Supplementary Data File S1 to

Short Note

Palynological evidence supporting widespread synchronicity of Early Jurassic silicic volcanism throughout the Transantarctic Basin

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Table S1. Results of palynomorph counts from samples ML2P1 and ML2P4 from the Lower Jurassic at McLea Nunatak, southern Prince Albert Mountains, East Antarctica. Biostratigraphically significant taxa discussed below are marked in bold.

	Sample ML2P1		Sample ML2P4	
Anapiculatisporites pristidentatus	2	(0.71%)	1	(0.29%)
Neoraistrickia spp.	8	(2.85%)	3	(0.83%)
Retitriletes semimuris	4	(1.42%)	4	(1.11%)
Stereisporites antiquasporites	1	(0.36%)	–	
Antulsporites varigranulatus	1	(0.36%)	1	(028%)
Foveosporites moretonensis	5	(1.78%)	2	(0.55%)
Polycingulatisporites sp.	1	(0.36%)	3	(0.83%)
Podosporites variabilis	3	(1.07%)	2	(0.55%)
Classopollis* sp. cf. *C. chateaunovii	128	(45.55%)	209	(57.89%)
***Classopollis meyerianus* (intrapunctate)**	68	(24.2%)	67	(18.56%)
Classopollis simplex	6	(2.14%)	7	(1.94%)
***Classopollis* spp. indet.**	28	(9.96%)	25	(6.93%)
Unidentified	26	(9.25%)	37	(10.25%)
Total	281		361	

Our palynostratigraphic age assignment rests on comparison with Jurassic palynostratigraphic zonations of New Zealand (de Jersey & Raine 1990; Zhang & Grant-Mackie 2001) and eastern Australia, the latter including both the informal unit system of Price (1997) and the formal zonation proposed in de Jersey & McKellar (2013), reviewed and partly modified in Bomfleur *et al.* (2014). According to these schemes, the following taxa are particularly informative:

Retitriletes semimuris (Danzé-Corsin et Laveine) McKellar.—This species is widely distributed throughout the Jurassic. Its first occurrence in Australia and New Zealand is at or slightly above the base of the Hettangian (de Jersey & Raine 1990, Zhang & Grant-Mackie 2001, de Jersey & McKellar 2013), in the *Toripustulatisporites hokonuiensis* Association Zone of de Jersey & McKellar (2013).

Podosporites variabilis Sukh Dev.—Incoming of this species in unspecified assemblages from southeastern Queensland defines the base of unit APJ2 of Price (1997; there recorded under the name *Podosporites tripakshii* Rao). Its first occurrence in the Surat Basin, eastern Australia, is near the base of de Jersey (1975)'s "Assemblage D" (see also Reiser & Williams 1969, there under the name *Podosporites* sp.), slightly higher than that of the index taxon of that assemblage, *Ischyosporites punctatus* Cookson & Dettmann (*I. crateris-punctatus* in Price 1997). The respective zone was only recently formally defined as the *Ischyosporites punctatus* Association Subzone (de Jersey & McKellar 2013) of the *Classopollis* Abundance Zone (below). In the Clarence-Moreton Basin, *Podosporites variabilis* and *Ischyosporites punctatus* appear at about the same level (de Jersey & McKellar 2013).

Classopollis Pflug.—Overall, the general pattern in first appearance, rise, and decline of cheirolepidiaceous pollen (*Classopollis* including *Corollina* Malyavkina; see Traverse, 2004) during the Triassic–Early Jurassic forms a series of key events for the palynostratigraphic zonation of southeastern Gondwana. First appearance of *Classopollis* in the regional palynological record is in the form of inconsistent and sporadic occurrences of massive-walled forms—referred to as *C. simplex* de Jersey & Paten or as "massive/unstructured specimens of *C. meyerianus*" (Klaus) de Jersey (see de Jersey & McKellar 2013)—in the upper Rhaetian: this is seen in the upper part of the *Foveosporites moretonensis* Association Subzone of the *Polycingulatisporites crenulatus* Association Zone of Bomfleur *et al*. (2014) and in the upper part of the equivalent informal unit APT5M of Bomfleur *et al.* (2014). Abundance of *Classopollis* increases and the intrapunctate forms (*C. meyerianus*) become increasingly prominent up across the Triassic-Jurassic boundary and throughout the Hettangian *Toripustulatisporites hokonuiensis* Association Zone (de Jersey & McKellar 2013) and the equivalent unit APT5U of Bomfleur *et al*. (2014)/APT522 of Price (1997). Near the top of that zone (de Jersey & McKellar 2013) and its equivalents (see Price 1997; Zhang & Grant-Mackie 2001; Bomfleur *et al.* 2014), around the Hettangian-Sinemurian boundary, appear the first, sporadic occurrences of intrastriate *Classopollis* grains variably referred to in the literature as *Corollina torosa* (Reissinger) Klaus, *Classopollis torosus* (Reissinger) Couper, *Classopollis classoides* Pflug, or—most recently and as followed in this paper—*Classopollis* sp. cf. *C*. *chateaunovii* Reyre. This is followed by the sudden rise of *Classopollis* pollen marking the base of the succeeding early Sinemurian to early Toarcian *Classopollis* Abundance Zone of de Jersey & McKellar 2013, and equivalent units APJ1, APJ2, and APJ31 of Price (1997). Throughout this zone and its equivalents, *Classopollis* is abundant and commonly dominant, but overall abundance decreases upwards, from highest proportions (up to 85%) in the lower part (*Classopollis* Abundance Subzone of de Jersey & McKellar 2013; unit APJ11 of Price 1997; see Bomfleur *et al.* 2014) to usually less than 25% throughout the upper part of the zone (*Ischyosporites punctatus* Association Subzone of de Jersey & McKellar 2013).

Based on the combination of taxon ranges outlined above, it follows that

(1) Occurrences of *Retitriletes semimuris*, of *Podosporites variabilis*, and *Classopollis* sp. cf. *C. chateaunovii* in our samples each indicate a Jurassic age.
(2) Abundance of *Classopollis* in our samples enables assignment to the *Classopollis* Abundance Zone (early Sinemurian to early Toarcian);
(3) Consistent co-occurrence of *Podosporites variabilis* enables assignment to the upper part of that zone, i.e., to the *Ischyosporites punctatus* Association Subzone.

At the same time, combination of the following observations is indicative of placement near the base of this subzone:

(1) The absence of additional index taxa of this subzone as a whole (*Ischyosporites* spp.);
(2) the absence of other taxa indicating a younger age within this subzone (e.g., *Nevesisporites vallatus*, *Antulsporites saevus*: see Price 1997, de Jersey & McKellar 2013);
(3) the still very high proportion of *Classopollis*, considered typical more of the underlying *Classopollis* Abundance Subzone.

In summary, the samples we analysed are here assigned to the basal part of the *Ischyosporites punctatus* Association Subzone of the *Classopollis* Abundance Zone, and are thus considered to be late Sinemurian in age.

Additional references

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