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**Autor:** Foley, Michael J.Y.  
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## Carex trinervis Degl. (Cyperaceae) – a western European coastal endemic

MICHAEL J. Y. FOLEY

### ABSTRACT

FOLEY, M. J. Y. (2005). *Carex trinervis* Degl. (Cyperaceae) – a western European coastal endemic. *Candollea* 60: 87-95. In English, English and French abstracts.

*Carex trinervis* Degl. is a western European endemic occurring spasmodically on the Atlantic, Channel and North Sea coasts from Portugal to Denmark. Its taxonomy and ecology are briefly discussed and its provisional geographical distribution, based mainly on herbarium specimens and literature records, is mapped. Its former occurrence in England, which has sometimes been questioned, is supported by the herbarium collections examined.

### RÉSUMÉ

FOLEY, M. J. Y. (2005). *Carex trinervis* Degl. (Cyperaceae) – une endémique des côtes occidentales européennes. *Candollea* 60: 87-95. En anglais, résumés anglais et français.

*Carex trinervis* Degl. est une espèce endémique des côtes occidentales européennes dont la distribution s'étend par endroits le long de l'Océan atlantique, de la Manche et de la Mer du nord, du Portugal au Danemark. Sa taxonomie et son écologie sont brièvement présentées. Une carte résume sa distribution actuellement connue, basée principalement sur des spécimens d'herbier et la littérature. Sa présence ancienne en Angleterre, parfois discutée, est confirmée sur la base de collections d'herbier.

**KEY-WORDS:** CYPERACEAE – *Carex trinervis* – endemism

### Introduction

*Carex trinervis* Degl. is a member of Section *Phacocystis* Dumort. (Section *Acutae* (Fries) Christ). This section is often referred to as the “*Carex nigra* group” after what is perhaps its commonest and most widespread member and one able to occupy a relatively wide range of habitats. The group comprises a number of closely-related species which frequently hybridise between themselves to produce partially fertile offspring; these can also back-cross with one or other parent to produce introgressed progeny.

Members of the group are characterised by possessing two stigmas, in having characteristic red-brown to purple-black glumes with pale greenish midribs, and having green, biconvex, short-beaked utricles. In the British Isles seven species are represented: *C. recta*, *C. aquatilis*, *C. acuta*, *C. nigra*, *C. elata*, *C. salina* and *C. bigelowii*. A eighth, *C. trinervis*, whose authenticity has sometimes been questioned, was recorded from a single locality in Norfolk in the 19th Century but is now extinct. *Carex trinervis*, however, is widely recorded from the coasts of western Europe ranging from Portugal to Denmark and so its past (or even present) occurrence in the British Isles would seem quite feasible. In possessing a similarity to *C. nigra*, it is possible that it may have been overlooked.

Following an examination in the field of living plants of *C. trinervis* in western France (and of other members of the Section elsewhere) along with a wide range of preserved material from most European localities, its taxonomy and ecology are briefly discussed and its provisional geographical distribution indicated.

### Taxonomic description

*Carex trinervis* Degl.

≡ *C. glauca* subsp. *trinervis* (Degl.) Asch. & Graebn.

**Lectotype:** “Lieux marécageux à Biarritz, 25 mai 1803”, *herb. Loiseleur* (AV) (selected by FOLEY, 2001).

Plant laxly caespitose with far-creeping rhizomes 2.5–4.0 mm diameter; basal sheaths few, light brown; fertile stems obtusely trigonous, smooth below, becoming scabrid towards the apex, (10–)20–40(–60) cm long; leaves ± equalling or exceeding the stem, 1.5–2.0(–3.0) mm wide, canaliculate to in-rolled, grey-green, glaucous, with numerous stomata on both surfaces; bracts leaf-like, the lowest appreciably exceeding the inflorescence, canaliculate; inflorescence comprising (1–) 2–3(–4) male spikes, 20–50 × 2.0–3.5 mm, narrowly oblong, female spikes 2–4, clustered, 20–40 × 5–8 mm, subsessile, the lowest ± sessile, broadly oblong-cylindric, sometimes male above; female glumes brown with a green midrib and a hyaline margin, slightly shorter than the utricles, elliptic to oblong-ovate, ± obtuse to mucronate, in the lower ones the midrib sometimes excurrent; utricles grey-green, 3–5 mm long, broadly ovoid, glabrous, often noticeably 3-veined and spotted purple-brown, short-beaked; stigmas 2.

