

**Table S1.** Characters analysed in the *Muellerella* spp. specimens included in the molecular analysis of this study.

Coll	Muellerella species	Ascomata diam.	Ascus	Ascospore wall	Ascospore color	Ascospore size	Host	Notes
Ertz 16261	<i>lichenicola</i>	115 µm	>100-spored	thin	pale	3.5–5 × 2 µm	<i>Caloplaca</i> (corticolous, orange apothecia on pale yellowish thallus)	Fits rather well with <i>M. lichenicola</i> because of the asci with more than 100 spores, the small ascospores (though slightly smaller than in Triebel 1989), small perithecia and host genus <i>Caloplaca</i> (corticolous with habit-color similar to the saxicolous <i>C. flavovirescens</i> /host of the type)
Ertz 17847	sp.	100 µm	>>32-spored	thin	pale to medium	6–7(–8) × 3(–4) µm	unknown	Perithecia too small for <i>M. pygmaea</i> , ascospores too long for <i>M. lichenicola</i> and host unknown, thus sp.
Ertz 19263	<i>erratica</i>	150–170 µm	~64	thin to medium	pale to medium	5–8(–11) × 3–4 µm	cf <i>Caloplaca chalybaea</i>	Range of ascospore size larger than indicated for <i>M. athallina</i> var. <i>pygmaea</i> and host genus different, thus cf.
Ertz 20419	sp.	95–135 µm	~64	thin to medium	medium	5–6 × (2.5–)2.75–3 µm	<i>Protoblastenia rupestris</i>	cf; ascospore size close to <i>M. lichenicola</i> but asci less than 100-spored.
Ertz 20470	<i>erratica</i> s.lat.	140–170 µm	~64-spored	medium to thick	medium to dark	(6.5–)7(–7.5) × (3–)3.5(–3.75) µm	<i>Lecanora</i>	Fits well <i>pygmaea</i> var. <i>athallina</i> but host different from type, thus s.lat.
Ertz 20485	<i>erratica</i>	170–190 µm	>>32-spored	medium to thick	medium to dark	7(–8) × (3.75–)4(–4.5) µm	<i>Xanthoria elegans</i>	Close to <i>M. pygmaea</i> var. <i>athallina</i> but ascospores too dark and host genus different; not <i>M. ventosicola</i> because perithecia too small and ascospores rather narrow
Ertz 20489	<i>ventosicola</i>	(150–)250(–300) µm	32–64	thick	dark	5.5–7(–7.5) × 4–5(–6) µm	<i>Rhizocarpon geographicum</i>	Fits well <i>M. pygmaea</i> var. <i>ventosicola</i> but host genus different from the type, thus cf. Triebel (1989) also recorded several specimens from Austria on <i>Rhizocarpon</i> , thus fits well the concept of Triebel
Reidar 150307	<i>ventosicola</i>	250–300 µm	64	medium	medium to dark	6.5–7.5 × 4–4.5 µm	<i>Ophioparma ventosa</i>	Fits rather well with <i>M. pygmaea</i> var. <i>ventosicola</i> and the same host as the type, thus s.str.!
Pérez-Ortega 8875	<i>ventosicola</i>	200–240 µm	64	medium to thick	medium to dark	7–8(–9) × 5–6 µm	<i>Rhizocarpon geographicum</i>	Fits rather well with <i>M. ventosicola</i> , but different host and ascospores slightly wider. Wider than most of the specimens of this species recorded by Triebel (1989)
Pérez-Ortega 8778	<i>erratica</i>	200–310 µm	64	thin to medium	pale to medium	6–7(–8) × 3(–4) µm	<i>Lecanora polytropia</i> s.lat.	Perithecia size corresponds to <i>M. ventosicola</i> . Ascospore size fits with <i>M. erratica</i>