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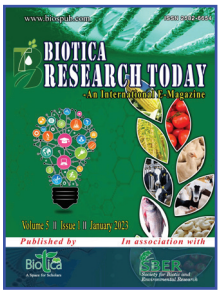

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Multifarious Uses of Sunflower

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Abstract

Sunflower is considered as important crop based on its nutritional and medicinal value. Due to its beneficial health effects, sunflower has been recognized as nutracautical. The oil extracted from sunflower is known to be a potential source of antimicrobial, anti-inflammatory, anti-tumour and antioxidants and also have industrial values. Sunflower seeds, meal and cake could be a promising human diet and livestock feed. Exploitation of sunflower seed products with high protein content has fond applicable in food processing, various pharmaceutical and agriculture.

Introduction

The continuous rise in the human population coupled with high demand for food demands intensification of agricultural practices for maximum food production. Globally, the sunflower is ranked the fourth most important oilseed crop after soybean, rapeseed and safflower, as the most profitable and economic oilseed crop. Sunflower has emerged as an economical oil crop that can be incorporated into local cropping systems, enhance soil health, and increased biodiversity in a crop rotation system. Sunflower crop has a strong adaptive mechanism for growing in complex environments.

The crop is mainly grown as a source of premium oil and dietary fiber that significantly contributes to human health. It forms an economical and promising agricultural crop with many benefits in enhancing valuable market products; provide a source of income and poverty alleviation. The economic and health benefits of sunflower crop are discussed in brief hereunder.

Sunflower Oil

Sunflower oil is generally classified as nonvolatile oil. It is majorly used as principal ingredient in food preparation with unique physical and chemical properties. The major composition of sunflower oil is linoleic acid and oleic acid and fatty acid composition of sunflower oil was given below (Figure 1). Consumption of sunflower oil in maintaining low-density lipoprotein and cholesterol levels in the body, is advantageous in the treatment of disease conditions like acne, arthritis, and hair damage (Lai *et al.*, 2017). According to the USDA, the nutritional value of 100 g of sunflower oil is as detailed below in Table 1.

It has potential applications in the cosmetic industry because of its water retention and non-inflammable. The oil acts as ingredient for manufacture of paints, soaps, detergents, varnish, lighting oil, pest adjuvant in industries and it can be used as an alternative to bio-diesel.

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Table 1: Nutritional value of 100 g of sunflower oil

Nutrition Fact	Quantity	% Daily Value
Calories	884	
Total fat	100 g	128%
Saturated fat	10 g	50%
Vitamin E (alpha-tocopherol)	41.08 mg	274%
Vitamin K	5.4 mcg	4%
Cholesterol	0.00 mg	0%

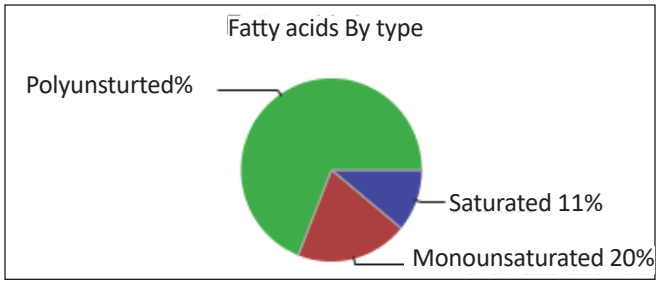

Figure 1: Fatty acid composition of sunflower oil

Sunflower Meal and Oil Cake

Sunflower meal (Figure 2) is the largest by-product obtained after the oil extraction process from seeds in an industry accounts for 36% mass composition, protein content ranging between 45% and 50%.

In terms of nutritional balance, it is ranked the 4th most invaluable oil meal after cotton seed meal, rapeseed meal and soybean meal. It is an excellent source of protein, essential amino acids, vitamin B, minerals with high antioxidant property, which is fascinating as a nutritional food for humans and composite meals for livestock, which enhance the animal growth and milk production as well as relative biomass generation.

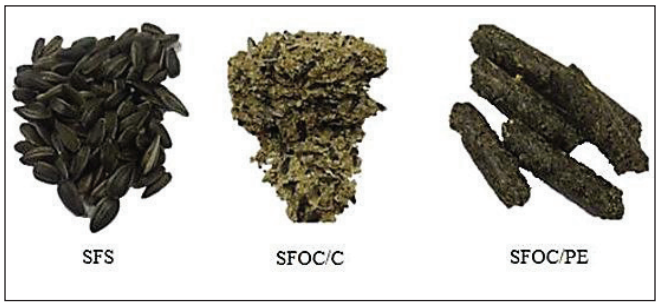

Figure 2: Sunflower meal and Oil cake

Sunflower Seed

Sunflower seeds contain high amounts of vitamins like vitamin E, B, folate and niacin and minerals like calcium, copper, iron, magnesium, manganese, selenium, phosphorous, potassium, sodium and zinc which has made it a domesticated food source in many homes. Confectionery type sunflower seeds can be eaten raw, roasted, cooked, dried and ground (Islam *et al.*, 2016).

The roasted seeds can serve as a substitute for coffee. Dehulled and roasted sunflower seeds are rich in methionine and cysteine which could serve as alternative nutritious meals for man and in feeding livestock. According to the USDA, 100 g of raw sunflower seed contains following nutritional components (Table 2).

Table 2: Nutritional value of 100 g of raw sunflower seed

Nutrition Fact	Quantity	% Daily Value
Calories	571	
Total fat	50 g	64%
Saturated fat	5.4 g	27%
Total Carbohydrate	18 g	7%
Dietary fiber	11 g	39%
Sugar	3.6 g	0%
Proteins	21 g	42%
Calcium	143 mg	11%
Iron	6.4 g	36%

The overview of pharmacological and health benefits of sunflower seed and oil was given in brief in figure 3.

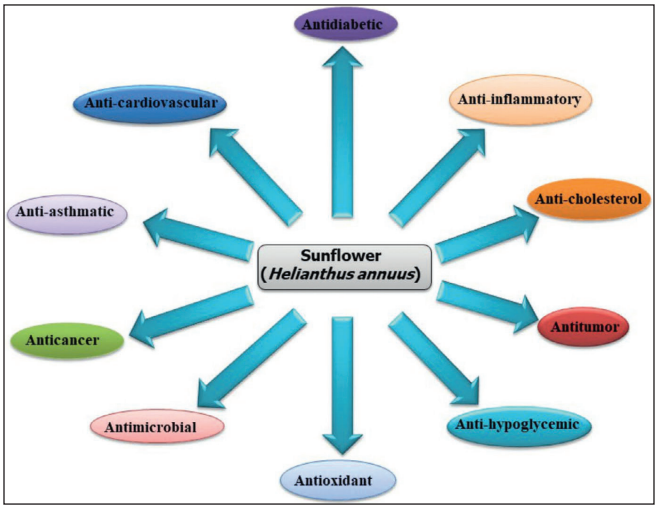

Figure 3: Pharmacological and health benefits of sunflower

Conclusion

From the time immortal sunflower crop has been exploited and used for many purposes such as vegetable oil, food industry, medicinal and pharmaceutical uses and as ornamental plant. Further, growing of sunflower might be more competitive to other crops like maize, soybean, and sorghum in near future.

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