## Jungemamia, IT Sp

Autoicous, Male bracts some distance below perianth. Leaves, siaall below, . 35 mm , enl arging gradually above till practs are reacheh. -bracts, 8 wide and .sian bread,
All broadly ovate, broadest at or below the midalergradnally couing to an obtuse or obtusely pointed apex. Concave.
Insertion, transyerse, me distinctly narrover at point of insertion. Cells, thin walled, but with minute trigones. above averaging 10u, irregular (varying betweon 13 and 23u) gradually but slorly onlarging towards base of leaf in centre, where averaging 18 by $30 u$, but on the outside of leaves at Dase, very little larger than apleal cells. surface verruculose. Rhizoids, munerous on steris and innovations.
Perianth usually lateral by imovations, fron hovizontal to suberect, but
 below to a point about $2 / 3$ of leñgth, where graduaily contraeting to a small mouth, which is. 2 wide, and with numerous erenulations clowfed, Short to 2 cells long. Upper part of perianth plicate. The male bracts more concave than the leaves, shallow basin shaped.

Jungermannia, N Sp
Hatoieous, lale bracts some distance below perianth. Leaves, small below, . 35 mm , enl arging gradually above till bracts are reach -Bracts, .8 wide and .8wan bread.
All broadly ovate, broadest at or below the middle, gradually coning to an obtuse or obtusely pointed apex. Concave.
Insertion, transverse, $\# \theta$ distinctly narrower at point of insertion. Cells, thin walled, but with minute trigones. above averaging 19u,irregula (varying between 13 and $23 u$ ) gradually but slowly enlarging towards base on leaf in centre, where averaging 18 by 30 , but on the outside of leaves at base, vory littie larger than apical cells. Surface verruculose. Phizoids, mumerous on stems and innovations.
Periantli usually lateral by imovations, from horizontal to suberect, but
 below to a point about $2 / 3$ of leñ th, where gradually contracting to a small mouth, which is . 2m wide, and with numerous crenulations crovded, short to 2 cells long. Upper part of perianth plicate. The male bracts more concave than the leaves, shallow basin shaped.

Nhagermancia it sp Noy
 antoicoin, anthriutin braotsi amie iivtle rdistance belo jerimuth. thants shall, tusually undop 1 en 2 ong. beaves frequently srbsecund (refer to Hacvicans miate or $J$ ebrovipens, ex. 1 )but sotetimes hiplanteate.
Learos broadiy ovate, clasping atom, attachat much as in misg it ond 2 under J sphampocarya, by Hacvicar, comanye, mam 71 y Jaregest just helew pexienths, Whero up 01 , twa long avil 1.05 broad, simaller below. Attachus obli que, hrarroved

 in tze, somewhat thick 解iled, with small trigones. Cradually 2 argor belav, at b so $\frac{1.12}{}$ centre up to $30 \times 18 \mathrm{~m}$.but at margins distinetly shalica and wore isoddanetric. Sunface verpneulose.
 Wille it or avout cenire, whileh is strollen to ventricose. llouth . ? iug wide deoply plieato, wi th zumorons long celldd cromulations, 1-2 cells high, lase
. a min. Mideotas munderous on stems
Type, (angyon CrGelc, fionte Yista Dam, placor Co, Califormia, Jul 11, 1903, Col if A Hacknalen. Tn Herb Hachactien

Jungernamila * 62 dov
Plants pleurocarpous through mumerous innovations beyond fenale 2 . autoieous, austheidial bracts sone litcio distance below perianth. Plants shall, usuaily under 1 m longoleaves froquently sulusecmad (yofer to HacVicars plate of $J$ atrovipens, ifs 1 lunt sometimes iniplanteate.
 J sphaeroearpa, by Hacvicar, concave, wamally lajgest just belov perlonths,



 at buse ix centre up to $30 \times 18$ u.but at margins distimetiy sualien and wore isodiauletrig. Suriace vorruculose.
perianths eblique by contimuance of imnovations; $1.30 \mathrm{rs3}$ Jong, by 48 rma wide ath ore alvout centre, which is swollen to ventricose. Ilouth . 2 mate wide deeply plicato,with mumoros long cellda crenmlations, $1-2$ ee31s high, base