$2n = c.84$ .

Flowering V–VI.

For a morphological comparison with *C. nigra* see Table 1 and for an illustration of habit and rhizomatous growth see Fig. 1 (reprint of LANGE, 1861).

### Habitat

*Carex trinervis* is a plant of the dampish sand of dune slacks along the coasts of western Europe but it may also be found on sandy heaths in rather more inland localities such as around the étangs near Sanguinet to the south-west of Bordeaux. At coastal localities, the rhizomes can be far reaching in the soft, damp sand whilst the lower part of the flowering stems often become partially buried by blown sand which accretes to a point just below the female spikes. In localities where *C. nigra* is present, the hybrid (*C. xtimmiana* Junge) can also occur.

### Geographical distribution

The plant was first described from south-west France by J. V. Degland in 1807 in an account of the genus which he provided for Loiseleur-DeLongchamps' *Flora Gallica* (LOISELEUR DESLONGCHAMPS, 1807); there it was recorded “in sabuletis uliginosis circà Bainonam [Bayonne]” flowering in May and June. The plant is thought to still occur in this area to the present day.

The code in bold type refers to the appropriate 50 × 50 km<sup>2</sup> of the U. T. M. grid.

### PORTUGAL:

Restricted to depressions amongst the dunes in the coastal strip between Porto and Figueira da Foz (see also LUCEÑO & AEDO, 1994).

*Specimens seen include:* **MD3** or **NE2?**: Pinhal de Leira, 1917, *Felguiras* (COI); Boa Nova-Pampelido (?), s.d., *Braun-Blanquet* (COI). **NE2**: Pinhal do Urso, in Juncus, VII.1898, *Ferreira* (K); Kuste, auf sumpfigen terrain, alt. 35m, VII.1902, *Ferreira* (BM, E, K, MANCH); arredores, VII.1890, *Moller* (E). **NE1**: Ared. D'Aveiro, dunas, VIII.1994, *Mesquito* (K, MANCH). **NF2**: Espinho, 15.VI.1889, *Murray* (BM). **NF1**: Matasinhos/Oporto, shore, 14.V.1888, *Murray* (BM); Matosinhos, s.d., *Sampaio* (COI); VI.1890, *herb. Monteiro* (BM); near Leca, Oporto, 7.VI.1887, *Murray* (BM); north of Oporto, sandy ground by the sea, VI.1889, *Murray* (LANC).

#### SPAIN:

Although indicated as occurring on the west coast by ROUY (1912) no material has been seen. LUCEÑO & AEDO (1994) also record it as absent from Spain but, in view of its general distribution, its presence on the north-west or northern coasts might be expected. A specimen reputedly collected near Sevilla (Puerto Serrano (**TF1**), 18.VI.1851, *Ball* (E)) appears to be this plant. However, the locality is a considerable distance from the coast and so a mis-labelling of the collection is suspected.

#### FRANCE:

*Carex trinervis* occurs spasmodically on the south-west Atlantic coast from Biarritz northwards to a point north-west of Bordeaux, but is quite frequent around Étang de Cazaux and Biscarosse; it has also been recorded a little further to the north from the Ile d'Oléron and also from the Rochefort area (pers. comm. J.-F. Prost). There is then a long section of coastline where it is unrecorded (cf. DUHAMEL, 1998), both on the Atlantic and on the Channel coasts of the Normandy peninsula. It formerly reappeared on the western side of the Cotentin peninsula (near Pirou) but may now be extinct there (DES ABBAYES & al., 1971). Further east it is again unrecorded until found around the mouth of the Somme; from there it occurs intermittently along the coast northwards and eastwards to the Belgian border. In the Nord/Pas de Calais regions it also occurs on acid heaths where it may have become introgressed by *C. nigra*.

