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## A SYNOPSIS OF THE SOUTH AMERICAN *LEPIDIUM* (BRASSICACEAE)

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**Abstract.** Al-Shehbaz, I. A. 2010. A synopsis of the South American *Lepidium* (Brassicaceae). *Darwiniana* 48(2): 141-167.

Fifty native and 12 naturalized species of *Lepidium* grow in South America, and a key to all 62 species is presented. Three new species from Argentina (*L. hickenii*, *L. pedersenii*, and *L. santacruzensis*) and two from Peru (*L. cuzcoensis* and *L. werffii*) are described, illustrated, and their relationships to nearest relatives are discussed. The new combination *Lepidium crassius* is proposed. Furthermore, 19 taxa (*Coronopus didymus* var. *macrocarpus*, *C. didymus* var. *procumbens*, *L. abrotanifolium* var. *steinmannii*, *L. affine*, *L. argentinum*, *L. auriculatum*, *L. bonariense* var. *pseudovirginicum*, *L. calycinum* var. *integrifolium*, *L. costaricense*, *L. cumingianum* var. *orbiculatum*, *L. cumingianum* subsp. *berteroanum*, *L. depressum*, *L. myrianthum*, *L. neglectum*, *L. parodii*, *L. pubescens* var. *fallax*, *L. subvaginatum*, *L. virginicum* subsp. *centrali-americanum*, *Thlaspi campestre*) are lectotypified and 17 others (*Coronopus leptocarpus*, *C. leptocarpus* var. *microcarpus*, *L. boelckii*, *L. bonariense* var. *gayi*, *L. bonariense* var. *pseudovirginicum*, *L. brevicaule*, *L. calycinum*, *L. danielsii*, *L. demissum*, *L. kalenbornii*, *L. morrisonii*, *L. peruvianum*, *L. philippianum* var. *boliviense*, *L. raimondii*, *L. scabrifructum*, *L. spicatum* var. *caylx-persistente*, *L. subvaginatum*) are reduced to synonymy. *L. depressum* and *L. rahmeri* are new records for Argentina.

**Keywords.** Brassicaceae, *Lepidium*, South America, taxonomy.

**Resumen.** Al-Shehbaz, I. A. 2010. Sinopsis de las especies sudamericanas de *Lepidium* (Brassicaceae). *Darwiniana* 48(2): 141-167.

Cincuenta especies nativas y 12 naturalizadas de *Lepidium* crecen en América del Sur, se presenta una clave para las 62 especies. Se describen e ilustran tres nuevas especies de Argentina (*L. hickenii*, *L. pedersenii* y *L. santacruzensis*) y dos para Perú (*L. cuzcoensis* y *L. werffii*), y se discuten sus relaciones con sus especies más afines. Se propone *Lepidium crassius* comb. nov., se designa lectotipo para 19 binomios (*Coronopus didymus* var. *macrocarpus*, *C. didymus* var. *procumbens*, *L. abrotanifolium* var. *steinmannii*, *L. affine*, *L. argentinum*, *L. auriculatum*, *L. bonariense* var. *pseudovirginicum*, *L. calycinum* var. *integrifolium*, *L. costaricense*, *L. cumingianum* var. *orbiculatum*, *L. cumingianum* subsp. *berteroanum*, *L. depressum*, *L. myrianthum*, *L. neglectum*, *L. parodii*, *L. pubescens* var. *fallax*, *L. subvaginatum*, *L. virginicum* subsp. *centrali-americanum*, *Thlaspi campestre*), y se reducen a sinónimos otros 17 nombres (*Coronopus leptocarpus*, *C. leptocarpus* var. *microcarpus*, *L. boelckii*, *L. bonariense* var. *gayi*, *L. bonariense* var. *pseudovirginicum*, *L. brevicaule*, *L. calycinum*, *L. danielsii*, *L. demissum*, *L. kalenbornii*, *L. morrisonii*, *L. peruvianum*, *L. philippianum* var. *boliviense*, *L. raimondii*, *L. scabrifructum*, *L. spicatum* var. *caylx-persistente*, *L. subvaginatum*). *L. depressum* y *L. rahmeri* son nuevos registros para la Argentina.

**Palabras clave.** Brassicaceae, *Lepidium*, Sudamérica, taxonomía.

### INTRODUCTION

The limits of *Lepidium* (Brassicaceae) were initially expanded by Al-Shehbaz et al. (2002)

to include *Cardaria* Desv., *Coronopus* Zinn, and *Stroganowia* Kar. & Kir., and more recently by Al-Shehbaz and Mummenhoff (2010) to include *Stubendorffia* Schrenk ex Fisch. and

*Winklera* Regel, based on extensive molecular studies by Brüggemann (2000) and Mummehoff et al. (2001, 2009, and references therein). *Lepidium* is now represented by native species on all continents except Antarctica, and as currently recognized, the genus has 230 species.

During work on the accounts of Brassicaceae (Cruciferae) for *Catálogo de las Plantas Vasculares del Cono Sur* (Al-Shehbaz, 2008) and for *Flora de la República Argentina*, several new species of *Lepidium* L. were discovered. Furthermore, an examination of the types of nearly all South American taxa of the genus necessitated several nomenclatural adjustments and lectotypifications. As a result, it became clear that a synopsis of the entire genus for the continent is needed, and it is provided herein along with a key to all native and naturalized species.

