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Parmelia Ach. s. str. in the southern Baltic region

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The lichen genus *Parmelia* in the southern Baltic region

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Summary

The distinguishing morphological and chemical characters of nine species of *Parmelia* Ach. s. str. occurring in the southern Baltic region, namely *P. barrenoae* Divakar et al., *P. ernstiae* Feuerer & A. Thell, *P. fraudans* (Nyl.) Nyl., *P. omphalodes* (L.) Ach. (including subsp. *discordans* (Nyl.) Skult and subsp. *omphalodes*), *P. pinnatifida* Kurok., *P. saxatilis* (L.) Ach., *P. serrana* A. Crespo et al., *P. submontana* Nádv. ex Hale and *P. sulcata* Taylor, are presented. Four of the species are cryptic or semi-cryptic, being recent segregates from *P. saxatilis* and *P. sulcata* based primarily on evidence derived from molecular analyses. *P. ernstiae* was formerly believed to be chemically distinct from *P. serrana* by the presence of lobaric acid, but recently this has been reported in both species. Furthermore, three chemotypes of *P. serrana* have been found by TLC in solvents A, C and G: 1) atranorin, consalazinic, salazinic and lichesterinic acids; 2) atranorin, consalazinic, salazinic, protolichesterinic and lichesterinic acids; 3) atranorin, consalazinic, salazinic, protolichesterinic, lichesterinic and lobaric acids. The first chemotype is rarely found while the other two appear to be common. At least three of the species, *P. ernstiae*, *P. serrana* and *P. submontana* are increasing in frequency in the region and spreading northwards.

Isidiate species

Parmelia ernstiae Feuerer & A.Thell

Key characters: pruinose, often lobulate, isidia flattened, mainly in central parts. Distribution: Denmark, Estonia, Sweden, Poland, Germany.

Parmelia saxatilis (L.) Ach.

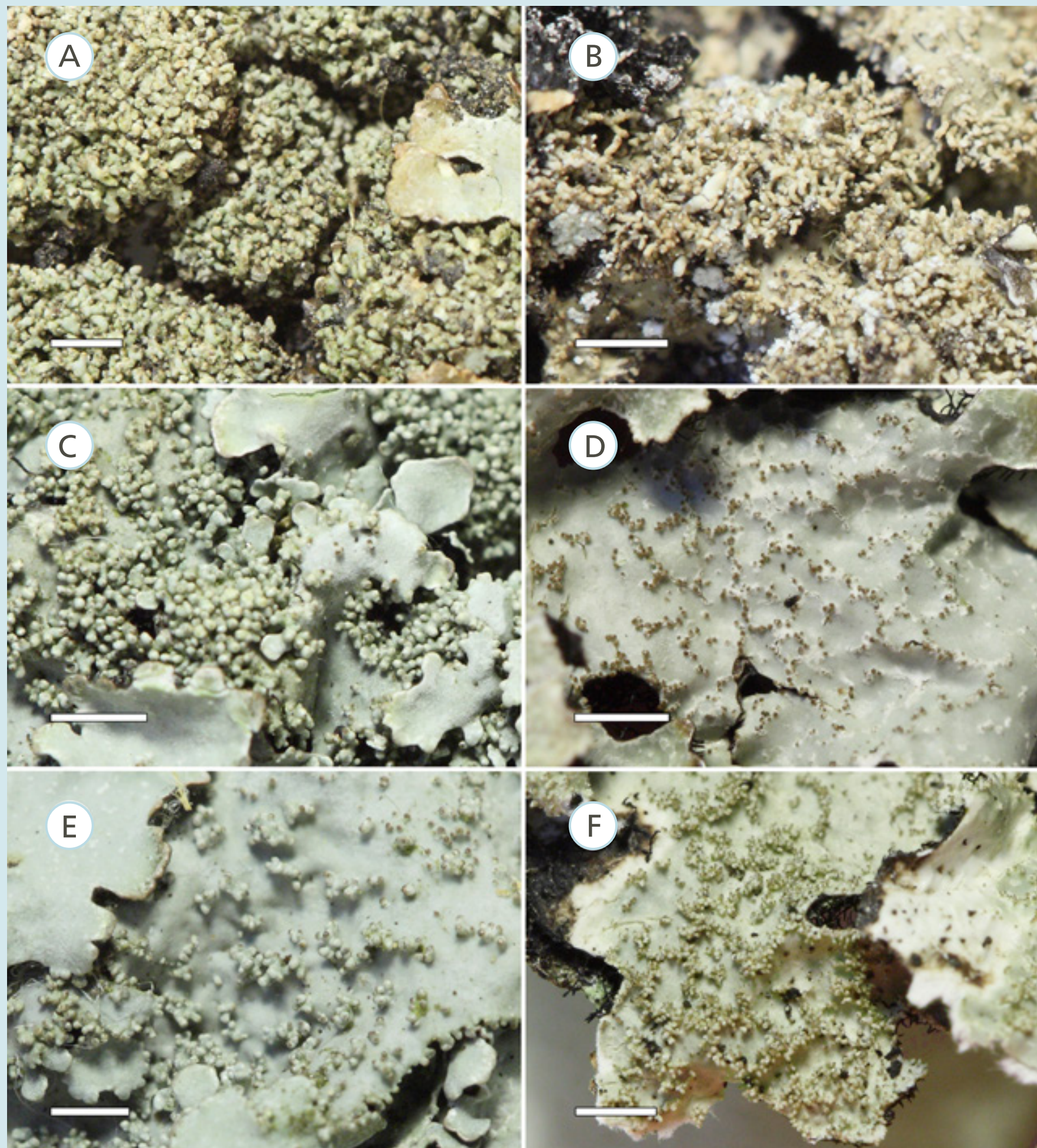
Key characters: reddish margin, isidia blackish at tips. Distribution: ± common.

