

List of phytochemicals in food

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While there is ample evidence to support the health benefits of diets rich in fruits, vegetables, legumes, whole grains and nuts, evidence that these effects are due to specific nutrients or phytochemicals is limited.^[1]

The following is a list of phytochemicals present in commonly consumed foods.

1) Phenolic compounds

- **Monophenols**
 - Apiole – parsley.
 - Carnosol – rosemary.
 - Carvacrol – oregano, thyme.
 - Dillapiole – dill.
 - Rosemarinol – rosemary.
- **Flavonoids (polyphenols)** – red, blue, purple pigments.
 - Flavonols
 - Quercetin – red and yellow onions, tea, wine, apples, cranberries, buckwheat, beans.
 - Gingerol – ginger.
 - Kaempferol – strawberries, gooseberries, cranberries, peas, brassicates, chives.
 - Myricetin – grapes, walnuts.
 - Rutin – citrus fruits, buckwheat, parsley, tomato, apricot, rhubarb, tea.
 - Isorhamnetin
 - Flavanones
 - Hesperidin – citrus fruits.
 - Naringenin – citrus fruits.
 - Silybin – blessed milk thistle.
 - Eriodictyol
 - Flavones
 - Apigenin – chamomile, celery, parsley.
 - Tangeritin – tangerine and other citrus peels.
 - Luteolin
 - Flavan-3-ols
 - Catechins – white tea, green tea, black tea, grapes, wine, apple juice, cocoa, lentils, black-eyed peas.
 - (+)-Catechin
 - (+)-Gallocatechin
 - (-)-Epicatechin
 - (-)-Epigallocatechin

- (-)-Epigallocatechin gallate (EGCG) – green tea;
 - (-)-Epicatechin 3-gallate
 - Theaflavin – black tea;
 - Theaflavin-3-gallate – black tea;
 - Theaflavin-3'-gallate – black tea;
 - Theaflavin-3,3'-digallate – black tea;
 - Thearubigins
- Anthocyanins (flavonals) and Anthocyanidins – red wine, many red, purple or blue fruits and vegetables.
 - Pelargonidin – bilberry, raspberry, strawberry.
 - Peonidin – bilberry, blueberry, cherry, cranberry, peach.
 - Cyanidin – red apple & pear, bilberry, blackberry, blueberry, cherry, cranberry, peach, plum, hawthorn, loganberry, cocoa.
 - Delphinidin – bilberry, blueberry, eggplant.
 - Malvidin – bilberry, blueberry.
 - Petunidin
- Isoflavones (phytoestrogens)
 - Daidzein (formononetin) – soy, alfalfa sprouts, red clover, chickpeas, peanuts, other legumes.
 - Genistein (biochanin A) – soy, alfalfa sprouts, red clover, chickpeas, peanuts, other legumes.
 - Glycitein – soy.
- Dihydroflavonols
- Chalcones
- Coumestans (phytoestrogens)
 - Coumestrol – red clover, alfalfa sprouts, soy, peas, brussels sprouts.
- **Phenolic acids**
 - Ellagic acid – walnuts, strawberries, cranberries, blackberries, guava, grapes.
 - Gallic acid – tea, mango, strawberries, rhubarb, soy.
 - Salicylic acid – peppermint, licorice, peanut, wheat.
 - Tannic acid – nettles, tea, berries.
 - Vanillin – vanilla beans, cloves.
 - Capsaicin – chilli peppers.
 - Curcumin – turmeric, mustard. (Oxidizes to vanillin.)
- **Hydroxycinnamic acids**
 - Caffeic acid – burdock, hawthorn, artichoke, pear, basil, thyme, oregano, apple.
 - Chlorogenic acid – echinacea, strawberries, pineapple, coffee, sunflower, blueberries.
 - Cinnamic acid – aloe.
 - Ferulic acid – oats, rice, artichoke, orange, pineapple, apple, peanut.
 - Coumarin – citrus fruits, maize.

- **Lignans (phytoestrogens)** – seeds (flax, sesame, pumpkin, sunflower, poppy), whole grains (rye, oats, barley), bran (wheat, oat, rye), fruits (particularly berries) and vegetables.^[2]
 - Silymarin – artichokes, milk thistle.
 - Matairesinol – flax seed, sesame seed, rye bran and meal, oat bran, poppy seed, strawberries, blackcurrants, broccoli.
 - Secoisolariciresinol – flax seeds, sunflower seeds, sesame seeds, pumpkin, strawberries, blueberries, cranberries, zucchini, blackcurrant, carrots.
 - Pinoresinol and lariciresinol – ^[3] sesame seed, Brassica vegetables
- **Tyrosol esters**
 - Tyrosol – olive oil
 - Hydroxytyrosol – olive oil
 - Oleocanthal – olive oil
 - Oleuropein – olive oil
- **Stilbenoids**
 - Resveratrol – grape skins and seeds, wine, nuts, peanuts
 - Pterostilbene – grapes, blueberries
 - Piceatannol – grapes
- **Punicalagins** – pomegranates

