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Some wild potato species from Argentina

By

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The wild potatoes of the Argentine Republic have, perhaps, been more extensively collected than those of any other country. These collections have been made largely by Argentine botanists or by foreign botanists working in the service of Argentine Government Institutes, Museums and Universities, and are mostly to be found in Argentina itself.

In the preparation of a monographic work on the Argentine wild potatoes we have been kindly allowed to borrow freely from these sources, and we should like to record here our grateful thanks to the Directors of the Institutes concerned*).

During the course of this work we have discovered two new endemic species of wild potato from North-West Argentina. One of these, *Solanum sanctae-rosae* Hawkes, has already been described (Hawkes 1954). The second, which we have named *Solanum venturii*, in honour of the celebrated Argentine botanist S. Venturi, is described in the present communication. In view of the fact that we have had to propose a certain number of name changes in connection with the nearly-related *S. microdontum*, *S. gigantophyllum* and *S. simplicifolium*, we have thought it advisable to include these at the same time, since the publication of the complete monograph may be somewhat delayed.

Solanum venturii Hawkes & Hjerting, sp. nov.

Herba infirmam glaborosam et ramificatam inalatam caulem exhibens atque parvos globulos tuberes; folium magnum ovatum-oblongum foliolum terminale atque 0-3-juga multo parviorum foliolorum lateralium ferens; foliola interjecta nonnulla aut absunt; inflorescentia laxa pedicellis furcatis in medio; omnes partes virides plusminusve sparsos atque breves maxime adpressos 3-cellulares triangulares pilos exhibens; corolla alba atque rotata tamquam angustis lobis ornata.

Herbaceous, of low and delicate habit, bearing underground stolons with small globular tubers about 5—10 mm. diam.

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Stem decumbent, weak, branched, generally 10—30(—60) cm. long, occasionally shorter, slender, 1,5—3,0 mm. diam., unwinged, sparsely pubescent.

Leaf thin, frequently eaten by insects, often with red veins; lateral leaflets (0—)1—3-jugate, much smaller than the terminal, up to 20(—50) mm. long, decreasing in size rapidly towards the base of the leaf, ovate, cordate or orbicular, sessile or shortly (0—3 mm.) petiolulate, apically obtuse or acute; terminal leaflet broad-ovate, elliptic or elliptic-oblong, apically acute or somewhat acuminate, basally cordate, truncate or broadly cuneate, (3,5—)6—9(—13) cm. long × (2—)4—6(—10) cm. broad; interjected leaflets often absent or 1—2-jugate, ovate or orbicular, up to 5 mm. long, sessile; pubescence on upper and lower surfaces of very sparse closely adpressed short 3-celled triangular white hairs; pseudo-stipular leaflets generally well-developed, semi-lunate, 0,5—1 cm. long.

Inflorescence lax, (3—)6—18-flowered; peduncle once or twice forked, short below the fork (0,5—5 cm.), 3—5 cm. long above the fork; pedicels about 2—2,5 cm. long in the flowering state, articulated more or less in the centre, though sometimes slightly below or up to $^2/_3$ the length from the base; peduncles and pedicels glabrescent, or with very sparse short few-celled hairs similar to those on the leaf.

Calyx broadly campanulate, 5—7 mm. long, with short lobes and well-defined acumens which vary a little in length in the same flower; lobes and acumens 3—6 mm. long, the acumens themselves 2—4 mm. long; pubescence of very sparse to moderately frequent short few-celled transparent triangular hairs. Corolla white, rotate, 1,75—3(—3,5) cm. diam.; lobes rather narrow, about 8—10(—15) mm. broad and 8—10(—12) mm. long including the sometimes not very well-defined acumen. Anthers 5—6,5 × 1,75—2 mm. Style 8—11 mm. long, generally gradually swollen above, with quite long dense papillae on the lower $^1/_3$; stigma capitate to conical, slightly thicker than the swollen style apex, entire or barely emarginate. Berry more or less globose or slightly longer than broad, small, about 1 cm. diam. — Chromosome number probably 2 n = 24.

