

Arisaema - Subtle Beauties for the Woodland

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Interest in members of the genus *Arisaema* has increased markedly in recent years, particularly as more species become available. The name *Arisaema* means 'blood arum', presumably because of the affinity of the genus to the genus *Arum* and the spotting on the stems of two of the earliest-described species.

The genus is comprised of approximately 170 species and they are primarily found in the Himalayas, China and Japan, although a number of species are found in southern India, South East Asia, north-eastern Africa and North America. What appeals to me is the range of inflorescence forms and colourations, the range of leaf morphologies and the marbled patterns on stems of some species.

A digression - *Arisaema* being members of the family Araceae, have inflorescences comprised of spadices, on which the actual flowers are borne, and spathes, modified leaves that surround the spadices. In the closely related arum or calla lily, *Zantedeschia aethiopica*, the white part of the 'flower' is the spathe and the central orange 'spike' is the spadix.

The spathes in *Arisaema* are generally combinations of green, brown and white. Also in *Arisaema*, both spathes and spadices can have extensions, though the longest are found on the latter, and are thought to be associated with attracting pollinating insects. For example, in *A. costatum*, the spadix extension (appendix) can be up to 50 cm in length.

The leaves of *Arisaema* can be either trifoliate (with three leaflets like clover), pedate ('foot-like', with the leaflets arising from a broad base like *Helleborus niger*) or radiate (many leaflets radiating from a common point like spokes on a wheel). The stems are often marbled or spotted with white, red and brown and are like particularly beautiful in, for example, *A. serratum*.

Arisaema tend to be woodland plants and many are quite hardy in this country. I grow about 25 species in my Waikato garden, where short-duration ground frosts of -5 to -8 °C are not uncommon in winter. *Arisaema* are not difficult to grow as long as several key requirements are met. They require a well draining, moisture retentive soil. If they are allowed to dry out during the summer, they tend to go dormant prematurely and are therefore slower to increase in size and flower. They also require a dappled woodland situation. The brighter the light, ideally without burning the leaves, the better and bigger the plants grow.

As a general statement the more divided the leaf the more sun they can take without damage. I have found *A. flavum* and *A. tortuosum* grow quite well in full sun, given

enough water, but they do not appear to set seed as well as those growing in shade, possibly because either the pollen or stigmas desiccate.

Arisaema respond well to feeding, but I believe a little often is best. I believe, for nearly all species I grow, the tuber is replaced annually and the better the plants do, the bigger the tuber grows.

Arisaema can also be grown in pots. The important thing to remember is that the pot needs to be quite a bit larger than the tuber, say four to five times the diameter of the tuber, if you want to optimise growth that season. Also, plants need to be fertilised more regularly when potted.

It is often stated that potted tubers should be repotted annually for optimum growth as *Arisaema* soon exhaust the potting mix. I have a feeling that tubers multiply more rapidly when grown in a pot, I suspect that is because I fertilise my potted plants more often than those in the ground. I do have a friend however, who thinks I am a little reckless growing my *Arisaema* in the ground!

The main advantages to me of growing them in the ground is that, because of the 'buffering capacity' of the soil, the plants are more tolerant of missed waterings and fertilisations. To be honest, the most difficult thing about growing *Arisaema* is procuring the plants, although with a little perseverance about seven species can be purchased from specialist nurseries in New Zealand.

If you live in an area much colder than the Waikato, it is probably a good idea to mulch your plants during winter until you get a feeling for an individual species' hardiness. British books, such as the new Royal Horticultural Society Dictionary of Gardening, can be useful here, in that they give the relative hardiness of a number of species. If you decide to store your *Arisaema* tubers out of the ground over the winter, whether that be because of cold or wet, keep them in a damp, open medium (for example, old potting mix) to stop them drying out. Small and seedling tubers are particularly susceptible to desiccation. *Arisaema* tubers are not as resilient to drying as daffodil or tulip bulbs.

Arisaema come up in spring in one flush of growth. If they are damaged at that time (mechanically or frost) you will probably have to wait until the next growing season before that growth is replaced. Although frost has never been a problem for me (touch wood!), be aware also that late-spring frosts can damage the shoots of the species that come up in early-spring.