Parmelia serrana A.Crespo, M.C.Molina & D.Hawksw.

Key characters: isidia clustered marginally or along ridges. Distribution: Denmark (Zealand), Latvia, Poland, Sweden

Comparison of *Parmelia ernstiae* and *P. serrana*.

Feature	<i>Parmelia ernstiae</i>	<i>Parmelia serrana</i>
Isidia		
Form	thick, mainly simple	thin, simple to branched
Shape	often flattened	never flattened
Location	cover central parts	develop mainly along ridges
Surface		
Cortex	mainly dull	mainly shiny
Pruina	often develop, rarely absent	occasionally develop
Pseudocyphellae	short, rounded	linear



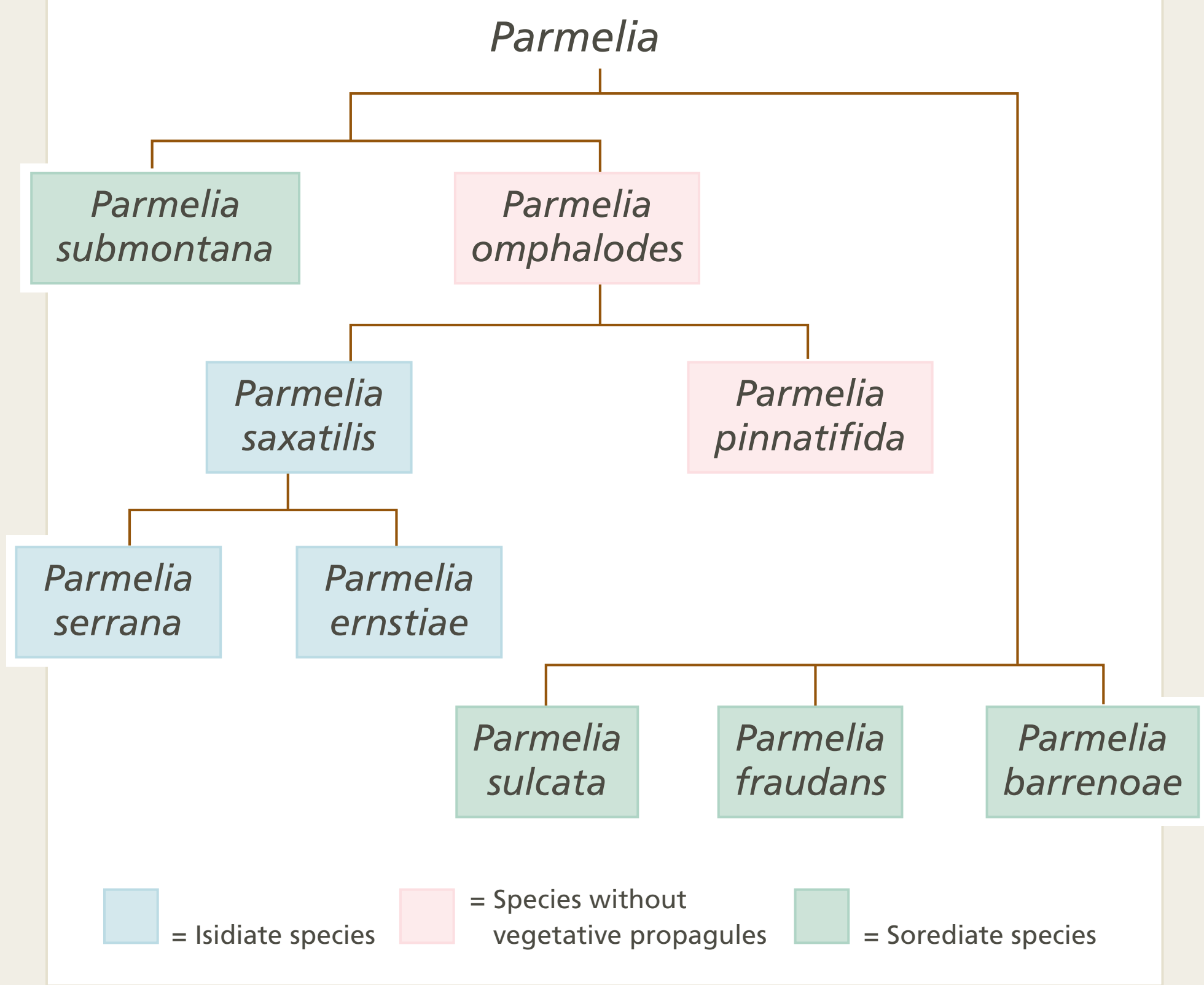
Differences in isidia between *Parmelia ernstiae* and *P. serrana*. Scale = 1.0 mm.