**Key to *Lepidium* species**

- 1. At least some cauline leaves auriculate, sagittate, or amplexicaul . . . . . 2
- 1. Cauline leaves not auriculate, petiolate or sessile, sometimes absent . . . . . 22
- 2(1). Fruits indehiscent; plants perennial, rhizomatous; fruiting racemes hardly elongated . . . . . 3
- 2. Fruits dehiscent; plants annual or biennial, rarely perennial with caudex; fruiting racemes strongly elongated . . . 5
- 3(2). Fruits cordate to reniform, flattened; valves reticulately veined . . . . . *L. draba*
- 3. Fruits globose, subglobose, or ovoid, inflated; valves not reticulately veined . . . . . 4
- 4(3). Fruits pubescent, (2-)3-4(-5) mm in diam.; style 0.7-1.5 mm . . . . . *L. appelianum*
- 4. Fruits glabrous, (3.5-)4-6.2(-7) mm in diam.; style (0.8-)1.2-2(-2.3) mm . . . . . *L. chalapense*
- 5(2). Petals yellow; uppermost leaves deeply cordate-amplexicaul at base, entire . . . . . *L. perfoliatum*
- 5. Petals white, rudimentary, or absent; uppermost leaves auriculate or sagittate, entire, dentate, pinnatifid, or pinnatisect . . . . . 6
- 6(5). Stamens 6; fruit wings united with basal part of style; naturalized weeds . . . . . 7
- 6. Stamens 2, rarely 4; fruit wings not united with basal part of style; native species . . . . . 8
- 7(6). Annuals or biennials; fruit valves papillate; style 0.2-0.5(-0.7) mm, included in apical notch . . . . . *L. campestre*
- 7. Perennials with caudex; fruit valves often not papillate; style (0.6-)1-1.5 mm, well exerted from apical notch . . . . . *L. heterophyllum*
- 8(6). Annuals or rarely biennial without caudex . . . . . 9
- 8. Perennials with slender to well-developed caudex . . . . . 14
- 9(8). Stems prostrate, several from base, branched throughout; style as long as apical notch of fruit; seeds wingless . . . . . *L. santacruzensis*
- 9. Stems erect, often simple at base, branched mainly above; style shorter than apical notch of fruit; seeds winged or margined at least apically . . . . . 10
- 10(9). All cauline leaves 1-3-pinnatisect or -pinnatifid . . . . . *L. auriculatum*
- 10. At least some cauline leaves entire, dentate, serrate, or incised . . . . . 11
- 11(10). Fruits wider than long; petals absent; North Chile . . . . . *L. johnstonii*
- 11. Fruits longer than broad, rarely as long as wide; petals present; Argentina, Patagonian Chile, Paraguay . . . . . 12
- 12(11). Uppermost leaves linear to linear-lanceolate; basal leaves pinnatisect; fruit 2-2.6 mm; sepals caducous or rarely persistent . . . . . *L. spicatum*
- 12. Uppermost leaves oblong, ovate, or lanceolate; basal leaves dentate, serrate, or serrulate; fruit 2.5-3.5 mm; sepals persistent . . . . . 13

**MATERIALS AND METHODS**

The present study is based on loans of over 2,500 specimens (including types) of South American *Lepidium* from most of the major herbaria. In addition, databases and digital images on-line were consulted, as well as additional images were directly requested (see acknowledgements).

**RESULTS AND TAXONOMIC TREATMENT**

Fifty native and 12 naturalized species grow in South America. The majority of native species grow in Argentina (24 spp., 10 endemic), followed by Chile (18 spp., seven endemic), Bolivia (12 spp., four endemic), and Peru (11 spp., four endemic). The following key deals with all 62 South American species of *Lepidium*.

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13(12). Stems 1.5-4.5 dm; middle and upper leaves subentire or serrulate; fruiting pedicels strigillose adaxially	<i>L. pedersenii</i>	
13. Stems 0.5-1.2(-1.5) dm; middle and upper cauline leaves incised; fruits 2.5-3.2 mm; fruiting pedicels puberulent all around	<i>L. tandilense</i>	
14(8). Stamens 4; petals 2-3 mm; apical notch of fruit absent	<i>L. crassius</i>	
14. Stamens 2; petals 0.3-1.5(-2) mm; apical notch of fruit 0.1-1 mm		15
15(14). Fruits wingless, wider than long; style 0.35-0.5 mm; petals 1.5-2 mm	<i>L. spathulatum</i>	
15. Fruits winged, longer than wide, rarely length and width subequal; style obsolete or to 0.2 mm; petals 0.3-1.5 mm		16
16(15). Middle and upper cauline leaves pinnatifid or pinnatisect, rarely laciniate, with 3-6(-8) lobes on each side	<i>L. bipinnatifidum</i>	
16. Middle and upper cauline leaves entire or toothed		17
17(16). Fruits 2.2-3 × 2-2.5 mm; fruiting pedicels 1.5-2(-3) mm		18
17. Fruits 3-5.3 × 2.5-5 mm; fruiting pedicels 2.5-6 mm		19
18(17). Basal leaves pinnatisect with linear lobes; upper leaves linear to linear-oblongate; fruiting pedicels puberulent adaxially; petals shorter than sepals or absent; style included in apical notch; Argentina	<i>L. spicatum</i>	
18. Basal leaves entire or serrate; upper leaves oblong; fruiting pedicels puberulent all around; petals subequaling sepals; style subequaling apical notch; Peru	<i>L. cuzcoensis</i>	
19(17). Stems decumbent or ascending from base; rachis of raceme with spreading trichomes; Bolivia, Chile, Ecuador, Peru	<i>L. chichicara</i>	
19. Stems erect at base; rachis of raceme with retrorse trichomes; Argentina		20
20(19). Lower cauline leaves pinnatisect; petals 0.9-1.5 mm	<i>L. parodii</i>	
20. Lower cauline leaves entire or dentate; petals 0.4-0.7 mm		21
21(20). Fruits obovate-suborbicular, 4.2-5.3 × 3.5-5 mm, apical notch 0.5-1 mm; basal leaves persistent, serrate-dentate; cauline leaves entire	<i>L. hickenii</i>	
21. Fruits elliptic-ovate, 3.5-4.2 × 2.4-3 mm; apical notch 0.1-0.2 mm; basal leaves deciduous, pinnatifid; cauline leaves dentate	<i>L. burkartii</i>	
22(1). Annuals or rarely biennials		23
22. Perennials with caudex, rarely subshrubs		42
23(22). Fruits indehiscent; valves thick, prominently rugose to verrucose, closed and enclosing seeds		24
23. Fruits dehiscent; valves thin, smooth or rarely reticulate, open		25
24(23). Fruits reniform to ovate-cordate; valves prominently ridged; stamens 6; petals 1-2 mm	<i>L. coronopus</i>	
24. Fruits didymous; valves without ridges; stamens 2; petals 0.4-0.5 mm	<i>L. didymum</i>	
25(23). Fruit valves prominently reticulate-veined		26
25. Fruit valves smooth, not prominently veined		28
26(25). Fruits 3.4-5 × 3.4-5 mm, winged all around	<i>L. angustissimum</i>	
26. Fruits 2.2-3.3 × 2-3.2 mm, winged apically		27
27(26). Sepals caducous; fruits subdidymous, usually wider than long, margin glabrous	<i>L. pseudodidymum</i>	
27. Sepals persistent; fruits not didymous, longer than wide; margin minutely puberulent, very rarely glabrous	<i>L. strictum</i>	
28(25). Stamens 6 or 4		29
28. Stamens 2		31
29(28). Fruits 1.8-2 × 1.7-1.8 mm, apically wingless, valves pilose	<i>L. pinnatifidum</i>	
29. Fruits 2.5-7 × 2-5.5 mm, apically winged; valves glabrous or very rarely puberulent along margin		30
30(29). Fruiting pedicels strongly flattened, puberulent adaxially; stamens 4; cotyledons entire; style obsolete or very rarely to 0.1 mm	<i>L. nitidum</i>	
30. Fruiting pedicels terete or subterete, glabrous; stamens 6; cotyledons trifid; style 0.2-0.5(-0.8) mm	<i>L. sativum</i>	
31(28). Fruits wingless; style exerted from apical notch of fruit	<i>L. cyclocarpum</i>	
31. Fruits apically winged; style included in apical notch of fruit		32
32(31). All leaves entire	<i>L. horstii</i>	
32. At least some leaves dentate, incised, trifid, pinnatifid, or pinnatisect		33
33(32). Fruits 1.5-2 × 1.3-1.5 mm, slightly reticulate; seeds neither winged nor margined	<i>L. myrianthum</i>	
33. Fruits 2-5 × 1.7-4.8 mm, not reticulate; seeds winged or margined, rarely neither		34
34(33). Middle or upper leaves or leaf segments linear, 0.5-2 mm wide; fruits 2-3 mm		35
34. Leaves or leaf segments variously shaped, not linear, usually broader; fruits 2.5-5 mm		37