Different *Arisaema* come through the ground at different times, the earliest species in August (for example, *A. ringens* and *A. speciosum*) and the latest in late November/early December (for example, *A. candidissimum*). Most species flower soon after they come

through the ground. Female inflorescences can last up to about six weeks, much longer than male inflorescences, particularly if not pollinated.

One of the peculiarities of *Arisaema* is that most species are paradioecious. That means that their gender is not fixed, but individuals switch between producing male and female inflorescences depending on how well they are growing. Small plants tend not to flower. As they increase in size, the first inflorescence tends to be male and as the plant continues to grow, a change takes place and subsequent inflorescences are female.

If a female- inflorescence producing plant becomes resource depleted, it may not flower the following season or may produce a male inflorescence. Several scientific studies have been conducted describing this phenomenon. It is believed that the adaptive advantage conferred by this reproductive strategy is that only moderately-performing plants that could mature seed, can still contribute to the reproductive effort of the population as a whole by producing male inflorescences.

One of the disadvantages of growing your plants really well is that all your plants will become female, which is not a problem in itself, except if you want seed to distribute to friends! I have a clump of *A. serratum* which is now all female. A Japanese botanist suggested that I should jump on them as they are coming through the ground and the following year I would have some male inflorescences! I felt that 'treatment' was a little too severe for me! An alternative, which works really well for *A. amurense*, is to feed the plants well so that they offset rapidly. The small offsets produce male inflorescences whose pollen can be used to pollinate the female inflorescence of the parent tuber.

Male inflorescences can easily be distinguished from female inflorescences. Male flowers are discrete entities at the base of the spadix whereas female flowers are tightly grouped together and look not dissimilar to a small pineapple. The female flowers are easily pollinated by transferring pollen (the pollen, a powder, sometimes collects at the base of the spathe where it joins the spadix) with a small paint brush or, if one tends to the 'one-off' approach, the spadix of the male inflorescence can be broken off and inserted into the female inflorescence. I prefer the former method.

A. tortuosum and *A. flavum* are two commonly grown species with bisexual inflorescences (both male and female flowers present, male flowers grouped above the female flowers) and self pollination is the norm.

Arisaema are easily propagated by separation of the tubers or from seed. When digging tubers in winter, remember that there can be considerable increases in size over the growing season, so dig widely. Be aware also that some species (for example, *A. concinnum* and *A. exappendiculatum*) produce bulbils on rhizomes and that those bulbils can be some distance from the parent tuber.

To grow *Arisaema* from seed, wash off all of the fruit pulp from the seed. This is for two reasons, one, it contains inhibitors that slow germination and, two, the remaining pulp will rot and this can affect the young seedlings.

Sow seed in a freely draining mix, keep moist and warm. *Arisaema* appear to be like *Lilium* in that there are two types of germination. Some species produce a seedling leaf immediately. In the others (for example, *A. urashima*) a small tuber is produced and that remains dormant until the following season.

Seeds of species that 'germinate immediately' should produce leaves in six to eight weeks. Species with 'delayed germination' need a period of warmth, then a period of chilling and then warmth again before growth appears above the ground. It is probably best to let nature take its course, because of the difficulty is knowing the specific requirements of a particular *Arisaema* received as seed. Seedlings should flower in three to five years if given good conditions.

The most commonly grown and readily available *Arisaema* is the Japanese species *A. ringens*. This species has large glossy, trifoliate leaves and is often erroneously distributed as *A. triphyllum*. The spathe is hooded with the opening pointing downwards. It has been described as looking like a helmet or a fat snail! *Ringens* means 'gaping, with two lipped mouth' and presumably refers to the opening of the spathe. This plant does very well in quite deeply shaded situations and under those conditions the leaves can be up to 50 cm across.

The true *A. triphyllum* is a smaller plant from the United States and also has trifoliate leaves (hence the specific name *triphyllum*), but are matt rather than glossy. The spathe is green and white striped, although some forms have purple markings.

