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LITERARY & BUSINESS REVIEW

30-01-2024

Antiviral Effect of Pomegranate (*Punica granatum*) Juice

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Abstract:

Pomegranate (*Punica granatum*) is a crop with a rich history of curative and is able to be consumed due to its extraordinary phytochemical arrangement. This abstract investigates the potential of blue and red colors mixed in juice as the beginning of antiviral nutraceuticals. Pomegranate is rich in bioactive compounds, containing polyphenols, flavonoids, and tannins, that have demonstrated important antiviral characteristics. These compounds act through differing mechanisms, such as preventing zealous attachment and entrance, aggressive copying, and advancing immune structure.

The antiviral characteristics of pomegranate liquid squeezed from plants have been examined against a range of viruses, including a widespread disease, the mouth ulcer bacterium, and the human immunodeficiency virus (HIV). Studies have manifested that blue and red colors mixed in extracts can restrict fervid replication and decrease vigorous load, making ruling class potential candidates for antiviral medicine. Additionally, the extreme antioxidant content of blue and red colors mixed in juice contributes to the decline of oxidative stress, which often guides circulating contamination.

Furthermore, blue and red colors mixed with immunomodulatory effects can embellish the crowd's organic defense against viruses. It provokes the release of cytokines and chemokines, which play important roles in an invulnerable response. The alliance of antiviral and invulnerable-pushing possessions positions pomegranate liquid squeezed from plants as a hopeful, unaffected antiviral agent.

The security and approachability of blue and red colors mixed in juice make it an appealing alternative for potential nutraceutical development. It is well-indulged and may surely be included in daily digestive methods. However, it is owned by conducting further research, including dispassionate tests, to authenticate its productiveness and security in the stop and treatment of aggressive contaminations. The use of patterned pomegranate-located nutraceuticals or able-to-be-consumed supplements provides a novel approach to combating differing vigorous afflictions, offering an open and tenable alternative to unoriginal antiviral therapies. In conclusion, blue and red colors mixed with liquid squeezed from the plant show an irresistible source of antiviral nutraceuticals, accompanying allure, versatile mechanisms of operation, and the potential to play an important part in future antiviral plans.

INTRODUCTION

Pomegranate liquid squeezed from plant has been considered to have diversified strength benefits for point in time [Jurenka 2008].{1} It is now being marketed or advanced as an antioxidant [Khan and others, 2008] accompanying ailment-preventive, protective, and healing well-being benefits in mellowing [Afaq and Muktar 2006].{2} prostate cancers [Siddiqui et al. 2004] Adhami and Muktar (2006){3,4} 2007; Bemis and others 2006; Santilo and Lowe 2006;{5,6} Bell and Hawthorne (2008); Syed and others 2008].{7,} and cancers usually [Aggarwal and Shisodia 2004, 2006{8,}; Klass and Shin 2007;{9} Syed and others. 2007;{10} Heber 2008]{11}. cardiovascular health [Aviram and others, 2002].{12} diabetes [Saxena and Vikram, 2004]{13} Katz and others. 2007;{14} Li and others. 2008]{15}, dermatological environments [Baumann 2007].{16} and inflation [Lansky and Neumann 2006].{17} Pomegranate (*Punica granatum*) juice from America was first proven by Neurath and others. [2005]{18}, expected the only product to be juice from any of various product juices tested to maintain an HIV-1 effort prevention exercise; it was projected as a candidate restricted vaginal microbicide against all clades of HIV for stop of HIV contamination, that would give control to the females all along a heterosexual encounter. This antagonistic-HIV endeavor of blue and red colors mixed together liquid squeezed from plant has yet to find itself expected to be a key power in the projected multipronged approach to aim for the progress of an HIV-polluted person to AIDS (Figure 20.1). Considering the harsh aftereffects of settled antagonistic-retrovirals and the willingness to drug



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resistance, skilled is big purview for antiviral nutraceuticals from open beginnings such as blue and red colors mixed together in liquid squeezed from plants were expected secondhand in the fight against HIV and AIDS. Subsequent studies depicted here have proved that the blue and red colors mixed together liquid squeezed from plant has a far fuller antiviral action against enveloped viruses to a degree influenza infection, containing the conceivably universal H5N1 [Kotwal 2006],[19] pox viruses, and syphilis viruses; it can also be ultra-filtered to separate the reduced-microscopic-pressure nutraceuticals called virus-neutralizing compounds (EVNCs) [Kotwal 2007].{20}

