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A REEVALUATION OF BUDDLEIA CORRUGATA

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As a thesis at the L. H. Bailey Hortorium, Cornell University, I prepared a revision of the North American species of *Buddleia* (Loganiaceae). This revision has not yet been published. However additional material from Baja California, Mexico, has recently become available which has made it necessary to alter the interpretation of two species treated in the thesis.

Buddleia corrugata was first collected by Marcus Jones at Arroyo Hondo (he spelled it Undo), Loreto, in October 1930. This locality lies at an altitude of approximately 2000 ft. on the north side of Cerro Giganta. The type collection is quite depauperate. Now with additional collections from several areas of Baja California, the species can be much better defined and the variability better evaluated. Material from the Cape Region which had been interpreted in my thesis as a different, if closely allied species, should be regarded as a subspecies of *corrugata*. Two recent collections from the area of Volcan Las Tres Virgenes are very similar to the type in morphology and it seems best to treat them also as a subspecies.

The pattern of variation in *B. corrugata* may be a reflection of the geologic history of Baja California. During pre-Pleistocene time the Cape Region was cut off repeatedly from the northern part of the peninsula (Durham and Allison, 1960) thus isolating the two areas and allowing divergent evolution to take place. The volcanic peaks of Las Tres Virgenes which arose in late Miocene (Savage, 1960) similarly provided an area where ecotypic variation could develop.

KEY TO THE SUBSPECIES

Leaves ovate, 0.7-3.0 cm broad.

Lower surface of the leaves with erect pubescence, the stellate hairs candelabra; calyx 2.0-2.5 mm long; corolla 2.5-3.7 mm long; capsule 1.5-2.0 mm long
B. corrugata ssp. *corrugata*

Lower surface of the leaves with appressed pubescence, the stellate hairs mostly simple; calyx 3.0-4.0 mm long; corolla 4.0-5.5 mm long; capsule 2.5-3.0 mm long.....*B. corrugata* ssp. *gentryi*

Leaves linear, 0.2-0.3 mm broad.....*B. corrugata* ssp. *moranii*

BUDDLEIA CORRUGATA Jones, Contr. West. Bot. 18:56.1933, ssp. *CORRUGATA*. Shrub dioecious, 0.5–1.0 m high, with diffuse growth, the young twigs stellate-tomentose, the older branches greyish with rimose bark, the old naked branchlets persisting; leaves greyish-green with petiole 0.3–0.5 cm long, the stipular line inconspicuous, the blade ovate 1.0–3.0 cm long, 0.7–1.5 cm broad, thick erect stellate tomentum on both surfaces, underlain by glandular trichomes, the apex acute or obtuse, the base cuneate, somewhat decurrent, the margin strongly crenate or dentate; inflorescences sometimes branching at the base, with 3–15 pairs of sessile or short-pedunculate heads subtended by bracts, each head 0.5 cm in diameter usually with 5 flowers; calyx tubular, stellate outside, the tube 1.2–1.5 mm long, the lobes acute 0.5–1.0 mm long; corolla orange at maturity, campanulate, stellate-tomentose outside on upper half, the tube 1.7–2.5 mm long, with pitted hairs within, the lobes orbicular, spreading, 0.8–1.2 mm long; stamens subsessile, inserted on upper third of tube, the anthers 0.5 mm long, ovary oblong, 1.0–1.5 mm long, the style 0.5–0.8 mm long, the stigma 0.4–0.6 mm long, shallowly 2-lipped; capsule ovoid, 1.5–2.0 mm long, puberulent, opening septically and loculicidally at the apex, the valves separating broadly; seeds ovoid, wingless, approximately 0.5 mm long.

Northern portion of Sierra Giganta, at 2000–3000 ft. and limestone mesa of Monserrate Island (fig. 1). Flowering in the spring.

Type: Arroyo Hondo (Undo) Ranch, Loreto, Sierra Giganta, Oct. 26, 1930, *Jones 27361* (POM!, isotype at GH!).

Specimens examined. Rocky N facing slope, Valle de los Encinos, S side of Cerro Giganta, 750 m, *Carter & Reese 4570* (UC); Scandent on nearly vertical N facing cliffs of peak S of Portezuela de Peloteado, S of La Victoria, 1050 m *Carter & Medellin-Lean 4675* (UC); Locally common at N edge of limestone mesa, Monserrate I., 200 m, *Moran 9309* (SD).