35(34). Stems often decumbent; basal leaves 2-pinnatisect; fruits oblong-obovate, 1.7-2.1 mm wide; Patagonia .....	<i>L. filisegmentum</i>	
35. Stems erect; basal leaves 1-pinnatisect; fruits orbicular or orbicular-obovate, 2-3.2 mm wide; C and N. Argentina, Paraguay .....		36
36(35). Fruiting pedicels terete, wingless, 2-3 mm; fruits 2.7-3.2 mm .....	<i>L. gracile</i>	
36. Fruiting pedicels flattened, narrowly winged, 2-6 mm; fruits 2-2.5 mm .....	<i>L. stuckertianum</i>	
37(34). Rachis of raceme papillate with straight subclavate trichomes .....	<i>L. densiflorum</i>	
37. Rachis or raceme puberulent or strigillose with recurved trichomes .....		38
38(37). Fruits puberulent at least along margin when young .....	<i>L. pubescens</i>	
38. Fruits almost always glabrous, if puberulent ( <i>L. argentinum</i> ) then leaves not pinnatisect .....		39
39(38). Petals 1-2(-2.5) mm; fruits orbicular or suborbicular; cotyledons accumbent .....	<i>L. virginicum</i>	
39. Petals absent or rudimentary and less than 1 mm; fruits obovate, obovate-oblong, elliptic, or rarely suborbicular; cotyledons incumbent .....		40
40(39). Cauline leaves entire, dentate, lacinate, or rarely pinnatifid; fruits sharply acute winged apically, sparsely and minutely puberulent on margin at least when young, or glabrous .....	<i>L. argentinum</i>	
40. At least lower cauline leaves 1-3-pinnatisect or -pinnatifid; fruits obtusely winged apically, glabrous .....		41
41(40). Fruits broadly elliptic-obovate to orbicular, (2.5-)3-3.5 mm, apical notch 0.1-0.3 mm; widespread .....	<i>L. bonariense</i>	
41. Fruits broadly obovate to oblong-obovate, (3-)3.7-4.5(-5) mm, apical notch 0.5-1 mm; Colombia .....	<i>L. costaricense</i>	
42(22). Subshrubs or perennial herbs with woody lower stems; basal leaves absent .....		43
42. Perennial herbs without woody stems; basal leaves present .....		46
43(42). Fruits oblong or elliptic to obovate, not subdidymous, dehiscent, thin walled, smooth; style exerted from api- cal notch; stamens 4; petals 1-3 mm		44
43. Fruits orbicular to broadly obovate-suborbicular, subdidymous, indehiscent, breaking into closed, 1-seeded valves, thick walled, reticulate-alveolate; style included in apical notch; stamens 2 or 6; petals 0.3-0.6 mm .....		45
44(43). Petals white, 2.5-3 mm; fruits puberulent, 4-5 × 3-3.5 mm; Bolivia .....	<i>L. beckii</i>	
44. Petals yellow, 1-1.5(-2) mm; fruits glabrous, 3-4 × 1.5-2.5 mm; Ecuador .....	<i>L. quitense</i>	
45(43). Leaves entire or 3-5-lobed; stamens 2; fruits 2.5-3.5 × 3.5-4.5 mm, on terminal and lateral branches .....	<i>L. rhytidocarpum</i>	
45. Leaves serrate; stamens 6; fruits 4-5 × 3-3.5 mm, axillary .....	<i>L. serratum</i>	
46(42). Plants scapose; cauline leaves absent .....		47
46. Plants not scapose; cauline leaves present .....		48
47(46). Rachis and pedicels puberulent; stamens 6; fruits elliptic-rhombic, 4.5-6 mm, wingless, not notched; Chile .....	<i>L. philippianum</i>	
47. Rachis and pedicels glabrous; stamens 4; fruits orbicular, 3.2-3.8 mm, winged apically, notched; Bolivia .....	<i>L. solomonii</i>	
48(46). Stamens .....		649
48. Stamens 2 or rarely .....		450
49(48). Plants 2-4 dm; fruits 5-7 × 3-4 mm; notch and style 0.25-0.5 mm, subequal; seeds 2-3 mm; Brazil .....	<i>L. grandifructum</i>	
49. Plants (2-)3.5-12(-15) dm; fruits 1.6-2.7 × 1.3-1.8 mm, notch and style obsolete; seeds 0.8-1.3 mm; naturalized in Argentina .....	<i>L. latifolium</i>	
50(48). Style exerted from or rarely subequaling apical notch of fruit .....		51
50. Style distinctly included in apical notch of fruit .....		57
51(50). Stamens 4; petals 1.2-2.2 mm wide; fruits reticulate, distinctly wider than long .....	<i>L. werffii</i>	
51. Stamens 2; petals 0.2-1.3 mm wide; fruits not reticulate, narrower than or rarely slightly wider than long ...		52
52(51). Fruits 5-8 × 3-4 mm, 1.5-2 times as long as wide, puberulent at least when young, rarely glabrous; seeds black- ish 2-3 mm .....	<i>L. marginatum</i>	
52. Fruits 2.5-4.5(-5) × 2.5-5 mm, about as long as or slightly longer than or shorter than wide, glabrous; seeds brown, 1.5-2.2 mm .....		53
53(52). Plants with appressed strongly crisped trichomes; stems often shorter than basal leaves	<i>L. jujuyanum</i>	
53. Plants with spreading to curved, non-crisped trichomes; stems longer than basal leaves .....		54
54(53). Basal and lowermost cauline leaves serrate; fruits wingless, 4.5-5 mm wide, slightly wider than long .....	<i>L. spathulatum</i>	

