

Cordylanthus rigidus (Benth.) Jepson subsp. *setigerus* T. I. Chuang & Heckard, DARK-TIPPED BIRD'S-BEAK. Annual, photosynthetic root parasite (hemiparasite), feathery, taprooted, 1–several-stemmed at base, with an ascending lateral branch from each node along main axis, erect, 20–175 cm tall; shoots short-hairy and sparsely hirsute with long hairs having swollen bases (pustulate), drying \pm hispid; upper taproot (hypocotyl-root axis) with colorful brown-orange surface and thick wood (large specimen), wood in root pale orange. **Stems:** cylindric, to 12 mm diameter, green, short-hairy and sparsely hispid with long, pustulate hairs. **Leaves:** helically alternate, unlobed to deeply pinnately 3-lobed with slender lobes, sessile, without stipules; blade linear and threadlike to linear-lanceolate (unlobed) and deeply 3-lobed from within 10 mm of base, 10–47 mm long, central lobe 25–40 mm long and lateral lobes $1/2$ – $3/4$ length of central lobe, lobes and blade axis < 1 mm wide, often folded along midrib or inrolled, entire, acute to obtuse at tips, with only midrib conspicuous and slightly raised on lower surface, short-hairy, lower surface also sparsely hispid along midrib and on margins. **Inflorescence:** leafy, headlike cyme, terminal, spheroid, 10–25 mm across, with 5–15 flowers, often consisting of several clustered cymes, cyme branchlet spikelike, 2–3-flowered (often also with a miniature, undeveloped future flower), bracteate, short-hairy and sparsely hirsute; bract (“outer bract”) subtending pedicel leaflike, deeply 3-lobed, 19–26 mm long, axis at base ca. 1–1.5 mm wide with narrower, linear lobes, green, sometimes tips slightly expanded, inrolled, and deep purple, long-hirsute and soft-pubescent; “pedicel” ± 1.5 mm long, bracts at top of pedicel and subtending flower 1–2, typically unlobed or 3-lobed, $<$ outer bract; bractlet subtending flower (“floral bract”) sheathlike, open and overlapping at base, boat-shaped, 11 – 16.5×2.5 – 4 mm increasing in fruit and persistent, keeled, 5-veined, densely puberulent with veins raised on back, pilose-ciliate on margins and having long white hairs approaching tip, the long hairs with purple bases, internally with evenly spaced glandular hairs and some nonglandular hairs approaching tip. **Flower:** bisexual, bilateral, 6–7 mm across; **calyx** resembling a closed sheath and distichous with sheathing bractlet, 10 – 17×2 – 4 mm increasing in fruit; tube ca. 1 mm long; green with red-purple at tip and on margins, with at least 6 parallel veins slightly raised, obtuse and commonly minutely 2-toothed or 4-toothed at tip, densely pubescent, internally with evenly spaced glandular hairs, persistent around fruit; **corolla** 2-lipped, appearing like a bird's beak, 10–16.5 mm long, evenly short-hairy; tube + throat 6–9 mm long, flaring into lips, tube yellowish to yellowish green and throat grading into white or yellow with green veins, longitudinally 3-pouched, pleated between pouches, with a U-shaped, red-burgundy mark on lower side (darker on inside), the pouches and pleats continuing into lower lip; lips yellowish or mostly white and yellowish green in center and approaching tip; upper lip terminating in a green-ribbed, helmet (galea) compressed side-to-side, concealing anthers and stigma; lower lip faintly 3-lobed, fleshy above midpoint on margins, marked red-burgundy on margins at base of lip, short-hairy and glandular-puberulent on inner and outer portion approaching tip, sometimes pilose centrally on outer surface; **stamens** 4, lacking staminode, 2 arising below lower lip, 2 arising below upper lip (galea), all fused at same level to corolla tube; filaments of longer pair fused to floor of corolla 4–10.5 mm long (lower stamens) and filaments of short pair fused to roof of tube 2.5–8 mm long (upper stamens), greenish, villous on 1 side; anthers dorsifixed, dithecal, the sacs separate, ca 1.5 mm long and equal (upper anthers) and 1.5 mm and 0.5 mm long (lower anthers), yellow,

oblique, short-ciliate on margins of aperture, longitudinally dehiscent; pollen whitish; **nectary** obliquely arched at base of ovary, dark green, nectar copious around ovary; **pistil** 1; ovary superior, ovoid to obovoid slightly compressed side-to-side, 3.5–4.1 mm long, glossy green, glabrous, 2-chambered, each chamber with 10–14 ovules attached to center; style 6–12 mm long, white at base changing to light purplish red with the terminal 1 mm thicker and green, bent and conforming to curve of galea; stigma terminal, short-papillate. **Fruit:** capsule, loculicidal, dehiscent by 2 valves, 20–25-seeded, cylindric-obovoid, 8–11 × 2.5 mm, semi-transparent brown, valve with medial furrow, ribbed at suture zones; typically still surrounded by old corolla. **Seed:** irregularly ovoid, 1.5–2 mm long, dark brown, irregularly wavy-striped. Late June–early September.

Native. Hemiparasitic annual occurring especially along trails in chaparral and southern oak woodland as well as open grassy areas throughout the range, presumably parasitic during part of its life on roots of neighboring annuals. *Cordylanthus rigidus* subsp. *setigerus*, formerly treated as *C. filifolius* Nutt. has two forms, green and reddish, often growing side by side. Its foliage initially is soft and feathery but becomes somewhat hispid as the plants dry out. Leaves typically have three slender lobes. Flowers are produced during summer in dense, leafy heads (often described as “spikes”), which are shortly branched, condensed cymes with three forms of bracts. Subtending the axis below the flower (often referred to as a pedicel) is a three-lobed bract resembling a leaf, and directly subtending the flower typically there are two more green, but slender, three-lobed or unlobed bracts; in the literature these three have been termed outer bracts. Sheathing the flower is the very different bractlet (in the literature termed a floral bract), broad with overlapping margins and five parallel veins in the green tissue. The bractlet is structurally similar to the calyx, which instead has a short tube with six parallel veins in the green tissue. Both the bractlet and the calyx have glandular hairs covering inner surfaces and are persistent around the fruit. The two-lipped corolla is yellow or mostly white with red-burgundy markings and resembles a bird’s beak, hence the common name, and stamens and the stigma are included, hidden in the “beak” of a corolla lip.

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