

The occurrence of *Solanum nigrum* L. × *S. sarrachoides* Sendtn. in Britain

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ABSTRACT

Solanum × *procurrens* Leslie, **hybr. nov.** (= *S. nigrum* L. × *S. sarrachoides* Sendtn.), a sterile hybrid, is described, with chromosome counts, from localities in south-eastern Britain.

INTRODUCTION

Gamlingay village lies 18 miles south-west of Cambridge near the boundary of Cambridgeshire, v.c. 29, with Bedfordshire, v.c. 30. Here the Lower Greensand has its botanically most important outcrop in Cambridgeshire and the area formerly held the best acid bogs in the county. These almost entirely disappeared during the last century as the land was drained and ploughed, with the result that the majority of the ground is now devoted to market-gardening, which prospers on the light soil.

To the west of the village, around the area known as the Cinques, several cultivated fields support large mixed populations of two *Solanum* species, the South American alien *S. sarrachoides* Sendtn. and the ubiquitous weed *S. nigrum* L. In September 1975 putative hybrids were found, easily recognized by their large size and abundant flowers. Dr J. M. Edmonds tentatively confirmed that these might be hybrids and further investigation has verified the original determination.

DESCRIPTION OF HYBRID

Stace (1975) recorded no British or European hybrids in the Solanaceae and no other literature records of this hybrid have been traced. Since the hybrid was widespread at Gamlingay, occurs in similar habitats in Bedfordshire and is likely to occur in other established mixed populations, it seems desirable that it be formally described:

Solanum* × *procurrens* Leslie, **hybr. nov.*

Hybrida inter *Solanum nigrum* L. et *S. sarrachoides* Sendtn.

Herba plerumque annua vegeta, pilis glanduliferis brevibus (1–2 cellulis) patentibus numerosis et longis (4–7 cellulis) ascendentibus vel adpressis paucis pilis simplicibus longis (4–7 cellulis) ascendentibus vel adpressis numerosis vestita. Caulis principalis ad 45cm altus, erectus; rami infimi divaricati, in plantis bene evolutis decumbentibus, interdum ad nodos radicanes. Folia 40–120 × 20–45mm, viridia, aliquando ad marginem atrocaerulea, trullata vel late trullata, apice acuta, integra vel sinuato-dentata, basi subtruncata vel late cuneata.

Cymae extra-axillares, racemosae, laxae, 3–7 floribus; pedunculi sub anthesi 9–22mm longi divaricati, interdum post anthesi reflexi; pedicelli sub anthesi leviter arcuati vel erecti, post anthesi reflexi. Calyx vix vel non accrescens; lobi triangulares acuti. Corolla 10–17mm in diametro, alba (interdum extra malvini suffusa); tubo brevissimo, lobis triangularibus vel late triangularibus. Antherae bene evolutae, sed pollinibus irregularibus praecipue (98–100%) sterilibus. Bacca interdum non evoluta vel plerumque parva (2.5–4.5mm lata) nigra caduca sine seminibus, saepe bacca pedicello cadua.

Usually a vigorous annual with numerous short (1–2 celled) spreading glandular hairs, few long (4–7 celled) ascending or adpressed glandular hairs and numerous long (4–7 celled) ascending or adpressed

simple hairs. Stems to 45cm, erect; lowest branches divaricate, long-decumbent in well-developed plants and occasionally rooting at the nodes. Leaves 40–120 × 20–45mm, green, sometimes suffused bluish-black on the margin, trullate or broadly trullate, acute at apex, entire or sinuate-dentate, truncate or broadly cuneate at base.

Cymes extra-axillary, racemose, lax, with 3–7 flowers; peduncles 9–22mm long at anthesis, divaricate, sometimes slightly reflexed in fruit. Calyx not or scarcely accrescent; lobes triangular, acute. Corolla 10–17mm diameter, white (sometimes tinged mauve externally); tube very short; lobes triangular or broadly triangular. Anthers well developed but pollen irregular and largely (98–100%) sterile. Berries either not developed or more usually small (2.5–4.5mm wide), black, caducous, without seeds, and often shed with the pedicels.

HOLOTYPE: sandy, market-garden field, Gamlingay Cinques, Cambs., v.c. 29, GR 52/228.530, 26 October 1975, *A. C. Leslie* no. 1029/1975 (CGE)

The epithet (*procurrens*, extending) was suggested by the habit of well-developed plants. A single specimen grown at the Botany School Field Station in Cambridge made a circular patch over 4m in diameter with very long decumbent branches, before being killed by the first frosts. Both parents can exhibit this behaviour, but neither in the field nor usually in cultivation is this feature so pronounced. Voucher specimens of both parents from the same locality as the holotype of the hybrid have been placed in CGE.

Both parents are variable species and to some extent *S.* × *procurrens* reflects this, especially as regards leaf shape. *S. nigrum* is represented at Gamlingay by subsp. *nigrum*, and plants of this with either entire or sinuate-dentate leaves occur, as well as plants having either normal or deeply divided corollas with very narrow lobes (var. *stenopetalum* Döll). A similar, apparently un-named corolla variant of *S. sarrachoides* occurred in a field at Potton, just over the border in Bedfordshire; this plant also had entire leaves. Specimens of *S. sarrachoides* with the latter character are frequent in the Gamlingay populations in company with sinuate-dentate plants.

