

### Dipteryx (3.01–3.03)

Genus: *Dipteryx* J.C.D. von Schreber

Phylogenetic Number: 3.01.

Tribe: Dipteryx.

Species Studied—Species in Genus: 9 spp.—ca. 10 spp.

Fruit a nutlet or legume; 4.2–6.3 × 2.4–3.5 × 1.6–3 cm; with deciduous calyx; without orifice formed by curving of fruit or fruit segments; straight; not plicate; not twisted; symmetrical; circular to elliptic to ovate; not inflated; compressed; without beak; short tapered to rounded at apex; apex aligned with longitudinal axis of fruit; rounded at base; base aligned with longitudinal axis of fruit; with the apex and base uniform in texture; drupaceous; seed chambers externally invisible. Fruit margin not constricted; without sulcus; plain. Fruit stipitate; with the stipe 15 mm long. Fruit indehiscent. Replum invisible. Epicarp dull; monochrome; brown; glabrous (when dry) or pubescent but soon deciduous (when fresh); with pubescence uniformly distributed; with simple hairs; eglandular; without spines; not smooth; with elevated features; not veined; not tuberculate; exfoliating; with cracks; cracking irregular. Mesocarp thick; surface not veined; 1- or 2-layered; with balsamic vesicles; with fibers; firm-walled open empty cells (with balsamic vesicle); with fibers over solid layer; ligneous. Endocarp dull; monochrome; red (dish); fibrous (white fibers over reddish surface in *D. trifoliolata* A. Ducke) or smooth; nonseptate; coriaceous; exfoliating; remaining fused to mesocarp and epicarp; entire. Seed 1; length parallel with fruit length. Funiculus measured; up to 1 mm long; thick; straight. Aril absent.

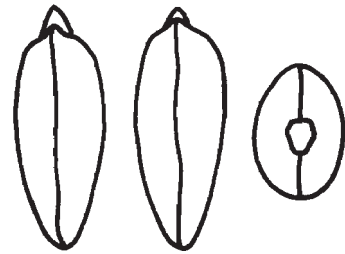
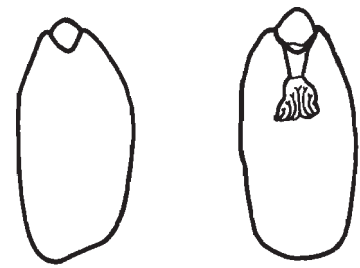
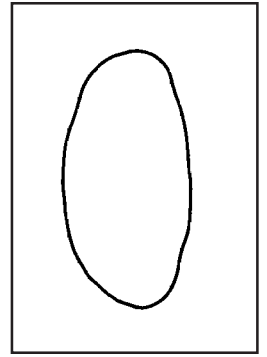
Seed 23–50 × 13–15 × 4–8 mm; not overgrown; not angular; symmetrical; elliptic, oblong, or ovate and linear; compressed; with surface grooved; with grooves reticulate; without visible radicle and cotyledon lobes; without umbo on seed faces. Testa not adhering to endocarp; dull; not modified by a bloom; colored; monochrome; black; glabrous; not smooth; with elevated features; reticulately wrinkled; coriaceous. Fracture lines absent. Rim absent. Raphe not visible. Hilum fully concealed; concealed by funicular remnant; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; larger than punctiform; 5 mm long; with curved outline; elliptic; subapical or marginal according to radicle tip; flush; not

within corona, halo, or rim. Lens not discernible. Endosperm absent. Cotyledons not smooth; wrinkled; both outer faces convex; both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; partially concealing radicle (by radicle); notched at or split over radicle; without or with lobes; with the interface division terminating at base of radicle; without margins recessed; yellow or red (dish); inner face flat; glabrous around base of radicle. Embryonic axis straight; parallel to length of seed. Radicle linear; straight with embryonic axis; centered between cotyledons; less than 1/2 length of cotyledons. Plumule well developed; glabrous.

