# An Artificial Rubus Hybrid.

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WHEN describing *Rubus Barkeri* from a single plant discovered by the late Mr. S. D. Barker at Inchbonny, Westland, Cockayne (1910, p. 325) stated:—

"Possibly the species under consideration is a recent break from *R. parvus,* the new characters having originated by mutation. Equally possible is the chance of its being a hybrid between one or other of the species of *Rubus,* especially *R. australis* and *R. parvus,* though this view is somewhat discounted by the non-climbing habit." Later Cockayne (1923, p. 125) lists *R. Barkeri,* without query, as being *R. australis* x *parvus.* To gain further light on the matter I decided to endeavour to secure hybrids by artificial cross-pollination.

A female plant of *R. parvus* was secured from the Wangapeka Valley (North-western Botanical District). The plant was gathered from a colony showing no signs of hybridism among its members. This was grown in Feilding in a position isolated from all other *Rubus* plants, and there was no other *R. parvus* grown in the neighbourhood. The plant was observed for four flowering seasons, during which it grew vigorously, and flowered freely. In no season was there any sign whatever of fruit-setting, the flowers simply withering up and falling away. The possibilities of accidental pollination, or of parthenogenesis thus seemed to be eliminated. A number of young flower-buds were protected from accidental pollination, and on opening were pollinated by hand in November, 1924. In all the flowers operated on, some achenes developed, while others failed to do so, apparently not having received the pollen. All the untreated flowers, as before, entirely failed to produce any development of the achenes. As pollen from *R. australis* was not available *R. schmidelioides* was used as the male parent, the pollen (all from one plant) being applied within an hour of gathering by means of a fine brush. Difficulty was experienced in obtaining a sufficient supply of pollen, and a certain percentage of that used was probably immature, which, in part, may account for the number of unfertilized achenes. Some 30 achenes were secured, and were sown on December 10th, 1924, being then almost ripe. Unfortunately three of the seed-pans were accidentally destroyed, but from the remaining one six healthy hybrid plants have been obtained. The seedlings appeared above ground between the 15th and the 20th October, 1925, and are thus now just one year old.

When large enough to handle, the plants were transplanted to small pots, which were plunged in a shady part of the garden. In May, 1926, the plants were placed in an open border. Some trouble was experienced with aphis infestation, one plant particularly being stunted and somewhat deformed. All are now (October, 1926), how-

ever, healthy, and commencing to make vigorous growth. The main stems are about 12 cm. long, of trailing habit, with a tendency to ascend, but at present showing no signs of adventitious rooting. Side stems are developing from near the bases of the main stems, and the stunted plant has a somewhat bushy habit.

## DESCRIPTION OF THE HYBRID SEEDLINGS.

COTYLEDONS.—Oblong-orbicular, ciliated with fine glandular hairs, thin, pale-green, ± 4 mm. long by ± 5 mm. broad, flat or slightly concave above, persisting till third or fourth leaf is developed.

FIRST LEAVES.—Broadly ovate, serrate, ciliate as in cotyledons, bearing also scattered fine, pale hairs on both surfaces; petioles short, slender, ciliated; blades ± 5.5 mm. long by ± 5 mm. broad, pale green to yellowish, with reddish veins, both surfaces bearing scattered pale hairs.

SECOND LEAVES.—Similar to first, but rather larger and subacute, less hairy above, glabrate below, petioles slender, longer, glandular-hairy.

THIRD LEAVES.—Ovate-oblong, subacute, deeply and coarsely serrate-dentate, midrib very evident below, surfaces as in second leaves, hairs caducous; blades ± 2 cm. long by ± 12 mm. broad; petioles as in second leaves, but hairs soon disappearing.

FOURTH LEAVES.—Similar to third leaves, but longer, more accuminate, slightly more coriaceous, sometimes more or less deeply lobed, in one case almost trifoliolate, darker green, becoming bronzed in winter.

SUBSEQUENT LEAVES.—Coriaceous, mainly trifoliolate, sometimes bifoliolate or merely deeply lobed, bronzed in winter, pubescent when young, becoming glabrate when mature; petioles ± 2.2 cm. long; terminal leaflets ± 5 cm. long by ± 1 cm. broad, on very short petiolules, linear-oblong, acute or accuminate, dentate; lateral leaflets ± 1.4 cm. long, similar in shape to terminal; midribs and occasionally the petioles and petiolules bearing a few small, rather stout prickles. The first leaves to develop this spring were again unifoliolate and similar to the third and fourth leaves of the first season, the succeeding leaves are bi- or trifoliolate.

