OPEN ACCESS
Freely Available Online

INTERNATIONAL JOURNAL OF CORONAVIRUSES

ISSN NO: 2692-1537

Review

Doi: 10.14302/issn.2692-1537.ijcv-20-3344

SARS-Corona Virus-2 Origin and Treatment, From Coffee To Coffee: A Double-Edged Sword

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Abstract

Identifying the epidemiological characteristics of COVID-19 disease will help to make appropriate decisions and thus control the epidemic. Although many details, such as the source of the virus and its ability to spread between people remain unknown, an increasing number of cases show the signs of human-to-human transmission.

The purpose of this review is to introduce the reservoir hosts, and the possible role of distributions of bat corona-viruses in China, and eventually to aim to predict virus natural hotspots and their cross-species transmission potential. Why bats can maintain coronaviruses long-term without showing clinical symptoms of diseases and what is allowing bats to have a higher tolerance against viral diseases. We need to unveil the mystery of unique bat immunity. Although bats are not in close contact with humans, spillover of viruses from bats to intermediate animal hosts like civet is thought to be the most likely mode to cause human infection. It appears that the coffee beans which are a rich source of chlorogenic acid are acting as a reservoir host and causative agent, and at the same time as a defense agent to create resistance in the consumers (bats and animals). It is assumed that the intake of chlorogenic acid should be capable of protecting human from contamination or se-vere morbidity.

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Citation: Mohammad Reza Naghii (2020) SARS-Corona Virus-2 Origin and Treatment, From Coffee to Coffee: A Double-Edged Sword. International Journal of Coronaviruses - 1(1):31-43. https://doi.org/10.14302/issn.2692-1537.ijcv-20-3344

Keywords: SARS-Corona Virus-2, origin, treatment, coffee beans, bat, civet, chlorogenic acid

Received: Apr 28, 2020 **Accepted:** May 04, 2020 **Published:** May 11, 2020

Editor: Sasho Stoleski, Institute of Occupational Health of R. Macedonia, WHO CC and Ga2len CC, Macedonia.

Introduction

Coronaviruses are a large family of viruses that can cause illnesses ranging widely in severity. Bats are now recognized as important reservoir hosts of CoVs. Although civet cats were initially identified as the animal origin of SARS-CoV, bats were soon found to be the most likely natural reservoir hosts of this virus. Thus, it is likely that a closely related virus circulated in the wet animal markets for several years before a series of factors facilitated its spread into the larger population.

Most of the bat hosts of these CoVs live near humans, potentially transmitting viruses to humans and livestock. Chinese food culture maintains that live slaughtered animals are more nutritious, and this belief may enhance viral transmission [1]. The analysis of public genome sequence data from SARS-CoV-2 and related viruses found that SARS-CoV-2 originated through natural processes. In two research studies published within the last month, the genome of the new human virus was found to be 96% identical to the genome of a bat coronavirus. On December 31 of last year, Chinese authorities alerted the World Health Organization of an outbreak of a novel strain of coronavirus causing severe illness, which was subsequently named SARS-CoV-2 [2]. Out of 41 laboratory-confirmed cases infected with 2019-nCoV. 27 (66%) of 41 patients had a history of direct exposure to the Huanan seafood market. An epidemiological alert was released by the local health authority, and the market was shut down on Jan 1, 2020. It is vital to determine and to rule out of common bacterial and viral pathogens that cause pneumonia and to find a potential alternative route of transmission that is unknown at this stage. Moreover, the routes of transmission and the possible role of so-called super spreaders remain to be clarified. Efforts should be made to introduce the reservoir hosts, and the possible role of distributions of bat coronaviruses in China, and eventually to aim to predict virus natural hotspots and their cross-species transmission potential and try to find answers to the questions in future studies.

It is reported that, both SARS-CoV and MERS-CoV were believed to originate in bats, and these infections were transmitted directly to humans from market civets and dromedary camels, respectively. Extensive research on SARS-CoV and MERS-CoV has driven the discovery of many SARS-like and MERS-like coronaviruses in bats. Although many details, such as the source of the virus and its ability to spread between people remain unknown, an increasing number of cases show the signs of human-to-human transmission. Persons with suspicious exposure are those who are exposed without effective protection to processing, sales, handling, distributing, or administrative management of wild animals, materials, and the environments that are positive for the 2019-nCoV test.

