Flavonoids Encyclopedia Article

Flavonoids

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Contents

Flavonoids Encyclopedia Article.....1

Contents.....2

Flavonoids.....3

Flavonoids

Flavonoids are phenolic **compounds** composed of fifteen carbons that are found in land plants, including bryophytes (hornworts, liverworts, mosses) and **vascular** plants (ferns, **gymnosperms**, and **angiosperms**). There are five major types of flavonoids: anthocyanins, flavones, flavonols, isoflavonoids, and proanthocyanidins. They are synthesized in the cytoplasm and subsequently accumulated in small vacuoles that fuse with the central vacuole in both the **epidermis** and cortex. The original function of flavonoids in plant cells is thought to be defensive, providing protection against insect, fungal, and viral attacks and consumption by invertebrate and vertebrate **herbivores**. Over evolutionary time, their functions became diverse. Anthocyanins in floral and vegetative tissues range in colors from yellow to blue. Those found in petals and pollen grains of the flower attract pollinator insects and birds that visit for food. Visibly colorless flavonoids in the epidermal cells, such as flavones and flavonols, serve as ultraviolet shields for the underlying cells. Proanthocyanidins accumulate in vacuoles of **cortical** cells, seed coats, and secondary tissues such as bark, where they form mixtures of brown-black reddish pigments called condensed **tannins** in the walls. Isoflavonoids and flavones are secreted into the surrounding soil layers and function as signals in the interaction between plant roots and nitrogen-fixing bacteria to form nodules.

See Also

Anthocyanins; Pigments; Vacuoles.

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