ASPLENIUM LOBATUM VAR. *PSEUDO-ABYSSINICUM*, A NEW RECORD FOR SOUTH AFRICA

Asplenium lobatum Pappe & Rawson is a terrestrial fern with tufted, glabrous, narrowly lanceolate to elliptic fronds of up to 400 mm long. The stipe is dark matt brown, 45–230 mm long, glabrous or with a few hair-like scales and is sometimes vigorously proliferous. This fern is found on shaded floors of high-altitude, evergreen forests, often away from water, where it can form dense stands. The species is very variable, especially in the degree of lamina dissection and the shape and proportions of the pinnules. In general, Zimbabwean material is more often 3-pinnate to 4-pinnatifid with narrowly linear ultimate lobes, whereas South African material is generally 2-pinnate to 3-pinnatifid, with broadly obtuse ultimate lobes.

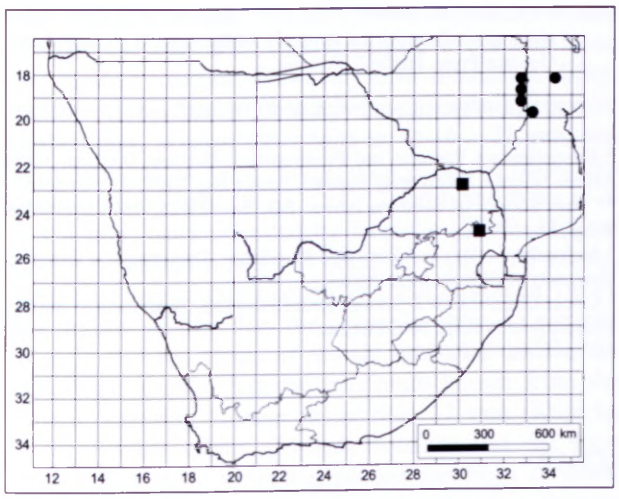

FIGURE 3.—Distribution of *Asplenium lobatum* var. *pseudo-abyssinicum*, adapted from Burrows (1990), with kind permission of the author, ●; new localities in South Africa, ■.

Furthermore, the more dissected fronds from north of the Limpopo River are sometimes proliferous at the base of the lamina, whereas the less dissected plants are not proliferous (Jacobsen 1983; Burrows 1990). Due to these differences, *A. lobatum* var. *pseudo-abyssinicum* Schelpe & N.C.Anthony was described in 1982 (Schelpe & Anthony 1982). Some authors still consider *A. lobatum* as a single extremely variable species and do not recognize the latter variety as a separate entity (Roux 2001).

Asplenium lobatum var. *lobatum* is widespread in the Eastern Cape, KwaZulu-Natal, along the eastern escarpment of Mpumalanga and Limpopo, in Swaziland, along the border of Zimbabwe and Mozambique, in Malawi and also on Madagascar. The much more dissected *A. lobatum* var. *pseudo-abyssinicum* has previously been recorded only on the highlands of Zimbabwe and Mozambique (Figure 3) (Jacobsen 1983; Burrows 1990; Roux 2001).

On a recent trip to the Entabeni State Forest near Levubu in the Soutpansberg, three plants of *A. lobatum* var. *pseudo-abyssinicum* were found next to the trail near Vera's Tears Waterfall. They grew on a moderately steep slope, well away from the stream. Fronds were 350–400 mm long and strongly 3-pinnate to 4-pinnatifid, with very narrow ultimate lobes. The plants were initially thought to be small specimens of the superficially similar *A. hypomelas* Kuhn, a widespread fern occurring from west tropical Africa and Ethiopia southwards to the Nyika Plateau in Malawi and the Zimbabwean highlands, with a disjunct collection from Woodbush in Limpopo, South Africa (Burrows 1990). *A. lobatum* var. *pseudo-abyssinicum* is easily distinguished from the latter species by the sori: *A. hypomelas* has a single, apparently marginal, cup-shaped sorus per lobe, whereas *A. lobatum* var. *pseudo-abyssinicum* has several oval, non-marginal sori per lobe. The fronds of *A. hypomelas* are, furthermore, usually longer than 1.5 m, whereas *A. lobatum* var. *pseudo-abyssinicum* is a smaller plant with fronds shorter than 0.5 m (Schelpe & Anthony 1986; Burrows 1990). On closer inspection of the Entabeni plants, it was found that one had a fertile frond, and it was subsequently identified as *A. lobatum* var. *pseudo-abyssinicum*.

