



THE
BEGONIAN

January/February 2013



B. 'Raspberry Blush' in bloom
Photo by Kit Jeans Mounger

The Begonian

Publication of the American Begonia Society

American Begonia Society

Founded January 1932 by Herbert P. Dyckman

Aims and Purposes

To stimulate and promote interest in begonias and other shade-loving plants.

To encourage the introduction and development of new types of these plants.

To standardize the nomenclature of begonias.

To gather and publish information in regard to kinds, propagation, and culture of begonias and companion plants.

To issue a bulletin that will be mailed to all members of the society.

To bring into friendly contact all who love and grow begonias.

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Front cover: One of Paul and Laurel Carlisle's many amazing tuberous begonias, *B. 'Majesty'*, in their shade house in California. See the article on page 17. Photo by Gary Hunt

Back cover: An adventitious plant grows from the base of a fallen begonia leaf. A Word with You on page 14. Photo by Jem Wiseman



President's Message

The holidays are over and winter is in full swing. Many friends and relatives who live in the north often tell me that January and February are especially trying; cold weather and short days are often very depressing. I have heard that February is especially bad. We who grow begonias and other plants can get a break from the winter doldrums, the wonderful leaf shapes and colors are especially a pick-me-up. Rhizomatous begonias will soon begin their blooming season and will reward us with beautiful spikes of flowers. Terrariums in their own tropical environment are especially satisfying. If a friend or relative is "blue" during this period; bring them a begonia and it will certainly cheer them up.

Of course, now may be a good time to catch up on reading as well. The ABS bookstore has plethora of wonderful books and CD's to purchase. Look in your last *Begonian* or check our website for a list of items available. Just the CD's alone could give hours of pleasure as they are actual *Bego-*

Begonia 'Falstaff' grown by Paul & Laurel Carlisle
Photo by Gary Hunt

nians that have been scanned and downloaded. What a bountiful amount of information these past *Begonians* have.

Something to really look forward to is the ABS 2013 Convention. This year's convention will be held in Austin, Texas (the state capital) with the Austin Branch and the SW Region as hosts. Dates are May 29, 2013 – June 2, 2013. The Austin Branch is one of our newer branches, so I am very pleased that they are hosting the convention. Be sure to attend and show your support. Look for more information about the Austin Convention in this issue and subsequent *Begonians*. Branches don't be shy about hosting a convention, the ABS is full of members ready to volunteer to help so whether you are a large or smaller branch please consider hosting a convention in the future; 2015 and beyond are available. Remember that the 2014 Convention will be held in Tampa.

Again, a Happy 2013 and may 2013 be a great begonia growing year.

Good Begonia Growing,
Charles Jaros, ABS President

Letter to the Editor

Does anyone know who holds the copyright to Elda Haring's book, "*Begonias for Beginners*"? My club is considering a project of getting it reprinted in a booklet form for our newer members. Even though it was printed in 1976 it still has useful basic information for a beginner. I have hosted a begonia study group and used it as my guideline, but I didn't have any copies to hand out for the attendees. This would also be a good thing for the bookstore to have again.

ALSO - a quick note to let our members know I have found a 3-ring binder that our *Begonians* will fit in. Unfortunately they have been discontinued by the company, Avery Dennison. I found mine here in Buena Park, CA. After I made sure

The Begonian fit in them I bought all that the store had. I asked if they could get more, and the manager wasn't sure.

I do have about 35 that I am willing to sell to the members for \$5.00 ea. They are 2" binders and hold at least 2 yrs. (12 copies) of issues. Postage will depend on how many binders are ordered.

E-mail me at bboopfans@aol.com or write me at 10550 Western Ave #133, Stanton, CA 90680 about Elda Haring's book or to tell me how many binders you are interested in. I will then notify you how much the postage is. Order quickly, because I don't think they will last very long.

Bobbie West, The Doug Frost Branch



Begonia longimaculata (left) with *B. rajah* and miniature aroid
Photo by Linda Tamblin

Another Begonia Expedition: Madagascar

Article & photos by Jacky Duruisseau,
Bois France

We went to Madagascar in 2009 and we found many begonias. Most of them are endemic ones such as *B. lyallii* subsp. *lyalli* form *masoalensis*. I wrote about it in *The Begonian* (September/October 2010). Some of the Madagascar begonias are new species still not described (Figures 1, 2, 3, 4, 5). We must act quickly since the deforestation is very serious in the North and East of Madagascar and the forests will be completely burned down and destroyed before ten years pass.

We go again to Madagascar in January for three weeks. We plan to explore the same areas - Makira forest (on the left of Antongil Bay), and Masoala Peninsular (on the right of the same bay). In January, it will be the rainy season, which is not a good time for driving but it is the best season for finding tuberous begonias, which start in November after the first rains, and for collecting seeds.

Unfortunately, as you know, travels are more and more expensive. I would be very glad if you could help me. In return, seeds will be given to the donors and to the ABS Seed Fund.

I'm aware that my request is a bit slow in coming but even if the money arrives after the trip takes



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Figures 1-5 Undescribed Madagascar begonia species

place it will still help fund the trip.

Thank you for your help.