BUDDLEIA CORRUGATA ssp. **gentryi** Norman, ssp. nov. Frutex 0.5–1.0 m altus; folia ovato-oblonga 2.0–6.0 cm longa, 1.0–3.0 cm lata primum utrinque appressa stellato-tomentulosa et glandulosa deinde superne glabrata, marginis inequale sinuatis; inflorescentia aliquando basi ramosa, axe principe 4–10 juga cymarum capitularum sessilium breviterve pedunculatarum ferente, capite quoque 0.7–1.0 cm lato, 3–5 floro; calyx tubiformis 3.0–4.0 mm longus; corolla aurantiaca campanulata tubo 2.8–3.8 mm longo intus piloso, extus stellato-tomentello, lobis orbiculatis patentibus, 1.0–1.5 mm longis; capsula ovata 2.5–3.0 mm longa dehiscentis; semina ovata, non alata 0.5 mm longa.

Differing from ssp. *corrugata* by the larger leaves with appressed tomentum on the underside (fig. 2) and larger flowers and fruits.

Southernmost part of the Magdalena Plain (fig. 1). Flowering in the spring.

Type: Arroyo Seco about 25 mi W of La Paz, arroyo margin at base of limy cliff, March 29, 1939, *Gentry 4446* (UC!, isotypes at ARIZ!, DS!, GH!, K!, US!).

Specimen examined. Arroyo Conejo near the mouth, *Moran 7455* (BH, CAS, DS, GH, RSA, SD, US, US).

