Presence Of C3 & C4 Sugar Adulterants In Honey Products: Research Showed!

Natural honey is a syrupy liquid made by honey bees using plant nectar. It is loved by people worldwide for its sweetness and depth of flavor; and is used in numerous foods and recipes. Honey comes in countless aromas, colors, and tastes, all because of the difference in the nectar from which it is made. In addition, it offers numerous health benefits and plays a crucial role in alternative medicine treatments and home remedies.

On the other side, **natural honey** is produced in natural ways by the bees using the nectar of the flowers with the added benefits of their enzyme. It contains natural sugars like glucose, fructose, and sucrose. But honey adulteration has become a common problem these days. It is done using cheap sugar syrup made from C3 and C4 sugar plants. As this syrup contains processed sugar, these cause harmful effects on the health. Adding sugar cane syrup or corn syrup to pure honey has become a global issue.

Several laboratories worldwide are trying to monitor this adulteration utilizing unique, insightful strategies to decide honey's purity or adulteration. To analyze this, chromatography & other analytical procedures were carried out. However, these procedures were not sensitive enough to detect the low concentration of adulterating sugars.

What are C3 and C4 Sugar Plants?

Honey bees collect nectar from the flowers of C3 plants cycle and to a lesser extent from the flowers of C4 plants. C4 plants are plants such as sugar cane plants, and if bees collect nectar from them, that does not mean that the honey is adulterated. C3 and C4 are direct adulterants, meaning they are added directly to the honey to increase its quantity.

C3 and C4 plants have natural sugar; however, it becomes poisonous when they are utilized to make sugar syrup through harsh handling. Honey adulteration happens to utilize these toxic sugar syrups.

Which Tests Are Done to Determine C3 and C4 Sugar Types Content in Honey?

The **Carbon Isotope test** identifies adulteration from C4 sugar plants. This test estimates the proportion of typically forming carbon - 12 and carbon - 13 isotopes found in sugar from C4 sugar plants.

Natural honey in the Carbon Isotope test shouldn't contain C4 plant sugar over 7%. Provided that this is true, then, at that point, the honey is adulterated with inverted sugar.

The **NMR test** assists with distinguishing honey purity by checking the herbal and topographical starting origins of honey. Thus, it will assist us with knowing the specific source of nectar and from which plants and flowers honey bees collected it. However, this NMR test is robust in identifying sugar adulteration in honey from C3 and C4 sugar plants.

The **LC-HRMS test** is a high-level testing technique that screens honey at the atomic level for C4, C3, and some other custom-made sugar syrup adulterants in honey. It has the capacity of screening almost 15000 sugar compounds to identify honey adulteration with sugar.

While tasting the purity of honey, the information demonstrates that LC-HRMS has detected more than 4000 sugar adulterant markers so far. There is also an indirect method of honey adulteration where honey bees are fed sugar syrup and given antibiotics.

According to Mr. Basem Barry, founder & CEO of Geohoney, sugar syrup for honey adulteration is becoming a common practice these days. Therefore, advanced tests like NMR and LC-HRMS are essential to detect them. Geohoney stays away from such practices and strives hard to deliver 100% pure, organic, and natural honey products harvested directly from the farms located across the globe in original quality. This global brand provides only authentic products with no additives to help people gain genuine health benefits.