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CHEMICAL STUDIES ON SOME TOBACCO TYPES

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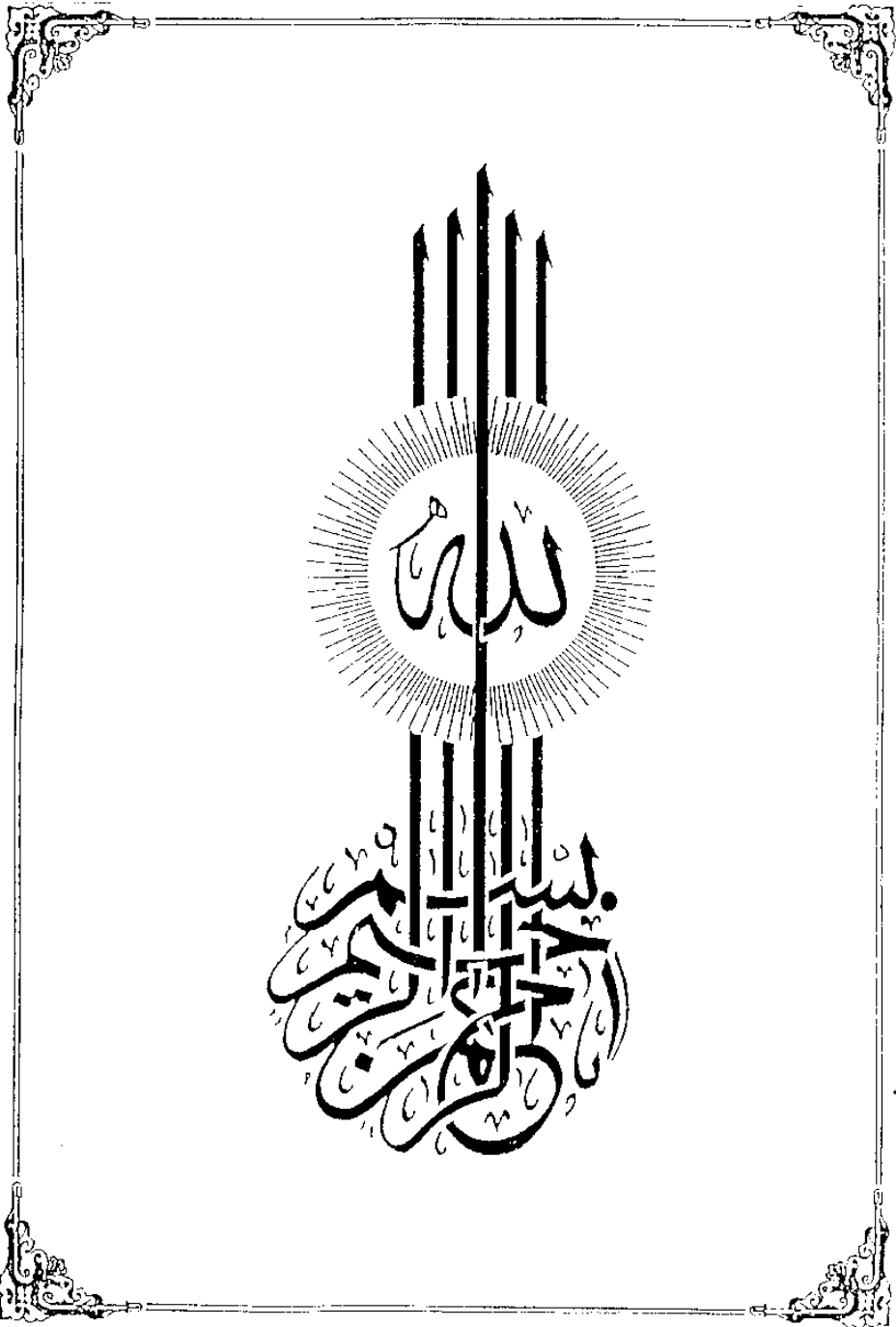
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ABSTRACT

Tobacco leaves that utilized in cigarette manufacture are divided into three main types according to the nature of the curing process. The major tobacco types in the Eastern Company for Tobacco and Cigarettes are Virginian, Burley and Oriental tobacco leaves. Manufacture of cigarettes from tobacco include different treatments. These processes include :

- Reconditioning of tobacco leaves to increase their moisture content (in Apparatus "vacuum chamber"). This is commonly done by thermovacuum process of evacuating air from the tobacco mass in an atmosphere of steam to increase moisture content from 8.0 to 18.0%, also to increase the volume and for puffing the tobacco.

The present work is devoted to study the effect of reconditioning factors (i.e. different temperatures and exposing

time) on the chemical constituents of three different types of tobacco leaves imported from different localities and their relation to quality of tobacco. The parameters tested in this study, include temperature and exposing time :

1. The temperature used during reconditioning process were 70, 80 and 90°C.
2. The exposing time of reconditioning process was one cycle (15 min.), two cycles (30 min.) and three cycles (45 min.).