This is the first confirmed record of *A. lobatum* var. *pseudo-abyssinicum* in South Africa. However, on inspection of the *A. lobatum* collection at the National Herbarium, Pretoria (PRE), two collections from South Africa labelled as the 'tripinnatifid' form of the species were found. The first was collected by A.A. Obermeyer, also at Entabeni, Soutpansberg, in 1931, but no precise locality information is given. The second collection was from Kowyn's Pass near Graskop in Mpumalanga by J.P. Kluge in 1979 (Figure 3). The fronds of both these collections are strongly 3-pinnate to 4-pinnatifid and the ultimate lobes narrow and linear, making it *A. lobatum* var. *pseudo-abyssinicum*. Both localities fall within the Northern Mistbelt Forest vegetation type (Mucina & Rutherford 2006).

The Soutpansberg forms part of a centre of endemism with a very high biodiversity and with floristic links to several other such centres in southern Africa. Entabeni is situated at the intersection of the Drakensberg and Soutpansberg Mountain Ranges and has the highest annual rainfall recorded for the Soutpansberg (1 874 mm). The area also receives an additional average precipitation through mist of 1 366 mm per annum (Hahn 2002). These wetter areas of the Soutpansberg Centre of Endemism form part of the Afromontane region and show clear affinities with, amongst others, the Chimanimani-Nyanga Centre in the Eastern Highlands of Zimbabwe and the Wolkberg Centre of the northeastern Drakensberg Escarpment, of which the Graskop area forms the eastern border (Van Wyk & Smith 2001). It is therefore not surprising that *A. lobatum* var. *pseudo-abyssinicum*, previously known only from the Eastern Highlands of Zimbabwe, also occurs further south in the Soutpansberg and Wolkberg Centres of Endemism.

LIMPOPO.—2230 (Messina): Levubu, Entabeni State Forest, near Vera's Tears Waterfall, (–CC), *R.R. Klopper & A.W. Klopper 218* (PRE); Zoutpansberg, Entabeni, (–CC), *A.A. Obermeyer TM1919C* (PRE).

MPUMALANGA.—2430 (Pilgrim's Rest): Kowyn's Pass, (–DD), *J.P. Kluge 1699* (PRE).

ACKNOWLEDGEMENTS

Mr John Burrows is thanked for giving permission to use the distribution map of this species from his book *Southern African ferns and fern allies* (1990); Ms Hester Steyn, Data Management Unit, SANBI, Pretoria, for producing the distribution map; Ms Emsie du Plessis, of the Scientific Publications Section, SANBI, Pretoria, for comments on an earlier draft of this paper.

REFERENCES

BURROWS, J.E. 1990. *Southern African ferns and fern allies*. Frandsen Publishers, Sandton.

HAHN, N. 2002. *Endemic flora of the Soutpansberg*. M.Sc. thesis, University of Natal, Pietermaritzburg.

JACOBSEN, W.B.G. 1983. *The ferns and fern allies of southern Africa.* Butterworths, Durban.

MUCINA, L. & RUTHERFORD, M.C. (eds). 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

ROUX, J.P. 2001. *Conspectus of southern Africa Pteridophyta.* Southern African Botanical Diversity Network Report No. 13. SABONET, Pretoria.

SCHELPE, E.A.C.L.E. & ANTHONY, N.C. 1982. New species and combinations in African Pteridophyta and Orchidaceae. *Contributions from the Bolus Herbarium* 10: 143–161.

