Potamogeton \times schreberi G. Fisch. (P. natans L. \times P. nodosus Poir.) in Dorset, new to the British Isles

C. D. PRESTON

Institute of Terrestrial Ecology, Monks Wood, Abbots Ripton, Huntingdon, PE17 2LS

ABSTRACT

Potamogeton × schreberi G. Fisch. (P. natans L. × P. nodosus Poir., Potamogetonaceae) was discovered in 1992 in the River Stour, Dorset, the first record from the British Isles. Both P. natans and P. nodosus are recorded from the R. Stour, although neither has been found growing with P. × schreberi. The Dorset plant is described and compared with material from Germany and Switzerland. P. × schreberi differs from P. natans in having laminar submersed leaves and from P. nodosus in having phyllodes near the base of the stem and narrower submersed leaves which are entire rather than minutely denticulate. The differences between this hybrid and P. × fluitans Roth (P. natans × P. lucens L.) and P. × sparganifolius Laest. ex Fr. (P. natans × P. gramineus L.) are discussed. P. × schreberi appears to be sterile, but is apparently able to persist and spread by vegetative reproduction.

Keywords: hybrid, Potamogeton \times fluitans, P. \times sparganiifolius, vegetative reproduction, England.

INTRODUCTION

Potamogeton nodosus Poir. (Loddon Pondweed) has been known from the River Stour in Dorset since 1928, when it was first recorded (as *P. drucei* Fryer) by Druce (1929). In 1988–89 its distribution in the river was surveyed for the Nature Conservancy Council by Lady Rosemary FitzGerald, D. A. Pearman and other local botanists (FitzGerald 1990). The plant proved to be locally abundant in the river for about 9 km from immediately above Hayward Bridge at Child Okeford, grid reference ST/825.122, downstream to Blandford Bridge at Blandford Forum, ST/ 884.060 (see Fig. 1). All known herbarium specimens collected prior to this survey come from the same stretch of river. Most of them were collected at Hayward Bridge, the best known site for the species and the one where Druce was photographed examining it in 1931 (Allen 1986).

Although all the authenticated records of *P. nodosus* have been made at Hayward Bridge or downstream of it, there are a number of unconfirmed reports of the species at sites some distance upstream of Child Okeford. Good (1969) reported that *P. nodosus* "was found in considerable quantity, and flowering and fruiting well" during a Dorset Natural History and Archaeological Society excursion to West Mill, Stalbridge, on 27 July 1968. In 1981 the Rev. A. J. C. Beddow reported *P. nodosus* from Marnhull, and the distribution of the species was summarised by Good (1984) as "plentiful in the R. Stour between Marnhull Ham and Child Okeford". Both Marnhull and Stalbridge are more than 10 km upstream of Child Okeford. FitzGerald (1990) and her colleagues made determined searches for *P. nodosus* at West Mill and other localities upstream of Child Okeford, but failed to find it.

In 1992 Dr H. J. M. Bowen and Dr C. Turner reported that they had recently seen *P. nodosus* in quantity at Marnhull, in a stretch of river which had not been surveyed by FitzGerald (1990). This appeared to provide an opportunity of confirming the presence of the species upstream of Child Okeford. I visited the area on 14 October 1992 with D. A. Pearman, and we found the population Bowen and Turner had discovered. Examination of these plants showed that they were not *P. nodosus* but a hybrid between *P. natans* L. (Broad-leaved Pondweed) and a species with broad submersed leaves. At first I tentatively concluded that the other parent must be *P. lucens*. More detailed examination of the material, following a second visit to the site in July 1993, revealed characters which were inconsistent with this parentage, but could be explained if the broad-leaved parent was not *P. lucens* but *P. nodosus*. The putative hybrid between *P. natans* and *P. nodosus*



FIGURE 1. Map of the River Stour between Fifehead Mill and Blandford Forum, Dorset, showing the 10-km squares of the national grid and the place-names mentioned in the text. The stretch of river in which P. × *schreberi* is found is shown by a solid arrow. *P. nodosus* grows in the river between the open arrows. Details of the records of *P. natans* are given in the text.

 $(P. \times schreberi$ G. Fisch.) has not hitherto been recorded in the British Isles, but is known from Germany and Switzerland. Comparison of the Dorset plant with continental material has shown that it is similar, and I have therefore concluded that it is indeed $P. \times schreberi$.

