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THE RE-ESTABLISHMENT OF *MOUSSONIA* REGEL (GESNERIACEAE)

*Hans Wiehler**

The genus *Moussonia* was described by Eduard Regel in 1848, recognized by Oersted, Walpers, Decaisne, and Hanstein, submerged by Bentham (1876) in his genus *Isoloma* (= *Kohleria* Regel), and finally treated as a separate section of *Kohleria* by Fritsch (1893-94). There has been no further taxonomic revision of the genus *Kohleria* which now comprises a diverse group of more than 50 species. *Kohleria* belongs into the tribe Gloxinieae Fritsch of the neotropical subfamily Gesnerioideae. The species are herbaceous or suffrutescent, varying in height from 15 cm to 2 m. They occur mostly at the edge of the rain forest, in clearings, by river banks, or on moist cliffs and road cuts. Most of the species have red corollas with long inflated tubes. Some showy *Kohleria* species and their hybrids have been in horticulture in Europe since about 1840. A number of these hybrids were produced by Regel himself.

Many new species have been introduced to cultivation since around 1960. The observation of living material (especially at Cornell University), cytogenetic investigations (at Cornell University, at the Agricultural Experiment Station in New Haven, Connecticut and at the University of Miami), the study of herbarium material, and field work in Central and South America have increased our knowledge of *Kohleria*. It can now be stated that *Kohleria* is another of the gesneriaceous "corolla genera" where the similarity in flower shape determined the assumed affinity of the taxa (cf. Wiehler, 1972b, 1973). Yet an increased awareness of the phenomena of pollination shows us now that similar corolla forms indicate mostly a particular type of pollinating agent, in this case hummingbirds.

There exists now sufficient evidence to warrant the separation of *Kohleria* into three genera, *Kohleria* sensu stricto, *Moussonia*, and a third entity to be treated later as a separate, new genus and designated from here on as "*Kohleria* group III"). This third group will also contain six species now attributed to *Diastema* Bentham. The division of *Kohleria* into three genera is also reflected in the geographical distribution of the taxa. The species of *Kohleria* sensu stricto extend from southern Mexico (Oaxaca, Chiapas, Vera Cruz) through Central America and Colombia to the Guianas, and along the Andes to central Peru. The species of *Moussonia* occur from north-central Mexico (Sinaloa, Nayarit, Jalisco, Hildago, Mexico, Puebla, Vera Cruz) to western Panama (Chiriqui). The species of *Kohleria* group III are native to Ecuador, Peru, and Bolivia.

The proposed separation of section *Moussonia* from *Kohleria* is based on the following factors:

Moussonia	*Kohleria*
1. plants without scaly rhizomes	plants with scaly rhizomes
2. chromosome number: n = 11	chromosome number: n = 13
3. nectary ring-shaped	nectary consisting of individual glands
4. stigma stomatomorphic	stigma bilabiate