Affinities. *S. venturii* is apparently closely related to *S. microdontum*, agreeing with it in the enlarged terminal and reduced lateral leaflets, the general form of the calyx and the form and colour of the corolla. It differs from it in the different ecological adaptation, weak decumbent habit, small sparse tubers, thin branched unwinged stem, sparse pubescence of adpressed triangular transparent 3-celled hairs on all green parts, shorter peduncle below the fork, smaller corolla, and dense quite long papillae on the lowest third of the style. It possibly represents a recently derived endemic separation from the ancestral stock of *S. microdontum*, which has not been able to spread far owing to its special ecological requirements.

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Specimens examined.* Prov. Tucumán: Dept. Chicligasta, El Bolsón a La Cascada. Alt. 2,100 m. 9th March, 1949. T. MEYER 14868 (LIL). — Dept. Chicligasta, Quebrada Las Pavas, de Puesto Bolsón hasta Puesto La Cascada. Alt. 2,200—2,550 m. 6—7th March, 1949. "En lugares húmedos. Hojas a veces con nervaduras rojizas. Tallo no alado, tubérculos muy chicos." PETERSEN & HJERTING P-54 (Ha, Hj) (Perhaps some introgression from *S. microdontum* subsp. *gigantophyllum*). — Dept. Chicligasta, Estancia Las Pavas, Puesto La Cascada. Alt. 2,600 m. 17th March, 1924. "Fl. blanca; entre los pastos." VENTURI 3271 (GH, LIL, US). — Dept. Chicligasta, Estancia Santa Rosa. Alt. 3,600 m. 6th Jan., 1927. "Fl. blanca. Falda del cerro." VENTURI 4727 (BA, GH, LIL, LP, SI, UC, US). (Probably all specimens show introgression with *S. sanctae-rosae*). — Dept. Tafí, Cumbres de San José, La Queñoa. Alt. 2,800 m. March, 1933. "Flor blanco." R. DÍAZ 9583 (LIL). — Dept. Tafí, La Ciénega. 14th Feb., 1905. "Lugares húmedos. Corola blanca." LILLO 4028 (LIL). — Dept. Tafí, Sala Chaquivil. 14th Jan., 1945. "Flor blanca." OLEA 270 (LIL). — Dept. Tafí, Estancia San José (de Chaquivil). Alt. 2,150—2,200 m. 4th Jan., 1953. PETERSEN & HJERTING 898a (K Holotype, C, LIL, Ha, Hj). — Same collection data but altitude 2,650 m. PETERSEN & HJERTING 898b (Ha, Hj). — Dept. Tafí, Quebrada de Las Juntas. Alt. 1,500 m. 21st Nov., 1921. "Flor. blanco." SCHREITER 1917 (LIL). — Dept. Tafí, Tafí del Valle, Cerro Pelado. Alt. 2,200 m. 24th Jan., 1950. "Fl. alb." SLEUMER 151 (LIL). — Dept. Tafí, La Ciénega, cerca de la casa grande. Alt. 2,500 m. 27th Jan., 1950. "Fl. alb." SLEUMER 300 (LIL). — Dept. Tafí, San José. Alt. 2,100 m. 17th Feb., 1949. SPARRE 5835 (LIL). — Dept. Tafí, Cerro San José. Alt. 2,700 m. 10th Feb., 1925. "En los prados." VENTURI 3565 (BA, LIL, SI, US). (Probably some introgression from *S. sanctae-rosae*). — — Prov. Catamarca: Dept. Andalgalá, Estancia Yunka Suma, entre Puesto Vallecito y Puesto Chapina. Alt. 2,150—2,250 m. 16—24th Jan., 1949. "En un lugar húmedo, en pasto alto. Flor blanca, hojas glabras, tallo glabro, sin alas." PETERSEN & HJERTING P-28 (Ha, Hj). — Dept. Andalgalá, Estancia Yunka Suma, entre Los Queñoales y Mesadas de Vallecito. Alt. 2,350—2,800 m. 16—23 Jan., 1949. "Prefiere lugares húmedos. Tallo y hojas glabras. Sin alas." PETERSEN & HJERTING P-30 (Ha, Hj). — Dept. Andalgalá, Río Pisavil, cerca del río. Alt. 2,250—2,500 m. 10th Feb., 1949. "En pasto." PETERSEN & HJERTING P-38 (Ha, Hj). — — Exact locality unknown: Surroundings of Tucumán. BRÜCHER (s. n.) E. B. S. 457. Herbarium specimen made by Dr. H. ROSS in Germany (Ha).