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54. At least some basal and lowermost cauline leaves pinnatifid or pinnatisect; fruits narrowly winged apically, 2.5-3.8(-4) mm wide, often longer than wide ..... 55
- 55(54). Petals (1-)1.5-2.5(-3) mm; style 0.3-1 mm; fruits 2.5-3.8(-4) mm wide, rhombic-suborbicular or rarely rhombic-elliptic ..... *L. meyenii*
55. Petals 0.5-1.3 mm; style 0.1-0.3 mm; fruits 1.8-2.8 mm wide, elliptic or elliptic-obovate ..... 56
- 56(55). Sepals persistent; fruits elliptic, 2.5-3.2 mm; stems 0.3-2.5 dm, decumbent; middle cauline leaves pinnatifid; Argentina, Bolivia, Peru ..... *L. depressum*
56. Sepals caducous; fruits elliptic-obovate, 3.8-4.5 mm; stems 3-5 dm, ascending; middle cauline leaves entire, subapically toothed; Colombia ..... *L. trianae*
- 57(50). Fruiting pedicels pubescent all around at least basally ..... 58
57. Fruiting pedicels glabrous or pubescent only adaxially ..... 60
- 58(57). Sepals caducous; fruits puberulent at least when young; petals 1.2-1.8 mm ..... *L. ecuadoriense*
58. Sepals persistent or caducous; fruits glabrous; petals 0.6-1 mm ..... 59
- 59(58). Basal leaves pinnatifid with (2 or)3-8 lateral lobes on each side; middle cauline leaves serrate or lacinate; fruits narrowly oblong-ovate to oblong, 2-2.3 mm wide ..... *L. abrotanifolium*
59. Basal leaves entire or rarely with one lobe on each side; cauline leaves entire; fruits broadly ovate or obovate, 2.5-3 mm wide ..... *L. fraseri*
- 60(57). Petals spatulate to oblanceolate, 1.5-2 mm, longer than sepals; fruits 4-5.5 × 3-4 mm ..... *L. cumingianum*
60. Petals linear, filiform or subulate, 0.2-0.8 mm, shorter than sepals; fruits 2-4(-4.2) × 1-3(-3.5) mm ..... 61
- 61(60). Leaves or leaf lobes linear, entire, 0.3-1 mm wide ..... 62
61. Leaves or leaf lobes pinnatifid, dentate, serrate, or incised, often broader ..... 63
- 62(61). Fruiting racemes dense; fruiting pedicels puberulent adaxially; fruits orbicular to broadly elliptic, 2-2.5 mm wide; C Argentina and Patagonia ..... *L. spicatum*
62. Fruiting racemes lax; fruiting pedicels glabrous; fruits elliptic, 1.8-2 mm wide; Bolivia ..... *L. steinbachii*
- 63(61). Fruits 2-2.8 × 1-1.8 mm ..... 64
63. Fruits 3-4.2 × 2.4-4 mm ..... 65
- 64(63). Basal and lowermost cauline leaves serrate or dentate; stems 2-5 dm; racemes compact in fruit, rachis glabrous; fruiting pedicels recurved; Argentina ..... *L. boelckeanum*
64. Basal and lowermost cauline leaves pinnatifid or pinnatisect; stems 0.3-1.5 dm; racemes elongated in fruit, rachis pubescent; fruiting pedicels straight, appressed to rachis; Chile ..... *L. reichei*
- 65(63). Stems single from base, erect; rachis of raceme with retrorse trichomes; seeds narrowly winged or margined; Argentina ..... *L. burkartii*
65. Stems few to several from base, decumbent to ascending; rachis of raceme with spreading trichomes; seeds wingless and marginless; elsewhere ..... 66
- 66(65). Stems 1.5-4.5 dm; fruits elliptic to obovate, glabrous; fruiting pedicels 2.5-5 mm; seeds 1.3-1.5 mm ..... *L. chichicara*
66. Stems 0.4-1(-2) dm; fruits orbicular to ovate-orbicular, often puberulent along margin when young, fruiting pedicels 1-2(-3) mm; seeds 1.5-1.9 mm ..... *L. rahmeri*

**Lepidium abrotanifolium** Turcz., Bull. Soc. Naturalistes Moscou 27: 308. 1854. TYPE: Ecuador. Antisana, 14,000 ft, 1850, *Jameson s.n.* (holotype KW; isotypes F!, G-BOIS!).

*Lepidium abrotanifolium* var. *steinmannii* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 247. 1906. TYPE: Bolivia. Oruro and Cochabamba, 4000 m, 1900, *Steinmann s.n.* (lectotype B! here designated).

*Lepidium fraseri* Thell. var. *dielsianum* O. E. Schulz ex Diels, Biblioth. Bot. 116: 89. 1937. TYPE: Ecuador. Chimborazo, N of Riobamba, Sanancajas, páramo, 3500 m, 28-VII-1933, *L. Diels 400* (holotype B!).

**Distribution.** Bolivia, Ecuador, and Peru.

**Observations.** The lectotype designated herein is the most complete of the two syntypes cited, and it was named after its collector. The other syntype, *K. Fiebrig 2772* (B), was collected from Tarija, Bolivia.

**Lepidium angustissimum** Phil., Anales Univ. Chile 81: 333. 1892. TYPE: Chile. Travesía, between Chañarcillo and Carrizal valley, IX-1885, *F. Philippi s.n.* [lectotype SGO71482!]

designated by M. Muñoz-Schick, Notic. Mens. Mus. Nac. Hist. Nat. (Chile) 359: 7. 2007].

*Lepidium tayloriae* Al-Shehbaz, Novon 3: 93. 1993. TYPE: Chile. Región III (Atacama), Copiapó Province, between Huasco and Copiapó, ca. 20-25 km W of Totoral on road to coaset, dry plains and hillside, 20°00' S, 70°50' W, 8-X-1991, C. M. Taylor, C. von Bohlen & A. Marticorena 10804 (holotype MO!; isotype CONC!).

**Distribution.** Endemic to Chile.

**Observations.** Upon the examination of the type collections of *Lepidium angustissimum* and *L. tayloriae*, Muñoz-Schick (2007) concluded that they are conspecific, a position with which I agree.

**Lepidium appelianum** Al-Shehbaz, Novon 12: 7. 2002. *Hymenophysa pubescens* C. A. Mey. in Ledeb., Icon. Pl. 2: 20. 1830, non *Lepidium pubescens* Desv., J. Bot. Agric. 3: 180. 1815, nec *L. pubescens* Tineo, Cat. Pl. Hort. Panorm. 150. 1827. *Cardaria pubescens* (C. A. Mey.) Jarm. in Keller et al., Weeds USSR 3: 29. 1934. TYPE: [Kazakhstan]. "Locis humidis subsalsis deserti Soongoro-Kirghisici orientalis versus montes Arkaul," 14-V-1826, C. A. Meyer s.n. (lectotype LE designated by I. A. Al-Shehbaz et al., Novon 12: 7. 2002).

**Distribution.** Native to Central Asia, naturalized in North America and South America (Argentina).

**Lepidium argentinum** Thell., Physis 9: 9. 1928. TYPE: Argentina. La Rioja, Chilecito, Sañugasta, 30-I-1927, L. R. Parodi 7785 (lectotype BAA! here designated).