In 2007, Scientists warned that, although many markets selling animals in China have already been closed or restricted following outbreaks of SARS and other infectious diseases, but the latest results suggest the risk is still present [3].

"It reinforces the notion that we should not disturb wildlife habitats and never put wild animals into markets". The viruses have co-evolved with bats due to bats' special social, biological and immunological features. Although bats are not in close contact with humans, spillover of viruses from bats to intermediate animal hosts, such as horses, pigs, civets, or non-human primates, is thought to be the most likely mode to cause human infection. Humans may also become infected with viruses through aerosol by intruding into bat roosting caves or via direct contact with bats, such as catching bats or been bitten by bats. It is hoped the study findings will inform the global community of the emergence of this novel coronavirus and its clinical features and requires to identify the general factor that may contribute to this outbreak. Therefore, the identification of a potential intermediate host of SARS-CoV-2 would similarly be highly informative.

Moreover, there are other outstanding questions that should be addressed in future studies. Why bats can maintain CoVs long-term without showing clinical symptoms of diseases and what is allowing bats to have a higher tolerance against viral diseases. We need to unveil the mystery of unique bat immunity. Although SARS-CoV and SADS-CoV were known to be transmitted from bats to human or swine, their exact transmissions are unknown and it could be multifactorial [3].

Coffee Beans, Virus, Bats, Wild Animals and Lastly Human as A Victim

According to the above points, the following

data were collected from network and matched with the sources in Pub Med to speculate a possible functional and inter correlated relations and the roles existed between coffee beans, bats, wild animals and virus, and lastly human as a victim, namely the chain of transmission.

Kopi Luwak

Kopi luwak is a coffee that consists of partially digested coffee cherries, which have been eaten and defecated by the Asian palm civet (*Paradoxurus hermaphroditus*) (Figure 1). It is therefore also called civet coffee. Asian palm civets are increasingly caught in the wild and traded for this purpose (Figure 2). Most customers are Asian, especially those originating from Japan, China and South Korea (Figure 3). The question has stumped scientists: where did it come from???

It requires further confirmation whether pneumonia infected by the 2019-nCoV is transmitted directly from bats or through an intermediate host. It is believed that clarifying the source of the virus will help determine zoonotic transmission patterns.

Bats and Coffee Cherry

}https://seaislandcoffee.com/products/wild-bat-coffee-costa-rican-coffee}

Wild Animal Beans

The Artibeus Jamaicensis is the bat species found in the forests surrounding the Coffea Diversa Estate in Biolley, Southern Costa Rica on the border of Panama. The wild bats feed on the exotic coffee cherries but, unlike most wild animal coffees, like the famous Kopi Luwak civet cats, the cherries are not ingested whole. Instead, the bat breaks the skin of the ripe cherry with its teeth, feeds on the pulp and licks the sugar-rich mucilage (Figure 4), thereby initiating a uniquely natural coffee processing method.

Question

Is the bat broken or licked coffee cherry likely to be one of the most natural reservoir hosts of this virus? A potential alternative route of virus transmission by contaminated bat. There is possibility that the contaminated beans be harvested by farmers (Figure 5, Figure 6) and to be served to the animals such as civet to produce contaminated Kopi luwak coffee, or the infected animals later be handled in the market or be consumed by humans. There is also a chance of transmission while kept in the cages in the market. Part of this harvested coffee beans may be sun dried and to be purchased in the market.

https://www.freshcup.com/yunnan-coffee/

Further evidence indicates that bats will eat the cherry and leave/spit the beans as leftover (a possible route of transmission from bat or vice versa).

The Fact about Bat Poop Coffee, a Unique and Exotic Coffee

https://thebeveragecorner.com/the-fact-about-bat-poop-coffee-a-unique-and-exotic-coffee/

The bat poop coffee is one of coffee variants from Indonesia. Figure 7 shows a unique and exotic coffee beans on tree. This variant is produced by animal, like Luwak coffee. However, the animal is a bat. In Pagaralam, South Sumatera, Indonesia, a farmer found an amazing discovery about the bat coffee.

Before we go further, we need to get this right, the bat did not actually eat and poop the coffee bean, she only eats the fruit, and spits the bean, because it's too big for them to eat it. Sometimes they only chew the fruit on the tree and leave the bean in the tree. But why it's popular as bat poop coffee? It's mostly because people think of the famous luwak /civet coffee who eat and poop the coffee, so they also think that the process for bat coffee is similar.

