

Repertorium specierum novarum regni vegetabilis.

Herausgegeben von Professor Dr. phil. Friedrich Fedde
Beihefte. Band LXXX.

PRELIMINARY REVISION OF AMERICAN STACHYS

by

CARL EPLING

0457

(57)

Ausgegeben am 5. November 1934

DAHLEM bei BERLIN
VERLAG DES REPERTORIUMS, FABECKSTRASSE 49
1 9 3 4



CU-1798

The arrangement here presented is based upon examination of the material at the following institutions, some by loan: the Royal Botanic Gardens at Kew, the British Museum of Natural History, the Jardin des Plantes, Paris, the National Herbarium at Brussels, the Delessert and Boissier Herbaria at Geneva, the herbaria of the Botanical Institutes at Berlin-Dahlem and at Munich, the National Herbarium at Vienna, the National Herbarium at Stockholm, the National Herbarium at Copenhagen, the herbarium of the University of Göttingen, the herbaria of Oxford and Cambridge Universities, the Linnean Herbarium, the U. S. National Herbarium, the Gray Herbarium, the herbaria of the New York and Missouri Botanical Gardens, the herbarium of the Philadelphia Academy of Sciences, the Field Museum, the Herbarium of Pomona College, the herbarium of the Santa Barbara Museum, the herbarium of the Oregon State College, of Stanford University and the herbaria of the Universities of Michigan, Texas, California at Berkeley and at Los Angeles. To the directors of these institutions and their associates the author makes grateful acknowledgments for sustained interest and repeated courtesies. It is a pleasure also to acknowledge loans and gifts of material from Mr. Ray Fosberg, Dr. Fortunato Herrera, Dr. Gualterio Looser, Dr. F. C. Hoehne, Dr. W. L. Jepson, Mr. Joseph Ewan, Mr. Charles Deam, Dr. Angel Cabrera and Sr. Alberto Castellanos.

Stachys arvensis L. is widely introduced throughout the western hemisphere, being the only species found in the West Indies. A glabrous variety there is known as var. *bermudiana* Millsp. *S. lanata* Jacq. is an occasional escape. The former may be recognized by the scarcely exerted corolla tube 3.5—5 mm long and roughened nutlets; the latter is marked by the coarse habit and dense soft white pubescence. *S. annua* is occasionally found as a waif in North America.

Since the genus forms a network of interrelated species it is difficult to cast them into even an artificial scheme which is satisfactory. In view of probable changes in grouping after detailed study of the Eurasian species, the species-groups here employed are only temporary devices.

The groups are designated by numbers only and are arranged largely as a matter of convenience. The first four groups are characterized by an exannulate corolla tube. The remainder have an annulus situated sometimes just below the middle, sometimes near the base of the tube which in some species may be constricted, causing a small saccate protuberance on the anterior face.

Stachys L. Sp. Pl. 580. 1753 et Gen. Pl. ed. V. 253, 1754 per species 8 constituta est; species normalis *S. sylvatica* est.

Herbae vel annuae vel perennes caulibus maximam partem debilibus et internodiis elongatis etiam prostratis, rarius in basi suffruticosis; foliorum laminis nunc oblongis nunc ovatis, saepe deltoideis, supremis et petiolis gradatim deminutis, rarius pilis sericeis saepius pilis rigidioribus rectis vestitis; floribus saepius tribus in foliorum supremorum deminutorum axillis dispositis, glomerula saepius remota formantibus; calycibus florentibus turbinatis, pedicellis brevibus elatis, in maturitate campanulatis vel urceolatis, dentibus nunc deltoideis nunc lanceolatis in apice maximam partem spinis rigidis attenuatis rarius muticatis, ore rarius obliquo; corollarum tubo cylindrato, saepius leniter arcuato, superne leniter dilato, nunc integro et intus glabrato nunc infra medium vel ad basim piloso-annulato, frequenter sub labiolo lenissime saccato, limbo valde bilabiato, labia superiore erecta concava saepius rotundata, inferiore patente trifido, lacinia media majore; staminibus saepius ad tubi medium positis, infime pubescentibus, didynamis, e tubo sub labiam superiorem exsertis, rarius in tubo omnino inclusis; antheris bilocularibus, thecis late divaricatis; stylo in apice inaequaliter bifido; nuculis nunc laevibus nunc verrucosis obovatis, in apice nullomodo truncatis.

Regional Keys to the Species.

Species of South America.

Colombia:

Caulis ad angulos pilis rigidis in basi pustulatis
retorse armatis *S. hamata*

Caulis pilis extensis nec rigidis nec pustulatis
sat dense vestiti vel glabrati.

Corollarum tubi 2,5—3,5 mm longi e calyci-
bus vix exserti.

Calycum dentes obtusi nunc muticati
nunc debiliter spinulosi; herbae pu-
sillae *S. pusilla*

Calycum dentes acuminato-spinosi, pa-
tentes; herbae majores caulibus ad
60 cm longibus *S. micheliana*

Corollarum tubi 5—15 mm longi, e calyceibus
patenter exserti.

Corollarum tubi 10—15 mm longi . . . *S. lamioides*

Corollarum tubi 5—7 mm longi.

Stamines e corollae tubo vix 1 mm
exserti; tubi intus nudi *S. eriantha*

Stamines e corollae tubo 2—3 mm
exserti; tubi intus ad medium
annulati.

Herbae repentes; folia fere
glabra, ovato-oblonga, vix
1 cm lata *S. radicans*

Herbae saepe debiles vix tamen
repentes; folia sat hirsuta,
ovata, 1—3 cm lata.

Folia acutiusecula glabrata,
3—7 cm lata *S. hebens*

Folia obtusa sat hirsuta,
1,5—3,5 cm longa . . . *S. bogotensis*

Peruvia:

Corollarum tubi 2,5—3,5 mm longi.

Foliorum laminae 0,5—2 cm longae; calycum
dentes obtusi *S. pusilla*

Foliorum laminae 2—5 cm longae; calycum
dentes acuminato-spinosi *S. micheliana*

Corollarum tubi 4,5—15 mm longi.

Corollarum tubi 10—15 mm longi *S. lamioides*

Corollarum tubi 4,5—8 mm longi.

Corollarum tubi 6—8 mm longi intus ad
medium annulati *S. aperta*

Corollarum tubi 4,5—6,5 mm longi intus
exannulati.

Calycum dentes deltoidei acuti;
corollarum labia inferior quam
tubus brevior *S. Herrerae*

Calycum dentes ovati obtusi; co-
rollarum labia inferior tubum
aequans vel longior *S. peruviana*

Bolivia:

Corollarum tubi 3—3,5 mm longi; flores in axillis
saepius solitarii *S. pusilla*

Corollarum tubi 4—9 mm longi; flores in axillis
saepius tres.

- Corollarum tubi 5—6,5 mm longi *S. petiolosa*
 Corollarum tubi 7—9 mm longi *S. mandoniana*

Venezuela:

- Folia in basi rotundata vix crenata, ovato-cordata; corollarum tubi 8 mm longi *S. venezuelana*
 Folia in basi pulchre cordata; corollarum tubi 6—6,5 mm longi *S. Fendleri*

Ecuador:

- Corollarum tubi 3—3,5 mm longi; flores in axillis saepius solitarii *S. pusilla*
 Corollarum tubi 5—15 mm longi, flores in axillis saepius tres.
 Corollarum tubi 10—15 mm longi *S. lamiooides*
 Corollarum tubi 5—9 mm longi.
 Stamines e corollae tubo vix 1 mm exserti.
 Tubi intus annulati; calycum dentes acuminato-spinosi *S. debilis*
 Tubi intus exannulati; calycum dentes nunc muticati nunc debiliter spinulosi *S. eriantha*
 Stamines e corollae tubo 2—3 mm exserti.
 Folia glabra; calycum dentes spinis 1,5—2 mm longis armati *S. Sprucei*
 Folia sat hirsuta; calycum dentes in spinis debilibus circa 0,5 mm longi frequenter subnulli terminati *S. elliptica*

Chili:

- Corollarum tubi 3,5—4,5 mm longi, intus exannulati; stamines in tubo omnino inclusi *S. truncata*
 Corollarum tubi 5—11 mm longi, intus ad medium annulati, stamines e tubo exserti.
 Herbae annuae pusillae altitudine saepius 5—20 cm, rarius 30 cm *S. eremicola*
 Herbae perennes maximam partem 20 ad 50 cm et ultra.
 Foliorum laminae oblongae in basi plus minusve angustatae nec cordatae.

Planta tota pilis appressis mollibus
sericeo-hirsuta nunc cinereo-
viridia nunc candidissima . . . *S. sericea*

Planta nec sericea, superne glandu-
losa.

Caules in basi et folia dense
albo-lanata, arachnoidea . . . *S. albicaulis*

Caules utrimque et folia pilis
rectiusculis sparse hirsuta,
viridia.

Corollarum tubi 5—7 mm
longi *S. grandidentata*

Corollarum tubi 8—11 mm
longi *S. philippiana*

Foliorum laminae ovatae in basi rotun-
datae et saepe subcordatae vel trun-
catae.

Folia fere glabra, pilis brevibus
sparse induta *S. Gilliesii*

Folia plus minusve hirsuta interdum
incana.

Folia in basi rotundata vix cor-
data plus minusve incana.

Foliorum paginae superiorae
sericeo-hirsutae, inferiorae
tomentosae et ad venas
sericeo-hirsutae; caules plus
minusve indumento tomen-
toso vestiti *S. Bridgesii*

Foliorum paginae ambae pilis
mollibus subsericeo-hirsutae,
nec tomentosae; caulis pilis
extensis induti *S. philippiana*

Folia in basi saepius cordata, inter-
dum truncata, vix incana, fre-
quenter cinerea.

Foliorum indumentum sat
densum, areolas subtus pro-
minulas formans *S. pannosa*

Foliorum indumentum spar-
sius, areolae subtus nullae.

Caules sat crassi, pilis
extensis et brevioribus
subvillosi *S. litoralis*

Caules sat tenues, pilis ex-
tensis sparse vestiti . . . *S. Macraei*

Argentina:

Folia lineari-oblonga, in basi attenuata *S. albicaulis*

Folia ovata, in basi cordata.

Corollarum tubi 8—9 mm longi *S. Gilliesii*

Corollarum tubi 3,5—6,5 mm longi.

Corollarum tubi 3,5—4 mm longi, vix
e calycum tubo exserti *S. micheliana*

Corollarum tubi 4—6,5 mm longi, e
calycum tubo patenter exserti *S. petiolosa*

Brasilia — Uruguay — Paraguay:

Species una: *S. micheliana*.

Species ex Europa elatae:

S. arvensis L. praesertim in Brasilia.

S. lanata Jacq. in Chili.

Species of Mexico and Central America:

Stamina in corollae tubo patentim inclusa.

Corollarum tubi 4—5 mm longi.

Caules et bractea pilis rigidiusculis 2 ad
4 mm longis extensis ornati *S. Keerlii*

Caules pilis brevibus extensis vestiti *S. inclusa*

Corollarum tubi 7—8 mm longi *S. nepetifolia*

Stamina e corollae tubo patentim exserta.

Corollarum tubi 12—23 mm longi.

Caules ad angulos pilis retrorsis armati
caeterum saepius glabri interdum
glanduloso-villosi.

Folia acuminata; corollarum tubi
18—23 mm longi *S. Lindenii*

Folia obtusa; corollarum tubi 12 ad
14 mm longi *S. nubilorum*

Caules pilis extensis frequenter glandu-
losis in basi nullomodo pustulatis
utrimque vestiti *S. coccinea*

Corollarum tubi 2,5—11 mm longi.

Corollarum tubi 2,5—4 mm longi *S. agraria*

Corollarum tubi 5—11 mm longi.

Corollarum labiae superiores 2 ad
2,5 mm altae.

Plantae costaricensis *S. Pittieri*

Plantae mexicanae.

Calycum dentes obtusi
nunc mutici nunc debi-
liter spinosi; plantae
humiles prostratae al-
pinae radicibus incre-
satis *S. eriantha*

Calycum dentes acuti vel
acuminati sat spinosi;
plantae erectae.

Stamina labiam su-
periolem subae-
quanta *S. Grahami*

Stamina dimidia par-
te labiae superioris
breviores vix ex-
serta *S. parvifolia*

Corollarum labiae superiores 3 ad
5,5 mm altae.

Plantae Californiae inferioris.

Corollarum tubi 9—15 mm
longi *S. Bigelovii*

Corollarum tubi 7—9 mm
longi.

Plantae annuae *S. tenerrima*

Plantae perennes . . . *S. rigida*

Plantae mexicanae vel cen-
trali-americanae.

Calyces 3,5—4 mm longi;
plantae strictae spicis
attenuatis *S. collina*

Calyces 4—9 mm longi
rarius minusquam 5 mm
longi. (See continuation.)

Caules ad angulos pilis retrorsis in basi
pustulatis armati caeterum glabri . . . *S. boraginoides*

Caules pilis extensis interdum glandulosis
vestiti frequenter glabri.

Caules plus minusve prostratae et re-
pentes in nodis infimis radicantes.

Folia 1—2 cm longa oblongo-ovata
fere glabra *S. radicans*

- Folia plerumque 2—6 cm longa
ovata vel rotundato-ovata.
Calyces extus pilis extensis
longioribus vestiti.
Folia rotundato-ovata;
 plantae mexicanae . . . *S. vulcanica*
Folia ovata; plantae guate-
 malenses *S. guatemalensis*
Calyces extus pilis brevibus
 hirtelli *S. costaricensis*
Caulis erecti in nodis inferioribus nullo
modo radicantes.
Corollarum tubi intus exannulati.
 Tubi 9—15 mm longi . . . *S. Bigelovii*
 Tubi 6 mm longi *S. aristata*
Corollarum tubi intus infra medium
patenter annulati.
 Stamines e corollae tubo 1 ad
 1,5 mm exserti.
 Corollarum tubi 7—7,5 mm
 longi *S. exilis*
 Corollarum tubi 5,5—6 mm
 longi *S. globosa*
 Stamines e corollae tubo 2 ad
 4 mm exserti.
 Calyces extus pilis longiori-
 bus extensis vestiti; co-
 rollarum tubi 8—11 mm
 longi *S. mexicana*
 Calyces extus pilis brevi-
 bus hispiduli vel glabri.
 Folia plerumque 10 ad
 15 mm lata . . . *S. venulosa*
 Folia plerumque 2 ad
 5 cm lata.
 Plantae glabrae. *S. flaccida*
 Plantae pilis ex-
 tensis sparse
 vestitae . . . *S. Pringlei*

Species of the Pacific Coast States north of Mexico:

Corolla tubes 13—24 mm long.

- Calyces 11—15 mm long; margins of leaves
tending to be straight *S. Chamissonis*

Calyces 7,5—10,5 mm long; margins of leaves

convex *S. ciliata*

Corolla tubes 6—11 mm long.

Upper and lower leaves sessile, the median on

petioles 1—4 mm long *S. palustris*

Upper leaves usually sessile, the petioles gradually increased towards the base, the lowermost rarely less than 1 cm long.

Corolla tubes transversely annulate within near the base just above the nutlets,

never saccate *S. bullata*

Corolla tubes obliquely annulate just below the middle and often constricted and saccate on the anterior face.

Stamens exerted from the corolla tube 1—1,5 mm; upper lip of corolla

2—2,5 mm tall *S. stricta*

Stamens exerted from the corolla tube 2—3 mm or more; upper lip of the corolla 3—6 mm tall.

Pubescence consisting of very slender soft hairs which become tangled and cobwebby in age; corolla whitish . . .

S. albens

Pubescence consisting of straight usually stiffish hairs.

Leaves oblong, narrowed at the base, their pubescence silky when well developed, usually appressed; corolla whitish

S. ajugoides

Leaves oval or ovate, less often oblong, rounded at the base or cordate, scarcely narrowed there, their pubescence never silky.

Verticils crowded even at maturity, forming a continuous spike, the lowermost verticils sometimes separated; corolla whitish

S. pycnantha

Verticils sometimes approximate but hardly crowded.

Coastal plants ranging from Mendocino County north to Alaska; corolla purple or blotched with purple, its tube lightly constricted at the annulus, sometimes saccate .

S. Emersoni

Plants of the interior, or if coastal, ranging from Mendocino County southward; corolla pallid or whitish, its tube clearly constricted at the annulus and usually saccate on the anterior face . .

S. rigida

Species of the Rocky Mountains and Southwestern States, north of Mexico, exclusive of the Pacific Coast States:

Corolla tubes 9—21 mm long.

Corolla tubes 9—15 mm long, hirtellous within but scarcely annulate; upper lip of corolla 3—4 mm tall

S. Bigelovii

Corolla tubes 18—21 mm long, annulate near the base; upper lip of corolla 6—8 mm tall

S. coccinea

Corolla tubes 2,5—8,5 mm long.

Leaves oblong, sessile or nearly so.

Stems clothed with soft appressed silvery hairs; leaves prevailingly 8—12 mm broad, both surfaces appressed-pubescent, the upper somewhat silky . . .

S. Rothrockii

Stems clothed with spreading stiffish hairs; leaves prevailingly 1,5—4 cm broad, both surfaces thinly clothed with spreading hairs

S. palustris

Leaves prevailingly ovate, sometimes oblong-ovate, borne on petioles 0,5—3 cm long.

Corolla tubes 2,5—3,5 mm long *S. agraria*

Corolla tubes 5—6,5 mm long.

Calyces 4,5—5 mm long; upper lip of corolla 2—2,5 mm tall.

Stamens approximately as long as the upper lip *S. Grahami*

Stamens less than half as long as the upper lip *S. parvifolia*

Calyces 6,5—7 mm long; upper lip of corolla 3,5 mm tall *S. Drummondii*

Species of Eastern North America:

Lower and upper leaves sessile, the median ones subsessile or on petioles rarely as long as 8 mm.

Leaves entirely glabrous or thinly hispid with stiff hairs only.

Calyces essentially glabrous, sometimes bearing a few bristles, their teeth subequal to the tube; leaves entire or serrulate with low teeth.

Leaves rarely more than 6 mm broad, mostly entire *S. hyssopifolia*

Leaves mostly 8—12 mm broad, usually serrulate *S. aspera*

Calyces definitely hairy, either hispid with long hairs or clothed with short spreading hairs or both.

Calyx clothed with short hairs, its teeth deltoid, clearly shorter than the tube *S. latidens*

Calyx hispid with stiff hairs, otherwise glabrous, its teeth very acute, subequal to the tube *S. hispida*

Leaves definitely pubescent .

Calyx teeth deltoid-acuminate, clearly shorter than the tube; leaves prevailingly 3—6 cm broad *S. Nuttallii*

Calyx teeth acuminate, subequal to the tube; leaves mostly less than 4 cm broad.

- Leaves tending to be elliptical and narrowed below the middle, prevailingly acute or acuminate at the apex, mostly 2—4 cm broad, sometimes more *S. ambigua*
- Leaves tending to be oblong, particularly below the middle, usually less than 2,5 cm broad *S. palustris*
- Lower leaves on petioles usually 1—2 cm long, the median ones on petioles 1—7 cm long, the uppermost rarely sessile.
- Species confined to Florida, forming conspicuous tubers *S. floridana*
- Species not found in Florida, their rootstocks some times swollen but not commonly tuberous.
- Plants essentially glabrous.
- Leaves oblong; calyx teeth acute or sometimes obtuse *S. tenuifolia*
- Leaves ovate; calyx teeth acuminate, very sharp *S. subcordata*
- Plants definitely hairy.
- Stems clothed with stiffish hairs both long and short, spreading at right angles; leaves prevailingly ovate or obovate *S. Riddellii*
- Stems clothed with subretorse stiffish hairs, especially on the angles, for the rest glabrous; leaves prevailingly oblong *S. Clingmanii*
- Stems clothed with short subretorse hairs and a few stiff longer ones; leaves prevailingly oblong *S. salvioides*

Species Group I.

Perennial herbs with deltoid-ovate leaves, characterized particularly by the wholly included stamens, partly also by the proportionately short upper lip. Corolla tubes 4—8 mm long, exannulate. Mexican species.

1. *S. inclusa* Epling sp. nov. per specim. in Mexico prov. Puebla prope Mayorazgo a Fr. Arsène (no. 1338) lectum constituta est, typum in herb. Smithson., isotypum in herb. hortorum bot. Missouri. et Nov. Eborac. vidi.

Herbae verisimiliter palustres radicibus incrassatis altitudine 30—100 cm et ultra, caulibus ramosis ramis ascendentibus, ad basim fere glabris superne pilis extensis mollibus brevibus interdum glandulosis vestitis et longioribus rigidiusculis conspersis; foliorum laminis plerumque 3—5 cm longis, 1,5—2,5 cm latis, oblongo-ovatis, in apice rotundatis, in basi truncato-subcordatis, marginibus obtuse serratis, paginis ambobus pilis brevibus sparse vestitis inferiore interdum cinerea, petiolis 1—4 cm longis elatis; verticillastris 6-floribus in bracteorum reflexorum axillis dispositis, remotis, spicas interruptas graciles rigidiusculas formantibus; calycibus 5—6,5 mm longis extus pilis brevibus hirtellis plus minusve glandulosis dentibus anguste deltoideis spinosis; corollarum extus pilis crispulis sparse vestitarum tubo 5 mm longo intus infra stamines glabro exannulato, labia superiore 3 mm alta, inferiore 5,5—6 mm longa; staminibus in corollae tubo omnino inclusis 2 mm altis filamentis hirtellis; styli ramis sat acutis.

Mexico: Puebla, ad oppidum Puebla prope Mayorazgo, 2135 m, 16. VIII. 1906, Fr. Arsene 97; Rancho Posada ad Puebla, 2194 m, 1. VI. 1909, Fr. Nicolas 154; ad oppidum Puebla prope Mayorazgo, 2120 m, 4. VII. 1907, Fr. Arsene 1338; Teocalli de Cholula, 2224 m, 7. XI. 1907, Fr. Arsene; prope Mayorazgo, 2120 m, 18. VII. 1907, Fr. Arsene 2158. — Oaxaca: prope San Miguel, 2360 m, 15. X. 1921, Conzatti.

2. *S. Keerlii* Benth., Lab. Gen. et Sp. 551, 1834 et in DC. Prodr. 12, 480, 1848 per specim. in Mexico prope Tlalpujahua a Keerl lectum constituta est; typum in herb. Kew vidi. — *S. excelsa* M. et G. in Bull. Acad. Brux. 11. II, 194, 1844 per specim. in Mexico prov. Oaxaca in savannis ad Juquila del Sur a Galeotti (no. 662) lectum constituta est; typum in herb. Mus. Brux., isotypum in herb. Kew. vidi.

Herba gracilis verisimiliter perennis erecta altitudine 60—100 cm, caulibus pilis extensis rigidiusculis 2—3 mm longis ornatis et superne glandulosis, internodiis elongatis; foliorum laminis plerumque ovatis 3—6 cm longis, 2—4 cm latis, in apice obtusis vel rotundatis, in basi leniter cordatis, marginibus saepius convexis obtuse serratis, paginis ambobus pilis rigidiusculis conspersis, petiolis 1—5 cm longis elatis; verticillastris 6-floribus in spicis interruptis elongatis gracilibus dispositis bracteis pilis longissimis ad 4 mm longis sparse pilosis et brevioribus glandulosis vestitis subtentis; calycibus 5—5,5 mm longis extus pilis extensis glandulosis vestitis, dentibus deltoideo-lanceolatis acuminatis acutissimis; corollarum tubo 4 mm longo intus infra stamines glabro exannulato, labia superiore 3—3,5 mm alta, inferiore

6,5—7 mm longa; staminibus in corollae tubo omnino inclusis 1,5 mm longis, filamentis hirtellis; styli ramis acutis.

Mexico: Michoacan: prope Tlalpujahua, Keerl. — Oaxaca: in savannis ad Juquila del Sur, Galeotti 662; in valle Oaxaca, 1894, Nelson 1171; in Sierra de San Felipe, 7500 ped., 11. IX. 1894, Pringle 4878; El Parian, Nochixtlan, 1000 m, 28. VII. 1907, Conzatti 1941.

3. *S. nepetifolia* Desf., Tabl. ed. I, 60, 1804 (nomen) et ex Pers. Syn. 2, 123, 1807 per specim. cultum constituta est; typum non reperire potui — ? *S. nepetaefolia* Cav., Descr. 74, 1802.

Herbae laxae perennes altitudine 30—80 cm, caulibus ascendentibus in basi saepe procumbentibus etiam prostratis pilis mollibus brevibus retrorsis pubescentibus, nullomodo glandulosis; foliorum laminis deltoideo-ovatis plerumque 2—4 cm longis, 1,5—3 cm latis in apice saepius rotundatis, in basi leniter cordatis, marginibus crenato-serratis rectiusculis, paginis ambobus pubescentibus, petiolis plerumque 1—3 cm longis elatis; verticillastris plerumque 6-floribus in bractorum axillis remote dispositis; calycibus 5—7 mm longis, extus pilis brevibus nullomodo glandulosis molliter pubescentibus, dentibus anguste deltoideis acutissimis 2—2,5 mm longis; corollarum extus pilis brevibus appressis hirtellarum tubo arcuato 7—8 mm longo, intus infra stamines glabro exannulato, labia superiore 2,5—3 mm alta, inferiore 4,5—5 mm longa; staminibus in corollae tubo omnino inclusis 2 mm altis filamentis hirtellis; styli ramis incrassatis truncatis.

Mexico: Mexico et D. F.: in monte Zacoalco prope Guadalupe, 10. VII. 1865, Bourgeau 488; in valle Mexico, 1875, Schaffner 416, 405; in collibus ad Guadalupe, 8000 ped., 19. VII. 1901, Pringle 9543; in valle Mexico, 1865, Bourgeau 398. — Hidalgo: prope El Salto, 7000 ped., 18. IX. 1902, Pringle 11104; prope Ixmiquilpan, IX. 1905, Purpus 1426; prope Ixtaccihuatl, 1903, Purpus; in collibus ad Pachuca, 8000 ped., 3. VII. 1898, Pringle 6884. — San Luis Potosi: in montibus ad oppidum San Luis Potosi, 6000 ad 8000 ped., 1878, Parry et Palmer 733.

Species Group II.

Perennial herbs with deltoid-ovate glabrate leaves and exannulate corolla tubes 6—15 mm long. The stamens are very shortly exerted from the corolla tube and the upper lip is proportionately short. Chiefly Mexican, *S. Bigelovii* extending into southernmost Texas.

4. *S. aristata* Greenm. in Proc. Am. Acad. 39, 87, 1903 per specim. in Mexico prov. Jalisco ad cataractam Guanacatlan a

Pringle (no. 8623) lectum constituta est; typum in herb. Gray., isotypis complures vidi.

Herba perennis altitudine 30—60 cm, caulibus paucis gracilibus erectis e caudice lignoso fere glabris superne sparse hirtellis; foliorum laminis 2—6 cm longis, 6—24 mm latis, anguste deltoideis, in apice acutis, in basi rotundato-truncatis, marginibus rectis serratis, paginis ambobus breviter hirtellis, petiolis 1—3 cm longis elatis; verticillastris plerumque 6-floribus in spicis interruptis gracilibus dispositis bracteis linearibus subtentis; calycibus 5 mm. longis extus pilis brevibus extensis hirtellis, dentibus subulatis acutissimis; corollarum tubo 6 mm longo, intus hirtello exannulato, labia superiore 3.5 mm alta, inferiore 7 mm longa; staminibus e corollae tubo 1—1.5 mm exsertis, filamentis hirtellis.

