

Byblis—Notes On Forms New To Cultivation

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Because of the efforts of our intrepid colleague Allen Lowrie of Western Australia, there are some new forms of *Byblis* in cultivation (*B. liniflora* aff. 'Darwin', 'Kununurra', and 'Robust straggling plant, Darwin'—hereafter 'Darwin', 'Kununurra', and 'Robust', respectively). During the past few years I have been growing them and learning about their cultural requirements. *Byblis* is a genus of passive flypaper plants similar to *Drosera*—indeed the species *D. indica* looks much like a *Byblis*. The major characteristic distinguishing the two genera is in the arrangement of the floral sexual organs. In *Drosera* the five stamens are arranged symmetrically around the ovary and there are five (often branched) styles also symmetrically arranged. In contrast *Byblis* flowers are subtly zygomorphic. The five stamens are grouped together to the side of the ovary—the five curved anthers looking like a bunch of bananas—while the single pistil extends away from the bundle of anthers.

The most commonly grown plant in the genus is *B. liniflora*. This is certainly the easiest plant of these to grow because its seeds germinate and grow in any medium without any special treatment. I prefer to use a 50/50 sand/peat mix in a deep pot because the plants live longer. In smaller pots they tend to be annuals. In big pots they also branch more to make a bushy plant, especially if just a few plants are grown in a pot. The first flowers appear when the plant is just a few months old, and seed is produced generously without intervention—this plant is a weed!

B. gigantea is more challenging. The seeds must be pretreated in order to germinate well. I have tried boiling water, bleach, gibberellic acid, and patience, but I have found the best way is by fire! The sort of fire you need to produce is a cool burn. I gather some completely dried grasses and straw and make a loose pile on the soil surface of my pots, several centimeters tall and broad. When I light the fire I puff on it so it burns vigorously for about 20–30 seconds before burning out. When I set fires for seed in plastic pots I first bury the pots to the rim in large buckets filled with moist sand. This prevents the plastic pot from melting. Because I'm a little paranoid about the effects of unknown variables, I always use dead grass from areas I know haven't been treated with pesticides or herbicides. I think it may be important to let the seeds sit on a moist soil surface for a week or two before they are fire treated. Germination should follow in a few weeks. While Adrian Slack in foggy England and other growers in humid environments may need tuning forks to induce the anthers to release pollen, I have found this is not necessary in my 60% humidity Arizona greenhouse. Holding the flower petals with thumb just under the mature stamens I briskly rub or flick the anthers a dozen or more times. Pollen collects on the thumb. Tuning forks will also work but are a bother.

'Kununurra' needs no special treatment to germinate, and is catholic regarding soil mixes. It is a lanky form with a weak stem and large internode distances. It grows to a meter or more long, generally causing problems as it scrambles though the tops of my *Sarracenia*. Often the entire plant is pale green. It grows best in pots 15 cm (6") or more deep. I have grown this giant in 5 cm pots (2") housing four plants, but the plants were dwarfed in all respects to about one half normal size. These plants also became tinged with red color overall. 'Kununurra' needs a tuning fork or similar method (such as mine above) to release pollen. Cross pollination is required for it to

set seed. This means you must have two plants flowering approximately concurrently. Self a plant all you like, but you will get nothing for your labours. The flowers on 'Kununurra' are very large (2—3 cm across), which are about as big as on *B. gigantea*. The petals on the largest flowers are clearly placed in a zygomorphic arrangement. Two of the petals are paired on one side of the flower, and the other three are grouped on the other side of the flower, very much like on most Mexican *Pinguicula*. The petals on smaller flowers do not show this asymmetry.

'Darwin' must be exposed to fire to germinate well. When I first tried to germinate this plant I did not use fire and nothing happened. A year later I tried another batch of seed and got rapid germination after an experimental firing. Heady with success, I fired the old pot which had been sitting moist in a tray for a year and got more seedlings! This plant has a compact bushy habit with many small flowers. The entire plant is deep red. 'Darwin' will self naturally and produce seed. I made a delightful discovery about 'Darwin' when I was collecting seed for the first time. At the time I was mildly annoyed because the seed capsules do not split open when they dry out at maturity. Instead they stay firmly sealed. Since the capsules are sturdily made, this makes collecting seed a little irritating because each must be forcibly but carefully smashed without losing seed. But I noticed one of the seed pods still on the plant had opened widely without my intervention. Thinking about how *Erodium*, *Lithops* and other plants use moisture as an aid in seed dispersal, I dunked a sealed 'Darwin' seed capsule in water and was delighted when, a few minutes later, the capsule halves splayed open to reveal the seeds within, like a mussel opening at low tide! 'Darwin' is a wonderful plant to think about—it requires water for seed dispersal and fire for germination. I wonder if a brush fire swept through 'Darwin' habitat, would seeds locked in dry capsules survive the conflagration and be liberated when their capsules burn away? Thus heat treated, they would be ready to germinate. This is similar to a fire survival method some pines trees have—their tough cones do not release seed until a fire opens them.

B. liniflora and 'Kununurra' both have small seeds and do not require a fire treatment, while *B. gigantea* and 'Darwin' have large seeds which must be burnt. My seeds of 'Robust' were of intermediate size but also responded well to fire. My plants are largely indistinguishable from 'Darwin,' but other growers tell me their plants look more like 'Kununurra.' So I am not too sure of what is happening here—I think somewhere some seed has gotten mixed up. Capsules of my 'Robust' open with water the same as 'Darwin.'

Are the forms 'Kununurra' and 'Darwin' taxonomically significant, or are their morphological differences minor or even induced environmentally? Certainly it is not environmental, because all my plants are growing in the same conditions, in partial shade in trays (I know my descriptions of the plants sound like I'm growing 'Darwin' in full sun and 'Kununurra' in a dimly lit closet!). I have experimented with hybridization to see if I could make crosses between these forms. Since 'Kununurra' does not produce seed if selfed, it makes an ideal maternal parent since it eliminates the danger of accidental selfing. I pollinated 'Kununurra' flowers with pollen from 'Darwin' and waited. Within a few days I could tell the crosses were not being successful, because 'Kununurra' flowers which are successfully pollinated usually lose their petals within two days. Repeated attempts at making this cross have produced no seed. Since the flower parts are so large I am sure I am successfully making the cross, especially since my crosses between different clones of 'Kununurra' invariably produces seed. I think I am encountering a genetic barrier—in other words, 'Kununurra' and 'Darwin' are certainly different species and should be formally described. All these plants are interesting and easy to grow. I keep mine sitting in water and away from frost and they flower and set seed well.