Please send your donation to: Jacky Duruisseau, 24 rue de La Romade, 17240 Bois France. Email: jacky.duruisseau@akeonet.com



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Please Can You Help Fund a Begonia Collecting Trip to Colombia?



Dear Member of the American Begonia Society.

In January 2013 I will conduct an expedition to the southern Andes of Bolivia, a research trip made possible by a grant from the ABS and its members. During this trip I plan to search for new species of tuberous begonias and visit known sites of *B. pearcei*, *B. parodiana*, *B. rubricaulis* and other rare species. I will report back on my discoveries in The Begonian.

In addition to visiting Bolivia I also have an opportunity in July 2013 to join an expedition to Colombia that is being organized in collaboration with scientists from the Universidad de los Andes, Bogotá and the Royal Botanic Garden Ed-

inburgh. In this case the target plants will be the poorly known members of the *Begonia* sections *Casparya*, *Semi-begoniella*, and *Gobenia*, although we of course plan to collect examples of every begonia encountered. The expedition is still in the planning stage but one of the areas that we propose to visit is the Sierra Nevada de Santa Marta, a protected area that is particularly rich in begonias. In fact, Colombia's tropical forests as a whole likely have a higher diversity of begonia species than those of any other country on Earth. With such diversity in one area, discovering interesting begonias is guaranteed and I again hope to share these findings with you.

In order for me to take part in this second expedition to Colombia I am trying to raise \$3,000. Please contact me if you are in a position to help finance this expedition. Donations of any amount will be very gratefully received.

A handwritten signature in black ink that reads "Mark Tebbitt".

Dr. Mark C. Tebbitt

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The Genus *Begonia* in México

Article and photos by Kathleen Burt-Utley and John F. Utley
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México has a rich flora resulting from its diverse topography with its often dry coastlines, high mountain chains and plains to its barranca systems and its volcanoes, with Volcán Orizaba in Veracruz being the highest peak in North America. Correspondingly, as you might expect, there are a diversity of habitats in México for its flowering plants, ranging from seasonally very dry deciduous forests and thorn-scrub vegetation at both low and higher elevations and cloud forests, pine-oak forests and montane rainforests at higher elevations. The consequence is simply that species found in an area are physiologically adapted to grow under the environmental conditions in the area and most cannot successfully colonize very different habitats; a corollary to this is that species effectively can be isolated in a given environment because of topography, substrates and rainfall. *Begonia* species occurring at high elevations in montane rainforests or cloud forests in México are not likely to successfully survive when transplanted to warmer and much drier conditions in other parts of México without human intervention. The same is true for *Begonia* species adapted to very dry environments that are transported to cloud forests. Habitat diversity is particularly important in the distribution and abundance of *Begonia* species and other groups of flowering plants found in México.



Fig. 1 One of the diverse begonia habitats in Mexico
Fig. 2 *B. monophylla* and habitat

Many species of *Begonia* in México appear to have very limited distributions. While this may, at times, be a reflection of the inability of botanists and others to successfully collect in certain areas because of their inaccessibility, it is equally likely that species are adapted to a particular combination of environmental parameters and have been effectively isolated from other areas of the country by high mountains or dry habitats (Fig 1). Interestingly, seeds of *Begonia* lack the kind of sculpturing that would be essential for significant transport by the feathers of birds or coats of mammals to other areas. Seeds of *Begonia* species are most likely distributed by wind or rain, with the result that populations of some species



Fig. 3 *B. oaxacana* male-female



Fig. 4 *B. convallariodora*

like *B. imperialis* Lem. are abundant in the Isthmus of Tehuantepec where they are found. The same is true for the large populations of *B. mariti* Burt-Utley and *B. ludicra* A.DC. on the northern slopes of the Sierra Madre in Oaxaca, as well as *B. violifolia* A.DC. from Tabasco and the tuberous *B. monophylla* A.DC. (Fig. 2) from western Mexico. *Begonia oaxacana* A.DC (Fig. 3), and *B. yunckeri* Irmsch. have potentially a very different strategy for seed distribution that could explain how they can be moved more readily some distance from one location to another. Having collected both species in México and *B. oaxacana* also in Costa Rica and Panamá, it was surprising to realize that the capsules of these species are indehiscent. There simply are no herbarium specimens of these species (and they have been abundantly collected!) with capsules normally dehiscent and shedding seed, although pressing and drying specimens may squash a few capsules open. In other *Begonia* species with maturing capsules, the capsules will dehisce during specimen preparation. Apparently, the capsules or berries of *B. oaxacana* and *B. yunckeri*

either are consumed while on the plant or drop from the individuals intact where they could be eaten by animals and subsequently

be dispersed in fecal droppings some distance from the seed source. This strategy is certainly not uncommon in other plant groups where fleshy or tasty fruits are produced. A good example of this can be seen in various *Anthurium* species where the seeds have fleshy, often colorful outer coverings, or in various bromeliad species that produce fleshy berries that attract dispersal agents.