Mexico: Jalisco: ad cataractam Guanacatlan, 6. VIII. 1902, Pringle 8623; prope lacum Chapala, II. 1893, Sheldon 7.

5. *S. Bigelovii* Gray in Proc. Am. Acad. 8, 371, 1872 per specim. in Texas in rupestribus ad rivulum Limpio a Bigelow lectum constituta est; typum et isotypum in herb. horti bot. Nov. Eborac. vidi.

Herbae laxae perennes altitudine 40—80 cm et ultra, caulibus ramosis in basi procumbentibus etiam prostratis pilis brevibus sparse hirtellis infime subglabris; foliorum laminis deltoideo-ovatis rarius ovatis plerumque 3—5 cm longis, 2—4 cm latis, in apice obtusis, in basi leniter cordatis, marginibus rectiusculis obtuse serratis, paginis ambobus hirtellis petiolis 1—3 cm longis elatis; verticillastris 6-floribus in spicis interruptis gracilibus elongatis remote dispositis; calycibus 6—9 mm longis extus pilis brevibus extensis vestitis vix glandulosis, dentibus deltoideo-acuminatis spinosis acutissimis; corollarum tubo 9—15 mm longo intus hirtello vix tamen annulato, labia superiore 3—4 mm alta, inferiore 7—8 mm longa; staminibus e corollae tubo 1.5—2.5 mm exsertis filamentis hirtellis.

Although the range is rather unusual I can find little difference between the plants of Texas and central Mexico. The corollas of the former are somewhat smaller. The single specimen from Lower California is seemingly conspecific.

Texas: In valle Rio Grande infra Doñana in rupibus ad rivulum Limpio, Bigelow; Chisos Mts., VIII. 1883, Harvard 28; sine loco, Nealley; in angustiis prope Ft. Davis, 6. VII. 1917, Munz; in saxosis humidis ad rivuli ripas ad Ft. Davis, 9. VI. 1926, Palmer 30606; Chisos Mts., 7. VIII. 1915, Young; Chisos Mts., 23. IV. 1928, Palmer 34089; in angustiis Little Ajuga dictis, Davis Mts., 12. VI. 1928, Palmer 34505; prope Alpine, com. Brewster, 10. VI. 1918, Palmer 34443.

Mexico: Baja California: Soledad, 8. I. 1890, Brandegee. — Coahuila or Nuevo Leon: in montibus Caracol dictis prope Mondora, VIII. 1880, Palmer 1094. — Durango: in quercetis prope Sandia, 7500 ped., 15. X. 1905, Pringle 10107; in umbrosis ad Santiago Papasquiaro, VIII. 1896, Palmer 442; prope Tejaman, 21. ad 27. VIII. 1906, Palmer 492; prope Cacaria (Oacaria) 5. VIII. 1898, Nelson 4650. — Zacatecas: in collibus, 26. X. 1888, Pringle 2187; sine loco, Coulter 1072; prope Concepcion del Oro, 22. XI. 1902, Palmer 383. — San Luis Potosi: in valle San Luis Potosi circa urbem in paludosis, Schaffner 685 (323); prope urbem, 5950 ped., 23. VIII. 1926, Fisher 201.

Species Group III.

Small perennial or annual herbs with oblong-ovate leaves and often obtuse calyx teeth. Corolla tubes 3—7 mm long, exannulate, the stamens very shortly exerted from the tube, the upper lip proportionately short. High montane species of Mexico, Peru and Bolivia.

6. *S. eriantha* Benth., Lab. Gen. et Sp. 549, 1834 et in DC. Prodr. 12, 479, 1848 per specim. in Mexico a Mociño et Sesse lectum constituta est, typum olim in herb. Lambert. verisimiliter perditum non reperire potui. — *S. repens* M. et G. in Bull. Acad. Brux. 11. II, 194, 1844 per specim. in Mexico in monte Orizaba a Galeotti (no. 682) lectum constituta est; typum in herb. Mus. Brux., isotypum in herb. Kew. vidi.

Herba pusilla altitudine 10—15 cm perennis radicibus carnosis caulibus prostratis ramosis repentibus pilis extensis brevibus et plus minusve glandulosis sparse vestitis; foliorum laminis 6 ad 18 mm longis, nunc rotundatis nunc oblongo-ovatis, petiolis 2—5 mm longis elatis, in apice rotundatis, in basi truncato-rotundatis vix cordatis, marginibus convexioribus crenatis, crenis 0,5—1 mm altis, paginis ambobus hirtis brevibus plus minusve appressis vestitis; floribus in foliorum supremorum sat deminatorum axillis dispositis, glomerulis nunc confertis nunc 1—2 cm inter se distantibus; calycibus subsessilibus 4,5—6 mm longis turbinatis, in maturitate urceolatis extus pilis brevibus extensis vestitis, dentibus 1,5—2 mm longis ovatis obtusis nunc muticatis nunc spinis brevibus debilibus 0,2—0,6 mm longis armatis; corollarum labia superiore 2—2,5 mm alta, inferiore tubum subaequante; staminibus e corollae tubo vix 1 mm exsertis; nuculis maturis non visis.

I believe that Bentham's description, particularly with reference to the calyx teeth, leaves little doubt that this species was renamed by Martens.

Colombia: Norte de Santander: Paramo de Romeral, 3800 ad 4200 m, 30. I. 1927, Killip et Smith 18691; Santander: Paramo de Santurban prope Vetas, 3950—4160 m, 17. I. 1927, Killip et Smith 17497.

Ecuador: Paramo in declivitate occidentale montis Chimborazo, 3000 m, 5. X. 1923, Hitchcock 22042; Urbina, Chimborazo, 11,400 ped., 22.—28. X. 1923, Anthony et Tate 360; ad Carchi prope Tulcan in collibus silvaticis, 10. VIII. 1923, Hitchcock 20965.

South American specimens here referred differ from the Mexican chiefly in the slightly shorter stamens and less fleshy roots.

Mexico: in arenosis ad arborum terminum in monte Popocatepetl, IX. 1908, Purpus 3079; in monte Orizaba, Galeotti 682; in monte Popocatepetl, 7.—8. VIII. 1901, Rose et Hay 5995; in monte Orizaba, 25.—26. VII. 1901, Rose et Hay 5708; in monte Orizaba, 10000—13000 ped., IX. 1841, Liebmann 15614, 15610.

7. *S. pusilla* Briq. in Ann. Conserv. et Jard. Bot. Geneve 2, 120, 1898 per *S. ellipticam* var. *pusillam* Wedd., loc. cit., constituta est. — *S. elliptica* var. *pusilla* Wedd., Chl. And. 183, 1860 per specim. in Colombiae prov. Cundinamarca in paramo de Herve a Goudot lectum constituta est; typum in herb. Mus. Par. vidi.

Herba annua pusilla ramosior tegeticulas saepe formans caulibus 5—20 cm longis, pilis brevibus sparse vestitis; foliorum laminae 5—20 mm longis, ovatis vel oblongo-ovatis, in basi rotundato-truncatis, margine pro rata grande dentata, crenis circa 1 mm altis, obtusis, paginis ambobus pilis rectis sparse hirsutis, petiolis 5—15 mm longis elatis; floribus in foliorum supremorum axillis saepius solitariis interdum binis ternisve, bracteolis parvis setaceis subtentis; calycibus florentibus 3—3.5 mm longis, turbinatis, in maturitate 4 mm longis, urceolatis, nuculis distentis, extus breviter vestitis, dentibus vix 1 mm longis, ovatis, obtusis, nunc muticatis nunc debiliter spinulosis; corollarum tubo 3—3.5 mm longo, e calyce vix exserto, intus exannulato, labia superiore 1.5—2 mm alta; staminibus ad fauces sitis; nuculis 1.5—2 mm diametro.

Colombia: Montserrate ad Bogota, 3100 m, 2. I. 1914, Fr. Ariste-Joseph 942; sine loco, Goudot.

Ecuador: Monte Antisana, Hartweg 1345; Paramo de Lanancaja, Spruce 5861; sine loco, Spruce 5946; Cuenca, 17. ad 24. IX. 1918, Rose 22901; in altoplanitie prope Quito, Jameson.

Peru: Occa Pampa, Huancane, 3965 m, 10. XII. 1919, Shepard 66; Mito, 3000 m, 23. VII.—14. VIII. 1922, Macbride et Featherstone 1716; Rio Blanco, 500 m, 8.—19. V. 1922, Macbride et Featherstone 814; ad ripas glareosas, 3850—3900 m, Chuquibambilla, Puno, 19.—21. IV. 1925, Pennell 13398; Huaron, 14000

ped., ad lacus litus arenosum, 12. VI. 1922, Macbride et Featherstone 1147.

Bolivia: Sorata, 10000 ped., II. 1886, Rusby 2413; Unduavi, Nord Yungas, 3300 m, XI. 1910, Buchtien 2950; La Paz, 3800 m, 28. III. 1907, Buchtien 757; ad Sorata prope Coripata, 3000 m, 8. XI. 1858, Mandon 521; La Paz, 3850 m, 3. II. 1919, Buchtien 536; Titicaca ad litus, 31. I. 1903, Hall 384.

8. *S. Herrerae* Epling sp. nov. per specim. in Peruviae prov. Cuzco ad Sacsahuaman a Pennell (no. 13577) lectum constituta est; typum in herb. Mus. Field. vidi.

Herba perennis ramosa decumbens caulibus longitudine 15 ad 40 cm, internodiis saepius elongatis, pilis extensis sparse vestitis; foliorum laminis 1,5—3 cm longis, ovatis, in apice obtusis, in basi leniter cordatis, marginibus convexioribus, crenato-serratis, crenis 1—2 mm altis, infimis petiolis gracilibus 1—3 cm longis elatis, supremis sessilibus deminutis, omnibus pilis rectis sparse vestitis; floribus nunc in foliorum supremorum axillis nunc in spicis interruptis elongatis dispositis; calycibus florentibus turbinatis, in maturitate urceolatis, extus pilis rectis sparse vestitis, dentibus deltoideis 1,5—2 mm longis acutis in spinas circa 0,5 mm longas sat rigidas acuminatis; corollarum tubo 5—7 mm longo intus exannulato, labia superiore circa 2,5 mm alta, inferiore quam corollae tubus brevior; staminibus e corollae tubo vix 1 mm exsertis; nuculis circa 1,5 mm diametro.

Peruvia: Cuzco: prope Tinta, 3500 m, 15. IV. 1915, Cook et Gilbert 220; Ollantaytambo, 3000 m, V. 1915, Cook et Gilbert 506, 637; ad Viso, in saxosis graminosis, 9000 ped., 5.—14. V. 1922, Macbride et Featherstone 593; in saxosis prope Sacsahuaman ad Cusco, 3500—3600 m, 24. IV. 1925, Pennell 13577; in saxosis prope Vilcanota ad Caicai, 3200—3500 m, 7. V. 1925, Pennell 14186; in dumetis inter Paucartambo et Tres Cruces, Cerro de Cusilluyoc, 3200—3400 m, 2.—6. V. 1925, Pennell 14153; prope Cusco, 3000 ad 3600 m, VII. 1923, Herrera.

A puzzling species resembling *Stachys peruviana* in habit but having flowers more nearly like *S. petiolosa*. The more robust forms approach the latter in habit and form of leaf.

9. *S. peruviana* Dombey ex Benth., Lab. Gen. et Sp. 551, 1834 per specim. in Peruvia prope Lima in uliginosis a Dombey lectum constituta est; typum in herb. Mus. Brit., isotypos in herb. Kew. et Par. vidi.

Herba perennis decumbens, in basi ramosa altitudine 15—30 cm, caulibus saepius decumbentibus, pilis extensis sparse vestitis; foliorum laminis 2—5 cm longis, ovatis, in apice rotundatis, in basi leniter cordatis, infimis petiolis 0,5—1,5 cm longis elatis, supremis sessilibus

deminutis, omnibus praesertim ad venas pilis rectis sparse vestitis caeterum fere glabris, margine convexiore, crenato-serrata, crenis 1—2 mm altis; floribus nunc in foliorum supremorum axillis nunc in spicis interruptis elongatis dispositis; calycibus florentibus turbatis, in maturitate urceolatis, 5—6,5 mm longis, extus pilis rectis sparse vestitis, dentibus 1,5—2,5 mm longis, ovatis, obtusis, spinis debilibus 0,5—0,8 mm longis armatis; corollarum tubo 4,5—5,5 mm longo, intus exannulato, labia superiore circa 2,5 alta, inferiore corollae tubum aequante et ultra; staminibus e corollae tubo vix 1 mm exsertis; nuculis circa 1,5 mm diametro.

Peru: Lima: Santa Clara, 18. VII. 1914, Rose 18744; prope Lima, Dombey, Mathews 719; in monte Amancaes dicto prope Lima 200—800 m, 21. X. 1902, Weberbauer 1633; ad Callao, Gaudichaud 84; prope Lima, IV. 1876, Savatier 1503; prope Las Ramas ad Lima, VII. 1876, Savatier 1677; prope Lima, 1862, Nation; in saxosis ad San Buenaventura, 2700—2800 m, 17. VI. 1925, Pennell 14557; in saxosis prope Antaicocha, Cerro Colorado ad Canta, 3400—3800 m, 20. VI. 1925, Pennell 14638; prope Viso in saxosis graminosis, 9000 ped., 5.—14. V. 1922, Macbride et Featherstone 593; Rio Blanco, 3000—5000 m, 15.—17. IV. 1929, Killip et Smith 21706.

Species Group IV.

Small annual herbs with mostly deltoid-ovate or oblong leaves and small flowers, their corolla tubes 2,5—6 mm long, exannulate or obscurely annulate near the middle. The verticils are commonly many-flowered and remote. The stamens are wholly included in *S. truncata*, lightly exserted in *S. latipes*, *Micheliana* and *agraria* and about equal to the upper lip in *S. Grahami* and *S. radicans*. This group is heterogeneous. Species of Mexico, Texas, Colombia, Chile, Brasil, Uruguay and Argentina.

10. *S. micheliana* Briq. in Micheli, Fl. Parag. 7, 1897 per specim. in Paraguay ad Babe-Pororo prope Yaguaron in agris et ad margines viarum a Balansa (no. 3210) lectum constituta est; isotypum in herb. Kew. vidi. — ? *S. Mayorii* Briq. in Mem. Soc. Neuchât. Nat. Sci. 5, 402, 1913 per specimina in Colombiae prov. Antioquia a Mayor (no. 405, 505 a, 505 b) lecta constituta est; specimina non vidi.

Herba videtur annua caulibus maximam partem decumbentibus 30—60 cm longis, pilis extensis sparse vestitis, internodiis elongatis; foliorum 2—5 cm longis, tenuibus, petiolis hirsutis 0,5—3 cm longis elatis, ovatis, obtusis, in basi cordatis, marginibus praesertim infra medium convexis, supra medium interdum fere rectis, crenato-

serratis, crenis gibbosis, paginis ambobus tenuiter hispido-hirsutis; floribus in spicis interruptis 10—30 cm longis dispositis, bracteis subfoliosis valde deminutis reflexis subtentis, glomerulis subglobosis multifloribus vix 1 cm diametro, infimis inter se 1—3 cm distantibus, supremis confertis; calycibus florentibus turbinato-campanulatis, 3,5—4 mm longis, extus hispidis, in maturitate urceolatis, dentibus 1,5 mm longis, ovato-lanceolatis, acuminato-spinosis, patentibus; corollarum tubo 2,5—3 mm longo pro rata crasso, intus nudo; nuculis 1 mm diametro.

The species as here understood has rather an unusual distribution yet I am unable to perceive any remarkable differences between the specimens of Colombia and those of the lowlands of Paraguay and Argentina.

Colombia: prope Medellin, 24. III. 1927, Toro 139; Rio Ortega prope Tambo, El Cauca, 1900—2100 m, 2. VII. 1922, Pennell et Killip 8067; La Sombra prope Apia, Caldas, 1300—1600 m, 4. IX. 1922, Pennell 10267; Rio Quindio prope Armenia, Caldas, 1300 ad 1500 m, 25. VII. 1922, Pennell, Killip et Hazen 8674; Cuesta de Tocota inter Buenaventura et Cali, 1500—1900 m, XII. 1905, Pittier 704; La Manuelita prope Palmira, Cauca, 1100—1300 m, XII. 1905, Pittier 823; La Cumbre, El Valle, 1600—1800 m, 21. ad 25. V. 1922, Killip 6005; Cachipay, Cundinamarca, 1600 m, 14. IX. 1917, Rusby et Pennell 1229; La Cumbre, El Valle, 1500—1700 m, 7.—10. V. 1922, Pennell 5211; Balsillas, Huila, 2000—2100 m, 3.—5. VIII. 1917, Rusby et Pennell 716; San Clemente, Caldas, 1800—2200 m, 16. IX. 1922, Pennell 10675.

Peruvia: San Martin: prope San Roque, I.—II. 1930, L. Williams 7150.

Brasilia: Minas Geraes: sine loco 13. XI. 1866, Regnell; Novo Württemberg, 450 m, 14. X. 1904, Bornmüller 268; Novo Friburgo, Claussen, Beyrich; Caldas, Regnell III. 937; São Paulo: ad Rio Pardo, St. Hilaire 1028; ad Rio de Tibaia, St. Hilaire 1068; ad São Paulo, St. Hilaire 1099.

Uruguay: sine loco, St. Hilaire 2315; in silvis Sta. Lucia, 1. IX. 1869, Fruchard.

Paraguay: Babe-Pororo prope Yaguaron, Balansa 3120; in montibus prope Encarnación, IX. 1915, Rojas 1444; sine loco, Fiebrig 5732.

Argentina: Entre Rios: prope Concepción, X. 1875, Lorentz 555; ? Chubut: ad flumen Corcovado, II. 1903, Illin 157; Santa Fe, 15. XI. 1905, Venturi 136; Las Mollas, IV. 1876, Calot 101; Las Palmas, Chaco, X. 1917, Jörgensen 11768; Formosa, X. 1918, Jörgensen 2838.

11. *S. truncata* Kuntze ex Benth., Lab. Gen. et Sp. 550, 1834 per specim. in Chili in glareosis ad Concon a Poeppig (no. 267) lectum constituta est; typum in herb. Kew., isotypos in herb. Mus. Par. et Vindob. vidi.

Herba annua pusilla altitudine 5—25 cm caulibus frequenter in basi ramosis, pilis brevibus extensis sparse conspersis superne plus minusve glandulosis; foliorum laminis ovatis, in apice rotundatis, in basi ad petiolos quam laminae breviores rotundato-angustatis, margine crenato-serrata, crenis pro rata majoribus paucis, paginis ambobus sparse villosulis; floribus in verticillastris paucis dispositis; glomerulis infimis inter se 1—5 cm distantibus supremis confertis, omnibus bracteis subfoliosis plerumque serratis subtentis; calycibus florentibus turbinatis 5—6 mm longis, extus sparse villosulis, dentibus vix 2 mm longis spinosis; corollarum tubo 3,5—4,5 mm longo, intus exannulato; staminibus in tubo omnino inclusis; nuculis non visis.

Chili: prope Valparaiso, King, Cuming 733; Limache, 1832, Bridges 405; prov. Aconcagua, Philippi; in glareosis ad Concon, Poeppig 267; inter fruticeta pascuorum ad Concon, Poeppig 154; prope Coquimbo, Coppinger, Harvey; Talca, IX. 1926, Fr. Claude-Joseph 4334.

12. *S. agraria* C. et S. in Linnaea 5, 100, 1830 per specim. in Mexico prope Jalapa a Schiede et Deppe (no. 143) lectum constituta est; typum in herb. Mus. Berolin. vidi. — *S. umbrosa* Scheele in Linnaea 22, 595, 1849 per specim. in Texas prope New Braunfels a Roemer lectum constituta est; typum non vidi. — *S. confusa* Briq. in Ann. Conserv. et Jard. Bot. Genève 2, 122, 1898 per specim. in Texas ad flumen Brazos a Drummond lectum constituta est; typum in herb. Delessert., isotypum in herb. Kew. et Gray. vidi. — *S. camporum* M. E. Jones, Contrib. Western Botany, 12, 70, 1908 per specim. in Mexico in prov. Chihuahua in montibus Sierra Madre dictis in Round Valley a Jones lectum constituta est; typum in herb. Coll. Pomonae, isotypum in herb. Univ. Stanford. vidi. — *S. polysegia* Briq. in Ann. Conserv. et Jard. Bot. Geneve 13 et 14, 385, 1911 per specim. in Mexico prov. Tamaulipas prope San Juan a Kemp lectum constituta est; typum in herb. horti bot. Nov. Eborac. vidi.

Herba annua altitudine 15—25 cm, rarius 40 cm et ultra, radicibus interdum incrassatis caulibus ascendentibus in basi saepius procumbentibus pilis extensis plus minusve vestitis et superne frequenter breviter glandulosis; foliorum laminis ovato-oblongis 1,5—4 cm longis, 1—2 cm latis, in apice rotundatis vel obtusis, in basi truncato-rotundatis vix cordatis, marginibus saepe rectiusculis obtuse serratis, paginis ambobus pilis rectis sparse hirtellis, petiolis 0,5—4 cm longis

elatis; verticillastris 6—12-floribus in bracteorum subfoliosorum reflexorum axillis remote dispositis, infimis frequenter in foliorum supremorum axillis, supremis confertis; calycibus 4—5 mm longis extus pilis brevibus extensis plus minusve vestitis, dentibus plerumque deltoideo-ovatis interdum deltoideo-lanceolatis acutis plus minusve spinosis; corollarum tubo 2,5—4 mm longo intus frequenter obscure annulato; labia superiore 1—1,2 mm alta, inferiore 2—4 mm longa; staminibus e tubo plus minusve exsertis, filamentis hirtellis.

S. polysegia appears to be no more than a large leaved form of *S. agraria*. *S. camporum* is a form with leaves tending to oblongovate rather than ovate and with somewhat more prominent braets. It passes imperceptibly into the typical form and occurs throughout its range in Mexico, but seemingly not in Texas. Briquet's confusion may lie in the fact that Schiede collected two similar species, one *S. agraria*, the other *S. Grahami*.

Ranges from southern Louisiana (Alexandria) and Texas (Brazos Santiago, Dallas, Tarrant, Travis, Comal, Harris, Bexar) through Mexico to Guatemala.

13. *S. parvifolia* M. et G. in Bull. Acad. Brux. 11. II, 193, 1844 per specim. in Mexico prov. Hidalgo ad Real del Monte a Galeotti (no. 701) lectum constituta est; typum in herb. Mus. Brux. vidi. — *S. latipes* Greenm. in Proc. Am. Acad. 39, 87, 1903 per specim. in Mexico prov. Chihuahua in montibus Sierra Madre dictis ad Coloniám Garcia a Townsend et Barber (no. 128) lectum constituta est; typum in herb. Gray., isotypos in herb. Smithson., Mus. Field. et hortorum bot. Nov. Eborac. et Missouri. vidi. ? *S. Galeottii* Martens in Bull. Acad. Brux. 11. II, 192, 1844 per specim. in Mexico prov. ? Michoacan in Cerro de Quinceo a Galeotti (no. 698) lectum constituta est; typum in herb. Brux. vidi.

Herba annua altitudine saepius 15—30 cm, caulibus erectis vel ascendentibus fere glabris vel pilis brevibus extensis sparse conspersis; foliorum laminis 1,5—4 cm longis, 8—16 mm latis, ovato-oblongis vel oblongo-ellipticis, in apice obtusis vel rotundatis, in basi truncato-subcordatis interdum rotundato-angustatis, marginibus obtuse serratis, paginis ambobus fere glabris, petiolis 0,5—2 cm longis elatis; verticillastris saepe multifloribus in foliorum supremorum deminatorum axillis dispositis supremis confertis; calycibus 4—6 mm longis extus sparse hispidulis, dentibus lanceolatis subspinosis acutissimis; corollarum tubo 5—6 mm longo intus paulo infra medium saepe leniter annulato, labia superiore 2—2,5 mm alta, inferiore 4,5—5 mm longa; staminibus e tubo vix exsertis labiae superioris dimidia parte brevioribus.

Scarcely distinguishable from *S. agraria* save in the degree of exsertion of the stamens and larger flowers. The type of *S. latipes*

has oblong leaves narrowed toward the base; none of the specimens here included quite equal it in this respect, although Nelson's gathering is assuredly conspecific. It seemingly bears to *S. parvifolia* the same relation that *S. camporum* bears to *S. agraria*. The type of *S. Galeottii* is remarkably similar but is somewhat more pubescent.

Texas: Brownsville, Resaca, 7. V. 1919, Hanson 420.

Mexico: Tamaulipas: Santa Rita Ranch, 1500 m, 8. IV. 1926, Runyon 867; prope Victoria, 900 m, 27. III. 1925, Runyon 751; prope Victoria, 400 m, 4. IV. 1926, Runyon 964. — Coahuila: in montibus prope Saltillo 25. VII.—1. VIII. 1880, Palmer 1092, 1093. — Hidalgo: Real del Monte, 15. IX. 1910, Clokey 1861; Real del Monte, 8000 ped., 1844, Galeotti 701. — Chihuahua: Mt. Mohinora, 1. IX. 1898, Nelson 4872; in montibus prope Coloniam Garcia 8000 ped., 17. VII. 1899, Townsend et Barber 128.

14. *S. Grahmi* Benth., Lab. Gen. et Sp. 551, 1834 per specim. in Mexico prope Tlalpujahua a Graham lectum constituta est; typum in herb. Kew. vidi. — ? *S. biflora* Hook. et Arnott, Bot. Beechey 155, 1841 per specim. mancum a Lay et Collie lectum constituta est; typum in herb. Kew. vidi. — *S. agraria* var. *glabrior* Benth. in DC. Prodr. 12, 479, 1848 per specim. in Mexico a Hartweg (no. 167) lectum constituta est; typum in herb. Kew., isotypum in herb. horti bot. Nov. Eborac. vidi.

Herba annua debilis altitudine plerumque 30—40 cm., caulibus praesertim in basi ramosis pilis extensis superne brevioribus et glandulosis sparse vestitis; foliorum laminis plerumque 1,5—3,5 rarius 4,5 cm longis, 1—2 cm latis oblongo-ovatis, in apice obtusis vel rotundatis, in basi truncato-subcordatis necnon patentim cordatis, marginibus convexis vel rectiusculis crenato-serratis, paginis ambobus pilis rectiusculis brevibus sparse hirtellis, petiolis 0,5—3 cm longis elatis; verticillastris 6—10-floribus in bracteorum subfoliosorum axillis remote dispositis; calycibus 4,5—5 mm longis extus pilis brevibus extensis hirtellis et plus minusve glandulosis dentibus lanceolatis subspinosis rarius deltoideis; corollarum tubo 5 mm longo intus obscure annulato; labia superiore 2—2,5 mm alta, inferiore 4—5 mm longa; staminibus e tubo exsertis, labiam superiorem subaequantibus.

Reappears along the Gulf Coast of the United States, apparently as a ballast plant.

Mexico: Vera Cruz: prope La Joya, VI. 1829, Schiede et Deppe. — San Luis Potosi: ad Rio Verde prope Media Luna, 2. ad 8. VI. 1904, Palmer 76. — Mexico: in collibus prope Lecheria, 7500 ped., 4. VII. 1904, Pringle 13172; prope Tlalpujahua, Graham; Keerl. — Aguas Calientes: in silvis, Hartweg 167. — Nayarit: inter

Aguacata et Dolores, 6. VIII. 1897, Rose 2025. — Jalisco: prope Guadalajara, 1886, Palmer 228.