A preliminary analysis of the isozymes of *P. nodosus* and the putative hybrid from the R. Stour and *P. natans* from the Moors River (v.c. 11, S. Hants) has added support to the hypothesis that the Stour hybrid is *P. × schreberi* (P. M. Hollingsworth 1993, unpublished data). *P. natans* and *P. nodosus* differed consistently in five enzyme systems, for all of which the hybrid showed a banding pattern which combined the bands of both putative parents. The remaining three enzyme systems produced banding patterns which were invariant across all three taxa.

More fieldwork is needed to establish the distribution of the hybrid and its putative parents in the R. Stour, but this paper has been written to document the occurrence of the plant in the British Isles prior to its inclusion in a forthcoming B.S.B.I. handbook.

DESCRIPTION

The following description is based on fresh material and pressed specimens collected from the R. Stour in Dorset.



Rhizome $2 \cdot 5 - 4 \cdot 2$ mm in diameter. Stem $0 \cdot 5 - 2 \cdot 2$ m long, $1 \cdot 75 - 4 \cdot 0$ mm in diameter near the base, terete, unbranched. Phyllodes present at base of stem, $95-133 \times 2 \cdot 3-2 \cdot 6 \text{ mm}$, 41-52 times as long as wide, opaque, green, slightly canaliculate, acute at the apex. Submersed leaves with lamina 56-182 $\times 2.5-14.5$ mm, (6-)10-20(-31) times as long as wide, translucent, pale brown when young, green when mature, linear-elliptical, very gradually tapering into the petiole, acute at the apex, entire, the midrib bordered on each side by a band of lacunae up to 1 mm wide, the lateral veins 1-4 on each side of the midrib, the secondary veins transverse or ascending, rather irregular; petioles (60–)100– 355 mm. Transitional leaves present between the submersed and the floating leaves. Floating leaves with laminae all pointing in the same direction on the surface of the water, $68-140 \times 16-45$ mm, $2\cdot 3-$ 5.8 times as long as wide, opaque, subcoriaceous or coriaceous, rather flaccid, brown or brownish green when young, rather dark olive green when mature, elliptical to oblong-elliptical, tapering into the petiole, acute at the apex, entire, the lateral veins 5–10 on each side of the midrib, paler than the lamina when the living leaf is held up to the light, the secondary veins inconspicuous; petioles 89-180(-330) mm, without a distinct, discoloured section between the petiole and the lamina. Stipules 60–141 mm, rigid, translucent, brownish green, green, colourless with a greenish tinge or pale pink, with two slight or strong ridges along their length, obtuse to rounded and slightly hooded at the apex but appearing acute when rolled inwards. Inflorescences $22-28 \times c.6 \text{ mm}$; peduncles 46–79 mm, slightly compressed towards the base, similar in diameter from base to apex, spongy. Flowers 33-48, crowded together, with 4 carpels which protrude through the closed perianth segments; pollen apparently sterile. Fruits not developing.

IDENTIFICATION OF P. \times SCHREBERI

Potamogeton \times schreberi can be distinguished without difficulty from its putative parents. It has linear phyllodes at the base of the stem, but above these there are submersed leaves with a distinct lamina. These submersed leaves vary from leaves which resemble phyllodes but are expanded into a narrow, rather opaque lamina at the distal end, to leaves with a much more distinct, translucent lamina. *P. natans* has phyllodes but lacks laminar submersed leaves; *P. nodosus* lacks phyllodes but has laminar submersed leaves. The submersed leaves of *P. nodosus* are broader than those of *P. \times schreberi* and are minutely denticulate (the teeth on fresh leaves can be seen in the field with a $\times 20$ lens) whereas those of *P. \times schreberi* are absolutely entire, even when examined at high power under the microscope. All three taxa produce floating leaves. The floating leaves of *P. natans* usually (but not invariably) have a discoloured, flexible section between the petiole and the lamina. This is not found in either the hybrid or *P. nodosus*. However, in some living leaves of *P. \times schreberi* the petiole adjacent to the lamina is slightly browner than the green lamina or greenish brown petiole, and this may represent a vestige of the flexible section of *P. natans*. Because they lack this flexible section, the floating leaves of *P. \times schreberi* tend to point to the same direction whereas those of *P. natans* do not.