SCHELPE, E.A.C.L.E. & ANTHONY, N.C. 1986. Pteridophyta. In O.A. Leistner, *Flora of southern Africa.* Botanical Research Institute, Pretoria.

VAN WYK, A.E. & SMITH, G.F. 2001. Regions of floristic endemism in southern Africa. A review with emphasis on succulents. Umdaus Press, Hatfield, Pretoria.

R.R. KLOPPER*, J. NEL**, A.W. KLOPPER[+] and G.F. SMITH*[†]

* Biosystematics Research and Biodiversity Collections Division, South African National Biodiversity Institute, Private Bag X101, 0001 Pretoria.
** Fern Society of Southern Africa, P.O. Box 73125, 0040 Lynnwood Ridge, South Africa.
[+] Molecular Ecology and Evolution Programme, Department of Genetics, University of Pretoria, 0002 Pretoria.
[†] Acocks Chair, H.G.W.J. Schweickerdt Herbarium, Department of Botany, University of Pretoria, 0002 Pretoria.
MS. received: 2007-05-10.

BEGONIACEAE

BEGONIA SONDERIANA, A NEW KWAZULU-NATAL RECORD FROM THE SOUTHERN LEBOMBO RANGE, MAPUTALAND, SOUTH AFRICA

In the Begoniaceae account for the *Flora of southern Africa* (*FSA*), Hilliard (1976) treated only two regional taxa that possess bilamellate placentae, the naturalized *Begonia hirtella* Link, and the indigenous *B. sonderiana* Irmsch., with only the former reported by her from KwaZulu-Natal. However, subsequent regional checklists (Van Wyk 1993; Bredenkamp 2003, 2006) record *B. sonderiana* as occurring in KwaZulu-Natal, based, seemingly, on a misidentified specimen of *B. sutherlandii* Hook.f. collected in 1980 from Karkloof Falls (*Hildyard 102* PRE). The previously documented occurrence of *B. sonderiana* falls within the Afromontane Archipelago-like Centre of Endemism (Van Wyk & Smith 2001), reported from the eastern highlands of Zimbabwe/western highlands of Mozambique through mountainous sites in the Limpopo and Mpumalanga Provinces of South Africa, to northwestern Swaziland (Figure 4). In the *FSA* region, the altitude range for *B. sonderiana* has been given as 1 000–1 850 m (Hilliard 1976), whereas in the *Flora zambesiaca* (*FZ*) region, plants have been found at expectedly higher elevations of between 1 650 and 2 000 m (Kupicha 1978). Herbarium records further reveal a single collection (*J. Culverwell 789* PRE) from the Lebombo Mountains in Swaziland; plants were found growing in Chilobe Forest at an altitude of 600 m, in deep shade with very moist conditions.

During a recent search for *Begonia homonyma* Steud. in the vicinity of Gwalaweni (Hlatikulu) Forest in the southern Lebombo Mountains, KwaZulu-Natal, plants of *B. sonderiana* were unexpectedly encountered growing at a site overlooking the Jozini Dam, close to the border with Swaziland, at an altitude of 680 m. The exact locality is the head of Devil's Dive. Although found on a southern aspect, the habitat was xeric, very unlike the mesic one recorded previously for this species: Kupicha (1978) described its occurrence on rocks in the spray of waterfalls or on damp mossy boulders in kloof forest, whereas Hilliard (1976) recorded it from forest or forest margins in which sites it favours rockfalls or broken cliff faces. Hilliard (1976) also reported its presence amongst shady rock outcrops in steep grasslands. At the Devil's Dive site, *B. sonderiana* grows in shallow humic pockets overlying rhyolite, together with *Euphorbia evansii*, *Streptocarpus confusus* subsp. *lebomboensis*, *Cheilanthes hirta* var. *nemorosa*, *Kalanchoe rotundifolia*, *Dracaena aletriformis*, *Plectranthus verticillatus* and *Dioscorea sylvatica*. The vegetation type corresponds to Southern Lebombo Bushveld (Rutherford *et al.* 2006).