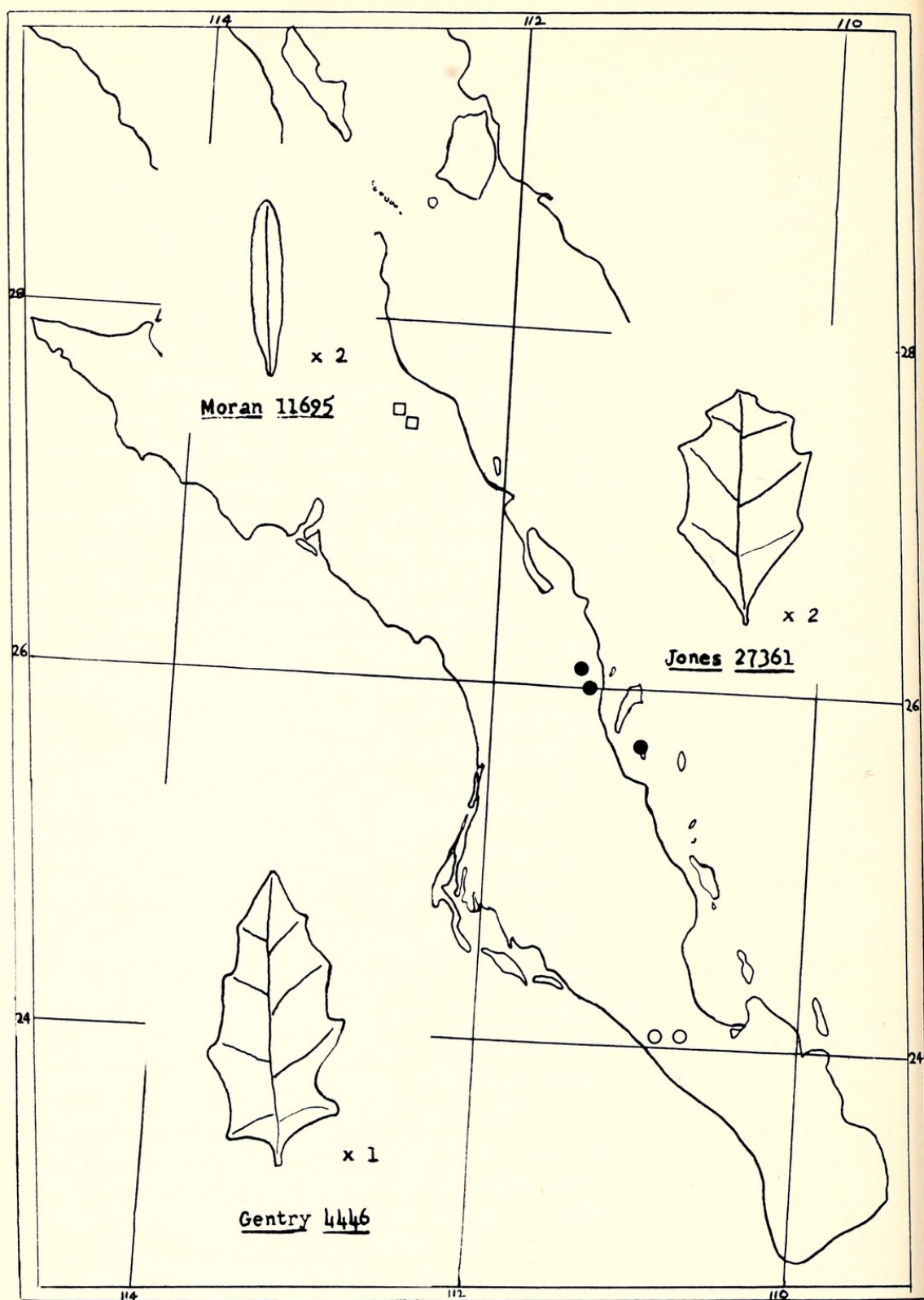


FIG. 1. Distribution of *Buddleia corrugata*; ssp. *corrugata*, closed circle; ssp. *gentryi*, open circle; ssp. *moranii*, open square.

BUDDLEIA CORRUGATA ssp. ***moranii*** Norman, ssp. nov. Frutex 0.5–1.0 m altus; folia lineares 0.5–2.0 cm longa, 0.2–0.3 cm lata, subsessiles, utrinque erecta stellato-tomentulosa, marginis aliquantum involutis, apice ovata, basi attenuata; inflorescentia 3–6 juga cymarum capitulum