15. *S. radicans* Epling sp. nov. per specim. in Mexico in prov. Mexico in Sierra de las Cruces a Pringle (no. 4208) lectum constituta est; typum in herb. Univ. Calif. (Los Angeles), isotypos complures vidi.

Herba videtur annua repentibus caulibus in nodis infimis radicanibus prostratis vel ascendentibus ramosis 15—30 cm longis. pilis extensis sparse vestitis, fere glabris; foliorum laminis maximam partem ovato-oblongis, 1—2 cm longis, in apice rotundatis, in basi rotundato-truncatis, vix cordatis, marginibus sat convexis obtuse sparse conspersis, fere glabris, petiolis 2—5 mm longis elatis; floribus in foliorum supremorum deminutorum axillis dispositis, superne frequenter spicas interruptas confertiores formantibus; calycibus florentibus 4,5—5 mm longis turbinatis subsessilibus extus pilis rectis breviter hirsutis, dentibus deltoideo-ovatis vix 2 mm longis breviter spinosis; corollarum tubo 5,5—6 mm longo intus ad medium patentim annulato; labia superiore 3—3,5 mm alta; staminibus 2—2,5 mm e tubo exsertis; nuculis circa 1,5 mm diametro.

Colombia: Chapinero prope Bogota, 8500 ped., V. 1923, Pringle 62; verisimiliter ad Bogota, Goudot; prope Bogota, 25. V. 1926, Juzepczuk 4939; sine loco, Linden 109; sine loco, Triana.

Mexico: Mexico: in valle Toluca, 29. VIII. 1892, Pringle 5341; in pratis alpinis in Sierra de las Cruces, 9800 ped., 28. VIII. 1904, Pringle 13174; in glareosis, Sierra de las Cruces, 21. VIII. 1892, Pringle 4208. — ? Vera Cruz: La Cima prope Jalapa, Hb. Kuntze.

Species Group V.

Perennial herbs with usually strict habit and elongate internodes, their leaves mostly oblong-deltoid, often long-petioled; corolla-tubes 5—7,5 mm long, transversely annulate below the middle, not at all constricted, the upper lip of the corolla proportionately short, the stamens very shortly exserted.

Californian and Mexican species.

16. *S. globosa* Epling sp. nov. per specim. in Mexico prov. San Luis Potosi in collibus ad Las Canoas a Pringle (no. 3217) lectum constituta est; typum in herb. Univ. Calif. (Los Angeles), isotypos complures vidi.

Herba verisimiliter perennis erecta altitudine 40—70 cm, caulibus pilis rigidiusculis extensis vestitis; foliorum laminis oblongo-ovatis plerumque 3—5 cm longis, 2—3 cm latis, in apice rotundatis, in basi nunc leniter cordatis nunc cordato-truncatis, marginibus maximam partem convexis crenato-serratis, paginis ambobus pilis rectis conspersis petiolis ad 4 cm longis elatis; verticillastris praesertim infimis multifloribus demum globosis compactis in spicis inter-

ruptis moniliformibus strictis dispositis; calycibus 5—6,5 mm longis extus pilis extensis rigidiusculis ornatis, dentibus deltoideo-acuminatis spinosis; corollarum tubo 5,5—6 mm longo, intus infra medium annulato, labia superiore 3—3,5 mm alta, inferiore 4—6 mm longa; staminibus e corollae tubo 1,5 mm exsertis, filamentis hirtellis.

Mexico: San Luis Potosi: ad oppidum San Luis Potosi, 6000 ad 8000 ped., 1878, Parry et Palmer 735; in arenosis circa urbem, 1876, Schaffner 684; in collibus prope Las Canoas, 15. VII. 1890, Pringle 3217. — Mexico: prope Amecameca, 27. VII. 1924, Fisher 311; in Sacro Monte, Amecameca, 31. VIII. 1900, Pringle 9143. — Nayarit: in collibus montium Sierra Madre inter San Paulo et San Blascito, 4. VIII. 1897, Rose 1989.

17. *S. exilis* Epling sp. nov. per specim. in Mexico prov. Oaxaca in Cerro Verde a Purpus (no. 3298) lectum constituta est; typum in herb. Gray., isotypos in herb. Mus. Field. et hortorum bot. Nov. Eborac. et Missouri. vidi.

Herbae perennes exiles caulibus verisimiliter pluribus erecto-ascendentibus 30—60 cm altis gracilibus internodiis elongatis, superne pilis brevibus extensis interdum glandulosis infime longioribus sparse vestitis; foliorum laminis oblongis plerumque 3,5—4,5 cm longis, 12—20 mm latis, in apice rotundatis in basi saepius truncatis, marginibus rectiusculis crenatis, paginis ambobus fere glabris infimis petiolis 4—5 cm longis elatis; verticillastris 6-floribus remotissimis infimis 8—10 cm distantibus; calycibus extus pilis extensis necnon glandulosis vestitis, 6 mm longis, dentibus anguste deltoideo-ovatis, obtusis, breviter spinosis, infimis duobus paulo longioribus ad medium connatis; corollarum tubo 7—7,5 mm longo, intus infra medium annulato supra anulum hirtello infra anulum glabro, labia superiore 4,5 mm alta, inferiore 9 mm longa; staminibus e corollae tubo vix 1 mm exsertis, filamentis hirtellis; stylo glabro.

Mexico: Oaxaca: Cerro Verde, VII. 1908, Purpus 3298.

Similar in flower structure to *S. collina* but with larger flowers and differences in habit and pubescence such as to suggest specific segregation.

18. *S. collina* Brandege in Univ. Calif. Publ. Bot. 3, 391, 1909 per specim. in Mexico prov. Puebla ad vicum San Luis Tultitlanapa a Purpus (no. 2576) lectum constituta est; typum in herb. Univ. Calif. (Berkeley) vidi.

Herba perennis caulibus verisimiliter pluribus erecto-ascendentibus 30—60 cm altis, internodiis infimis brevibus foliis itaque ad basim confertis supremis elongatis pilis mollibus brevibus retrorsis interdum glandulosis vestitis; foliorum laminis oblongo-ovatis 2—4 cm longis, plerumque 18—22 mm latis, in apice rotundatis in basi cordatis, marginibus rectiusculis crenulatis, pagina

superiore molliter hirtella inferiore cinerea pilis mollibus brevibus densiore vestita necnon subtomentosa, infimis petiolis 3—5 cm longis elatis; verticillastris plerumque 6—8-floribus in spicis interruptis gracilibus internodiis elongatis dispositis; calycibus extus pilis brevibus extensis saepe glandulosis vestitis, 3,5—4 mm longis, dentibus deltoideo-ovatis in apice obtusis etiam rotundatis tamen spinis brevibus abrupte ornatis; corollarum tubo 5,5—6 mm longo intus infra medium annulato supra anulum hirtello infra anulum glabro. labia superiore 3—4 mm alta, inferiore 6,5—7 mm longa; staminibus e corollae tubo vix 1 mm exsertis, filamentis hirtellis; stylo glabro.

The two lowermost calyx teeth appear to be somewhat longer than the others and to be connate in the lower part.

Mexico: Puebla: prope San Luis Tultitlanapa, VI. 1908, Purpus 3297; in Cerros prope San Luis, VII. 1908, Purpus 2576; in Cerro del Gavilan, 7000—9000 ped., VIII. 1909, Purpus 3966; prope San Luis Tultitlanapa, VI. 1908, Purpus 2576.

19. *S. stricta* Greene in *Erythea* 2, 122, 1894 per specim. in Californiae com. Sonoma in Knights Valley in pratis a Greene (?) lectum constituta est; specim. Davyi verisimiliter verum in hebr. Univ. Calif. (Berkeley) vidi. — *S. ajugoides* var. *stricta* Jepson, Fl. W. Middlæ Calif. 457, 1901 per *S. strictam* constituta est.

Herba sordida perennis altitudine 30—80 cm, caulibus simplicibus strictis interdum decumbentibus frequenter ramosis pilis extensis rigidiusculis glandulosis vestitis; foliorum laminis oblongo-deltoidis 5—15 cm longis, 2—6 cm latis, in apice obtusis vel rotundatis in basi truncato-subcordatis, marginibus crenato-serratis, paginis ambobus hirsuto-glandulosis, petiolis infimis 2—5 cm longis, supremis subnullis; verticillastris 8—12-floribus approximatis in maturitate subglobosis frequenter confertis; calycibus 5—6,5 mm longis, extus glanduloso-hirsutis, dentibus deltoideis acutis debiliter spinosis; corollarum pallidarum tubo 5—6 mm longo, intus ad medium leniter oblique annulato vix tamen constricto nullomodo saccato, labio superiore 2—2,5 mm alta, inferiore 5—5,5 mm longa; staminibus e tubo 1—1,5 mm exsertis.

California: Mendocino: Potter Valley, Purpus. — Sonoma: Knight's Valley, 18. VI. 1894, Davy. — Lake: Cold Cr., Kelseyville, 18. VII. 1928, Blankinship. — Glenn: near Mud Flat between Newville and Covello, 7. VII. 1914, Heller 11524. — Butte: big Chico, IV. 1883, Austin; 8 m north of Oroville, 16. VII. 1914, Heller 11577. — Amador: Dry Creek, Ione, VII. 1904, Braunton 1087; Pine Grove, 2200 ft., 29. VII. 1895, Hansen 1390; Sutter Cr., Ione, VI. 1904, Braunton 1076; Plymouth, 20. VI. 1903, Gross. — Calaveras: Mokelumne Hill, Blaisdell 3; Milton, 18.—30. V. 1895.

Davy 1305. — Tuolumne: Spring Gulch near Bear Cr., 1300 ft., 10. VI. 1919, Williamson 202; near Rawhide, 13. VIII. 1915, Stinchfield 119. — Mariposa: Bear Mt., 1865, Torrey; without place, Bridges, Marshall Harris Place, 12. VII. 1898, Congdon; Mariposa, 13. IX. 1896, Congdon; Darrah, 23. IX. 1894, Congdon 685. — Merced: in slough near Hopeton on Merced R. bottom, 29. IV. 1926, Howell 1994.

Species Group VI.

Perennial herbs (annual in *S. eremicola* and *S. tenerrima*) of usually lax habit, often decumbent, more or less hirsute with stiffish hairs, their leaves prevailingy deltoide-ovate, petiolate; corolla tubes 4—11 mm long, prevailingly 5—8 mm, annulate below the middle or near the base, the annulus usually well-defined and mostly transverse, infrequently somewhat oblique, rarely constricted and somewhat saccate; stamens exerted 2—4 mm from the corolla tube.

Chiefly cordilleran species of Mexico and the Andes, one in California, three in Chili. I have been unable to prepare a satisfactory key to the group as a whole because of the remarkable similarities in habit throughout. It would appear that most of the species were derived from fragmentation of a former widely spread species and subsequent localization.

20. *S. bullata* Benth., Lab. Gen. et Sp. 547, 1834 per specim. in California a Beechey lectum constituta est; typum in herb. Kew. vidi. — *S. californica* Benth. in DC. Prodr. 12, 469, 1848 per specim. in California prope San Francisco a Barclay lectum constituta est; typum in herb. Kew. vidi. — *S. acuminata* Greene in Bull. Calif. Acad. 2, VII, 410, 1887 per specim. in insula Santa Cruz a Greene lectum constituta est; specimina vera in herb. Kew. et Smithsonian. vidi.

Herba perennis caulibus in basi procumbentibus saepius debilibus rarius erectis 30—100 cm longis et ultra pilis brevibus praesertim glandulosis et longioribus extensis subhispidis vestitis; foliorum laminis magnitudine valde variis 3—20 cm longis, 2—12 cm latis, plerumque 5—6 cm longis, maximam partem deltoideo-ovatis interdum ovatis, in apice obtusis rarius actiusculis in basi cordatis petiolis ad 6 cm longis elatis, marginibus rectiusculis rarius convexis, crenato-serratis, paginis ambobus viridibus pilis extensis brevibus glandulosis et longioribus plus minusve vestitis; verticillastris saepius 6-floribus sat remotis; calycibus 6—7,5 mm longis extus pilis brevibus glandulosis et longioribus extensis vestitis, dentibus deltoideis in apice spinosis; corollarum tubo 7—11 mm longo sat crasso intus in basi circa nuculas transverse annulato; labia superiore 3,5—5,5 mm lata, inferiore 6—10 mm longa.

Ranges along the coast from San Francisco County to Orange County, being found in the canyons of the coastal hills. It apparently does not occur in Marin County. It ranges inland as far as Palo Alto in the north, and in the lower canyons of the San Gabriel and Santa Ana Mountains in the south. In the latter it has been collected as high as 4300 feet. It has been found also on Santa Rosa, Santa Cruz and Anacapa islands. In habit the species is sometimes closely approached by *S. rigida* subsp. *quercetorum* from which it may readily be differentiated by the basal transverse annulus. Ordinarily the more deltoid-cordate leaves distinguish it. The name *S. bullata* has been generally applied to this last named species. However, examination of the type and comparison with material from the region of Santa Cruz and the Monterey peninsula leave no doubt that it is conspecific with *S. californica*. I believe the type was collected near Santa Cruz. Only one detached corolla remains, this being in the pocket. There is no reason to doubt its contemporary nature however, since the pocket is contemporary and bears a notation by Bentham.

21. *S. Pittieri* Briq. in Ann. Conserv. et Jard. Bot. Geneve 2, 119, 1898 per specim. in Costa Rica in valle de los Archangles, massif Iscazu, a Pittier et Durand (no. 240) lectum constituta est, typum in herb. Mus. Brux. vidi.

Herba perennis nunc ascendens nunc procumbens altitudine ad 1 m, caulibus sat ramosis in nodis infimis radicanibus, pilis brevibus extensis vestitis, superne plus minusve glandulosis; foliorum lamina deltoideo-ovatis, plerumque 2,5—4 cm longis, in apice acutiusculis, in basi cordatis, petiolis ad 3 cm longis elatis, marginibus crenato-serratis supra medium rectiusculis, paginis ambobus pilis extensis mollibus sparse vestitis; verticillastris plerumque 6-floribus infimis in foliorum deminutorum axillis dispositis; calycibus 6—8 mm longis, extus pilis extensis vestitis, dentibus deltoideo-ovatis saepius obtusis et spinis brevibus ornatis interdum acuminato-spinosis; corollarum tubo 5,6—6 mm longo, intus ad basim annulato, labia superiore 2 mm alta, inferiore 3—4 mm longa; staminibus e corollae tubo 1—1,5 mm exsertis.

Costa Rica: San Jose: Las Nubes, 1500—1900 m, in silvis humidis, 20.—22. III. 1924, Standley 38767; Cartago: in Volcan Turrialba, 2600 m, I. 1899, Pittier 7534 (13081); in decliv. austr. Volcan Turrialba, 2000—2400 m, 22. II. 1924, Standley 35139; in valle de los Archangles, massif Iscazu, Pittier et Durand 240.

22. *S. pannosa* Philippi in Anal. Univ. Chili 90, 564, 1895 per specim. in Chili ad Paposo a San Roman lectum constituta est; typum non vidi.

Herba perennis caulibus paucis ascendentibus etiam decumbentibus frequenter ramosis longitudine saepius 20—40 cm, pilis ex-

tensis sat dense vestitis plus minusve glandulosis, internodiis 2—8 cm longis; foliorum laminis 2—4 cm longis, ovatis vel deltoideo-ovatis, in apice rotundatis, in basi cordatis rarius truncato-cordatis, petiolis 0,5—4 cm longis elatis, marginibus ad medium fere rectis, utrimque crenato-serratis, crenis rotundatis, paginis ambobus sat dense vestitis mollibus vix tamen incanis, superiore suta inferiore subtomentosa areolis intervenosis promi-hienulis; floribus in spicis interruptis 5—15 cm longis dispositis, verticillastris infimis inter se 1—3 cm distantibus supremis confertis, bracteis subfoliosis subtentis; calycibus florentibus turbinatis, 7—8 mm longis, extus sparse hispido-hirsutis et glandulosis, dentibus 3 ad 3,5 mm longis, posterioribus angustioribus, omnibus spinis 1,5—2 mm longis armatis; corollarum tubo 8—10 mm longo infra medium annulato saepius leniter constricto; nuculis circa 1,5 mm diametro.

Scarcely definable from *S. Macraei*. It is to be wondered whether the plants here listed from central Chili are conspecific with those from the north. My nomenclature is based upon I. M. Johnston's determinations.

Chili: Taltal; prope Aguada de Cardon, in glareosis apud fontes, 30. XI. 1925, Johnston 5260; ad Aguada de Miguel Diaz, in glareosis humidis, 1.—4. XII. 1925, Johnston 5338; in Atacamae deserto, IX.—X. 1890, Morong 1135; Concepción: prope San Vicente, 3. III. 1925, Pennell 12860; Concepción, XI. 1925, Fr. Claude-Joseph 4065; ex regione inferiori Andium Chilensium prope tepidaria Cauquerres, Reid.

23. *S. Macraei* Benth. in *Linnaea* 6, 78, 1831 per specim. in Chili prope Collina (?), Valparaiso et Concepción a M' Rae lecta constituta est; typum in herb. Kew. vidi. — *S. chonotica* Hook. f., *Flora Antarctica* 336, 1844—1847 per specim. in insulis Chonos dictis a Darwin lectum constituta est; typum in herb. Kew. vidi.

Herba varia perennis altitudine 30—60 cm, caulibus laxis diffusis procumbentibus ascendentibusve, frequenter ramosis, internodiis elongatis saepius 5—10 cm longis, utrimque pilis extensis sparse vestitis, plus minusve glandulosis; foliorum laminis tenuibus, maximam partem deltoideo-ovatis, 2,5—5 cm longis, in apice nunc acutis, nunc obtusis, in basi truncato-cordatis, margine convexiuscula, crenato-serrata, crenis obtusis, omnibus petiolis 0,5 ad 3 cm longis elatis, paginis ambobus pilis rectis sparse vestitis, superiore plus minusve appresso-hirsuta; floribus in spicis interruptis elongatis dispositis, verticillastris infimis remotis, supremis confertis, omnibus bracteis subfoliosis extenso-reflexis sessilibus subtentis; calycibus florentibus turbinato-campanulatis, extus sparse hispido-villosis, intus fere glabris, 6—7 mm longis, dentibus 2—2,5 mm longis, lanceolatis, acuminato-spinosis, leniter patentibus; corollarum

tubo 6—8 mm longo, ad medium annulato; nuculis circa 1,5 mm diametro.

Chili: Valparaiso, Poeppig 155; Wilkes, Macrae, Cumming 543; X. 1925, Fr. Claude-Joseph 3628; Bridges 404; Santiago, Bertero 668, Cerro San Cristobal, X. 1869, Reed; Philippi 658; Germain; inter fruticeta pascuorum ad Concon, Poeppig 150; Valdivia, Bridges; I. 1851, Lechler 443; Gay 145; 1852, Philippi 74; 13. XII. 1896, Buchtien; Chonos Arch., Darwin; Collina, 1825, Macrae; Quillota, Germain; Concepción, X. 1825, Macrae; Papudo, 19. IX. 1919, Holway 52; Isle St. Mary's, Eights; Lota, 7. XI. 1868, Cunningham; Panguipulli, I. 1924, Fr. Claude-Joseph 2570; Chiloe, 1871, Reed; Costa, XII. 1922, Fr. Claude-Joseph 2182; Nunoa, XI. 1922, Fr. Claude-Joseph 2104; Tavolango, IX. 1829, Bertero 1333; Prov. Cautin: Maquehue, 8. I. 1925, Middleton; Chiloe, XI. 1925, Fr. Claude-Joseph 3303; in saxosis prope Copada (O'Higgins), 1750—2000 m, 25. I. 1925, Pennell 12264; Port Melimboa, 23. XI. 1868, Cunningham; Ballena, 1873, Guajardo; Temuco, X.—XI. 1927, Fr. Claude-Joseph 4852, 4906; La Obra, F. F. Llano Maipo, Prov. Santiago, 5. XI. 1922, Montero 54; Arrique, XI. 1854, Lechler 3203; ad Santiago, Germain, Santiago: El Manzano in valle del Maipo, 800—1000 m, 14. XI. 1926, Looser 1213; El Volcan, 16. XI. 1925, Looser 1212; Malleco: Buenavista ad Volcan Tolguaca, 900—1000 m, 23.—24. II. 1925, Pennell 12748; Aconcagua: prope Limache, Cerro Tres Puntas, 19. IX. 1929, Looser 1219; La Serena, X. 1926, Fr. Claude-Joseph 4484, 4483.

24. *S. eremicola* Epling sp. nov. per specim. in Chili prope Puerto de Chanaral in collibus ad El Barquito a Johnston (no. 4810) lectum constituta est; typum in herb. Gray., isotypum in herb. Univ. Calif. (Los Angeles) vidi. — *S. crenata* Philippi, Anal. Univ. Chili 90, 562, 1895 per specim. in Chili prope Carrizal a Geisse lectum constituta est; specimina certa verisimiliter isotypos in herb. hort. bot. Kew. et Nov. Eborac. vidi (non *S. crenata* Raf., Flora Ludov. 1817).

Herba annua altitudine 8—30 cm, in basi ramosis caulibus ascendentibus, internodiis saepius 3—5 cm longis pilis extensis sparse vestitis, plus minusve glandulosis; foliorum laminis tenuibus, maximam partem ovatis, in apice rotundatis, in basi truncato-subcordatis margine convexiuscula, crenato-serrata, crenis saepe rotundatis, infimis petiolis 1—2 cm longis supremis subnullis elatis, paginis ambobus pilis rectis sparse vestitis; floribus in spicis interruptis 3—15 cm longis dispositis, verticillastris infimis remotis, supremis confertis, omnibus bracteis subfoliosis extenso-reflexis sessilibus subtentis; calycibus florentibus late turbinatis, 5—7 mm

longis, dentibus 2—3 mm longis, deltoideis, acuminato-spinosis, vix patentibus; corollarum rosearum tubo 6—7 mm longo, intus ad medium annulato; nuculis circa 1,5 mm diametro.

Chili: Atacamae deserto, Geisse; Zapallar, 1. II. 1920, Holway 306; prope Puerto de Chanaral in collibus ad El Barquito, 28. ad 29. X. 1925, Johnston 4810; prope Taltal, 200 m, X. 1925, Werdermann 819; Caleta de Hueso Prado prope Taltal in glareosis ad litus, 26. XI. 1925, Johnston 5132.

25. *S. Drummondii* Benth., Lab. Gen. et Sp. 551, 1834 et in DC. Prodr. 12, 478, 1848 per specim. in Texas ad flumen Brazos a Drummond lectum constituta est; typum in herb. Kew., isotypum in herb. horti bot. Nov. Eborac. vidi.

Herbae annuae laxae altitudine 15—60 cm, caulibus ramosis pilis longioribus 1—2 mm longis mollibus extensis et brevioribus glandulosis vestitis; foliorum tenuum laminis ovatis rarius deltoideo-ovatis, plerumque 3—6 cm longis, 2—4 cm latis, in apice obtusis, in basi leniter cordatis, marginibus saepius convexis crenatis, paginis ambobus pilis rectis conspersis interdum fere glabris, petiolis saepius 1—3 cm longis elatis; verticillastris 6-floribus in spicis interruptis gracilibus laxis remote dispositis; calycibus 6,5—7 mm longis extus pilis brevibus extensis et brevioribus glandulosis sparse vestitis dentibus lanceolatis acutissimis spinosis calycum tubum subaequantibus; corollarum tubo 5,5—6,5 mm longo, infra medium leniter annulato, labia superiore videtur subplana 3,5 mm alta, inferiore 6—7,5 mm diametro; staminibus e corollae tubo 1—1,5 mm exserto, filamentis hirtellis.

Forms occur at Brownsville Texas, which are suggestive of intermixture with *S. agraria*.

Texas: Harris: Houston, 22. IV. 1923, Fisher 46; Houston, 29. III. 1900, Thurow; Harrisburg, 20. IV. 1899, Eggert. — Galveston: Galveston, III. 1877, Joor; Galveston, 29. II. 1870, Bodin; Matagorda: Turtle Bay Peninsula (Palacios), 8. IX. 1922, Tharp 1405; Neueces: Neueces Bay, 12. III. 1894, Heller 1434; in campis maritimis ad Corpus Christi, 9. III. 1925, Tharp; Corpus Bay, Oso Cr., 16. III. 1929, Tharp 5604; Corpus Christi, 8. III. 1917, Palmer 11221; Willacy: Raymondville, 3. III. 1925, Runyon 708. — Cameron: Brownsville, I. 1923, Runyon 328; Brownsville, 12. IV. 1905, Lewton 158; Brownsville, 14.—15. III. 1923, Tharp 1875, 1877; prope Harlingen, 1. III. 1930, Ecology Class; La Feria, 24. II. 1926, Cannon; Santa Rosa, 12. II. 1927, Cannon. — Hidalgo: in humidis saepius in silvis prope Mission, 5. II. 1919, Hanson 335; Sam Fordyce, 1927, Malby. — Starr: in silvis ad flumen prope Rio Grande City, 5. II. 1919, Hanson.

26. *S. Pringlei* Greenm. in Proc. Am. Acad. 41, 245, 1905 per specim. in Mexico prov. Hidalgo in silvis prope Trinidad Iron Works a Pringle (no. 8941) lectum constituta est; typum in herb. Gray., isotypos complures vidi.

Herbae verisimiliter perennes altitudine 40—100 cm, caulibus gracilibus plus minusve erectis pilis rigidis retrorsis praesertim ad angulos sparse vestitis, internodiis elongatis; foliorum laminis plerumque deltoideis 3—5 cm longis, in apice obtusis vel rotundatis in basi pulchre cordatis, marginibus infimis convexioribus supremis rectiusculis omnibus crenato-serratis, paginis ambobus pilis rectis conspersis, petiolis saepius 1—3 cm longis elatis; verticillastris 6-floribus in spicis gracilibus sat remote dispositis; calycibus 6 mm longis, extus pilis brevibus extensis sparse vestitis, dentibus deltoideo-lanceolatis spinosis acutissimis; corollarum tubo sat amplo 7—8 mm longo, intus hirtello et ad basim annulato, labia superiore 4—4,5 mm alta, inferiore 7—7,5 mm diametro; staminibus e corollae tubo 3 ad 3,5 mm exsertis, filamentis hirtellis superne glandulosis.

Mexico: Hidalgo: in silvis prope Trinidad Iron Works, 5700 ped., 11. VII. 1904, Pringle 8941; prope Zimapan, Coulter 1073.

27. *S. flaccida* Fernald in Proc. Am. Acad. 35, 563, 1900 per specim. in Mexico prov. Oaxaca in Hacienda de Caciques prope Cuicatlan a L. C. Smith (no. 612) lectum constituta est; typum in herb. Gray. vidi.

Herbae fere glabrae flaccidae internodiis elongatis; foliorum laminis 5—7 cm longis, 3—4 cm latis, ovatis, in apice obtusis in basi subcordatis petiolis 3—4 cm longis elatis, marginibus crenato-serratis convexis, paginis ambobus fere glabris, verticillastris 6—8-floribus sat remotis; calycibus extus breviter hirtellis 6 mm longis, dentibus subulatis acutissimis; corollarum tubo 8 mm longo sat amplo intus ad basim annulato, labia superiore 4,5 mm alta, inferiore 7 mm longa; staminibus e corollae tubo 3 mm exsertis, filamentis hirtellis.

Mexico: Oaxaca: in Hacienda de Caciques prope Cuicatlan, 4. VIII. 1895, L. C. Smith 612.