Distribution. *S. venturii* is one of the few species of tuber-bearing Solanums endemic to the Argentine republic, having been found only in provinces Tucumán (depts. Chicligasta and Tafí) and Catamarca (dept. Andalgalá).

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*) Herbarium abbreviations according to Index Herbariorum, ed. 4. — Ha = HAWKES, Hj = HJERTING.

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Habitat. A typical species of very humid grasslands at altitudes of [1500*)—] 2000—2800 m., perhaps sometimes higher. It is never to be found in dense shade, always amongst high grass and occasionally in the partial shade of bushes. The restricted altitudinal and geographical range of this species and its superficial similarity to *S. microdontum* has caused it to be overlooked until now. It occupies approximately the Montane district of the western subtropical vegetational province according to the phytogeographical scheme of CABRERA 1953, or the regionof Aliso, Queñoa and alpine meadows of LORENTZ 1876, HOLMBERG 1898 and LILLO 1919. The growth period is from November to March, perhaps beginning even earlier, in October.

It is often found growing near to *S. vernei* and *S. microdontum* subsp. *gigantophyllum*, but does not normally seem to form hybrids with them; in the upper part of its range it comes into contact with *S. sanctae-rosae* with which it appears to hybridize freely.

Taxonomic notes. In 1952, when the material so generously sent on loan by the Fundación Miguel Lillo of Tucumán was being revised for the first time, two collections by VENTURI (Nos. 3271 and 3565) seemed to be specifically distinct from all other forms hitherto described in the Aconquija mountains of Tucumán and Catamarca. The name *S. venturii* was provisionally applied to them, though no description was published at that time. These were low-growing semi-rosette forms with flowers that varied from white to blue. Later, however, when the more numerous collections of PETERSEN and HJERTING and of SLEUMER became available to us it was realized that these two collections of VENTURI were unfortunately not typical of the species but were extreme forms with the low habit and blue flowers due to introgression from *S. sanctae-rosae*. It was therefore decided not to designate VENTURI 3271 as the type, although this had been the original intention, but to select a specimen that showed the normal growth of this species and had no obvious introgression of genes from any other species. Accordingly, we have designated PETERSEN & HJERTING 898a as the type for *S. venturii* in the present work.

For some time the differences between *S. venturii* and *S. microdontum* subsp. *microdontum* were thought perhaps to be of little significance, and it was not until we were able to obtain abundant material of the latter species from Santa Victoria that we were quite certain of their specific distinctness. We began, indeed, by considering *S. venturii* as a high altitude southern subspecies of *S. microdontum* (= *S. simplicifolium*); we later thought it might be equivalent to subsp. *microdontum* from Santa Victoria, and ended by being convinced that it was indeed a good species in its own right. The very characteristic habit, loose inflorescence and hair type

*) The single record for 1500 m. may be an error (see collection of SCHREITER No. 1917.

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served finally to distinguish *S. venturii* from *S. microdontum*, though the two species are most certainly closely related.

Solanum microdontum BITTER 1912a: 535—536, emend. HAWKES & HJERTING

The following two geographical subspecies of this species — sensu emendato — can be distinguished:

subsp. ***microdontum*** — *S. bijugum* BITTER 1912a: 533.

subsp. ***gigantophyllum*** (BITTER) HAWKES & HJERTING, comb. nov. — *S. gigantophyllum* BITTER 1912b: 368—369; *S. simplicifolium* BITTER 1912b: 369—370; *S. simplicifolium* subsp. *gigantophyllum* BITTER 1913: 445; *S. simplicifolium* var. *metriophyllum* BITTER 1913: 445; *S. simplicifolium* var. *mollifrons* BITTER 1913: 445—446; *S. simplicifolium* var. *trimerophyllum* BITTER 1913: 446; *S. simplicifolium* var. *variabile* BRÜCHER & ROSS 1953: 465—466.

S. microdontum was first described by BITTER from material collected by FIEBRIG at Toldos, formerly in south Bolivia, but now lying just within the Argentine frontier.