At anthesis the flowers of the putative parents open, whereas the carpels of P. × schreberi protrude through closed perianth segments (as in some other sterile hybrids). *P. natans* fruits regularly. I have not seen any fruiting material of *P. nodosus* collected in Britain in the wild, although plants from the River Loddon cultivated by Fryer (1899) did develop some well-formed fruit (specimens in **BM**). Druce (1929) reported that the species was fruiting freely in the R. Stour in September 1928, but although he distributed specimens collected on this visit I have not yet seen any with fruits. The inflorescences of *P.* × schreberi in Dorset show no sign of developing fruit, and the pollen appears to be sterile (under the microscope the grains appear to be collapsed like a burst football).

Potamogeton \times schreberi is more similar to two other hybrids than it is to its putative parents: P. \times fluitans Roth (P. natans \times lucens) and P. \times sparganiifolius Laest. ex Fr. (P. natans \times gramineus L.). Both of these (like P. \times schreberi) are hybrids between P. natans and species with broad submersed leaves, and both have phyllodes at the base of the stem, laminar submersed leaves and possess the capacity to produce floating leaves. P. \times fluitans is a variable hybrid, but all the populations I have examined have had stipules with two narrow wings at the base, extending for most of the length of the stipule. This character is derived from P. lucens, which has stipules winged for most of their length. The midrib of the submersed leaves of P. \times fluitans lacks a border of

lacunae and can be excurrent for up to 12 mm. Both the submersed and floating leaves of P. × *fluitans* have shorter petioles than those of P. × *schreberi*. P. × *sparganiifolius* is more difficult to distinguish from P. × *schreberi* but its submersed leaves can be much longer both in absolute terms and in relation to their width (especially in running water), and the fully developed submersed leaves have a shorter petiole than those of P. × *schreberi*. In both P. × *fluitans* and P. × *sparganiifolius* the lamina is usually longer than the petiole, whereas in P. × *schreberi* it is shorter than or only slightly exceeds the petiole. The shorter petioles of the submersed leaves of P. × *sparganiifolius* have a short petiole, and those of P. *sparganiifolius* are sessile, whereas those of P. *nodosus* have a long petiole. When comparing the submersed leaves of these taxa the true submersed leaves should be considered, not leaves which are transitional between submersed and floating leaves.

The differences between *P. natans*, *P. nodosus*, *P.* \times *fluitans*, *P.* \times *sparganiifolius* and *P.* \times *schreberi* are summarised in Table 1.

COMPARISON OF THE DORSET PLANT WITH CONTINENTAL MATERIAL

Potamogeton \times schreberi is recorded from Germany and Switzerland (Dandy 1975). Fischer (1907) described the Bavarian plant in detail. I have seen specimens of P. \times schreberi in **BM**, **CGE**, **E**, **M**, **MANCH**, **RNG**, **Z** and **ZT**; those in **M** (German plants) and **ZT** (Swiss) are most useful in showing the range of variation of continental plants. Specimens circulated by Koch (1933, 1934) to members of the Watson Botanical Exchange Club are typical of much Swiss material. Some characters of the German and Swiss plants are compared to those of the Dorset P. \times schreberi and to related taxa in Table 1. Details of some of the specimens I have seen are listed at the end of this paper.

Fischer (1907) described the lowest 1–3 leaves on his material as " \pm aphyllis (phyllodis vel pseudo-phyllodis)". He described the floating leaves as variable in shape, some subcordate or rounded at the base, others tapering into the petiole. Examination of plants collected by Fischer (and of other Bavarian material) confirms that those submersed leaves which are present are of the type which resemble phyllodes with an expanded, distal lamina, and that floating leaves predominate. None of the floating leaves has a well-developed discoloured section between the petiole and the lamina, although some of them appear to have a slight discolouration in this area. Some of the floating leaves are broader in relation to their length than those of the Dorset plant, and have more lateral veins.

Swiss specimens of P. × schreberi show a full range of submersed leaves, from expanded phyllodes to leaves with a long petiole and a distinct, translucent lamina with a band of lacunae on each side of the midrib. The latter closely resemble the well-developed submersed leaves of the Dorset plant. On some Swiss plants the slight discolouration between the petiole and the lamina of the floating leaves is more apparent than on any material I have seen from Dorset or Bavaria, and is clearly derived from the strongly discoloured and (in herbarium specimens) shrunken section typical of *P. natans*. (One specimen in **ZT** determined as *P. cf. natans* × nodosus by W. Koch has such a section, but it has no submersed leaves and in my opinion it is probably *P. natans*.)