2) Terpenes (isoprenoids)

- **Carotenoids (tetraterpenoids)**
 - Carotenes - orange pigments
 - α-Carotene – to vitamin A, in carrots, pumpkins, maize, tangerine, orange.
 - β-Carotene – to vitamin A, in dark, leafy greens and red, orange and yellow fruits and vegetables.
 - γ-Carotene
 - δ-Carotene
 - Lycopene – Vietnam Gac, tomatoes, grapefruit, watermelon, guava, apricots, carrots.
 - Neurosporene
 - Phytofluene – star fruit, sweet potato, orange.
 - Phytoene – sweet potato, orange.
 - Xanthophylls - yellow pigments.
 - Canthaxanthin – paprika.
 - Cryptoxanthin – mango, tangerine, orange, papaya, peaches, avocado, pea, grapefruit, kiwi.
 - Zeaxanthin – wolfberry, spinach, kale, turnip greens, maize, eggs, red pepper, pumpkin, oranges.
 - Astaxanthin – microalge, yeast, krill, shrimp, salmon, lobsters, and some crabs

- Lutein – spinach, turnip greens, romaine lettuce, eggs, red pepper, pumpkin, mango, papaya, oranges, kiwi, peaches, squash, legumes, brassicates, prunes, sweet potatoes, honeydew melon, rhubarb, plum, avocado, pear.
 - Rubixanthin – rose hips.
- **Monoterpenes**
 - Limonene – oils of citrus, cherries, spearmint, dill, garlic, celery, maize, rosemary, ginger, basil.
 - Perillyl alcohol – citrus oils, caraway, mints.
- **Saponins** – soybeans, beans, other legumes, maize, alfalfa.
- **Lipids**
 - Phytosterols – almonds, cashews, peanuts, sesame seeds, sunflower seeds, whole wheat, maize, soybeans, many vegetable oils.
 - Campesterol - buckwheat.
 - beta Sitosterol – avocados, rice bran, wheat germ, corn oils, fennel, peanuts, soybeans, hawthorn, basil, buckwheat.
 - gamma sitosterol
 - Stigmasterol – buckwheat.
 - Tocopherols (vitamin E)
 - omega-3,6,9 fatty acids – dark-green leafy vegetables, grains, legumes, nuts.
 - gamma-linolenic acid – evening primrose, borage, blackcurrant.
- **Triterpenoid**
 - Oleanolic acid - American pokeweed, honey mesquite, garlic, java apple, cloves, and many other Syzygium species.
 - Ursolic acid - apples, basil, bilberries, cranberries, elder flower, peppermint, lavender, oregano, thyme, hawthorn, prunes.
 - Betulinic acid - Ber tree, white birch, tropical carnivorous plants Triphyophyllum peltatum and Ancistrocladus heyneanus, Diospyros leucomelas a member of the persimmon family, Tetracera boiviniana, the jambul (Syzygium formosanum), and many other Syzygium species.
 - Moronic acid - Rhus javanica (a sumac), mistletoe

3) Betalains

- **Betalains**
 - Betacyanins
 - betanin - beets
 - isobetanin - beets
 - probetanin - beets
 - neobetanin - beets
 - Betaxanthins (non glycosidic versions)
 - Indicaxanthin - beets, sicilian prickly pear
 - Vulgaxanthin - beets

4) Organosulfides

- **Dithiolthiones (isothiocyanates)**
 - Sulphoraphane – Brassicates.
- **Thiosulphonates (allium compounds)**
 - Allyl methyl trisulfide – garlic, onions, leeks, chives, shallots.
 - Diallyl sulfide – garlic, onions, leeks, chives, shallots.

5) Indoles, glucosinolates

- Indole-3-carbinol – cabbage, kale, brussels sprouts, rutabaga, mustard greens.
- sulforaphane - broccoli family
- 3,3'-Diindolylmethane or DIM - broccoli family
- Sinigrin - broccoli family
- Allicin - garlic
- Alliin - garlic
- Allyl isothiocyanate - horseradish, mustard, wasabi
- Piperine - black pepper
- Syn-propanethial-S-oxide - cut onions.

6) Protein inhibitors

- Protease inhibitors – soy, seeds, legumes, potatoes, eggs, cereals.

7) Other organic acids

- Oxalic acid – orange, spinach, rhubarb, tea and coffee, banana, ginger, almond, sweet potato, bell pepper.
- Phytic acid (inositol hexaphosphate) – cereals, nuts, sesame seeds, soybeans, wheat, pumpkin, beans, almonds.
- Tartaric acid – apricots, apples, sunflower, avocado, grapes.
- Anacardic acid - cashews, mangoes.

References

1. [^] Linus Pauling Institute at Oregon State University
2. [^] Linus Pauling Institute at Oregon State University
3. [^] Lignan contents of Dutch plant foods: a database i...[Br J Nutr. 2005] - PubMed Result

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