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Detection of Oxytocin in Fruits and Vegetables using Wireless Sensor

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Abstract

Background/Objectives: This study is focused on detecting the presence of Oxytocin, a Schedule H drug, used in fruits like pumpkin, watermelon, cucumber etc., illegally to make them appear bigger using a wireless sensor. **Methods/ Statistical analysis**: Oxytocin is nono-peptide hormone in mammals. It is used in medical field. Oxytocin is normally stored in the posterior pituitary gland, which plays a role in sexual reproduction of both sexes, and also during and after the child birth as well as social bonding. In India, Oxytocin is cheaper than fertilizer, so it is used to inject in fruits to appear them bigger. **Findings:** Unfortunately, there is no way to visually distinguish between a normal vegetable and that are boon pumped with Oxytocin. Using Wireless sensors, it would be easier for detecting the presence of Oxytocin in fruits and vegetables. This study introduces remote sensor for recognizing Oxytocin levels in Fruits and vegetables and this methodology can enhance comprehension of surviving examination, recommend novel systems through which Oxytocin may work, and refine forecasts about Oxytocin pharmacotherapy. **Application/Improvements:** Its application can be in the field of agriculture and in the field of production of milk.

Keywords: Agriculture, Chemical, Drug, Fertilizer, Milk, Organic, Oxytocin, WSN

1. Introduction

Oxytocin is a neuro-hypophysial peptide that is produced in the paraventricular nuclei of the hypothalamus. Oxytocin is stored in the posterior pituitary. It is mammalian hormone and it is used as drugs in veterinary services. This Oxytocin is composed of 9 amino acids with a disulfide bond and a semi-flexible carboxyamidated tail. One of the Oxytocin degradation products is citrate adducts, which is formed as citrate buffer[1]. This hormone was first found to be partial to female smooth muscle reproductive physiology, but its function like a neurotransmitter, which involved in neuropsychiatric disorders sexual/social behavior and is also vital in reproductive physiology of male. In the Oxytocin-like peptide, mesotocin, a peptide found in some fishes, marsupials, reptiles, amphibians, and non-mammalian tetrapods, the leucine at residue is substituted for isoleucine. Oxytocin brings out the regulatory effects by binding specific cell surface receptors via a phosphoinositide signaling pathway. The roots of the plants are injected with oxytocin to produce bigger fruits and vegetables and also their production quantity can be more. It is also injected in cows and buffaloes to produce more milk without considering the side effects caused to the animals.

Specialists and dieticians prescribes eating leafy foods consistently will lead for good well-being. The recent studies have uncovered that Oxytocin, a hormone

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is used to accelerate the aging procedure of products of the soil, may have antagonistic long haul impacts[2]. The medication is known not mental meltdowns, sterility, and other symptoms as per Union Minister of State for Health and Family Welfare. It is a well-being danger of using Oxytocin. This hormone is actually seen in the mammalian cerebrum, regularly utilized by clinicians to instigate work in pregnant ladies, and to control draining and animate lactation. The Oxytocin drug, also known by their regional standards such aspaani, cocin, and dawai, is cheap and effortlessly accessible in India, where it is named a Schedule H drug[3]. Trivedi says that it is utilized as a part of creatures, for example, dairy animals for expanding their milk generation, and is accessible in numerous general stores in the nation. Oxytocin infusions are likewise being generally utilized by products of the soil cultivators to increase benefits. The natural products liable to be tainted with the hormone incorporate jackfruit, pumpkin, watermelon, aubergine, and cucumber. Thus, this proposed paper is focused on to detect the presence of Oxytocin, a Schedule H drug that is used in fruits like pumpkin, watermelon, cucumber etc., illegally to make them appear bigger using a wireless sensor[4].

The farmers are using Oxytocin for the extraordinary growth of pumpkin, watermelon, brinjal, gourd and cucumber for its increased market value[5]. Most of the research work in the field of Oxytocin shows that it is hazardous to use them in food production. A letter from Dinesh Trivedi, on unlawful use of Oxytocin, taken over a long time could cause serious health problems.

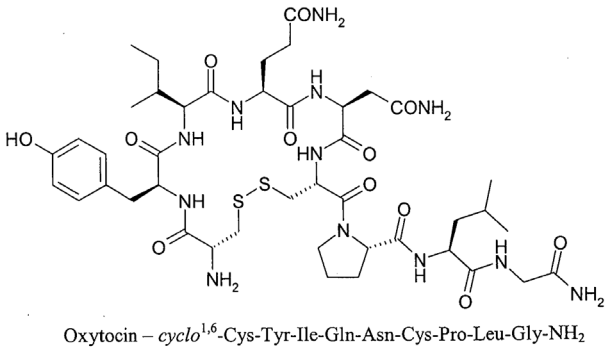
The minister also said that, the Oxytocin, used for inducing childbirth as similar to big fruits and vegetables, which was injected by Oxytocin, before it is being delivered to the market. Results, fruits and vegetables are appearing as plump and fresh. Trivedi also states that "These hormones may cause irreparable damage to our health if taken through these vegetables over a period of time". It may cause sterility, nervous failures, heart disorders, and memory loss[6].