At our last count, there are over 110 *Begonia* species represented in México's rich and diverse *Begonia* flora; this is a far greater number of species than is found in all of Central America. Within México, there are 56 known species with leafy erect stems, including *B. oaxacana* which ranges from Jalisco on the west coast of México to Costa Rica and Panamá. *Begonia convallariodora* C.DC. (Fig. 4) was described from Guatemala but occurs in Chiapas and extends its range throughout Central America to Panamá, but is not known from South America. Species like *B. incarnata* L. & O. (Fig. 5) are commonly encountered at higher elevations in Veracruz and Oaxaca along roadbanks and margins of evergreen forests. Also included here are several other species including *B. manicata* Brongn. ex F. Cels which extends

into Nicaragua, and the Chiapan endemics *B. mazaе* Ziesenh. and *B. bettinæ* Ziesenh. Considering the locations of these latter two species, it is to some extent surprising that they haven't been collected in similar habitats in adjacent parts of Guatemala. There is only one species with leafy erect stems that develops annually from seed in México is *B. wallichiana* Lehm. which ranges from northeastern México to Honduras.

Of those 56 species with leafy erect stems, 37 develop annually from underground tubers, and all but five of these species are endemic to México. These tuberous species, with few exceptions, occur in western and central México in seasonally dry environments where their habitats range from tropical deciduous forests to pine-oak forests or very rarely cloud forests. In Flora Novo-Galiciana, 19 of the 25 species that Dr. Rogers McVaugh and I treated are tuberous, representing a little over half the tuberous species known from México. These species develop annually from underground tubers that are not often collected by individuals not specifically collecting *Begonia*. Moreover, during the late dry season, these species will not be evident and will only begin developing once the rains begin again either early or rather late in the rainy season. We've searched locations where we collected *B. gracilis* H.B.K. (Fig. 6), only to be disappointed because it was still too dry for the tubers to sprout. Some years ago, we discovered what I believe to be a new tuberous species in a very dry part of Puebla. I



Fig. 5 *B. incarnata* and habitat
Fig. 6 *B. gracilis* capsules and bulbils

first noticed very small individuals of the species along dry stream beds during the end of a collecting trip in August one year. After visiting this area on a number of successive field trips, we were lucky enough to find the species in full flower and will be describing it soon. It is also interesting to note that some tuberous species like *B. fernaldiana* L. B. Sm. & B. G. Schub. appear to be known only from their original collections made over 60 years ago. *Begonia weberlingii* Irmsch. was described from El Salvador and is unknown in Guatemala and Chiapas, but has most recently been collected in Oaxaca. It is a small, and likely inconspicuous species with highly lobed leaves that should be found between El Salvador and Oaxaca in the appropriate dry habitats in Chiapas and Guatemala. Although not tuberous, the rhizomatous species, *B. crassicaulis* Lind., has rarely been collected in Guatemala, but was found years ago by Dr. Hal Moore in a very dry part of Guerrero where it grows on exposed rock faces in thorn scrub vegetation in full sunlight and is deciduous during the dry season. Many tuberous species (17 of 37)



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Fig. 7 *B. extranea* in habit
Fig. 8 *B. rhodochlamys* in habit

are also interesting because they produce clusters of very small bulbils or rarely solitary large bulbils (some populations of *B. biserrata* and the Mexican endemic *B. uruapensis* Sessé & Mociño) in their leaf axils and sometimes at their inflorescence nodes. *Begonia gracilis* will occasionally produce stems with bulbils but no flowers, and certainly allows this species and others with bulbils to reproduce asexually. We've observed a population of *B. gracilis* in the state of México with both flowering individuals and individuals producing only bulbils. Whether bulbils are distributed in the same manner as seed is unknown.

Begonia species typically produce both male and female flowers in the same in-

florescence and the plants are considered to be monoecious. However, in México there are at least three tuberous species that are dioecious, having separate male and female plants, *B. extranea* L. B. Sm. & Schub. (Fig. 7), *B. nemoralis* L. B. Sm. & Schub, and most populations of *B. biserrata* Lindl. Another unusual tuberous species from Chiapas, Guatemala and El Salvador, *B. cebadillensis* Houghton ex L. B. Sm. & Schub. has both all male and all female inflorescences on the same plant, and, at times inflorescences may also bear both male and female flowers. This species may be either monoecious or possibly dioecious like *B. biserrata*. Interestingly, dioecious species are uncommon in the Neotropics, and the only other apparently dioecious species known from Central America is *B. wilburi* Burt-Utley and Utley from montane rainforests between 1800-3350 m in central Costa Rica and eastern Panamá. A related species, *B. ursina* L. B. Sm. & Schub. was described from Colombia, but has only rarely been collected. Both these species are in sect. *Casparya* (Kl.) Warb. that is characterized by "horns" rather than wings on its capsules.

Although Mexican tuberous *Begonia* species may be a challenge to grow and are certainly uncommon in cultivation even in México, they represent a very interesting group of species. Some like *B. rhodochlamys* L. B. Sm. & Schub. (Fig. 8) and *B. biserrata* are spectacular when flowering, while others including *B. extranea* and *B. monophylla* are really handsome and interesting plants.

Is Your Propagation Mix Nutritional?

by Greg Sytch, Horticultural Correspondent

Rarely do we think about our propagation mix being more than just a medium to root leaves and cuttings, but the reality is that the standard mix most of us use is completely reliant on us for feeding, mostly through fine mist sprays or overhead watering. However, that need not be.