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These features are generic characters among the rest of the genera of the tribe Gloxinieae. The division of *Kohleria* into more natural units thus fits into the general reclassification scheme of the taxa of the subfamily Gesnerioideae and of the large tribe Gloxinieae (Wiehler, 1970, 1975). This division is further substantiated by cytological data. In fact, a difference in chromosome numbers alone would establish *Moussonia* and *Kohleria* as separate genera (Wiehler, 1972a). Hybridization data at Cornell University (Wiehler, unpublished data) and the cytogenetic work of C. D. Clayberg at New Haven, Connecticut (unpublished data) indicate that species of *Kohleria* sensu stricto can be easily hybridized to produce at least partially fertile hybrids; all hybridized species of *Moussonia* produce completely fertile hybrids. (Table 1). All attempts to cross *Kohleria* with *Moussonia* (and vice versa) have failed except in one instance where the hybrid is completely sterile (see Table II). This result conforms with the general pattern of intergeneric hybridization in the Gesnerioideae; artificial intergeneric hybrids in the tribe Gloxinieae are comparatively easy to obtain, but they are usually sterile (Wiehler 1970). Species of *Moussonia* (n = 11) have also produced sterile intergeneric hybrids with species of *Solenophora* Bentham (n = 10) *Smithiantha* Kuntze (n = 12), and *Gloxinia* L' Heritier (n = 13). The details of these hybrids are listed in Table II. Intergeneric hybrids involving *Kohleria* sensu stricto are listed in Table III. The chromosome number of all parental genera *(Koellikeria* Regel, *Diastema, Gloxinia,* and *Kohleria* group III) is here n = 13. The hybrids within the genus *Kohleria* sensu stricto are recorded in Table IV. A much more detailed hybridization program with *Kohleria* will be reported elsewhere by Clayberg. Table V catalogues the known chromosome numbers for *Kohleria* and *Moussonia,* and lists some supplementary and some new counts. Herbarium specimens of all species and hybrids registered in Tables I - IV and voucher specimens for the new chromosome counts are deposited either at BH or SEL.

The re-establishment of the genus *Moussonia* is thus based on easily recognizable morphological characters and on good cytogenetic evidence. From our present knowledge of the taxa in the tribe Gloxinieae it becomes apparent that *Moussonia* has not even a close affinity to *Kohleria.* Both genera just happen to employ the same type of pollinating agents. A complete revision of *Moussonia* will follow later, after detailed field work in the native territory. The new name combinations are now needed for floristic studies and for a clearer definition of horticultural material.

Moussonia Regel, Flora 31:248. 1848; Index sem. hort. bot. Turic. 1847.

Isoloma Benth., sect. *Brachyloma* (Hanst.) Benth., pro parte, in Benth. & Hook., Gen. Pl. 2:1001. 1876.

Kohleria Regel, sect. *Moussonia* (Regel) Fritsch, in Engler & Prantl, Nat. Pflanzenfam. 4(3b):179. 1894.

TYPE SP.: *Moussonia elongata* Regel, Index. sem. hort. bot. Turic. 1847; Flora 31:248. 1848; or *Moussonia elongata* Regel ex Walpers, Annales Bot. 1:471. 1849 = *Moussonia deppeana* (Schlecht. & Cham.) Hanst.

ETYMOLOGY: A. Mousson, Swiss naturalist and scientist, active around 1850.

The genus *Moussonia* (n = 11) can be separated from *Kohleria* (n = 13) by the absence of scaly underground rhizomes, the presence of

a ring-shaped nectary, by the stomatomorphic stigma, and by the difference in chromosome numbers. The plants are herbaceous or suffrutescent, growing to a height of 3 to 7 feet. The axillary inflorescences have pronounced peduncles with simple (4-flowered) or compound gesneriaceous cymes. The calyx lobes are either short and deltoid or ovoid, or elongated and lanceolate to linear. The red, orange, or yellow corollas are tubular, dilated in the midsection, the limb consisting of subequal rounded lobes. The ovary is semiinferior, the fruit a dry, pointed, bivalved capsule with loculicidal dehiscence. The seeds are small and numerous. The species, distributed from northcentral Mexico to western Panama, prefer the cool and moist habitats of the montane rain and cloud forests. Eleven species are presently assigned to *Moussonia*, but the delimitation of some of these species is not very clear and needs to be evaluated through field studies. *Moussonia deppeana*, the most widely distributed species of the genus, is used for medicinal purposes in Mexico, and is commonly found in the herb markets of the villages and towns. The flowers and leaves are brewed in a tea to cure gastro-intestinal ailments. In Mexico City this species is sold as "tlachinole" (O'Gorman, 1961).

1. **Moussonia deppeana** (Schlecht. & Cham.) Hanst., Linnaea 34:284. 1865.

   Gesneria deppeana Schlecht. & Cham., Linnaea 5:110. 1830.