28. *S. tenerrima* Epling sp. nov. per specim. in Mexico prov. Baja California in regione San Jose del Cabo prope San Bartolome a Brandegee lectum constituta est; typum in herb. Univ. Calif. (Berkeley) vidi.

Herba annua tenerrima fere glabra altitudine 30—50 cm et ultra, caulibus superne gracile ramosis sparse hirtellis; foliorum laminis tenuibus plerumque 3—4,5 cm longis anguste ovatis, in apice obtusis in basi rotundatis interdum leniter cordatis, marginibus grande serratis convexis, paginis ambobus sparse hirtellis, infimis petiolis 2—3 cm longis elatis; calycibus brevissime hirtellis fere glabris 5 ad

5,5 mm longis, dentibus subulatis acutissimis tubum aequantibus; corollarum tubo 7—8 mm longo intus in basi circa nuculas annulato, labia superiore 5 mm alta, inferiore 7 mm longa; staminibus e corollae tubo 3 mm exsertis, filamentis hirtellis.

Mexico: Baja California: Cape Region, XI. 1902, Brandegee; prope San Jose del Cabo, 26. IV. 1897, Brandegee; Sierra de Laguna, 22. I. 1890, Brandegee; San José del Cabo, 15. III. 1892, Brandegee; El Taste, 11. IX. 1893, Brandegee; prope San Bartholome, 23. X. 1890, Brandegee.

29. *S. mexicana* Benth., Lab. Gen. et Sp. 541, 1834 et in DC. Prodr. 12, 469, 1848 per specim. in Mexico a Mociño et Sesse lectum constituta est; typum olim in herb. Lambert. verisimiliter perditum reperire non potui. — *S. pilosissima* M. et G. in Bull. Acad. Brux. 11. II. 194, 1844 per specim. in Mexico prov. Oaxaca a Galeotti (no. 647) lectum constituta est; typum in herb. Mus. Brux. vidi.

Herba laxa videtur perennis caulibus pilis extensis rigidiusculis 1—3 mm longis vestitis et superne interdum glandulosis; foliorum laminis 3—6 cm longis, 2—3,5 cm latis, deltoideo-ovatis rarius ovatis, in apice plerumque rotundatis, in basi cordatis, marginibus maximam partem rectiusculis regulariter crenatis, paginis ambobus pilis rigidiusculis 2—3 mm longis hispidis, petiolis 0,5—2,5 cm longis elatis; verticillastris 6-floribus, in foliorum supremorum deminutorum vel bracteorum subfoliosorum axillis dispositis; calycibus tenuibus 6 ad 8 mm longis, extus pilis extensis 1—2 mm longis hispidis, dentibus acuminato-deltoideis subspinosis, posticis tribus paulo majoribus; corollarum tubo 8—11 mm longo, supra anulum paulo ampliato, labia superiore 4—5 mm alta, inferiore 7—9 mm longa; staminum filamentis hirsutis; stylo glabro.

Mexico: Oaxaca: in Sierra de San Felipe, 10000 ped., 18. IX. 1894, C. L. Smith 416; in Cerro San Felipe, 9500—11000 ped., 1894, Nelson 1101, 1057; in Sierra San Felipe, 10000 ped., 19. IX. 1894, Pringle 4899; in montibus oaxacanis, Galeotti 647.

30. *S. vulcanica* Epling sp. nov. per specim. in Mexico in monte ignivomum Zempoaltepec in prov. Oaxaca a Nelson (no. 696) lectum constituta est; typum in herb. Smithson. vidi.

Herba humilis procumbens etiom prostrata caulibus in nodis radicanibus pilis extensis 1—2 mm longis rigidiusculis vestitis; foliorum laminis rotundato-ovatis magnitudine variis 1—4 cm diametro, in basi cordatis, marginibus crenatis interdum rectiusculis saepius convexis, paginis ambobus pilis rigidiusculis hirsutis, petiolis 1—3 cm longis elatis; verticillastris 6-floribus in spicis interruptis brevibus dispositis; calycibus 5—8 mm longis extus pilis longioribus extensis vestitis, dentibus deltoideo-ovatis breviter spinosis; corolla-

rum tubo 7—10 mm longo ad basim annulato, labia superiore 4,5 ad 5 mm alta, inferiore 6—8 mm longa; staminibus e tubo exsertis.

Because of the degree of variation in flower size I am by no means certain that the specimens here referred are conspecific, yet their similarities of habit, pubescence and distribution suggest this tentative arrangement. The differences between it and *S. mexicana* are chiefly those of habit.

Mexico: Vera Cruz: Orizaba: Engenio, Sierra de la Cruz, XII. 1853, Müller; in monte Orizaba, V. 1905, Purpus; in monte Ixtacihuatl, 9000 ped., IV. 1905, Purpus 1817. — Oaxaca: in monte Zempoaltepeque, 10000—11000 ped., 9. VII. 1894, Nelson 660, 696.

31. *S. guatemalensis* Epling sp. nov. per specim. in Guatemalae prov. Alta Vera Paz prope Coban a Türckheim (no. 8445) lectum constituta est; typum in herb. Smithson., isotypos in herb. Mus. Field., Gray., et horti bot. Nov. Eborac. vidi.

Herba laxa verisimiliter annua caulibus in basi prostratis in nodis radicanibus superne ascendentibus utrimque pilis extensis rigidiusculis 1—2 mm longis vestitis; foliorum laminis plerumque 5—8 cm longis, 3—5 cm latis, ovatis, in apice obtusis, in basi cordatis, marginibus saepius convexis, regulariter crenatis, paginis ambobus inferiore praesertim ad venas pilis extensis 1—2 mm longis sparse conspersis, petiolis 1,5—4 cm longis elatis; verticillastris 6-floribus in spicis interruptis gracilibus dispositis bracteis reflexis subtentis; calycibus campanulatis 4—6 mm longis, extus pilis extensis dentes aequantibus hispidis, dentibus acuminato-deltaeideis, posticis tribus paulo majoribus; corollarum tubo 5—7 mm longo supra anulum paulo ampliato, labia superiore 4—4,5 mm alta, inferiore 5—6 mm diametro; staminum filamentis hirsutis; stylo glabro.

Guatemala: Alta Vera Paz: prope Coban, 1300 m, XI. 1902, Türckheim 8445; prope Coban, 1350 m, VI. 1906, Türckheim 652; Finca Mocca, 2900 ped., 12. XII. 1919, Johnson 137; prope Senahu, 13. XII. 1904, Goll 181; ad fluvii ripam prope Coban, 4400 ped., VII. 1880, Türckheim 512; prope Tactic, 4800 ped., V. 1886, Türckheim 934; prope Chicoyonito, 4300 ped., IV. 1889, J. D. Smith 1801; inter Sepacuite et Secoyocte, 1100 m, 24. V. 1905, Pittier 339.

32. *S. costaricensis* Briq. ex Dur. et Pittier in Bull. Soc. Bot. Belg. 30, 240, 1891 (1892) per specim. in Costa Rica prope oppidum San Jose in pascuis Rancho Flores ad S. du Barba a Tonduz (no. 279) lectum constituta est; typum in herb. Mus. Brux. vidi.

Herba repens debilis internodiis elongatis in nodis radicans, caulibus gracilibus pilis gracilibus retrorso-extensis sparse vestitis

interdum fere glabris; foliorum laminis plerumque 3—5 cm longis, 2—4 cm latis, ovatis, in apice obtusis necnon acutiusculis, in basi cordatis, marginibus saepius convexis pulchre crenato-serratis, paginis ambobus pilis rigidiusculis conspersis, petiolis 1,5—4 cm longis elatis; verticillastris 6-floribus in spicis interruptis dispositis bracteis reflexis subtentis; calycibus campanulatis 5—5,5 mm longis, extus pilis brevibus hirtellis, dentibus deltoideo-lanceolatis, acutissimis, posticis tribus paulo majoribus; corollarum tubo 5—6 mm longo, supra annulum leniter ampliato, ad annulum praesertim subtus patentim constricto necnon leniter saccato, labia superiore 3,5—5 mm, alta inferiore subaequilonga; staminum filamentis hirsutis; stylo glabro.

Mexico: Vera Cruz: Orizaba, Botteri; Engenio, Sierra de la Cruz, l. VIII. 1853, Müller 1099; Chiapas: in Cerro del Boqueron, VI. 1914, Purpus 7304. (It is doubtful whether the Mexican specimens are properly associated with this species. The available material does not permit definite conclusions.)

Guatemala: Sta. Maria, Izabal, V. 1878, Bernoulli et Cario 2069; in monte ignivomo Jumaytepeque, Santa Rosa, 600 ped., V. 1893, Heyde et Lux 4565; prope oppidum Guatemala, 1400 m, VII. 1921, Tonduz 714.

El Salvador: in monte ignivomo El Salvador, 1000—1800 m, 7. IV. 1922, Standley 22886; in monte ignivomo El Salvador, IV. 1922, Calderon 485.

Costa Rica: Cartago: ad oppidum Cartago, 4250 ped., XII. 1887, Cooper 5893; prope San José, 1135 m, VI. 1892, Tonduz 450; prope San José, 25. XI. 1890, (Tonduz) Pittier 3142; prope La Verbena, 1000 m, VIII. 1894, Tonduz 8873; prope San José in pascuis Rancho Flores ad S. du Barba, 2050 m, Tonduz 279; ad rivulum Tiliri prope San José, 1100 m, Pittier 4262; prope Vara Blanca inter montes ignivomos Poas et Barba, 1600—1700 m, 22. VII. 1923, Maxon et Harvey 8362; prope Cartago, 1923, Stark 352; prope Banderilla, Cartago, 1700 m, I. VIII. 1924, Rojas 33; prope Paraiso, Cartago, 1350 m, 7. VIII. 1924, Rojas 102; prope San Rafael, 1500 m, 28. VIII. 1892, Pittier 6988; inter San Pedro de Montes de Oca et Curridabat, San José, 1200 m, 2. II. 1924, Standley 32800; prope La Esperanza in decliv. austr. montis Irazu, 23. II. 1924, Standley 35394; in silvis humidis prope Cerro de La Carpintera, Cartago, 1500—1850 m, II. 1924, Standley 35711; ad Dulce Nombre, Cartago, 1400 m, 27. II. 1924, Standley 35970.

Panama: in pascuis prope El Boquete, Chiriqui, 1000—1300 m, III. 1911, Pittier 2966.

33. *S. hebens* Epling sp. nov. per specim. in Colombiae prov. Santa Marta a H. H. Smith (no. 1362) lectum constituta est; typum in herb. Smithson.; isotypum in herb. horti bot. Nov. Eborac. vidi.

Herba perennis ut videtur caulibus decumbentibus laxis, 40 ad 60 cm longis et ultra, gracilibus, pilis extensis sparse vestitis, internodiis elongatis; foliorum laminis 3—7 cm longis, sat tenuibus, ovatis, obtusis, frequenter tamen acutiusculis, in basi pulchre cordatis, margine convexiore interdum supra medium rectiuscula, crenata, crenis 1—1,5 mm altis, pagina superiore tenuiter hirsuta, inferiore ad venas sparse vestita, fere glabra, petiolis gracilibus 1—5 cm longis elatis; floribus in spicis gracilibus interruptis 15—25 cm longis, bracteis subfoliosis subtentis glomerulis remotis, inter se 1—5 cm distantibus; calycibus florentibus 5—5,5 mm longis, turbinatis extus sparse hirtis, in maturitate urceolatis, dentibus vix 2 mm longis deltoideo-lanceolatis debiliter spinosis, pedicellis 1—2 mm longis elatis; corollarum tubo circa 6 mm longo, intus infra medium annulato; nuculis circa 1,5 mm diametro.

Colombia: Santa Marta, 4500 ped., H. H. Smith 1362.

34. *S. elliptica* Kunth in Humboldt et Bonpland, Voy., Nov. Gen. et Sp. Pl. 2, 308, 1817 per specim. in Ecuador ad Turubamba et Chillo a Humboldt lectum constituta est; typum in herb. Mus. Par. vidi.

Herba pusilla perennis caulibus 15—25 cm longis in basi decumbentibus sparse ramosis, pilis brevibus extensis hirsutis, internodiis plerumque quam folia brevioribus; foliorum laminis 1—2,5 cm longis, nunc ovatis nunc oblongo-ovatis, in apice rotundatis, in basi truncato-cordatis, marginibus convexioribus, rarius ad medium plus minusve rectiusculis, crenatis, paginis ambobus molliter breviterque hirsutis, petiolis ad 1 cm longis elatis; floribus in foliorum supremorum axillis dispositis pedicellis 1—2 mm longis elatis, glomerulis sat confertis infimis rarius 3 cm remotis; calycibus florentibus 6—6,5 mm longis, turbinatis, extus pilis rectis brevibus vestitis, subhirsutis, dentibus deltoideo-ovatis, 1,5—2,5 mm longis, debiliter spinosis; corollarum tubo 7—9 mm longo, intus infra medium patenter annulato; labro 3—4 mm alto, staminibus supra tubi medium sitis, e tubo 2 mm exsertis; nuculis non visis.

Ecuador: in monte ignivomo Cotopaxi dicto, VIII. 1856, Remy; in pascuis elevatis ad Quito, 13000 ped., Jameson 62; sine loco, Jameson 161; in monte Pichincha, 9000—11500 ped., Wagner; in monte Pichincha, 13000 ped. Jameson 214, 46; prope Quito, 1855, Couthouy; in monte Chimborazo, 4000 m, 7. VII. 1876, Andre 462; Urbina, Chimborazo, 11400 ped., 22.—28. X. 1923, Anthony and Tate 418; in monte ignivomo Pichincha, 3500 m, 21. IV. 1927, Firmin 37; in arenosis ad villam Antisanam, 13400 ped., Hartweg 1346; ad Turubamba et Chillo, Humboldt et Bonpland; sine loco, Spruce 6515.

35. *S. aperta* Epling sp. nov. per specim. in Peru prope Muna in humidis a Macbride (no. 3963) lectum constituta est; typum in herb. Mus. Field., isotypum in herb. horti bot. Missouri. vidi.

Herba videtur perennis caulibus laxis decumbentibus 60—90 cm longis et ultra, ramosis, internodiis elongatis, pilis extensis sparse vestitis; foliorum laminis sat tenuibus, 4—7 cm longis, deltoideo-ovatis, in apice acutis, in basi pulchre cordatis, petiolis hirsutis 1—3 cm longis elatis, margine supra medium rectiuscula, utrimque crenata, crenis 1—1,5 mm altis, 3—5 cm latis, subgibbosis, paginis ambobus pilis rectis sparse hirsutis; floribus in spicis interruptis laxis elongatis dispositis, bracteis subfoliosis valde deminutis supremis 2—4 mm longis subtentis, glomerulis inter se 2—6 cm distantibus; calycibus florentibus turbinatis, circa 7 mm longis, in maturitate 8—9 mm longis, pedicellis 1 mm longis elatis, tubo leniter arcuato, extus hirsuto et leniter glanduloso, dentibus 2—2,5 mm longis, plerumque deltoideis spinosis patentibus; corollarum tubo 7—8 mm longo, crasso, intus villosa et ad medium piloso-annulato; staminibus ad tubi medium sitis e tubo 3 mm exsertis, filamentis infra medium valde villosis; nuculis 2 mm diametro.

Peru: ad Muna in humidis, 7000 ped., 23. V.—4. VI. 1923, Macbride 3963.

36. *S. mandoniana* Briq. in Ann. Conserv. et Jard. Bot. Genève 2, 118, 1898 per specim. in Bolivia prope Sorata a Mandon (no. 519) lectum constituta est; typum in herb. Delessert., isotypos in herb. Mus. Par., Gray. et horti bot. Nov. Eborac. vidi.

Herba perennis decumbens caulibus 30—60 cm longis, in nodis infimis radicanibus, laxis, ascendentibus, pilis extensis subvillosis, internodiis elongatis; foliorum laminis 4—8 cm longis, pedicellis hirsutis 1—3 cm longis elatis, ovatis, plerumque obtusis, in basi cordatis, marginibus convexioribus, crenatis, crenis 2—2,5 mm altis, 3—4 mm latis, paginis ambobus molliter hirsutis; floribus in spicis interruptis 5—10 cm longis et in foliorum supremorum axillis dispositis, glomerulis infimis 3—5 cm remotis, supremis confertis bracteis subfoliosis subtentis; calycibus florentibus turbinatis 5—6 mm longis, extus sat dense villosis, dentibus 2—2,5 mm longis, lanceolato-acuminatis, in apice spinosis, pedicellis 1—2 mm longis elatis; corollarum tubo sat crasso 7—9 mm longo, intus infra medium patenter annulato; nuculis circa 1,5 mm diametro.

Bolivia: prope Sorata in cultis, dumosis et silvulis, 2600 ad 3000 m, 1859, Mandon 519; prope Sorata, 10000 ped., II. 1886, Rusby 1494; Unduavi, 8000 ped., X. 1885, Rusby 1495.

37. *S. venezuelana* Briq. in Ann. Conserv. et Jard. Bot. Genève 2, 114, 1898 per specim. in Venezuela in andibus regionum Trujillo

et Merida a Linden (no. 388) lectum constituta est; typum in herb. Delessert., isotypum in herb. Mus. Par. vidi.

Herba perennis caulibus ascendentibus 30—50 cm altis et ultra, pilis extensis sat dense vestitis, internodiis elongatis; foliorum laminis 3—4,5 cm longis, oblongo-ovatis, in apice rotundatis, in basi vel rotundatis vel subcordatis, marginibus convexis et saepe supra medium rectiusculis, crenatis, paginis ambobus pilis rectis vestitis, superiore hirsuta, pedicellis 0,5—1 cm longis elatis; floribus in spicis interruptis elongatis etiam ramosis vel in foliorum deminutorum supremorum axillis dispositis; calycibus florentibus turbinatis 6 mm longis, extus sat dense vestitis, pedicellis 1—2 mm longis elatis, dentibus ovatis, circa 2 mm longis, subito spinosis, spinis 0,5 mm longis; corollarum tubo 8 mm longo, sat crasso, intus infra medium annulato; nuculis circa 1,5 mm diametro.

Venezuela: in andibus regionum Trujillo et Merida, Linden 388; in campis elevatis paramos dictis inter Sta. Domingo et Chacopa, Merida, 3200 m, 14. IX. 1922, Jahn 1131.

Forma caulibus depressis, 15—25 cm longis, decumbentibus, internodiis quam foliis plerumque brevioribus; foliorum infimorum petiolis ad 1,5 cm longis; floribus maximam partem in foliorum supremorum axillis dispositis; floribus magnitudine variabilibus; calycibus 4—7 mm longis; corollarum tubo nunc 8—10 mm, nunc 6—7 mm longo.

Due to the fragmentary nature of the collections especially of the typical form, it is difficult to judge whether two species are here confused. Those here associated are such as one might expect in exposed places:

Venezuela: Merida, Moritz 991, 1621; Paramo de las Rosas, Jabon, Trujillo, 3300 m, 2. X. 1910, Jahn 31; Paramo Santo Domingo, Merida, 3600 m, 12. IX. 1922, Jahn 1099; Paramo de la Sal, Merida, 3000 m, 3. IX. 1921, Jahn 513.

38. *S. Sprucei* Briq. in Ann. Conserv. et Jard. Bot. Genève 2, 117, 1898 per specim. in Ecuador in Andibus a Spruce (no. 5964) lectum constituta est; typum in herb. Delessert., isotypos in herb. Mus. Par., Gray. et Kew. vidi.

Herba perennis videtur altitudine 30—50 cm caulibus in basi decumbentibus videtur repentibus, superne ascendentibus, interdum ramosis, maximam partem fere glabris, internodiis plerumque elongatis; foliorum laminis 3,5—8 cm longis, tenuibus, ovatis, in apice rotundatis, in basi rotundatis et plus minusve cordatis, marginibus nunc convexis nunc ad medium rectiusculis, etiam concavis, crenatis, paginis ambobus glabris, petiolis 1—3 cm longis elatis; floribus in spicis interruptis 15—20 cm longis dispositis, bracteis subfoliosis valde deminutis reflexis subtentis, glomerulis inter se 1—4 cm

distantibus; calycibus florentibus 8—9 mm longis, turbinatis, extus pilis rectis glandulosis tenuiter vestitis in maturitate paulo auctis, dentibus deltoideo-acuminatis 3—5 mm longis, acutissime spinosis, spinis 1,5—2 mm longis; corollarum tubo 6—8 mm longo, intus infra medium annulato; nuculis circa 1,5 mm diametro.

Ecuador: Huigra: Hacienda de Licay, 6. IX. 1918, Rose 22535; sine loco, Spruce 5964.

39. *S. debilis* Kunth in Humboldt et Bonpland, Voy., Nov. Gen. et Sp. Pl. 2, 309, 1817 per specim. in Ecuador inter Cochapamba et Chillo a Humboldt et Bonpland lectum constituta est; typum in herb. Mus. Par. vidi.

Herba perennis debilis laxa caulibus gracilibus decumbentibus, 30—60 cm longis interdum ramosis, pilis extensis sparse vestitis, fere glabris, internodiis elongatis; foliorum laminis 2—4 cm longis, vel ovatis vel oblongo-ovatis, in apice maximam partem rotundatis, in basi subcordatis, marginibus ad medium saepius rectiusculis utrimque crenatis, paginis ambobus pilis rectis sparse vestitis frequenter fere glabris, foliorum infimorum petiolis 1—2 cm longis, supremis subnullis; floribus in foliorum supremorum deminatorum axillis spicas interruptas laxas formantibus, glomerulis inter se 1—8 cm distantibus; calycibus florentibus turbinatis, 5—5,5 mm longis, in maturitate campanulatis, extus pilis brevibus rectis sparse vestitis et glandulosis, dentibus 2—2,5 mm longis, deltoideo-acuminatis, acutissimis, spinis 1—1,5 mm longis armatis; corollarum tubo sat crasso, 5—6 mm longo, intus infra medium annulato; nuculis circa 1,5 mm diametro.

Ecuador: passim in regione interandina prope Riobamba, II. 1922, Mille 43; in andibus Quitensibus, Couthouy; prope Ambato, II. 1919, Pachano 143; in altaplanitie Rumibamba prope Quito, Hartweg 1344; Punin: Quebrada Chalan, 9200 ped., 28. X. ad 4. XI. 1923, Anthony et Tate 453, 440; in andibus sine loco, Spruce 5860; prope Tambillo ad Quito, 22. VI. 1876, Andre 3688; inter Cochapamba et Chillo, Bonpland; in prato humido ad La Carolina prope Quito, 14. IV. 1920, Heilborn 515; ad Banos, Tangurahua, Tate 628.

40. *S. bogotensis* Kunth in Humboldt et Bonpland, Voy., Nov. Gen. et Sp. Pl. 2, 309, 1817 per specim. in Colombia ad urbem Santa Fe de Bogota a Humboldt et Bonpland lectum constituta est; typum in herb. Mus. Par. vidi. — *S. hians* Briq. in Ann. Conserv. et Jard. Bot. Genève 2, 116, 1898 per specim. in Colombiae prov. Ocana in paramos a Schlim (no. 558) lectum constituta est; typum in herb. Delessert. isotypum in herb. Par. vidi.

Herba perennis debilis caulibus laxis decumbentibus pilis extensis sparse vestitis internodiis maximam partem elongatis;

foliorum laminis saepius 1,5—3,5 cm longis, in apice nunc rotundatis nunc obtusis, in base rotundatis et plus minusve cordatis, marginibus saepius convexis interdum supra medium rectiusculis, crenatis, paginis ambobus hirsuto-villosis; floribus in spicis interruptis et in foliorum supremorum axillis dispositis, glomerulis inter se 1—4 cm distantibus; calycibus florentibus 5 mm longis, turbinatis, extus pilis rectis sat dense vestitis, in maturitate campanulatis, dentibus circa 2 mm longis deltoideis, subito spinosis; corollarum tubo sat crasso 5—6 mm longo, intus supra basim annulato; nuculis circa 1,5 mm diametro.

Colombia: in paramo de Choachi ad Bogota, 3700 m, 8. VIII. 1922, Killip et Fr. Ariste-Joseph 11934; Santander: prope Vetas, 3100—3200 m, in dumetis ripariis, 16. I. 1927, Killip et Smith 17362; Cundinamarca: prope Zipacon, 14. VIII. 1917, Rusby et Pennell 1219; Cundinamarca: ad Rio del Arzobispo prope Bogota inter frutices 2800—2900 m, 22.—24. IX. 1917, Pennell 2098; Facatativa, 2600 m, 16. X. 1875, Andre 643; Bogota, 1862, Grandmaison 68; ad cataractam Tequedamam, 8.—11. XII. 1852, Holton; ad Santa Fe de Bogota, Bonpland; Ocana, Schlim 558.

41. *S. Fendleri* Briq. in Ann. Conserv. et Jard. Bot Genève 2, 115, 1898 per specim. in Venezuela ad coloniam Tovar a Fendler (no. 879) lectum constituta est; typum in herb. Delessert., isotypos in herb. hortorum bot. Missouri. et Nov. Eborac. vidi.

Herba ut videtur perennis debilis caulibus 30—50 cm longis, in nodis infimis radicanibus, pilis extensis subvillosis; foliorum laminis sat tenuibus, late ovatis, 3—6 cm longis obtusis, in basi pulchre cordatis, marginibus supra medium rectiusculis, crenatis, crenis gibbosis, paginis ambobus pilis rectis sparse vestitis superiore subhirsuta, petiolis gracilibus 1—6 cm longis elatis; floribus nunc in spicis interruptis nunc in foliorum supremorum axillis dispositis, glomerulis inter se 1—8 cm distantibus; calycibus 5—6 mm longis, florentibus turbinatis, in maturitate urceolatis, extus pilis extensis sparse vestitis, dentibus ovato-lanceolatis, 2—2,5 mm longis, acuminato-spinosis, pedicellis 1—2 mm longis elatis; corollarum tubo 6—6,5 mm longo, intus infra medium annulato; nuculis circa 1,5 mm diametro.

Venezuela: prope Carapas, 1680 m, 1925, Tate 49; ad coloniam Tovar, 1854/55, Fendler 879; inter El Aguacatal et Alto del Cogollal in sylvis, 1000—2150 m, 18. II. 1921, Pittier 9241; in regione temp., Moritz 415; Merida, 5. II. 1928, Pittier 12872.

42. *S. petiolosa* Briq. in Bull. Herb. Boiss. 4, 868, 1896 per specim. in Argentinae montibus cordobensibus a Kuntze lectum constituta est; typum in herb. Delessert. isotypum in herb. horti bot. Nov. Eborac. vidi. — *S. micrantha* Griseb. in Goett. Abh. 24, 275,

1879 per specim. in Argentina prope Oran in silvis Tabacal a Lorentz et Hieronymus (no. 851) lectum constituta est; typum in herb. Mus. Goett. vidi (non *S. micrantha* Koch 1848). — *S. boliviana* Briq. in Bull. Herb. Boiss. 4, 871, 1896 per specim. in Bolivia prope Santa Rosa a Kuntze lectum constituta est; typum in herb. Delessert., isotypum in herb. horti bot. Nov. Eborac. vidi. — *S. tucumanensis* Briq. in Bull. Herb. Boiss. 4, 872, 1896 per specim. in Argentinae prov. Tucuman a Kuntze lectum constituta est; typum in herb. Delessert., isotypum in herb. horti bot. Nov. Eborac. vidi. — *S. Galanderi* Briq. in Bull. Herb. Boiss. 4, 870, 1896 per specim. in Argentinae montibus cordobensibus a Galander lectum constituta est; typum in herb. Delessert., isotypum in herb. horti bot. Nov. Eborac. vidi. — *S. Lorentzii* Briq. in Bull. Herb. Boiss. 4, 869, 1896 per specim. in Argentinae prov. Tucuman prope La Cruz a Lorentz lectum constituta est; typum in herb. Delessert. vidi.