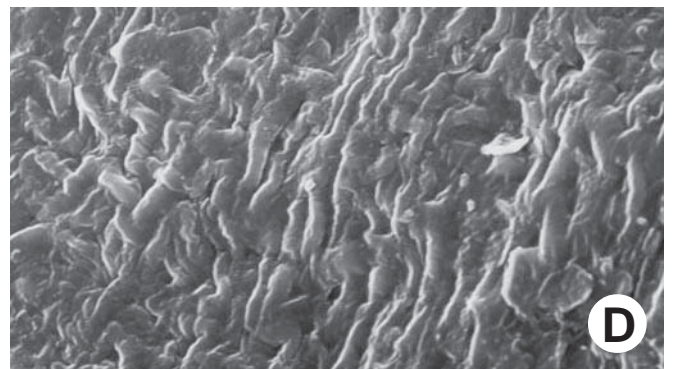
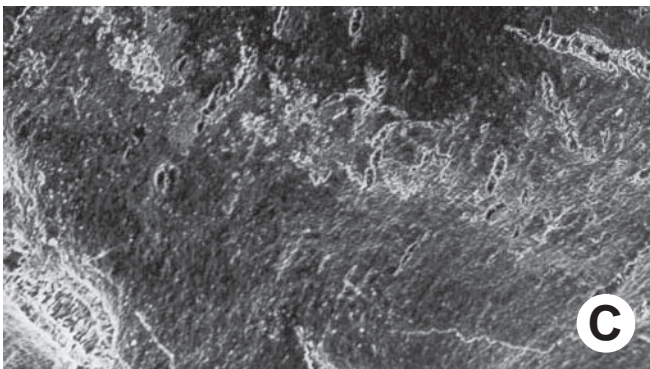
Distribution: Central and South America.

Notes: Polhill (1981c) noted that the tribe has “woody dehiscent valves, or with stony endocarp tardily opening on ground, or winged around the hard central seed-chamber with epicarp flaking.” Melhem (1974a,b, 1975) reported on the morphology, anatomy, and germination of seeds of *D. alata* (J.R.T. Vogel) P.H.W. Taubert.

*Dipteryx*: *D. punctata* (J. Blake) G.J.H. Amshoff (C–E), *D.* spp. (A–B). A, Fruits, valves, fruits in transection, and fruit without epicarp (× 0.8); B, seeds (× 1.8); C–D, testa (× 50, × 1000); E, embryos (× 1).



E



Genus: *Taralea* J.B.C.F. Aublet

Phylogenetic Number: 3.02.

Tribe: Dipteryxae.

Species Studied—Species in Genus: 3 spp.—ca. 5 spp.

Fruit a legume; unilocular;  $3-7.5 \times 1.5-4 \times 0.8-1.2$  cm; with deciduous calyx; without orifice formed by curving of fruit or fruit segments; straight; not plicate; not twisted; asymmetrical; when asymmetrical with 1 straight and 1 curved suture; widest near middle or D-shaped; not inflated; flattened; without beak; short tapered at apex; apex oblique (or nearly so) with longitudinal axis of fruit; rounded at base; base aligned with longitudinal axis of fruit; with the apex and base uniform in texture; ligenous; seed chambers externally visible or invisible; with the raised seed chambers not torulose. Fruit margin not constricted; without sulcus; plain. Fruit wings absent. Fruit nonstipitate (based on loose fruits). Fruit with all layers dehiscing; splitting along sutures. Dehiscence of valves along both sutures; probably apical and down; active or passive; with valves enrolling. Replum invisible. Epicarp dull; monochrome; black or brown; glabrous; eglandular; without spines; not smooth; with elevated features; longitudinally veined relative to fruit length; not tuberculate; not exfoliating; without cracks. Mesocarp thick; 1-layered; without balsamic vesicles; without fibers; solid; ligenous. Endocarp dull; monochrome; tan; smooth; nonseptate; coriaceous; not exfoliating; remaining fused to mesocarp and epicarp. Seeds 1 or 2; length parallel with fruit length; neither overlapping nor touching; in 1 series. Funiculus measured; 1 mm long; of 1 length only; thick; straight. Aril absent.