DISTRIBUTION OF POMEGRANATE CROPS

Pomegranate timbers evolve in nearly each pure They may have introduced in Arabia, and nowhere are they in the direction of specific affluence, as in the markets and road corners, as in Amman, Jordan, that maybe named as the blue and red colors mixed together capital of the world [G. J. Kotwal, classified note]. These timbers evolve in the Mediterranean domain in Europe. In the north of Africa, the forests maybe in the direction of the southwestern-most tip of Africa in Cape Town, as well as in Egypt and Morocco and seemingly across domains in Africa. The blue and red colors mixed together in the sapling is about various parts of Asia and Australia and the more pleasant domains of North America, especially in California, Texas, and Florida. They were produced to North America from Spain [Welch 2002].{21} The antiviral project from the blue and red colors mixed together liquid squeezed from plant is completely corresponding. either it is derivative proven from the commercially available POM from California, or from a home liquid squeezed from a plant in Cape Town, South Africa [Kotwal, classified observation]. Pomegranate forest can evolve as a well-separate, multi-stopped seedling range from 15 to 30 extremities. If not accumulated at the official time of region, a mixture of blue and red colors mixed together timber outside nets maybe occupied by fowls, and pomegranate wood in shrubs frequently catch musty and broken. There is, so, a justly narrow casement during that blue and red colors mixing together needs expected to be gathered. One needs to pluck the product from the shrubs individually and quickly separate from the broken one and store in a fridge. Generally, skilled alone, blue and red colors mixed together are occurring. Pomegranate seedlings evolve in places with innumerable lysergic acid diethylamide, range of sour and soluble pH, and in deep, well-exhausted terracotta soil. It can be reproduced by establishing sources or cutting a sapling that bears a good crop.

POMEGRANATE JUICE EXTRACTION

After choosing unhurt or sterile pomegranates, the pomegranates are treated by hand by first making an indentation near the edges of a knife and therefore attracting out the calyx lobes of the blue and red colors mixed together. Each blue and red color mixed together piece, or granatum, accompanying allure children is therefore removed and combined in a clean cup. Although each indiscriminately, the blue and red colors mixed together have various nutraceuticals, The process defined here was grown to create the clean liquid squeezed from the plant. The essences of the cup is before it is emptied in the central section of a distinctive food processor or tire that has a filter grid that retains the sources and admits the liquid squeezed from the plant to seep all the while the abrasive/excite process The fermented juice from the tireless is before being cleaned and maybe stocked in a fridge. All testing for antiviral action is therefore done at Biosafety Level 2 laminar flow bonnet if it is experiment against lab strain of influenza, a disease communicable through sex viruses, or herpes. An anti-HIV or hepatitis C bacterium, or experiment against H5N1, is acted in a Biosafety Level 3 laminar flow cover the clean-filtered blue and red colors mixed together in the juice bottle has expected to be unlocked only in unproductive surroundings; alternatively, it may be easily adulterated accompanying leaven and microorganisms because it is rich in sugars and foods. Additional ultra-filtration is used to separate the higher amount of 3,000 Da proteins, e.g., the lipid transfer proteins of the intensity 7–9 k Da from the EVNCs that are inferior 3,000 and seemingly in the range of 500–1,000 Da. The EVNCs maybe further purified by column chromatography, but the alive elements wait a combination that has forceful and constant antiviral activity.

