

## Criminal use of a drug from its properties

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### Introduction

Scopolamine is a tropane alkaloid extensively used for clinical purposes because is a selective muscarinic receptor antagonist occurring naturally in solanaceous family plants, such as *Solanum dulcamara* and *Datura stramonium*<sup>1</sup>. It acts like a competitive antagonist of acetylcholine at muscarinic receptors. It has hallucinogenic properties to create altered states at the Central Nervous System (CNS)<sup>1</sup>.

Burundanga is a mixture of scopolamine and others CNS depressants. It is related with various types of poisonings<sup>2</sup>.

The main aim of this study is to analyze how some traits of a pharmacological drug can be used to commit criminal acts.

### SCOPOLAMINE

Is an anticholinergic competitive antagonist of acetylcholine because usually contains in its chemical structure basic and steric groups in the same proportion that acetylcholine. Its most frequent effects are<sup>3</sup>:

- Mydriasis and cycloplegia
- Dry mouth by reduction of saliva secretions
- Overdose: Anticholinergic syndrome
- CNS and vestibular effects: The recommended doses of scopolamine produce CNS depressive effects such as drowsiness, amnesia and fatiga. Higher doses can lead to CNS stimulation<sup>3</sup>.

### Administration routes

- **Traditional routes:** Oral tablets or parenteral injections are the traditional modes of scopolamine administration<sup>4</sup>. This leads to variable drug serum concentrations → A lot of limitations (dose-dependent adverse effects and a short half-life in plasma)<sup>3</sup>.
- **Transdermal therapeutic System (TTS-S → Fig2)<sup>3</sup>:** Provide a constant rate of delivery of scopolamine through intact skin<sup>4</sup>.



Fig1. *Datura stramonium*

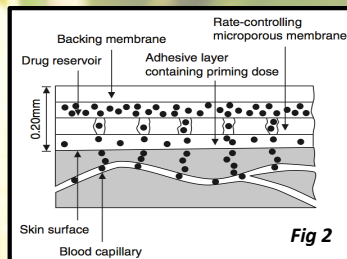
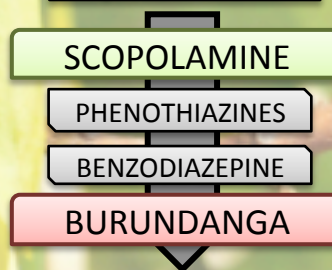


Fig 2

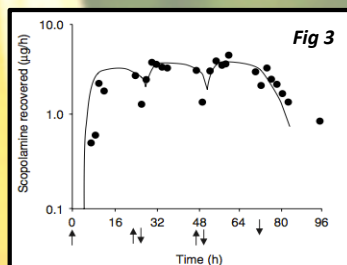


Fig 3

### BURUNDANGA

**Composition:** Its main component is scopolamine<sup>2</sup>. It is combined with:

- **Phenothiazines:** Anxiolytic effect. Help to calm down the victim and causes drowsiness<sup>5</sup>.
- **Benzodiazepines:** Anticholinergic effect over Basal Nucleus of Meynert → More somnolence<sup>5</sup>.

### Effects

Burundanga has immediate effects<sup>2</sup>. After only 2 to 5 minutes after its administration, the victim is under its effects<sup>5</sup>.

**Cascade effect:** The drug disappears but its effects can persist on the brain (sequel may occur → That may lead to death<sup>5</sup>).

### Peripheral symptoms

- Smooth muscle alterations
- Hyperthermia

### Central symptoms

- Hallucinations
- Memory deterioration

**Fig 2.** Schematic representation of the transdermal delivery system for scopolamine placed on the skin surface<sup>3</sup>.

**Fig 3.** Scopolamine excretion rates after and multiple applications of transdermal therapeutic system for scopolamine (TTS-S) for 24 hours<sup>3</sup>.

### Discussion

TTS-S was designed to maintain greater control of drug plasma concentrations and thereby to restrict the incidence of adverse effects. Scopolamine tends to be more potent in its action on the irirs, ciliary body and certain secretory glands.

Scopolamine also has prominent CNS effects, presumably due to the greater permeation through the blood-brain barrier. This may be the basis for the efficacy of scopolamine in the treatment of motion sickness.

**Burundanga:** Burundanga is considered an emergent drug which is used under criminal purposes. It is thought that this drug has arrived to Europe, causing a social state alarm due to the ignorance of its actual power.

### References

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