Very similar to *A. triphyllum* is *A. amurense*. It is a slightly stockier plant, but the main difference is that the leaves in well grown plants have five leaflets instead of three. *Amurense* refers to the Amur River in eastern Russia, north of Vladivostok, from where it was first collected.

One of the most beautiful species is *A. sikokianum*. The specific name is a corruption of the name Shikoku, the smallest of the main islands in the Japanese archipelago. The spathe is basically brown, finely marked with white, with an overall greenish tinge, but the inside of the spathe tube is vivid white. The spadix is shaped like a chemist's pestle and is also vivid white. The plant normally produces two leaves, the basal one being the larger with five leaflets, and the upper with only three leaflets. Often, each leaflet has a blotchy silvery stripe down its center.

Another highly sought-after species is *A. candidissimum* (*candidissimum* meaning 'brilliantly white', referring to the colour of the spathe). This species is from western China and, as

said earlier, is one of the last to come through the ground. Each plant has a single trifoliate leaf, with the central leaflet being much larger than the two laterals. The outside of the tubers are purple, not unlike some of the older potato cultivars.

A very unusual and sought-after species is *A. griffithii* from the Himalayas. My plants have yet to flower, but the inflorescences are hooded like *A. ringens* and a very unusual burnished copper colour with a creamy-white network of veins. Each plant normally produces two trifoliate leaves.

A. serratum is a very variable species from Japan. One form I have grows about 80 cm tall and has green and white striped spathes, the other is much shorter (about 30 cm) and has chocolate-brown and white striped spathes. Each plant produces two pedate leaves.

A. dracontium also has pedate leaves and is from the United States. The form I have grows about 60 cm high, although I was recently told of plants reaching 1.5 m in height. The spathe is green and the spadix is yellow, long and slender, and upward pointing.

A. flavum is probably the most widespread species, being found from Yemen to western China. It also has the smallest inflorescence of the genus, only about 2.5 cm in length, and is also different in that the spathe is yellow (hence the specific name). As said earlier, the inflorescences are bisexual, so the plants set seed readily. The leaves are pedate.

A rather uncommon, but very beautiful species, is *A. costatum* from Nepal. The single leaf is trifoliate. The plant is easily recognised by the prominent and near parallel side veins on the leaflets. The specific name means 'prominent ribs' and refers to the inner surface of the spathe, rather than the leaves. The spathe is brown and white striped. The spadix is brown and as already noted, can be up to 50 cm long.

Similar to *A. costatum*, but more readily available is *A. speciosum*. It also has a single trifoliate leaf, but the leaflets do not have the prominent veins and are connected to the petiole (leaf stem) by petiolules (leaflet stems) rather than being directly attached to the petiole, as is the case with *A. costatum*. The spathe is also brown and white striped but opens more widely than *A. costatum*. *A. speciosum* is unique among the species discussed here in that it is rhizomatous. The tuber is not replaced annually, but remains and is added to each growing season. Seedling tubers of *A. speciosum* appear the same as other *Arisaema* species, the rhizomatous nature does not become readily apparent until after a number of years of growth. Many of the tropical *Arisaema* species are rhizomatous, a condition thought to be evolutionally primitive.

A. consanguineum is one of the tallest species, up to 1 m in height. It is from the Himalayas and down through South East Asia. The form I grow is rather plain, being green all over. The single leaf however, is radiate and this is very attractive.

Another tall species is *A. tortuosum*. The specific name *tortuosum* refers to the bends in the spadix and is similar in shape to the spadix on *A. dracontium*. *A. tortuosum* is the only species I grow with 'scented' inflorescences. To me it is rather unpleasantly strong and musty, not dissimilar to *Lilium pyrenaicum*. Each plant has two pedate leaves.

As already stated I grow a number of other species, but only the most readily available are discussed here. All species generate much comment from visitors. My suggestion is to try a few in your garden.

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Photographs

1. Leaf of *A. consanguineum*
2. Flower of *A. ringens*
3. Flower of *A. triphyllum*
4. Flower of *A. speciosum*
5. Flower of *A. sikokianum*
6. Flower of *A. candidissimum*
7. Flower of *A. tortuosum*