Herba debilis inamoena caulibus laxis in basi decumbentibus ramis erectis 30—60 cm longis, pilis extensis sparse vestitis, internodiis plerumque elongatis; foliorum laminis maximam partem 3—5 cm longis, ovatis vel deltoideo-ovatis, in apice obtusis, in basi leniter cordatis, marginibus saepe supra medium rectiusculis, crenatis, paginis ambobus pilis rectis sat dense vestitis, subhirsutis, petiolis gracilibus 1—5 cm longis elatis; floribus maximam partem in spicis interruptis gracilibus 10—25 cm longis, bracteis subfoliosis parvis reflexis subtentis, rarius in foliorum supremorum deminutorum axillis dispositis; calycibus florentibus turbinatis, in maturitate urceolatis 3,5—5 mm longis, extus pilis rectis sparse vestitis, dentibus 1,5—2 mm longis, nunc deltoideo-ovatis nunc ovato-lanceolatis, breviter spinosis; corollarum tubo 4—5,5 mm longo, intus infra medium annulato; nuculis 1—1,5 mm diametro.

The material upon which the interpretation of this species is based is uniformly poor. Such differences as may exist between the types of the proposed species of Briquet and other specimens do not exceed the differences to be expected within a species of this range.

Bolivia: prope Cochabamba, Bang 1054; prope Sorata, Mandon 521; 519 (partim); Urupana, VIII. 1921, Cardenas; ad Santa Rosa, Kuntze; prope Cochabamba, 25. II. 1920, Holway 319; ad Inca-chaca, 2500 m, 9. X. 1921, Steinbach 5833; Unduavi, 8000 ped., X. 1885, Rusby 1495 (partim); prov. Chuquisaca, Weddell 3856, 3652.

Argentina: Tucuman: La Cruz, Tusca et Tameca pampa, 22. ad 28. XII. 1872, Lorentz 110; sine loco, 6.—22. XII. 1872, Lorentz et Hieronymus 1157; 6.—22. XII. 1872, Lorentz et Hieronymus 1156; sine loco, 17. X. 1873, Hieronymus et Lorentz 433; sine loco, 7. I. 1873, Lorentz et Hieronymus; sine loco, 18. XI. 1887,

Lillo 388; Potrero grande, XII. 1886, Schickendantz 389; sine loco, XI. 1892, Kuntze. — Cordoba: 23. XII. 1880, Galander; Potrero de Loza, Sierra Chica de Cordoba. 31. XI. 1879, Galander; sine loco, XII. 1891, Kuntze; 25. X. 1877, Hieronymus; 18. X. 1877, Hieronymus 511; Estancio Germanica prope Cordoba, VI.—XII. 1874, Lorentz 179; canad adel Molino, 28. XII. 1883, Galander; Bella Villa, XI. 1923, Hauman; — Salta: in silvis Tabacal, Oran, 2. IX. 1873, Lorentz et Hieronymus 851; Esquina Grande, 2400 m, 1915, Jörgensen 1425. — Formosa: sine loco, XI. 1891, Niederlein 115d. — Catamarca; sine loco, Bettfreund 951. — Tafi: Siombon, 1200 m, XI. 1925, Vanturi 3934. — Tujuy: Ladesma, Sierra de Calilegua, 750 m, X. 1927, Venturi 5366.

43. *S. venulosa* Greene in Pittonia 1, 157, 1888 per specim. in Mexico prov. Durango in montibus altioribus prope oppidum Durango a Forrer lectum constituta est; specim. vera in herb. Gray. et Univ. Calif. (Berkeley) vidi.

Herba altitudine 20—40 cm, caulibus videtur simplicibus fere glabris; foliorum laminis oblongo-ellipticis 2—4 cm longis, 10—15 mm latis, in apice obtusis, in basi rotundato-subtruncato, marginibus convexiusculis crenulatis paginis ambobus fere glabris venis subtus prominulis, petiolis 4—6 mm longis elatis; verticillastris 6—12-floribus in foliorum supremorum deminutorum axillis dispositis; calycibus 6—6,5 mm longis, extus pilis rigidiusculis subappressis vestitis, dentibus deltoideo-ovatis breviter spinosis; corollarum tubo 7 mm longo, intus ad basim annulato, labia superiore 4,5 mm alta, inferiore 7,5 mm longa; staminibus 3—3,5 mm e tubo exsertis hirtellis.

Mexico: Durango: in montibus ad oppidum Durango, 8100 ped., IX.—X. 1881, Forrer; sine loco, Garcia 409.

Species Group VII.

Perennial herbs with ovate, usually acuminate leaves, the stems usually armed along the angles with stiff sharp hairs which are pustulate at the base; corolla tubes elongate for the genus, 7,5—23 mm long, usually more than 10 mm, transversely or somewhat obliquely annulate but never saccate (except *S. Emersoni*). The corollas are usually a deep purple or red, less often blotched.

Species of the Pacific Coast in North America, Mexico and Southwestern United States, central Mexico, and the Andes of Colombia, Ecuador and Peru.

44. *S. coccinea* Jacq., Hort. Schoenb. 3:18, t. 284, 1798 per specim. hortatum e patria ignota eductum constituta est; nec typum nec specimen certum in herb. Mus. Vindob. reperire potui. — ? *S. coccinea* Ort., Hort. Mat. 20, 1797—1800. — *S. cardinalis* Kunze in Bot. Zeit.

2, 645, 1844 per specim. cultum patriae ignotae constituta est; typum non vidi. — *S. oaxacana* Fern. in Proc. Am. Acad. 35, 564, 1900 per specimina in Mexico prov. Oaxaca a Nelson (no. 1795), Gonzalez (no. 47), L. C. Smith (no. 924) et Conzatti (in exsicc. L. C. Smith 709) lecta constituta est; specim. normale prope Cuicatlan a Gonzalez (no. 47) lectum designo.

Herbae annuae altitudine 30—60 cm et ultra, caulibus paucis plerumque simplicibus e basi assurgentibus, internodiis mediis sat elongatis, pilis extensis 1—2 mm longis plus minusve vestitis caetero fere glabris interdum praesertim superne pilis nunc brevibus mollibus nunc glandulosis extensis dense vestitis; foliorum laminis 2,5—8 cm longis plerumque 3—5 cm longis, saepius deltoideo-ovatis necnon cordatis, omnibus in basi plus minusve cordatis, in apice nunc obtusis nunc breviter acuminatis, margine crenata vel crenato-serrata, pagina superiore pilis appressis conspersa inferiore nunc ad venas solum pilis longioribus ornatis nunc utrimque vestitis interdum pilis et longioribus et brevioribus saepe glandulosis cinerea, petiolis 1—3 cm longis elatis; verticillastris 6-floribus; calycum florentium tubis 3—7 mm longis plerumque 6—6,5 mm longis, extus pilis brevibus extensis saepius glandulosis vestitis, in maturitate paulo auctis, dentibus nunc deltoideis nunc deltoideo-lanceolatis acuminatis 1 ad 4 mm longis saepius circa 3 mm longis; corollarum pulchre coccinearum tubo 18—21 mm longo intus ad basim annulato, labiis rotundatis superiore 6—8 mm diametro, inferiore 9—14 mm longo; genitalibus inclusis, filamentis villosis, stylo glabro.

S. oaxacana is a thin leaved form with leaves tending to be ovate, the pubescence thin and the stems clothed into the inflorescence with long spreading hairs. This form is found principally in south central Mexico, but ranges as far as the limits of the species. In central Mexico it passes into a form in which the longer spreading hairs are wanting and in which the inflorescence is glandular with short spreading hairs. This, too, occurs throughout the limits of the species. In the north it passes into a form characteristic of southern Arizona and New Mexico, in which the stem and inflorescence is densely clothed with short spreading usually non-glandular hairs.

Texas: El Paso.

New Mexico: Catron, Grant, Sierra, Dona Ana.

Arizona: Coconino, Maricopa, Gila, Pima, Santa Cruz, Cochise.

Mexico: Sonora, Chihuahua, Baja California, Sinaloa, Nayarit, Tres Marias, Durango, Zacatecas, San Luis Potosi, Jalisco, Guanajuato, Queretaro, Hidalgo, Colima, Michoacan, Mexico et Distr. Fed.; Morelos, Puebla, Vera Cruz, Guerrero, Oaxaca, Chiapas.

Guatemala: Quiche, Quezaltenango, Jalapa, Santa Rosa, Zacatepequez.

45. *S. Emersoni* Piper in *Erythea* 6, 31, (10. IV.) 1898 per specim. in Washington comitatu Chehalis prope Hoquiam a Lamb (no. 1138) lectum constituta est; isotypos plures vidi. — *S. pubens* Heller in Bull. Torr. Bot. Cl. 26, 581, (7. XI.) 1898 per *S. ciliata* var. *pubens* Gray, loc. cit., constituta est. — ? *S. Riederi* Cham. in *Linnaea* 6, 570, 1831 per specim. in „Kamtchatka“ a Rieder lectum constituta est; typus verisimiliter perditus est. — *S. ciliata* var. *pubens* Gray, Syn. Fl. N. A. 2¹, 388, 1878. — *S. Nuttallii* var. *occidentalis* Benth. in DC. Prodr. 12, 469, 1848 per specim. in America bor.-occ. a Hinds et Barclay lectum constituta est; typum in herb. Kew. vidi.

Herba perennis altitudine 40—120 cm, caulibus plerumque simplicibus infime ad angulos pilis retrorsis rigidis in basi plus minusve pustulatis armatis superne mollioribus extensis plus minusve glandulosis sat vestitis; foliorum laminis tenuibus plerumque 6—12 cm longis, 3—6 cm latis, saepius ovatis interdum anguste ovatis, in apice acutis vel leniter acuminatis, in basi rotundatis vel leniter cordatis, marginibus maximam partem convexis crenato-serratis, paginis ambobus nunc hirsutis nunc frequenter fere glabris, petiolis ad 5 cm longis elatis; verticillastris 6—20-floribus in foliorum supremorum et bracteorum foliosorum quam calyces plerumque longorum axillis dispositis; calycibus 5—8 mm longis, extus pilis extensis mollibus vix glandulosis sparse vestitis, dentibus plerumque deltoideis breviter spinosis; corollarum purpurearum tubo 7,5—11 mm longo, intus infra medium annulato, labia superiore 3,5—5 mm alta, inferiore 6—10 mm longa; filamentis hirsutis.

British Columbia: Queen Charlotte Islands: Louise Island, Vancouver Island.

Washington: Grays Harbor, Pacific, Wahkiakum.

Oregon: Clatsop, Tillamook, Yamhill, Benton, Lincoln, Coos, Curry.

California: Del Norte, Humboldt, Mendocino.

This species is confined to the coastal ranges at usually low elevations. In California it is chiefly confined to the limits of *Sequoia sempervirens*, but extends somewhat further south and inland beyond the range of that species.

Few Californian specimens referred here are typical in the sense of the Oregon and Washington plants, having usually smaller thicker more deltoid leaves and more flowers in each cluster. The species approaches *S. rigida* subsp. *quercetorum*, particularly in habit and pubescence. The corollas however, remain fairly constant, those of *S. Emersoni* being actually longer, more exerted and having the

annulus more faint, placed lower and infrequently saccate. As stated elsewhere, the forms of *S. rigida* subsp. *quercetorum* north of the Bay region are more hairy and have thicker leaves. The corolla tube is uniformly saccate. In the field the species may readily be distinguished from *S. ciliata*, not only by the shorter corolla of different conformation but by the habit of the inflorescence and thinner texture of the leaves.

46. *S. Chamissonis* Benth. in *Linnaea* 6, 80, 1831 per specim. in California a Chamisso lectum constituta est; typum olim in herb. Chamiss. hodie in herb. Mus. Berolin. vidi. — *S. flaccida* Eastwood in *Bull. Torr. Bot. Cl.* 29, 80, 1902 per specim. in Californiae comitatu Mendocino a Brown (no. 836) lectum constituta est; typum in herb. Acad. Sci. Calif., isotypos in herb. Univ. Calif. (Berkeley) Mus. Field. et Smithson. vidi (non Fernald).

Herba perennis altitudine 60—100 cm et ultra, caulibus plerumque simplicibus interdum superne debiliter ramosis infime praesertim ad angulos pilis retrorsis rigidis in basi pustulatis (et interdum mollioribus) armatis superne pilis extensis glandulosis dense vestitis; foliorum laminis anguste ovatis rarius ovatis, 6—20 cm longis, 3—9 cm latis, plerumque 7—9 cm longis, 3—5 cm latis, supra medium regulariter angustatis, in apice obtusis, in basi saepius cordatis, necnon superioribus rotundatis, marginibus rectiusculis crenato-serratis, pagina superiore hirsuta inferiore molle densiore etiam areolato-velutina rarius glabratis, petiolis ad 8 cm longis elatis; verticillastris 6-floribus in spicas interruptas virgatas approximatis, bracteis plerumque quam calyces brevioribus subtentis; calycibus 11—15 mm longis extus pilis extensis longioribus glandulosis dense vestitis, dentibus deltoideis breviter spinosis; corollarum pulchre rubrarum tubo 15—22 mm longo saepius 18—20 mm longo, intus ad basim annulato, labia superiore 7—9 mm alta rarius 6 mm alta, inferiore 12—13 mm longa; staminum filamentis hirsutis.

As far as one is able to judge from present evidence, *S. Chamissonis*, *S. ciliata* and *S. Emersoni* appear almost certainly to have been derived from a common stock. Segregation is still apparently incomplete, for while the modes are very clearly definable individuals frequently approach one or the other related species in some characteristics. It is accordingly impossible to use any single character as a basis for absolute segregation. However, the extremes are too distant and the great majority of individuals too easily recognized and defined to make expedient or desirable their treatment as subspecies, particularly in view of their geographical distribution. Furthermore, the differences existing between these species and *S. Lindenii*, *S. boraginoides* and *S. lamioides* are of much the same order. *S. Chamissonis* varies greatly in the size and thickness of

leaf and in the density of pubescence, some forms being large-leaved, very thin and glabrate, others being much compacted and densely hairy. *S. flaccida* is a thin-leaved glabrate form. Some forms of *S. ciliata* in the Willamette Valley suggest *S. Chamissonis* in pubescence.

Occurs along the coast, from Humboldt County to San Mateo County; in addition specimens have been collected in San Luis Obispo County by Palmer and by Hall. It is to be wondered whether these were introduced. I have seen no specimens from Santa Cruz or Monterey Counties. Some specimens from the Santa Lucia Mountains referred here are clearly referable to *S. bullata*.

47. *S. ciliata* Dougl. ex Benth., Lab. Gen. et Sp. 539, 1834 per specim. in America bor. ad ripas fluminis Columbiae a Douglas lectum constituta est; typum in herb. Kew. vidi. — ? *S. Cooleyae* Heller in Bull. Torr. Bot. Cl. 26, 590, 1899 per specim. in insula Vancouver a Domina Cooley lectum constituta est; typum in herb. horti bot. Nov. Eborac. vidi. — *S. ciliata* subsp. *macrantha* Piper in Proc. Biolog. Soc. Wash. 32, 43, 1919 per specim. in Columbia Brit. in valle Chilliwack a Macoun (no. 54685) lectum constituta est; typum in herb. Smithson. vidi. — *S. caurina* Piper in Proc. Biol. Soc. Wash. 32, 42, 1919 per specim. in Washington in comitatu Clallam in montibus Olympic dictis a Elmer (no. 2543) lectum constituta est; typum in herb. Smithson. vidi. — *S. confertiflora* Piper in Proc. Biol. Soc. Wash. 32, 42, 1919 per specim. in Oregon comitatu Benton prope Corvallis a Piper lectum constituta est; isotypum in herb. Gray. vidi.

Herba perennis altitudine 60—120 cm et ultra, caulibus plerumque simplicibus interdum superne debiliter ramosis infime ad angulos pilis retrorsis rigidis in basi pustulatis armatis superne mollioribus extensis glandulosis vestitis; foliorum laminis tenuibus plerumque ovatis interdum anguste ovatis, 6—20 cm longis, 4—8 cm latis, maximam partem 8—12 cm longis, 4—6 mm latis, supra medium saepius acuminatis rarius rectiusculis, in basi cordatis interdum praesertim superioribus rotundatis, marginibus crenato-serratis, pagina superiore sparse hirsuta interdum fere glabra inferiore densiore hirsuta nullo modo velutina, petiolis ad 5 cm longis elatis; verticillastris 6-floribus in spicis interruptis dispositis infimis in foliorum supremorum deminutorum axillis dispositis; calycibus 7,5—10,5 (rarius 13) mm longis extus pilis extensis plus minusve glandulosis sparse vestitis, dentibus anguste deltoideis breviter spinosis; corollarum pulchre rubrarum tubo 13—24 mm longo saepius 16—17 mm longo, intus ad basim annulato, labia superiore 6—8 mm alta, inferiore 10—15 mm longa, staminum filamentis hirsutis.

S. Cooleyae is based upon a poor and seemingly abnormal specimen from Vancouver Island. However, it is well represented by Macoun's collections from Cedar Hills. It differs primarily in having calyces 13 mm long, in this respect suggesting *S. Chamissonis*. *S. caurina* appears to me to be typical *S. ciliata*, nothing more. The species might be indefinitely subdivided upon the basis of corolla length. There is in this respect however, a definite hiatus with *S. Emersoni*, as well as a difference in texture and conformation of the corolla. The species is primarily montane, and infrequently coastal.

Canada: British Columbia (Western); Vancouver Island.

Washington: Whatcom, San Juan, Island, Clallam, Jefferson, Grays Harbor, King, Pierce, Clarke, Okanogan, Chelan, Kittitas, Yakima, Klickitat, Spokane.

Oregon: Clatsop, Washington, Yamhill, Benton, Multnomah, Clackamas, Marion, Lane, Jackson, Hood River (Mt. Hood), Jefferson (Mt. Jefferson), Deschutes (The Sisters).

48. *S. boraginoides* Cham. et Schlecht. in *Linnaea* 5, 100, 1830 per specim. in Mexico in umbrosis in monte Macultepec et versus S. Andres prope Jalapa a Schiede (no. 144) lectum constituta est; typum in herb. Berolin. vidi. — *S. boraginoides* var. *glandulosa* Greenm. in Proc. Am. Acad. 41, 245, 1905 per specim. in Mexico prov. Hidalgo prope Trinidad a Pringle (no. 8894) lectum constituta est; typum in herb. Gray. vidi.

Herbae laxae plerumque procumbentes caulibus ad angulos pilis rigidis retrorsis 1—3 mm longis in basi patentim pustulatis armatis caeterum glabris, interdum sparse glandulosis internodiis frequenter elongatis; foliorum laminis maximam partem 4—7 cm longis, 2,5—4 cm latis, ovatis, acuminatis, in basi cordatis, marginibus convexis crenatis, paginis ambobus pilis rigidiusculis hispidis, petiolis 2—4 cm longis elatis; verticillastris 6-floribus in spicis interruptis laxis remote dispositis infimis frequenter in foliorum supremorum axillis positis; calycibus turbinatis 7—8 mm longis, extus pilis rigidiusculis conspersis et pilis brevioribus glandulosis vestitis interdum glabris, dentibus 2,5—4 mm longis, deltoideo-acuminatis acutissimis acicularibus; corollarum tubis 9—10 mm longis, supra anulum paulo ampliatis, labia superiore 4—5,5 mm alta, inferiore 6—8 mm longa; filamentis hirsutis; stylo glabro.

Mexico: Vera Cruz: sine loco, Galeotti 623; prope Jalapa in humidis, 4000 ped., 13. IV. 1899, Pringle 7788; in Barranca de Tenampa in humidis, V. 1907, Purpus 2427; in sylvaticis umbrosis prope Jalapa, V. 1829, Schiede; in umbrosis montis Macultepec et versus S. Andres prope Jalapa, Schiede; prope Jalapa, 5. VII. 1908, Pringle 15589; prope Huatusco in dumetis humidis, Mohr. —

Hidalgo: in barranca infra Trinidad, 5500 ped., 5. V. 1904, Pringle 8894 (var. *glandulosa* Greenm.).

49. *S. nubiflorum* Epling sp. nov. per specim. in Guatemalae prov. Chimaltenango prope Santa Elena in silvis nubigenis a Skutch (no. 209) lectum constituta est; typum in herb. Smithson. vidi.

Herba laxa in apertis reclinata in umbrosis scandens in nodis infimis radicans internodiis frequenter 10—15 cm longis, caulibus elongatis ad angulos pilis retrorsis in basi vix pustulatis vestitis caetero glabris; foliorum laminis cordatis petiolis 1—3 cm longis elatis, 2—5 cm longis, in apice obtusis, marginibus convexioribus pulchre crenatis, paginis ambobus pilis longioribus rectis conspersis; floribus saepius tribus in verticillastris in foliorum supremorum paulo deminutorum axillis dispositis; calycum florentium tubo 4,5—5 mm longo, extus pilis extensis sparse vestitis dentibus deltoideo-acuminatis spinosis 2,5—3 mm longis, in maturitate paulo auctis; corollarum purpurearum tubo 12—14 mm longo sat crasso, intus supra basim 3 mm transverse annulato, labia superiore 5—7 mm alta, inferiore 8—10 mm diametro.

Guatemala: Chimaltenango, Santa Elena, 2400—2700 m, in silvis nubigenis, 18. VII. 1933, Skutch 209; in loco eodem in apertis cultis, 23. I. 1933, Skutch 445.

50. *S. Lindenii* Benth. in DC. Prodr. 12, 467, 1848 per specim. in Mexico prov. Tabasco prope Teapa a Linden (no. 127) lectum constituta est; typum in herb. Kew. vidi.

Herbae laxae videtur prostratae vel procumbentes caulibus gracilibus ad angulos pilis incrassatis retrorsis rigidis in basi pustulatis armatis caeterum glabris vel villosis; foliorum laminis membranaceis cordatis, 5—12 cm longis, saepius 4—7 cm, 3—8 cm latis, acuminatis, marginibus regulariter crenato-serratis, paginis ambobus sparse hispidis; verticillastris 6-floribus; calycum florentium tubis 6—7 mm longis glabris vel retrorse hispidis, dentibus 3,5—4,5 mm longis deltoideo-lanceolatis valde acuminatis subpatentibus; corollarum sanguinearum tubis 18—23 mm longis ad basim annulatis, labiis rotundatis superiore 6—7 mm diametro, inferiore 13—14 mm, genitalibus in labia superiore inclusis, filamentis villosis, stylo glabro.

Mexico: Vera Cruz: in valle Cordoba, 12. XII. 1865, Bourgeau 1547; in monte Orizaba, Botteri 635; ad flumen Orizaba, I. 1854, Müller 876. — Guerrero: in Sierra Madre del Sur, 1840 m, 23. I. 1899, Langlasse 783. — Oaxaca: in Sierra San Pedro Nolasco, Talea etc., Jürgensen 880; Villa Alta, 1250 m, 15. II. 1919, Reko 4018. — Tabasco: Teapa, XII. 1839, Linden 127.

Guatemala: Quezaltenango: prope San Martin, 8140 ped., XII. 1891, J. D. Smith 266; Aguas Amargas, 5000 ped., 30. I. 1917, Holway 805.

var. *aristulata* Epling var. nov. per specim. in Mexico prov. Oaxaca in monte Zempoaltepeque a Liebmann (no. 15666) lectum constituta est; typum in herb. Univ. Calif. (Los Angeles) vidi.

Herba elata pilis brevibus glandulosis et praesertim ad angulos rigidis pustulatis armatis; calycibus extus glandulosis dentibus aristulatis.

Resembles *S. lamioides* var. *aristulata* of Ecuador, and bears to *S. Lindenii* the same relationship as that form does to *S. lamioides*.

Mexico: Oaxaca: Serra Zempoaltepeque, VI. 1842, Liebmann 156666.

51. *S. hamata* Epling sp. nov. per specim. in Colombia in Paramo del Quindio a André (no. 2179) lectum constituta est; typum in herb. Kew. vidi.

Herba ut videtur perennis caulibus ascendentibus videtur sat elongatis, gracilibus, ad angulos pilis rigidis brevibus pustulatis retrorse hamatis, caeterum glabris, internodiis elongatis; foliorum laminis mediis 5—6 cm longis, infimis non visis, anguste ovatis, acuminatis, acutissimis, in basi pulchre rotundatis, leniter cordatis, marginibus crenatis, paginis ambobus pilis rectis sparse vestitis, superiore subhirsuta, petiolis 1—2 cm (et ultra?) elatis; floribus in spicis interruptis elongatis bracteis subfoliosis mox valde deminutis subtentis, glomerulis inter se 1—6 cm distantibus supremis confertis; calycibus florentibus 8—9 mm longis, turbinatis, in maturitate paulo auctis, campanulatis, extus pilis rectis sparse vestitis, pedicellis 1—2 mm longis elatis, dentibus deltoideo-ovatis circa 3 mm longis patentibus spinosis, spinis 1,5—2 mm longis; corollarum tubo 8—9 mm longo, intus ad medium valde annulato; nuculis maturis non visis.

Colombia: sine loco, 25. XI. 1853, Holton 490; paramo del Quindio, 3200 m, 10. III. 1876, André 2179.

52. *S. lamioides* Benth., Pl. Hartweg. 244, 1846 et in DC. Prod. 12, 468, 1848 per specim. in Colombiae prov. Popayan in sylvis in ascensu ad Paramo de Sotara a Hartweg (no. 1343) lectum constituta est; typum in herb. Kew. vidi.

Herba perennis decumbens caulibus ascendentibus pilis extensis sat dense vestitis, subhispidis, frequenter ramosis; foliorum laminis 3—6 cm longis, petiolis hirsutis 2—5 cm longis elatis, nunc late ovatis nunc deltoideis, in apice plerumque acutis, in basi pulchre cordatis, marginibus saepe convexis maximam partem supre medium rectis, utrimque crenatis, crenis 1—2 mm altis, paginis ambobus pilis rectis sat hirsutis in siccis rufis; floribus in foliorum supremorum

deminutorum axillis dispositis glomerulis remotis inter se 2—4 cm distantibus; calycibus florentibus sat tenuibus 7—8 mm longis extus hispido-hirsutis, dentibus 1,5—2 mm longis, deltoideo-ovatis, acutis, spinis 0,5—1 mm longis armatis, pedicellis 2—4 mm longis elatis; corollis rubro-purpurearum, magnitudine variabilibus, tubo 10—15 mm longo, crasso, ad basim leniter gibboso et intus piloso-annulato; nuculis fere 2 mm longis, verrucosis.

Colombia: in ascensu ad Paramo de Sotara, Popayan, Hartweg 1343; ad Quindio, Triana; Alto Pesares prope Popayan, 2500 ad 2800 m, Lehmann 5960; ad Paramo de Guanacas prope Popayan, Lehmann; Boqueron del Quindio, 3400 m, 10. III. 1876, Andre 2219; ad Rio Cauca inter frutices 2950—3000 m, 15.—17. VI. 1922, Pennell 7066; Rosalito prope Paramo de Ruiz in prato, 15.—17. XII. 1917, Pennell 2951; in dumetis ad Rio Aguablanca prope Canaan, Cauca, 2900—3100 m, 11.—16. VI. 1922, Killip 6739; ad vias in gramineis ad Caramanta, 1500—2100 m, 19. IX. 1922, Pennell 10793; Paramo de la Union, 27. V. 1876, Andre 463; Paramo de Ruiz, Cauca, 2800—3500 m, 11. IX. 1883, Lehmann 3105; ad Carthago, Goudot; Alto de Cuitambo, Sotara, 2900—3400 m, Lehmann 6189.

