Nutraceuticals: An Alternative Treatment for Influenza Virus

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Abstract

Influenza virus is a contagious respiratory pathogen that infects hundreds of thousands of people a year, making it a serious global health concern. The virus has a rapid mutation rate and has developed resistance to current antiviral agents, making it a difficult target for effective treatment. There is an increasing need to identify new treatments for Influenza. Recently, we have tested nutraceuticals as an effective alternative for blocking Influenza. We have tested Jamaican Sorrel, Black Currant Berries, and Manuka Honey paired with Bee Pollen for antiviral activity. We have demonstrated that these nutraceuticals block the 2009 Pandemic California Influenza strain between a concentration range of 1:8-1:16 dilution. Stock solutions of these nutraceuticals were extracted with water to create a roughly 300 nmol/kg solution. They are then neutralized with water to create a roughly 300 nmol/kg buffer, 1N HCl and 1N NaOH.

Methods & Materials

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Results

Jamaican Sorrel

Figure 1: The 96-well plate from the Jamaican Sorrel (267 nmol/kg, Neutral pH) vs. A/CA/07/09 CPE assay. Column two contains no virus or Jamaican Sorrel extract, serving as a positive control. Column eleven contains only virus, with no Jamaican Sorrel extract, serving as a negative control. Columns 3-10 contain a two-fold serial dilution with column 10 as the starting stock well.

Figure 2: A double sigmoid function of the quantified spectrophotometric values from the plate in Figure 1. The red points are normalized data. A vitality of 1.0 is indicative of a 100% reduction of viral replication. At a concentration of 0.50 of its stock solution, the low vitality is indicative of cytotoxic effect by 1:1 Manuka Honey & Bee Pollen.

Black Currant Berries

Figure 3: The 96-well plate from the Black Currant Berries (150nmol/kg, Physiological pH) vs. A/CA/07/09 CPE assay. Column two contains no virus or Black Currant Berry extract, serving as a positive control. Column eleven contains only virus, with no Black Currant Berry extract, serving as a negative control. Columns 3-10 contain a two-fold serial dilution with column 10 as the starting stock well.

Figure 4: A double sigmoid function of the quantified spectrophotometric values from the plate in Figure 3. The red points are normalized data. A vitality of 1.0 is indicative of a 100% reduction of viral replication. At a concentration range of 0.50 (of stock solution), the low vitality is indicative of cytotoxic effect by Black Currant Berries.

I:1 Manuka Honey & Bee Pollen

Figure 5: The 96-well plate from the I:1 Manuka Honey & Bee Pollen (302 nmol/kg) vs. A/CA/07/09 CPE assay. Column two contains no virus or Manuka Honey & Bee Pollen, serving as a positive control. Column eleven contains only virus, with no I:1 Manuka Honey & Bee Pollen extract, serving as a negative control. Columns 3-10 contain a two-fold serial dilution with column 10 as the starting stock well.

Figure 6: A double sigmoid function of the quantified spectrophotometric values from the plate in Figure 5. The red points are normalized data. A vitality of 1.0 is indicative of a 100% reduction of viral replication. At a concentration of 0.31 (of stock solution), I:1 Manuka Honey & Bee Pollen vitality is >0.8. A vitality close to 0.0 is indicative of toxicity (right) or no anti-viral activity (left). At a concentration range of 0.50 (of stock solution), the low vitality is indicative of cytotoxic effect by I:1 Manuka Honey & Bee Pollen.

Conclusions

We conclude that the administration of Jamaican Sorrel, Black Currant Berries, and the I:1 mixture of Manuka Honey and Bee Pollen have antiviral activity against the 2009 pandemic California strain of influenza virus. Jamaican Sorrel, Black Currant Berries, and the mixture of Manuka Honey and Bee Pollen should be considered for treatment of Influenza virus infections. Further testing is being done to identify other nutraceutical compounds with antiviral activity.

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References
