

florets, and achenes are smaller than in *lanata*, it is fair to assume that *Mairei* is also a diploid with eight pairs. Geographic distribution is consistent with this hypothesis. It is possible, however, that there are other diploid species in the Yunnan region which may have been involved in the origin of *paleacea*.

13. *Youngia lanata* sp. nov. (Fig. 19)

Herba perennis, 9–28 cm alta; radix tenuis; caudex 4–7 mm latus, fuscus; folia caudicalia pauca, parva, scandentia, obovalia vel oblanceolata, petiolata, infra fusca et tomentosa, supra pubescentia; folia caulina

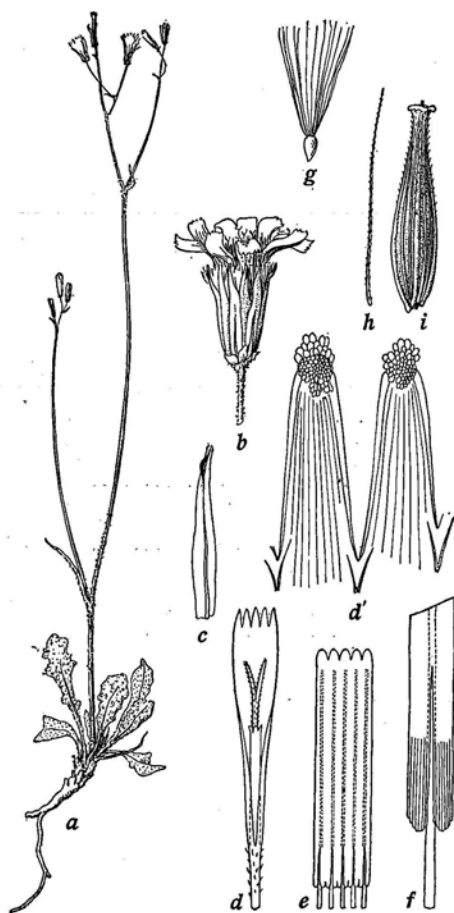


FIG. 19—*Youngia lanata*, a–g, from type (DL); h, i, from *Maire 2872* (UC 388604): a, whole plant,  $\times \frac{1}{2}$ ; b, head with all florets in anthesis,  $\times 2$ ; c, inner involucre bract, outer face,  $\times 4$ ; d, floret lacking ovary,  $\times 4$ ; d', detail of ligule-teeth,  $\times 50$ ; e, anther-tube,  $\times 8$ ; f, detail of appendages,  $\times 32$ ; g, ovary with pappus,  $\times 4$ ; h, i, achene (nearly mature) and pappus-bristle,  $\times 8$ .

pauca, bracteaformia; caulis erectus, fuscus ad nodos, dichotomus cum 2–4 ramis, rami stricti, inflorescentia paniculata vel corymbiformia; pedunculi filiformes, tomentulosi; capitula pauca, parva, 9–10-flora;

involucrum nigro-viride, glabratum, squamæ exteriores ovatæ, 1–1.5 mm longæ, interiores lanceolatæ, 5–6 mm longæ cum crista brevissima; corolla flava, 10 mm longa; antheræ viridulæ, circa 4 mm longæ; stylus flavus, rami 1.5 mm longi; achænia fusca, 3.25 mm longa, fusiformia, compressa, forte attenuata ad apicem, cum 14 costis inæqualibus; pappus albus, 3.5–4 mm longus, persistens.

Perennial, 9 to 28 cm high; taproot slender, woody, straight or oblique; caudex 4 to 7 mm wide, covered with brown bases of old petioles; caudical leaves 4 to 7, ascending, up to 10 cm long, 1.5 cm wide, obovate to oblanceolate, obtuse or acute, sinuately or runcinately dentate, papillose-mucronate, margin retrorsely revolute, abruptly or gradually attenuate into a winged petiole, brown-woolly at base of petiole, fuscous-tomentose below, pubescent above with short pale crinkled several-celled trichomes; cauline leaves 1 to 3, reduced, linear, mostly bractlike, brown-woolly at base; stem erect, sinuate, terete, striate,  $\pm$  brown-woolly especially at bifurcations, dichotomously 2- to 4-branched, branches strict, slender, shorter than or equal to axis, aggregate inflorescence paniculate-corymbiform; peduncles 4 to 15 mm long, filiform, lanate or tomentulose; heads few, erect, small, 9- to 10-flowered; involucre cylindric, 6 to 7 mm high, dark green, glabrous; outer involucral bracts about 5, ovate, 1 to 1.5 mm long, acute or acuminate; inner bracts 8, lanceolate, acute, 5 to 6 mm long, with pale membranous margins, glabrous on both sides, dorsally 1-nerved, alternate bracts with a very short wing or small salient claw near tip; corolla 10 mm long; ligule 1.5 mm wide; teeth 0.6 mm long, conspicuously gland-crested, hooded, anteriorly labiate; corollatube 2 mm long, sparsely pubescent with very short (up to 0.1 mm) acicular hairs; anther-tube about  $4 \times 1$  mm dis., greenish yellow; filaments slender, extending beyond appendages 0.3 mm; appendages 0.7 mm long, oblong, obtuse, united; style-branches 1.5 mm long, 0.1 mm wide, attenuate toward tip, yellow; achenes (nearly mature) dark brown, 3.25 mm long, 0.5 mm wide, fusiform, strongly attenuate to the narrow (about 0.2 mm wide) summit below the slightly expanded pappus-disk, narrowed to the oblique calloused hollow base, base 0.25 mm wide,  $\pm$  compressed, about 14-ribbed, ribs unequal, with 3 to 4 stronger ones, rounded, spiculate toward summit; pappus white, 3.5 to 4 mm long, 2-seriate, rather coarse, soft, barbellulate, persistent. Flowering May to June; flowers yellow, ligules tinged purplish red, teeth purple.