The Story of Bat "Poop" Coffee in Sumatra Indonesia

A coffee farmer, Mr. Mardoyo, the first person who discover this oddity, first thought his plants was ruined and wondering what animal did this. He later did night watch and found that bat did it. Looking closer, the leftover beans look almost similar to luwak coffee. And yeah, after further inspection he gave it a try, a bat leftover.

Bats known as omnivore, they will eat anything, they will eat insect or fruit, whatever it's available to them. But this also depend on their species, some bats prefer insects while the other eat fruits as their main menu. In Pagaralam, where coffee plantation is big, the fruit this bat eats mostly is coffee.

In the night, this nocturnal animal will looking for fruit, using their echolocation ability, they can distinguish which fruit is ripe and not. They will eat the cherry and leave/spit the bean, the natural acid from bat's saliva combined with the sun ray will change the

Figure 1. A wild civet gathers ripe coffee cherries.

Figure 2. Asian palm civets are increasingly caught in the wild and traded for coffee production by eating coffee cherries .

Figure 3. Kopi luwak: From coffee cherries, eaten and defecated by the Asian palm civet
}The guardian 2003: In China the civet cat is a delicacy - and may have caused SARS. https://www.theguardian.com/world/2003/may/24/china.sars{

Figure 4. Bat broken or licked coffee cherry

Figure 5. Coffee beans drying process (possibly contaminated??)

Figure 6. Coffee beans drying process (possibly contaminated??)

Figure 7. A unique and exotic coffee beans

character of the bean.

Bat Coffee Compared to Luwak Coffee and Other Coffees

You may wonder about the taste of bat coffee, is it any good? In luwak coffee where the beans go through its digestive system, the beans go through a long way of fermentation process caused by enzymes and microbes. Although bats have almost similar enzymes and microbes in its mouth, but the beans are not exposed to it for a long time.

Fermentation in bat coffee only happen in short time, the coffee still bitter and a bit acidic. But it has a unique taste. Compared the top variant of coffee, luwak coffee, it's like a cheaper version of luwak coffee. The long fermentation process in luwak coffee make the coffee has a really low acidity, thus make it no longer bitter. Not to mention the aroma is great and the taste is smooth.

How Much It Cost to Get Bat Coffee?

Because of its rarity thus limiting its supply, bat poop coffee cost a little bit much compared normal coffee. Bat coffee will cost you around $12.00 per ounce or $42.00 per 100g. Luwak or civet coffee still the most expensive coffee at this moment, with around $31.00 per ounce or $109.00 each 100g.

Animal Coffees

Bat poop coffee is one of many animal coffee, at least there are 4 animal coffees, 2 of them go through its digestive system, which are elephant and luwak coffee, the other 2 that do not go through digestive system are bat coffee and monkey coffee, although the misconception of "poop coffee" exist on both bat coffee and monkey coffee.

Other Possible Source of Virus

Zeuzera Coffea

Zeuzera coffea is supposed to be a serious pest of tea and coffee in India (Figure 8), but is more prevalent in Tea and coffee producing countries. It also infests Sandal trees. The destruction is caused by the caterpillars of this pest. The caterpillars bore into the bark of the stem and makes tunnel inside it. It should be determined if the pest is capable of contaminating the coffee beans and causes outbreaks [4].

Bat Guano

Coronavirus RNAs were detected in fecal samples and bat guano viruses related to those infecting mammals comprised the third largest group, including members of the viral families *Parvoviridae*, *Circoviridae*, *Picornaviridae*, *Adenoviridae*, *Poxviridae*, *Astroviridae*, and *Coronaviridae [5,6]*.

Mode of Action of Virus

Moreover, it was revealed that various SARSr-CoVs capable of using human ACE2 are still circulating among bats in the region of Yunnan Province. Thus, the risk of spillover into people and emergence of a disease similar to SARS is possible. This is particularly important given that the nearest village to the bat cave being surveyed is only 1.1 km away, which indicates a potential risk of exposure to bats for the local residents.

The full-length genomes of 11 newly discovered SARSr-CoV strains, together with other previous findings, reveals that the SARSr-CoVs circulating in a cave inhabited by multiple species of horseshoe bats in Yunnan Province, China are highly diverse in the S gene, ORF3 and ORF8. It is hypothesized that the direct progenitor of SARS-CoV may have originated after sequential recombination events between the precursors of these SARSr-CoVs. Cell entry studies demonstrated that three newly identified SARSr-CoVs with different S protein sequences are all able to use human ACE2 as the receptor, further exhibiting the close relationship between strains in this cave and SARS-CoV [5].

