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CARDIOPROTECTIVE NUTRIENTS IN COMMON FRUITS: A REVIEW

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Abstract: Cardioprotective Nutrients in Common Foods focuses on explaining the cardioprotective values of tomatoes, blueberries, and lime. The study aims to present a comprehensive review of the cardioprotective benefits of these fruits because of their availability to the public and capability to supplement the diet in efforts towards fighting heart diseases due to their content of chemicals that make foods consumed daily have a shot at reducing the effects of heart diseases. This study has been prepared based on these three fruits, tomatoes, blueberries, and lime which help prevent the risk of cardiovascular diseases due to the presence of antioxidants and other similar nutrients.

Keywords: tomatoes, blueberries, lime, cardioprotective diet

• Introduction

- As known, the most prevalent reasons for death among people are irregular life, bad eating, smoking, lack of exercise, and ignoring the signs that our bodies send us, which is something life is relying on its tomatoes for their abundance of highly effective antioxidants, lycopene, and beta carotene that help lessened oxidative stress and inflammation, thereby supporting cardiovascular health. Flavonoids and anthocyanins in blueberries optimize blood vessel performance, reduce blood pressure, and normalize cholesterol. Full of vitamin C and flavonoids, lime offers immune boosting and anti-inflammatory benefits which protect the blood vessels and contribute towards a healthy heart [2]. The cardioprotective effect due to cardiovascular disease prevention is through the content of chemical compounds and antioxidants (lycopene, beta-carotene, potassium, and vitamin C) in tomatoes and blueberries, which neutralize free radicals and therefore decrease oxidative stress.
- Tomatoes are described by the presence of antioxidant compounds (lycopene, beta-carotene, potassium, and vitamin C), which have the role of lowering oxidative stress, and neutralizing free radicals; helping the prevention of cardiovascular diseases. Lycopene contributes to the reduction of LDL (bad) cholesterol levels, as such it helps in reducing atheroma formation in arteries. The potassium content makes blood pressure regulation possible, because potassium counteracts the hypertensive effects of sodium, and vitamin C makes sure that blood vessels are so flexible and elastic. Consuming tomatoes or products that contain tomatoes reduces LDL cholesterol levels and systolic blood pressure and has cardioprotective benefits. As a result, the consumption of lycopene improves the endothelial function decreasing the danger of cardiovascular disease [2].
- In the case of blueberries, the key compounds are Vitamin C, fiber, resveratrol, and anthocyanins. Blueberries are very rich in anthocyanins, showing the capacity to increase endothelial function, relaxing blood vessels, and in that way making the blood flow more efficiently. Blueberries are also important factors that can decrease cardiovascular risk due to their effect on regulating lipid and glucose levels, and due to the presence of anthocyanins and vitamin C to decrease inflammation. Regular consumption of blueberries reduces the risk of a myocardial infarction, having beneficial effects on vascular function, and blood pressure, and thus reduces the probability of a cardiovascular event [4].
- Lime's key compounds are Vitamin C, flavonoids (e.g., hesperidin), and limonoids. The consumption of lime, reduces oxidative stress, due to its anti-inflammatory and antioxidant properties like high contents of vitamin C and flavonoids, working also, for heart health because hesperidin, improves blood flow and functions in endothelial cells through the regulation of lipid metabolism. Regular consumption of lime reduces a person's risk of ischemic cardiac incidents [1].
- The study aimed to present a review regarding three fruits with cardioprotective effects because of their capability to supplement the diet to fight heart diseases due to their content of chemicals with antioxidant activity.

• Comparative Analysis of Nutritional Composition of Fruits

- The nutritional profiles of tomatoes, blueberries, and lime are presented in Figure 1. The table compares the nutritional and bioactive compound content of three commonly consumed fruits: tomatoes, blueberries, and limes. The properties of each fruit are unique, all contributing to cardiovascular health and overall nutrition.
- Combining these fruits (tomatoes, blueberries, and lime) increases the potential of cardio-protection, because of the chemical compound synergism that helps the health of the vasculature. It is obvious that when vitamin C, anthocyanins, and lycopene are consumed together, the combination reduces oxidative stress and systemic inflammation caused by free radicals in blood vessel cells [1,3]. To reduce the risk of hypertension, the synergy between flavonoids and anthocyanins allows both to relax and make blood vessels more elastic (i.e., increase elasticity and reduce blood pressure through endothelial dysfunction that prevents vessel stiffness and intensifies vascular flexibility) [1]. Anthocyanins available in tomatoes and blueberries decrease bad cholesterol levels (LDL) and help to control glucose levels and inflammation, while lycopene is involved with diabetes, and with reducing cardiovascular risk. Consuming these fruits synergistically, the combination is more effective for decreasing inflammation, an important risk factor in cardiovascular diseases. Flavonoids, lycopene, vitamin C, and anthocyanins modulate inflammatory responses affecting the likelihood of atherosclerotic plaque formation [7].
- Another possible option to bring all three fruits together is a smoothie with blueberries, tomatoes, and lime. The potential best proportion of fruits for creating a healthy rich smoothie based on the nutritional profile of fruits is presented in Figure 2.