Ecuador: sine loco, Spruce 5503; ad Loja, 8. XI. 1876, Andre 4423.

Peru: Arequipa, Camana, XI. 1915, Weberbauer 7191.

var. *aristulata* Epling var. nov. per specim. in Ecuador loco mihi ignoto a Spruce (no. 5536) lectum constituta est; typum in herb. Gray., isotypos in herb. Paris. et Kew. vidi.

Calycum dentibus 4 mm longis, acuminatis, spinis gracilibus acutissimis armatis.

Ecuador: sine loco, Spruce 5536; Jameson.

Species Group VIII.

Perennial herbs with oblong or ovate-oblong short-petioled or sessile leaves usually truncate at the base or narrowed, less often cordate, with usually a silky more or less appressed pubescence, (arachnoid in *S. albicaulis*) less often glabrate. Corolla tubes more often obliquely annulate and sometimes constricted-saccate. Chilean species, one Californian, and one in Arizona and New Mexico.

53. *S. Bridgesii* Benth., Lab. Gen. et Sp. 546, 1834 et in DC. Prodr. 12, 474, 1848 per specim. in Chili ad Valdivia a Bridges (no. 728) lectum constituta est; typum in herb. Kew. vidi.

Herba perennis altitudine 30—50 cm, omnino albo-lanata, caulibus ascendentibus, internodiis infimis brevibus, supremis 3—15 cm longis; foliorum laminis 1,5—4 cm longis, 6—20 mm latis, ovatis ovato-oblongisve, in apice rotundatis, in basi rotundatis vel

truncatis vix cordatis, rugosis, pagina superiore sericeo-hirsuta, inferiore tomentosa et ad venas sericeo-hirsuta margine leniter crenatis, crenis vix 1 mm altis, infimis petiolis 8 ad 20 mm longis elatis, supremis sessilibus; floribus in spicis interruptis 8—10 cm longis, bracteis foliis conformibus ovatis integris acutis calyces paulo superantibus, verticillastris trifloribus, infimis inter se 2—4 cm distantibus, supremis confertis; calycibus 6—7 mm longis turbinatis extus mollissime lanatis subsericeis, dentibus 2—2,5 mm longis deltoideo-ovatis acutis leniter spinosis; corollarum purpurearum tubo 7—8 mm longo, superne leniter ampliato, intus ad medium obscure annulato; nuculis 1,5 mm diametro.

Chili: Temuco, XII. 1926, Claude-Joseph 4667, 4660; X. 1927, Claude-Joseph 4820; Linares, IX. 1926, Claude-Joseph 4354; in collibus siccis prope Bellavista in valle fl. Trumas prov. Valdivia, Lechler 344; Valdivia, Philippi; Puren, I. 1925, Claude-Joseph 3028; in collibus prope San Juan, Leibold 2827; prope San Juan, I. 1852, Philippi 321; Pennell 12289; ad Valdivia, Bridges 728; sine loco, Gillies; San Juan, Neger; Temuco XII. 1928, Fr. Claude-Joseph 5806.

54. *S. philippiana* Vatke in Bot. Zeit. 33, 448, 1875 per *S. ellipticam* Phil., loc. cit., constituta est. — *S. elliptica* Philippi in Linnaea 33, 193, 1864 per specim. in Andibus chilensibus provinciae Santiago a ? Philippi lectum constituta est; typum non vidi (non *S. elliptica* Kunth 1817). — *S. andina* Philippi in Anal. Univ. Chili 90, 562, 1895 (nomen).

Herba perennis cinerea vix incana altitudine 15—30 cm, in basi suffruticosa ramosa, caulibus ascendentibus, pilis subextensis sat villosis; foliorum laminis 12—30 mm longis, ovatis oblongo-ovatisve, in apice obtusis vel rotundatis, in basi rotundatis et saepe ad petiolos angustatis, petiolis 3—10 cm longis elatis, margine crenato-serrata, sat convexa, paginis ambobus pilis brevibus molliter vestitis, superiore hirsuta, inferiore subtomentosa, maximam partem eglandulosis; floribus in spicis interruptis 5—15 cm longis dispositis, verticillastris infimis inter se 1—3 cm distantibus supremis confertis, bracteis subfoliosis subintegris subtentis; calycibus florentibus turbinatis 6—7 mm longis, extus hirsutis et rarius glandulosis, dentibus deltoideis, 2—2,5 mm longis, spinis brevibus armatis; corollarum tubo 8—11 mm longo; nuculis circa 1,5 mm diametro.

My nomenclature is based upon Vatke's determinations.

Chili: prov. O'Higgins apud El Teniente in saxosis prope Rio Coya, 2500—2700 m, 26. I. 1925, Pennell 12278, 12287, 12288, 12289; prov. Santiago in Cordillera Rio San Francisco ad Fierro Carrera, 3000 m, I. 1925, Werdermann 622; in aridis prope Sewell ad Rancagua, 7000—8000 ped., 1916, Bastin 19; prope Juncal,

2300 m, II. 1903 et 18. I. 1903, Buchtien; Juncal, 1903, F. Philippi; Cord. de los Condes, 2800 m, 25.—29. I. 1930, Loöser 1223.

55. *S. Gilliesii* Benth., Lab. Gen. et Sp. 740, 1835 et in DC. Prodr. 12, 473, 1848 per specim. in *Andibus Argentinae* prope Mendoza a Gillies lectum constituta est; typum in herb. Kew., isotypum in herb. Gray. vidi.

Herba perennis altitudine 20—50 cm, caulibus ascendentibus, pilis brevibus extensis sparse vestitis; foliorum laminis 2,5—4 cm longis, nunc ovatis nunc oblongo-ovatis, in apice rotundatis, in basi rotundatis et saepe cordatis, margine sat convexa frequenter tamen ad medium recta, crenato-serrata, crenis rotundatis, pagina superiore sparse breviterque hirsuta, etiam fere glabra, inferiore praesertim ad venas pilis rectis puberula vel breviter hirsuta, petiolis 0,5—3 cm longis elatis; floribus in spicis interruptis confertioribus dispositis, verticillastris maximam partem 0,5—1 cm, infimis 2 cm inter se distantibus, bracteis subintegris subtentis; calycibus florentibus turbinatis, 5—6 mm longis, extus villosulo-hirsutis, dentibus deltoideo-ovatis, 1,5—2 mm longis, breviter spinosis, corollarum tubo 8—9 mm longo, intus ad medium annulato; nuculis circa 2 mm longis.

Pennell's specimens which I have here associated with *S. Gilliesii* are not typical and may represent another species.

Argentina: prope Los Rabones in *Andibus* ad Mendoza, Gillies.

Chili: Quebrada de Lina Rios et Valle de Franz Carlos in *Andibus Chilensibus*, Gillies; ad La Casucha de la Calavera et El Alto de la Laguna, III. 1821, Gillies; Banos de Chillan in saxosis gramineis, 1400—1500 m, 29.—31. I. 1925, Pennell 12482; Banos de Chillan in saxosis, 1800—1900 m, 29.—31. 1925, Pennell 12379.

56. *S. litoralis* Philippi in Anal. Univ. Chili 90, 560, 1895 per specimina prope Constitucion a Ibar et prope Matanzos (prov. Colchagua) a Fernandez lecta constituta est; typum non vidi sed tamen specimina certa in herb. Kew. et Mus. Brit. vidi. — *S. dubia* Briq. in Bull. Herb. Boiss. 4, 873, 1896 per specim. ad Paso Cruz a Kuntze lectum constituta est; typum in herb. Delessert., isotypos in herb. Smithson. et horti bot. Nov. Eborac. vidi. — ? *S. ochroleuca* Philippi in Linnaea 33, 192, 1864 per specim. in Chili prope San Rafael inter Tome et Chillan a Volckmann lectum constituta est; typum non vidi sed specim. videtur isotypum in herb. Kew. vidi. — ? *S. Meyeni* Philippi in Anal. Univ. Chili 43, 520, 1873 per specim. in *Andibus Chilensibus* Cordillera de Tinguiririca dictis in valle las Damos a ? Meyen lectum constituta est; typum non vidi; specimina a Philippi determinata in herb. Kew. et Vindob. vidi (non *S. Meyeni* Walp. 1843). — ? *S. rupestris* Philippi in Anal. Univ. Chili 90, 562, 1895 (nomen; non *S. rupestris* Mont. et Auct. 1836).

Herba perennis sordida in basi suffruticosa ramosa decumbens caulibus ascendentibus longitudine 20—40 cm, sat crassis, pilis extensis et brevioribus subvillosis; foliorum laminis ovatis ovato-oblongisve, 2—4 cm longis, in apice obtusis rotundatisve, in basi rotundato-truncatis vix cordatis, petiolis 0,5—3 cm longis elatis, margine sat convexa, crenato-serrata, crenis rotundatis, paginis ambobus praesertim ad venas hirsuto-villosis; floribus in spicis interruptis 8—15 cm longis, maximam partem confertioribus, verticillastris plerumque inter se 0,5—2 cm rarius 4—5 cm distantibus, bracteis subfoliosis subtentis; calycibus florentibus turbinatis 6—7 mm longis, extus hispido-hirsutis et glandulosis, dentibus deltoideo-ovatis, circa 2,5 mm longis, spinis circa 1 mm longis armatis; corollarum tubo 7—11 mm longo, intus ad medium annulato; nuculis circa 1,5 mm diametro.

Chili: Constitucion, R. A. Philippi; Mina Cristo, XII. 1869, R. A. Philippi; ad litora maris, XII. 1898, F. Philippi; prope San Rafael, ? Volckmann (*S. ochroleuca*); San Rosendo, IX. 1926, Fr. Claude-Joseph 4373 (*S. dubia*); ? Sierra de Solis, 1891, Kuntze (*S. dubia*); Paso Cruz 2100 m, I. 1892, Kuntze (*S. dubia*).

57. *S. albicaulis* Lindl. in Bot. Reg. 13, sub t. 1080, 1827 et 18, sub t. 1558, 1832 per specim. in Chili prope Collina a M' Rae lectum constituta est; typum in herb. Cantab., isotypum in herb. Kew. vidi. — *S. eriophylla* Briq. in Ann. Conserv. et Jard. Bot. Genève 2, 713, 1898 per specim. in Patagoniae campis ignoto dictum, sed tamen veri simile est in Andibus prope Mendoza a Gillies lectum constituta est; typum in herb. Delessert. vidi.

Herba erecta altitudine maximam partem 40—60 cm caulibus paucis simplicibus virgatis vel in axillis supremis breviter ramosis, internodiis infimis dense albo-lanatis, arachnoideis saepius circa 10 cm longis, supremis viridibus glanduloso-pubescentibus, 3—6 cm longis; foliorum laminis 3—7 cm longis, 0,5—2 cm latis, oblongis, in apice obtusis vel subtruncatis, in infimarum basi ad petiolos 3—4 cm longos attenuatis, supremis subsessilibus, omnium marginibus irregulariter dentato-serratis, crenis 1—2 mm altis, paginis ambobus albo-lanatis nullomodo sericeis vel infimorum pagina superiore subglabra; floribus in spicas virgatas attenuatas 10—25 cm longas dispositis, verticillastris inter se 1—2 cm distantibus bracteis subfoliosis integris sessilibus glanduloso-pubescentibus subtentis; calycibus 6—8 mm longis fere sessilibus, turbinatis, maturis subcampanulatis extus glanduloso-hirsutis, dentibus 1—2 mm longis lanceolatis, spinis frequenter 1 mm longis armatis; corollarum purpurearum tubo circa 8 mm longo, intus ad medium incomplete piloso-annulato; nuculis 2 mm longis et ultra.

Chili: Santiago, Germain; in Andibus, Cuming 175; verisimiliter in Andibus prope Mendoza, Gillies; Nunca, Claude-Joseph 1756; Santiago, Hastings 51, 145; Cerro Blanco, 16. XI. 1900, Hastings 166; prov. Valdivia, I. 1835, Gay; Santiago, 15. X. 1921, Fr. Claude-Joseph 1415; San Fernando, Colchagua, X. 1920, Montero 96; prope Collina, M^rRae.

58. *S. grandidentata* Lindl. in Bot. Reg. 13, Sub t. 1080, 1827 per specim. e seminibus chilensibus prope Valparaiso a M^rRae lectis educatum constituta est; isotypum probabilem in herb. Kew. vidi. — *S. serrata* Clos in Gay, Flora Chilena 4, 500, 1849 per specim. in Chili prope Coquimbo, Arqueros et Rivadavia lecta constituta est; specimina certa in herb. Mus. Par. vidi. — ? *S. Toronjilcillo* Phil. in Linnaea 33, 193, 1864 per specimina prope Concumen a Landbeck lecta constituta est; specim. certum verisimiliter isotypum in herb. Vindob. vidi. — ? *S. Closi* Phil. in Anal. Univ. Chili 90, 561, 1895 per specim in montibus Talca lectum constituta est; typum non vidi.

Herba perennis altitudine 20—60 cm, caulibus virgatis maximam partem pilis extensis sparse indutis internodiis nisi infimis elongatis 5—15 cm longis, superne plus minusve glandulosis, nullo modo incanis sericeisve; foliorum laminis oblongis, maximam partem 2—4 cm longis, 6—12 mm latis, frequenter 6—8 cm longis, 12—20 mm latis, in apice rotundatis, in basi ad petiolos 1—3 cm longos angustatis nec cordatis, supremis sessilibus, margine serrata, crenis plerumque acutis prorsus salientibus, paginis ambobus sparse hirsutis et glandulosis nec sericeis nec incanis; floribus in spicas interruptas elongatas dispositis, verticillastris inter se 1—4 cm distantibus supremis confertis, bracteis subfoliosis subintegris subtentis; calycibus florentibus turbinatis, 5,5—6,5 mm longis, extus hispido-villosis glandulosis intus hirsutis, dentibus 1,5—2,5 mm longis leniter acuminatis spinosis; corollarum tubo 5—7 mm longo, intus ad medium annulato; nuculis 1,5—2 mm diametro.

Chili: prope Quillota, VIII. 1829, Bertero 1332; Plumo, 20. IX. 1921, Claude-Joseph 1421; Casa Blanca, V. 1856, Harvey; Valparaiso: X. 1925, Claude-Joseph 3627; Miss Calvert; 25. X. 1895, Buchtien; Bertero 669; Gaudichaud 93; Poeppig 74; Tavolango, IX. 1829, Bertero 1333; Santiago III. 1828, Bertero; prov. Aconcagua, Philippi; Concumen, I. 1863, Landbeck; prov. Coquimbo, Gay; Valparaiso, Mathews 216; Aconcagua: Limache (Cerro Tres Puntas), 19. IX. 1929, Looser 1219.

59. *S. sericea* Cav., Desc. de las Plant. 75, 1802, per specim. in Chili lecta constituta est; typum non vidi. — *S. sideritidoides* Gillies ex Benth., Lab. Gen. et Sp. 740, 1835 per specim. in Argentinae Andibus prope Mendoza a Gillies lectum constituta est; typum in herb. Kew. vidi. — *S. candidissima* Philippi in Linnaea 29, 19, 1857

per specim. in *Andibus chilensibus Chillan dictis* a Germain lectum constituta est; isotypos probabiles in herb. Mus. Brit., Vindob. et Kew. vidi. — ? *S. glabrata* Philippi in Anal. Univ. Chili 90, 559, 1895 per specim. in montibus chilensibus Nahuelbuta dictis in locis apricis a Philippi lectum constituta est.

Herba perennis altitudine 15—40 cm in basi dura caulibus paucis ascendentibus sericeo-pilosis nunc cinereo-viridibus pilis mollibus plus minusve appressis vestitis, internodiis infimis 1—2 cm longis, mediis 2—4 cm longis et ultra; foliorum laminis anguste oblongis 1,5—5 cm longis, 4—8 mm latis, in apice rotundato-truncatis, in basi praecipue infimorum ad petiolos 0,5—2 cm longos angustatis supremis sessilibus, omnium marginibus argute serrata, crenis prorsus salientibus, paginis ambobus molliter sericeis, nunc praesertim infimorum albis etiam candidissimis nunc cinereo-viridibus sed tamen pilis semper appressis; floribus in spicis interruptis dispositis, verticillastris densis infimis remotis inter se 1—5 cm distantibus supremis confertis omnibus bracteis subfoliosis subintegris subtentis; calycibus sessilibus florentibus turbinatis, 5,5—6,5 mm longis, extus pilis appressis sericeis, dentibus deltoideo-ovatis acutis breviter spinosis 2—3 mm longis; corollarum tubo 6—8 mm longo, intus ad medium annulato; nuculis circa 1,5 mm diametro.

Chili: prov. Colchagua, XII. 1869 Philippi; prov. Santiago, Philippi; in pascuis sylvaticis prope La Quinta, Rio Claro, IX. 1828, Bertero 669; Cord. de Chillan, Germain; Talca, IX. 1926, Claude-Joseph 4327; Bureo, XI. 1926, Claude-Joseph 3439; prov. Curico, Hacienda Monte Grande, 1700 m, XII. 1924, Werdermann 573; Valparaiso, I. 1920, Claude-Joseph 1095; Talca, X. 1921, Claude-Joseph 1675; Curico, XI. 1925, Claude-Joseph 4039; in montibus Chillan, 1863, de Solis; prov. Santiago, Philippi; prope Mendoza, Gillies.

60. *S. ajugoides* Benth. in *Linnaea* 6, 80, 1831 per specim. in California a Chamisso lectum constituta est; typum in herb. Mus. Berol., isotypum in herb. Kew. vidi.

Herba perennis altitudine 5—50 cm plerumque 15—30 cm, caulibus saepius in basi ramosis frequenter decumbentibus rarius strictis, pilis extensis nec tamen strictis et brevioribus glandulosis sat dense vestitis; foliorum laminis oblongis, 1,5—8 cm longis, 7—30 mm latis, saepius 3—5 cm longis 1—2 cm latis, in apice rotundatis in basi angustatis rarissime rotundatis, supremis sessilibus infimis petiolis ad 3 cm longis elatis, marginibus crenato-serratis frequenter rectiusculis saepius leniter convexis, paginis ambobus pilis longioribus praesertim ad venas hirsutis saepius subsericeis; verticillastris plerumque 6-floribus approximatis; calycibus 6—8 mm longis extus pilis longioribus nec tamen strictis et brevioribus glandulosis dense

hirsutis etiam subsericeis, dentibus deltoideo-ovatis breviter spinosis; corollarum rosearum tubo 7,5—9,5 mm longo intus infra medium oblique constricto-annulato et antice saccato, labia superiore 5—6 mm alta, inferiore 6—7,5 mm longa.

California: Humboldt (? extra limital), Sonoma, Napa, Marin, Glenn, Yolo, Solano, Contra Costa, San Joaquin, Alameda, San Francisco, San Mateo, Santa Clara, Monterey, San Luis Obispo, Santa Barbara, Los Angeles. The species is confined to the coast ranges at lower elevations in marshy ground.

61. *S. Rothrockii* Gray in Proc. Am. Acad. 12, 32, 1877 per specim. in New Mexico ad aboriginum vicum Zuni dictum a Rothrock (no. 177) lectum constituta est; typum in herb. Gray., isotypos in herb. Smithson., Mus. Field., Acad. Sci. Philad. et horti bot. Nov. Eborac. vidi.

Herba perennis rhizocarpica altitudine 15—30 cm caulibus erectis nunc simplicibus nunc in basi pluriramosis utrimque pilis mollibus appressis argenteis lanato-vestitis internodiis plerumque quam folia brevioribus; foliorum laminis sessilibus maximam partem ellipticis, 3—5 cm longis, 8—12 mm latis, in apice obtusis rarius acutiusculis utrimque angustatis, marginibus subintegris, pagina superiore pilis appressis molliter subsericeis, inferiore tomentosa et ad venas appresso-sericea; verticillastris 6—10-floribus saepius in spicas cylindratas congestis interdum approximatis; calycibus intus extus sericeo-lanatis 6—8,5 mm longis, in maturitate ad 9 mm auctis, dentibus anguste deltoideis acutis; corollarum tubo 5,5—7 mm longo intus paulo infra medium oblique annulato et sub inferiore ad anulum breviter saccato, labia superiore 4,5—5 mm alta, inferiore concavo-ascendente subaequilonga; staminibus e corollae tubo 4 mm exsertis, filamentis hirtellis.

N. Mexico: Mc Kinley: aboriginum vicum Zuni, 1874, Rothrock 177; Ojo Caliente, 28. VII. 1904, Wooton 2842; Valencia: prope Atarque in campis elevatis, 18. VII. 1906, Wooton; prope Atarque de Garcia, 18. VII. 1902, Wooton.

Arizona: Apache: Atoscacita Spring, 2570 m, 18. VIII. 1920, Eggleston 17032; Coconino: inter Williams et Grand Canyon, 23. VIII. 1919, Eggleston 15653; prope Flagstaff, 5. VIII. 1884, Jones 3995; Bill Williams Mt., Davenport Lake, X. 1884, Lemmon 3214; Walnut Canon, 7000 ped., 27. VII. 1898, MacDougal 351; Rattlesnake Tank, San Francisco Mts., 1900 m, 13. IX. 1901, Leiberg 5919; Flagstaff, 23. VII. 1891, MacDougal; Flagstaff, 1900, Purpus 8055; Williams, 8.—25. VII. 1903, Griffiths 4917; Bellemont, 29. VI. 1892, Toumey 386; Mojave: Peach Springs, 1884, Jones.

Species Group IX.

A single species of California characterized by very soft spreading pubescence which becomes arachnoid; corolla tubes constricted-annulate and saccate; allied perhaps to *S. albicaulis* of Chili.

62. *S. albens* Gray in Proc. Am. Acad. 7, 387, 1868 per specim. in Californiae montibus prope Ft. Tejon a Xantus (no. 80) lectum constituta est; typum in herb. Gray., isotypum in herb. Smithson. vidi. — *S. pycnostachya* Torr., Bot. U. S. Expl. Exped. 2, 408, 1874 (nomen). — *S. velutina* Greene in Erythea 2, 121, 1894 per specim. in Californiae paludibus prope Suisun a Greene lectum constituta est; non typum sed specimina vera in herb. Univ. Calif. (Berkeley) vidi (nec Schweinitz nec Willd.). — *S. lanuginosa* Greene, Pittonia 3, 342, 1895 per specim. in Californiae montibus comitatus Fresno a Peckinpah lectum constituta est; typum non vidi. — *S. malacophylla* Greene Pittonia 3, 343, 1895 per *S. velutinam* Greene, loc. cit. (non Schwein.) constituta est. — *S. ajugoides* var. *velutina* Jepson, Fl. W. Middle Calif. 457, 1901 per *S. velutinam* Greene constituta est. — *S. albens* var. *juliensis* Jeps., Manual 877, 1925 per specim. in Californiae com. Fresno in McKinley Grove a Grant (no. 1198) lectum constituta est; typum in herb. Jepsonianum vidi.

Herbae perennes crassae erectae altitudine 30 cm ad 1 m et ultra caulibus robustis saepius simplicibus utrimque pilis tenuissimis mollissimis albo-lanuginosis; foliorum laminis infimis 3—12 cm longis et ultra, petiolis ad 6 cm longis elatis, supremis subsessilibus vel deltoideo-cordatis vel oblongis maximam partem oblongo-ovatis, obtusis, paginis superioribus molliter hirsutis, inferioribus mollissime arachnoideo-tomentosis areolatis; verticillastris 6—20-floribus in spicas interruptas albo-lanatas congestis supremis confertis infimis approximatis; calycibus 6,5—7 mm longis in maturitate paulo auctis, extus lanatis, dentibus debiliter spinosis deltoideo-ovatis nunc obtusis nunc acutis rarius in spinas acuminatis; corollarum albarum tubo 6—8,5 mm longo infra medium oblique annulato ad anulum sub labia inferiore saccato, labia superiore 3,5—5,5 mm alta, inferiore 6—8 mm longa; staminibus e corollae tubo 3—4 mm exsertis filamentis hirsutis.

The plants of valley marshes tend generally to be robust with deltoid leaves. Great variation occurs however within a single very limited region as for example the marshy ground at the type station. The type collection itself is notably varied. The plants of montane streams tend to be smaller, more strict and have narrowly ovate or even oblong leaves which are generally less cordate at the base. The latter form is Jepson's variety *juliensis*, and was described by Greene as *S. lanuginosa*. They intergrade very closely; there

are no geographical correlations. The species ranges from sea level to at least 8000 ft.

California: Lake, Napa, Solano, Contra Costa, Alameda, San Joaquin, Tuolumne, Santa Clara, Merced, Mariposa, San Benito, Madera, Fresno, Tulare, Inyo, San Luis Obispo, Santa Barbara, Ventura, Kern, Los Angeles, San Bernardino (San Bernardino Mts.) and Riverside (western edge).

Species Group X.

Perennial herbs with usually oblong short-petioled leaves, less often oblong-cordate and petioled, the stems sometimes hispid on the angles; corolla tubes obliquely constricted-annulate and saccate, the stamens exerted from the tube 2—4 mm. Species of North America north of Mexico. A group of diverse origins, which presents a bewildering complex of cross-relationships. A key to this puzzle may be found in consideration of the Eurasian species which are closely allied to ours. It seems something more than a coincidence that the three most diverse species of this group in North America, namely, *S. palustris*, *S. Riddellii* and *S. hyssopifolia* have very close counterparts in the Eurasian species *S. palustris*, *S. sylvatica* and *S. chinensis*. The pubescence, leaf-shape and conformation of the calyces of these species suggest strongly that they represent the basic types from which this species group has been derived through hybridization.

63. *S. pycnantha* Benth., Pl. Hartweg. 331, 1849 per specim. in Californiae umbrosis montium prope Carmel a Hartweg (no. 1922) lectum constituta est; typum in herb. Kew. et isotypos in herb. Kew. et horti bot. Nov. Eborac. vidi.

Herba perennis altitudine 30—100 cm et ultra caulibus superne saepius cymoso-ramosis pilis longioribus extensis et subsessilibus glandulosis vestitis; foliorum laminis forma et magnitudine valde variis nunc deltoideo-ovatis nunc oblongis maximam partem ovatis 5—10 cm longis, 3—5 cm latis, in apice obtusis vel rotundatis, in basi plerumque leniter cordatis necnon rotundatis, petiolis ad 4 cm longis superne gradatim deminutis elatis, marginibus nunc rectiusculis nunc convexis, paginis ambobus hirsutis et pilis subsessilibus glandulosis conspersis; verticillastris 6—10-floribus in spicas densas cylindratas hirsutas in maturitate ad 15 cm productas congestis; calycibus 6—10 mm longis extus pilis longioribus hirsutis sessilibus glandulosis vestitis in maturitate plus minusve auctis, dentibus deltoideis rarius ovato-deltoideis breviter spinosis; corollarum pallidarum tubo 6—7,5 mm longo intus paulo infra medium oblique annulato et antice non solum constricto sed

etiam saccato, labia superiore 3,5—4 mm alta, inferiore 5,5—7 mm longa.

Occurs in Eastern Tehama and Butte Counties but ranges principally along the westward face of the coast ranges from Mt. Tamalpais and Mt. Diablo, southward to the region of Santa Maria. Occurs also on Mt. Hamilton.

The Sierran forms of this species have the lower lip of the corolla proportionately somewhat longer and the tube is somewhat less saccate. Otherwise the differences are few. The flowers tend to be withering-persistent.