## SEEDLINGS OF THE PARENTS.

I have at present no seedling material of *R. parvus*, but give a description of seedlings of *R. schmidelioides* grown at the same time as, and under similar conditions to those of the hybrids. The achenes were gathered from a plant similar in character to that used

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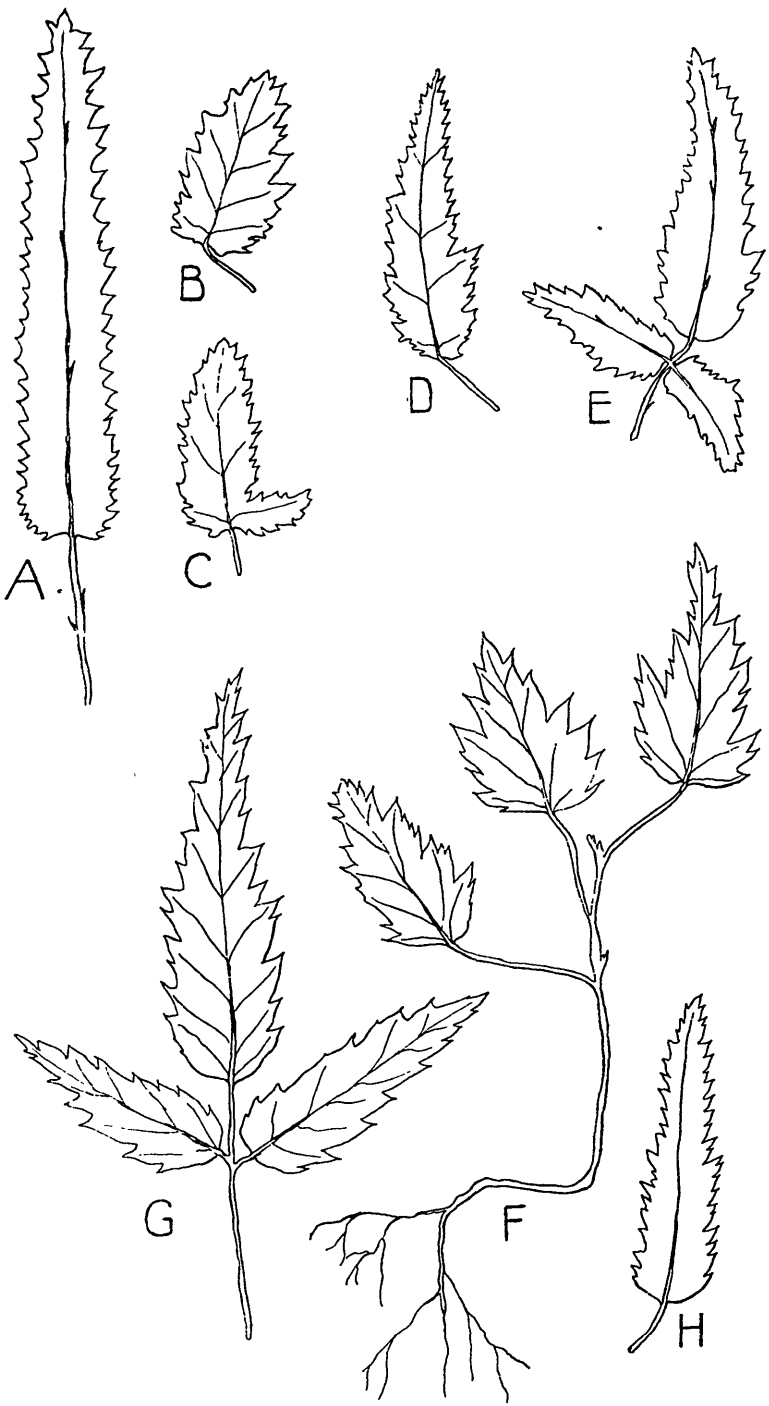
A *Rubus parvus* adult leaf.
B Second leaf of hybrid.
C, D, H. Fourth leaves of hybrids.
E Trifoliolate leaf of hybrid
F Seedling *R. schmidelioides*, showing first, second and third leaves.
G Trifoliolate leaf of seedling *R. schmidelioides*.




LEAVES OF RUBUS—Natural Size.

as pollen parent, and growing in an association where *R. australis* was absent.

COTYLEDONS.—Very similar to those of the hybrid, but narrower, oblong.

FIRST LEAVES.—Petioles ± 1.3 cm. long, slender, densely clothed in pale brown hairs; blades ovate, acuminate, deeply and coarsely irregularly serrate, very thin, clad above and on the margins with numerous pale brown hairs, glabrate below, midrib densely hairy above, not prominent below.

SECOND AND THIRD LEAVES.—Similar, but larger, ± 3 cm. long by 1.5 cm. broad.

FOURTH LEAVES.—Trifoliolate, similar in character to others; terminal leaflet ± 2.6 cm. long by ± 1.4 cm. broad, with petiolules ± .75 cm. long; lateral leaflets smaller; all leaflets ovate, acute or acuminate.

SUBSEQUENT LEAVES.—Similar, but leaflets longer and narrower.

A fuller description will be published later when the hybrid plants become more mature, and a comparison made between the adult forms. I intend this season to pollinate *R. parvus* with pollen from the form of *R. australis* occurring near Feilding. It will be seen from the above account that the hybrids resemble *R. schmidelioides* in producing trifoliolate leaves, but more closely approach the female parent in the more coriaceous texture of the leaves, their more nearly dentate toothing, their narrower shape, the presence of prickles on the midribs, the lesser development of hairs on the young stems, leaf-stalks and midribs. *Rubus Barkeri,* which occasionally produces unifoliolate leaves, parallels these features, and I have little doubt that the hybrid theory as to its origin is the correct one; var. *coloratus* of *R. schmidelioides* is referred to throughout.

## LITERATURE CITED.

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