

Annatto (*Bixa Orellana* L.) - A Natural Alternative to Synthetic Colorants

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Introduction

Annatto is an orange-red condiment and food coloring derived from the seeds of the achiote tree (*Bixa orellana*), native to tropical regions (e.g., from Mexico to Brazil). It is often used to impart a yellow or orange color to foods, but sometimes also for its flavor and aroma. Its scent is described as "slightly peppery with a hint of nutmeg" and flavor as "slightly nutty, sweet and peppery". (Smith and James 2012)

Plant Profile	
Family	Bixaceae
English name	Arnotta or Annatto plant
Indian name	Sinduri (Sanskrit) Sinduriya, Latkan (Hindi) Rangmale (Kannada) Kurangumanjal (Tamil)
Species	<i>Bixa orellana</i>



The color of annatto comes from various carotenoid pigments, mainly bixin and norbixin, found in the reddish waxy coating of the seeds. The condiment is typically prepared by grinding the seeds to a powder or paste. Similar effects can be obtained by extracting some of the color and flavor principles from the seeds with hot water, oil, or lard, which are then added to the food.

Annatto and its extracts are now widely used in an artisanal or industrial scale as a coloring agent in many processed food products, such as cheeses, dairy spreads, butter and

margarine, custards, cakes and other baked goods, potatoes, snack foods, breakfast cereals, smoked fish, sausages, and more. In these uses, annatto is a natural alternative to synthetic food coloring compounds, but it has been linked to rare cases of food-related allergies. Annatto is of particular commercial value in the United States because the Food and Drug Administration considers colorants derived from it to be "exempt of certification".

Industrial food coloring



Annatto is commonly used to impart a yellow or orange color to many industrialized and semi-industrialized foods, including cheese, ice cream, bakery products, desserts, fruit fillings, yogurt, butter, oils, margarines, processed cheese, and fat-based products.

In the United States, annatto extract is listed as a color additive "exempt from certification" and is informally considered to be a natural coloring. Foods colored with annatto may declare the coloring in the statement of ingredients as "colored with annatto" or "annatto color." In the European Union, it is identified by the "E number E160 b". (Socaciu and Carmen 2007)

Chemical composition

Bixin is the major apo-carotenoid of annatto. The yellow to orange color is produced by the chemical compounds bixin and nor-bixin, which are classified as carotenoids. The fat-soluble color in the crude extract is called bixin, which can then be saponified into water-soluble nor-bixin. This dual solubility property of annatto is rare for carotenoids (Smith et al., 2013). The seeds contain 4.5–5.5% pigment, which consists of 70–80% bixin. Unlike beta-carotene, another well-known carotenoid, annatto-based pigments are not vitamin A precursors. The more nor-bixin in an annatto color, the more yellow it is; a higher level of bixin gives it a more orange shade (Kuntz and Lynn 2013).

Antimicrobial Effect on Annatto Treated Fabric

Our cloth is producing pathogenic odour, bacteria, fungi and moulds. They include a variety of microorganisms like bacteria, algae, fungi and virus. Microbes require certain conditions to grow including dirt, perspiration, warm environment moisture and a receipting

surface like skin or fabrics. Textiles are carriers of microorganisms such as pathogenic bacteria, odour generating bacterial, mould and fungi. Annatto is a natural carotenoid obtained from *Bixa orellana* shrub. In Recent Years, the seeds are gaining economical importance as a highly desirable colorant. The ripe fruits of annatto on drying yield annatto seed which serves as the raw material for the production of annatto colour. The coloring matter is collected from the outer part of the seed. Annatto dye is non toxic and is mainly used for coloring edible products. It is used for only the purpose of coloring edible items like butter, ghee, chocolates. Annatto is also used as an ingredients in medicine to cure fevers, dysentery and kidney diseases. Now, it is mostly used to colour the medicine like tablets and capsule. And it is used to produce ointments for curing wounds. In India, it used as an insect repellent.

It is a natural dye obtained from annatto tree. Annatto possess good substantive towards cotton material and give orange colour. If we use mordant means there is a chance of getting colour from light orange to orange red. It gives pleasant odor to textile material. Natural herbal products can be used for antimicrobial composition to be the effective candidates in bringing out herbal textiles. (Anandhan and Karthick 2012)

As a Food Coloring

- The nor-bixin (water soluble part) and bixin (fat soluble part) and both share the same as annatto.
- Annatto seed contains 4.5-5.5% pigments, which consists of 70-80% bixin.
- In the United States, annatto extract is listed as a color additive exempt from certification and is informally considered to be natural color. The yellowish orange color. The yellowish orange color is produced by the chemical compounds bixin and nor-bixin which are classified as carotenoids.
- A higher level of bixin gives it a more reddish shade; the more nor-bixin in an annatto color, the more yellow it is. It takes on a pink shade at low pH, unless an acid-proof version is used.

Conclusion:

Annatto is a natural alternative to synthetic food coloring compounds and fabric antimicrobial finishing are successfully employed in non-woven sector especially in medical the bioactive fibers includes sanitary materials, surgical threads, dressing materials and



materials for filtration of gases and liquids, air conditioning and ventilation, and special materials for food industry also. The plants and plant products are traditionally used for healing of wounds, burn-injuries and antimicrobial activity against skin infections. Several medicinal plants are used for years in treating many diseases in daily life. Plants are reliable source of potentially important bioactive natural products. The growing interest in herbs and economically useful plant is part of the movement towards green economical life style.

References

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