Subsequent consideration of herbarium materials revealed that this gathering on the western edge of the southern Lebombo range was actually the second collection from this vicinity, the first (*Vahrmeijer & Drijhout 2002* PRE) having been made nearly 30 years earlier, but misidentified as *Begonia homonyma*. These two records are the first to authenticate the occurrence of *B. sonderiana* in KwaZulu-Natal as well as the Maputaland-Pondoland Region of Plant Endemism (Van Wyk & Smith 2001), extending its known distribution in a southerly direction by 95 km. The plants grow at a lower altitude than northern subpopulations of the Lebombo Mountains, and here receive less than 800 mm of rain per annum on average (Rutherford *et al.* 2006). The plants conform in most respects to typical *B. sonderiana*, possessing tubers and glabrous aerial parts, in contrast to the thinly villous and atuberous *B. hirtella* which is known from the same general locality (*Vahrmeijer 2000* PRE). Further, in contrast to *B. homonyma*, the *B. sonde-*

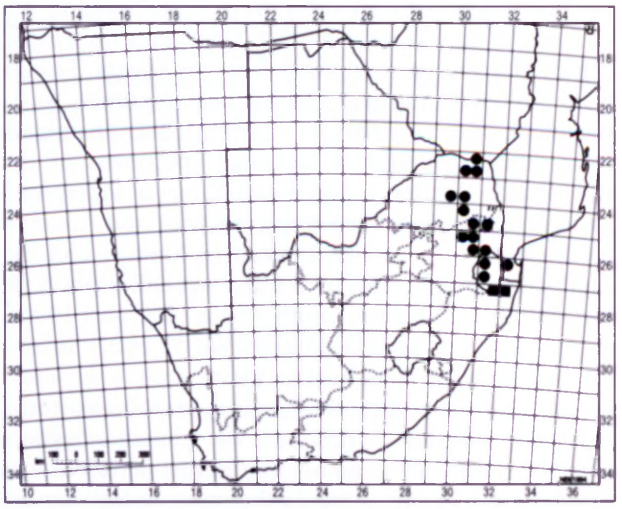

FIGURE 4.—Known distribution of *Begonia sonderiana* in *FSA* region based on specimens at J, NH, NU and PRE, ●; new provincial localities, ■.

riana plants presented female flowers with characteristic divided placentae, and ovate-acuminate leaves with lobed and toothed margins. However, tepal dimension differences warrant mention: the male flowers, which are white flushed pink, possess outer pairs up to 16 × 21 mm, and inner pairs up to 11 × 5 mm, relative to the respective dimensions of outer (8–13 × 11–17 mm), and inner (5–8 × 3–4 mm) pairs provided by Kupicha (1978). Hilliard (1976) described flowers as being up to 30 mm across, somewhat larger than tropical material (Kupicha 1978), but slightly smaller than the Lebombo form. In contrast to male flowers, tepals of female flowers from Devil's Dive were shorter than the maximum known from the tropics, attaining 12 mm rather than 17 mm (Kupicha 1978). Further, tubers of plants from the arid site were entire rather than presenting spaced swellings as noted for the mesic form (*Hilliard & Burtt 5962* NU). Despite their dry habitat, flowering specimens still attained a height of 350 mm and remained turgid whereas the surrounding vegetation, with the exception of stem and leaf succulents, showed signs of drought stress. The drought tolerance of these begonias may be attributed to their succulent tubers, one measured 75 × 29 mm.

An unconfirmed sight record by the second author places *Begonia sonderiana* still further south, in the mistbelt component of Ngome Forest (2731 CD) at ± 1 200 m elevation.

Specimens examined

Begonia hirtella

KWAZULU-NATAL.—2732 (Ubombo): Gwalaweni Forest, southern Lebombo Mountain range, (–AA), 08-01-1970, *J. Vahrmeijer 2000* (PRE).