*Specimens seen include:* **XP2**: Biarritz, VII.1853, *Parseval-Grandmaison* (MANCH), also Biarritz, marshy area, 25.V.1803, *herb. Loiseleur* (AV, lectotype); Bayonne, étangs, s.d, s.coll. (MANCH); St Jean de Marsacq, Landes, sandy places, 13.VII.1977, *Charpin & Jacquemoud 15609* (E). **XP1**: Mimizan-Plage, 1977, s.coll. (MA); Courant d'Huchet, Molites Plage, 23.VII.1961, *Horwood L15* (BM). **XQ4**: Sanguinet, Landes, damp sand, VII.1898, *Neyraut* (BM, E, MANCH); Lake Cazaux, 23.VII.1898, *Moseley* (BM). **XQ3**: Gironde, La Teste, VI.1847, *Chantelart* (MANCH); Teste de Buch, VI.1831, *Endrefts* (BM, E, K, MANCH); La Teste, pine woods, VI.1851, *Chant* (E); also, s.d., *Dumolin, herb. Loiseleur* (AV). **XR1**: Ile d'Oléron, 18.VI.1890, *Gadecau* (BM). **XV2**: Créances à Pirou, Manche, 26.VII.1882, consolidated dunes, *Gay* (BM, MANCH), also 1.VI.1883, *Gay* (BM, LANC, MANCH). **DR1**: Le Crotoy, Somme, damp maritime sands, VII.1880, *Magnier* (MANCH); St Quentin, Tourmont, Somme, maritime sands, 13.VI.1870, *Copineau* (MANCH, MSTR), also 15.VII.1849, [*Cosson?*], (E, BM, MANCH); dunes, Abbeville, VII/VIII.1853, *de Clermont* (E); Quend, 15.VII.1877, *Gonse* (MANCH); St. Valery, Somme, s.d., *Schoenefeld* (MANCH); Etaples, Pas de Calais, 15.VIII.1863, coastal, *Mouillefarine* (BM). **DS2**: Ambleteuse, 7.VI.1956, *Lousley* (BM); 4.VII.1959, *Young* (BM), 4.VII.1959, *Hall & Hall* (BM). **DS3**: Rosendal, Dunkerque, 18.IX.1854, dunes, *Cussac* (BM, LIV, MANCH), also, IX.1873, *Cussac* (E).

#### BELGIUM:

There are old records from near Nieuwpoort, Wenduyne and Heyst.

*Specimens seen include:* **DS3**: Nieuwpoort, s.d., *herb. Dieudonné* (K, MANCH, BM). **ES1**: Wenduyne, maritime sands, dunes, VII.1866, *Crepin* (BM, E, K, MANCH); Heyst, sandhills, 11.VII.1883, *Rogers* (LANC).

**HOLLAND:**

Known from damp dunes near Oostvoorne and from several points along the coast and from the island of Terschelling.

*Specimens seen include:* **ET4:** Voorne, pool by sea, *Simons* (K); Insel Rozenburg, Hook, 12.VII.1938, *Kern* (K); Oostvoorne, damp dunes, 31.VIII.1938, *Kern* (K), also 20.VII.1967, *Faulkner* (BM), 6.IX.1935, *Campbell* (BM). **FU1:** Leeland, s.d., s.coll. (K). **FU4:** Doornspijk, Velvive, in damp heath, V.1947, *van Soest* (K). **FV2:** Wetterschelling, damp dune slack, 25.V.1988, *Kiffe* (MSTR). **FV4:** Insel Terschelling, dune slack, 24.VI.1980, *Wentz* (MSTR); Stamhof?, s.d., *Lewejohann* (MSTR).

**GERMANY:**

Frequent in the dune systems of the off-shore islands of Borkum and Langeoog where it also hybridises with *C. nigra* (KIFFE, 1997; VAN BARGEN, 1998).