Media reports has shown that these drugs are being administered not only to plants, fruits and vegetables but it being administered also to under-age slim girls in rural parts of Rajasthan to make them look bigger[7]. After the series of media reports, the health ministry has banned Oxytocin to be sold to the publics. Though it is banned, it easily available still from most of the pesticide and fertilizer vendors. Oxytocin, a Schedule H drug, is cheap and readily available.

Oxytocin may contribute to growth of social shortfalls in autism[8]. Though Oxytocin is used in labour, the less effectiveness of usage of oxytocin for treatment creates adverse events[9]. Oxy from gland occurs also in response to different stressful stimuli[10].

2. Proposed Work

Figure 1 indicates the structure of Oxytocin. Since there were no methods still to detect the presence of Oxytocin in fruits and vegetables, the proposed system will be able to detect the presence of Oxytocin in fruits and vegetables. This proposal is in the research area still. In the proposed system, the chemical content of Oxytocin is studied by which, the study will be able to detect that particular chemical presence in fruits.



Oxytocin – *cyclo*[1,6]-Cys-Tyr-Ile-Gln-Asn-Cys-Pro-Leu-Gly-NH_2

Figure 1. Structure of oxytocin.

Oxytocin has the chemical formula $C_{43}H_{66}N_{12}O_{12}S_2$ (Figure 1). It is a relatively short polypeptide, being composed of only nine amino acids (anono-peptide). The sequence is cysteine-trysteine-isoleucine-glutamine-asparagine-cysteine-proline-leucine (CYIDNCPLG). In the proposed system, the concept of two devices the refractometer and the glucometer is taken into consideration. The device refractometer is used to detect the content of nutrients present in the fruits or vegetables.

The refraction behaviour of light, when travels through liquid is used to measure the concentration of an aqueous solution. The refraction is more in case of suspended solids; such as salts or sugars. The refraction index can be measured for an aqueous solution using the tool Refractometer and the Brix scale can be used to assign a value of it.

While passing through a liquid, the light bends and its refraction may measure using the Brix scale, which helps to assess the different concentrations levels in

solution. Brix value for pure water is zero, and higher Brix value is obtained for the solutions having more salts, sugars, and minerals. Digital refractometer has LED which helps them for producing their own beam of light, which is passed through the sample and resulting refraction was measured as numerical value on the Brix scale.

A hand-held device, Glucometer that tells glucose level is high, low, or right on target. A finger cab be pricked to obtain a blood droplet and that can be applied to a plastic strip that's inserted in a glucometer. An electrochemical sensor gives the blood glucose values based on the reaction. Wireless Sensor Glucometer is Tattoo-like sensor (Figure 2) that can be detected the glucose levels without painful finger prick.

Figure 2. Tattoo type glucometer.

This tattoo Glucometer measures the level of glucose in between skin cells and it is flexible and easy to wear. The proposed device will be able to detect the presence of Oxytocin considering these two devices working principle. The proposed device when injected orplaced on the fruits it will be able to show the presence of Oxytocin.

Since, no such instruments are already available, hence, this study is considering the working principle of Refractometer and Glucometer. Those devices are based on the principles of nano science[11,12].

"Refractometer" a simple instrument that can be used for measuring nutritional content of fruits and vegetables. "Glucometer" is a another instrument used for determining the glucose concentration level is high, low, or right on target.

Glucose level and Nutritional content of fruits and vegetables can be detected using the device glucometer and refractometer. Similarly, considering these two devices working principle, this study develops a system which will be able to detect Oxytocin in Fruits and Vegetables.

3. Conclusion

Liquid chromatography mass spectrometry (LC-MS/MS) is widely used for monitoring the presence of Oxytocin in an aqueous solution, mammalian plasma, raw materials, and milk. Wireless sensors are also not used for the detection of Oxytocin in fruits and vegetables. This study aimed at detection of Oxytocin in fruits and vegetables by considering the principle of Refractometer and Glucometer. So, this study introduces remote sensor for recognizing Oxytocin levels in Fruits and vegetables and this methodology can enhance comprehension of surviving examination, recommend novel systems through which Oxytocin may work, and refine forecasts about Oxytocin pharmacotherapy.

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