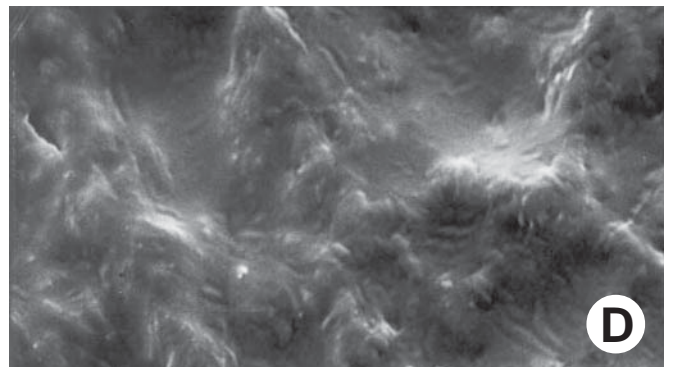
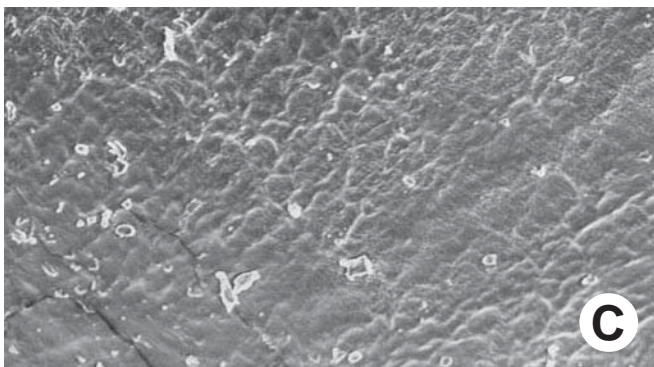
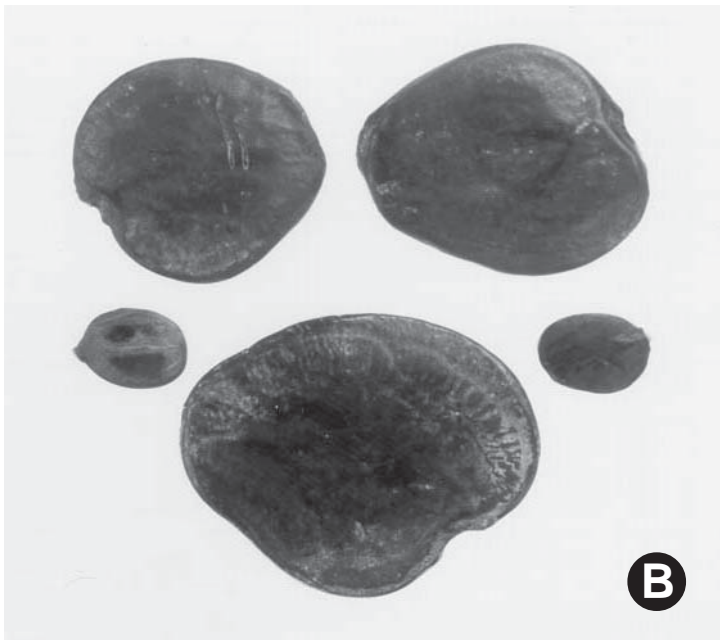
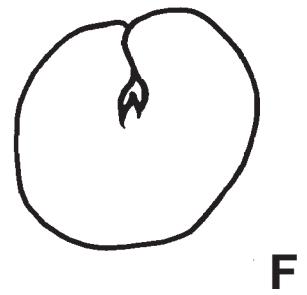
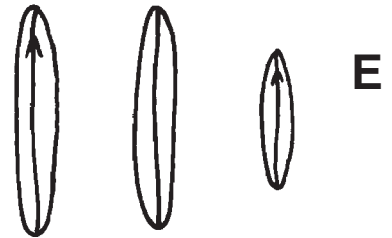
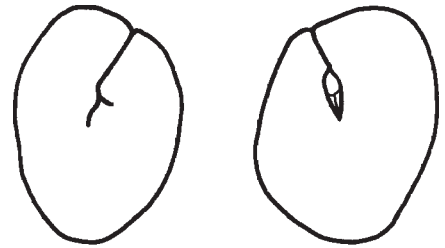
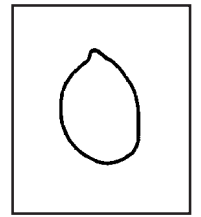
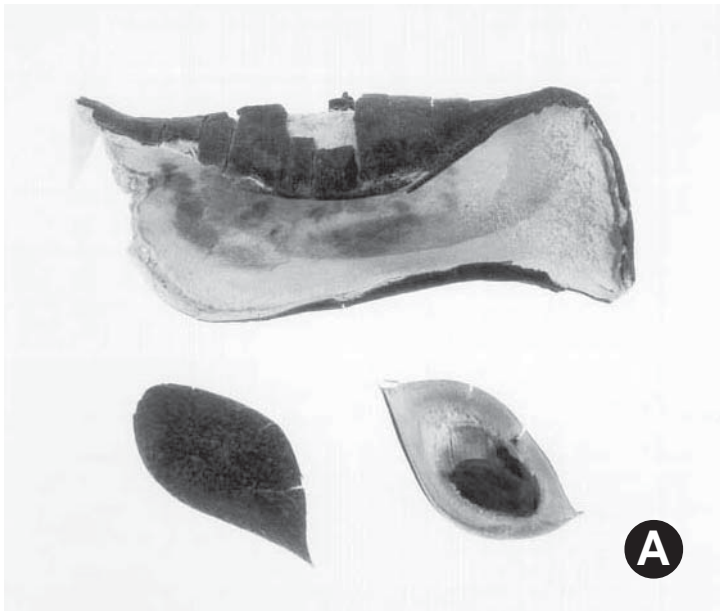
Seed  $22-32 \times 18-27 \times 5$  mm; not overgrown; angular or not angular; asymmetrical; circular to ovate to rhombic; compressed to flattened; without visible radicle and cotyledon lobes; without umbo on seed faces. Testa not adhering to endocarp; dull; not modified by a bloom; colored; monochrome; dark brown; glabrous; not smooth; with elevated or recessed features; somewhat wrinkled; faintly, longitudinally striate; coriaceous. Fracture lines absent. Rim absent. Raphe not visible. Hilum visible; without faboid split; punctiform; subapical or marginal according to radicle tip (depending on shape of seed); recessed; not within corona, halo, or rim. Lens not discernible. Endosperm absent. Cotyledons smooth or not smooth; wrinkled (*T. oppositifolia* J.C.B.F. Aublet); both outer faces convex;