Coronaviruses are a group of enveloped

Figure 8. A Zeuzera coffea pest

positive-stranded RNA viruses that consist of four structural proteins including spike (S) glycoprotein, envelope (E) protein, membrane (M) protein, and nucleocapsid (N) protein. Spike glycoprotein is the most important surface protein of coronavirus, which can mediate the entrance to human respiratory epithelial cells by interacting with cell surface receptor angiotensin-converting enzyme 2 (ACE2).

One may speculate that the new virus might exploit cellular attachment-promoting factors with higher efficiency than SARS-CoV to ensure robust infection of $ACE2^+$ cells in the upper respiratory tract. It is suggested that the virus might target a similar spectrum of cells as SARS-CoV. In the lung, SARS-CoV infects mainly pneumocytes and macrophages. However, ACE2 expression is not limited to the lung, and extrapulmonary spread of SARS-CoV in $ACE2^+$ tissues was observed. The same can be expected for SARS-CoV-2, although affinity of SARS-S and SARS-2-S for ACE2 remains to be compared [7]. Also, the idea of considering AT1R blockers angiotensin receptor 1 (AT1R) blockers, such as losartan as tentative treatment for reducing the aggressiveness and mortality from SARS-CoV-2 virus, and proposing a research direction based on data mining of clinical patient records for assessing its feasibility is presented [8].

The scientists analyzed the genetic template for spike proteins, armatures on the outside of the virus that it uses to grab and penetrate the outer walls of human and animal cells. More specifically, they focused on two important features of the spike protein: the receptor-binding domain (RBD), a kind of grappling hook that grips onto host cells, and the cleavage site, a molecular can opener that allows the virus to crack open and enter host cells. The scientists found that the RBD portion of the SARS-CoV-2 spike proteins had evolved to effectively target a molecular feature on the outside of human cells called ACE2, a receptor involved in regulating blood pressure. The scientists found that the SARS-CoV-2 backbone mostly resembled related viruses found in bats and pangolins.

Based on their genomic sequencing analysis, it is concluded that the most likely origins for SARS-CoV-2 followed that the virus evolved to its current pathogenic state through natural selection in a non-human host and then jumped to humans. This is how previous coronavirus outbreaks have emerged, with humans contracting the virus after direct exposure to civets (SARS) and camels (MERS). The researchers proposed bats as the most likely reservoir for SARS-CoV-2 as it is very similar to a bat coronavirus. There are no documented cases of direct bat-human transmission, however, suggesting that an intermediate host was likely involved between bats and humans.

In this scenario, both of the distinctive features of SARS-CoV-2's spike protein -- the RBD portion that binds to cells and the cleavage site that opens the virus up -- would have evolved to their current state prior to entering humans. In this case, the current epidemic would probably have emerged rapidly as soon as humans were infected, as the virus would have already evolved the features that make it pathogenic and able to spread between people.

In the other proposed scenario, a non-pathogenic version of the virus jumped from an animal host into humans and then evolved to its current pathogenic state within the human population. For instance, some coronaviruses from pangolins, armadillo-like mammals found in Asia and Africa, have an RBD structure very similar to that of SARS-CoV-2. A coronavirus from a pangolin could possibly have been transmitted to a human, either directly or through an intermediary host such as civets or ferrets.

Then, the other distinct spike protein characteristic of SARS-CoV-2, the cleavage site, could have evolved within a human host, possibly via limited undetected circulation in the human population prior to the beginning of the epidemic. The researchers found that the SARS-CoV-2 cleavage site, appears similar to the cleavage sites of strains of bird flu that has been shown to transmit easily between people. SARS-CoV-2 could have evolved such a virulent cleavage site in human cells and soon kicked off the current epidemic, as the coronavirus would possibly have become far more capable of spreading between people.

If the SARS-CoV-2 entered humans in its current pathogenic form from an animal source, it raises the probability of future outbreaks, as the illness-causing strain of the virus could still be circulating in the animal population and might once again jump into humans. (Summarized and extracted from9-11).

Question

What is Allowing The Contaminated Bats or Civets To Have A Higher Tolerance Or Resistance Against Viral Diseases?

