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A Research-based Study of the Permissibility and Impermissibility of Cochineal (E120)

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ABSTRACT

Islam gives us a complete code of conduct for spending our lives. The Islamic commandments regarding the permissibility and impermissibility of something are divine, which considered Absolute; according to the authentic faith of the Muslims these commandments cannot be changed by any human being. As well as, there is no part of life which isn't guided in the Qur'an and Hadith. Health is an important area in human life and it is closely associated to Halāl and Harām. Islam not only emphasized to the Prophets but Human being also to eat Halāl things. It also clearly explained the permissibility and impermissibility of edible things, but in modern industrial and scientific era, the food technology has made a lot of progress and right now food additives are being used in the production of food items without any distinction of Halāl and Haram to fulfill the nutritional requirement of increasing population and to make food, delicious, safe and long lasting. Cochineal (E120) is also in one of these food additives. Present article studies with this perspective and explains the introduction, characteristics, and uses of the Cochineal. Along with this perspective it will also describe the processes of color acquisition, and alternative sources of Cochineal (E120) along with its sharia status.

Keywords: *Cochineal, Color, Insect, Permissibility (Halāl), Impermissibility (Harām)*

Introduction

Islam being a complete code of life provides us a solid guidance in all areas of our lives. Its guidance covers all spheres of life and has not left any of them unaddressed. The basic sources of Islamic law ;Quran and Sunnah has not only addressed the issues emerged in the age of the Holy Prophet but also laid down the principles through which issues of all ages can be addressed. Human's Health is an important part of life and it is an established fact that health is closely related to halāl and harām. Sharia law in the Qur'an and Sunnah not only instructed to the

Prophets and human beings to eat halal food, but also clearly stated the status of Permissible (Halāl) and Impermissible (Harām) food items in the world.

Nevertheless, in the modern scientific period, food technology has developed a lot and a variety of food additives are being used to meet the nutritional needs of the growing population and to make food safe, tasty, long lasting and nutritious without distinguishing between halāl and haram. The cochineal (E120) also exists in this list. In the discussion under consideration, the introduction, characteristics, uses, process of obtaining color from Cochineal (E120, its alternative and its Shariah (legal) status have been described in detail.

Cochineal

Cochineal is called "Kachnila" or "Karam D āna" in Urdu, and "Qarmaz" in the Arabic. This is a small insect of the order Lepidoptera that is about the size of a bee and is found especially in the United States of America. This moth is found on a specific plant which called cactus and gets its food from this plant (De Lotto, G. 1974).

Picture of Female Cochineal Insects

Cochineal, Crimson foreign, crimson the dead insects that are found in the country of Mexico and from which burgundy color is made. "Kachnila, worm seeds, crimson, or red color, which is made by grinding the dried bodies of many crimson worms. These grow in the bushes of Cactus in Mexico.

Cochineal is defined in English language as:

“A red dye made from the dried bodies of female cochineal insects: used, esp. formerly, in coloring foods, cosmetics, etc’’ (cochineal). Due to this characteristic, this worm has become the center of attention of the world. These feature that sets it apart from other insects is not its taste, pleasure, nutrition, beauty or healing ability. Rather than this, there is a deep redness in the stomach of its female. The substance of this insect is full of red color, but especially in its belly there are eggs which have a deeper red color than the rest of the body. It is

also done by artificially insemination (grown) in different regions to achieve the same bright and sharp color. About 70,000 insects produce a pound of red color; Peru is far ahead in this regard, producing 200 tons of dye annually. (De Lotto, G. 1974).

It should be noted, that the color obtained after the chemical process from cochineal is called carmine which is excellent while the color obtained initially is called carmine from Cochineal extract.

Alternative Names of Cochineal

1. Carmine
2. Carminic acid
3. Crimson Lake
4. C.I. 75470 (This name and particular Code is used in make-up industry)
5. Natural Red (Dapson, R. W., Frank, M., Penney, D. P., & Kiernan, J. A. 2007).

E-Number of Cochineal

The different food additives that are added to numerous products have their specific numerical indicators called E-Numbers. According to this method its E-Number is E-120, which is the numerical code of Cochineal or Carmine.(Breinholt, V., Dragsted, L., Hansen, M., Hossaini, A., Lam, H. R., Mortensen, A., … Knudsen, I 2002.)