*Specimens seen include:* **LE2:** Borkum, dunes, VIII.1887, *Bertram* (BM, K, LIV, MANCH), also 1865, *Wilms* (MSTR), 23.VII.1880, *Buchenau* (BM), s.d., *Suffrian* (MSTR), s.d., *herb. Beckhaus* (MSTR), s.d., s.coll. (MANCH). **LE4:** Norderney, Niedersachsen, damp heath, 21.VIII.1992, *Kiffe* (MSTR). **ME1:** Insel Langeoog, 4-10.VIII.1877, *Schäfer* (E, K, MANCH), also VIII.1906, *Jagorski* (MANCH), 4.VIII.1880, *Buchenau* (BM), 25.VII.1996, *Kiffe* (MSTR).

**DENMARK:**

Occurs in dunes and damp heath on the west coast near Ringkøbing and the off-shore islands of Rømø and Fanø. The hybrid with *C. nigra* has also been recorded from Denmark (KIFFE, 1996).

*Specimens seen include:* **MG4:** Kongsmark, Romö, VII.1877, *Holm* (E); Insel Romö, Schleswig, blown sand, *Prahe* (E); Insel Romö, dunes, VIII.1875, *Borst* (K); Röm, ad Lakok, heath, VII.1906, *Fitscher* (MANCH); Jutland, Rømø; damp Empetrum heath, 13.VII.1990, *Kiffe* (MSTR); Insel Franol?, 3.VIII.1880, sands, *Holm & Jensen* (K). **MG3:** Ins. Fanö, VIII.1880, *Holm* (K). **MH4:** Ringkøbing-Fjord, damp heath, 26.VII.1992, *Kiffe* (MSTR); Ringkøbing, Haride, damp dune slack, IX.1951, *Robinson* (K).

**NORWAY:**

There is an unlocalised and undated specimen (*Merreil* (LIV)) reputedly collected from "Norway". It is possible that the plant could occur there but confirmed records are lacking.

**ENGLAND:**

It was first identified as occurring in the British Isles by A. Bennett in late 1883 (BENNET, 1884) from specimens collected by H. G. Glasspoole around 1869-1870 at Ormesby Common, Norfolk. The plant seems to have survived there into the early twentieth century but has not been seen since.

At one time much discussion ensued as to the authenticity of this record but several herbarium specimens apparently from here are undoubtedly *C. trinervis* whilst others appear to be the hybrid with, or are introgressed by, *C. nigra*. Plants from Ormesby were also frequently cultivated in the gardens of interested botanists such as E. F. Linton, S. H. Bickham, F. J. Hanbury, A. W. Stelfox and also at Kew, all from stock collected from the mid-1880s onwards.

Ormesby St Michael (sometimes referred to as Caistor on herbarium sheets) is nowadays several kilometres inland but centuries ago there were intrusions by the sea into the vicinity. Saline evaporation pans were also formerly present and this suggests the previous existence of a coastal, and probably sandy, habitat around Ormesby. A. Bennett noted (*in sched.*) on a herbarium sheet (Ormesby St Michael, 17.VII.1885, *Reeves & Glaspoole* (BM)) "I say *C. trinervis* Degl. although growing among furze and near water its habitat years ago had been sand"; on the same sheet is a slightly later collection of good *C. trinervis* (Caistor, 25.VI. 1890, comm. *F. Leitch*).

Collectors commented on the fact that the utricles of plants removed from Ormesby and cultivated elsewhere were often sterile or contained only partly formed nutlets but this was not always the case (e.g. Ormesby, 23.VIII.1886, *Linton* (LIV)). This gave rise to theories of introgression by *C. nigra* or of the plant being a true hybrid and, in fact, in some collections this appears to be so.

It is most surprising that *C. trinervis* has not been recorded from other sandy coastal areas of south-east England, especially along the Channel coast opposite to the Continental localities, but it has possibly been overlooked there.

*Specimens seen include:* **DU2:** Ormesby 23.VIII.1886, *Linton* (LIV); Ormesby St Michael, VIII.1884, 17.VII.1885, 27.VII.1886, 10.VII.1886 & s.d., *Glasspoole* (BM); s.d., *Reeves & Glaspoole* (BM); Caistor, 25.VI.1890, comm. *F. Leitch* (BM).