The viruses have co-evolved with bats due to bats' special social, biological and immunological features. Although bats are not in close contact with humans, spillover of viruses from bats to intermediate animal hosts, such as horses, pigs, civets, or non-human primates, is thought to be the most likely mode to cause human infection. Humans may also become infected with viruses through aerosol by intruding into bat roosting caves or via direct contact with bats, such as catching bats or been bitten by bats. Moreover, based on the above data, coffee beans seem to be a major contributing factor, too. It appears that the beans are acting as a reservoir host and causative agent, and at the same time as a defense agent to create resistance in the consumers (bats and animals).

Proposed Defense Mechanism

Chlorogenic Acids

Chlorogenic acids are secondary metabolites in diverse plants. Some chlorogenic acids extracted from traditional medicinal plants are known for their healing properties, e.g., against viral infections. Also, green coffee beans are a rich source of chlorogenic acids. Data show that 3,4-*O*-dicaffeoyl-1,5-*γ*-quinide is a potential anti-respiratory syncytial virus drug [12]. Phenolic acids have recently gained substantial attention due to their various practical, biological and pharmacological effects. Chlorogenic Acid (CGA, 3-CQA) is a most abundant isomer among caffeoylquinic acid isomers (3-, 4-, and 5-CQA), that currently known as 5-CQA as per guidelines of IUPAC. It is one of the most available acids among phenolic acid compounds which can be naturally found in green coffee extracts and tea. CGA is an important and biologically active dietary polyphenol, playing several important and therapeutic roles such as antioxidant activity, antibacterial, hepatoprotective, cardioprotective, anti-inflammatory, antipyretic, neuroprotective, anti-obesity, antiviral, anti-microbial, anti-hypertension, free radicals scavenger and a central nervous system (CNS) stimulator. In addition, it has been found that CGA could modulate lipid metabolism and glucose in both genetically and healthy metabolic related disorders [13]. Japonica Thunb, rich in chlorogenic acid (CHA), is used for viral upper respiratory tract infection treatment caused by influenza virus, parainfluenza virus, and respiratory syncytial virus, etc. in China. It was reported that CHA reduced serum hepatitis B virus level and death rate of influenza virus-infected mice [14].

An animal study found that the intravenous injection of chlorogenic acid (CHA) derived from lonicera inhibited H1N1 and H3N2 influenza by up to 60 percent. Chlorogenic acid is a dietary polyphenol compound that's produced by many plants, including coffee. Robusta raw coffee beans have up to 10% chlorogenic acid [15]. It is shown that quercetin, chlorogenic acid, oleanolic acid, and baicalein present oseltamivir-comparable high binding potentials with neuraminidase and the molecular docking studies identified four potential inhibitors for neuraminidase of H7N9, which might be effective for the drug-resistant mutants [16]. Plants rich in chlorogenic acids (CGAs), caffeic acids and their derivatives have been found to exert antiviral effects against influenza virus neuroaminidase. The enzyme inhibition results indicated that chlorogenic acids and selected derivatives, exhibited high activities against NAs. It seems that the catechol group from caffeic acid was important for the activity. Dietary CGA therefore show promise as potential antiviral agents [17].

The inhibition of neuraminidase activity confirmed chlorogenic acid (CHA) blocked release of newly formed virus particles from infected cells. Thus, CHA has potential utility in the treatment of the influenza virus infection [14].

Chlorogenic acid is one of the representatives that has been proven to have the potential to inhibit both the influenza virus and *Streptococcus pneumoniae*. The results from binding energy calculation indicated that chlorogenic acid had strong binding potential with neuraminidase. The results predicted a detailed binding mechanism of a potential *Streptococcus pneumoniae* neuraminidase inhibitor, which will be provide a theoretical basis for the mechanism of new inhibitors [18].

Caffeic acid (CAA) and chlorogenic acid (CHA) are important members of hydroxycinnamic acid with natural antioxidant and cardio-protective properties. Findings from this study shows that CAA and CHA exhibited blood pressure lowering properties and

reduced activities of key enzymes linked to the pathogenesis of hypertension in cyclosporine-induced rats, (the activity of the angiotensin-1-converting enzyme (ACE)) [19].

The aim of a rat study was to investigate the modulatory properties of caffeic acid (CA) and chlorogenic acid (CH) on the activity of angiotensin converting enzyme (ACE), purinergic enzyme (PE), and lipid lowering properties in hypercholesterolemic rats. The results showed that CH exhibited stronger ameliorative properties than caffeic acid, based on its effect on the activities of PE, ACE, and atherogenic index. Also, CA exhibited stronger antioxidant properties than CH [20].