After FIEBRIG's collection in 1903 it was not gathered again from the type locality until 1953, when SLEUMER obtained dried collections. Later, in 1956, HJERTING and RAHN were able to bring living material to Europe for further study, making it possible for us to connect up a whole group of species and varieties, whose relationships were previously unknown.

BITTER described another species, *S. bijugum*, in the same publication as *S. microdontum*. HJERTING and RAHN's collections from Toldos, where *S. bijugum* also was collected, show conclusively that the natural variation within this area easily encompasses the type specimens of both species, without showing any break or discontinuity. In other words, there is a gradual variation from the simple leaf of *S. microdontum* to the bijugate leaf of *S. bijugum*, even in small populations. The two species cannot be considered in any way distinct, therefore.

Although *S. bijugum* was placed before *S. microdontum* in BITTER's 1912a publication we have decided to supress the former name because only one specimen was collected by FIEBRIG; this was deposited in the Berlin herbarium and has now been destroyed. On the other hand *S. microdontum*, whose type specimen was also destroyed at Berlin, is known as isotype material in four other herbaria, Vienna, Munich, Chicago and San Isidro. In view of this we feel that the name *S. microdontum* should be used and we designate the Vienna sheet of FIEBRIG 2498 as the neotype of this species. This sheet agrees very well with the type description and with the photograph of the now destroyed Berlin sheet.

Shortly after publishing his descriptions of *S. microdontum* and *S. bijugum* BITTER described another species, *S. simplicifolium*, from a little further south. This species has become well known since 1939, when living

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material was collected by the British Commonwealth Potato Expedition. Until recently we had assumed that it was specifically distinct from *S. microdontum* because of the fact that the latter species remained virtually unknown.

In 1956 we were able for the first time to compare living material of *S. microdontum* and *S. simplicifolium*, growing under identical conditions. There was no doubt at all that they were conspecific and that the rather small differences between them would only justify a sub-specific separation.

Since *S. microdontum* was published prior to *S. simplicifolium* the latter taxon must be given the lower rank. Unfortunately, if we wish to place *S. simplicifolium* as a subspecies of *S. microdontum* a further name change becomes necessary, for the following reason:

BITTER 1912b described yet another "species" in this form circle, *S. gigantophyllum*, at the same time as *S. simplicifolium*. He later changed its rank to a subspecies of *S. simplicifolium*. Our present studies have shown most clearly that not only is there a continuous range of variation between *S. simplicifolium* and *S. gigantophyllum* but that the known material far exceeds the variability described by BITTER. In a similar way there seems to be no objective reason for maintaining BITTER's varieties *metriophyllum*, *mollifrons* and *trimerophyllum*, or BRÜCHER & ROSS' variety *variabile*. As with most wild potatoes there is considerable genetic diversity, which makes it impossible to use classical methods of taxonomy for any category lower than that of subspecies.

In view of the virtual impossibility of making any objective separation between *S. simplicifolium*, its subspecies *gigantophyllum* and its above-mentioned varieties, it will be clear that a name already exists at the sub-specific level for this taxon, subspecies *gigantophyllum*. We propose, therefore that this name be used for all the larger leaved more strong-growing forms of *S. microdontum* from provinces Salta, Tucuman and elsewhere, that were known previously as *S. simplicifolium*.

The suppression of the well known name *S. simplicifolium* is to be greatly regretted, of course. Nevertheless, such things are inevitable in a group such as *Solanum* which in the past has been excessively divided into microspecies. The few specimens available to the authors of fifty years ago gave a false impression of discontinuities, which we are able to correct at the present day only when large and comprehensive collections become available and when comparisons between living collections can be made.

Summary

The authors describe a new endemic species of wild potato from the Argentine Republic, *Solanum venturii* HAWKES & HJERTING. This species has previously been confused with *S. microdontum*, which also occurs in the same general area but is much more widespread and quite distinct.

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In considering the taxonomy of *S. microdontum* it has become necessary to include within it *S. simplicifolium*, a species well known to plant breeders, as well as the less well-known *S. bijugum*. Although two geographical subspecies, subsp. *microdontum* and subsp. *gigantophyllum* can be distinguished, it is clear that none of the other taxa described in this form-circle have any taxonomic validity, since they represent only certain genetic combinations in a highly variable and widespread species.

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