Parmelia ernstiae: **A.** Thick short isidia totally cover central part of a thallus. **Parmelia serrana**: **B.** Thin long coralloid isidia. **D., F.** Isidia develop in long chains along ridges at initial and final stages. **C.** Few typical flattened isidia develop along with lacinate pruinose lobes. **E.** Isidia develop sporadically or in rounded clusters.



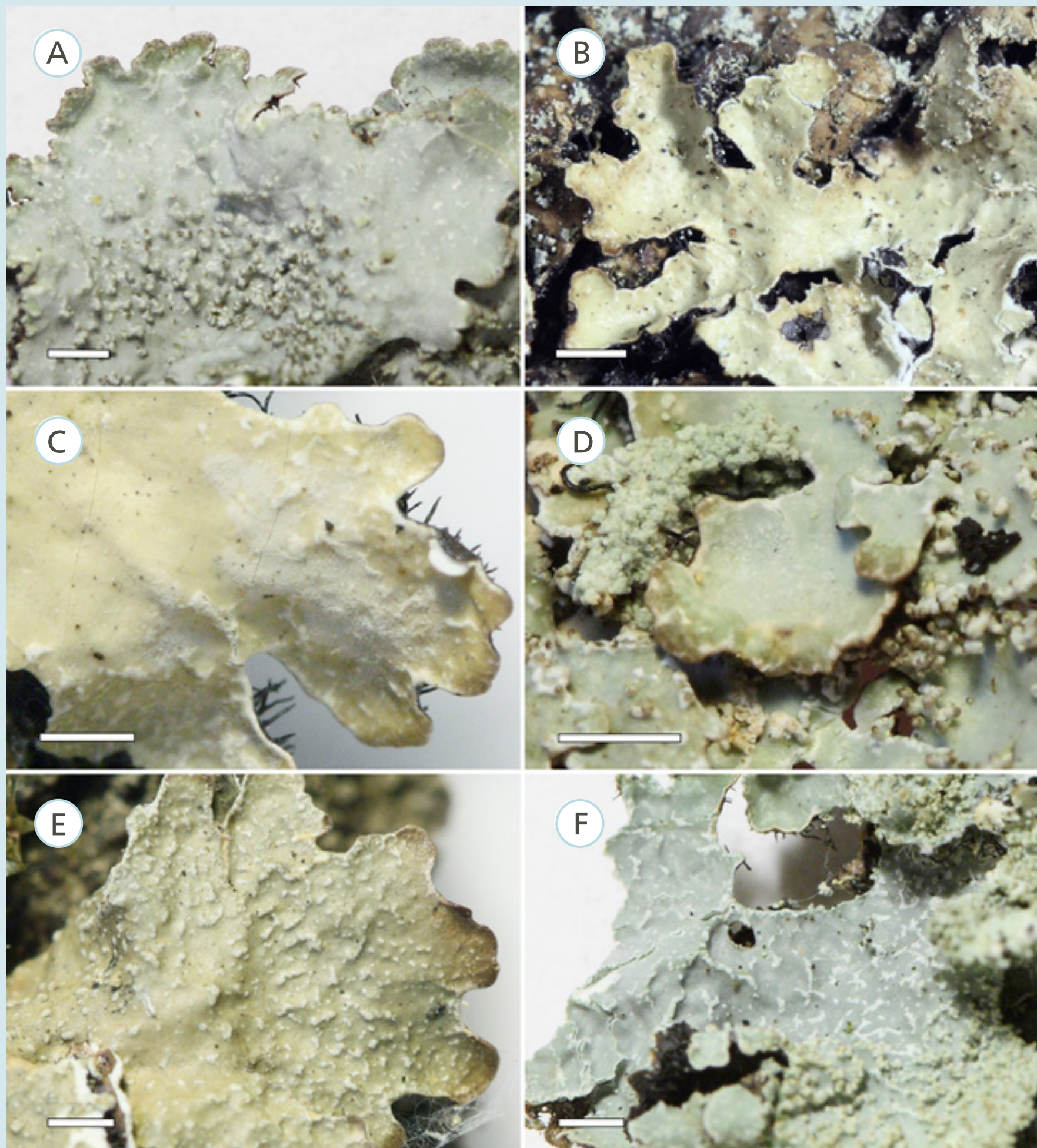
Adjacent *Parmelia ernstiae* and *P. serrana* (upper right corner), growing side by side, fighting for space. Sweden, Skåne, Billinge. (Photo: Nataliya Thell 2016)