My standard propagation mix does change slightly from summer to winter. Our Tampa Bay summers are hot, humid, rainy, and can be our cloudiest time of year. All of this moisture can be troublesome for cuttings, and rot is common unless measures are taken to prevent it. I use 3/4 perlite and 1/4 combination of large vermiculite and dry peat moss during summer, and in winter I take some of the perlite away and add more peat moss as our lower humidity levels can lead to drying. However, feeding can be a chore.

If you have been to my back yard and seen the trays of cuttings under my benches, in dappled light, you know they can be forgotten or hard to reach. At times, I do forget they are there but our plentiful summer rainfall forgives this. I mostly rely on filling my two gallon sprayer with fertilizer and fungicide then foliar feeding the leaves and cuttings whenever possible until they are ready for transplant. The past year I changed that, and for the better.

When mixing my propagation mix, I set aside the peat moss and mix in a generous handful of bone meal, 0-10-0. The peat, when moistened, holds the bone meal and releases it over time. The higher phosphorus (middle number) aids the rooting process. If I am rooting canes, I also add in a handful of blood meal, 15-0-0 or cottonseed meal. This

nitrogen gradually releases to the newly rooted canes, and as they root and begin to grow, you can see the difference. I still foliar feed, but it is not as imperative as it once was. A time saver for sure!

In the Mailbox

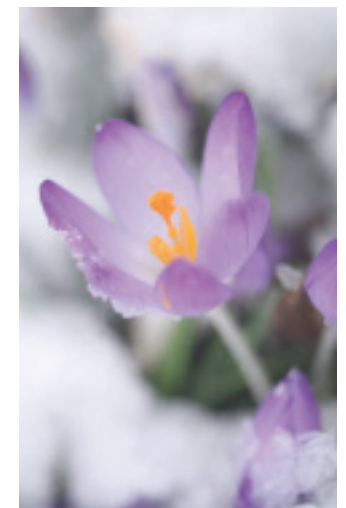
These items are easily purchased in any garden center and are inexpensive. Perlite really does not hold fertilizer well, and vermiculite can absorb some at the root level, which is why I put it in the peat. While it is just a very light amount, it will go a long way. For those of you who do not like the smell of these ingredients, I find once mixed it is not a problem.

If you ever need any advice on growing begonias, please do feel free to email me at gsytych@cs.com, or call (727) 841-9618. I don't know about you, but the closer we get to spring, the more excited I get as my plants wake up from the long winter and begin growing fast. This is an excellent time to take cuttings!

Happy Growing, Greg

A crocus pushes a blossom up through the snow - signaling that spring is on the way.

Photo courtesy of RBG Kew



A Word with You: Adventitious

By Claudia Goodridge, New Haven, CT

Adventitious. It sounds so familiar, bringing to mind adventure and Advent itself. Then there is that suffix – tious, which means ‘of, having, or characterized by,’ as in bumptious, facetious, cautious, and contentious. Flirtatious, infectious, and rambunctious. And that - tious suffix carried by superstitious, surreptitious, fictitious. All good word fun.

But in Botanispeak, *adventitious* describes growths that develop in places they’re not expected. Mr. Webster says it comes from Latin *adventitius*. He says it’s “added extrinsically, accidental; not inherent” and “in botany, occurring in an abnormal position, as leaf buds on the surface of a stem, or roots from aerial stems or branches.” Pruning, wounding, or other life threatening forces may initiate some *adventitious* growth. Plunk that cutting in a glass of water and you get *adventitious* roots. A sliced up leaf on vermiculite produces *adventitious* plantlets (for those with serious propagation skills). Prune that angel wing, and *adventitious* buds will form. Illustrative photos with this piece show *adventitious* plantlets on a *B. serratipetala* leaf that sat against the side of a plastic terrarium and another where a dead leaf fell and plants started.

I’m writing this after 5 days without power (and family members on their 10th day without power) after Hurricane Sandy. It’s now snowing heavily – a Nor’easter – and ice PELLETS are predicted for tonight. I’ve never heard of weather forecasts calling for ice pellets. Which brings me to *adventitious*, our word of the

moment. While it has specific meanings in botany, ultimately, for me, it speaks of the will to survive. Those plants won’t take ‘no’ for an answer. Survival strategies must be built into their DNA. Amazing. And that’s what we have to find here in the northeast – survival strategies including *adventitious* power lines – because Mother Nature is extremely annoyed.



When a leaf of *B. serratipetala* begin to touch the side of a plastic grow box, moisture built up, and the leaf started to rot. But the plant didn't give up that easily - where the dead leaf stuck babies grew (Fig. 1). Six weeks after the adventitious babies were discovered they are definitely still growing and getting larger (Fig. 2). Photos by Linda Tamblyn

A. B. burkillii photographed at Mary Bucholtz's condominium. When she lifted the lid, both were surprised to see how the dropped leaf had hatched plantlets (Fig 3). Here's a closer look at the tenacious little plantlets (Fig. 4).

Photos by Kit Jeans Mounger



ABS/SWR Convention '13

It's your lucky year – you're coming to Austin, Texas.

The Austin Area Branch invites you to experience Central Texas at its best. Austin is the capital of Texas and in true Texas fashion our capital building is larger than the one in Washington D.C. Known for many years as the "Live" Music Capitol of the World, the area also has a growing film and wine industry. In November of 2012 Austin held their first Formula One Race at the newly completed Circuit of the Americas racetrack. Even with all this international fame the city slogan "Keep Austin Weird" is alive and well. They have all sorts of festivals to celebrate things like "Eyore's Birthday" and the bats that live under South Congress Bridge.