   Isoloma deppeanum (Schlecht. & Cham.) Hemsely, in Godman & Salvin, Biol. Central-Amer., Bot 2:478. 1882; *Kohleria deppeana* (Schlecht. & Cham.) Fritsch, in Engler & Prantl, Nat. Pflanzenfam. 4(3b): 179. 1894.

   Gesnera elongata Regel, Flora 31:248. 1848; *Moussonia elongata* Regel, Index sem. hort. bot. Turic. 1847, or *M. elongata* Regel ex Walpers, Annales Bot. 1:471. 1849; non *Kohleria elongata* Regel, Gartenflora 4:4. 1855; non *Kohleria elongata* (HBK) Hanst., Linnaea 34:442 (#27). 1865, based on *Gesneria elongata* HBK, Nov. Gen. et Sp. Pl. 2:396. 1818.

   Gesnera lasiantha Zucc., Abhandl. Math. Phys. Kl. Bayr. Akad. Wiss. 1:300 (1832); *Kohleria deppeana* var. *lasiantha* (Zucc.) Fritsch, Bot. Jahrb. 50:425. 1914.

Note: the combination "*Gesneria elongata* Martens & Galeotti, Bull. Acad. Bruxelles 9(2):32 (1842)" has been cited repeatedly in the literature of the Gesneriaceae, first by Hanstein in Linnaea 34:285 (1865), then by Hemsley in Godman & Salvin, Biol. Central-Amer., Bot. 2:478 (1882), Fritsch in Bot. Jahrb. 50:424 (1914), in the Index Kewensis, and lately by Morton in Baileya 15(2);64 (1967). In checking the original text it becomes evident, however, that Martens & Galeotti never published such a combination nor described a new species by that name. The text on page 32 lists "*Gesneria elongata* H.B. et Dec." for the collections *Galeotti 1903, 1918* from Mexico. The author citation is apparently a misprint for "HBK," referring to *Gesneria elongata* HBK, published in 1818 with an illustration. This is a species from Colombia, now *Kohleria trianae* (Regel) Hanst. which bears superficial resemblance to the Mexican material but differs precisely in the critical characters which separate *Moussonia* from *Kohleria*. In fact, these same two species had been regarded as conspecific previously (see the *Moussonia* type species story, below), due probably to the wide distribution

of Kunth's 1818 publication with its handy illustrations. There is thus sufficient reason why Martens and Galeotti should cite *Gesneria elongata* HBK for the collections *Galeotti 1903, 1918*. The internal textual evidence in the publication of Martens and Galeotti is even stronger. Of the 14 Gesneriaceae species listed in their account, nine are new species in which the new binomial is followed by the indication "nobis," then a formal diagnosis and description in Latin, and further ecological and geographical comments in French. The brief data under "*Gesneria elongata* H.B. et Dec.," however, is all in French and pertains only to ecology and geography. There is no Latin diagnosis and description. The combination "*Gesneria elongata* Martens & Galeotti" does not exist.

2. **Moussonia elegans** Decne., Fl. Serres Jard. Eur. 5:t. 489. 1849.

   Isoloma elegans (Decne.) Hemsley, in Godman & Salvin, Biol. Central-Amer., Bot. 2:478. 1882; *Kohleria elegans* (Decne.) Loesener, Bull. Herb. Boiss. 7:574. 1899;

   Moussonia formosa Van Houtte, Gartenflora 3:310, t. 101. 1854; *Moussonia costaricensis Kl.* ex Oerst., Centralamer. Gesner. 33. 1858; *Isoloma costaricense* (Kl. ex Oerst.) Hemsley, in Godman & Salvin, Biol. Central-Amer., Bot. 2:478. 1882; *Moussonia papillosa* Oerst. ex Hanst., Linnaea 34:288. 1865; *Kohleria papillosa* (Oerst. ex Hanst.) Fritsch, Bot. Jahrb. 50:427. 1914; *K. papillosa* var. *sericea* Fritsch, ibidem, p. 428; *K. papillosa* var. *pendula* Morton, Baileya 15(2):72. 1967; *K. papillosa* var. *solitaria* Morton, ibidem, p. 73; *Isoloma jaliscanum* S. Watson, Proc. Amer. Acad. 15:159. 1890; *Kohleria collina* T. S. Brandegee, Univ. Calif. Publ., Bot. 6:66. 1914; *Kohleria pedunculata* T. S. Brandegee, ibidem, p. 67.

