

# Edible flower considerations as ingredients in food, medicine and cosmetics

## Abstract

There is a great demand in the market for natural products derived from plants. The edible flowers have in their constitution proteins, lipids, carbohydrates, minerals and vitamins, important for the food industry, medicines and cosmetics. The antioxidant activity and phenolic compounds present in flowers provide several beneficial effects to human health. Thus, edible flower extracts or use of fresh flowers may be a viable alternative as a natural antioxidant in place of synthetic antioxidants in the food, pharmaceutical and cosmetology industries.

**Keywords:** medicinal plants, bioactive compounds, chemical characterization, nutritional value

Volume 7 Issue 3 - 2018

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**Received:** April 09, 2018 | **Published:** May 24, 2018

## Mini review

The high consumption of industrialized foods associated with physical inactivity and overweight caused an increase in the number of chronic diseases related to inadequate food.<sup>1</sup> With the focus on reducing these incidences the population has sought a healthier diet associated with the practicality and the presence of functional characteristics, being an important point to be approached by studies and mainly of greater interest for the food industries.<sup>2,3</sup>

The compounds of antioxidant action used by the food industries can be synthetic or natural, and those of greater use are those of synthetic nature. However, the salubrity of some synthetic antioxidants has been questioned, since there are studies demonstrating that they may favor mutagenic and carcinogenic effects.<sup>4</sup> Numerous phytochemicals present in edible flowers are related to health-promoting benefits such as antioxidants, anti-inflammatories, anticancer, anti-obesity, hypoglycemic agents, and substances with protective properties of the neurological, hepatic and gastro system.<sup>5-7</sup>

The natural antioxidants are presented as an alternative to prevent oxidative deterioration of food, thus minimizing the damage that these oxidative compounds would cause in humans.<sup>8</sup> The colors of the flowers, as well as the colors of fruits and vegetables, indicate the presence of phytochemicals such as polyphenols or phenolic compounds, flavonoids, carotenoids and anthocyanins.<sup>9</sup> Xiong et al.<sup>10</sup> found in a study with edible flowers in China that the flowers have large amount of polyphenols, which are substances known to have high anti oxidant capacity and biological activity.

To the extent that research defines the health benefits of physiologically active components in flowers, they may still have potential for use as an additive in food to help prevent chronic disease and even oxidation of food.<sup>11</sup> One of the biggest concerns related to flower consumption is its possible toxicity. Edible flowers

can add distinctive flavor and provide a unique touch of color to foods. However, not all flowers are edible, it is important to correctly identify each species and know which parts of the flowers should be consumed.<sup>12</sup> The flowers of florists, nursery or garden centers, are commonly treated with pesticides, fungicides and herbicides not rated for food crops, and should not be used in the formulations and n and m as accompanying diets.<sup>5</sup>

The search for raw materials that are beneficial to health and do not cause undesirable sensorial changes to the final product has gained emphasis and intensified interest in bioactive compounds of plant origin. These compounds have great commercial appeal due to their biological action and their use in the development of functional foods and also to become an alternative as food additives (dyes, flavorings, antioxidants and preservatives).<sup>13,14</sup>

The nutritional need required by the human body in health and disease states has been the object of intense research in recent years, as well as the concern about the chemical characterization of foods with economic and nutritional potential, especially those of low caloric value, since obesity and chronic-degenerative diseases become prominent in public health. For this reason, it is extremely important to study the chemical composition of foods.<sup>15,16</sup>

Natural substances, of vegetable origin, make the food more attractive to the consumer, besides increasing the shelf life by bacteriostatic and bactericidal capacity, these substances delay the onset of deterioration and the growth of undesirable microorganisms.<sup>17</sup> From the perspective of phytochemical research it is possible to know the chemical constituents of plant species or to evaluate their presence in them. Where no chemical studies on the species of interest, this analysis can identify metabolites groups *secunda rivers* relevant es.<sup>18</sup>

Several studies have been carried out to verify the antioxidant potential of phenolic acids, aiming to replace synthetic

antioxidants. Faced with this fact a diversity of natural antioxidants has been studied for this purpose.<sup>19</sup>

Plant extracts rich in polyphenols are good choices as they are easily obtained from natural sources and prevent lipid oxidation in food products. Among the most commonly used natural antioxidants are tocopherols, phenolic acids and plant extracts such as rosemary and sage.<sup>20</sup>

Several species of flowers with edible use are already known and used in the diet, and more recently, it is sought to know the properties of species not yet used in food.<sup>21</sup> Some plant-derived foods have the ability to reduce the risk of chronic diseases, and this is in part associated with secondary metabolites (phytochemicals). These metabolites exhibit low potency as bioactive compounds when compared to pharmaceutical drugs, but when ingested regularly and in significant amounts as part of the diet may have a remarkable physiological effect. Metabolites that are present in diets and related to health benefits include glucosinolates, terpenoids (carotenoids, monoterpenes, phytosterols) and various groups of polyphenols (anthocyanins, flavones, isoflavones, ellagic acid, among others). The activity of these compounds is in part associated with the antioxidant properties.<sup>22</sup>

The use of flowers has not been merely ornamental, since some species are used as food for wild animals, while others have phytotherapeutic properties, produce oils and essences used in perfumery and cosmetics or are used in cooking.<sup>23</sup> However, even today, few data confirm the comestibility of flowers when related to compounds of nutritional interest, since there is no tradition of flower use in food, as well as little research concerning the toxicity of some species.<sup>24</sup> The importance of phenolic compounds to the nutritional quality of foods is due to their antioxidant action due to their stable intermediate radicals, which prevent the oxidation of various food ingredients, particularly lipids, as well as the ability to donate hydrogen or electrons.<sup>25</sup>

Antioxidants play an important protective role in cell damage promoted by free radicals induced by oxidative stress.<sup>26</sup> Foods containing natural antioxidants, such as polyphenols, aid in the oxidative damage of the human body and arouse the interest of researchers.<sup>26–28</sup>

## Acknowledgments

None.

## Conflict of interest

The author declares that there is no conflict of interest.

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