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FORMULATION AND SENSORY EVALUATION OF SUNFLOWER SEEDS POWDER INCOPORATED CANDIES

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ABSTRACT:

The sunflower seed powder was studied for its effect of antioxidant activity property. Sunflower seeds were collected, sundried for 3 days and finally its ground into powder. The sunflower seed powder was used in candy with 3 variation of each 5%,10% and 15% respectively. The standard candy and the 3 variation were given to 20 panel members and found the highest acceptability. Of all the variations variation 1 with 5% sunflower seed powder incorporated candy had the highest acceptability.

Key words: antioxidant, sunflower seed powder, coronary heart disease.

INTRODUCTION:

Sunflower seeds are the rich source of proteins, tocopherols, minerals, vitamin E, niacin, pyridoxine, folic acid, calcium, copper, iron, magnesium, and phosphorous. Pharmacological action of sunflower bear antibacterial, antifungal, anti-inflammatory and dermoprotective. Literature revealed that the ingestion of fruits in daily diet contributes to the low incidence of cancer. Therefore, various fruits, their juices, and aqueous extracts reported for anticancer activities.

A compound in sunflower seeds blocks an enzyme that causes blood vessels to constrict. As a result, it may help your blood vessels relax, lowering your blood pressure. The magnesium in sunflower seeds helps reduce blood pressure levels as well.

Additionally, sunflower seeds are rich in unsaturated fatty acids, especially linoleic acid. Your body uses linoleic acid to make a hormone-like compound that relaxes blood vessels, promoting lower blood pressure. This fatty acid also helps lower cholesterol.

Furthermore, in a review of 13 studies, people with the highest linoleic acid intake had a 15% lower risk of heart disease events, such as heart attack, and a 21% lower risk of dying of heart disease, compared to those with the lowest intake.

The sunflower seed and sprout is a ubiquitous crop with abundant nutrients and biological activities. This review summarizes the nutritional and medical importance currently recognised but under-researched concerning both seed and sprout highlighting the potential benefits of the phytochemicals constituent including phenolic acid, flavonoids and tocopherol (shangshuanguo, yange, kriskamalna, 2017).

They are nutritious, healthy and prevent you from several kinds of chronic diseases. Sunflower seeds are one such type of seeds that is loaded with high-quality nutrients. They are rich in healthy fats, beneficial plant compounds and several vitamins and minerals. Sunflower seeds can even help reduce inflammation, heart disease and type 2 diabetes.

Sunflowers seeds contain zinc that is known to activate about 300 enzymes in the body and boost immunity. They also contain selenium and other vitamins, which can fight infection and boost immunity. Building internal immunity is important to protect oneself from chronic diseases.

Studies found that consumption of seeds — including sunflower seeds — was linked to lower rates of cardiovascular disease, high cholesterol and high blood pressure. Sunflower seeds are a source of many vitamins and minerals that can support your immune system and increase your ability to fight off viruses (**Dan Brennan, 2020**).

The sunflower (*Helianthus annuus* L.) seed and sprout is a ubiquitous crop with abundant nutrients and biological activities. This review summarizes the nutritional and medical importance currently recognized but under-researched concerning both seed and sprout highlighting the potential benefits of their phytochemical constituents including phenolic acids, flavonoids and tocopherols. Furthermore, the dynamic metabolite changes which occur during germination and biological activities are evaluated. The aim is to provide scientific evidence for improving the dietary and pharmaceutical applications of this common but popular crop as a functional food.

The sunflower seed and sprout contain valuable antioxidant, antimicrobial, anti-inflammatory, antihypertensive, wound-healing, and cardiovascular benefits found in its phenolic compounds, flavonoids, polyunsaturated fatty acids, and vitamins. It is used in ethnomedicine for treating a number of disease conditions including heart disease, bronchial, laryngeal and pulmonary infections, coughs and colds and in whooping cough (**TIMES OF INDIA, 2021**).

The sunflower seed is the seed of the sunflower (*Helianthus annuus*). There are three types of commonly used sunflower seeds: linoleic (most common), high oleic, and sunflower oil seeds. Each variety has its own unique levels of monounsaturated, saturated, and polyunsaturated fats.

The information in this article refers mainly to the linoleic variety. For commercial purposes, sunflower seeds are usually classified by the pattern on their husks. If the husk is solid black, the seeds are called black oil sunflower seeds.

The crops may be referred to as oilseed sunflower crops. These seeds are usually pressed to extract their oil. Striped sunflower seeds are primarily eaten as a snack food; as a result, they may be called confectionery sunflower seeds.