Begonia sonderiana

MPUMALANGA.—2430 (Pilgrims Rest): cliffs on road to summit of Mariepskop, 1 830 m, (–DB), 16-01-1969, *Hilliard & Burtt 5962* (NU).

KWAZULU-NATAL.—2731 (Golela): in humus on rocky ledge of steep dry southern slope at head of Devil's Dive on crest of Lebombo range overlooking Jozini Dam, 680 m, S 27°.31442, E 31°.97721, (–BD), 05-02-2008, *N. Crouch, T. Edwards & I. Johnson 1166* (NH). 2732 (Ubombo): Gwalaweni Forest, (–AC), 1969, *Vahrmeijer & Drijhout 2002* (PRE).

SWAZILAND.—2632 (Bela Vista): Chilobe Forest, Lubombo Mountains south of Siteki, southeast of Jilobi, very close to Tikuba, climax wet canopy forest, 600 m, (–AC), 10-04-1977, *J. Culverwell 789* (PRE).

Begonia sutherlandii

KWAZULU-NATAL.—2930 (Pietermaritzburg): Karkloof Waterfalls, picnic spot in riverside forest remnant at waters edge, (–AD), 21-01-1980, *C.J. Hildyard 102* (PRE).

ACKNOWLEDGEMENTS

The trip during which the *Begonia* material was collected was financed in part by the University of KwaZulu-Natal. The Curators of J, NH, NU and PRE kindly allowed use of their specimens. The staff of the Mary Gunn Library are thanked for facilitating access to literature, as is the Data Section of the National Herbarium for providing PRECIS data.

REFERENCES

BREDENKAMP, C.L. 2003. Begoniaceae. In G. Germishuizen & N.L. Meyer, Plants of southern Africa: an annotated checklist. *Strelitzia* 14: 278.

BREDENKAMP, C.L. 2006. Begoniaceae. In G. Germishuizen, N.L. Meyer, Y. Steenkamp & M. Keith, *A checklist of South African plants*. Southern African Botanical Diversity Network Report No. 41: 311, 312.

HILLIARD, O.M. 1976. Begoniaceae. *Flora of southern Africa* 22: 136–144.

KUPICHA, F.K. 1978. Begoniaceae. *Flora zambesiaca* 4: 499–506.

RUTHERFORD, M.C., MUCINA, L., LÖTTER, M.C., BREDENKAMP, G.J., SMIT, J.H.L., SCOTT-SCHAW, C.R., HOARE, D.B., GOODMAN, P.S., BEZUIDENHOUT, H., SCOTT, L., ELLIS, F., POWRIE, L.W., SIEBERT, F., MOSTERT, T.H., HENNING, B.J., VENTER, C.E., CAMP, K.G.T., SIEBERT, S.J., MATTHEWS, W.S., BURROWS, J.E., DOBSON, L., VAN ROOYEN, N., SCHMIDT, E., WINTER, P.J.D., DU PREEZ, J., WARD, R.A., WILLIAMSON, S. & HURTER, P.J.H. 2006. Savanna Biome. In L. Mucina & M.C. Rutherford, The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19: 438–538.

VAN WYK, A.E. & SMITH, G.F. 2001. *Regions of floristic endemism in southern Africa. A review with emphasis on succulents*. Umdaus Press, Pretoria.

VAN WYK, C.M. 1993. Begoniaceae. In T.H. Arnold & B.C. De Wet, Plants of southern Africa: names and distribution. *Memoirs of the Botanical Survey of South Africa* No. 62: 513. National Botanical Institute, Pretoria.

N.R. CROUCH* and T. McLELLAN**

* Ethnobotany Unit, South African National Biodiversity Institute, P.O. Box 5299, 4007 Berea Road/School of Chemistry, University of KwaZulu-Natal, Durban 4041.

** School of Molecular and Cell Biology, University of the Witwatersrand, Private Bag 3, 2050 Wits, Johannesburg.

MS. received: 2008-03-19.