Fischer (1907) described the stipules of P. × schreberi as "nervosis 1–2 carinatis acutis"; both German and Swiss specimens usually have stipules with two distinct ridges along their length but these ridges are not winged.

Plants of P. × schreberi from Dorset, Bavaria and Switzerland are essentially similar. J. E. Dandy annotated the only Fischer specimen in **BM**, "apparently is *P. natans* × nodosus as G. Fischer thought". *P.* × schreberi shows some variation, with the German plants rather closer to *P. natans* than those from elsewhere.

DISTRIBUTION AND HABITAT

I have seen P. × schreberi at intervals in a stretch of the R. Stour some 1.5 km long. It is particularly frequent for about 0.5 km between ST/764.183 and ST/768.184, where there are extensive stands of

	P. natans	P. nodosus	$P. \times schreberi$				
			Dorset	Ge	He	P. \times fluitans	$P. \times sparganii folius$
Phyllodes	Present	Absent	Present	Present	Present	Present	Present
Submersed leaves	Absent						
Length of lamina (mm)		(70-)130-290	56-182	30-85	73-300	60-220	60-520
Breadth (mm)		13-38	2.5-14.5	2.0-4.5	2.5-13.0	8-33	1.8-11.5
Length:breadth ratio		4.7-7.5	(6-)10-20(-31)	20-34	14.3 - 40(-56)	4.3-20	16-72
No. of veins on each							
side of midrib		5-10	1-4	1-3	2-5	3-7	1-6
Margin		Denticulate	Entire	Entire	Entire	± Entire	\pm Entire
Petiole (mm)		40-210	(60-)100-355	100-205	95-425	25 - 70(-90)	0-55(-70)
Lamina:petiole ratio		$1 \cdot 4 - 2 \cdot 9(-5 \cdot 1)$	0.5-1.3	(0.2-)0.3-0.8	0.4 - 1.2	$1 \cdot 3 - 10(-14 \cdot 5)$	(1.5−)7−∞
Floating leaves							
Petiole (mm)	50-150(-300)	30-210	89-180(-330)	(50 -)80 - 220	56-300	25 - 70(-90)	30-250
Discoloured junction	Usually present	Absent	Absent	Absent	Absent or trace	Absent	Sometimes
between petiole and					visible		present
lamina							
Base of stipules	Ridged	Ridged	Ridged	Ridged	Ridged	Winged	Ridged
Capacity to produce numerous							
well-formed fruits	Present	Present	Absent	Absent	Absent	Absent	Absent

TABLE 1. A COMPARISON OF SOME CHARACTERS OF POTAMOGETON NATANS, P. NODOSUS, P. × FLUITANS (P. NATANS × LUCENS)AND P. × SPARGANIIFOLIUS (P. NATANS × GRAMINEUS)FROM THE BRITISH ISLES AND P. × SCHREBERI FROM DORSET,
GERMANY (Ge) AND SWITZERLAND (He)

the hybrid. Isolated patches occur downstream of this stretch as far as the footbridge at ST/764.176, which is the only point along this stretch of the river beside a public right-of-way. I have not searched other stretches of the river systematically, and P. × *schreberi* could well be more widespread.

The R. Stour in the vicinity of the P. × schreberi site flows through an area of Oxford Clay. The hybrid grows over a soft clay substrate in water from 0.2 m to at least 1 m deep. In those areas where it occurs it tends to be the most frequent macrophyte, and in places stands span the narrow river from bank to bank. Associated species include *Callitriche* sp., *Nuphar lutea*, *Potamogeton pectinatus*, *Sagittaria sagittifolia* and *Sparganium emersum*. There are well-developed stands of emergents (*Phalaris arundinacea*, *Phragmites australis*, *Schoenoplectus lacustris* and *Sparganium erectum*) along the sides of the river. According to Mr H. Cluett, whose farm lies along the stretch of the river where *P*. × schreberi is particularly frequent, the river was last dredged some 10–15 years ago.