3. **Moussonia fruticosa** (T. S. Brandegee) Wiehler, comb. nov.

   Kohleria fruticosa T. S. Brandegee, Univ. Calif. Publ., Bot. 6:67. 1914.

4. **Moussonia hirsutissima** (Morton) Wiehler, comb. nov.

   Kohleria hirsutissima Morton, Baileya 15(2):65. 1967.

5. **Moussonia rupicola** (Standl. & L. O. Williams) Wiehler, comb. nov.

   Kohleria rupicola Standl. & L. O. Williams, Ceiba 3:62. 1952.

6. **Moussonia septentrionalis** (Denham) Wiehler, comb. nov.

   Kohleria septentrionalis Denham, Baileya 15(2):70. 1967.

7. **Moussonia serrulata** (Morton) Wiehler, comb. nov.

   Kohleria serrulata Morton, Ann. Missouri Bot. Gard. 26:309. 1939.

8. **Moussonia skutchii** (Morton & Gibson) Wiehler, comb. nov.

   Kohleria skutchii Morton & Gibson, Phytologia 23(4):336. 1972.

9. **Moussonia strigosa** (Morton) Wiehler, comb. nov.

   Kohleria strigosa Morton, Fieldiana Bot. 18(3-4):1181. 1938.

10. **Moussonia triflora** (Martens & Galeotti) Hanst., Linneae 34:286. 1865.

    Gesneria triflora Martens & Galeotti, Bull. Acad. Bruxelles 9(2):33. 1842; non *Kohleria triflora* (Regel) Hook., Flora 31:250. 1848 = *Kohleria tubiflora* (Cav.) Hanst.; *Kohleria martensii* Fritsch, Bot. Jahrb. 50:428. 1814.

11. **Moussonia viminalis** (T. S. Brandegee) Wiehler, comb. nov.
Kohleria viminalis T.S. Brandegee, Univ. Calif. Publ., Bot. 6(8):194. 6(8): 194 (1914).

There exists some difficulty in establishing the type material for the genus *Moussonia*. Eduard Regel, founder and editor of Gartenflora, and a botanist with a strong horticultural bent, held in 1848 a position at the Zurich Botanical Garden where one of his special projects was the hybridization of neotropical Gesneriaceae for which he became well-known in Europe. Regel in Zurich, Johannes Hanstein in Berlin, and, to some lesser extent, Joseph Decaisne in Paris, were the foremost authorities on American Gesneriaceae in the middle of the 19th century. In his Latin diagnosis, Regel sets his new genus *Moussonia* apart from *Gesnera* Martius (= *Kohleria* Regel, pro parte) by the presence of the ring-shaped nectary and the capitate (= stomatomorphic) stigma in *Moussonia*, but then he states rather obliquely, in German: "Der Typus dieser Gattung is *Gesnera elongata*," without author citation, and without transferring this name to *Moussonia*. According to Fritsch (Bot. Jahrb. 50:424, 1914), Regel had published the combination *Moussonia elongata* Regel already a year earlier, in the Seed Catalogue of the Zurich Botanical Garden for 1847 (Index sem. hort. bot. Turic. 1847). I was advised by the present Director of the Botanical Garden and the Institute for Systematic Botany at the University of Zurich, Dr. C. D. K. Cook, that copies of this Seed Catalogue do no longer exist at Zurich, and that there is no type material of *Moussonia* or *Gesnera elongata* in their herbarium (personal communication, 5 March, 1974).