California: Tehama (Lassen Butte), Butte, Marin, Contra Costa, Alameda, San Francisco, San Mateo, Santa Clara, Monterey, San Luis Obispo.

64. *S. rigida* Nutt. ex Benth. in DC. Prodr. 12, 472, 1848 per specim. in Oregon a Nuttall lectum constituta est; typum in herb. Kew., isotypum in herb. Mus. Brit. vidi. — *S. bullata* Auct., non Benth.

Herbae perennes habitu varii pilis strictis plus minusve hirsutis; verticillastris 6—12-floribus sat remotis in spicis interruptis rarius bracteatis dispositis; calycibus 5—8 mm longis extus pilis extensis hirsutis, dentibus deltoideis acutis rarius obtusis debiliter spinosis plerumque subpatentibus; corollarum saepe pallidarum tubo 6 ad 10 mm longo, intus infra medium oblique constricto-annulato et antice plus minusve saccato, labia superiore 3,5—6 mm alta, inferiore 7—9 mm longa; staminibus e tubo 2—3 mm exsertis.

Key to the subspecies.

Folia saepius ovata, infima petiolis saepius
2,5—4 cm longis elata subsp. *quercetorum*

Folia vel anguste ovata vel oblonga, infima
petiolis saepius 0,5—2,5 cm longis elata.

Folia oblonga, infima petiolis 0,5—1 cm
longa elata subsp. *rivularis*

Folia anguste ovata, infima petiolis
1—2,5 cm longa elata subsp. *typica*

subsp. *quercetorum* Epling subsp. nov. — *S. Nuttallii* var. *leptostachya* Benth., Plantae Hartweg. 331, 1849 per specim. in Californiae com. Monterey ad Carmel a Hartweg (no. 1921) lectum constituta est; typum in herb. Kew., isotypum in herb. horti bot. Nov. Eborac. vidi. — *S. quercetorum* Heller in Muhlenbergia 2, 318, 1907 per specim. in Californiae com. San Mateo prope Crystal Springs a Heller (no. 8577) lectum constituta est; isotypos in herb. Smithson. et Mus. Field. vidi. — *S. gracilentata* Heller in Muhlenbergia

2, 319, 1907 per specim. in Californiae com. San Mateo prope Crystal Springs a Heller (no. 8574) lectum constituta est; isotypos in herb. Field. Mus. et Smithson. vidi. — *S. viarum* Heller in Muhlenbergia 2, 316, 1907 per specim. in Californiae com. San Mateo ad oppidum San Mateo a Heller (no. 858) lectum constituta est; isotypos in herb. Smithson. et Field. Mus. vidi. — ? *S. ramosa* Heller in Muhlenbergia 1, 116, 1906 per specim. in Californiae com. Santa Clara in collibus Fairview dictis prope pagum Los Gatos a Heller (no. 7510) lectum constituta est; isotypos in herb. Smithson., Mus. Field. et Univ. Calif. (Berkeley) vidi.

Herbae perennes altitudine saepius 40—60 cm caulibus plerumque ramosis interdum simplicibus maximam partem laxis etiam decumbentibus rarius strictis utrimque pilis extensis sparse vestitis; foliorum laminis forma et magnitudine variis vel deltoideo-ovatis, rarius oblongo-ovatis plerumque ovatis, 4—8 cm longis, infimis petiolis 2—5 cm longis elatis supremis subsessilibus, omnibus in apice obtusis, in basi saepius leniter cordatis frequenter rotundatis vel subtruncatis, marginibus convexioribus crenato-dentatis; paginis ambobus pilis inaequilongis extensis plus minusve vestitis, rarius glabris.

subsp. *typica* Epling subsp. nov. — *S. vestita* Howell, Fl. N. W. Amer. 1, 558, 1901 per specim. in Oregon australe in humidis a Howell lectum constituta est; icones et fragmentum in herb. Smithson. et Mus. Field. vidi. — *S. bracteata* Greene, Pittonia 3, 342, 1898 per specimina in Californiae com. Modoc et Plumas a Dom. Austin lecta constituta est; typum non vidi.

Herbae perennes altitudine plerumque 40—70 cm erectae caulibus in axillis superioribus saepius ramosis pilis subretorsis sparse hirsutis; foliorum laminis saepius 5—9 cm longis, 2,5—4,5 cm latis maximam partem anguste ovatis, in apice acutiusculis vel obtusis, in basi saepius rotundato-subcordatis, marginibus crenato-serratis, paginis ambobus molliter hirsuta interdum glabratis, infimis petiolis maximam partem 1—2 cm longis elatis, mediis breviter petiolatis.

subsp. *rivularis* Epling subsp. nov. — *S. rivularis* Heller in Muhlenbergia 1, p. 33, 1906 per specim. in Californiae com. Nevada ad ripas fluminis Truckee a Heller (no. 7114) lectum constituta est; isotypos in herb. Smithson. et Coll. Pomonae vidi. — *S. Prattenii* Durand in Journ. Acad. Sci. Phil. II, 3, 100, 1855 per specim. in Californiae com. Calaveras ad rivuli ripas prope pagum Nevada a Pratten lectum constituta est; typum in herb. Acad. Phil. vidi. — *S. littoralis* Greene, Pittonia 3, 341, 1898 per specim. in Californiae com. Modoc a Baker lectum constituta est; typum non vidi (non Philippi in Anal. Univ. Chili 90, 560, 1895). — *S. striata* Greene, Pittonia 3, 341, 1898 per specimina in Californiae com. Plumas et Modoc a Dom. Austin

lecta constituta est; typum non vidi. — *S. ingrata* Greene, Pittonia 3, 341, 1898 per specimina in Californiae Sierra Nevada a Dom. Harrison lecta constituta est; typum non vidi. — *S. veronicaefolia* Davy ex Jepson, Man 878, 1925 per specim. in Californiae com. Shasta prope Morley's Station a Baker et Nutting lectum constituta est; typum in herb. Jepsoniano vidi.

Herbae perennes altitudine plerumque 15—40 cm erectae strictae caulibus simplicibus pilis subretrois sparse hirsutis; foliis infimis approximatis supremis remotis omnibus ascendentibus vel erectis, laminis maximam partem oblongis 4—9 cm longis, saepius 1,5—2,5 cm latis, in apice obtusis in basi rotundato-truncatis, marginibus crenato-serratis, paginis ambobus molliter hirsutis interdum glabratibus, infimis petiolis maximam partem minus quam 1 cm longis elatis mediis subsessilibus.

As understood by me, *S. rigida* is a polymorphic species of more than usual variation even within limited populations. The modes of the geographical races here treated as subspecies may be readily distinguished yet I have been unable to find any very satisfactory lines of demarcation between them.

As far as one may surmise from examination and comparison of phenotypes, it seems not impossible that this complex has had its origin through hybridization of *S. palustris* or an allied form with some endemic species similar perhaps to *S. pycnantha*. The extremes of *S. rigida* subsp. *rivularis* may be distinguished from *S. palustris* subsp. *pilosa* chiefly in the longer basal petioles of the former. The extremes of *S. rigida* subsp. *quercetorum* may be distinguished from *S. pycnantha* chiefly in habit, particularly of the inflorescence.

Subsp. *typica* occurs abundantly on the Shasta plateau, extending northward to the Columbia River on the western side of the Cascade Mountains. In the Sierra Nevada it occurs in the vicinity of Mt. Lassen, in Plumas and in Butte Counties. It is found also in the coast ranges of Trinity and Humboldt Counties.

Subsp. *rivularis* is primarily the characteristic form of the Sierra Nevada, ranging from Jackson County, Oregon, southward to Yosemite National Park. It occurs also in the Warner Mountains of Modoc County and in the coast ranges in Napa and Lake Counties.

Subsp. *quercetorum* is the characteristic form of the coast ranges, occurring from southern Oregon to northern Lower California. It is found also in Butte County. Forms occur in San Diego County which are intermediate with subsp. *typica* of the higher surrounding mountains and *S. quercetorum*. They resemble *S. gracilentata* of Heller, described from San Mateo County. A hairy form with ovate leaves which is found in Marin, Sonoma and Mendocino Counties might be given a distinguishing name. It approaches the

forms of *S. Emersoni* found in southwestern Oregon and northwestern California.

S. ramosa of Heller is either a very luxuriant form of subsp. *quercetorum*, or as I suspect, represents an intermixture with *S. pycnantha*.

In the San Jacinto and Cuyamaca mountains of Southern California subsp. *quercetorum* passes at higher altitudes into forms not distinguishable from subsp. *typica*. In Oregon some specimens which I have referred to subsp. *typica* are not essentially different from subsp. *quercetorum*; subsp. *rivularis* und subsp. *quercetorum* are readily separable, but both merge imperceptibly into subsp. *typica*.

North of San Francisco Bay the tendency is toward an ovate leaf, mostly blunt at the apex, more deeply cordate at the base, with a denser pubescence. South of the Bay region, particularly in Southern California, the tendency is toward a more oblong leaf, rounded at the base and often glabrate.

S. gracilentia is a slender unbranched sun-form with deltoid erect leaves.

S. viarum is a form more or less intermediate with *S. gracilentia* and more average plants.

65. *S. palustris* L. Spec. Pl. 580, 1753.

Herba perennis altitudine plerumque 50—100 cm, caulibus erectis saepius strictis interdum superne ramosis pilis brevibus et praesertim ad angulos longioribus subrigidis saepius reflexis vestitis; foliorum laminis maximam partem oblongis nunc sublanceolatis nunc subellipticis, plerumque 5—10 cm longis, 1,5—2,5 cm latis, in apice acutis vel obtusis vix acuminatis, in basi truncatis rarius subcordatis infimis et supremis sessilibus mediis petiolis latioribus 1—3 mm longis elatis, omnium marginibus serratis vel serrato-crenatis, paginis ambobus pubescentibus et inferiore praesertim ad venas pilis longioribus rigidiusculis conspersis; verticillastris plerumque 6-floribus infimis sat remotis in foliorum supremorum axillis positis supremis sat confertis; calycibus 5,5—9 mm longis extus pilis extensis brevibus et longioribus plus minusve rigidis vestitis, dentibus acuminatis plerumque subulatis acutissimis in apice spinosis; corollarum tubo 6—8,5 mm longo intus infra medium oblique constricto-annulato, labia superiore 3,5—5,5 mm alta, inferiore 6—7,5 mm longa.

Occurs in typical form chiefly in Eastern Canada, passing further south into *S. ambigua* and westward into subsp. *pilosa*. The American plants have about the same range of variation as the European. I have seen no specimens from west of the Mississippi River certainly referable to this species. The plants of Alaska and Western Canada are all referable to the subspecies, which apparently occurs

sporadically, perhaps as a vagrant, as far eastward as Massachusetts. As is frequently the case with wide spread northern species, Minnesota and Wisconsin are meeting grounds for eastern and western forms, with numerous intermediates. Frequent individuals from the New England States are hardly separable from the subspecies save in the retrorse rather than spreading, somewhat finer pubescence. Occasional European forms suggest subsp. *pilosa* in habit but not in pubescence.

subsp. *pilosa* Epling comb. nov. per *Stachydem pilosam* Nuttall, loc. cit. constituta est. — *S. pilosa* Nutt., in Journ. Acad. Phil. 7, 48, 1834, per specim. verisimiliter in Idaho "ad fluminis Columbiae fontes" a Wyeth lectum constituta est; typum hodie in herb. Mus. Brit. vidi. — *S. scopulorum* Greene, Pittonia 3, 342, 1901 per specim. in Colorado a ? Greene lectum constituta est; typum non vidi. — *S. teucriformis* Rydb. in Bull. Torr. Bot. Cl. 31, 640, 1904 per specim. prope New Windsor, Colorado, a Osterhout lectum constituta est; typum in herb. horti bot. Nov. Eborac. vidi. — *S. teucrifolia* Rydb., Fl. Colo. 297, 1906 (nomen). — *S. asperrima* Rydb. in Bull. Torr. Bot. Cl. 36, 682, 1909 per specim. in Utah ad Jordan City a Leonard (no. 138) lectum constituta est; typum in herb. horti bot. Nov. Eborac. vidi. — *S. Leibergii* Rydb. in Bull. Torr. Bot. Cl. 36, 682, 1909 per specim. in Idaho ad Blue Cr. in Coeur d'Alene montibus a Leiberg (no. 1328) lectum constituta est; typum in herb. Smithson., isotypos in herb. Coll. Pom. et Univ. Calif. (Berk.) vidi. — *S. ampla* Rydb. in Bull. Torr. Bot. Cl. 36, 683, 1909 per specim. in S. Dakota prope Custer in montibus Black Hills dictis a Rydberg (no. 1208) lectum constituta est; typum in herb. horti bot. Nov. Eborac.; isotypum in herb. Smithson. vidi. — *S. borealis* Rydb. in Brittonia 1, 95, 1931 per specim. in regione fluminis Mackenzie a Onion et al. lectum constituta est; typum in herb. horti bot. Nov. Eborac. vidi.

Herbae perennes altitudine 15—90 cm, plerumque 40—60 cm, caulibus pilis longioribus et brevioribus extensis sat dense vestitis; foliorum laminae maximam partem ovato-oblongis vel oblongis rarius ellipticis plerumque 4—8 cm longis, 2—3 cm latis, in apice obtusis, in basi rotundato-subcordatis vel truncatis, mediis petioli 1—3 mm longis elatis, paginis ambobus concoloribus pilis longioribus et brevioribus rigidiusculis sat dense vestitis; calycibus pilis longioribus et brevioribus extensis densiore hirsutis et dentibus maximam partem deltoideo-acuminatis.

The form here described as subspecies *pilosa* is relatively uniform throughout its wide and diversified range. It ranges from Alaska southward along the Cordillera and the western margin of the Great Basin to Southern Nevada, Northern Arizona and all but the southern-

most ranges of New Mexico. In the northern plains states it reaches to the Mississippi River, passing into the species. Some forms of *S. palustris* from New England are difficultly separable save in pubescence. In habit of foliage the subspecies suggests some intermixture with *S. ambigua*.

I have seen one or two specimens from Modoc County, California certainly referable to this subspecies. However, *S. rigida* subsp. *rivularis* of the Sierra Nevada approaches it very closely at times, differing chiefly in the longer petioles of the lower leaves. I am wholly at loss to understand the basis for segregation of Rydberg's numerous species. I might add that the subspecies is approached by some European forms commonly referred by European botanists to *S. palustris*.

66. *S. ambigua* (*S. palustris* × *S. sylvatica*) Smith, Engl. Botany 30, pl. 2089, 1810 per specim. in insulis (Orkney) a Borrer et Hooker lectum constituta est; non typum sed icon vidi. — *S. velutina* Schwein. in Longs Exped. Winnep. 2, 390, 1814 per specim. a Say hodie in herb. Acad. Sci. Nat. Philadelph. constituta est; typum vidi (non Willd., Enum. Suppl. 41, 1813). — *S. arenicola* Britton, Man. Fl. N. U. S. 792, 1901 per specim. in New York a Staten Island prope New Dorp a Domina Britton lectum constituta est; typum in herb. horti bot. Nov. Eborac. vidi. — *S. palustris* var. *arenicola* Farw. in Am. Midl. Nat., 11, 82, 1928 per *S. arenicolam* Britt., loc. cit., constituta est. — *S. palustris* var. *homotricha* Fern. in Rhodora 10, 85, 1908 per specimina pauca in herb. Gray. constituta est; specimina vidi. — *S. palustris* var. *puberula* Jennings in Journ. Wash. Acad. Sci. 10, 458, 1920 per specim. in Ontario lectum constituta est; typum non vidi. — *S. Schweinitzii* Rydb. in Brittonia 1, 95, 1931 per *S. velutinam* Schwein., loc. cit., constituta est. — *S. puberula* Rydb. in Brittonia 1, 96, 1931 per *S. palustrem* var. *puberulam* Jennings, loc. cit., constituta est. — *S. homotricha* Rydb. in Brittonia 1, 95, 1931 per *S. palustris* var. *homotricha* Fern., loc. cit., constituta est. — *S. pustulosa* Rydb. in Brittonia 1, 95, 1931 per specim. in Wisconsin prope Ft. Harvard a Schuette lectum constituta est; typum in herb. horti bot. Nov. Eborac. vidi.

S. ambigua Sm. (not of Britton) is recognized by European botanists as of hybrid origin from *S. palustris* and *S. silvatica*. As nearly as one may judge from phenotypes it occurs also in North America where it has much the same range of variation, although leaning more toward the first named parent with which it merges imperceptibly. In addition I believe it forms more readily perceptible intermediates with *S. hispida* and perhaps also with *S. tenuifolia*. The corollas of the European plants are somewhat larger than those of the American and the petioles are more frequently longer. The

range of this species lies somewhat further south and west than that of *S. palustris* but occurs with it in the New England and North Central States. I have seen Canadian specimens only from southern Ontario. *S. arenicola* is a narrow-leaved hairy form which occurs occasionally throughout most of the range of the species. It is very shadowy. *S. pustulosa* apparently represents an intermixture of *S. ambigua* and *S. hispida*.

Since the above was written I have had the privilege of discussing this form with Prof. Göte Turesson who is of the opinion that I have mis-interpreted the European hybrid *S. ambigua*. This, according to him is a rare and sterile plant. Until I can review the whole matter I am accordingly at a loss. Suffice it to say that the form here described as *S. ambigua* is scarcely to be distinguished from plants commonly referred to that species by European botanists.

67. *S. hispida* Pursh Fl. Am. Sept. 2, 407, 1814 per specim. Claytonianum olim in herb. Gronov. constituta est; typum hodie in herb. Mus. Brit. vidi. — *S. tenuifolia* var. *aspera* Fern. in Rhodora 10, 85, 1908 (non *S. aspera* Michx.).

Herba perennis altitudine 60—90 cm et ultra caulibus virgatis strictis erectis ad angulos pilis retrorsis rigidis in basi pustulatis armatis caetero glaberrimis; foliorum laminis sat firmis subcoriaceis plerumque 6—12 cm longis, 1,5—4 cm latis, elliptico-lanceolatis rarius ellipticis rarius oblongis, supra medium angustatis et acuminatis vel acutis, ad basim angustatis et anguste rotundato-truncatis, infimis et superioribus sessilibus, mediis petiolis 1—8 mm longis elatis, pagina superiore pilis rigidis et inferiore praesertim ad venas conspersa ambobus frequenter omnino glabris inferioris venis prominulis; verticillastris 6—8-floribus approximatis, infimis sat remotis in foliorum supremorum axillis positae bracteis valde ciliatis subtentis; calycibus 5,5—7 mm longis extus praesertim ad venas pilis longioribus strictis ornatis caeterum glabris dentibus lanceolato-acuminatis vel subulatis acutissimis; corollarum tubo 6—7 mm longo, intus infra medium oblique constricto-annulato, labia superiore 4—5 mm alta, inferiore 6—7,5 mm longa.

I am inclined to believe *S. hispida* to have been derived from *S. ambigua*, probably after intermixture with *S. hyssopifolia*. For the most part it is readily distinguishable by reason of the thicker sharp leaves and pubescence of stiff hairs only; occasionally forms occur in which a shorter pubescence is also found in the inflorescence and to a less extent on the leaves. It is true that occasional forms occur which suggest intermixture with *S. tenuifolia* yet I see no more reason for considering *S. aspera* as a variant of that species than of

S. palustris or of *S. hyssopifolia* or of *S. aspera*. A puzzling form intermediate between *S. aspera* and *S. hispida* has been collected by Harper near Wrightsville, Georgia, and by Small near Augusta, Georgia. It is characterized by narrowly oblong leaves 7—12 mm wide, yet specimens almost as extreme may be found in New England (for example, Bartlett 849 collected near Concord, Massachusetts). The species ranges from the shores of the Saint Lawrence River and Lake Ontario southward to Maryland (except the mentioned Georgian plants) westward to eastern North Dakota and south-westward to northern Arkansas.

68. *S. Nuttallii* Shuttlew. ex Benth. in DC. Prodr. 12, 469, 1848 per specim. in Tennessee in regione superiore montium Cumberland a Rugel lectum constituta est; typum probabilem in herb. Mus. Brit., isotypum in herb. horti bot. Nov. Eborac. vidi.

Herbae perennes altitudine ad 1 m, caulibus strictis praesertim ad angulos pilis rigidis longioribus subreversis et saepius pilis brevibus interdum minutissimis glandulosis vestitis rarius caeterum glabris; foliorum laminis oblongo-elliptis ascendentibus 6 ad 15 cm longis, 3—6 cm latis, in apice sat acuminatis vel acutis, in basi angustatis vix subcordatis, infimis et supremis sessilibus, mediis petiolis 3—6 mm longis elatis, marginibus crenatis, pagina superiore et inferiore praesertim ad venas pilis rigidioribus conspersis frequenter pilis brevissimis glandulosis vestitis; verticillastris multifloribus approximatis; calycibus extus pilis brevibus saepius glandulosis et longioribus rigidis conspersis rarius subglabris, dentibus deltoideo-acuminatis subspinosis 1,5—2 mm longis; corollarum tubo 6—8 mm longo, intus infra medium oblique annulato et leniter constricto; labia superiore 3,5—4 mm alta, inferiore 5—7 mm longa.

This species exhibits 3 forms: one in which the pubescence is chiefly or wholly composed of stiffish hairs, one in which in addition is a puberulent covering of minute glandular hairs and one in which the hairs are intermediate in length and softer, but more or less glandular. The last named is characterized also by thinner larger foliage. The first two forms have been sporadically collected in the Cumberland Mountains of Tennessee and in the Blue Ridge Mts. of Virginia and North Carolina, and near Washington, D.C. The third named form has been collected on Rich Mt., Le Flore Co., Oklahoma and on Magazine Mt., Logan Co., Arkansas. The species passes into *S. hispida*, forms occurring in Illinois, New York and Massachusetts which are difficultly separable.

69. *S. latidens* Small in Britton, Man. Fl. N. U. S. 793, 1901 per specim. in Virginia in monte White Top dicta a Small lectum constituta est; typum in herb. horti bot. Nov. Eborac., isotypos plures vidi.

Herba perennis altitudine 30—80 cm, caulibus simplicibus gracilibus glabris vel ad angulos saepe muricatis; foliorum laminis tenuibus plerumque ellipticis vel ovato-ellipticis nunc 5—7 cm longis, 1,5—2 cm latis nunc 10—15 cm longis, 4—6 cm latis, superioribus praesertim sessilibus mediis petiolis 3—8 mm longis elatis, omnibus in apice pulchre acuminatis acutissimis, in basi rotundato-angustatis rarius subcordatis, marginibus serratis, paginis ambobus concoloribus glabris vel pilis strictis paucis conspersis; verticillastris sat remotis 6-floribus; calycibus 3,5—8 mm longis pallidibus extus pilis brevibus extensis sparse conspersis dentibus deltoideis 1—2 mm longis leniter acuminatis debiliter spinosis; corollarum tubo 7—9 mm longo, intus infra medium oblique constricto-annulato, labia superiore 4—4,5 mm alta, inferiore 6 ad 8 mm longa.

Found primarily in the mountains of western North Carolina but known also from Washington Co., Virginia, Fannin Co., Georgia, and Fayette Co., West Virginia. Passes into *S. Nuttallii* and *S. tenuifolia*.

70. *S. tenuifolia* Willd., Sp. Pl. 3, 100, 1800 per specim. in „Pennsylvania“ lectum constituta est; typum in herb. Mus. Berolin. vidi. — *S. glabra* Riddell, Suppl. Cat. Ohio Pl. 16, 1836 per specim. in Ohio a Riddell lectum constituta est; specim. verum verisimiliter typum in herb. Smithson. vidi. — *S. aspera* var. *glabra* Gray, Syn. Fl. 2, pt. 1, 387, 1878. — *S. cincinnatensis* Kuntze, Rev. Gen. 2, 531, 1891 per specim. in Ohio prope Cincinnati a (?) Kuntze lectum constituta est; typum in herb. horti bot. Nov. Eborac. vidi.

Herba perennis altitudine 40—100 cm, caulibus simplicibus vel superne plus minusve ramosis nunc laevibus nunc ad angulos muricatis rarius pilis longioribus extenso-retrorsis ad angulos ornatis caetero glaberrimis; foliorum laminis oblongis vel lanceolato-oblongis, ad apices acuminatis, in basi rotundato-truncatis interdum subcordatis, 5—20 cm longis, 1,5—5 cm latis, maximam partem 8—10 cm longis, 2,5—3 cm latis, marginibus serratis, paginis ambobus atro-viridibus glaberrimis interdum pilis strictis paucis conspersis, petiolis superne gradatim brevioribus 0,5—4 cm longis elatis; verticillastris 6-floribus sat remotis interdum in paniculis dispositis; calycibus 5—7,5 mm longis extus glaberrimis rarius pilis strictis paucis conspersis dentibus glabris lanceolatis vel deltoideo-lanceolatis acutis necnon obtusiusculis rarius debiliter spinosis plerumque 2—3 mm longis; corollarum tubo 6—7,5 mm longo, intus infra medium oblique constricto-annulato, labia superiore 3,5—4 mm alta, inferiore 5,5—6,5 mm longa.

Specimens collected by Holzinger near Winona, Minnesota and by Killip (no. 6286) near Great Falls, Virginia, show an apparent intermixture with *S. hispida* chiefly in hairiness of the calyces and the more subulate calyx teeth. Specimens collected by Phelps in New York near Massena (no. 815) and near Waddington (no. 1698); by Haberer (no. 2300) in New York on Oneida Lake; by Nuedech (no. 930) at Middleboro Massachusetts; by Maxon (no. 6376) near Scotland School, Maryland; and by Bush (no. 1782) near Courtney, Missouri, suggest intermixtures with *S. ambigua* or *S. hispida* or both. These specimens are more intermediate in habit. The species ranges from Western New York and Southeastern Pennsylvania westward to Michigan and Minnesota, and southwestward through Tennessee and Alabama to Louisiana and Texas (Orange Co.). Westward it reaches to Oklahoma and Kansas.

71. *S. subcordata* Rydb. in *Torrey* 27, 88, pl. 4, 1927 per specim. in Virginiae com. Bedford in monte Peak of Otter dicto a Rydberg (no. 9264) lectum constituta est; typum in herb. horti bot. Nov. Eborac. vidi.

Herba perennis altitudine 80—100 cm, caulibus ad angulos muricatis caeterum glaberrimis gracilibus simplicibus; foliorum laminis ovatis vel ellipticis, 8—12 cm longis, 3,5—6 cm latis, in apice abrupte acuminatis, in basi rotundatis, petiolis infimis 1—2 cm longis mediis ad 3 cm longis elatis, marginibus acute serratis paginis ambobus concoloribus atro-viridibus sparse hispidulis caetero glaberrimis; verticillastris 6-floribus sat remotis; calycibus 5,5—6 mm longis extus pilis brevibus extensis sparse conspersis, dentibus anguste deltoideo-acuminatis 1,5—2 mm longis subspinosis; corollarum tubo 7,5—8 mm longo intus infra medium oblique constricto-annulato, labia superiore 4 mm alta, inferiore 6,5—7 mm longa.

An anomalous form known only from two collections (Rydberg 9264 and Palmer 93) on the Peaks of Otter.

72. *S. Riddellii* House in Bull. N. Y. State Mus. 233—234, 60, 1921 per *S. cordatam* Riddell, loc. cit., constituta est. — *S. cordata* Riddell, Suppl. Cat. Ohio Pl. 15, 1836 per specim. in Ohio a Riddell lectum constituta est; specim. verum verisimiliter typum in herb. Smithson. vidi (non *S. cordata* Gilib., Fl. Lithuan. 1781).

