

BACKYARD PLANTS USED IN MEDICAL RESEARCH

By Maritta Perry Grau, Frederick County Master Gardener, December, 2022

The Christmas and New Year's seasons always seem to be a time that I get the urge to start cleaning out closets and drawers. Closets aren't the only things that cry out for a good purging: In October, I brought in a few bedraggled geraniums, begonias, and other plants to shelter through the winter. Seeing the geraniums and begonias put out the occasional bloom evokes memories of summer fun and colorful garden beds. And the old tees I wear for gardening chores elicit fond memories from several years ago, as their imprimatures were designed by my colleagues at the former National Cancer Institute at Frederick (now the Frederick National Laboratory for Cancer Research). All featured organisms used in cancer research, from trees and shrubs to lizards, sea shells, and flowers. And though I haven't had any gila monsters or poisonous cone snails in my gardens, I do host several plants used in the FNLCR basic research. After all, "More than 60 percent of anticancer compounds... are obtained from herbal, marine, and microorganism sources" (Kooti, Wesam, *et al. Journal of Evidence-based Complementary and Alternative Medicine*).

You may recognize the plants listed below more for their decorative effects than for their medicinal properties, which treat a variety of ailments, such as diabetes, thyroid disorders, anemia, and even some psychological disorders. Beware: Don't try to treat yourself at home! Extracts and compounds go through many steps, many tests, and clinical trials in the laboratory before they can even be considered to treat any disease.

Pacific yew (*Taxus brevifolia*)

Many of us plant yews as hedges, and many species of yews have been used for folk remedies for thousands of years, but did you know that bark harvested from the Pacific yew contains the compound Taxol, one of the first and perhaps best-known of the naturally sourced cancer drugs? These trees have a dual nature: while the yews provides us with Taxol, **all** parts of the yew are poisonous; even one berry may hold enough poison to kill a small child, according to <rxlist.com>.

Thyme (*Thymus vulgaris*)

You're probably noticed the delightful scent when you brush by this small evergreen plant, and you may have noted its light purple or white flowers in spring. But did you know that compounds from this ordinary garden thyme may help in treating various cancers and other diseases(National Library of Medicine, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8293693/>)?

Garlic (*Allium sativum*)

Do you keep garlic around to ward off vampires? Or, more likely, grow it in your garden to add a delicious flavor to certain dishes? According to researchers, garlic reduces the risk of cancer in many areas of the human body.

Wormwood (*Artemisia absinthium*)

Wormwood, an herb often planted in mid-Maryland for its soft, feathery foliage, is found throughout the United States. Like the other plants mentioned in this article, its compounds work well against certain types of cancer cells.

Green tea (*Camellia sinensis*)

Green tea is a natural source of caffeine and antioxidants; research indicates that it may help inhibit prostate and breast cancers. The tea is made by steeping the fresh buds and petals of its brilliantly white flowers in hot water.

Pennyroyal (*Mentha pulegium*)

Pennyroyal is a perennial invasive creeping herb in the mint family, with small, lavender flowers and aromatic, grayish-green leaves. Grow it in a pot. While most people use it as a tea for ailments such as stomach upsets, compounds have also been used to treat leukemia and other types of cancer cells.

Wild pansy (*Viola tricolor*)

Not to be confused with the invasive lawn violet that displays large, rounded leaves and whose flowers are usually all purple or white, the tiny *Viola tricolor* is a short-lived perennial or annual. The springtime flowers are usually a mix of deep purple upper petals, fading into white and then into yellow lower petals, although other color combinations are common. Leaves are narrow and pointed. Extracts of the *Viola tricolor* are used to treat cervical cancer and other cancers.

Madagascar periwinkle (*Catharanthus roseus*)

Nurseries often advertise and label Madagascar periwinkle as an annual vinca. Actually, while the flowers look very much the same, true vinca is actually a vine—*vinca minor*. Both have five petals, but *vinca minor* exhibits squared-off petals and somewhat leathery leaves; Madagascar periwinkle petals are more rounded, and its slender leaves have faint yellowish/white veining. Periwinkle produces the powerful anticancer drugs vinblastine and vincristine. For now, compounds are extracted directly from the periwinkle, but future research may express the compounds in a bacterium or yeast.

So, I won't throw away my old tee shirts just yet. Each one reminds me of the important research being done right here in Frederick, and next spring when I am planting flowers and herbs in my garden, it will be comforting to know that those plants may also be helping someone to successfully combat medical issues.



The Frederick National Laboratory for Cancer Research (formerly, the National Cancer Institute at Frederick) has held a Spring Research Festival in conjunction with Fort Detrick's Armed Forces Day in mid-May each year since 1998, although since Covid it has been virtual. Souvenir tee shirts are illustrated with an organism used in cancer research. Pictured on the left is the 2007 shirt with a Gila monster, whose venom has been used to make compounds in cancer research; and on the right, the 2003 shirt, with a test tube holding a Madagascar Periwinkle, often confused with *vinca minor*, a vine. (Photo courtesy of Jennifer Brown, retired senior illustrator for NCI-Frederick)

PACIFIC YEW -- Bark harvested from the Pacific yew, native to the Pacific northwest American forests, provides us with the compound Taxol, one of the first and perhaps best-known of the naturally sourced cancer drugs now used in treatments for several forms of cancer. (Photo courtesy of Chris Rusch, "Ask a Master Gardener." *News Review*, Roseburg, Oregon)





THYME -- Compounds from garden thyme can inhibit the growth of abnormal and precancerous lesions; also, two of its compounds, thymol and carvacrol, are useful in the treatment of breast and colorectal cancers and other diseases. (Photo courtesy of University of Maryland Extension)

VIOLA TRICOLOR

The Viola tricolor, sometimes called the wild pansy or Johnny Jump-up, is another in the pantheon of naturally sourced plants used in cancer research. Leaves are narrow and pointed. Flowers usually have a mix of three colors, ranging from dark purple to white to yellow. Extracts of the Viola tricolor are used to treat cervical and other cancers. (Photo courtesy of University of Maryland Extension)



For more information about the Frederick County Extension Master Gardener/Horticulture Program, gardening information and advice visit: <http://extension.umd.edu/locations/frederick-county/home-gardening> or call Susan Trice at the University of Maryland Extension Frederick County office, 301-600-1596. Find us on Facebook at <http://www.facebook.com/mastergardenersfrederickcountymaryland>. UME Home & Garden Information Center, <https://extension.umd.edu/programs/environmentnatural-resources/program-areas/home-and-garden-information-center>.

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