We are still in the planning stage. Our target date is May 29th thru June 2nd which is the same time that the African Violet Society is holding their National Convention in Austin. When the registration forms are ready we would like to email them to as many folks as possible. We have set up the email address absswr2013@yahoo.com. Just send us a note that you would like your registration to be emailed. If we don't receive an email from you we will send yours by mail. We will draw numbers for everyone's place in line at the plant sale.

If you are reading this it means the Mayan calendar was wrong and you have no excuse not to attend this year's convention. See you in Austin.



Growing Tuberous Begonias

By Paul and Laurel Carlisle

I got my first tuberous begonia in 1979 at a small retail nursery in Northern California. Like many nurseries at the time, the customer could choose their tuberous begonia from a row of blooming begonias growing directly in the ground. With my first dig I was hooked. Every time we went north we would have to include a stop at Antonelli's Nursery in Capitola, California. Adding to my ever growing collection, I would select from nursery benches filled with blooming begonia plants, growing in 4 inch pots. At first our children were impatient, yet eventually, they learned to like begonia and nursery shopping.

Mike Steven's from New Zealand, who I met on the internet, introduced me to growing named variety tuberous begonias for exhibition or show. Growing for ex-

hibition for me is producing plants which are high quality with large sized blossoms. Named varieties are usually selected for their form and larger flower size. By purchasing named varieties, you are getting plants which have been asexually propagated. These plants will be the same as the parent plant. Plants propagated this way are more expensive. There are many books and websites with information about how to grow begonias for exhibition. So you can choose to do more research if you like. In this writing however, I will give you what I think to be some of the more important growing tips.

Whether you are growing for exhibition or hobby (or obsession as the case may be),

Fig. 1 Inside the Carlisle's shade house
Photo by Gary Hunt



some cultural practices are the same.

Tuberous begonias grow their best where summers are cool, especially in the evening.

They like humidity and bright indirect light, (bright shade).

They also like well drained soil, which dries out between watering. Don't over water your plants.

Plants grow stronger with a balanced (14-14-14) time release fertilizer in the soil mix. If you live where it is hot, use a fertilizer which is not heat activated.

To pump up plants before roots form (first 6 weeks), foliar feed with a weak ¼ to ½ strength balanced fertilizer solution two times per week.

Most important is to take a proactive approach to mildew control. Spray for mildew 2 or 3 times per growing season.

Second most important; for a stronger flowering plant later, you MUST pinch out the first (and sometimes the second) flowering bud.

All tuberous begonias need to take a nap in the winter. If you live where winters are warm, then you will need to withhold water to force the tubers' dormancy.

Seed grown tubers are a great bargain for the hobbyist; they are less expensive and often have more flexible temperature and cultural requirements. Seed grown tubers have variation from their two parent plants; however, over the years breeders have reached far higher consistency in their crops. The breeder knows what the hybrid tuber will produce; flower size and color. If you are new to growing tuberous begonias, try growing the seed grown. There are also smaller,



more compact varieties which take quite a bit more heat and don't require staking, some even have fragrance.

The highlight for me this year was getting to visit Golden State's tuberous begonia fields and greenhouses on the Central California Coast. Golden State has been growing tuberous begonias for as long as Antonelli's and now has incorporated Antonelli's genetics into their stock. To walk in 20 acres, 2 million blooming seed grown tuberous begonias. The mass of color, and variety was AMAZING!

For further reading:

Begonias, by Mike Stevens

Fig. 2 *B.* 'Santa Margarita'

Fig. 3 *B.* 'Crystal Cascade'

Fig. 4 *B.* 'Snow Goose'

Fig. 5 Unknown seedling Photos by Gary Hunt

Fig. 6 Golden State's Tuberous Begonia fields

Photo by Laurel Carlisle

Pages 20-21 *B.* 85 Antonellis

Photo by Gary Hunt







B. hirtella is a fast-spreading species, often considered and found as a weed.

Begonia hirtella Link : A Fast Naturalized Tropical American Begonia From India

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Tropical Botanic Garden and Research Institute, Palode,
Thiruvananthapuram 695 562, Kerala

On a plant collection trip to the Thiruvananthapuram district of Kerala, a curious rheophytic population of *Begonia* was collected. On critical study of specimens with relevant literature, it was identified as *Begonia hirtella* Link, which belongs to the section *Doratometra* of *Begonia*, a species native to Tropical America (Smith & al., 1986; Jayasuriya, 1983). Perusal of the literature reveals that it has been previously reported from India from Karnataka by Bachulkar and Yadav in 2000.

B. hirtella is a fast-spreading species, often considered and found as a weed. Its sporadic and vigorous nature is due to high germination percentage of seeds which helps to establish a considerable population in a very limited span of time. Its exact date of introduction to India is not known, but is considered very recent as indicated by the restricted distribution. It grows in humid shady places on wet soil or along the bank of water bodies where it grows as large populations which often threaten native herbaceous flora. The species can be distinguished by its pale pink, densely villous petiole, persistent lacerate-ciliate stipules and laciniate bracts. Since this species is new to Indian flora and the information pertaining to the taxonomy are very scanty, a brief description with photographs is provided to facilitate its easy identification.