Known only from the type locality.

CHINA: Yunnan, rocks on mountain behind Tong-tchouan (= Tung-chwan?), 2600 m alt., *E. E. Maire* (DL), right-hand plant is *type*; *ibid.*, fissures of rocks, mountains behind Tong-tchouan, 2700 m alt., *E. E. Maire* 2872 (UC).

#### RELATIONSHIP

Close to *Y. fusca*, from which it is very distinct in the more strongly attenuate achenes and much shorter pappus, the shorter florets and style-branches, and the shorter, oblong, obtuse anther-appendages.

Similar also to *Y. paleacea typica*, but smaller, and differing from all three subspecies of *paleacea* in the strongly attenuate but scarcely beaked achenes. From its close resemblance to *paleacea* and its small size, it

might well be one of the diploid ancestors of that polyploid species. This supposition is supported by the comparison of stomatal sizes. In *Y. lanata* the average length of the stomata on caudical leaves is  $26 \mu$ , whereas on *paleacea typica* it is  $34 \mu$ . Another species which, from its morphology, may have been one of the diploid ancestors of *paleacea* is *Y. Mairei*. From this species *lanata* is distinct in its larger, more attenuate achenes, longer florets, anther-tubes, and style-branches, and shorter, obtuse anther-appendages.

14. *Youngia fusca* (Babcock) comb. nov. (Fig. 20)

Perennial, 20 to 40 cm high; taproot slender, woody, oblique or straight; caudex 1 cm wide, leafy or covered with brown bases of old leaves; caudical leaves up to 8 cm long, 1.5 cm wide, oblanceolate, acute,

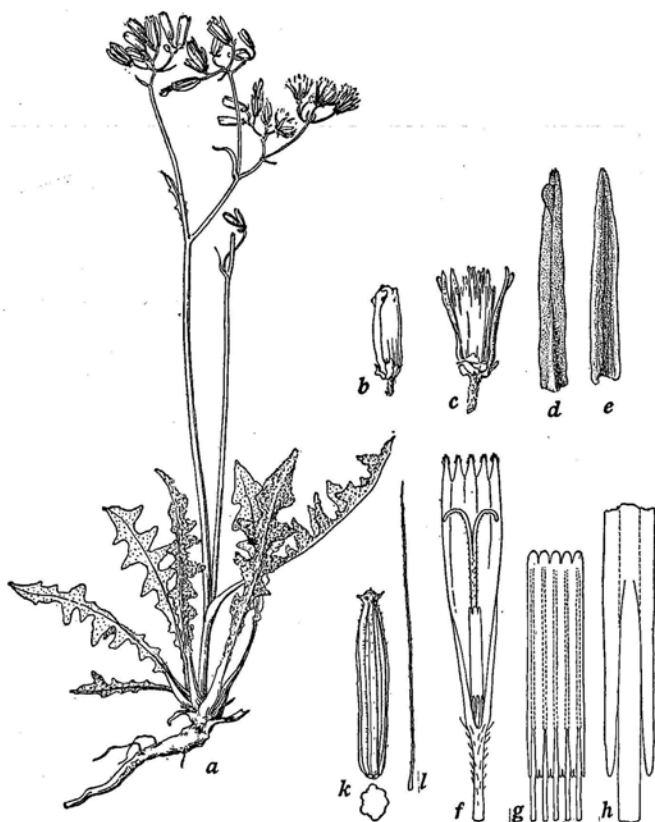


FIG. 20—*Youngia fusca*, from type (K): a, plant,  $\times \frac{1}{2}$ ; b, young head,  $\times 2$ ; c, head before anthesis, part of inner bracts removed,  $\times 2$ ; d, e, 2 inner involucre bracts, dorsal and ventral,  $\times 4$ ; f, floret lacking ovary,  $\times 4$ ; g, anther-tube,  $\times 8$ ; h, detail of appendages,  $\times 32$ ; k, achene and outline of cross-section,  $\times 8$ ; l, pappus-bristle,  $\times 8$ .

attenuate into a winged petiole with clasping base, sinuate-dentate to runcinate-pinnatifid, margins retrorsely revolute, brown-woolly at base of petiole and beneath, densely pubescent above with short crinkled hairs; cauline leaves similar, or sessile, subamplexicaul, uppermost linear