It is possible to trace the origin of Regel's live plant material to which he assigned the name *Moussonia elongata* at Zurich, but that involves a somewhat complicated account of the name *Gesnera* or *Gesneria elongata* in the botanical literature. This binomial or at least the specific epithet has been attached to six different gesneriad collections all of which have a superficially similar appearance. This material is listed here in chronological order, as it appears in the literature. Regel was familiar with at least some of these *Gesneria elongata* publications:

1. *Gesneria elongata* HBK, Nov. Gen. & Sp. Pl. 2:396, tab. 192 (1818), based on *Humboldt 11253*, from Colombia, Dept. Tolima, Mt. Quindiu (Quito? in text), now *Kohleria trianae* (Regel) Hanst. Plants with scaly rhizomes, bilobed stigmas, and the nectary consisting of five individual glands. This species has apparently never been in cultivation in Europe.

2. "*Gesneria elongata* HBK. This label was attached to live material growing at the Berlin Botanical Garden, raised from seed which was sent by Deppe sometime before 1830 from Mexico. Schlechtendal and Chamisso rightly recognized that this Mexican species is distinct from the Colombian *Gesneria elongata* HBK and thus named it *Gesneria deppeana* Schlecht. & Cham. in Linnaea 5:110 (1830). They did not cite a type collection with their description, but if any existed it is now destroyed by war at Berlin. However, live material of the Mexican collection had apparently been distributed to other botanical gardens before or after 1830, still under the name *Gesneria elongata*.

3a. "*Gesneria elongata Humboldt*," published with an illustration in The Botanist (London) 1:27 (1839). "Several British cultivators imported this

species from the Continent in 1835. We are not aware of its having been introduced previously." Judging by the illustration, this material differs from the true *Gesneria elongata* and from *Gesneria deppeana* above. It is a member of the *Kohleria hirsuta* (HBK) Regel species complex and hails from either Colombia or Venezuela.

3b. "*Gesneria elongata* Humboldt, var." illustrated in Botanical Magazine 66: t. 3725 (1839). This is the same plant material as in 3a, and Graham, the author, recognizes it as a different variety from Humboldt's collection, and also lists the stigma as bilobed, and the nectary as consisting of five glands.

4. "*Gesneria oblongata* Paxton, synonym *Gesneria elongata* Humboldt, var. *fruticosa*," illustrated in Paxton's Magazine of Botany 6:103 (1839). This collection differs from that of 3a and 3b, and is another member of the *Kohleria hirsuta* complex. "We believe it to be a native of South America."

5. "*Gesneria elongata* Martens & Galeotti" in subsequent literature, but actually published by Martens and Galeotti in Bull. Acad. Bruxelles 9(2):32 (1842) as "*Gesneria elongata* H.B. et Dec." (See note under *Moussonia deppeana*, above). This Mexican material belongs in the species complex of *Moussonia deppeana*. There existed no live plants of this collection in cultivation in Europe *(Galeotti 1903, 1918)*.

6. *Kohleria elongata* Regel, Gartenflora 4:4 (1855). Regel must have liked this confusing epithet to use it once more for a related species. The seed of this plant material was sent to him to Zurich by K. Wagner from Colombia. The exact status of this species is presently unknown in the absence of herbarium material.

Which of these *Gesneria elongata* did Regel have in mind as the type of the genus *Moussonia?* Only two of the entities listed above fit into *Moussonia* (numbers 2 and 5). These are Mexican collections, and the rest is from South America. The live Mexican material available to Regel was the Deppe collection from the Berlin Botanical Garden (number 2). Hanstein corroborates this idea in Linnaea 29:575 (1859) by acknowledging that Regel accurately regarded the living material from the Berlin Botanical Garden, labelled *Gesnera elongata*, as the type of a new genus, his *Moussonia*. Hanstein also stated, however, that Regel was not aware that this same plant material had already been described by Schlechtendal and Chamisso as *Gesneria deppeana*, thus noting its distinctness from *Gesneria elongata* HBK at the specific level. Hanstein's testimony therefore implies that Regel either saw the live Mexican material at Berlin, or that he grew the same plant material (from seed or cuttings) at Zurich. The Seed Catalogue of the Zurich Botanical Garden of 1847, offering seed of *Moussonia elongata*, attests the latter to be a fact.