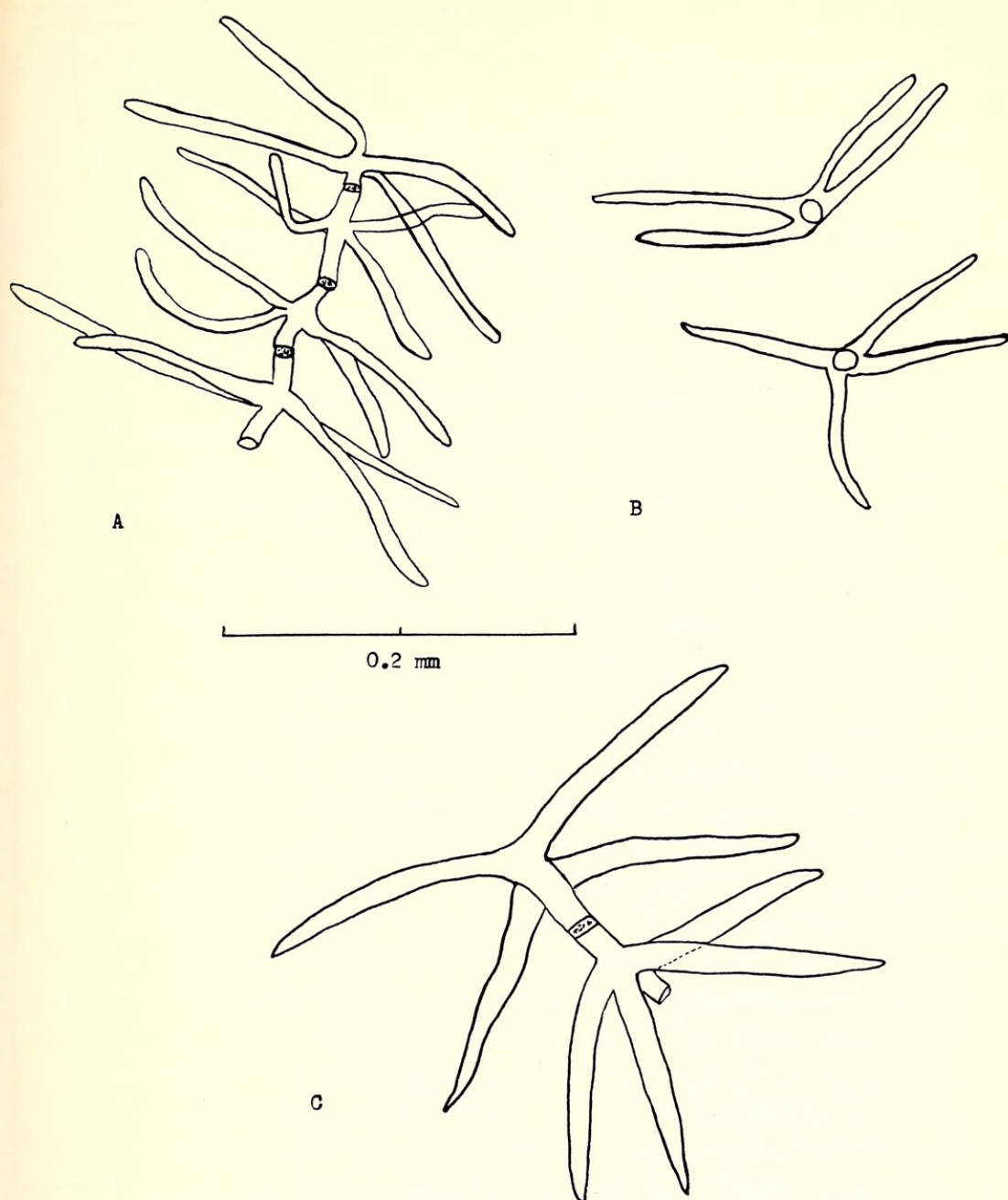


FIG. 2. Trichomes of underside of leaves of *Buddleia corrugata*; A, ssp. *corrugata* (Carter 4570); B, ssp. *gentryi* (Gentry 4446); C, ssp. *moranii* (Moran 11695).

sessilium breviterve pedunculatarum ferente, capite quoque 0.5–0.7 cm lato, 3–5 floro; calyx tubiformis 3.0 mm longus, corolla aurantiaca, campanulata tubo 3.0–3.5 mm longo intus piloso, extus stellato-tomentello, lobis orbiculatis patentibus 1.0 mm longis; capsula ovata 2.5–3.0 mm longa dehiscens; semina ovata, non alata 0.5 mm longa.

Differing from ssp. *corrugata* and *gentryi* by its much narrower linear leaves and shorter inflorescences.

Las Tres Virgenes Volcano, central Gulf Coast Region (fig. 1). Flowering in the spring.

Type: Volcan las Tres Virgenes, on cliff, steep arroyo on east slope from 1600–1900 m, Lat. 27° 28' N, Long. 112° 36' W, Feb. 12, 1964, *Moran 11695* (SD!).

Specimen examined. Crater of Volcan las Tres Virgenes, 1850 m, *Moran 11690* (SD).

It is very interesting to note the parallelism in leaf shape that has taken place in *corrugata* ssp. *moranii* and *B. utahensis*. Both have evolved in similar habitat—the latter is limited to the Mojave Desert at elevations of 800–1800 m, in an area where the mean annual rainfall rarely exceeds 15 cm (Clokey, 1951); it grows mostly on limestone and volcanic cliffs. The former, as already noted is known only from the Volcan las Tres Virgenes at elevations of 1600–1900 m, an area which lies in the driest subdivision of the Sonoran Desert with an annual mean rainfall of 13.8 cm (Shreve and Wiggins, 1964). I believe that this development in leaf structure is an instance of parallel evolution as it is very likely that *B. utahensis* and *B. corrugata* were both derived from *B. marrubiiifolia* stock.

Buddleia corrugata closely resembles *B. marrubiiifolia* of Texas and northern Mexico, differing in the size of the seed and the shape of the capsular valve. The westernmost element of that species, which seems to be a relict, possesses an inflorescence of several heads as does *B. corrugata*. This type of inflorescence is thought to be more primitive than the solitary head characteristic of *B. marrubiiifolia* ssp. *marrubiiifolia*.

Judging from their great similarity, it would seem likely that *B. corrugata* and *B. marrubiiifolia* had a common ancestry. It is not known when *Buddleia* migrated to Baja California; it may have been in early Miocene or earlier when it is believed that the Gulf of California extended north only to the latitude of Tiburon Island. At that time direct interchange would have been possible between the Sonoran-Chihuahuan Desert and the peninsula (Wiggins, 1960).

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