The results obtained could be summarized as follows:

1. Remarkable increases in the moisture content of different tobacco types due to reconditioning process, and the moisture content increased by increasing the temperature.
2. Effect of different temperature during reconditioning process exerted non-significant influence on total volatile bases, potassium and ash in the three tobacco types. Also, there is no significant change in reducing, non-reducing and total sugars due to the reconditioning process.
3. Total alkaloids and total nitrogen in the leaves of different tobacco types, showed variable changes due to reconditioning process. Total alkaloids and total nitrogen decreased significantly due to reconditioning process and the decrease became more pronounced with increasing the temperature employed.
4. The moisture content increased significantly due to reconditioning process with increasing exposing time.

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I. INTRODUCTION

The botanical genus Nicotiana contains over fifty species, yet the only one which has never been found growing wild is Nicotiana tabacum, the plant whose leaves have, and continue to have, such a tremendous impact on the world. The main alkaloid in the green leaves of Nicotiana tabacum is nicotine, in addition to small amounts of nornicotine, anabasine and myosmine.

Tobacco holds an unparalleled position among crop plants in several individual particulars, while in overall situation the status achieved by this single species is remarkable. Some of the more noteworthy points are listed below:

1. It is one of very few crops entering world trade entirely on a leaf basis.
2. In many countries it is an element of very high importance in financial and economic policy.
3. It is the most widely grown commercial non-food plant in the world.
4. Consumption is by way of smoking, inhalation and chewing.

Tobacco plant is grown in a large areas in many countries. The top ten countries in tobacco production are America, China, India, Russia, Japan, Brazil, Turkey, Pakistan, Greece and Rhodesia. It is also produced in many other countries. In Egypt, tobacco production is forbidden at any commercial scale however, for research purposes and economic studies, a special permission can be granted.

A. Uses of tobacco and tobacco processing :

Tobacco leaves are characterized by high content of nicotine, as plant alkaloid, than other plants. They also contain small amount of nornicotine, anabasine, myosmine and other unidentified compounds in green leaves. In other *Nicotiana* species nornicotine is dominant, while in some others anabasine is the main alkaloid.

Tobacco leaves are used in manufacturing of cigarettes, cigars, pipe, snuff, jurak, molasses tobacco and other forms as well.

Most tobacco products in most countries used processed leaves of *Nicotiana tabacum* as their major ingredient. In Eastern Europe, the Soviet Union, and perhaps India, *Nicotiana rustica* is used to some extent. Traditionally, tobacco is classified into different types which depend on the conditions of growth, processing and eventual use. The major tobacco types used in the Eastern company blends for tobacco and cigarettes are Virginia, Burley and Oriental tobacco leaves.

After harvesting, all tobacco is subjected to a curing process which is basically a dehydration accompanied by certain chemical changes resulting in the development of desired color and other properties. The major curing process which employed are flue-curing, and air-curing. Following curing, tobacco is treated in a series of industrial processes, including moisture adjustment, aging or

fermentation, blending and addition of humectants and flavors. The exact treatment will vary with the ultimate form of the smoking product and the particular manufacture practice. Fermentation is a vigorous process involving storage at elevated temperature with relatively high moisture levels in tobacco leaves. Aging is a relatively mild prolonged treatment storage up to 3 years at ambient temperature and low moisture levels, and is used for cigarette tobaccos. On the basis of scarce information the chemical changes occurring during aging are more subtle than those of fermentation.

B. Manufacture of cigarettes:

Manufacture of cigarettes from tobacco include different treatment. These treatments include :

- 1). Reconditioning of tobacco leaves to increase of moisture content to attain 16 - 18%.
- 2). Moisturization : i.e. the direct application of water in liquid form steaming to attain a moisture of 20-22% in tobacco leaves.
- 3). Flavouring and other additives :
Such materials may be added to retain moisture and make the tobacco less susceptible to change in atmospheric conditions at two stages in manufacture.
 - a). Before cutting, which is known as casing, materials usually include glycerine, glucose or sucrose are the main additive applied to tobacco leaves.

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B. Manufacture of cigarettes :

Manufacture of cigarettes from tobacco include different treatment. These treatments include :

- 1). Reconditioning of tobacco leaves to increase of moisture content to attain 16 - 18%.
- 2). Moisturization : i.e. the direct application of water in liquid form steaming to attain a moisture of 10-12% in tobacco leaves.
- 3). Flavouring and other additives :

Such materials may be added to retain moisture and make the tobacco less susceptible to change in atmospheric conditions at two stages in manufacture.

 - a). Before cutting, which it is known as casing, materials usually include glycerine, glucose or sucrose are the main additive applied to tobacco leaves.

- b). After drying, these materials include , sorbitol, diethylene-glycol, acrolein and mentol, in volatile solvents, which will give fragrance to the pack.

Casing and flavouring materials are intended to give taste and flavour and must resist the heat in tobacco smoking.

- 4). Storage process : After previous treatment, storage for twenty four hours enables full absorption of the casing materials.
- 5). Cutting process : The tobacco leaves are cut in a form of slices 0.6 - 0.8 mm width.
- 6). Drying process : i.e. the vaporization of water from the tobacco through the application of heat.
- 7). Cooling process : To decrease the temperature of tobacco slices produced from step (6) to ambient temperature.
- 8). Flavouring materials : They are intended to give taste and flavour and must be applied to dried and cooled cut rag. Relatively small amounts, normally in alcoholic solution, are applied by fine spray in revolving cylinder.
- 9). Cigarettes manufacture process and the finished cigarette

Most tobacco blends will begin to mold if the tobacco moisture is at 16% or above for a sufficient length of time