*Lepidium bonariense* L. var. *stenocarpum* Thell., Repert. Spec. Nov. Regni Veg. 11: 310. 1912. *Lepidium argentinum* var. *stenocarpum* (Thell.) Thell., Physis 9: 10. 1928. TYPE: Argentina. La Rioja, Entre la mina Jareta ya la altura del Espiritu Santo, Sierra Famatina, 25-I-1879, G. Hieronymus & G. Niederlein 785 (holotype B!; isotypes CORD! [2], G-DC!).

*Lepidium argentinum* var. *virginicifolium* Thell., Physis 9: 11. 1928. TYPE: Argentina. La Rioja, Chilecito,

Sañugasta, 30-I-1927, L. R. Parodi 7783 (lectotype Z designated by C. L. Hitchcock, Lilloa 11: 105. 1945; duplicates BAA!, GH!).

**Distribution.** Endemic to Argentina.

**Observations.** Thellung (1928) did not designate a type for the species and recognized the two varieties above. He listed under var. *virginicifolium* two collections, Parodi 7785 and Parodi 7783, of which Hitchcock (1945) took Parodi 7783 as the varietal type. The only other collection examined by Thellung is Parodi 7785, and the BAA sheet is taken herein as the lectotype because it was not possible to locate such collection among all of the major European herbaria consulted.

**Lepidium auriculatum** Regel & Körn., Ind. Sem. Hort. Petrop. 51. 1857. TYPE: Chile. [Región XIV (Los Ríos). Prov. Valdivia], San Juan, R. Philippi 317 (lectotype LE here designated; duplicates B!, G-BOIS!, P!, W!).

*Lepidium calycinum* Gordon, Mém. Acad. Montpel. 1: 416. 1853, syn. nov. Non Steph. ex Willd., Sp. Pl. 3: 433. 1800. *Lepidium aletes* J. F. Macbr., Candollea 5: 357. 1934. TYPE: France (adventive). Port-Juvenál près Montpellier, 1853, Touchy s.n. (holotype NCY!).

*Lepidium araucanum* Phil., Anales Univ. Chile 81: 335. 1892. *Lepidium bipinnatifidum* Desv. var. *araucanum* (Phil.) Reiche, Anales Univ. Chile 90: 95. 1895. TYPE: Chile. Curanilahue, XI-1891, R. Philippi s.n. (holotype SGO-071462!).

*Lepidium pubescens* Desv. var. *fallax* Thell., Bull. Herb. Boissier ser. 2, 8: 913. 1908. TYPE: Chile. Quillota, 1829, C. G. L. Bertero 1080 (lectotype P! here designated).

*Lepidium subvaginatum* Steud. ex Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 249. 1906, syn. nov. TYPE: Chile. Mt. Leona, Rancagua, 1828, C. G. L. Bertero 364 (lectotype P! questionably designated by C. L. Hitchcock, Lilloa 11: 112. 1945, and confirmed herein; duplicates F!, G[2]!, GH[2]!, NY!, P!).

**Distribution.** Argentina, Bolivia, Chile, Paraguay, and Uruguay.

**Observations.** The type collections of Regel's new taxa are housed at LE, and the lectotype of *Lepidium auriculatum* is not an exception. The

sheet of *L. pubescens* var. *fallax* at P was the only one annotated by Thellung as such, and it is designated herein as the lectotype of this taxon. Both Thellung (1906) and Hitchcock (1945) recognized *Lepidium auriculatum*, *L. subvaginatum*, and *L. calycinum* (= *L. aletes* by Hitchcock) as distinct species separated primarily by the degree of development of auricles on the cauline leaves, length of nectar glands at the base of the fruit, and trichome density on upper parts of the stem. However, the study of substantial material reveals that a single, vegetatively polymorphic species is involved. In every floral, fruit, and seed morphology, the above three species are basically indistinguishable. A combination of annual habit, pinnatifid or pinnatisect and auriculate cauline leaves, persistent sepals, and pedicels pubescent all around should readily distinguish the species from the other South American *Lepidium*.

The lectotype sheet of *Lepidium pubescens* var. *fallax* includes five plants, of which three were annotated by Thellung (1908) as this variety and one each as *L. pubescens* and *L. subvaginatum*. A close examination of all five plants reveals that they belong to *L. auriculatum*.

**Lepidium beckii** Al-Shehbaz, Novon 9: 5. 1999. TYPE: Bolivia. La Paz, Prov. José Romá de Loayza, Baños Termales de Urmiri, 17°09' S, 68°05' W, 3500 m, 26-I-1996, *S. G. Beck 21944* (holotype MO!; isotype LPB!).

*Lepidium philippianum* (Kuntze) Thell. var. *boliviense* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 201. 1906, syn. nov. TYPE: Bolivia. La Paz, Chive-sivi, Valeé de La Paz, 8500-12,500 ft, 1939, *Pentland s.n.* (holotype P!).

**Distribution.** Endemic to Bolivia.

The type of var. *boliviense* is indistinguishable from that of *Lepidium beckii* in every aspect of the plant and clearly differs from *L. philippianum* in which it was originally described (see couplet 42 of the key).

**Lepidium bipinnatifidum** Desv., J. Bot. Agric. 3: 177. 1815. TYPE: Peru, sine data,

*Dombey s.n.* (holotype P!; isotype P!). The holotype sheet was annotated in Desvaux's handwriting.

*Lepidium humboldtii* DC., Syst. Nat. 2: 532. 1821. TYPE: Ecuador, "Hab. locis aridis prope Chillo Quitensium altit 1340 hexapod," *A. J. A. Bonpland & F. W. H. A. von Humboldt 2223* (holotype B!).

*Senebiera dubia* Kunth in Humboldt, Bonpland & Kunth, Nov. Gen. Sp. 76. 1821 TYPE: Ecuador, sine locus, *F. W. H. A. von Humboldt & A. J. A. Bonpland s.n.* (holotype P; isotype B!).

*Lepidium auritum* Turcz., Bull. Soc. Imp. Naturalistes Moscou 27: 307. 1854. TYPE: Ecuador. Quito, *Jameson 772* (holotype KW; isotype G-DEL!).

*Lepidium sectifolium* Steud., Flora 39: 412. 1856. TYPE: Peru. Tabina, *Lechler 1879* (holotype B!; isotype K!).

*Lepidium kalenbornii* C. L. Hitchc., Lilloa 11: 88. 1945, syn. nov. TYPE: Peru. Oroya near Luma, dry soil, 10,000-13,000 ft, *A. S. Kalenborn 20* (holotype DS!; isotypes GH!, MO!, NY!, US!).