Herba perennis altitudine 40—80 cm et ultra, caulibus plerumque simplicibus pilis longioribus strictis extensis et brevioribus glandulosis vestitis rarius glabratis; foliorum laminis ovatis interdum enter obovatis rarius oblongis, 6—12 cm longis, 3—6 cm latis, in apice abrupte acuminatis in basi leniter cordatis, supremis rarius sessilibus infimis petiolis 1—2 cm longis mediis petiolis ad 7 cm longis saepius 2—3 cm longis elatis, marginibus crenato-

serratis, paginis ambobus pilis longioribus strictis hirsutis rarius fere glabris; verticillastris saepius 6-floribus sat approximatis; calycibus 4—6 mm longis plerumque circa 5 mm longis extus pilis brevibus extensis plus minusve glandulosis et longioribus extensis strictis vestitis, infra medium pallidioribus, dentibus deltoideis subacuminatis plerumque 1—1,5 mm longis; corollarum tubo 5,5—8,5 mm longo, maximam partem 7—8 mm longo, intus infra medium oblique annulato et leniter constricto; labia superiore 3,5—5 mm alta, inferiore 5—7 mm longa.

Frequent from Maryland and Virginia westward through West Virginia, Tennessee, Ohio and Indiana to Illinois. Passes into *S. Nuttallii*, *S. Clingmanii* and *S. salvioides*.

73. *S. salvioides* Small, Fl. S. E. U. S. 1032, 1903 per specim. in Tennessee ad White Cliff Springs a Kearney lectum constituta est; typum in herb. horti Nov. Eborac. vidi.

Herba perennis altitudine 40—60 cm caulibus subramosis gracilibus pilis brevibus subreversis et longioribus rigidis paucis vestitis; foliorum laminis oblongis vel ovato-oblongis mollibus 5 ad 15 cm longis, 3—7 cm latis, in apice leniter acuminatis in basi subcordatis, supremis subsessilibus, infimis petiolis 1—2 cm longis mediis 1—3 cm longis elatis, pagina superiore pilis strictis conspersa inferiore strictis et brevioribus vestita, marginibus crenato-serratis; verticillastris plerumque 6-floribus sat remotis spicas interruptas graciles formantibus; calycibus infra medium pallidis 4,5—6,5 mm longis saepius 4,5—5 mm longis extus pilis extensis plerumque brevibus vestitis, dentibus deltoideis acutis subspinosis 1—1,5 mm longis; corollarum tubo 6—7 mm longo intus infra medium oblique annulato, labia superiore 3,5—4 mm alta, inferiore 6—7 mm longa.

Known certainly only from Cocke Co., Tennessee and Madison Co., North Carolina. Seems hardly more than a variant of *S. Riddellii*.

74. *S. Clingmanii* Small, Fl. S. E. U. S. 1032, 1037, 1903 per specim. in Carolina septent. in monte Clingman's Dome dicto a Beardslee et Kofoid lectum constituta est; typum in herb. horti bot. Nov. Eborac., isotypos in herb. horti bot. Missour. vidi.

Herba perennis altitudine 60—80 cm et ultra caulibus gracilibus praesertim ad angulos pilis rigidis subretrorsis caeterum glabris vestitis; foliorum laminis oblongis vel ovato-oblongis 7—12 cm longis, 3—5 cm latis, in apice acuminatis, in basi rotundato-subtruncatis vel subcordatis, paginis ambobus praesertim ad venas pilis strictis subrigidis sparse conspersis, infimis petiolis 1—2 cm longis mediis 1—3 cm longis elatis; verticillastris plerumque 6-floribus sat remotis; calycibus 6—7 mm longis extus pilis longioribus et brevioribus strictis extensis vestitis, dentibus anguste deltoideo-acuminatis acutissimis 2—2,5 mm longis; corollarum tubo

7—9 mm longo intus infra medium oblique annulato, labia superiore 4,5—5 mm alta, inferiore 6—7 mm longa.

A dubious form appearing sporadically from Illinois and Indiana through Tennessee and West Virginia to Virginia and North Carolina.

75. *S. aspera* Michx., Fl. Bor. Am. 2, 5, 1803 per specim. in Carolina a Bosc (?) lectum constituta est; typum in herb. Mus. Par. vidi. — *S. hyssopifolia* var. *ambigua* Gray, Syn. Fl. 2, pt. 1, 387, 1878 per specim. in Missouri verisimiliter prope St. Louis a Engelmann lectum constituta est; typum in herb. Gray. vidi. — *S. ambigua* Britt. in Mem. Torr. Bot. Cl. 5, 288, 1894 per *S. hyssopifoliam* var. *ambiguam* Gray, loc. cit., constituta est (non *S. ambigua* Smith, Engl. Bot. 1810). — *S. lythroides* Small, Fl. S. E. U. S. 1031, 1903 per specim. in Florida prope Tallahassee a Berg lectum constituta est; typum in herb. horti bot. Nov. Eborac. vidi. — *S. Grayana* House in N. Y. State Mus. Bull. 233—234, 60, 1921 per *S. hyssopifoliam* var. *ambiguam* Gray, loc. cit., constituta est.

Herbae perennes 30—80 cm altae caulibus plerumque diffuse ramosis interdum glabris saepius pilis retrorsis praesertim ad angulos sparse conspersis caeterum glabris; foliorum laminis sessilibus plerumque 4—6 cm longis, 1—82 mm latis, oblongis vel elliptico-oblongis in apice obtusis vel acutis, in basi saepius angustatis rarius subtruncatis, marginibus serrulatis rarius subintegris, paginis ambobus glabris; verticillastris 6-floribus inter se sat distantibus; calycibus 6—7 mm longis extus pilis perpaucis ad venas posterioribus conspersis caetero glaberrimis, dentibus deltoideo-lanceolatis acutis vix tamen spinosis posticis quam tubus longioribus; corollarum tubo 6—7 mm longo, intus infra medium oblique constricto-annulato, labia superiore 4—5 mm alta, inferiore 5,5—6,5 mm longa.

Found locally in Iowa, Illinois, Missouri, Tennessee, Kentucky, Pennsylvania, South Carolina, Georgia and Northern Florida.

76. *S. hyssopifolia* Michx., Fl. Bor. Am. 2, 4, 1803 per specim. in „Carolina“ a Michaux lectum constituta est; typum in herb. Mus. Par. vidi. — *S. atlantica* Britton, Man. Fl. N. U. S. 792, 1901, per specim. in Long Island prope Southhampton a Clute (no. 277) lectum constituta est; typum in herb. horti bot. Nov. Eborac. vidi.

Herba perennis altitudine 30—50 cm, caulibus gracilibus rarius pilis retrorsis sparsissime armatis caeterum glaberrimis; foliorum laminis subsessilibus maximam partem linearibus 3—6 cm, longis, 3—6 mm latis integris rarius subserrulatis glaberrimis in apice obtusiusculis, verticillastris paucis 6-floribus sat remotis; calycibus 6—7 mm longis extus pilis perpaucis ad venas posterioribus conspersis caetero glaberrimis dentibus deltoideo-lanceolatis acutis vix spinosis posticis tribus paulo

longioribus; corollarum tubo 6—7 mm longo, intus infra medium oblique constricto-annulato, labia superiore 4—5 mm alta, interiore 5,5—6,5 mm longa.

The species tends to form slender tubers comparable to those of *S. floridana* but less developed. *S. atlantica* is a broad leaved form; it has little else to distinguish it.

S. hyssopifolia is readily recognized for the most part by its linear or narrowly oblong leaves and glabrous habit. It ranges from Eastern Massachusetts along the coast to New Jersey and Delaware, thence inland to eastern Pennsylvania. It occurs also in the Appalachian system in northern Virginia and in western North Carolina. It occurs in north central South Carolina. Further exploration of the Southern States may bring to light a more continuous distribution.

S. atlantica seems no more than a lax form with somewhat broader leaves.

77. *S. floridana* Shuttleworth ex Benth. in DC. Prodr. 12, 478, 1848 per specim. in Florida a Rugel (no. 176) lectum constituta est; isotypos in herb. hortorum bot. Nov. Eborac. et Missouri., Mus. Brit., Smithson. et Field. vidi.

Herba perennis rhizocarpica et tuberes esculentos moniliformes 2—5 cm longas efficiens; caulibus erectis plerumque simplicibus altitudine 3—60 cm, in basi pilis extenso-reflexis longioribus strictis saepius ornatis rarius omnino glabris superne pilis brevissimis extensis interdum glandulosis vestitis internodiis mediis elongatis; foliorum laminis oblongis vel ovato-oblongis plerumque 2,5—5 cm longis, 12—22 mm latis, in apice obtusis in basi nunc truncatis nunc subcordatis, petiolis 1—2 cm longis elatis supremis sessilibus, marginibus crenato-serratis, paginis ambobus nunc glabris nunc pilis brevissimis sparse conspersis; glomerulis maximam partem 6-floribus sat remotis; calycibus 5 ad 6,5 mm longis extus pilis brevissimis extensis vestitis, dentibus deltoideo-lanceolatis acutissimis leniter spinosis; corollarum tubo 5,5—7 mm longo intus infra medium annulo obliquo ornato et antice leniter constricto-saccato, labia superiore 4,5—5 mm alta, inferiore 5,5—7 mm longa.

Florida: Leon, Madison, Columbia, Duval, Clay, Alachua, Putnam, Levy, Marion, Lake, Hernando, Pasco, Pinellas, Lee.

Species mihi ignotae.

- S. araucana* Phil. in Anal. Univ. Chili **90**, 563, 1895.
S. brevidens Phil. in Anal. Univ. Chili **90**, 558, 1895.
S. brevidens Rydb. in Brittonia **1**, 95, 1931 (non Philippi 1895).
S. crenata Rafin., Fl. Ludov. 42, 1817.
S. hirsuta Kunth, in Humboldt et Bonpland, Voy., Nov. Gen. et Sp. Pl. **2**, 308, 1817. Typus verisimiliter perditus est.
S. longifolia Rafin. in Am. Monthly Mag. 356, 1818.
S. Mayorii Briq. in Mem. Soc. Neuchâtel. Sc. Nat. **5**, 402, 1913.
S. revoluta Rafin. in Atl. Journ. 148.
S. rotundifolia Moc. et Sesse ex Benth., Lab. Gen. et Sp. 548, 1834. Typus verisimiliter perditus est.
S. sessiliflora Raf. in Atl. Journ. 148.
S. Volkmani Phil. in Anal. Univ. Chili 519, 1873.

Index Nominum.

- acuminata* Greene
agraria Cham. et Schlecht.
 — var. *glabrior* Benth.
ajugoides Benth.
 — var. *stricta* Jeps.
 — var. *velutina* Jeps.
albens Gray
 — var. *jubiensis* Jeps.
albicaulis Lindl.
ambigua Britton
ambigua Sm.
ampla Rydb.
andina Phil.
annua L.
aperta Epl.
araucana Phil.
arenicola Britton
aristata Greenm.
arvensis L.
 — var. *bermudiana* Millsp.
aspera Michx.
asperrima Rydb.
atlantica Britton

biflora H. et A.
Bigelovii Gray
bogotensis Kunth
boliviana Briq.
boraginoides C. et S.
 — var. *glandulosa* Greenm.
borealis Rydb.
bracteata Greene
brevidens Phil.
 — Rydb.
Bridgesii Benth.
bullata Benth.
bullata Auct.

californica Benth.
camporum Jones
candidissima Phil.
cardinalis Kunze
caurina Piper
Chamissonis Benth.
chonotica Hook.
ciliata Dougl.
 — var. *pubens* Gray
 — subsp. *macrantha* Piper
cincinnatensis Kuntze
Clingmanii Small
Closi Phil.
coccinea Jacq.
collina Brandeg.
confertiflora Piper
confusa Briq.
Cooleyae Heller
cordata Riddell
costaricensis Briq.
crenata Phil.
 — Rafin.

debilis Kunth
Drummondii Benth.
dubia Briq.

elliptica Kunth
 — var. *pusilla* Wedd.
elliptica Phil.
Emersoni Piper
eremicola Epl.
eriantha Benth.
eriophylla Briq.
excelsa M. et G.
exilis Epl.

Fendleri Briq.
flaccida Eastw.
flaccida Fern.
floridana Shuttlew.

Galanderi Briq.
Galeottii Mart.
Gilliesii Benth.
glabra Riddell
glabrata Phil.
globosa Epl.
gracilentata Heller
Grahami Benth.
grandidentata Lindl.
Grayana House
guatemalensis Epl.

hamata Epl.
hebens Epl.
Herrerae Epl.
hians Briq.
hirsuta Kunth
hispida Pursh
homotricha Rydb.
hyssopifolia Michx.
 — var. *ambigua* Gray

inclusa Epl.
ingrata Greene

Keerlii Benth.

lamioides Benth.
 — var. *aristulata* Epl.

lanata Jacq.
lanuginosa Greene
latidens Small
latipes Greenm.
Leibergii Rydb.
Lindenii Benth.

— var. *aristulata* Epl.
litoralis Phil.
littoralis Greene
longifolia Rafin.

Lorentzii Briq.
lythroides Small

Macraei Benth.
malacophylla Greene
mandoniana Briq.
Mayorii Briq.
mexicana Benth.
Meyeni Walp.
Meyeni Phil.
melchiana Briq.
micrantha Griseb.

nepetifolia Desf.
nepetaefolia Cav.
nubilorum Epl.
Nuttallii Shuttlew.
 — var. *leptostachya* Benth.
 — var. *occidentalis* Benth.

oaxacana Fern.
ochroleuca Phil.

palustris L.
 — var. *arenicola* Farw.
 — *homotricha* Fern.
 — *puberula* Jennings
 — subsp. *pilosa* Epl.

pannosa Phil.
parvifolia M. et G.
peruviana Domb.
petiolosa Briq.
philippiana Vatke
pilosa Nutt.
pilosissima M. et G.
Pittieri Briq.
polysegia Briq.
Prattenii Darand
Pringlei Greenm.
pubens Heller
puberula Rydb.
pusilla Briq.
pustulosa Rydb.

pycnantha Benth.
pycnostachya Torr.

quercetorum Heller

radicans Epl.

ramosa Heller

repens M. et G.

revoluta Rafin.

Riddellii House

Riederi Cham.

rigida Nutt.

— subsp. **typica** Epl.

— subsp. **quercetorum** Epl.

— subsp. **rivularis** Epl.

rivularis Heller

Rothrockii Gray

rotundifolia Moc. et Sesse

rupestris Phil.

salvioides Small

Schweinitzii Rydb.

scopulorum Greene

sericea Cav.

serrata Clos

sessiliflora Rafin.

sideritidoides Benth.

Sprucei Briq.

striata Greene

stricta Greene

subcordata Rydb.

tenerrima Epl.

tenuifolia Willd.

— var. *aspera* Fern.

teucrifolia Rydb.

teucriformis Rydb.

Toronjilcillo Phil.

truncata Kunze

tucumanensis Briq.

umbrosa Scheele

velutina Greene

— Schw.

venezuelana Briq.

venulosa Greene

veronicaefolia Davy

vestita Howell

viarum Heller

Volkmanni Phil.

vulcanica Epl.

Ebenfalls von C. Epling erscheint demnächst als Beiheft LXXXII eine größere Arbeit über die Labiaten von Süd-Amerika. Beiheft LXXXIX von C. Regel über die pflanzengeographischen Verhältnisse der Halbinsel Kola befindet sich in Vorbereitung.

F. Fedde.

Repertorium specierum novarum regni vegetabilis¹⁾.

Herausgegeben von Prof. Dr. Friedrich Fedde.

Beiheft 1:	R. Schlechter, Die Orchideen von Deutsch-Neu-Guinea	40	RM.
Beiheft 2:	A. Schindler, Das Genus <i>Pseudarthria</i> W. et A.	1,50	„
Beiheft 3:	K. Dinter, Botanische Reisen in Deutsch-Südwestafrika	10	„
Beiheft 4:	R. Schlechter, Orchideologiae Sino-japonicae Prodrromus	20	„
Beiheft 5:	I. Urban, Clavis Plumeriana	20	„
Beiheft 6:	R. Schlechter, Orchideenflora von Venezuela	7,50	„
Beiheft 7:	R. Schlechter, Orchideenflora von Colombien	20	„
Beiheft 8:	R. Schlechter, Orchideenflora von Ecuador	10	„
Beiheft 9:	R. Schlechter, Orchideenflora von Peru	15	„
Beiheft 10:	R. Schlechter, Orchideenflora von Bolivia	5	„
Beiheft 11:	K. Lewin, Systematische Gliederung und geographische Verbreitung der <i>Arctotideae-Arctotidineae</i>	5	„
Beiheft 12:	W. Limpricht, Botanische Reisen in den Hochgebirgen Chinas und Ost-Tibets (mit zahlreichen Karten und Abbildungen)	10	„
Beiheft 13:	R. Görz, Über norddeutsche Weiden. Versuch einer kritischen Betrachtung ihrer Artreinheit und Formenkreise auf Grundlage der Weiden Brandenburgs	10	„
Beiheft 14:	K. A. Ugrinsky, Die Gesamtart <i>Iris flavissima</i>	5	„
Beiheft 15:	J. Matfeld, Geographisch-genetische Untersuchungen über die Gattung <i>Minuartia</i> (L.) Hiern.	20	„
Beiheft 16:	Bitter, <i>Solana africana</i>	28	„
Beiheft 17:	R. Schlechter, <i>Orchidaceae</i> panamenses	8	„
Beiheft 18:	Neitsch, Ranken der <i>Cucurbitaceae</i>	8	„
Beiheft 19:	R. Schlechter, Additamenta ad Orchideologiam Costari-censem	25	„
Beiheft 20:	F. J. Widder, Die Arten der Gattung <i>Xanthium</i>	20	„
Beiheft 21:	Figurenatlas zu Beiheft 1	140	„
Beiheft 22:	K. Meyer, Kulturgeschichtliche und systematische Bei-träge zur Gattung <i>Prunus</i>	7,50	„
Beiheft 23:	K. Dinter, Succulentenforschungen in Südwestafrika. I	6,25	„
Beiheft 24:	L. Lämmermayr, Die Entwicklung der Buchenassoziation	10	„
Beiheft 25:	M. Gellert, Anatomische Studien über den Bau der Orchideenblüte	10	„
Beiheft 26:	Beiträge zur Systematik und Pflanzengeographie. I.	7,50	„
Beiheft 27:	R. Schlechter, Beiträge zur Orchideenkunde von Colombia	15	„
Beiheft 28:	H. G. Mäkel, Zur Kenntnis der späteren Entwick-lungsstadien der Prothallien von <i>Equisetum arvense</i>	8	„
Beiheft 29:	F. Buxbaum, Vergleichende Anatomie der <i>Melanthoideae</i>	10	„
Beiheft 30:	A. Hayek, Prodrromus Florae peninsulae Balcanicae. I. Bd.	115	„
Beiheft 31:	O. v. Linstow, Die natürliche Anreicherung von Metall-salzen und anderen anorganischen Verbindungen in den Pflanzen	15	„
Beiheft 32:	R. Pohle, <i>Drabae asiaticae</i>	20	„
Beiheft 33:	R. Schlechter, <i>Orchidaceae</i> Perrierianae	40	„
Beiheft 34:	Fr. Kränzlin, Monographie von <i>Masdevallia</i>	24	„
Beiheft 35:	R. Schlechter, Die Orchideenflora von Rio Grande do Sul	14	„

¹⁾ Beiheft 1—12 sind im Preise meist um über 50 % herabgesetzt.

Beiheft 36:	Beiträge zur Systematik und Pflanzengeographie. II .	16 RM.
36 a:	H. Melchior, Die phylogenetische Entwicklung der Violaceen	2,50 „
Beiheft 37:	W. W. Alechin, Was ist eine Pflanzengesellschaft? Übersetzt von S. Ruoff	5 „
Beiheft 38:	F. O. Koch und Mildbräd, Die Banane	6 „
Beiheft 39:	Fr. Kränzlin, Monographie von <i>Polystachya</i>	14 „
Beiheft 40:	Peter, Flora von Deutsch-Ostafrika (im Druck) 1.—3. Lieferung	60 „
Beiheft 41:	Beiträge zur Systematik und Pflanzengeographie. III .	10 „
41 a:	J. Reimers, Die wichtigsten Fortschritte der pflanzengeographischen Forschung in den letzten Jahren	2 „
Beiheft 42:	F. Petrak und H. Sydow, Die Gattungen der Pyrenomyceten, Sphaeropsiden und Melanconieen	60 „
Beiheft 43:	R. Knuth, Primitiae Flora Venezoelensis	75 „
Beiheft 44:	E. Kaiser, Die Pflanzenwelt des hennebergisch-fränkischen Mäschelkalkgebietes	30 „
Beiheft 45:	F. Markgraf, An den Grenzen des Mittelmeergebiets. Pflanzengeographie von Mittelalbanien	25 „
Beiheft 46:	Beiträge zur Systematik und Pflanzengeographie. IV .	15 „
Beiheft 47:	W. W. Alechin, Überschwemmungswiesen	10 „
Beiheft 48:	P. Gorschboth, Die Hesperidine in den Achänen der Compositen	6 „
Beiheft 49:	A. K. Schindler, Die Desmodinen in der botanischen Literatur bis Linné	35 „
Beiheft 50:	H. Römpf, <i>Veronica</i>	20 „
Beiheft 51:	Beiträge zur Systematik und Pflanzengeographie. V . .	16 „
Beiheft 52:	R. Görz, <i>Salix silesiaca</i> und ihre Hybriden	20 „
Beiheft 53:	K. Dinter, Succulentenforschungen in Südwest-Afrika .	6 „
Beiheft 54:	Fr. Kränzlin, Beiträge zur Kenntnis der Familie der <i>Myoporinae</i>	15 „
Beiheft 55:	A. Eig, Monographisch-kritische Übersicht der Gattung <i>Aegilops</i>	25 „
Beiheft 56:	Beiträge zur Systematik und Pflanzengeographie. VI	30 „
56 a:	O. Warburg, Heimat und Geschichte der Lilie	2,50 „
56 b:	L. Flaksberger, Über künstliche und natürliche Klassifikation des Weizens	1 „
Beiheft 57:	R. Schlechter (†), Figurenatlas zu den Orchideenfloren der südamerikanischen Kordillerenstaaten (Beiheft VI—X)	60 „
Beiheft 58:	R. Schlechter (†), Blütenanalysen neuer Orchideen. I. Südamerikanische Orchideen	25 „
Beiheft 59:	R. Schlechter (†), Blütenanalysen neuer Orchideen. II. Mittelamerikanische Orchideen	40 „
Beiheft 60:	K. Schuster, <i>Orchidacearum Iconum Index</i> . 1—5	37,50 „
Beiheft 61:	Beiträge zur Systematik und Pflanzengeographie. VII	22,50 „
Beiheft 62:	Beiträge zur Systematik und Pflanzengeographie. VIII	25 „
62 a:	E. Kaiser, Die mitteldeutsche Steppenheide	1,50 „
Beiheft 63:	A. Eig, Les éléments et les groupes phytogéographiques auxiliaires dans la Flora palestinienne. (2 Bände) . .	60 „
Beiheft 64:	Herta Gross-Camerer, Arealmäßige und ökologische Beziehungen verschiedener Waldpflanzen zur Formation des Rotbuchenwaldes. Mit 17 Verbreitungskarten	25 „
Beiheft 65:	Fr. Kränzlin, Die Orchideen Sibiriens	15 „
Beiheft 66:	Beiträge zur Systematik und Pflanzengeographie. IX .	35 „
66 a:	Fr. Jonas, Die Vegetation der Emsländischen Heidekölke	2 „
66 b:	K. Wein, Die Geschichte der Einführung und ältesten Einbürgerung von <i>Datura Stramonium</i>	2,50 „
66 c:	H. Sbidussi, Aus den Karawanken	4 „
66 d:	J. Preuß, Gedanken zur Entwicklungsgeschichte der Flora des nordwestdeutschen Flachlandes seit seiner letzten Eisbedeckung	2 „
66 e:	F. J. Meyer, Blatt- und Wurzelbewerb im Sommerwald und Nadelwald	4 „

Beiheft 67: K. Schulz-Korth, Flechtenflora der Provinz Brandenburg	35 RM.
Beiheft 68: R. Schlechter (†), Blütenanalysen neuer Orchideen. III. Afrikanische und madagassische Orchideen (2 Hefte) . . .	20 „
Beiheft 69: G. Lettau, Fragmente zu einer Bearbeitung des Flechtenreiches. 1. Lief.	15 „
Beiheft 70: Cufodontis, Krit. Revision von <i>Senecio</i> § <i>Tephroseis</i> . 1 u. 2	20 „
Beiheft 71: Beiträge zur Systematik und Pflanzengeographie. X	40 „
71a: F. Morton, Pflanzensozial. Untersuchungen im Gebiete des Dachsteinmassivs	2 „
71b: Fr. Jonas, Der Hammrich	5 „
71c: R. Scheuermann, Die einheimischen Gewächse der Güterbahnhöfe des rhein.-westf. Industriegebietes	2 „
71d: K. Wein, Beiträge zur Geschichte der Floristik des 17. Jahrhunderts	4 „
71e: Fr. Jonas, Grenzhorizont und Vorlaufstorf. (Mit Tafeln)	2 „
71f: Fr. Fedde, Über die Ursache des Rückganges der System. Botanik und der pflanzengeograph. Forschung in Deutschland I—III	2 „
Beiheft 72: F. Bolle, Eine Übersicht über die Gattung <i>Geum</i>	12 „
Beiheft 73: J. Eggler, Die Pflanzengesellschaften der Umgebung von Graz. (Mit zahlreichen Karten)	50
Beiheft 74: R. Schlechter (†), Indische und malesische Orchideen	20 „
Beiheft 75: H. Pfalzgraf, Die Vegetation des Meißners und seine Waldgeschichte. (Mit 4 Bildtafeln)	15 „
Beiheft 76: Beiträge zur Systematik und Pflanzengeographie. XI.	30 „
Beiheft 77: H. Sleumer, Die Pflanzenwelt des Kaiserstuhls. Mit 20 Abb.	20 „
Beiheft 78: Fr. Jonas, Die Entwicklung der Hochmoore am Nordhümmling. II	20 „
Beiheft 79: L. Regel, Die Halbinsel Kola In Vorbereitung	
Beiheft 80: C. Epling, Preliminary Revision of American <i>Stachys</i>	10 RM.
Beiheft 82: C. Epling, <i>Labiatae</i> austro-americanae	Im Druck
Sonderbeiheft A: G. Keller und R. Schlechter, Monographie und Iconographie der Orchideen Europas u. des Mittelmeergebietes.	
I. Band: Monographie der Gattungen und Arten	120 RM.
II. Band (mit R. v. Soó): Kritische Monogr., enth. die Beschreibung der Arten, Unterarten usw. 1—7	70 „
III. Band: Krit. Monogr., enth. photogr. Bilder der Arten, Unterarten usw. 1—22	220 „
Sonderbeiheft B: L. Löske, Die Laubmoose Europas. II. <i>Funariaceae</i> .	20 „
Sonderbeiheft C: E. Werdermann, Blühende Sukkulenten. 1—21	105 „

Der Vorbestellpreis ist beim direkten Bezuge vom Verleger 1,20 RM. der Bogen nach Erscheinen wird er auf 1,50 RM. erhöht.

Neu erschienen: V. J. Grumann: Die Flechtenflora der Insel Rügen 4 RM.



Biblioteka
W. S. P.
w Gdańsku

0451

C-II-1798

729/20 PC.