### The hybrid with *C. nigra* (*C. xtimmiana* Junge)

Various recorded from Germany and Denmark by KIFFE (1996, 1997) and VAN BARGEN (1998) it is likely to occur throughout the range of *C. trinervis*. Some collections from (or cultivated from) the sole, now extinct, English locality may well be this plant. The hybrid is intermediate between its parents in rhizome diameter, in the comparative length of its lowest bract, in the length of the upper male spike, and in the shape and size of the female spikes. It resembles *C. trinervis* in having stomata on both surfaces of the leaves and is also closer to it in the appearance of its female glumes; in the number of male and female spikes it is closer to *C. nigra*.

*Specimens seen include:* **ME1: GERMANY:** Langeoog, Am SW-Rand der Fläche, etwa in Höhe des Inselkinos, 25.VII.1996 & 30.VIII.1996, *Kiffe* (MSTR).

### Conclusion

*Carex trinervis* occurs intermittently along the coast of western Europe from Portugal to Denmark (Fig. 2). It has also been recorded for Spain but this appears to be an error although, since it is known from Portugal, it might also be expected to occur there. Not previously thought to be present in Norway, a single unlocalised collection has been located and its occurrence in the south, closest to the Danish localities, might be anticipated. It was once known from a single English locality (Ormesby Common, Norfolk) in the nineteenth and early twentieth centuries but has now been lost, possibly through introgression with *C. nigra* or due to habitat change. Several herbarium specimens exist of plants cultivated in gardens from original Norfolk stock; these often have poorly developed fruits and/or spikes which have been affected by a blight. This has led to the suggestion that the Norfolk plant was the hybrid with *C. nigra* rather than *C. trinervis* itself; although this may be so in some cases, other material is true *C. trinervis*. It is difficult to explain the plant's absence from southern and eastern England and from similar large sections in France since, in both cases, suitable habitat exists.

*Carex trinervis* is most frequently found in the damp sand of coastal dune slacks but can also occur further inland on sandy heathland; this is especially the case in France in the area to the south-west of Bordeaux. However, all recorded localities are never very far from the coast. Its robust far-reaching rhizomes spread readily in the moist sand and help the plant increase vegetatively. It hybridises with *C. nigra* and several such instances are recorded for northern Germany and Denmark (KIFFE 1996, 1997; VAN BARGEN, 1998). Its tendency to do so and its confusion with *C. nigra* might also account for it having been unrecorded elsewhere within its range. It is fairly scarce overall and should be protected; this is the case in most countries whence it is known. The genetics of *C. trinervis* and of its putative hybrid with *C. nigra* would repay examination by molecular methods.



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Fig. 1.— *Carex trinervis* Degl. Reprint of *Flora Danica*, plate 2665 (1861), drawn by J. Lange [Library of the Conservatoire et Jardin botaniques de la Ville de Genève].