The term "sunflower seed" is actually a misnomer when applied to the seed in its pericarp (hull). Botanically speaking, it is a cypsela. When dehulled, the edible remainder is called the sunflower kernel or heart (**Cluebot, 2021**).

Sunflower (*Helianthus annuus* L.) is one of the few crop species that originated in North America (most originated in the fertile-crescent, Asia or South or Central America). It was most likely domesticated by Native Americans, who carried it eastward and southward of North America.

Sunflowers were probably first introduced to Europe through Spain. The crop, spread through Europe as a curiosity until it reached Russia, where it was readily adapted. In Russia, selection for seeds that were high in oil began in.

This selection for high producer varieties was largely responsible for increasing oil content from 28% to almost 50%. The high-oil lines from Russia were reintroduced into the U.S. after World War II, which rekindled interest in the crop. However, it was the discovery of the male-sterile and restorer gene system that made hybrids feasible and increased commercial interest in the crop.

Production of sunflowers subsequently rose dramatically in the Great Plains states because of new niches for the seeds, including oil, snack food, and birdseed. Production in these regions has declined mostly because of low profit margins as well as pests. Sunflower acreage is now moving westward into dryer regions; however, 85% of the North American sunflower seed is still produced in North and South Dakota and Minnesota (**Beach and Coral, 2017**).

MATERIALS AND METHODS

SELECTION, PROCUREMENT AND PROCESSING OF RAW MATERIALS:

Selection, procurement of sunflower Seeds Powder:

In this process of making a Cookies from components that has sunflower seeds as main ingredient and other wheat flour and butter are the other ingredients as the substituent, we have a simple and easy method of bringing up the ingredients as a mix.

Treatment of sunflower seeds powder :

The sunflower seeds are taken or bought for a moderate rate from a local shop or market and cleansed thoroughly for removal of bacteria.

Then, the sunflower seeds are dried of from moisture content and taken in a clean and dry tray of good convenience.

Preparation of sunflower seeds Powder:

The sunflower seeds in the plate are left outside in a free area for sun-dry to be natural for consumption for about a time of 2-3 days.

After this, the dried sunflower seeds are ground into a fine powder which is then ready for processing .

Storage of sunflower Seeds:

Sunflower seedspowder was stored in an air tight container for the development of food product and for the analysis of nutrients.

Procurement of other ingredients:

The other ingredients added to prepare the food products are Wheat flour, butter, Jaggery,

STANDARDISATION AND FORMULATION OF SUNFLOWER SEEDS POWDER INCORPORATED FOOD PRODUCTS:

According to United States Department of Agriculture (USDA), a standardisation is defined as one that “has been tried, adapted and retried several times for use by a given food service operation and has been found to produce the same good results and yield every time when the exact procedures are used with the same type of equipment and the same quantity and quality of ingredients”. In easier terms, a standardized recipe is a complete, specific set of written instruction for cook to produce consistent high quality recipes every time (<https://dphhs.mt.gov/portals>,2018).

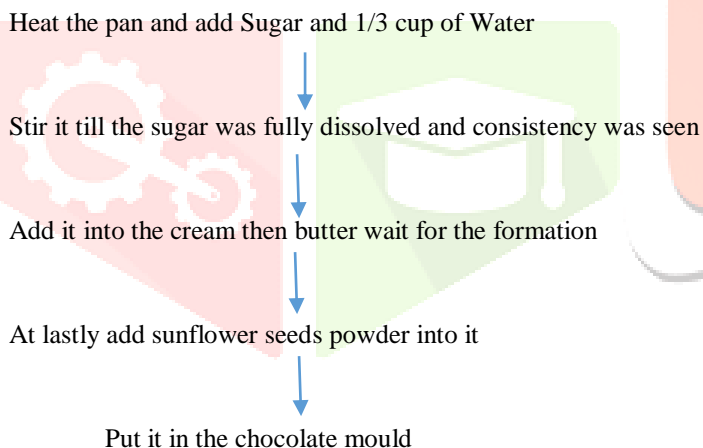
The following sunflower Seeds powder incorporated food products were standardized and prepared.

- Sunflower Seeds candy

STANDARDISATION AND FORMULATION OF SUNFLOWER SEEDS CANDY:

A Standard toffies were prepared using various ingredients, which are locally available sugar(20gm),cream(7gm),butter(3gm),without sunflower seeds powder

Sunflower seeds toffies were prepared in three variants the variation 1 contained, sugar(20gm),cream(6gm),butter(3gm),sunflower seeds powder (1gm). Variation2sugar(20gm),cream(5gm),butter(3gm) sunflower seeds powder(2gm). Variation 3 contained, sugar(20gm),cream(4gm),butter(3gm)Sunflower seeds powder(3gm).