I have not seen either of the putative parents of P. \times schreberi growing with it. Both are, however, recorded in the R. Stour. P. nodosus is, as discussed above, locally abundant downstream of Hayward Bridge, some 10 km from the nearest recorded P. × schreberi. The stretch of the river with P. nodosus flows through a variety of geological formations including Upper Chalk, Lower Chalk and Upper Greensand. FitzGerald (1990) noted that P. nodosus grows over a gravelly substrate, and is never found where the bottom of the river is muddy. This suggests that $P. \times$ schreberi either has different ecological requirements from P. nodosus, or tolerates a wider range of substrate, as the hybrid grows over muddy clay at Marnhull. P. natans is apparently rarer than P. nodosus in the river, J. C. Mansel-Plevdell collected *P. natans* in the R. Stour at Durweston (May 1865, **DOR**) and in the R. Lydden between Stalbridge and Sturminster Newton (29 August 1883, DOR). Durweston lies on the stretch of the R. Stour where P. nodosus occurs; FitzGerald (1990) recorded P. nodosus both above and below Durweston Bridge. The R. Lydden is a tributary of the R. Stour which enters the R. Stour S.S.W. of Marnhull. There are no recent records of *P. natans* in the R. Stour supported by herbarium specimens, and the species was only recorded once during the 1988–89 survey of P. nodosus, FitzGerald and A. Horsfall recorded P. natans in the R. Stour at ST/764.202, downstream of Fifehead Mill, but they noted that the floating leaves were uncharacteristically elongated. It is possible that they actually saw $P. \times$ schreberi, which has been recorded a short distance downstream.

A detailed survey of the R. Stour would be required to establish the distribution of P. × schreberi and its relationship to that of its parents. The absence of both parents at Marnhull is not particularly surprising. The ability of *Potamogeton* hybrids to persist and spread vegetatively often leads to the presence of a hybrid in sites from which one or both parents are absent.

REPRODUCTIVE BIOLOGY

The one stand of P. × schreberi which I visited in July 1993 was flowering sparingly. There was no sign of developing fruit on these plants, and their pollen appeared to be sterile. The hybrid has, however, a robust rhizome and it is clearly able to persist and spread vegetatively. In addition, a specimen collected in October 1992 had a short shoot, terminated by a bud, arising from a node towards the base of a stem which had lost its lower leaves. This resembled similar shoots found in *P. nodosus* (Dandy & Taylor 1939) and other species, which can act as a means of dispersal downstream. It is possible that the population of *P.* × schreberi in the R. Stour represents one clone, which has spread vegetatively following the initial establishment of a single hybrid plant.

I have seen some inflorescences on both Swiss and German specimens. The young inflorescences are very compact, with closed perianth segments; some (perhaps more mature) inflorescences are more elongated with the flowers less closely spaced, but there is no sign of developing fruit. Koch (1934) noted, of Swiss material which he circulated, "plantu statu florendi rarissima". Fischer (1907) reported that Bavarian plants failed to fruit and material from Glattbrugg cultivated by Koch (ZT) also appears to be sterile. Nevertheless, the hybrid can persist in one site for a long period, as shown by the fact that it was first collected in the Seebach by J. C. D. von Schreber in 1775, and refound there by Fischer in 1904 (Fischer 1905, 1907).

NOMENCLATURE

G. Fischer first mentioned the possibility of a hybrid between *P. natans* and *P. nodosus* in 1903, when he suggested that a specimen collected by Schreber in the Seebach at Dechsendorf in 1775 was probably referable to this hybrid (Fischer 1903). In 1904 he rediscovered Schreber's plant in the Seebach, and decided that it was definitely the hybrid *P. natans* \times *nodosus* (Fischer 1905). He applied the name *P.* \times *schreberi* to the hybrid, and although he did not provide a formal description of the plant he included just enough morphological detail in his discussion to validate the name. Shortly afterwards he provided a full account of the hybrid, based on specimens from the Seebach and two other localities in Bavaria (Fischer 1907). In his publications Fischer used the name *P. fluitans* Roth for the fertile species which is called *P. nodosus* in this paper and the name *P. noltei* G. Fisch. for the hybrid *P. lucens* \times *natans*.

The nomenclature of the hybrid is therefore:

Potamogeton × schreberi G. Fisch., *Mitteilungen der Bayerischen Botanischen Gesellschaft* 1: 471 (1905) (*P. natans* L. × *P. nodosus* Poir.).

LIST OF SPECIMENS EXAMINED

The British specimens of $P. \times$ schreberi which I have collected, and some of the German and Swiss specimens which I have examined, are listed below. The characters of other taxa mentioned in the text are (unless stated) based on descriptions which I have prepared for the forthcoming B.S.B.I. handbook. These descriptions are based on living plants and herbarium specimens from Britain and Ireland.