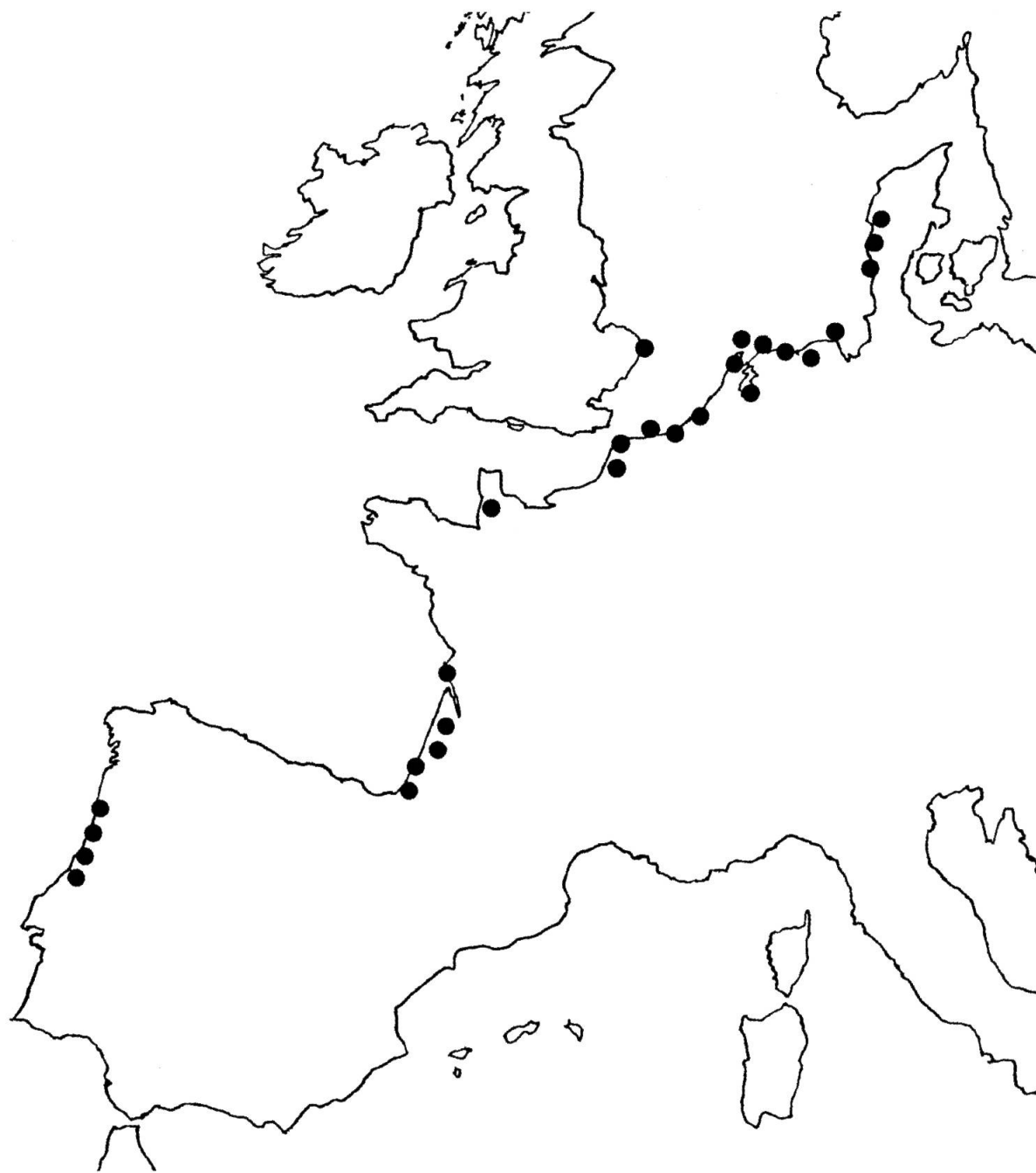


Fig. 2.— Distribution map of *Carex trinervis* Degl. (plotted as  $50 \times 50$  km<sup>2</sup> of the U.M.T. grid).

**Table 1.**– Important distinguishing characters between *Carex trinervis* Degl. and *C. nigra* (L.) Reichard

	<i>C. trinervis</i>	<i>C. nigra</i>
rhizome diameter (mm), etc	2.5-4.0 always	1.5-2.0(-2.5)
stem	far-creeping	sometimes far-creeping
leaf width (mm)	obtusely trigonous,	sharply trigonous
leaf shape etc	narrow, 1.5-2(-3)	1-3(-5)
	channelled, inrolled	± flat, somewhat
	distinctly glaucous	glaucous
leaf stomata surface	on both surfaces	only on upper
lowest bract	longer than inflorescence	shorter than or ± inflorescence
male spikes	(1-)2-3(-4)	1-2(-3)
female spikes	clustered, ± sessile	± contiguous, the lowest usually distant
lowest female spike (mm)	20-40 × 5-8	10-25(-50) × 3-4
lower female glumes	sometimes with an excurrent midrib	obtuse to acute
utricle size (mm)	3.5-5.0	2.5-3.5
utricle	often with purple -brown spots	unspotted

