

## Supplementary Materials for

### **Pre-Gondwanan-breakup origin of *Beauprea* (Proteaceae) explains its historical presence in New Caledonia and New Zealand**

Tianhua He, Byron B. Lamont, Bruno Fogliani

Published 29 April 2016, *Sci. Adv.* **2**, e1501648 (2016)

DOI: 10.1126/sciadv.1501648

#### **The PDF file includes:**

- table S1. Numerical states for 11 pollen characters assessed on eight *Beauprea* species, five fossil pollen types, and four other extant genera in the same subfamily (Proteoideae) as *Beauprea*.
- table S2. Species, voucher information, and GenBank accession for all sequences included in this study.

## Supplementary Materials

table S1. Numerical states for 11 pollen characters assessed on eight *Beauprea* species, five fossil pollen types, and four other extant genera in the same subfamily (Proteoideae) as *Beauprea*. All characters were assessed on individual species, except that values for the non-*Beauprea*-related pollen types were mostly taken from Sauquet *et al.* (42).

Taxon	1	2	3	4	5	6	7	8	9	10	11
<i>Beauprea</i>											
<i>asplenioides</i>	2	2	0	0	3	0	0	5	1	1	0
<i>Beauprea balansae</i>	2	2	0	0/1	3	1	0	2	0	1	0
<i>Beauprea</i>											
<i>comptonii</i>	2	2	0	0	3	0	0	4	0	1	0
<i>Beauprea filipes</i>	2	2	0	0	3	0	0	3	0	1	0
<i>Beauprea gracilis</i>	2	1	0	0	3	0	0	2	0	1	0
<i>Beauprea montana</i>	3	1	0	0	3	1	0	2	0	1	0
<i>Beauprea</i>											
<i>montisfontium</i>	1/2	2/3	0	1/3	3	1	0	1/2	0	1	0
<i>Beauprea</i>											
<i>spathulifolia</i>	2	0/1	0	0/1	3	0	0	4	0	1	0
<i>Beaupreaidites</i>											
<i>diversiformis</i>	1/2/3	1	0	1	3	0	0	1/2	1	1	0
<i>Beaupreaidites</i>	1/2/3	1	0	0/1	3	0	0	1/4	0	1	0

*elegansiformis*

*Beaupreaidites*

*orbiculatus*            1/2      1/2      0      3      3      1      0      2      0      1      0

*Cranwellipollis*

*palisadus*            1/2      2/3      0      1      0      0      0      6      3      0      1

*Eidothea* sp.        2/3      1      3      0/1      0      0      1      0      0      0      0

*Franklandia*

*triaristata*        2/3/4/5    2/3      0      0/1/2    0      0      0      6      3      0      1

*Faurea* spp.        0/1      1      0/1/2/3    0/1    0/1/2    0    1/2    1/4    1      0      0

*Peninsulapollis*

*gillii*              0/1      1      0      2/3      3      0      0      4      1      1      0

*Protea* spp.        0/1      1/2      1/3      0/1      1/2      0      2      0/1/4    0/1    0      0

---

Pollen characters scored:

1. Pollen length [L] (distance between two pores): (0) very small (0 to 20  $\mu\text{m}$ ); (1) small (20 to 40  $\mu\text{m}$ ); (2) average (40 to 60  $\mu\text{m}$ ); (3) large (60 to 80  $\mu\text{m}$ ); (4) very large (80 to 100  $\mu\text{m}$ ); (5) huge (100 to 200  $\mu\text{m}$ ).
2. Pollen shape (outline in polar view): (0) distinctly concave; (1) more or less straight; (2) distinctly convex; (3) globose.
3. Polarity (outline in equatorial view): (0) isopolar (apertures in median equatorial plane); (1) anisopolar (apertures and proximal pole in the same plane); (2) strongly anisopolar (apertures below the proximal pole); (3) subisopolar (apertures below median equatorial plane).