Reconstructed phylogenetic tree of the Baltic *Parmelia* species



Key to southern Baltic *Parmelia*-species

- 1 Thallus sorediate 2
- Thallus isidiate or without vegetative propagules 5
- 2 Soralia white, laminal 3
- Soralia mainly marginal, yellowish **P. fraudans**
- 3 Lobe margins not down-rolled; rhizines simple or squarrose 4
- Lobes down-rolled; rhizines simple **P. submontana**
- 4 Soredia released from finally empty cracks; rhizines simple **P. barrenoae**
- Most of soralia remaining full; rhizines squarrose **P. sulcata**
- 5 Thallus isidiate 6
- Thallus lacking isidia 8
- 6 Thallus shiny or dull, most parts without pruina, saxicolous or corticolous 7
- Thallus dull, whitish pruinose; mainly corticolous, isidia flattened **P. ernstiae**
- 7 Isidia mainly laminal; most frequent in the central part **P. saxatilis**
- Isidia along margins or laminal, clustered, often along ridges **P. serrana**
- 8 Pseudocyphellae marginal; upper surface shiny dark brown **P. omphalodes** subsp. **discordans**
- Pseudocyphellae both marginal and laminal; upper surface pale brown or grey to blackish 9
- 9 Lobes 2–4 mm wide; thallus usually pale brown or grey **P. omphalodes** subsp. **omphalodes**
- Lobes usually less than 1 mm wide; thallus usually blackish **P. pinnatifida**



Comparison of *Parmelia ernstiae* and *P. serrana* – thallus surface. Scale = 1.0 mm.

P. ernstiae: **A.** Dull epruinose lobe. **P. serrana**: **B.** Typical shiny non-pruinose lobes. **D.** Poorly developed pruina. **C.** Typical pruina developed on the upper surface. **E.** short pseudocyphellae. **F.** Linear pseudocyphellae.



Parmelia serrana growing on medieval gravestone of granite. Sweden, Skåne, Stehag. (Photo: Nataliya Thell 2017)

Species without vegetative propagules

Parmelia omphalodes (L.) Ach. subsp. **discordans** (Nyl.) Skult

Key characters: adnate thallus, a uniform dark brown colour, overlapping lobes. Distribution: ± common.

Parmelia omphalodes (L.) Ach. subsp. **omphalodes**

Key characters: distinct laminal and marginal pseudocyphellae. Distribution: ± common.

Parmelia pinnatifida Kurok.

Key characters: narrow, lobes 1–2 mm across. Distribution: Poland

Sorediate species

Parmelia barrenoae Divakar, M.C.Molina

Key characters: Similar to *P. sulcata* but simple to furcate rhizines, soredia develop in cracks Distribution: Poland

Parmelia fraudans (Nyl.) Nyl.