Additional elements (components)

Some additional ingredients are added to food products during its preparation, supplementation, packaging and storage. These additional ingredients are sometimes intended for uses it-self and sometimes as raw materials or supplements. These additional ingredients never have a nutritional value, but are intended to protect the product, improve the taste, beautify, thin or thicken and save to the products. A variety of additional ingredients is also used to enhance the beauty, elegance and attractiveness of objects so that they can be enjoyed with the tongue and satisfy one's aesthetic tastes. The additional components or ingredients are used for this purpose have an E-Number of 100 to 180 or 100 to 200. Then al'[subdivision of colors are divided into red, yellow, blue, etc. For example this division is made such as one 100 to 110 for green color etc. (approved-additives-and-e-numbers, 2020)

Molecular (chemical) formula of Cochineal (E120)

The molecular formula of Cochineal is $C_{22}H_{20}0_{13}$ and also called chemical formola. (approved-additives-and-e-numbers, 2020)

Uses of extracted colors of Cochineal:

Cochineal extracted colors are widely used in food and cosmetics products, some of them are listed below.

1. Foods such as fried fish and meat, etc.
2. Beverages such as soft drinks, fruit drinks, strength drinks and alcoholic beverages, etc.
3. Dairy products such as yoghurt, ice cream, and other dairy drinks
4. Confectionery items such as candy, candies, chewing gum, etc.
5. Preserved fruits such as canned fruits, such as pineapple, cherry, jam, etc.
6. Other products such as catch-up, powdered beverages, dried soups, canned soups etc.
7. Cosmetics, red eye make-up, lip balm and shampoo etc (e-code-traceability, 2015)
8. It is also widely used in painting and textile dyeing (textile industry).(Luo, Y., Li, M., & Du, J. (2017). Esterification of Cochineal Carmine Used For Dyeing Cationic Modified Cotton with High Color Fastness. Journal of Engineered Fibers and Fabrics, 12(2), 155892501701200208.)

Sides Effects of Cochineal

Cochineal also has its side effects along with its benefits, as it can lead to asthma, skin rashes and seasonal allergies in regular users. (Mian, 2003)

Permitted Countries

Cochineal products are permitted in Asian and European countries such as Russia, Germany, France, Italy, Spain, Ukraine, Poland, Netherlands, Belgium, Sweden, Portugal, etc.(https://www.food.gov.uk/business-guidance/approved-additives-and-e-numbers).These carminal products are also permitted in United States of America(https://www.fda.gov/industry/color-additive-inventories/summary-color-additives-use-united-states-foods-drugs-cosmetics-and-medical-devices)

The Process of Getting Red Color from Cochineal

The red color of Cochineal is obtained in a few steps, first the insect is killed then color is obtained. There are different ways to kill the Cochineals:

1. In the first stage, they are dried in the sun.
2. After drying, in the second stage, the cochineal's stomach and the eggs in it are separated from the other parts of the insect, because according to experts, most of the carmine is in the cochineal's eggs.
3. In the third stage, insect eggs and stomach parts are powdered to make dye.
4. In the fourth stage, the powder made from cochineal eggs and stomach parts is boiled in a solution of ammonia (NH3 or sodium carbonate (Na2CO3).

5. In the fifth stage, to filter the solution, alum is added to it and it is subjected to special steps, as a result of which the carmine particles separate from the solution and settle down in bottom and then the above water is removed. At the end pure carmine remains at the bottom.(Dapson, R. W. (2007). The history, chemistry and modes of action of carmine and related dyes. Biotechnic & Histochemistry, 82(4-5), 173-187.)

Cochineal's shar'ia ruling

According to all the Muslim jurists insects are Pak(clean), because they do not have blood, if they have, but that blood not flow. But not every Pak thing is Halal, like as clay and coal are pure, but its food is not Halal. For this reason, if any insect component is found in any external use item, it is not necessary to wash that part of the body with its external use.

Scholars differ on eating insects. Most Hanafis call it unlawful; Malikis deemed them permissible; and other scholars deemed them disliked. Shaf'i and Hanbali jurists banned the use of some insects and permitted the consumption of others. Ibn Rushd wrote in "Bida'at Al-Mujtahid" that the reason for this controversy is the difference in the meaning of the word "khabith" (which is mentioned in a Qur'anic verse) - some have explained it in the Qur'an and Sunnah. According to others, it also depended on human nature.