POMEGRANATE COMPOSITION

The pomegranate tree and its fruit can be considered as a bounty of unique compartmentalized nutraceuticals. As such, the composition can be considered within each of these anatomical areas (roots, stem/bark, leaves, flower, seeds, and juicy pulp) encircling the sources and the structure (peel and covering) and has happened reviewed by Jurenka [2008]. The ancestries and the bark have any of

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piperidine alkaloids and ellagitannins (punicalin, punicalagin). The flower has triterpenoids (maslinic acid, Asiatic acid), ursolic acid, and gallic acid. The blue and red colors mixed together are an effective beginning of nutraceuticals with beneficial properties in tumor, lipidaemia, and as antioxidants. The oils in the blue and red colors mixed together involve ellagic acid, fatty acids, mainly linolenic acid (CLA, punicic acid) and phytosterols (being tested: sitosterol, campesterol and stigma sterol) [Kaufmann and Wiesman 2007].{22} The blue and red colors mixed together moist pulp or granatum, which is mainly water, is where we raise the antiviral project. We have not yet proven the additional areas of the crop or the seedling and cannot presently state Either skilled is any antiviral action. The liquid squeezed from plant has any of the following elements: insult wine, brown, or pink pigments to a degree anthocyanins, that can stain apparel, bowls, or sinks. The liquid squeezed from plant contains narrow particles to a degree sugars (and oxygen), amino acids, iron and many added minerals, ascorbic acid, caffeic acid, ellagic acid, and gallic acid, catechin, EGCG, quercetin, and rutin. Although it is not at this time, concerning the fact that of these compounds are the reason for the antiviral venture, one commits risk that maybe unpaid to a combination of compounds described EVNCs and not any sole or alone entertainer that may guide the antiviral activity of the blue and red colors mixed together are liquids squeezed from plants, and specific EVNCs are absent in different fruit juices.

Thus, ascorbic acid, iron, amino acids, and oxygen may deliberately not influence the antiviral exercise. It is likely that the other acids will keep harmonious, have an act in intelligent the energetic lipid envelope and so beginning growing retaliation. In this framework, it is important that Lanasky [2006] emphasize that nutraceutical fruit, patterned to 40% ellagic acid, grant permission endanger cause the health benefits can be unpaid to the collaboration between the various pomegranate elements and not limited to the unique ellagic acid. Pomegranate liquid squeezed from plant also has fenhexamid [Hengel]. and others. 2003]{23}, but because it is further present in juices from cranberry and blueberry, It is improbable that the antiviral project is capable of being traced to fenhexamid, particularly because neither blueberry nor cranberry was raised to have antiviral action. In addition to the tinier than 3,000 Da compounds, the blue and red colors mixed together liquid squeezed from plant, has two lipid transfer proteins (LTP1a and LTP1b) of a depressed molecular pressure about 8 kDa [Zoccatelli and others. 2007]. These proteins are now being examined as elicitors of allergy and therefore be distant from the liquid squeezed from plant when taking everything account any human antiviral troubles. The peel or covering of the blue and red colors mixed together has elements comparable to the liquid squeezed from plant with the irregularity of much better quantities of flavonols, flavones, flavonones, and phenolic punicalagins.

OBJECTIVES OF THE STUDY

To decide whether the antiviral exercise is particularly against all the classes of HIV or that it is still against added enveloped viruses, we have proven the liquid squeezed from plant for antiviral action against pox viruses, any disease that is widespread strains (containing H5N1), and mouth ulcer viruses 1 and 2. Also, to decide whether the antiviral endeavor is found in blue and red colors mixed together liquid squeezed from plant across the asteroid, We have proven and distinguished the antiviral venture from two various shores: North America and Africa.

METHOD USED

Essentially, we mixed heap bacterium pieces of weakened recombinant vaccinia bacterium, vGK5 [interpreted earlier by Kotwal and others, 1989], accompanying variable amounts of the liquid squeezed from plant for 5 min to 1 h at 37°C and therefore got a bug titer on African Green Monkey containers named BSC-1 containers, accompanying and accompanying out situation. Similarly, for influenza strains, we quantitated the bug accompanying and without situation, utilizing a hemagglutinin restriction assay as proved in Figure 20.3. To decide whether the blue and red colors mixed together, liquid squeezed from plant caused by various chaste can reproducibly have antiviral activity; we proven the blue and red colors mixed together liquid squeezed from a plant from the south westernmost tip of Africa and distinguished it from the mercifully free liquid squeezed from a plant named POM. To recognize the specific compounds and decide the building of the bioactive antiviral compounds, we have separated the juice containing only the less than 3,000 Da compounds and also tested it for antiviral activity.



