



PEONY FLOWER PIGMENTS

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I. PLASTID PIGMENTS. These consist of (A) CHLOROPHYL (green) and (B) CAROTENOIDS (brilliant yellow). They are generally water-insoluble and occur within plastids, specialized tiny cells enclosed in the normal plant cells. The carotenoids are found only in *P. lutea* and its hybrids, and are located in the epidermal or outer layer of cells in the flower petals.

II. FLAVONOIDS. This class of pigments is water soluble, and consists of (A) ANTHOCYANIDINS (many colors), (B) FLAVONES (white or pale yellow), (C) CHALCONES (clear yellow), and (D) COMPLEX PIGMENTS.

ANTHOCYANIDINS are located in the sub-epidermal or inner layer of cells in the flower petals, and are dissolved in the cell sap. There are about sixteen in the plant kingdom, embracing yellow, orange, scarlet, crimson, and violet, but only three are found in peonies: (1) pelargonidin, (2) peonidin, and (3) cyanidin.



Pelargonidin (scarlet) appears ONLY in SOME *suffruticosa*, hence in SOME of the tree peony hybrids with *lutea*.

Peonidin (crimson) is the major pigment in *P. lactiflora*, *affincialis*, *tenuifolia*, many other herbaceous species (but excl. *lobata*, *delavlayi*, and many *suffruticosa* varieties). Depending upon its concentration, it can produce reds varying from blush through black-red. It is dominant over pelargonidin, and can almost certainly mutate to pelargonidin and cyanidin.

Cyanidin (crimson) appears as traces in the above species but as a 50-50 mix with peonidin in *P. Zabata*.

FLAVONES are probably found in all peonies, but more yellow in *Oriental Gold*, *mlokosewitschii*, *lobata*, and probably *tenuifolia*. They provide "body" to the petals of white peonies, cream and ivory in some *lactifloras*, yellow color to anthers in general, and to the petaloids of certain Japanese and anemone forms of *lactiflora* (in the early stages). Improvement in more yellow flavones is unlikely.

CHALCONES are found only in *P. potaninii* var. *trollioides*. Improved more yellow chalcones are a possibility.

COMPLEX PIGMENTS are (1) anthocyanidin combined with flavone to give violet or purple in *lactiflora*, *suffruticosa*, and many other species, but usually reddened by excess anthocyanidin, and (2) cyanidin combined with metals to give blue.