

Cicereae (20.01)

Genus: *Cicer* C. Linnaeus

Phylogenetic Number: 20.01.

Tribe: Cicereae.

Species Studied—Species in Genus: 28 spp.—43 spp.

Fruit a legume; unilocular; 1.8–3.6 × 0.7–2 cm; with deciduous calyx; without orifice formed by curving of fruit or fruit segments; straight; not plicate; not twisted; symmetrical; elliptic to oblong to obovate to rhombic (elongate); not inflated; terete; without beak; short tapered at apex; apex aligned with longitudinal axis of fruit; short tapered at base; base aligned with longitudinal axis of fruit; with the apex and base uniform in texture; membranous; seed chambers externally invisible. Fruit margin not constricted; without sulcus; plain. Fruit wings absent. Fruit nonstipitate. Fruit with all layers dehiscing; splitting along sutures. Dehiscence of valves along both sutures; apical and down; active or passive; with valves twisting. Replum invisible. Epicarp dull; monochrome; brown or yellow (-brown); glabrous or pubescent and indurate; with 1 type of pubescence; pilose; with pubescence gray; with pubescence uniformly distributed; with simple hairs; pliable; with hair bases plain; glandular or eglandular; with glandular hairs; without spines; not smooth; with elevated features; obliquely veined relative to fruit length; not tuberculate; not exfoliating; without cracks. Mesocarp thin; 1-layered; without balsamic vesicles; without fibers; solid; coriaceous. Endocarp glossy; monochrome; tan; smooth; nonseptate; chartaceous; not exfoliating; remaining fused to mesocarp and epicarp; entire. Seeds 1–2(–7); touching, or neither overlapping nor touching; in 1 series. Funiculus measured; 1.5 mm long; of 1 length only; thick; straight. Aril absent.

Seed 4–11 × 2.5–9 × 3–7 mm; overgrown, 1 seed filling entire fruit cavity; angular or not angular; asymmetrical; ovate or bilobed, ramshead-shaped (typically beaked); terete to quadrangular; with surface grooved; with grooves longitudinal; with or without visible radicle and cotyledon lobes; without umbo on seed faces. Testa not adhering to endocarp; dull; not modified by a bloom; colored or clear (*C. arietinum*); monochrome or mottled; with frequent mottles; black, brown, cream, gray, green, ivory, olive, orange (yellowish), pink (gray-brown), red, tan, white, or yellow; glabrous; smooth or not smooth; with elevated features;

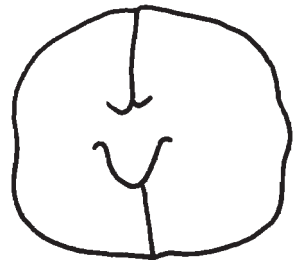
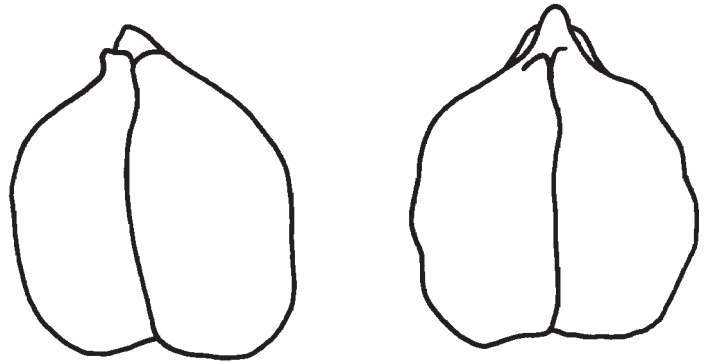
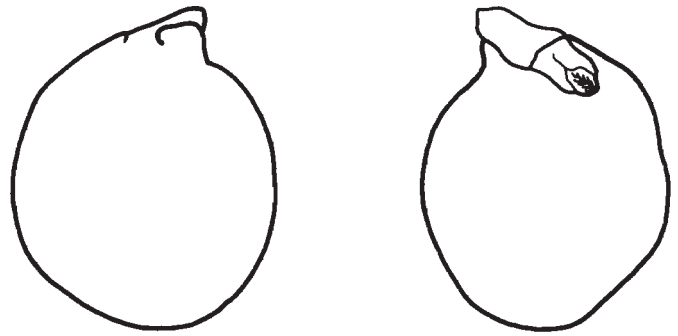
shagreen, tuberculate, warty, wrinkled, or echinate; coriaceous. Fracture lines absent. Rim absent. Raphe from lens to base of seed and bifurcating (*C. arietinum*); bifurcating at base of seed with each arm going up antiraphe side, then turning (U-shaped) down and approaching bifurcation; color of or darker than testa; tan, brown, or black; flush or recessed. Hilum visible; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; larger than punctiform; 0.5–1.7 mm long; with curved outline; circular or elliptic; marginal according to radicle tip or between cotyledon and radicle lobe; recessed; within rim or not within corona, halo, or rim. Hilum rim color lighter than or color of testa. Lens discernible; equal to or greater than 0.5 mm in length; 2 mm long; with margins straight or curved; triangular; elliptic; not in groove of raphe; adjacent to hilum; 1.5–2 mm from hilum; mounded or recessed; same color as or dissimilar color from testa; darker than testa; red; not within corona, halo, or rim. Endosperm thin; covering entire embryo; adnate to testa. Cotyledons smooth or not smooth; wrinkled (replicating testa surface); 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 lobes touching (auriculate); with basal groin formed by lobes; with the interface division terminating at base of radicle; without margins recessed; white; inner face flat; glabrous around base of radicle. Embryonic axis straight, or deflexed; parallel or oblique to length of seed. Radicle linear; lobe tip straight or curved; straight with embryonic axis or oblique to cotyledons; centered between cotyledons; less than 1/2 length of cotyledons. Plumule well developed; glabrous.

Distribution: Turkey south to Israel and east to the Himalayas and Central Asia; also in Morocco, Egypt, Ethiopia, Greece, and Crete. *Cicer arietinum* is widely cultivated.

Notes: After a cladistic analysis using morphological characters, including internal seed morphology, Endo and Ohashi (1997) proposed that Cicereae and Fabeae (19) form a monophyletic group whose sister group is Trifolieae (21). Van der Maesen (1972, 1987) monographed *Cicer*. Lersten and Gunn (1981, 1982) discussed the seed morphology and testa topography of *Cicer* species, which supported the separation of Cicereae from the Fabeae (19) (Werker 1997). Following traditions in the Indian subcontinent, Summerfield and Roberts (1985a) recognized two groups for the

guidance of plant breeders: Genotypes producing large, rounded, pale cream-colored seeds (greater than 25 g per 100 seeds) borne on tall plants (Kabuli), and genotypes producing smaller irregularly shaped, variously-colored seeds (less than 25 g per 100 seeds) borne on relatively short to prostrate plants (Desi).

Cicer: *C. arietinum* C. Linnaeus (*C–E*), *C. spp.* (*A–B*). *A*,
Fruits ($\times 1.6$); *B*, seeds ($\times 2.1$); *C–D*, testa ($\times 50$,
 $\times 1000$); *E*, embryos ($\times 5$).



E