both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; completely concealing radicle; split over radicle; with lobes; with the interface division terminating at base of radicle; without margins recessed; brown; inner face flat; glabrous around base of radicle. Embryonic axis straight; oblique to length of seed. Radicle linear; oblique to cotyledons; centered between cotyledons; less than 1/2 length of cotyledons. Plumule moderately developed; glabrous.

Distribution: Tropical South America.

Notes: Cowan (1958) included *Taralea* in *Dipteryx* (3.01) because only the fruit differ significantly. *Taralea* has dehiscent fruits and *Dipteryx* has indehiscent fruits. Polhill (1981c) also noted that the seeds are “quite different” and that there is a leaflet difference, thus he provisionally accepted *Taralea* as a genus. Our data supports Polhill’s treatment.

*Taralea: T. crassifolia* (G. Bentham) W.A. Ducke (C–E), *T.* spp. (A–B). A, Valves ( $\times 1$ ); B, seeds ( $\times 1.6$ ); C–D, testa ( $\times 50$ ,  $\times 1000$ ); E, embryos ( $\times 1$ ); F, external embryo ( $\times 1$ ).



Genus: *Pterodon* J.R.T. Vogel

Phylogenetic Number: 3.03.

Tribe: Dipteryxae.

Species Studied—Species in Genus: 3 spp.—ca. 6 spp.

