

Seed descriptions and illustrations

GYMNOSPERMS

Fruit often a cone; ovules naked; seed lacking true endosperm.

In many of the NZ gymnosperm genera, seeds have associated fleshy arils, scales or receptacles—where these are persistent in the dispersed fruit they are described with the seed: where they are soon separated from the seed, they are described as a second paragraph under the seed description.

ARAUCARIACEAE

Fruit a large woody many-seeded cone disintegrating when mature; seed often winged. Cotyledons 2–4.

AGATHIS Salisb.

Seed free from cone scales, compressed, winged. Cotyledons 2.

Seeds of *A. australis* are easily distinguished from those of both native *Libocedrus* species by their size, and the blunt apex and notched base of the body.

Agathis australis (D.Don) Lindl. [Pl. 1: 3] kauri

Seed usually with 2 very unequal wings in upper $\frac{1}{2}$ – $\frac{4}{5}$, sometimes with only the larger wing. Body obovate, 7–10(–11) mm long, strongly compressed with one surface often flatter, the wings on the 2 angles, sometimes with a central raised elliptic area; apex usually flattened or sometimes obtuse; base cuneate to a narrowly notched end. Narrower, shorter wing becoming broader toward apex of body, up to 15 mm wide. Broader, longer wing angled toward apex of body, usually obovate-oblong with broad rounded apex, sometimes elliptic, broadly ovate, oblong or square, 10–16(–17) mm long from end near base of seed. Surface dull, henna to brown, glabrous, distinctly reticulate, especially on wings, the cells mostly longitudinally elongate.

N.

CUPRESSACEAE

Fruit usually a many-seeded woody cone, rarely the cone scales fleshy; seed usually winged. Cotyledons 2–6.

LIBOCEDRUS Endl.

Cone of 4–6 valvate scales, the upper 2 fertile; seed winged.

- 1 Seed body 3.2–4.0 mm long, biconvex in section
 *L. bidwillii*
 Seed body (3.6–)4.0–6.0 mm long, biconvex or 3-
 angled in section *L. plumosa*

Libocedrus bidwillii Hook.f. [Pl. 1: 1] kaikawaka

Seed with 2 very unequal lateral wings running from base to near apex. Body ovate, 3.2–4.0 mm long, narrowed to an

apiculate tip projecting beyond wings, slightly compressed with the wings on the 2 angles; base oblique, comprising a large, circular, pale attachment scar. Narrower, shorter wing more or less even, *c.* 4–10 mm wide. Broader, longer wing angled toward apex of body, usually more or less oblong and broadly rounded to obtuse at apex, often waisted near body and broader above, sometimes more irregular, (3.5–)4.0–5.5 mm long from base of seed. Surface semi-glossy, orange to orange-brown, the body often darker and sometimes nut brown, glabrous, irregularly finely colliculate to reticulate with longitudinally elongate cells but pattern not well-defined.

N, S. The illustration shows the seed body at an oblique angle with the small apiculum to the right (lower two seeds) and left (upper two seeds) and the larger wing above.

Libocedrus plumosa (D.Don) Sarg. [Pl. 1: 2] kawaka

Seed with 2 very unequal lateral wings running from base to near apex. Body ovate, (3.6–)4.0–6.0 mm long, narrowed to an apiculate tip projecting beyond wings, slightly compressed or often 3-angled with the wings on 2 angles; base oblique, comprising a large, circular, pale attachment scar. Narrower, shorter wing more or less even, *c.* 3–10 (–14) mm wide. Broader, longer wing angled toward apex of body, usually more or less oblong and broadly rounded to obtuse at apex, or waisted near body and broader above, sometimes square to transversely oblong or more irregular, (2.5–)4.0–6.0 mm long from base of seed. Surface semi-glossy, orange to orange-brown, the body usually darker (henna to nut brown), glabrous, irregularly finely colliculate to reticulate with longitudinally elongate cells but pattern not well-defined.

N, S. The illustration shows the seed body at an oblique angle with the small apiculum to the left (lower two seeds) and the right (upper two seeds) and the larger wing above. Seeds illustrated are at the lower end of the size range for the species.

PHYLLOCLADACEAE

Fruit a cone but with the few seeds exposed, the aril and sometimes the cone fleshy; seed wingless. Cotyledons 2.

PHYLLOCLADUS Mirb.

Seed not fleshy, erect at maturity, surrounded by a cup-shaped aril at base and seated in the cone; cone somewhat fleshy, white, pink or bright red.

Seeds of the three indigenous species are not easily distinguished, but the following key should allow discrimination of most material.

- 1 Seed 2.5–2.9(–3.1) mm long; aril enveloping lower $\frac{1}{2}$ – $\frac{2}{3}$ of seed *P. alpinus*
 Seed (2.5–)3.0–3.6(–4.0) mm long; aril enveloping lower $\frac{1}{3}$ – $\frac{1}{2}$ of seed 2