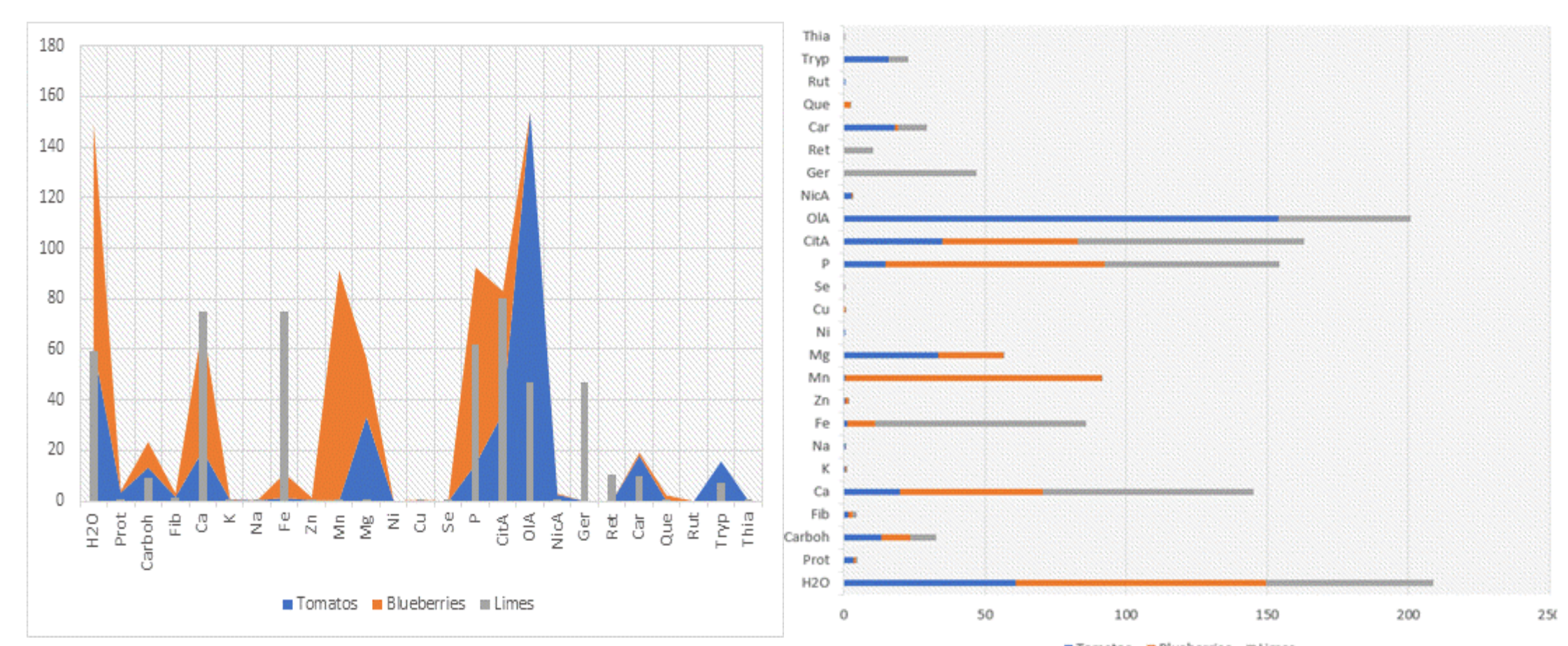


Fig.1. Tomatoes, blueberries, and lime fruits fingerprint

Figure 2. Stacked bar chart representation of fruit proportions for smoothies

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• Conclusions

- Tomatoes' chemical composition (lycopene and potassium) helps lower the risk of a cardiac event. Blueberries are very healthy due to their high anthocyanins and bioactive content which improve endothelial function, and regulate LDL cholesterol and glycemic index. They are important for cardiovascular health, being nutrient-dense and low in calories.
- Lime adds extra Vitamin C limonoids and flavonoids, adding supplementary anti-inflammatory and antioxidant compounds that contribute to maintaining healthy cardiovascular activity.