-Trichlorobenzen , 410 – molasses, 369- Methyl isobutyl ketone, 268- DMF are present, assumed by the given cutoff shown in figure.1.

B. Effect of gudhaku with Methanol:

Methanol+ gudhaku: 369- Methyl isobutyl ketone, 254- n butyl acetate, 308-1,2,4-Trichlorobenzen , 410 – molasses, 201- methanol are present shown in figure.2

Different components are found in both figures depending upon their wave length we assumed the components and there effects are:

1. Methyl isobutyl ketone-369: Also called Denatured alcohol or methylated spirits is ethanol that has additives to make it poisonous, extremely bad tasting, foul smelling or nauseating, to discourage recreational consumption.
2. N butyl acetate- 254: *n*-Butyl acetate, also known as butyl ethanoate, is an organic compound commonly used as a solvent in the production of lacquers .
3. Nicotine-325 causes endocrine- hyperinsulinemia - insulin resistance, Joints- pain muscular- tremor- pain, gastro-intestinal- nausea- dry mouth- dyspepsia- diarrhea - heartburn blood- increased clotting tendency, central-lightheadedness- headache- sleep disturbances- abnormal dreams- Irritability- Dizziness, heart- Increased or decreased heart rate - increased blood pressure, tachycardia- More (or less) arrhythmias- Coronary artery constriction.
4. 1,2,4-Trichlorobenzene-308 it affects the liver and kidney, and is possibly a teratogen.
5. Molasses: also found in both the cases.

B. Discussion

Most of components are same in both the cases expect DMF and methanol. Gudhaku is a mixture of tobacco, lime, red soil and molasses. In graph we have got lots of peaks of different wave length in both the cases where Methyl isobutyl ketone, N butyl acetate, Nicotine, Molasses, 1, 2, 4-Trichlorobenzene are common.

Among all the components nicotine is a highly toxic and addictive substance that poses a serious risk to health. Nicotine and nicotine products for human use should be regulated. The International Agency for research in cancer (IARC) has classified SLT as a group 1 human carcinogen.

Gul or gudhaku is causes hidden effect or we can say silent harm to our body. So, it is suggested try to avoid their use which is very common in villages.

There are generally two type of effects are present such as acute and chronic depending upon the exposures. Acute effect is generally occurs where the sudden exposure to high concentration occurs where as chronic effect arises from repeated exposure to low concentration for long period, mostly by harmful material.

Chronic effects are more harmful to human beings as compare to acute effects depending upon occupational health standards such as Threshold limit value.

IV. HEALTH HAZARD

SLT products contain a number of toxic, mutagenic or carcinogenic chemicals that can contribute to the onset of non-communicable diseases.

It causes cancer, heart disease, diabetes, oral pathologies, oral cancer³, hypertension, blood lipid profile, genetic damage, cytogenetic alterations, carcinogenicity, asthma, dental hygiene, ability to cause DNA damage and adverse effect on

pregnancy. Smokeless tobacco use also causes a number of cancerous oral conditions and can lead to nicotine addiction similar to that produced by cigarette smoking.

V. CONCLUSION

The various ways by which we can reduce the use or consumption of tobacco products are media it should bane the promotion of tobacco products. Educational messages, materials, and related issues should be conveying to all the peoples including children's regarding its adverse effects on human health. Spitting in public is one of the important public health hazards. Oral tobacco use enhances the frequency of public spitting as everyone is to spit after taking oral tobacco. It increases the chance of airborne communicable diseases in developing countries. Spread of TB is one of them. Non-spatters have all rights to protect themselves from the hazard of public spitting. Singapore is one of the best example where communicable and non communicable disease has been reduced after this law is enforced.⁶ Equal importance should be given to smokeless and Smoking control strategies.⁷ 'Smokeless tobacco use' is not given a priority during planning and management of comprehensive tobacco control. In developing countries policy makers need to be appraised that smokeless tobacco use is equally implacable society, environment and health of individual and community.

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