It appears thus fairly certain that the type of the genus *Moussonia*, *M. elongata* Regel, is based on the plant material first grown at the Berlin Botanical Garden. These plants were raised there from seed sent by Deppe from Mexico, from the woods around Jalapa in the state of Vera Cruz. There exist many other herbarium collections of this species from the same area. The correct name of the type species of the genus *Moussonia*, however, is *Moussonia deppeana* (Schlecht. & Cham.) Hanst.

There is still the question of the holotype of *Moussonia elongata* which may have been the live plants at the Zurich Botanical Garden, in the ab-

sence of deposited herbarium material. Type material may still exist at LE, for Regel spent the later part of his life, from 1855 - 1892, as director of the Botanical Garden in St. Petersburg. Hanstein cites, in Linnaea 34:284 (1865), a Deppe collection at Berlin, now destroyed: *Schiede & Deppe 186.* It is possible that this collection represents the same material from which Deppe sent seeds to Berlin. Other sheets of this collection may exist in other European herbaria. A solution to the typification problem will be proposed in a detailed revision of the genus *Moussonia.*

TABLE I
INTERSPECIFIC HYBRIDS OF *Moussonia*

	Parental Species		Hybrid Accession Number	Hybrid Pollen Stainability
	Female	Male		
1.	*M. deppeana* G-1061	× *M. elegans* G-724*	G-1281A	100%
2.	Reciprocal cross		G-1281B	100%
3.	*M. elegans* G-444	× *M. hirsutissima* G-826	G-1282	100%
4.	*M. elegans* G-724	× *M. hirsutissima* G-826	G-1332	98%
5.	*M. elegans* G-724	× *M. septentrionalis* G-1201	G-1312	99%
6.	*M. hirsutissima* G-793C	× *M. septentrionalis* G-1201	G-1313	91%
7.	*M. hirsutissima* G-793A	× *M. species* G-828	G-1284	98%
8.	*M. septentrionalis* G-1201	× *M. hirsutissima* G-826	G-1306A	100%
9.	Reciprocal cross		G-1306B	100%
10.	*M.* species G-828	× *M. deppeana* G-1061	G-1291	100%
11.	*M.* species G-828	× *M. elegans* G-444	G-1285	99%

* All accession numbers refer to greenhouse collections either at the Bailey Hortorium, Cornell University (G-numbers), or at the University of Miami (G- and W-numbers), or at the Selby Botanical Gardens (G- and W-numbers).

TABLE II
INTERGENERIC HYBRIDS WITH *Moussonia*

(The seed parent is listed first in each cross below. n = the parental base chromosome number. The pollen stainability of all hybrids is 0%.)

1. *M. hirsutissima* G-826 × *Smithiantha multiflora* (Martens & Galeotti) Fritsch G-717
   n=11 n=12 Hybrid Acc. #G-1217
2. *M. elegans* G-724 × *Gloxinia gymnostoma* Griseb. G-1038
   n=11 n=13 Hybrid Acc. # G-1220
3. *M. hirsutissima* G-826 × *Gloxinia gymnostoma* G-1038
   n=11 n=13 Hybrid Acc. # G-1221
4. *M. hirsutissima* G-793A × *Solenophora insignis* (Martens & Galeotti) Hanst. G-792
   n=11 n=10 Hybrid Acc. # G-1247
5. *M. elegans* G-724 × *Kohleria digitaliflora* (Linden & André) Fritsch G-941
   n=11 n=13 Hybrid Acc. # G-1330
6. *M. hirsutissima* G-826 × *Gloxinia nematanthodes* (Kuntze) Wiehler G-1324
   n=11 n=13 Hybrid Acc. # W-1757
7. *M. hirsutissima* G-826 × *Solenophora* sp. G-911
   n=11 n=10 Hybrid Acc. #G-1333