- 3 ran. Nhizoids numorous on stems



Jungermannia N Sp.
Plants autoicous,branched, usvally uncler \& cn long
minute.
Leaves smallest below, onlarging upmards. 155 mallest .35 mm long, usually broader than long, broadly ovate, broadest at or below the middle. hradually coming to an obtuse apex. Concave. somewhat obliquely inserted below, but nearly transverse near the perianth, as are also the male bracts. Usually the leaves are subsecund above, rach as in racticar's plate of $J$ atrovirens. The leaves clasping stem, but not at all decurrent. Cells irregular above averaging 19 u , varying from 13 to $23 u$. somevhat thick walled from contents clinging to walls. linute trigones present. Basal cells in middle up to 18 by 30 u , but not much larger than apical at margins. Surface verruculose
Remintion Rhizoids numerous on stems and innovations, colourless. Perianth usually lateral by innovations, from horizontal to suberect,
base ventricose abbve, 1.2 mm long by .75 mm wide. Broadest at or below middle, plicate from there above, gradually contracted to a narrow mouth . 2 man wide, the mouth with numerous erenulations, short, to 2 cells long. Hale bracts some distance below perianths, deeply concave, and transversely inserted. sracts below perianth up to 1.1 m long by 1.05 mm wide, Perianth at base . 3 mm wide.
Stem in section with outer row of cells, rather thick walled, $25 \times 30 \mathrm{~mm}$, internal cells thin walled, abruptly ilifering from outer row. Averaging 15 m wide.
nearly hyaline oater cell type, Canyon Ureek, Monte Vista Dam, placer co, Calistinctiy verrucpse 1933 Coll F A HacFadden, in herb macradden.
The continuous imovations give the plant a pleurocarpous character, and the perianths are sometimes curved.
the irregular cells are very similar to those of $\int$ atrovirens, to which the plant seems closest in relationship, but that plant is diocous, while perianth is ovete to oblong-ovate, but is variable in shape;it hovever does not apgear to have any tencency to approach tho shortld-attenuate pointedor the above. The stem is section shows smallerncents, and while the outer are nearly as large as thash of above, the inner are distibctly 1 arger, averaging 20min, and notnamked off from the outer row. The perianth of $J$ punila momes approach to that of above, but is more longly dttenuate, and less markedly crenulate at mouth, also it is nearly always terminal in appearance, and shows no sign of being ventrimose above, being rather fusifform. The leaves are larger, and while the cal cells are not marledly larger, they are less irregular, more noticeably thin walled, and below they are distinctly larger, mostly sone 50 u long, or even longer. The marginal row is rather distinctly marked off.
The cells In stem section thoof pumila show but little tendency to difier, and though the outer are larger, $25 \pm 30$, the immer are also larger than above, some 17u,gradmally mixing with outer row, not disticntly marked off. They are also distinctly firm walled
$J$ schiffneri has a different perianth, the male bracts are directly below the perianth, the leaves are distinctly different on the infertile branches from the broader than long leaves of the fertile stems. It has to be remenbe red however that othe $r$ of the valifornian Jungemannia are variable, thus $J$ Schiffneri fron there has larger cells than usual, and a longer perianth, though variable perianth if also noticeable from material collected in is $C$ and Alberta. Theno dpumila had not the longlyattenuated perianth usually found on luropean material. J Bolanderi is distinctly different, and the large decurrent leaves with "upper leaf cells 25-40u, and basal 45-96, will easily mark off from above. $J$ Danicola is described ss perianth obovoid, exserted,irregularly plicate towards the abruptly contracted, at first crenulate-denticulate nouth. The c画ll size given is larger also, 24-50u.

 of the above

A plant from valfimia, coll $\mathbb{H}$ C suteliffe, vet 1927, Plate Flat, siema Co, is so near the usual material of $d$ atrovirens, that it appears to fit well enough there to be quoted as an addition for valifomia. Thatnar at first sight similar to above, but the fow porianths found, though immature, or else imperfect, are distinctly dirferent, also the stem section is similar to that of Iuropean $\mathcal{F}$ atrovirens, and the plant seems diocous. Hale plants found with no anthequdia archegonia, and perinth bearing plants showing no sign of inthoridial bracts.