It is revealed that there are two different mechanisms, by which the coffee extracts exert inhibitory activities on the virus infection; (1) a direct inactivation of the infectivity of virus particle (i.e., a virucidal activity) and (2) the inhibition of progeny infectious virus formation at the late stage of viral multiplication in the infected cells. Caffeine, but not quinic acid and chlorogenic acid, inhibited the virus multiplication to some extent, but none of them showed the virucidal activity, suggesting that other component (s) in the coffee extracts must play a role in the observed antiviral activity [21]. Inhibitor prevents new viral particles (virion) from being released.

According to the above findings, the coffee extracts consumption containing natural protective polyphenol compounds by bats and animals exerts inhibitory activities on the virus infection and these animals remain healthy and resistance to the virus, although are acting as a transmission tools and continue the outbreak.

Coffee Cherry Tea

Coffee cherry tea is a herbal tea made from the dried skins of the coffee fruit (Figure 9). Often it is more than the skins that are used, and include the dried berries (or "cherries") of the coffee plant that remain after the coffee beans have been collected from within. It is also known as cascara, from the Spanish *cáscara*, meaning "husk".

Coffee cherry tea is a common drink in some coffee-growing nations, notably Bolivia, and, as the variant qishr, in Yemen. Outside of these traditional uses, the coffee fruit is usually considered a wasted byproduct of the coffee-production process.

{*Interestingly, Coffee producing and naturally consuming countries have a very low number of morbidity and mortality, despite having a low level of healthy living conditions and a very large number of population. It is assumed that the reason may lie in a reasonable blood level of the polyphenol compounds e.g., Chlorogenic acid* (Author assumption)}.

Coffee cherries contain caffeine, as does the tea, though while the tea is popularly understood to have a high level of caffeine, it actually only has about a quarter the caffeine levels of coffee. Cascara is known to be high in antioxidants. The taste of coffee cherry tea is different from coffee, and has been described as somewhat sweet and cherry flavored, surprisingly pleasant.

https://en.wikipedia.org/wiki/Coffee_cherry_tea

Tobacco Leaves as A Source of Chlorogenic Acid

It seems that the rate of morbidity and mortality of corona in the countries that freely use Naswār or "chewing tobacco" is fortunately low (Figure 10) and

Figure 9. After the coffee beans are collected, the remaining fruit is sundried and brewed into coffee cherry tea.

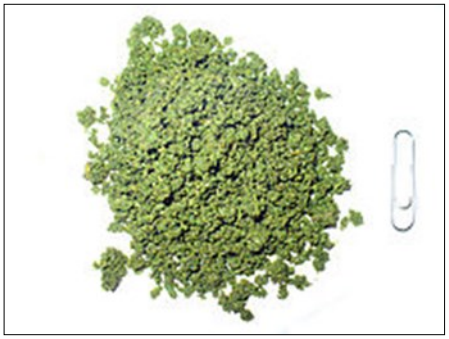

Figure 10. A pile of naswar

these countries are classified at the bottom row of corona statistical table. *The chlorogenic acid in tobacco is reported.* Thus, these countries may have a fair amount of chlorogenic acid intake from coffee and tobacco leaves which results to be in an involuntarily state of self- immunity or self- defense against the virus. Sun and heat-dried tobacco leaves, slaked lime, ash from tree bark, and flavoring and coloring agents are mixed together. Water is added and the mixture is rolled into balls.

In Afghanistan, Pakistan, Iran, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, and Uzbekistan. Naswar is stuffed in the floor of the mouth under the lower lip, or inside the cheek, for extended periods of time. Usually for from 15 minutes to 30 minutes. It is similar to dipping tobacco and snus. The green powder form is used most frequently. It is made by pouring water into a cement-lined cavity, to which slaked lime (calcium hydroxide) and air-cured, sun-dried, powdered tobacco is added. Indigo is added to the mixture to impart color, and juniper ash may be added as flavoring. Ash is highly alkaline. Currently, the countries of the region freely sell naswar in the markets, usually on trays with cigarettes and sunflower seeds.