According to Sahnun, the Maliki scholar (as Ibn Habib and Ibn Rushd also mentioned in "Al-Bayan wa Al-Tahseel"), insects can be used in any way when they are slaughtered (caring the main conditions of slaughtering; like Intention (Niyyah) and Takbeer (Recite the Allah'S name) - yes, of course, there is a difference in the method of slaughter. They are, such as beheadings, striking them with needles or thorns, throwing in fire or hot water, etc. Also, Maliki jurists and other scholars have denied the formal slaughter. Maliki Ibn Habib wrote in "Jami al-Ummhat" that vermin are edible and are slaughtered like locusts and if they fall into a pot, it would be permissible to eat from it. Similarly, it is permissible to eat insects found in food. The luminary Abu al-Barakat Ahmed al-Dardir has given examples of eating insects that are permissible for human consumption in "Ash-Sharh Al-Kabeer". For example, insects that reach the surface of the earth and they dig their own way and return to it; such as scorpions, beets, cockroaches, locusts, etc. Also permissible for human consumption are geckos, lizards, and sandfish which are considered filth when dead and only become pure through slaughtering-

In addition, through their medical heritage, past Muslim jurists realized the curative benefits of some insects such as ants so they allowed its use and sale. A clear example of this is the use of the fats of the ant for the treatment of diabetes and yellow fever. (Dar al-Iftaa Al-Missriyya)

This detail reveals that insects like cochineal are only Halal(permissible) in Maliki school .It is pertinent to mention that most of them impose two conditions for being insects Halal (permissible). One is to develop niyyat (intention) of slaughtering and second is to recite Allah's name on respective object. All other three schools of fiqh maintain in general the impermissibility of insects and they mark few of them Halal.

The Shariah Status of E-120 in rulings of Muslim Jurists,Halal Certification Agencies and Dar al-Ifta

Contemporary muslim jurists have diversed opinions over the shariah staus of E-120.A large group of muslim scholars,muftis and Halal Agencies have matured their opinion that the external use of those products which have E-120 in their ingrdients is permitted.So all cosmetics made by carmine are Halal.This group strictly prohibits the in-take of such products arguing that insects are Haram and unlawful.They have also refuted the argument that muslims round the globe are bound to use these products as these are made by multi-national companies.The state of necessity which converts Haram to Halal has not been found here according to this group of muslim scholars.

This group consists of scholars belong to all three schools of fiqh other than malikis.The second group of muslim scholars and a plentiful halal agencies went to mark such products Halal for consumption arguimg that apex category(Haraam)shall only be determined when it is derived from a definitive verse or Hadith(Qatʿi Al-dalālah)and the verse from which the ruiling of Haram has been derived is repulsive(zanni Al-dalālah)rather than definitive.(Rahim, S. F. 2018).

Here is the list of Halal Agencies allows E-120.

Halal certification bodies certifying E120:

a. IFANCA (Islamic Food and Nutrition Council of America)

b. HFCE (Halal Food Council of Europe)

c. MUI (Majlis-e-Ulama-e-Indonesia)

d. JAKIIM (Department of Islamic Development Malaysia)

Halal certification bodies decertifying E120:

a- Halaal Foundation

b-SANHA (South African National Halaal)

c- Punjab Halaal Development Authority

Countries with their Halal Acceptance Status of E120

Malaysia	E120 Allowed
Indonesia	E120 Allowed

UAE and Gulf	E120 Not Allowed
Pakistan	E120 Not Allowed
Turkey	E120 Allowed
Singapore	E120 Allowed
China	E120 Allowed
America and Europe	E120 Allowed
Tunisia	E120 Allowed
Algeria	E120 Allowed
Morocco	E120 Allowed
Iran E120	Not Allowed

Alternatives of Carmine

The creator of this universe has met all necessities of human being. If insects are declared Haram or at least detested other alternatives are there to achieve the same standard of redness which is extracted from cochineal. Here are some suggested alternatives of carmine.

1. Beetroot
2. Purple Carrot
3. Berries
4. Cherry
5. Plum

Conclusion

It is a belief that arthropod (the cochineal is its sub specie) is the largest phylum and consists eighty five percent of the known animals and a creature with this majority cannot be assumed sense beneficial for human being. Thus, scholars having the viewpoint of its permissibility keep a sound logic but it is not necessary that all creatures on this planet are created for direct consumption and in-take of human being. It is also argued that Edible insects have recently been proposed as an alternative source of dietary protein that may be produced on a more viable and sustainable commercial scale and, as such, may contribute to ensuring global food security (Churchward-Venne, T. A., Pinckaers, P. J., van Loon, J. J., & van Loon, L. J. 2017). The farming of insects is now a profitable business and insects are properly Insects produced in these facilities for human consumption are first cleaned, and then typically euthanized by freeze-drying. Freeze-dried insects can be packaged and consumed whole or subjected to further processing in the form of roasting, cooling, and grinding to produce a fine powder or flour from whole insects prior to packaging. This above said argument is given

in this context that the whole process of getting fine powder from these insects surely lefts them hazardous-free and divine text declares them haram for their impurity .So with this kind of processing they are made pure and hazardous-free. In the traditional circle of Muslim jurists and in the circle of Islamic jurisprudence the above said arguments are not sufficient for converting the status of insects from Halal to Haram.

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