Begonia hirtella Link, Enum. Pl. Hort. Berol. 2: 396. 1822; Klotzsch, Abh. Akad. Wiss. Berlin 29. 1855; A.DC. in Mart., Fl. Bras. 4: 344. 1861 Prodr. 15, 1: 1:299. 1864;

Jayasuriya in Dassanayake and Fosberg, Rev. Handb. Fl. Ceylon 4:144. 1983. *Begonia ciliata* HBK., Nov. Gen. & Sp. 7: 178. 1825.

Begonia villosa Lindl., Bot. Reg. 15: t.1252. 1829. *Begonia brasila* A.DC., Mem. Soc. Phys. Geneva 7: 295. 1836 & Prodr., 15. 1; 299. 1864. *Begonia diversifolia* var. *nana* Walp, Nova Acta Phys. Med. Acad. Caes. Leop.-Carol. Nat. Cur. 19 suppl. 1: 403. 1841. *Begonia hirtella* var. *nana* A.DC. in Mart., Fl. Bras. 4. 1:345. t.345. t. 8. 1861.

Herbs, to 30 cm high. Stem erect, often branched, cylindrical, succulent, semihyaline, villous with multicellular brownish hairs. Leaves strongly asymmetric, ovate to transversely ovate, 4-10 x 3-7cm, translucent when dry, base shallowly cordate, margin crenate-serrate, apex acute to acuminate, pilose above, sparsely pilose below, palmately 4-7 veined, shallowly lobed, petiole pale pink, densely villous on the upper part, 2-5cm long; stipules narrowly ovate, acuminate, to 1.5 cm long, lacerate-ciliate. Peduncle axillary, glabrous to sparsely pilose, to 4 cm long, pink. Cymes few-flowered, bracts persistent, linear to oblong or ovate, laciniate; pedicels glabrous or sparsely pilose in fruit, 4-10mm long. Tepals white, staminate tepals 2+2, rarely the inner one wanting; outer suborbicular, 0.6cm long; the inner smaller, linear oblong, 0.3mm long, obtuse at apex. Stamens free, 8-20; pistillate bracteoles elliptic to spatulate, ciliate-laciniate, 3-4mm long, caduceous. Pistillate tepals 5, unequal, oblong to obovate, acute, to 2.5mm



B. hirtella

long; styles 3; placenta deeply bifid. Capsule glandular punctuate. 8-14 x 12-18mm, dehiscent along lower margins of faces; wings subdeltoid, obtusely angled, unequal, the largest 8-10mm wide.

Flowering and Fruiting: June-October

Distribution: Native to tropical America. Introduced and naturalized in many tropical countries including Sri Lanka (Dasanayake & Fosberg, 1983).

Ecology: *B. hirtella* Link grows as a lithophyte or rheophyte along the bank and rivulet at an altitude between 80-120m. They are mainly associated with *Canscora perfoliata*, *Acrotrema arnotianum*, *Biophytum reinwardtii*, etc.

Specimen examined: INDIA: Kerala, Thiruvananthapuram district, Palode, Chittar riverside, 7.7.2010., Geethakumary & A.G.Pandurangan 69601 (TBGT).

Acknowledgements

The authors are grateful to the Director, TBGRI for the facilities provided and constant encouragement. They are also thankful to Mr. R. Thulaseedharan Nair, Gardener for collecting the material.

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ABS Adopt-A-Species Program

By Johanna Zinn, ABS Conservation Director

The ABS sponsors an Adopt-a-Species Program. It came into being in 1994 after a letter from Freda Holley suggested adoption of species by ABS members (see page 66 of the March/April 1994 *The Begonian*). Bruce Boardman, the Conservation Director at that time, thought that it was a good idea. Many plant and animal species are at risk because of over-collecting and habitat destruction secondary to agriculture and housing and commercial development. As an adopter, you will give your adoptee a chance to survive if its habitat becomes a parking lot or tea plantation. I am not aware of any begonias that have been reintroduced to their native habitats, but there is a possibility for reintroduction if the plants have survived in a hobbyist's collection or a botanic garden.

Once you have chosen one or more species, there are a few additional things for you to do. These include growing your begonia, observing it, learning about it, educating others by describing your experiences growing it if you are so inclined, propagating it, and sharing it.

The first thing you will do with your plant is grow it. It may be a plant that is easy to grow, or it may be a challenge because it has a need for a specific humidity level, soil composition, light, or other cultural need. While growing your begonia, make notes, whether mental or written, on aspects of its culture such as water needs, fertilization, light requirements, pests or diseases that affect the plant, or temperatures at which it grows well. Note the techniques that work well for you and might help someone else to grow the plant.

Find out as much as you can about your plant. First, talk to the person from whom you

received the plant material. Other growers are a valuable source of information, especially if they live in a similar climate. *The Begonian*, books and branch newsletters may have information on your begonia or contain useful general cultural information. The internet may also be a good source of information. The ABS website, www.begonias.org, has general care articles, articles and photos about specific plants, or plants within the same horticultural classification, and links to other sites. You can join the Yahoo Begonia Group and ask for assistance with specific begonia questions and view photos, or you can 'lurk' and read the posts of both experienced and inexperienced growers. Some Botanic Garden websites have

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interesting and useful information on them. The Royal Botanic Garden, Edinburgh, has a site that allows you to access information about SE Asian begonias. Surf the web looking for photos and information about your begonia. Some sites have incorrect information, so compare information from several sites.