Fruit a nutlet or legume;  $3-6 \times 2-3.5 \times 0.5-0.7$  cm; with deciduous calyx; without orifice formed by curving of fruit or fruit segments; straight; not plicate; not twisted; symmetrical; oblong to ovate; inflated; flattened; without beak; tapered or rounded at apex; apex aligned with longitudinal axis of fruit; short tapered to rounded at base; base aligned with longitudinal axis of fruit; with the apex and base uniform in texture; drupaceous; seed chambers externally invisible. Fruit margin not constricted; without sulcus; plain or embellished. Fruit wing present (readily visible when epicarp exfoliates); 1; 5–25 mm wide (most of our samples with damaged or nearly missing wings); continuous wing around fruit; on both sutures. Fruit substipitate. Fruit indehiscent. Replum invisible. Epicarp dull; monochrome; black; glabrous; without spines; not smooth; not veined; not tuberculate; exfoliating; with cracks; cracking irregular. Mesocarp thick; surface veined over seed chamber and inconspicuously veined on wing; 1-layered; with balsamic vesicles; without fibers; firm-walled open empty cells (with balsamic vesicles); ligneous. Endocarp dull; monochrome; tan; fibrous or spongy; nonseptate; coriaceous; not exfoliating; remaining fused to mesocarp and epicarp; entire. Seed 1; length parallel with fruit length. Funiculus measured; up to 1 mm long; thick; straight. Aril dry; rim-aril; brown.

Seed  $8.5-9.5 \times 4-5 \times 1.5-3.5$  mm; overgrown, 1 seed filling entire fruit cavity; not angular; symmetrical (except for hilum); oblong or ovate; compressed; without visible radicle and cotyledon lobes; without umbo on seed faces. Testa not adhering to endocarp; dull; not modified by a bloom; colored; monochrome; black or tan; glabrous; smooth; coriaceous. Fracture lines absent. Rim absent. Raphe from hilum through lens to base of seed and terminating; not bifurcating; darker than testa; black; flush. Hilum partially to fully concealed; concealed by aril; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; punctiform; marginal according to radicle tip; recessed; within rim. Hilum rim color of testa. Lens discernible; equal to or greater than 0.5 mm in length; 1 mm long; with margins straight or curved; oblong; not

in groove of raphe; adjacent to hilum; mounded; dissimilar color from testa; darker than testa; dark brown; within rim. Lens rim color of testa. Endosperm absent. Cotyledons smooth; both outer faces convex; both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; partially concealing radicle; split over radicle; with lobes; with the interface division terminating at base of radicle; white; inner face flat; glabrous around base of radicle. Embryonic axis straight; parallel to length of seed. Radicle linear; straight with embryonic axis; centered between cotyledons; less than 1/2 length of cotyledons. Plumule well developed; glabrous.

Distribution: Brazil and Bolivia.

Notes: Polhill (1981c) noted that a “critical reappraisal is needed” for *Pterodon*. Hutchinson (1964) noted that the seeds are “full of balsam oil.” The mature epicarp readily exfoliates, leaving the mesocarp with its fragile wing and woody seed chamber. Other legume fruits whose winged mesocarps “dehisce” from the epicarp include these diverse genera: *Amburana* (1.15), a faboid genus in tribe Sophoreae; *Schizolobium* (1.17), a caesalpinoid genus in tribe Caesalpinieae (Gunn 1991); and *Wallaceodendron* (5.16), a mimosoid genus in tribe Ingeae (Gunn 1984). The former two genera have winged mesocarps that are samaralike and the latter genus has winged mesocarp segments that have two marginal wings. *Pterodon* has a wing that encircles the mesocarp unit.

*Pterodon*: *P. polygalaeflorus* G. Bentham (C–E), *P.* spp. (A–B). A, Fruit with epicarp and two fruit without epicarp ( $\times 1$ ); B, seeds ( $\times 6.9$ ); C–D, testa ( $\times 50$ ,  $\times 1000$ ); E, embryos ( $\times 5$ ).