**Distribution.** Bolivia, Colombia, Ecuador, Peru, and Venezuela.

**Observations.** Hitchcock (1945) separated *Lepidium bipinnatifidum* from *L. kalenbornii* by the presence (vs. absence) of auricles, slightly longer nectar glands (<0.3 vs. ca. 0.3 mm), and slightly larger fruits (2.5-3.5 vs. 2-3 mm). However, these differences are unrealistic, and he recognized both auriculate and non-auriculate forms in *L. bipinnatifidum* and small (2-3 mm) and larger (3-4 mm) fruits in *L. kalenbornii* (see key couplets 6 and 47, respectively).

**Lepidium boelckeanum** A. Prina, Hickenia 2(18): 81. 1993. TYPE: Argentina. La Pampa, Depto. Chapaleufú, entre B. Larroudé y Río V, 29/30-X-1984, *H. O. Troiani & A. O. Prina 8193* (holotype SRFA!; isotype BACP!).

**Distribution.** Endemic to Argentina.

**Lepidium bonariense** L., Sp. Pl. 2: 645. 1753. TYPE: "Habitat in Bonaria" (lectotype designated by W. Marais, Flora of Southern Africa 13: 93. 1970: "*Thlaspi Bonar. multiscissum, flore*



*invisibili*" in Dillenius, Hort. Eltham., 2: 381, t. 286, f. 370. 1732).

*Thlaspi multifidum* Poir., Encycl. 7: 545. 1806. TYPE: Uruguay. Montevideo, 1767, *P. Commerson s.n.* (holotype P; isotypes P[3]!). The sheet annotated by Poiret is taken herein as the holotype.

*Lepidium mendocinum* Phil., Anales Univ. Chile 36: 160. 1870. TYPE: Argentina. Inter Mendocino et Santiago, *P. Ortega & E. Reed s.n.* (holotype SGO-045144).

*Lepidium bonariense* var. *hirsutulum* Thell., Repert. Spec. Nov. Regni Veg. 11: 310. 1912. TYPE: Argentina. Córdoba, without locality, 1876, *G. Hieronymus & G. Niederlein s.n.* (holotype B!).

*Lepidium bonariense* var. *microcarpum* Thell., Repert. Sp. Nov. Regni Veg. 13: 302. 1914. TYPE: Argentina. Córdoba, Depto. Capital: prope ciudad de Córdoba, *T. Stuckert 5647* (holotype G; isotype CORD!).

*Lepidium bonariense* var. *pseudovirginicum* Thell., Repert. Sp. Nov. Regni Veg. 13: 301. 1914. TYPE: Argentina. Córdoba, Punilla, Los Cocos, *T. Stuckert 19614* (lectotype G-DEL! here designated; duplicate CORD!).

**Distribution.** Argentina, Bolivia, Brazil, Chile, Paraguay, and Uruguay; naturalized in Australia, Europe, and South Africa.

**Observations.** *Stuckert 19614* at G was designated herein as the lectotype because it is the most complete specimen that agrees with the description and because it was annotated as that name by its author. Thellung (1906, 1914) and Hitchcock (1945) broadly delimited *Lepidium bonariense* to include at least three additional species, including *L. gracile*, *L. stuckertianum*, and *L. tandilense*. These species are easily distinguished by the key above.

**Lepidium burkartii** Boelcke, Parodiana 3(1): 21. 1984. TYPE: Argentina. Entre Ríos, Depto. Gualeguaychú, sotobosque del río Gualeguaychú, pocos km al N de Gualeguaychú, 5-XI-1983, *N. S. Troncoso, N. Bacigalupo & N. Tur 3740* (holotype SI!; isotypes BACP!, SI!). The holotype and isotype sheets at SI are marked a and b, respectively. The holotype sheet has two plants and the isotype has four.

**Distribution.** Endemic to Argentina.

**Lepidium campestre** (L.) W. T. Aiton, Hortus Kew., ed. 2, 4: 88. 1812. *Thlaspi campestre* L., Sp. Pl. 2: 646. 1753. TYPE: "Habitat in Europae arvis, viis argillosis, apricis" [lectotype Herb. Linn. 825.8 (LINN) here designated].

**Distribution.** Native to Europe, introduced into North America, South America (Chile), Australia, and South Africa.

**Observations.** Jarvis (2007) did not designate a lectotype among the five original material he listed under *Thlaspi campestre*. The specimen placed on Linnaean website ([http://www.linnean-online.org/view/plants\\_alpha/thlaspi\\_campestre.html](http://www.linnean-online.org/view/plants_alpha/thlaspi_campestre.html)) is designated herein as the lectotype.

**Lepidium chalepense** L., Cent. Pl. II, 23. 1756. *Cardaria chalepensis* (L.) Hand.-Mazz., Ann. Nat. Hofmus. Wien 27: 55. 1913. *Cardaria draba* subsp. *chalepensis* (L.) O. E. Schulz in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 17b: 417. 1936. TYPE: "Habitat in Oriente" [lectotype Herb. Linn. No. 824.20 (LINN) designated by S. M. H. Jafri, in Nasir & Ali, Fl. W. Pakistan 55: 68. 1973].

**Distribution.** Native to SW Asia; naturalized in Europe and North and South America (Argentina).

**Lepidium chichicara** Desv., J. Bot. Agric. 3: 179. 1815. TYPE: Peru. Chichicara, *Dombey s.n.* [as *Dombrey*] (holotype P!; isotype P!). The sheet annotated by Desvaux is taken herein as the holotype.

*Lepidium lanceolatum* Walp., Nov. Actorum. Acad. Caes. Leop.-Carol. Nat. Cur. 19 (Suppl. 1): 250. 1843, non Presl, Fl. Sicul. 1: 82. 1826. *Lepidium chichicara* var. *lanceolatum* (Walp.) Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 221. 1906. *Lepidium walpersii* J. F. Macbr., Candollea 5: 357. 1934. TYPE: Peru. Lago Titicaca, 12400 ft, *F. J. F. Meyen s.n.* (holotype B!).

*Lepidium chichicara* var. *pseudobipinnatifidum* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 221. 1906. TYPE: Ecuador, sine locus, 1871, *A. Sodiro 58* (holotype B!).

*Lepidium chichicara* var. *rhombocarpum* Thell., Repert.

Spec. Nov. Regni Veg. 11: 309. 1912. TYPE: Bolivia. La Paz, Palca, Illimani, 3600-4800 m, 1906, *R. Hauthal 268* (holotype B!).

**Distribution.** Bolivia, Chile, Ecuador, and Peru.

**Lepidium coronopus** (L.) Al-Shehbaz, Novon 14: 156. 2004. *Cochlearia coronopus* L., Sp. Pl. 2: 648. 1753. TYPE: "Habitat in Europae apricis, nudis" [lectotype Herb. Linn. No. 826.5 (LINN) designated by B. Jonsell & C. Jarvis, Nord. J. Bot. 22: 68. 2002].