Share information about your adoptee. Fill out and return the Adopt-a-Species information sheet. It doesn't need to be filled out all at once or quickly. Adopt-a-Species sheets are available in a paper or electronic form. Write an article for your branch newsletter using information you have compiled on the

Adopt-a-Species form, or write an article for *The Begonian*. If you don't care to write about your species, discuss it at one of your branch meetings as the Begonia of the Month.

One of the easiest ways to ensure that you will always have a particular plant is to propagate it. Always keep a cutting of your adoptee in your prop box. In fact, keep several cuttings of it in your prop box. Another easy way to ensure that you will always have your plant is by sharing it with one or more people. You will not only increase the number of people growing your adoptee, but you will have a source for the plant if yours should die.

There are multiple ways you can share your adoptee. Donate plants, seeds, or cuttings to national or branch sales, PTA, library or church sales, botanic gardens or parks, your next door neighbor, other plant enthusiasts, or trade with online or snail mail buddies. Be inventive. Save a Begonia!

I have posted the information in this article and the computer version of the information sheet on the ABS-National Director Yahoo site for branches that would like to have an Adopt-a-Species branch program. Your branch National Director can access this information. E-mail me at jazinn@cox.net if you have any questions, or would like to adopt a species and need an information sheet. The same e-mail address can be used to send me your species lists. Three ABS members have sent me their lists; they are growing 146 species!

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continued on next page

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Three new natural hybrids of Andean tuberous begonias

Dr. Mark C. Tebbitt
California University of Pennsylvania

Every begonia enthusiast knows that *Begonia* species can often be hybridized in cultivation. Not every cross we attempt will work because sometimes there are reproductive barriers between species such as differences in chromosome number, or incompatibility mechanisms that for example prevent the growth of the male pollen after it reaches the female stigma. But many crosses do work as the more than 10,000 known artificial hybrids testify. Far fewer natural hybrids exist between wild begonia species. This is due in part because species are more likely to come into close proximity with one another in a greenhouse or garden than in nature. Added to this, there are additional reproductive barriers that help prevent wild plants from forming hybrids. For example, sometimes two species growing together will each specialize in attracting a different kind of pollinator, thus ensuring that pollen is only moved between the individuals of their own species. In other cases, the two species' flower open at different times of year or the different species might occupy distinct habitats, each containing different populations of a particular pollinator. The kinds of reproductive barriers found in plants are numerous and usually plants are isolated by a combination of different barriers. Most hybrids have reduced fertility and typically combine the characteristics of their two parent species. These barriers have arisen because they ensure that a plant's offspring will be both fully fertile and well adapted to the species' particular habitat.

Nevertheless different begonia species do occa-



Fig. 1 *B. boliviensis* flowers
Fig. 2 Hybrid *boliviensis* and *cinnabarina*

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Seed Fund continued

DISCLAIMER: The seeds distributed by the seed fund are identified as received from the donors. The species names (in italics) reported here are correct based on the latest information from *BEGONIA-CEAE, Ed. 2*; Golding, and Wasshausen. Hybrid names are made consistent with the *ABS Check List of Begonia Hybrids* edited by Howard Berg dated 9/13/2005.



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sionally hybridize in the wild. Usually these hybrids are between quite closely related species whose reproductive barriers have temporarily broken down. Documented examples include hybrids between *B. longifolia* and *B. palmata* in Taiwan (Peng & Ku, 2009), *B. variifolia* and *B. leprosa* in Guangxi, China (Peng et al, 2010), and *B. decora* and *B. venusta* in Malaysia (Lai-Lai & Kiew, 1999).

During a recent expedition to Bolivia, I was surprised to find that the Andean tuberous begonias form natural hybrids to an unprecedented degree. During three weeks of fieldwork around the town of Vallegrande I observed five natural hybrid populations involving seven different tuberous begonia species. That these different species were genetically similar enough to one another to form hybrids is not surprising since hundreds of artificially created hybrids of the Andean tuberous begonias exist and are known as

the *Begonia* × tuberhybrida group. But what was surprising to me was the fact that none of these natural hybrids had previously been documented. In fact, some of these hybrids even involved species currently unknown to science. I was intrigued to find that most of them involved *Begonia boliviensis* as a parent and I will restrict this article to just those examples.