TABLE III
INTERGENERIC HYBRIDS WITH *Kohleria*

1. *Koellikeria erinoides* (DC.) Mansf. G-125 × *Kohleria spicata* (HBK) Oerst. G-331
   n=13 n=13 Hybrid Acc. #G-1218*
2. *Diastema vexans* H. E. Moore G-866 × *Kohleria spicata* G-331
   n=13 n=13 Hybrid Acc. # G-1219
3. *Gloxinia sylvatica* (HBK) Wiehler G-999 × *Kohleria lanata* Lem. G-401
   n=13 n=13 Hybrid Acc. #G-1223
4. *Gloxinia gymnostoma* Griseb. × *Kohleria eriantha* (Benth.) Hanst. G-1277
   n=13 n=13 Hybrid Acc. # G-1336
5. *Kohleria weberbaueri* Mansf.** G-500 × *Kohleria spicata* G-331
   n=13 Hybrid Acc. # G-1303
6. *Kohleria reticulata* Fritsch.** W-1189 × *Kohleria hirsuta* (HBK) Regel G-1059
   n=13 Hybrid Acc. # W-1913

* This hybrid has been published as × *Koellikohleria rosea* Wiehler (1968); it is available in the commercial trade.

**Belonging to *Kohleria* Group III.

TABLE IV
INTERSPECIFIC HYBRIDS OF *Kohleria*

	Parental Species		Hybrid Accession Number	Hybrid Pollen Stainability
	Female	Male		
1.	*K. spicata* G-718	*K. digitaliflora* G-941 [synonym: *K. schiedeana* (DC.) Hanst.]	G-1290	49%
2.	*K. hirsuta* G-1059	*K. eriantha* G-798	G-1293	20%
3.	*K. spicata* G-331	*K. lanata* G-401	G-1294A	39%
4.	Reciprocal cross		G-1294B	41%
5.	*K. tubiflora* (Cav.) Hanst. G-274	*K. spicata* G-834 [synonym: *K. longifolia* (Lindl.) Hanst.]	G-1307A	62%
6.	*K. tubiflora* G-274	*K. spicata* G-331	G-1309A	39%
7.	Reciprocal cross		G-1309B	35%
8.	*K. peruviana* Fritsch G-1208	*K. eriantha* G-1277	G-1341	31%
9.	*K. allenii* Standl. & L. O. Williams G-1317	*K. spicata* G-834 [syn: *K. longifolia*]	W-1513	55%
10.	*K. allenii* G-1317	*K. spicata* G-331	W-1505	67%
11.	*K. digitaliflora* G-1278	*K. peruviana* G-1208	W-1893	11%

