

Milkworts are everywhere in the pine flatwoods in late April, sometimes thousands of plants belonging to several species will be in view on ridges and swales. As I look at the plants, I imagine Greek physician and author Pedanios Dioscorides, from the 1st century A.D., selecting samples. Bending over, he gently snaps off the stems, and thinks that the bitter plants will produce *polygalon* (Greek, *polys* = much, *gala* = milk), useful to the farmer who recently came for aid in renewing the flow of milk in his cow. Dioscorides tucks the plants gingerly into a small bag draped over his shoulder and walks on.

Speakers of several Mediterranean languages referred to these plants by their linguistic equivalent of milkwort (*wort* = plant) long before the Dutch herbalist Rembert Dodoens published the English and Latin names in 1578. Dodoens wrote that *Polygala* "engendreth plentie of milk; therefore it is good to be used of nurses that lack milk." Others following this idea include Italian *poligala*, Spanish *hierba lechera* (milk giving herb), Portuguese *erva leiteira*, and French *latier* (milk giver). In spite of these names and beliefs, there is no evidence that extracts of these plants increase milk flow.

Other Europeans know the plants under other names. Norwegians call them *Blåffær* (blue-flower). While not all their species have blue flowers, they retain the basic name and add modifiers, such as *Bitterblåffær* (*P. amarella*) or *Storrblåffær* ("storr" = big, *P. vulgaris*). In Gurnsey, *Polygala* is *herbe de paralysie*, and is used to treat or prevent paralysis or strokes. Gaelic speakers in Scotland say the herb is *Saibann nam Ban-sidh* (fairy women's soap). Indeed, many species contain saponins (soap-like compounds). The Germans call it the *Kreuzblume* (cross-flower). One can, with considerable imagination, see a resemblance to a cross in the flowers.

Because of their colorful flowers, many of our Florida species have common names. Bachelor's buttons, the least creative among these, was adopted from unrelated European plants (*Centaurea cyanus*, ASTERACEAE). The name is sometimes applied to all the species, but more often there are modifiers, as in white bachelor's-button (*P. baldwinii*), bog bachelor's-button (*P. lutea*), dwarf bachelor's-button (*P. nana*), and yellow bachelor's-button (*P. rugelii*).

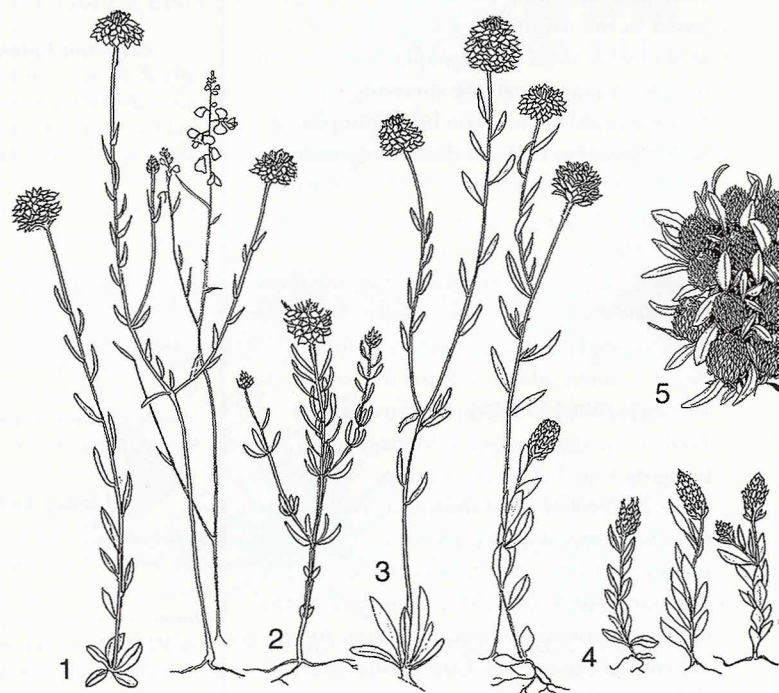
Some of the more intriguing common names for milkworts are given to *P. cruciata* (drum-heads) and *P. pauciflora* (gay-wings, bird on the wing, baby's toes, baby's feet, baby's slippers, satin flower, Indian pink, maywing). However, the most curious names of Florida's *P. incarnata* are procession-flower or Rogation-flower, both of which it shares with European *P. vulgaris*. Herbalist John Gerard,

