

**Effect of Lacatomtom Drink on Spatial Memory in Male Wistar Rat**Owemidu I. Olumorin<sup>1</sup>, Emmanuel F. Titus<sup>2</sup>, Negedu Mohammed<sup>1</sup>, Jimoh O. Emmanuel<sup>3</sup><sup>1</sup>Department of Physiology, Faculty of Basic Medical Sciences, Kogi State University, Anyigba, Nigeria, [owemidu.io@ksu.edu.ng](mailto:owemidu.io@ksu.edu.ng).<sup>2</sup>Department of Medical Biochemistry, Faculty of Basic Medical Sciences, Kogi State University, Anyigba, Nigeria.<sup>3</sup>University Health Services, Kogi State University, Anyigba, Nigeria**ABSTRACT**

Lacatomtom is one of the emerging psychoactive substances abused by youths in Nigeria. It's a mixture of tomtom candy and lacasera drink. The abuse of this substance has led to some psychosocial deficit, this deficit are thought to be as a result of memory impairment. This study is therefore designed to look at the effect of lacatomtom on spatial memory in male Wistar rats. Twenty (20) Wistar rats weighing 120-150 g were randomly divided, five (5) each in a group of four (4). Group A served as control and received 1 mL/kg distilled water orally. Group B received 1 mL/kg of Lacatomtom (LTT) orally, meanwhile group C took 1 mL/kg Lacasera (LC) orally. Group D received 1 mL/kg Lacawater (LW) orally. Animals were treated once, five minutes later, they were allowed to undergo the Y-maze test. Percentage alternations and number of entry was calculated for each group. Data were analysed using ANOVA at  $\alpha$  0.05. There was no significant difference in the arm entry in all the groups. Although the LTT group has the highest mean entry ( $14.8 \pm 1.16$ ) followed by the LC group ( $14.4 \pm 1.21$ ) and LW group ( $13.6 \pm 0.93$ ). The lowest entry observed was the control group ( $13.4 \pm 1.21$ ). There was a significant difference in the percentage alternation in the LTT group when compared to the control group. The findings from this study suggests that Lacatomtom alters the spatial memory function of the brain in Wistar rats through mechanisms that may be dependent on the activation of opiodergic system in the brain.

**Keywords:** Lacatomtom, memory, alternation, brain, opiodergic.

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Youths have been reported to increase their quest for psychoactive substances globally. In Nigeria, the desire to consume these substances has been attributed to psychological disorder, peer pressure, academic pressure and the need to perform extraordinarily during sex.<sup>1,2</sup> Gigabyte as they call Lacatomtom appears dark brown as a result of dissolution of the tom tom.<sup>3</sup> The consumption of Lacatomtom (LTT) is possibly necessitated by the ban on the importation and sale of codeine by the Federal government of Nigeria resulting in a sky rocketed price of the product. Therefore, the quest for cheaper alternatives has prompted the Nigerian youths to utilize new concoctions such as LTT.<sup>2,3</sup> However, stimulant consumption among Nigerian youths has emerged as a critical public health concern, with far-reaching implications spanning psychological, physiological, and socioeconomic dimensions. Various studies,<sup>4</sup> have underscored the profound psychological effects resulting from stimulant consumption.

The physiological impacts include alterations in feeding and sleeping habits, disregard of personal hygiene, shaking sensations in arms and legs, reddened eyes, unexplained money demands, excessive quest for privacy, lack of coordination, kidney, lung, and liver diseases.

Short and long term effects on the brain have been attributed to substance use resulting in behavioral alterations, memory impairment, cognitive deficit and movement disorders.<sup>5</sup>

These effects alter behaviour, leading to decisions that are risky, making people to have injury and physical trauma such as burns, automobile crashes and violence.<sup>6</sup> Meanwhile over time, substance use can affect the brain allowing addiction making withdrawal difficult and challenging.<sup>7</sup>

Lacatomtom (LTT), being an emerging substance, has scanty reports in the literature on its effect on the brain. This study is therefore designed to investigate the effect of LTT on spatial memory in male Wistar rats. The study investigated the effects of substance (Lacatomtom) abuse on spatial memory. The findings from this study could be used as preliminary data for further studies. Therefore, the article is important to scientific community.

**Materials and Methods***Preparation of Lacatomtom*

Sample Lacasera drinks (The Lacasera Company Plc, Nigeria) and tomtom candies (Cadbury Nigeria Plc, Nigeria) were purchased from Anyigba market, Dekina Local Government Area, Kogi State in Nigeria as shown in plate 1.

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**Figure 2: Effect of Lacatomtom (LTT) on percentage alternation in Y- maze Test**

The present study looks at the effect of Lacatomtom on spatial memory in male wistar rats using the Y maze animal model of memory.

Spatial memory and learning is widely studied in experimental animals using the Y maze behavioural model. The Y maze paradigms is used to evaluate novel drugs for their effects on cognition and to test the memory function in rodents.<sup>9,10</sup> Hallucinogenic drugs have been found to alter the learning capacity of rodents in the Y maze test.<sup>11</sup> In this study, LTT Significantly reduced the number of alternations when compared to the control group. This shows that the spatial memory was impaired. Different neurotransmitter in the central nervous system (CNS) play a key role in learning and memory.

There are several studies that illustrated that activation of opioid receptor impairs the memory in animals or in humans.<sup>12,13</sup> This suggests that LTT may impair memory through mechanisms that are dependent on the activation of the opioidergic system in the brain. This finding is comparable with the work of Ali Hosseini-Sharifabad et.al<sup>14</sup> 2015, where the acute and chronic administration of tramadol reversed the spatial memory capacity of rodents.

However, LTT, as observed in this study, increased the number of arm entries when compared with the other groups. Although this increase was not statistically significant.

This indicates that exploratory activity increased during administration with LTT compared with the control group, suggesting a moderate stimulation effect on motor behavior. This is consistent with other researcher.<sup>15</sup>

**Conclusion**

This study revealed that LTT impairs spatial memory in male Wistar rats through mechanisms that may be dependent on the activation of opioidergic system in the brain. More so, this study has also shown that exploratory activity increased with the administration of LTT.

**Conflict of Interest**

The authors declare no conflict of interest.

**Author's Declaration**

The authors hereby declare that the work presented in this article is original. Any liability for claims relating to this article will be borne by us.

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