# Jungexmamnia is Sp . <br> Plants autoicots, bronched, ustaily unter of en leng 

## winute.

 2aroailor than lomgg browly ovateg bayoudest at or below the widule. urath ually couing to an obtuse apez. Concave. sonowhat obliquely inserted below, but mearly trasisverse near the perianthgas are al so the malle bracts. Usually the loaves axe subsectund above, iacuta as in maevicar's plate of 3 atrovirons. Tho leaves claspiag stongiat not at all decurront. Colls irpegular above averagiag 19u, varying fron 13 to 2Bu. sompowat thick wailed irom contents oliaging to walls. Minuto trigonos prosont. Basal colls in midulio uy to 18 by sougbut not milteh larger thour apteal at muxgins. Surface verwuculose.
Hemianalhs Thizoids mumerotts on stoms and innovations, colotaloss. Perianth usualiy lateral by inmovations, fron hosfizontal to subereec, ventricose abbve, 1.2 an long by .77 mby thide. Droadest at or belou lidille, plicate from there above, gradually contaracterl to a marrow mouth . 2ymp wide, the mouth with munerous \$romulations, short, to 3 eells long
sale bracts some distance below portankisgieeply comeavegand ir amsvor-
 perianth at base odua wide.
Ston 131 section with outor row of cells, Fathor thilek walled, 26 又 20 ma, intormal cells thin wallea, abruptly dilforimg Cron onter row. Avoraging 1Gua vide. Mearly hyaline Wails distinetly vermease Type, Canyon ureck, Monte Vista Heungrlucer Co, Galifermia stme 11 th 1903 Coll if A Haciradien, in heris maciadulo. The contlimous immovations givo the plami a pleurocazpous ehometor, and the porianths are sonetines curved.
He irrogular colls are very sincilas to those of a atrovirons, to which the plant seens closest in polationship, inut that plant is diocous, with perianth is ovete to oblong-ovate, iuht is vaxiaible in shape, it hotrovor doos not appear to hatre any tentoncy to appoach the shovily-atbentiate polint of the above. Ihe stem is section shows srmalior celis, and while the outor are doarily as large as those of above, the inner are thistil etty 2 argor, avoruging zown, and not murkod ors Irout the outor row. The portanth of a pusila has sone approach to that of ahove, but is nore Iongly attenuate, anal less mawhedly cromulate at nouth, alise it is mearly alvays ternamal in appearvance, and shows no sign of being ventrecose above, being rather fusillosza the leaves are lasgergand while the pateal cells aro not mixicedly largorg they are less irregular, zaore noticeably thin wallod, and bolow they we distinctly largergmosty sone sou longoor even longer. the marginal row is mathor uistinctiy muiced off. In stera section tho o punila show but $11 t \mathrm{tle}$ tendency to atifor, and though the outer are 1argor, $x$ 30, the limbe are also lar or than above, sonio $17 u_{2}$ gractialiy mixing with onter row, not disticntly namked orf. They are also distinctly Plim walled.
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 \& occaoconally beyond ' stem cello $25+30$, iner, $6-17$, furn to thich walled glarth-gren almost as muchncorvured as outeri vather vapidily enlaiging Seaves largh thas neor or oval not as buach as lang frivinth longer i namuae, to 2 nm $x \cdot 75$. qradually taferig above Is a month 1 mm . The cets variatealure. Sosnolimes parly equal somelimes unequal. with a rather well defined maryinal ren.
Arsísicty larger baoal dllo langer leaves mere val sten shüchere alor
 sdeningly leimaiel, on all examened
F ahorvins , Pearson fones Guen. the cell structure drffers but little in sise or vregulaity from the new one either broal hi afical the leaves may be as thfad in frofrolion. The hem lao divide 25 ty ino iole, $v$, of no mained differente, the flome deems ducevers. There is consideratle variation in leaf sise o arditho no difierences can be laid dour as while nonallyonal they thay be on cecatums wedeh khan latl of white small betor, gradidity becume langer abre. The baves seem dercudedily. mare othine belviv itarin ihe new. Plont seems devevers what seems hive beiminat male hacts on ancherid beviy found
 Towhicnici vavidle, bhow no sign of heing einluicsos in slem swiclule whe 192 , whedi had cells net maikedh larqu the bes luith no Sign of male lsacto. bells mwand fones firmen $t$ is berng. dicicus 9 stape variable. unmatiere is vermatire freventho all erect. one with lobed month, umsinature seems crenulate 4 one so long as almest it anggest Arue filant.
8986. The cill shuchue ranule trie anar omgeor ahimins. The velle an
 gremone, neall ture green whe the sumile tiggoses: She roblem
 Semo sumedhat olhigine beluer neenty hamoreve alwe of eabecunds
 higmes nual nove. Allo of sten wosithanchic ale no greesn.

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