in 1597, explained these names by saying that the plants, "flourish in the Crosse or Gang weeke, or Rogation weeke; of which floures the maidens[,] which use in the countries to walk the Procession[,] doe make themselves garlands and noseгаies, in English we may call it Crosse-floure, Rogation floure, and Milkewort, of their virtues in procuring milk in the breasts of nurses." Rogation Sunday is the fifth Sunday after Easter, and is followed by Rogation Week when church processions or "gangs," led by a person carrying a cross, bless crops.

Milkworts, also known as candyweeds or candy-roots (because of a licorice taste to the roots of some), are small herbs in North America and northern Europe, but in dryer climates and within the tropics they may be shrubs or even trees. Some species produce dyes, and one from tropical Africa (*P. butyracea*) yields a fiber.

Many species around the world are used in medicines, although only one in North America has received much publicity. That northern species, *P. seneca* (snake-root, Seneca snakeroot), became famous as a snake-bite remedy when the first Europeans arrived in the New World. Although dubious in snakebites, the species became popular for treating pleurisy, the most common ailment in colonial Virginia. Even William Byrd, one of the surveyors of the line between North Carolina and Virginia, used it to treat gout in one of their party in early 1728.

Snake-root contains the glucoside senegin (a saponin), polygalic acid, resin, methyl salicylate, and fatty oils. Several of these make the plant potentially effective in medicines as an emetic, expectorant, cathartic, diuretic, antispasmodic, sweat inducer, to regulate menses, for colds, against croup, pleurisy, rheumatism, heart troubles, convulsions, coughs, and a poultice against swelling. The pres-



Some common species of Florida *Polygala*: 1. *P. rugelii*; 2. *P. grandiflora*; 3. *P. cruciata*; 4. *P. lutea*; 5. *P. smallii*. Sources: *P. smallii* from Austin, D. F., 1998. *Pine Rockland Plant Guide, A field guide to the plants of South Florida's Pine Rockland Community*, Miami-Dade Environmental Resources Management Department, Miami; other species from Austin, D. F., P. N. Honychurch, and S. Bass, 2001. *Flatwoods Plant Guide, A Pocket Guide To The Common Plants Of Southern Florida's Pine Flatwoods Community*, Gumbo Limbo Nature Center, Boca Raton.

ence of methyl salicylate also supports snake-root's use as a preventative medicine for some of these maladies. This chemical is more familiar under the name of "wintergreen" and has long been used in medicine and flavorings. Florida's *P. boykinii*, which shares methyl salicylate with other native North American polygalas, has been used in Mexico in a cold water infusion to correct dizziness.

Our yellow bachelor's-button or thimbles (*P. rugellii*) has a long use by Florida people. Pollen of the genus has been found in the pre-Columbian deposits at the Glades Indian site of Fort Center on the western side of Lake Okeechobee. The species has had religious significance in Florida for a long time. This relationship is indicated by the Miccosukee name *sápiyá' :bi* or *sápiyí* (resembling the mythical plant '*sápiyi*'). Organisms that have uses older than memory always have long associations with people. Large doses of this species also act as a strong laxative.

The Choctaw name for *P. lutea* (bog bachelor's-button, candy-weed, wild bachelor's-button) was *kwonokasha ipsa* and the plant was used as a poultice to treat swelling by infusing dried blossoms in hot water.

In addition to *P. rugellii* and *P. lutea*, Florida's other species with a recorded use is *P. polygama*. As with several others, it has been used to treat coughs and probably contains the saponin wintergreen.

John K. Small, a botanist from the New York Botanical Garden who explored Florida during his winter breaks from that snowy city, was the first to recognize one endemic *Polygala* as distinct. He named that herb *Polygala arenicola* in 1905. In the 1970s, Robert R. Smith and Daniel B. Ward at the University of Florida realized that because of a legal technicality, the plant needed a new name. They commemorated the New Yorker's keen observations by naming the plant *Polygala smallii*.