TABLE V — CHROMOSOME NUMBERS IN *Moussonia* AND *Kohleria*

	Taxon	*Accession Number*	*Voucher Specimen at*	*Origin of Collection*	*n*
1.	*Moussonia deppeana*	G-1081	BH, SEL	Hort.	11 Wiehler
2.	*M. elegans*	G-444	BH, SEL	Chiapas	11 Lee (1964)
3.	*M. elegans*	G-724	BH, SEL	Oaxaca	11 Lee (1964)
4.	*M. elegans* *Davidse & Pohl 1477*		ISC, F	Costa Rica	11 Davidse (1970)
5.	*M. hirsutissima*	G-826	BH, SEL, NY	Oaxaca	11 Lee (1967)
6.	*M. hirsutissima*	G-973C	BH, SEL	Oaxaca	11 Lee (1967)
7.	*M. septentrionalis*	G-1201	BH, SEL, US	Sinaloa	11 Wiehler
8.	*M. strigosa*	G-1275	BH, SEL	Costa Rica	11 Wiehler
9.	*M.* species	G-828	BH, SEL	Guatemala	11 Wiehler
10.	*Kohleria allenii*	G-1317	SEL	Costa Rica	13 Wiehler
11.	*K. bogotensis* (Nicholson) Fritsch	G-127	BH, SEL	Hort.	13 Fussell (1958)
12.	*K. bogotensis*	G-1276	BH, SEL	Hort.	13 Wiehler
13.	*K. digitaliflora*	G-941	BH, SEL	Hort.	13 Wiehler
14.	*K. digitaliflora*	G-1278	BH, SEL	Hort.	13 Wiehler
15.	*K. digitaliflora* *(Wiehler & N.H. Williams 72242)*	W-1727	SEL	Cauca, Colombia	13 Wiehler
16.	*K. digitaliflora* *(Wiehler & N.H. Williams 72159)*	W-1736	SEL	Valle, Colombia	13 Wiehler
17.	*K. eriantha*	G-798	BH, SEL	Hort.	13 Wiehler
18.	*K. eriantha*	G-1277	BH, SEL	Hort.	13 Wiehler
19.	*K. hirsuta*	G-1059	BH, SEL	Trinidad	13 Wiehler (1972a)
20.	*K. hirsuta* *(Wiehler & Bunting 72376)*	W-1825	SEL	Aragua, Venezuela	13 Wiehler
21.	*K. hirsuta* *(Wiehler & Steyermark 72500)*	W-1826	SEL	Barinas, Venezuela	13 Wiehler
22.	*K. lanata*	G-401	BH, SEL	Guerrero, Mexico	13 Wiehler
23.	*K. magnifica* *(Wiehler & N.E. Williams 72192)*	W-1731	SEL	Nariño, Colombia	13 Wiehler
24.	*K. peruviana*	G-1208	BH, SEL	Junin, Peru	13 Wiehler (1972a)
25.	*K. platylomata* (Donn. Sm.) Wiehler *(Wiehler & Landwer 7207)*	W-1616	SEL	Pichincha, Ecuador	13 Wiehler
26.	*K. spicata*	G-331	BH, SEL	Costa Rica	13 Wiehler
27.	*K. spicata* (synonym: *K. schiedeana)*	G-718	BH, SEL	Oaxaca, Mexico	13 Lee (1967)
28.	*K. spicata* (synonym: *K. longifolia)*	G-834	BH, SEL	Guatemala	13 Lee (1967)
29.	*K. spicata*	G-1348	BH, SEL	Peru	13 Wiehler
30.	*K. spicata* *Davidse & Pohl 1278*		ISC, F	Costa Rica	13 Davidse (1970)
31.	*K. spicata* *(Breedlove 29798)*	W-1909	SEL	Chiapas, Mexico	13 Wiehler
32.	*K. spicata* *(Wiehler & Diehl 7141)*	W-1192	SEL	Pastaza, Ecuador	13 Wiehler
33.	*K. spicata* *(Wiehler & N.H. Williams 72241)*	W-1735	SEL	Nariño, Colombia	13 Wiehler
34.	*K. spicata* *(Wiehler, Dressler, & Williams 7223)*	W-1708	SEL	Valle, Colombia	13 Wiehler
35.	*K. tubiflora*	G-274	BH, SEL	Hort.	13 Lee (1962)
36.	*K. tubiflora* *Davidse & Pohl 1321*		ISC, F	Costa Rica	13 Davidse (1970)
37.	*K. tubiflora* *(Wiehler & Dressler 71276)*	W-1756	SEL	Coclé, Panama	13 Wiehler
38.	*K. tubiflora* *(Wiehler & Steyermark 72503)*	W-1827	SEL	Barinas, Venezuela	13 Wiehler

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