Key characters: yellow soredia Distribution: Estonia. Sweden (Småland)

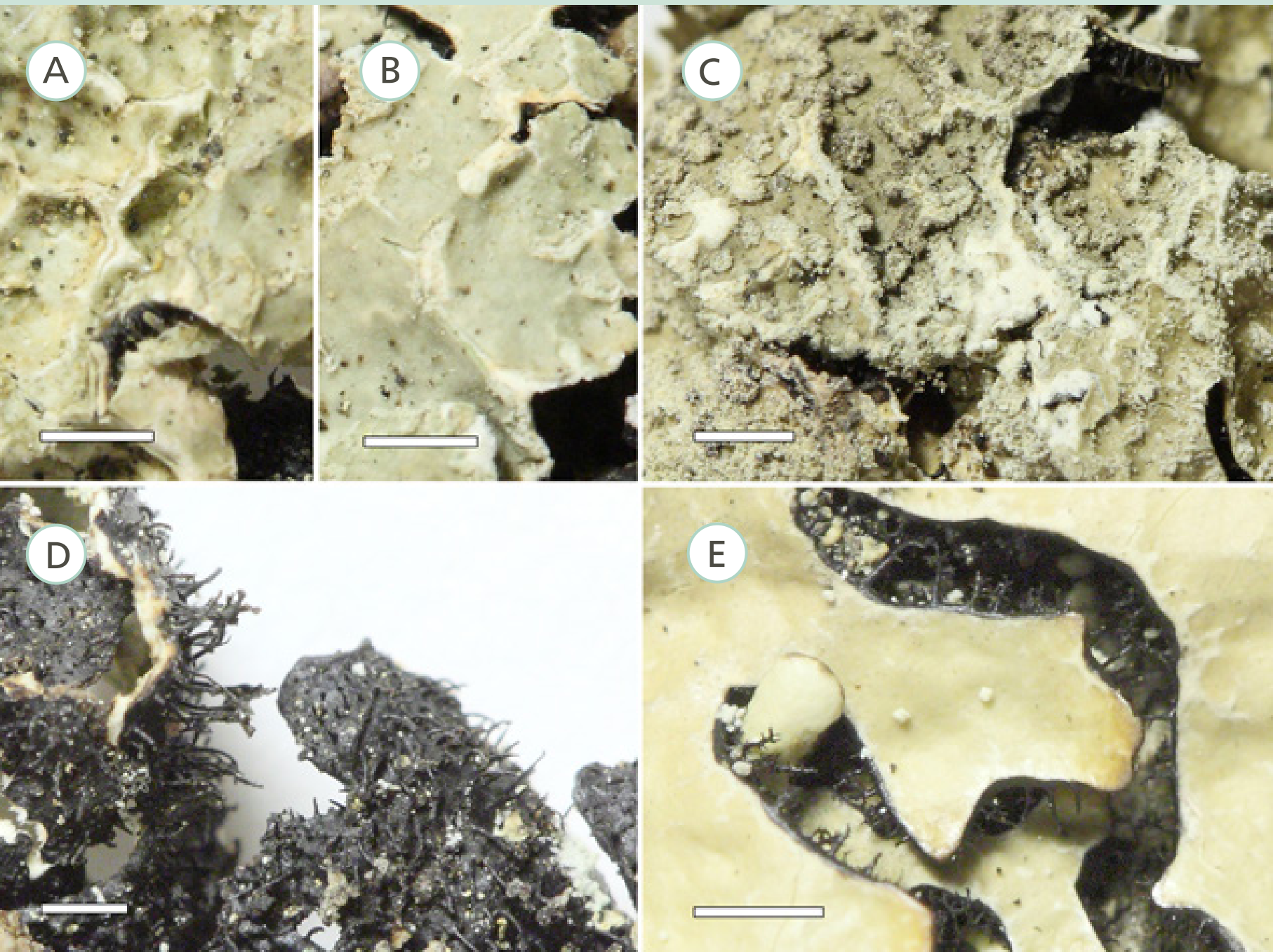
Parmelia submontana Hale

Key characters: Dome shaped lobes, isidia-like soredia, and, in fact, closer related with isidiate species

Distribution: Germany (Mecklenburg), Poland, Sweden (Skåne). Probably much overlooked.

Parmelia sulcata Taylor

Key characters: Soredia from laminal soralia – not cracks – but very variable morphology Distribution: ± common.



Distinctive morphological features of *Parmelia barrenoae* and *P. sulcata*. Scale = 1.0 mm.

Parmelia barrenoae: **A., B.** soralia developing and released from finally empty cracks; **D.** simple rhizines.

Parmelia sulcata: **C.** Most of soralia remaining full; some lack soredia but not developing from cracks. **E.** squarrose rhizines.



Parmelia submontana, Sweden. Skåne, Västra Sallerup [Eslöv], Kastberga, with interspersed **P. sulcata**. (Photo: Nataliya Thell 2016)

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