Urbanization in South Florida has pushed *P. smallii* to the edge of extinction. The species was proposed for the Federal Endangered Plant List and became one of the first from the region to be listed in 1985. Since no one knew much about the plants, or why they were so restricted, several studies were initiated.

Pamela Krauss, while at Florida Atlantic University, discovered by the early 1980s that the species was restricted to small sandy spots in rockland pine flatwoods in Miami-Dade County. Apparently, Broward County plants were extirpated by then. About the same time John Popenoe, then Director of Fairchild Tropical Garden, found the species in Martin County's Jonathan Dickinson State Park. In the late 1990s, George Gann rediscovered the plants in Martin County and, subsequently, in nearby Palm Beach and St. Lucie Counties.

Even these northern populations reproduce erratically, and studies for the Florida Native Plant Society by Christine Lockhart are producing population data that will help future management of this highly endangered Florida endemic. One of the aspects of the plant's biology that is a contributor to its spotty distribution is its isolation in "pockets" of sand within pinelands. Another of those aspects may be dispersal by ants.

Ant colonies have limited ranges, and that restricts where the seeds can be carried. To accomplish their dispersal, *Polygala* seeds have special "food-bodies" (elaiosomes). These tiny structures attract foraging ants. Ants carry the seeds back to their nests, eat the food, and then discard the seeds outside. The seeds, having been put in a rich garbage-heap with plenty of open space and reduced competition, germinate and provide new colonies. Maybe our disruption of native ants with pesticides and the introduction of alien ants is showing us the "ripple-effect" of disturbing one small segment of the web of life. We humans are incredibly arrogant and egocentric, and tend to think that only big animals are important. Still, we can make fun of ourselves and ants. There is a song in the movie *High Hopes* (1988) where, although everyone said it could not, an ant carries off a rubber-tree plant. So, never underestimate the importance of your neighbors! ✨

### *Polygala* species

Herbs in Florida, 2-30 cm tall. Leaves alternate, whorled or opposite, usually entire leaves lacking stipules. Flowers in racemes; calyx with five sepals, the outer three small, the inner two much larger, resembling "wings," often colored like the petals; petals three, fused and adnate to the staminal tube, the two upper ones similar, the lower one keel or boat shaped, with a fringed crest; stamens eight, sometimes six, fused by their filaments into a sheath split along the upper side; ovary two locular. Fruit a small capsule.

*Polygala* has about 500 species, found on all continents except Australia. It is the type genus in the POLYGALACEAE, a family of 950 species with 17 genera. Most of the 950 species are in the *Polygala* genus. Florida has 23 *Polygala* species; three are listed as endangered. Supposedly hybridization and polyploidy in the milkworts has caused them to be difficult taxonomically. However, our Florida species seem relatively straightforward. These plants are also notable because their flowers are easily confused with those of legumes (FABACEAE).

#### Useful References

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Top left: *Polygala cymosa*; right: *P. nana*;  
below: a field of *P. rugerii*.  
Photos by Dan Austin.



### Milkworts *Polygala* spp.

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More about the plants shown... On the front cover, *Polygala cruciata* (upper left) often grows in association with *P. baldwinii* (center right), found in moist areas such as wet prairies, usually in a few inches of standing water. *P. incarnata* (upper right) is the species called "Rogation flower." *P. lutea* (lower left) tends to have orange-colored flowers, although the species name, *lutea*, means "yellow." *P. grandiflora*, (bottom center), has the largest flowers in the genus in the southeastern states (still, the "petals" are only 5-7 mm. long). On this page, *P. cymosa* (upper left) is usually found growing with both *P. baldwinii* and *P. cruciata*. *P. nana* (upper right) ties with *P. smallii* (not pictured) for the smallest of the Florida species, and is hard to distinguish from *P. smallii* unless flower parts and seeds are examined. *P. rugelii* (bottom photo), perhaps the showiest of our species, is named for Ferdinand Rugel, 1806-1878, a German-born explorer and plant collector in the Southeastern United States.

