Aris to loch ia serpentaria
by Rufino Osorio

Many small herbaceous plants are of great interest botanically. Many will grow to perfection in pots. Some are extremely decorative and worthy of greater promulgation among both hobbyist growers and the wildflower horticultural trade. I have offered small native wildflowers as potted plants in several fund raisers and have always gone home empty-handed. I believe this indicates real horticultural and commercial possibilities for such plants — possibilities that wildflower nurseries have scarcely considered.

The genus Aristolochia consists primarily of large vines with unusual flowers, common in the tropics of both the Old and New Worlds. Probably the most commonly cultivated species is an exotic, A. elegans.

Several species, however, are native to the eastern United States, with A. serpentaria the most widespread, ranging from Connecticut west to Kansas and south to Texas and Florida. Its natural habitat is invariably described as "rich woods".

A. serpentaria is more or less erect, and is quite dwarf, growing to about 20 cm tall. The leaves vary from heart-shaped to narrowly linear, the narrow leaves being most common in the southern part of its range. The stems grow in a zig-zag, and the nodes are somewhat swollen. The flowers are borne on shoots near the base of the plant, often resulting in the flowers and fruits lying on the ground and sometimes being hidden by fallen leaves. The flowers form round fruits about 1 cm in diameter, which open from the apex and produce concave seeds with a whitish body that ants find attractive.

All of these features of A. serpentaria are in marked contrast to the exotic cultivated species, which are robust vines up to several meters in length, bear flowers from the tips of the stems, have fruits that open from the base, and produce flat, winged seeds dispersed by the wind. Because of these many differences, A. serpentaria has sometimes been referred to as a separate genus by some botanists.

The flowers of A. serpentaria are miniature replicas of its larger cousins.

They consist of a much modified calyx and lack any petals. Although only about 1.5 cm long, the flowers are extremely complex. Each is divided into three parts: a bulbous base, a narrow noticeably lighter, resulting in a "window" when seen through the mouth of the flower. I find these flowers fascinating, and when viewed from the front, they look exactly like the heads of grumpy little trolls.

Aristolochias are "trap" flowers, and once this is known, their intricate structure begins to make sense. They are mostly pollinated by flies, which explains the reddish brown colors simulating carrion or putrid meat. The little window at the back of the throat tricks the pollinators into "thinking" they are climbing out of the flower, but instead they are being guided to the bulbous base where they are temporarily trapped. Aristolochia are not carnivorous; the trapping of insects is connected solely with pollination.

Although more curious than beautiful, this plant has the great charm that all miniature things possess. Luckily, it is very easily grown, and — in cultivation at least — it is nearly everblooming. My parent plant has thrived in a 12.5 cm pot of rich soil made by combining one part each of coarse peat moss, vermiculite, and composted cow manure (the manure is sold under the trade name of Black Cow). In order to ensure sturdy, upright growths, the plants are given several hours of unobstructed morning sun. They will grow in deep shade, but under such conditions, they are lanky and decumbent. If provided with ample water, they will tolerate nearly full sun, and if grown under shaded conditions, the plants will tolerate drought.

Plants are easily propagated by division of large mature plants or from seed. Seeds germinate erratically over a period of many months. If you are growing this plant from seed, be patient and keep the container in which the seeds were sown for at least one
year. Seedlings can be quite precocious: I have had 5-month-old plants flower when only about 7 cm tall and growing in a 5 cm pot. If stressed, they will still flower although the flowers never open. Such flowers, however, still form perfectly normal fruits with viable seeds. The formation of fruits from flowers that self-fertilize without ever opening is technically referred to as cleistogamy.

Germination is unusual and reflects the plant’s adaptation to being dispersed by ants. The seeds are small and thus do not have large food reserves. In order to avoid exhausting these food reserves in growing up from deep underground where the ants may have taken them, the seeds have developed a curious strategy. If you have ever seen a bean germinate, you know that the bean pushes itself up out of the ground. If *A. serpentaria* did that, it would use up its food reserves in the process and perhaps never make it to the surface, even assuming that the soil was loose and friable enough for it to make the effort. Instead, the body of the seed remains underground while it produces an extremely thin, but rigid, stem which is tipped by a tiny, sharp-pointed, folded leaf. This stem can elongate to great lengths on the limited food reserves contained within the seed and forms a perfect “drill” for working its way out of an ant nest. Upon reaching the surface, the stem stops elongating and the leaf unfolds to begin photosynthesis.

The specialized adaptations described above do not exhaust this remarkable plant’s bag of tricks. The caterpillar of the pipevine swallowtail butterfly is a common herbivore of the genus *Aristolochia*, but not *A. serpentaria*! Perhaps in response to herbivore pressure, *A. serpentaria* has well-developed chemical defenses. Such defenses are not evident upon casual examination, but if any of the roots are damaged, they release a distinct odor similar to that of turpentine. Except for very slight infestations of whitefly, I have never seen any animal feeding on *A. serpentaria*, either in the wild or in cultivation. A second defense against herbivores may be the plant’s small size, which makes it difficult for large mammalian herbivores to detect it. Also, it may be too small for a pipevine swallowtail caterpillar to eat enough to reach maturity if its mother deposits eggs on this species.

Although not threatened or endangered, this species is not very common, and is listed as “occasional” by R.P. Wunderlin in *Guide to the Vascular Plants of Central Florida*. However, this does appear to be a plant of narrow ecological amplitude as indicated by its patchy distribution consisting of widely dispersed small populations, a preference for rich undisturbed habitats, and limited dispersal ability. Thus, while not rare at the moment, there is the possibility that it may become so in the future.

In order to avoid putting collection pressure on this species, I would be happy to send a few seeds from my cultivated plants to interested readers. Please send a stamped self-addressed envelope. Requests will be filled in the order received and, although I will try to respond to all inquiries, it may be necessary to file them until next year’s seed crop in the event that this year’s seed crop is exhausted before all requests can be fulfilled.

In summary, this plant is a small-growing native wildflower which adapts well to pot culture. It has curious comical flowers that are freely produced even on young plants, and it is easily grown from seed. In addition, it provides a good example of just how little is known about our native plants, since, as far as I know, neither cleistogamy nor ant dispersal has previously been recorded in writings on the genus *Aristolochia*.

Rufino Osorio is a keen amateur botanist currently employed by the American Orchid Society. Because of lack of suitable gardening space, he has specialized in the horticulture of small herbaceous native plants in containers, both as patio plants and as house plants. Current projects include the development of simplified and inexpensive methods to raise orchids from seed using aseptic culture. He has offered to write more articles on miniature native species.