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Jaleel Kareem Ahmed

University of Babylon, Iraq

Anthocyanin acts as scavenger for heavy metal ions, attack cancer cell, and interacts with uric acid and urea to expel it through urine system

Introduction: Anthocyanin is found mainly in red beet juice, cherry, red rose. It is red color pigment with high solubility in water. The power of exchangeable proton in its juice from red beet nearly 6.4 while in red rose juice more acidic .i.e. $pP < 6.4$. The radius of exchangeable proton = 1.5×10^{-15} meter thus it is called Trans membrane proton. This proton is called exchangeable proton due to its ability to exchange with metal ions and precipitated as metal anthocyanate. This is similar to the behavior of cation exchanger in demineralization processes of water (hetero reaction) while with the anthocyanin juice is homogenous reaction. Addition of heavy metal salt like metal nitrate (water soluble) result in sudden precipitation of metal anthocyanate and the color of the solution disappear slowly and the pP of the solution become more acidic due to the formation of nitric acid in which the pP reaches nearly four. No precipitations shown with sodium and potassium ions while with magnesium and calcium ions need high concentration of them. Anthocyanin can be used to purify water from poisonous metals ions. Anthocyanin color in acidic solution is shine red while changed to reddish green color in basic solution and deep red color in neutral solutions so it is suitable indicator in acid-base reaction more suitable than classically used phenolphthalein indicator which is water insoluble. Irrigation of red rose plant with acidic solution like hydrochloric acid result in changing the color of the rose from deep red to shine red, also that happen when red rose plant left in acidic atmosphere. This is a good test for detection of acidic rain in industrial area.

Methodology: A case study is carried out on the urine of a man of (40) years old. Two samples urine were taken from the urine system of that man, one after drinking concentrated red beet juice (mechanically extracted) and the second one without drinking juice.

Results and Conclusion:

- Anthocyanin formed hydrogen bonding with uric acid and urea which enhancing detoxification of both of them from blood.
- Anthocyanin lowers the acidity of urine which is good for lessening human tension.
- Anthocyanin reduces viscosity of urine even less than that of pure water which enhances the flow of urine through urine system.
- Reducing conductivity of urine i.e. captures proton of uric acid.
- Changing color of urine from yellow to pink as shown in figure below.



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Recent Publications

1. Jaleel A (2013), Anthocyanin in red beet juice acts as scavenger for heavy metal ions such as lead and cadmium :International Journal of Science and Technology 2,3: 269-274.
2. Christine G (2007), Anticancer colors in food, journal pharmacology 55: 699.
3. Davies K (2004). Plant pigments and their manipulation. Wiley-Blackwell. p. 6. ISBN 1-4051-1737-0.
4. Butelli E, Titta L, Giorgio M. , et al. (2008). "Enrichment of tomato fruit with health-promoting anthocyanin by expression of select transcription factors". Nature Biotechnology. 26 (11): 1301–8.
5. Jaleel A. (2015) Special issue published by international journal of material science and application (USA) as a Lead Guest Editor issue 2.

Biography

Jaleel Kareem Ahmed is a Professor of physical chemistry in college of Materials Engineering, Babylon University, Iraq. He was the Dean of the Institute of Foundry and Hammering (2002-2013). He has his expertise in Iron and steel Industry. He completed his Ph.D. from Baghdad University and Martin Luther / Germany. He used red beet juice as scavenger for poisonous heavy metal ions and anticancer and detoxification of urea and uric acid from blood via urine system thus it helps kidney work. He has registered 8 patents with 40 published papers and 3 books. He is a reviewer in Jon Wiley and Sons since 2016 USA and Editorial board Member of Science publishing Group 2015 USA, and a member in Encyclopedia of Chemistry Scientists 2012. In 2013 he was awarded Scientists Medal from Iraqi Government for my research "Using Chlorophyll as Gamma ray absorbent to protect Iraqi children from cancer ". In 2014 he became a member in Wh'o is Wh'o network. In 2018 Marquis Wh'o is Wh'o has selected him for their official 2018 Albert Nelson Marquis Lifetime Achievement Award in America. Since 2016 I took a part with quality Star (QS) Global Academic Survey (QS World University Rankings USA). In 2018 he was awarded honor certificate from International Human Rights for my researches activity.

jaleel_karim@yahoo.com

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