S. × *procurrens* can be distinguished from its parents by the characters shown in Table 1.

TABLE 1. COMPARISON OF *S. NIGRUM* L. SUBSP. *NIGRUM* AND *S. SARRACHOIDES* SENDTN. WITH THE HYBRID *S.* × *PROCURRENS* LESLIE

	<i>S. nigrum</i> subsp. <i>nigrum</i>	<i>S.</i> × <i>procurrens</i>	<i>S. sarrachoides</i>
Longest stem hairs	Appressed, eglandular	Ascending or appressed, occasionally glandular	Patent, glandular
Calyx (in fruit)	Not accrescent	Scarcely or not accrescent	Strongly accrescent
Calyx-teeth (at anthesis)	Broadly triangular, obtuse	Triangular, acute	Narrowly triangular, acute
Corolla-lobes	Longer than broad	About as long as broad	As long as broad
Berry colour	Black	Black	Green (or purplish-brown)
Sclerotic granules in berry	Absent	Absent	Present
Pollen fertility (%)	c 100	0–2	c 100
Chromosome number	2n = 72	2n = 48	2n = 24

The hybrid might otherwise be confused with *S. luteum* Miller, which differs in its fertile, red, orange or yellow berries and the peduncles usually shorter than the pedicels; or with *S. nigrum* L. subsp. *schultesii* (Opiz) Wessely, in which the long glandular hairs are patent and the berries are fertile.

CHROMOSOME NUMBER

Root-tips of the parents and the hybrid were obtained from individuals transplanted to the University Botanic Garden and the Botany School Field Station (hybrid only) and were pretreated with either a 0.05% solution of colchicine or a saturated aqueous solution of 1-bromonaphthalene for three hours and fixed in acetic-alcohol (1:3) overnight. Root-tip squashes were then made using the Feulgen method. Three counts from each of the two hybrid plants all gave the tetraploid number of $2n = 48$. *S. nigrum* and *S. sarrachoides* were confirmed to be hexaploid ($2n = 72$) and diploid ($2n = 16$) respectively. The natural occurrence of this tetraploid hybrid is of particular interest in the light of experimental hybridization, which suggests that there may be a *S. sarrachoides* genome in *S. nigrum* (Edmonds in press).

DISTRIBUTION OF THE HYBRID

Apart from the fields in the vicinity of the Cinques, *S. × procurrens* has been noted in the following sites, all on the greensand:

Market-garden field, Mill Hill, south of Gamlingay, Cambs., v.c. 29, GR 52/236.510, 26 October 1975

Market-garden field, Potton, Beds., v.c. 30, GR 52/230.501, 26 October 1975, A. C. Leslie no. 1033/1975 (herb. A.C.L.)

Market-garden field, Sutton, Beds., v.c. 30, GR 52/230.577, 26 October 1975

It undoubtedly occurs elsewhere in this area and should be looked for wherever the two parents are established together; potential sites exist in the East Anglian Breckland and on the sands to the south of Guildford, Surrey, v.c. 17.

The occurrence of *S. sarrachoides* at Gamlingay was first formally noted in 1972 (R. J. Pankhurst, card index of the Cambridgeshire flora in CGE), but it has evidently been established for a much longer time and it is known to the local farmers as the 'White Nightshade'. It has a longer recorded history in Bedfordshire, being listed for Potton by Dony (1953). It may well have been originally introduced with wool shoddy, which is still used irregularly at Sutton. Another South American annual, *Galinsoga parviflora* Cav., is also well established over the whole area.

DISCUSSION

Leslie (1976) showed that most British alien material named *S. sarrachoides* Sendtn. is in fact *S. nitidibaccatum* Bitter, whilst *S. sarrachoides* Sendtn. emend. Bitter is a much rarer plant. Continental authors (e.g. Ooststroom & Reichgelt 1966, Ludwig 1973) have come to similar conclusions. However the relationship of these two taxa is uncertain, for, although European alien material can be clearly divided into two, the variation in this group in South America is complex and other similar taxa occur. In view of the uncertainty about the distinction between the South American taxa *S. nitidibaccatum* Bitter and *S. sarrachoides* Sendtn. emend. Bitter, in this paper *S. sarrachoides* refers to the complex. However, if the two are distinguished, *S. × procurrens* strictly refers to the hybrid between *S. nigrum* subsp. *nigrum* and *S. nitidibaccatum*.

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DISTRIBUTION OF THE HYBRID

Apart from the fields in the vicinity of the C. and S. × progenitor has been noted in the following sites also on the west coast:

Market-garden field, 20th Hill, south of Gushage, Cambs., v.c. 28. GR 55 236 510, 28 October 1975.

Market-garden field, Pottun, Beds., v.c. 30. GR 55 230 577, 30 October 1975.

Market-garden field, Sutton, Beds., v.c. 30. GR 55 230 577, 30 October 1975.

It is undoubtedly correct to assume that the sites and should be looked for wherever the two parents are established together; potential sites exist in the East Anglian Fens, and on the sands to the south of Gushage, Cambs., v.c. 28.

The occurrence of *S. wendlandii* at Gushage was first formally noted in 1972 by J. P. B. (1972) and it is known to the local farmers as the 'White Nightshade'. It has a longer recorded history in Bedfordshire being listed for Pottun by Dore (1937). It may well have been originally introduced with wool holly, which is still used extensively at Sutton. Another South American annual, *Coleogyne papposa* Cav., is also well established over the whole area.

DISCUSSION

Leslie (1975) showed that most British sites material named *S. wendlandii* is in fact *S. nitidibaccatum* Bitter which *S. wendlandii* is a much rarer plant. Confusion has arisen because of the fact that *S. nitidibaccatum* and *S. wendlandii* have very similar flowers. However, the relationship of these two taxa is uncertain for although European sites material can be clearly identified into two, the variation in the type of South American sites and other similar taxa is such that the relationship between the South American taxa *S. nitidibaccatum* Bitter and *S. wendlandii* Bitter is uncertain. In this paper *S. wendlandii* refers to the complex, however, if the two are distinguished, *S. wendlandii* refers to the hybrid between *S. wendlandii* Bitter and *S. nitidibaccatum*.

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