*Lepidium squamatum* Forssk., Fl. Aegypt. Arab. 117. 1775. *Coronopus squamatus* (Forssk.) Aschers., Fl. Prov. Brandenb. 62. 1860. TYPE: [Egypt], Alexandria, *P. Forsskål s.n.* (holotype C).

**Distribution.** Native to Eurasia and N Africa; naturalized in North America, South America (Chile), Australia, and South Africa.

**Lepidium costaricense** Thell., Bull. Herb. Boissier, ser. 2, 4: 713. 1904. TYPE: Costa Rica. San José, XI-1875, *H. Polakowsky 533* (lectotype Z! here designated; duplicate W!).

*Lepidium costaricense* var. *friedrichsthalii* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 252. 1906. TYPE: Guatemala. Jinotepe, 1841, *Friedrichsthal 1199* (holotype W).

*Lepidium virginicum* L. subsp. *centrali-americanum* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 225. 1906. *Lepidium virginicum* var. *centrali-americanum* (Thell.) C. L. Hitchc., Madroño 8: 128. 1945. TYPE: Mexico. Yucatán, Izamal, 1895, *G. F. Gaumer 456* (lectotype B! here designated; duplicate G!).

**Distribution.** Belize, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama.

**Observations.** The reasons why the lectotypes of *Lepidium costaricense* and *L. virginicum* subsp. *centrali-americanum* were designated herein are because they were annotated by Thellung and were among the most complete specimens examined by the present author.

**Lepidium crassius** (C. L. Hitchc.) Al-Shehbaz, comb. nov. *Lepidium cyclocarpum* var. *crassius* C. L. Hitchc., Lilloa 11: 94. 1945. TYPE: Peru. Arequipa, 40 Km S of Chala, 5 km from the sea, 700 m, 22-IX-1938, *C. R. Worth & J. L. Morrison 15701* (holotype MO!; isotypes G!, GH, MO[2]!, NA!, UC!).

**Distribution.** Endemic to Peru.

**Observations.** Although Hitchcock (1945) described this species as a variety of *Lepidium cyclocarpum*, the differences between them are so substantial that it is difficult to imagine why there were treated as conspecific. *Lepidium crassius* differs from *L. cyclocarpum* by being a densely pubescent perennial (vs. sparsely pubescent annual) with hirsute (vs. puberulent) stems 3-5 (vs. 0.5-2) dm tall, auriculate (vs. non auriculate) middle and upper cauline leaves, narrowly winged fruiting pedicels pubescent all around (vs. wingless pedicels puberulent only adaxially), obovate petals, 2-3 × 1-1.8 mm (vs. spatulate to oblanceolate petals 1-1.5 × 0.2-0.5 mm), four (2 median and 2 lateral) stamens (vs. only 2 median), nectar glands 0.5-0.7 mm (vs. 0.1-0.2 mm) long, fruits without (vs. with) apical notch, and styles 0.7-0.1 (vs. 0.2-0.4) mm.

**Lepidium cumingianum** Fisch. & C. A. Mey., Index Sem. Hort. Petrop. 1: 30. 1835. TYPE: Chile, sine locus, 1834, *H. Cuming s.n.* (holotype LE).

*Lepidium cumingianum* subsp. *berteroanum* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 218. 1906. TYPE: Chile. [Región V]: Valparaíso, 1829, *C. G. L. Bertero 1082* (lectotype G-DC! here designated; duplicates F!, GH!, NY!, P!).

*Lepidium cumingianum* subsp. *orbiculatum* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 219. 1906. TYPE: Chile. [Región I], Tarapacá, *R. Philippi s.n.* (lectotype B! here designated; duplicate W!).

*Lepidium cumingianum* var. *canescens* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 219. 1906. TYPE: Chile. Santiago, 1818, *C. G. L. Bertero 366* (holotype G-DEL!).

*Lepidium cumingianum* var. *subsagittatum* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 219. 1906. TYPE: no specimens cited.

**Distribution.** Endemic to Chile.

**Observations.** The designated lectotypes of *Lepidium cumingianum* subsp. *orbiculatum* and subsp. *berteroanum* are represented by more duplicates than the others cited by Thellung, and all were examined by the present author. Hitchcock (1945) indicated that *Bertero 367* is the type collection of *Lepidium cumingianum*, but there is no indication that supports that. No collection data were provided for var. *subsagittatum*, and only "Herb. Petrop," now LE, was given.

**Lepidium cuzcoensis** Al-Shehbaz, sp. nov.

TYPE: Peru. Depto. Cuzco, Prov. Urobamba, Laderas de Muyock, 2860 m, 18-I-1963, *C. Vargas 14111* (holotype US; isotype US). Fig. 1.

*Species perennis, staminis 2, foliis basalibus integris vel serratis, petalis albis obovato-orbicularis 0.7-1 mm longis et sepalis equilongis, fructibus ellipticis 2.5-3 mm longis, apice emarginatis stylis equilongibus a congeneribus diversa.*

Herbs, perennial, puberulent with straight, spreading trichomes 0.01-0.1 mm; caudex simple or few branched, slender. Stems 4-13 cm, decumbent to ascending, few from caudex, branched above. Basal leaves 1.5-3 cm; petioles 0.6-1.5 cm, persistent, only slightly flattened at base; blade oblanceolate, 2-5 mm wide, entire or serrulate, puberulent at margin; lowermost cauline leaves shortly petiolate to sessile, not auriculate at base; middle and upper cauline leaves entire or few toothed, oblong, minutely auriculate at base. Racemes dense, slightly or considerably elongated in fruit; rachis densely and minutely puberulent with straight trichomes; fruiting pedicels ascending at base, recurved, divaricate, 2-3 mm, narrowly winged, minutely puberulent all around. Sepals broadly ovate, 0.8-1.1 mm, somewhat persistent, with a broadly white margin and apex, sparsely puberulent; petals white, broadly obovate-suborbicular, 0.7-1 × 0.6-0.9 mm; stamens 2, median; filaments 0.6-1 mm; anthers ca. 0.2 mm. Fruits dehiscent, broadly elliptic, 2.5-3 × 2.2-2.5 mm, glabrous, not veined, narrowly winged apically, apex emarginate; apical notch 0.15-0.2 mm; style 0.15-2 mm,

equaling apical notch. Seeds brown, ovate-oblong, wingless, 1.1-1.2 × 0.7-0.8 mm; cotyledons incumbent.

**Etymology.** The species is named for the Peruvian province of Cuzco.

**Distribution.** Known only from the type collection.

**Observations.** *Lepidium cuzcoensis* does not appear to be closely related to any of the South American species. It is readily distinguished by a combination of perennial habit, decumbent or ascending stems, minutely puberulent pedicels all around, two stamens, broadly obovate-orbicular petals 0.7-1 mm subequaling sepals, and broadly elliptic fruits 2.5-3 mm long with short style equaling the apical notch.