Begonia boliviensis is an interesting species since it has a flower shape that is very different to that of most other begonias (Figure 1). Its petals are particularly long and project forward, effectively forming a tube-like structure surrounding the plants' reproductive parts. Both the male and female structures of this begonia (which as is common with all begonias, are found in different flowers) are also unusually elongated being more than twice the length of those in most other begonias. All this suggests that they are adapted to an



Fig. 3 Hybrids flowers *boliviensis* and *cinnabarina*
 Fig. 4 *B. cinnabarina*
 Fig. 5 Habitat of the hybrids begonias

unusual kind of pollinator. Given these features and the fact that the petals are scarlet its pollinator is likely to be one or more species of hummingbird. This is because such floral features are typical of well-known hummingbird pollinated plants including the fuchsias and cupheas with which these Andean begonias were observed growing

in the wild. In fact, ruby throated hummingbirds are frequent visitors to the flowers of *B. boliviensis* that I grow at my home in Pennsylvania. However, I am yet to see a hummingbird visit *B. boliviensis* in the wild. But curiously I have also never seen a bee or wasp visit these flowers either, despite the fact that in Bolivia I have routinely observed bees and wasps visiting the flowers of other tuberous begonia species. I have noticed that a curious thing happens when these insects reach a *B. boliviensis* flower. Bees will fly up to the tip of the flower stay a while but then invariably they will fly away. Perhaps the forward pointing petals that project past the reproductive structures make it difficult for them to land and gain entry inside the flowers of *B. boliviensis*? So I suggest that *B. boliviensis* is likely pollinated by hummingbirds, of which there are several species in Bolivia, while related begonia species are bee and wasp pollinated. This difference in pollinator effectively isolates *B. boliviensis* from its close relatives and maintains it as a distinct species.

It appears that this reproductive barrier occasionally breaks down and sometimes a bee or wasp is successful in transporting pollen from a related species to a female flower of *B. boliviensis*, or vice versa. Perhaps if a *B. boliviensis* flower is damaged and loses a petal a bee can then more readily gain access to the

inside of the flowers? The result is a natural hybrid between these different species. These natural hybrids can be identified since they are typically found in close proximity to the two parent species and show a combination of their characteristics.

One such natural hybrid (Figures 2 and 3) that I found on two separate occasions occurs between *B. cinnabarina* (Figure 4) and *B. boliviensis*. In both cases *B. cinnabarina* was found on a dry cliff, with *B. boliviensis* growing in moister soils a short distance from the cliffs. Mountain roads had been cut through the cliff habitat of *B. cinnabarina* and this disturbance had created an intermediate habitat along the roadside (Figure 5). Here the hybrid could survive, since its characteristics are intermediate between those of its parents.

Other hybrid populations involving *B. boliviensis* that I found in the same general area of Bolivia included the two new yellow-flowered tuberous species (for example Figure 6) that are discussed and illustrated in a separate article in a future issue. These hybrids were again associated with habitat disturbance and like the previously discussed hybrid popula-

tions they contained just a few dozen individuals in a limited area adjacent to populations of the two parent species.

When I return to Bolivia in January 2013 I plan to once again search for natural hybrid populations of begonia and perhaps this time I may even be lucky enough to catch a hummingbird visiting the flowers of *B. boliviensis*.

ACKNOWLEDGEMENT:

This expedition was made possible by the generous financial support of many ABS members and branches. I also wish to thank Mr. Alexander Parada for accompanying me in the field and Drs. Michael Nee (NY) and Luzmilla Arroyo (USZ) for their advice and support.

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Begonia curtii

L.B. Smith & B.G. Schubert. Brazil 1955

Article and photos by Peter Sharp, Sydney, Australia

This most impressive shrub-like begonia is a recent acquisition for the Sydney Botanic Garden. It's proving to be a very popular attraction, asserting itself and showing off its large, mid-green leaves to perfection amongst a display that includes *Begonia acutifolia*, *sanguinea* and *undulata*, with *B. dichroa* blooming abundantly in the background and *B. luxurians* providing a wonderful backdrop. A feature is the large, papery bracts which cover the tops of the rather thick stems, bringing to this intriguing plant an aura of mystery.

The foliage is slightly leathery to the touch but never looks dull, the margins are entire with a faint red edging and the leaf color is even throughout. Producing a multiplicity of stems without any prompting – no pinching of tips or early pruning needed as its natural growth habit is all one could wish for. Flowers are white in spring, producing rather sparse umbels on long stems held above the foliage.

Begonia curtii (above) set in a display that includes *Begonia acutifolia*, *sanguinea*, *undulata*, *dichroa*, and *luxurians*.



Fig. 6 *B. boliviensis* hybrids and second new yellow-flowered species

The Begonian Index 2012



The papery bracts of *Begonia curtii*

This is a begonia for all seasons, tolerating well the cold winters of Sydney where temperatures drop, at times, to 7°C (44°F), and summer temperatures soar into the 30's (86°F). It grows happily in garden or pot, needing a well lit position and benefiting from exposure to sunshine in mottled shade. An easy-care plant which requires the minimum of watering and, for us to date, is free from pests and diseases. We have grown it for three years now in our gardens and several years before that in our shade-house and have found that, so far, pruning has not been necessary.

B. curtii is a large plant and seems to need plenty of room to spread its roots which makes it an ideal garden subject. Our garden specimen has grown to over a metre (plus of a foot), both tall and wide. If you are growing in pots then give this one a large tub.

Best propagation method we have found is from seed which it sets generously and which give excellent results – it seems a shame to take tip cuttings from these imposing stems!

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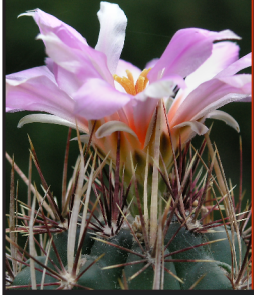
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