BRITISH ISLES

England: Dorset, v.c. 9: River Stour by footbridge S. W. of Mounters, near Marnhull, ST/764.176, 14 October 1992, D. A. Pearman & C. D. Preston (Preston 92/149) (BM, CGE); —, 22 September 1993, J. M. Croft, D. A. Pearman & C. D. Preston (Preston 93/84) (CGE). River Stour W. of Mounters near Marnhull, ST/765.183, 14 October 1992, D. A. Pearman & C. D. Preston (Preston 92/150) (CGE). River Stour W. of Mounters near Marnhull, ST/767.182, 10 July 1993, D. A. Pearman & C. D. Preston (Preston 93/30, 93/31) (BM, CGE, NMW); —, 22 September 1993, J. M. Croft, D. A. Pearman & C. D. Preston (Preston 93/85) (CGE).

GERMANY

Bavaria: Im Seebach nahe dem Ausfluss, alt. 270 m, Oberfranken, July 1904–1905, G. Fischer (Flora exsiccata Bavarica 997c) (E, M). Seebach bei Erlangen, alt. 270–275 m, Oberfranken, June–September 1904–1905, G. Fischer (Flora exsiccata Bavarica 997d) (E, M). Im Seebach bei Möhrendorf (Erlangen), alt. 272 m, Oberfranken, July 1904, G. Fischer (Flora exsiccata Bavaria 997a) (E). Im Seebach a) bei Möhrendorf, b) bei dem altdeutschen Grabhügel, alt. 274 m, Oberfranken, July & September 1904 & 1905, G. Fischer (Flora exsiccata Bavarica 997b) (E, M). Möhrendorf, September 1916, G. Fischer (BM: conf. J. E. Dandy & G. Taylor, 1938). In der Vils ober- und unterhalb Hahnbach, alt. 385 m, August 1905, W. Niebler (det. G. Fischer) (Flora exsiccata Bavaria 996) (E, M). In der Vils bei Hahnbach, alt. 375 m, August 1906, W. Niebler (MANCH). B[ei] Hahnbach, Oberpfalz, 15 July 1946, L. Oberneder 8230D (BM: det. J. E. Dandy, 1962). Kanalisierter Vilslauf zwischen Neumühle und Amberg, Oberpfalz, 27 July 1946, L. Oberneder 424 (BM).

SWITZERLAND

Schwyz: Im Rieselgiessen, Tuggen, 13 October 1918, W. Koch (Z, ZT). Im untern Rieselgiessen nahe der Mündung in die Spettlinth, Tuggen, 27 August 1919, W. Koch (ZT). Unter dem Sandsteinbrücklein über den Rieselgiessen im Stafelreit, 23 August 1920, W. Koch (ZT). In der Spettlinth unterhalb des Zusammenflusses mit dem Rieselgiessen, Tuggen, alt. 410 m, 31 August 1922, W. Koch (ZT).

St Gallen: Graben nahe Bahnhof, Rebstein, alt. 413 m, 28 September 1919, W. Koch & E. S. Büel

(ZT). Rheineck, Bodenseegebiet, August 1904, C. S. Büel (ZT). Neumühlekanal Rheineck, Bodenseegebiet, 2 November 1909, C. S. Büel (ZT: teste G. Fischer).

Zurich: Zurich, August 1847, *E. Müller* (Z). Dübendorf, July 1849, *C. Cramer* (ZT). In einem rasch fliessenden Bach an der Strasse zwischen Wallisellen (Station) und Düberndorf, June 1892, *F. v. Tavel* (Z). In der Glatt unterhalb Neugut, Wallisellen, 24 June 1917, *W. Koch* (ZT); —, 3 August 1931, *W. Koch* (ZT). In der Glatt beim [i.e. bei dem] Neugut, Wallisellen, 17 September 1917, *E. Baumann* (ZT: teste G. Fischer). In der Glatt bei Glattbrugg, alt. 425 m, 11 June 1932, *W. Koch* (BM, CGE, E, RNG (conf. J. E. Dandy & G. Taylor, 1938), ZT); —, 27 June 1933, *W. Koch* (CGE, E, RNG (conf. J. E. Dandy & G. Taylor, 1938), ZT).

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