4. Relative aperture size [ $A/L$  where  $A$  = aperture size]: (0) narrow (0% to 12%); (1) average (12% to 20%); (2) wide (20% to 30%); (3) huge (30% to 100%).
5. Aperture shape (outline in top view): (0) circular; (1) ellipsoid-lolongate; (2) slit-shaped; (3) colpoid; (4) lalongate; (5) colpate.
6. Supratectal gemmae scattered over surface: (0) no; (1) yes.
6. Tectum: (0) continuous to microperforate; (1) perforate; (2) foveolate; (3) reticulate; (4) verruco-areolate to rugulate; (5) clavate/gemmate; (6) semi-tectate.
7. Tectum homogeneity and polarity: (0) homogeneous and homopolar; (1) more or less heteropolar; (2) more or less heterogeneous.
8. Tectal microsculpture: (0) smooth; (1) perforate; (2) reticulate; (3) scabrate; (4) rugulate-areolate-granulate-pustulate; (5) verrucate; (6) clavate.
9. Relative exine thickness [ $E/L$  where  $E$  = exine thickness]: (0) thin (0% to 4%); (1) average (4% to 7%); (2) thick (7% to 10%); (3) very thick (10% to 20%).
10. Nexine dissolution at margin of pore: (0) absent; (1) present.
11. Continuity of tectum: (0) tectate; (1) intectate - baculate.

table S2. Species, voucher information, and GenBank accession for all sequences included in this study.

Taxon	<i>matK</i>	<i>ITS</i>	<i>rbcL</i>	<i>rpl16</i>	<i>trnL-trnF</i>	<i>trnLi</i>	<i>atpB-rbcL</i>	<i>atpB</i>	Voucher*
<i>Franklandia triaristata</i>				KT956876	KT956881	KT956892		KT956855	PP2014
<i>Beauprea asplenoides</i> Schltr.		KT956863			KT956882	KT956893			PPNC07
<i>Beauprea congesta</i> Viot.			KT956870		KT956883	KT956894	KT956850	KT956856	PPNC12
<i>Beauprea filipes</i> Schltr.	KT956868		KT956871		KT956884	KT956895	KT956851	KT956857	PPNC08
<i>Beauprea gracilis</i> Brongn. & Gris	KT956869	KT956864	KT956872	KT956877	KT956885	KT956896	KT956852	KT956858	PPNC01
<i>Beauprea montana</i> (Brongn. & Gris) Viot.		EU676065	KT956873		KT956886	KT956897	AF060749	KT956859	PPNC09
<i>Beauprea montisfontium</i> Guillaumin		KT956865			KT956887	KT956898			PPNC04
<i>Beauprea neglecta</i> Viot				KT956878	KT956888	KT956899		KT956860	PPNC02
<i>Beauprea pancheri</i> Brongn. & Gris			KT956874	KT956879	KT956889	KT956900		KT956861	PPNC05
<i>Beauprea spathulifolia</i> Brongn. & Gris		KT956866			KT956890	KT956901	KT956853		PPNC06
<i>Beaupreopsis paniculata</i>		KT956867	KT956875	KT956880	KT956891	KT956902	KT956854	KT956862	PPNC11
<i>Eidothea hardeniana</i> (Proteaceae)			DQ875826				AF061714	AF060395	
<i>Cenarrhenes nitida</i> (Proteaceae)		EU676067	DQ875827				AF060746	AF060396	
<i>Agastachys odorata</i> (Proteaceae)	EU169607		DQ875824				AF060717	AF060393	
<i>Platanus orientalis</i> (Platanaceae)	AM396503		AY858644		AM397164	AM397164			

<i>Sabia swinhoei</i> (Sabiaceae)	AM396512	AM183414	AM397158	AM183436	AF093395
<i>Meliosma cuneifolia</i> (Sabiaceae)	AM396513	AF206793	AM397160		AF209626
<i>Nelumbo lutea</i> (Nelumbonaceae)	AM366514	DQ182337	AY145359	EF377291	AF528853

---

\* Voucher specimens of *Beauprea* species were collected by T. He and B. Lamont, and were deposited in the Herbarium of the IRD Noumea (NOU), New Caledonia. *Franklandia triaristata* was collected by T. He, and was deposited in Biology Herbarium, Curtin University.