In 2011 naswar was included in the list of narcotic and psychoactive substances to be controlled in Kazakhstan. On the territory of Russia, naswar is not a traditional product, but it gained popularity especially among teenagers. It was sold in the markets of Moscow and in other cities of the Urals, Volga, and other regions of the country. Its trade was usually conducted on trays with spices. According to the association of tobacco distributors "Grandtabak", in the first half of 2004, Russia's import of naswar or "chewing tobacco" amounted to almost 67 tons (total value of 16,500 US dollars), primarily from Kazakhstan, Kyrgyzstan, and Tajikistan. On 23 February 2013, the Russian State Duma signed a federal law (*N 15-ФЗ*) which banned both wholesale and retail naswar from 1 June 2013 onward in Russia.

There are two forms of naswar; powder, and a paste cake style mixed with lime. It has a very pungent and powerful smell, resembling that of a fresh bale of coastal hay, and has a subtle flavor as it mixes with the saliva. The nicotine effect can occur within 5 minutes after intake, producing a slight burning sensation on the inner lip and tongue.

Nas: tobacco, ash, cotton or sesame oil, water, and sometimes gum.

Naswar: tobacco, slaked lime, indigo, cardamom, oil, menthol, water.

The major side effect of using naswar is addiction, and it becomes difficult to get rid of it. It is also increasingly known that naswar often causes oral and throat cancer.

https://en.wikipedia.org/wiki/Naswar

Sources of Chlorogenic Acid

In Foods

Foods contain phytochemicals, including phenolic compounds (mainly as neochlorogenic acids and chlorogenic acids) and sorbitol.

Artichoke, lettuce, sunflower seeds, Apple, quince, cherry, strawberry, potatoes, peach, prune, blueberry, bilberry, mulberry and sweet granadilla, Coffee, tea, and leaves of *Hibiscus sabdariffa (Roselle Tea), Tobacco leaves* [22].

As of today, there are mounting evidences of the reduced risk of developing type 2 diabetes by regular coffee drinkers of 3-4 cups a day. The effects are likely due to the presence of chlorogenic acids and caffeine, the two constituents of coffee in higher concentration after the roasting process.

Roselle (*Hibiscus Sabdariffa*) .

The *Hibiscus* leaves are a good source of polyphenolic compounds. The major identified compounds include neochlorogenic acid, chlorogenic acid, cryptochlorogenic acid, caffeoylshikimic acid and flavonoid compounds such as quercetin, kaempferol and their derivatives.

https://en.wikipedia.org/wiki/Roselle_(plant)

In Dietary supplement: (Figure 11)

Conclusion

It is highly evident that if chlorogenic acid is protective in survival of contaminated animals and causes the rout of transmission to human to be active for virus, then the intake of chlorogenic acid should be capable of protecting human from contamination or severe morbidity and consider to provide protection for human. It appears to have potential to inhibit virus

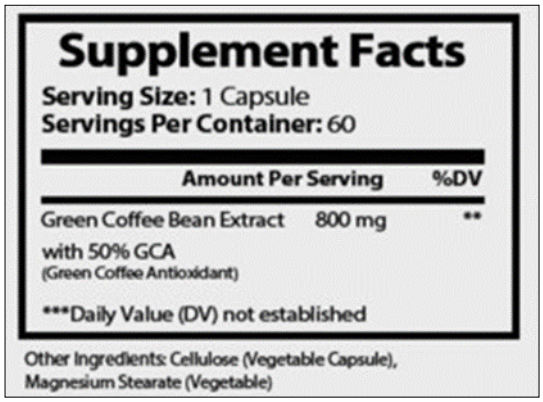

Figure 11. Green coffee bean extract

activity or virulence by inhibition of neuraminidase and the activity of angiotensin converting enzyme 2 (ACE2). It requires to take two steps for eradication of the virus. First, to recognize the component of corona interaction, including the primary agents (both virus and coffee beans), the susceptible hosts (coffee beans and bats/ animals), and human as victim. The theory of the coffee beans cherry with both unfavorable and favorable consequences is merely a speculation, but may help to predict and recognize virus hotspots which are still dominant in China and hold the danger of remission. It requires a set of preventive measures to be designed to reduce the risk of transmission of infectious diseases globally. The idea for initiation of treatment strategy with dietary sources of chlorogenic acid is a simple and applicable method adjuvant to the prescribed drug therapy. It appears to be wise to recommend it to the civilians and medical and health personnel to include it in their routine daily food program as a preventive and therapeutic measure.

Once again, it is noteworthy to emphasis that the whole story given in this communication is merely based on assumption and theory, however, it is likely a plausible scenario at first glance to have an insight into it for elimination of the virus.

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