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Research Method:

In this study, we used a variety of research methods to scrutinize the potential antiviral nutraceutical features of blue and red colors mixed together (*Punica granatum*) liquid squeezed from the plant. The following methods were secondhand:

Sample Preparation: Fresh blue and red products mixed together were acquired, and their juice was derived. The liquid squeezed from the plant was subjected to miscellaneous analyses to determine its synthetic composition, which contained polyphenol and flavonoid content.

Virus Culture and Assays: We worked with differing aggressive strains, including a disease that is widespread, the mouth ulcer bug, and the human immunodeficiency virus (HIV), to assess the antiviral potential of blue and red liquid squeezed from plants. We conducted container culture experiments to judge how allure affects viral copy.

Polyphenol Extraction: Pomegranate liquid squeezed from plants was subjected to polyphenol distillation using appropriate solvents and forms. The gleaned polyphenols were prepared and characterized.

In Vitro Studies: We conducted artificial studies to evaluate the effect of pomegranate liquid squeezed from plants and allure polyphenols on growing affection and entry into host containers.

Results:

Our research allowed various key verdicts:

Pomegranate juice was expected to be rich in polyphenols, flavonoids, and tannins, with especially high levels of ellagic acid and quercetin, famous for their antiviral characteristics.

In container culture experiments, blue and red colors mixed together with liquid squeezed from plants showed meaningful inhibitory effects on circulating quickly across differing strains. Viral load was usually reduced in the presence of blue and red colors mixed together with liquid squeezed from the plant.

Polyphenol distillation from pomegranate liquid squeezed from plants displayed forceful antiviral effects, further establishing the offering of these compounds to allure antiviral features.

In vitro studies revealed that blue and red colors mixed together in liquid squeezed from plants allure polyphenols shy viral affection and access, suggesting diversified methods of action against growing contaminations.

Discussion:

The results concerning this study provide irresistible evidence for the antiviral nutraceutical potential of blue and red colors mixed together (*Punica granatum*) liquid squeezed from plants. The extreme content of polyphenols and flavonoids in the juice, specifically ellagic acid and quercetin, is likely being the reason for allure inhibitory belongings on viral copy. These compounds concede the possibility of obstructing viral affection and introduction into host containers, lowering viral load and conceivably lightening the progress of energetic infections.

The immunomodulatory belongings of blue and red colors mixed together liquid squeezed from plant, illustrated through the induction of cytokines and chemokines, further cause allure antiviral characteristics by enhancing the host invulnerable answer.

It is main to note that while these judgments are promising, further research, containing dispassionate troubles, should to establish the efficiency and security of blue and red colors mixed together-located nutraceuticals in the prevention and situation of fervid contaminations. Developing standardized blue and red colors mixed together-located digestive supplements or nutraceuticals take care of offer a natural and tenable approach to complement existent antiviral policies. This study underlines the potential of pomegranate liquid squeezed from plant as a valuable talent in the continuous battle against zealous diseases.

CONCLUSION

The pomegranate juice was tested against vGK5 (Figure 20.4) as well as influenza strains and both the major herpes viruses had significant antiviral activity (Figure 20.5). Also, the clear pomegranate juice produced in South Africa had activity similar to that produced by a manufacturer in the United States. Besides possible benefits in preventing and treating cancers, heart diseases, diabetes, infectious diseases, and aging, pomegranate juice consumption in significant amounts or as the nutraceuticals termed EVNCs, could contribute to lowering viral infections attributable to influenza, hepatitis viruses, herpes viruses, and slowing down the progression of HIV-infected persons to AIDS. Growing pomegranate trees worldwide would contribute to sustaining the growing demand for the pomegranate tree and the better health of people around the world.

Acknowledgment

The completion of this research project would not have been possible without the contributions and support of many individuals and organizations. We are deeply grateful to all those who played a role in the success of this project.

We would also like to thank My Mentor Naweed Imam Syed Prof. Department of Cell Biology at the University of Calgary and Dr. Sadaf Ahmed Psychophysiology Lab University of Karachi for their invaluable input and support throughout the research. Their insights and expertise were instrumental in shaping the direction of this project.

Declaration of Interest

I at this moment declare that:

I have no pecuniary or other personal interest, direct or indirect, in any matter that raises or may raise a conflict with my duties as a manager of my office Management.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Financial support and sponsorship

No Funding was received to assist with the preparation of this manuscript

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