PREPARATION OF SUNFLOWER SEEDS POWDER CANDIES:**Flow Chart for the Preparation of Candies:**

RESULT AND DISCUSSION**STANDARDIZATION AND FORMULATION OF CANDIES INCORPORATED WITH SUNFLOWER SEED POWDER**

STANDARDISATION AND FORMULATION OF SUNFLOWERSEEDS CANDY(30g)

S.No	Ingredients	Standard	Variation 1 (g)	Variation 2 (g)	Variation 3 (g)
1	Sugar	20	20	20	20
2	Cream	7	6	5	4
3	Butter	3	3	3	3
4	Sunflower Seeds powder.	-	1	2	3
	TOTAL	30	30	30	30

S – Standard, V1 – Variation % V2 – Variation % V3 – Variation %

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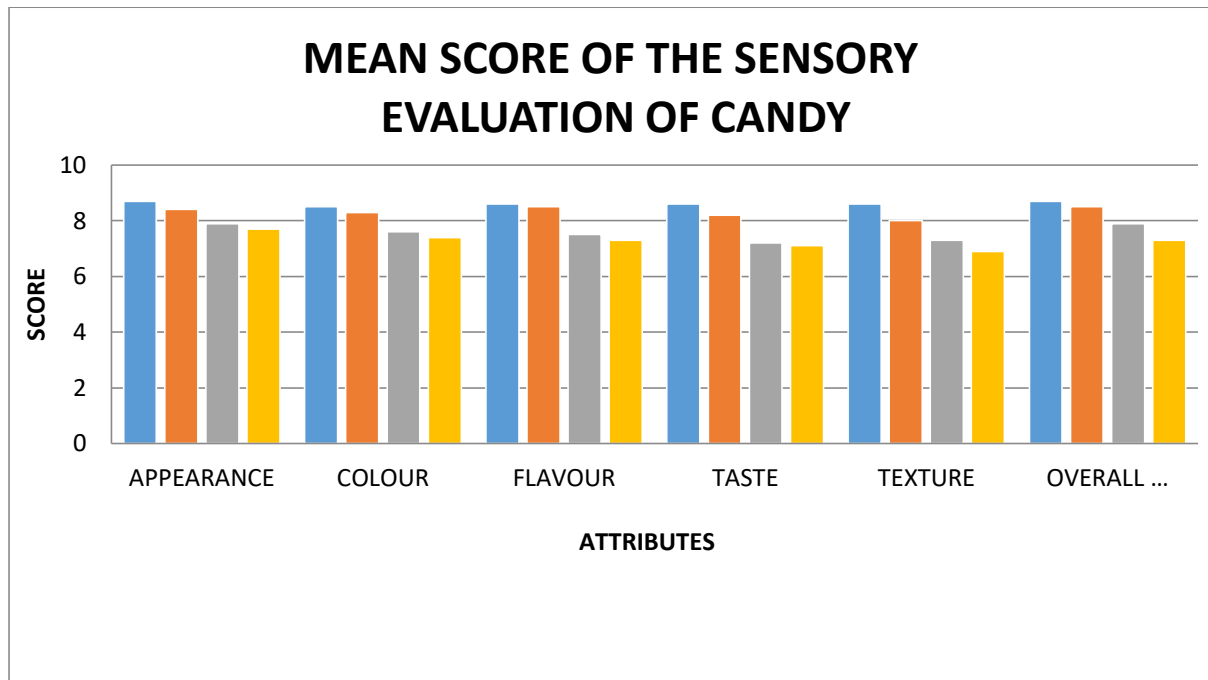
MEAN SCORE OF THE ACCEPTABILITY OF SUNFLOWER SEED POWDER INCORPORATED CANDY:

SAMPLE	MEAN ± STANDARD DEVIATION
Standard	8.7
Variation – 1	8.4
Variation – 2	7.6
Variation – 3	7.5

S- Standard, V1- Variation 5%, V2- Variation 10%, V3- Variation 15%.

The overall acceptability of Sunflower seed powder incorporated candy revealed that the variation 1 has got the highest mean score of 8.4. The least accepted sample were V3 with a mean score 7.5. The mean score of the Variation 1 is higher than all the variations.

MEAN SCORE OF THE SENSORY EVALUATION OF DELONIX ELATA LEAVES POWDER INCORPORATED CANDY



The mean score of the sensory evaluation showed that sunflower seed powder incorporated candy, the variation 1 has been better appearance of (8.4), colour (8.3), Flavour (8.5), Taste (8.2), Texture (8), and overall acceptability(8.5) among all the other variations. Of all the candy with the incorporation of sunflower seed powder at 5% had the highest level of overall acceptability.

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