**Lepidium cyclocarpum** Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 214. 1906. TYPE: Peru. Lima, Amancaes Hills, *Matthews* (as *Mathew*) 752 (lectotype W! designated by J. F. Macbride, Publ. Field Mus. Nat. Hist., Bot ser. 13(2): 949. 1938; isolectotype K!).

**Distribution.** Endemic to Peru.

**Observations.** Hitchcock (1945) indicated that the type collection is *Weberbauer 1614* and overlooked the earlier lectotypification given above.

**Lepidium densiflorum** Schrad., Index Sem. Hort. Gotting. 4. 1832. TYPE: Germany. Sine locus, 1831, *Schrader s.n.* (holotype Z!).

*Lepidium neglectum* Thell., Bull. Herb. Boissier, ser. 2, 4: 708. 1904. TYPE: United States of America. New York, New York City, Bedford Park, 12-VIII-1899, *Wilson s.n.* (lectotype Z! here designated).

**Distribution.** Native to North America, introduced into South America (Argentina), and Europe.

**Observations.** The above lectotype of *Lepidium neglectum* is the only sheet of the species annotated by Thellung and housed in the institution

where he worked. *Lepidium densiflorum* was first reported from Argentina by Prina (1997).

**Lepidium depressum** Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 201. 1906. TYPE: Bolivia. [La Paz], Larecaja, Omasuyos, vicinity of Achacache, Cerro Avichaca, 4000-4200 m, Jan-May 1861, *G. Mandon 922* (lectotype G! here designated; duplicate W!).

**Distribution.** Argentina, Bolivia, and Peru.

**Observations.** The reason why the above sheet of *Lepidium depressum* is designated herein as the lectotype is because it is the most complete of those annotated by Thellung.

Thellung (1906) gave the collection year for the type collection as 1857, but the lectotype has the year as 1861, and none of that original collection carry the date as he stated.

*Lepidium depressum* is reported herein for the first time from Argentina and Peru. All of the Argentinean records above were previously undetermined, whereas the Peruvian record was cited by Hitchcock (1945) as *L. weddellii*, a name that he mishandled and treated herein as a synonym of *L. meyenii*.

#### Specimens examined

ARGENTINA. **Jujuy.** Depto. Humahuaca, Mina Aguilar, *Cabrera et al. 18949* (LP). Depto. Yavi, La Quiaca, *Cabrera et al. 15294* (LP). **La Rioja.** Depto. Famatina, Sierra de Famatina, camino a la mina La Mexicana, *Kiesling et al. 6290* (BAA). **Tucumán.** Sierra Aconquija, Cerro Muñoz, *Lillo 4163* (GH, LIL, US). Depto. Tafi, Co. El Negrito, *Giusti et al. MC545* (BAA).

PERU. **Puno.** Chuquibambilla, *Pennell 13396* (F, GH, NY).

**Lepidium didymum** L., Syst. Nat., ed. 12, 2: 433. 1767. *Coronopus didymus* (L.) Sm., Fl. Brit. 2: 691. 1804. *Senebiera didyma* (L.) Pers.,

Synop. Pl. 2(1): 185. 1806. TYPE: [lectotype Herb. Linn. No. 824.16 (LINN!) designated by W. Fawcett & A. B. Rendle, Flora of Jamaica 3: 244. 1914].

*Senebiera pinnatifida* DC., Mem. Soc. Hist. Nat. Paris 1799: 144, t. 9. 1799. TYPE: not designated.

*Coronopus didymus* var. *macrocarpus* Muschl., Bot. Jahrb. Syst. 41: 137. 1908. TYPE: Uruguay. Concepción, *P. G. Lorentz 236* (lectotype B! here designated).

*Coronopus didymus* var. *procumbens* Muschl., Bot. Jahrb. Syst. 41: 137. 1908. TYPE: Argentina, Ciénega, 10/17-I-1874, *P. G. Lorentz & G. Hieronymus 650* (lectotype B! here designated).

*Coronopus leptocarpus* Boelcke, Darwiniana 19: 395. 1975, syn. nov. TYPE: Chile. Concepción, Depto. Lautaro, Laraquete, 11-XI-1955, *O. Boelcke 7309* (holotype SI!; isotype BAA!).

*Coronopus leptocarpus* var. *microcarpus* Boelcke, Darwiniana 19: 397. 1975, syn. nov. TYPE: Chile. Curicó, Depto. Vichuquén, Llico, 20-X-1938, *E. Barros 2722* (holotype SI!).

**Distribution.** Native to southern South America, naturalized in Central and North America, Europe, Asia, Africa, and Australia.

**Observations.** The lectotypes of *Coronopus didymus* var. *procumbens* and var. *macrocarpus* were designated as such because they were the only sheets examined by the present author and annotated by Muschler among all the collections at B, where he deposited his types. None of the original material cited under *Senebiera pinnatifida* was examined by the present author and, therefore, the species remains untypified.

**Lepidium draba** L., Sp. Pl. 2: 645. 1753. *Cardaria draba* (L.) Desv., J. Bot. Agric. 3: 163. 1815. TYPE: "Habitat in Germania, praesertim Austria, Gallia, Italia", "Herb. Clifford: 331. *Lepidium 2*, sheet 2" (lectotype BM-000646273 designated by B. Jonsell & C. Jarvis, Nord. J. Bot. 22: 70. 2002).

**Distribution.** Native to Eurasia; naturalized in South Africa, Australia, North America, and South America (Argentina, Bolivia, Chile, and Uruguay).

**Lepidium ecuadoriense** Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 222. 1906. TYPE: Ecuador. Cotopaxi, páramo, 4100 m, VII-1903, *Hans Meyer 198* (holotype JE!).

**Distribution.** Endemic to Ecuador.

**Observations.** Hitchcock (1945) reduced *Lepidium ecuadoriense* to synonymy of *L. chichicara*, but the two are so different in habit, indumentum, and fruits that justify their recognition as distinct species. From the latter, *L. ecuadoriense* differs by having thick (vs. thin) caudex, shorter stems (0.5-1.5 vs. 1.5-4.5 dm), non-auriculate (vs. often auriculate) cauline leaves, fruiting pedicels puberulent all around (vs. only adaxially), petals subequaling or slightly longer (vs. shorter) than sepals, puberulent (vs. glabrous) fruits, and styles subequaling (vs. distinctly shorter than) apical notch.

**Lepidium filisegmentum** C. L. Hitchc., Lilloa 11: 125. 1945. TYPE: Argentina. Santa Cruz, Caleta Olivia, 100-200 m, 12-X-1929, *A. Donat 185* (holotype GH!; isotypes BAA!, CAS!, F!, GH!, MO!, NY!, SI!, UC!).

*Lepidium reticulatum* Howell var. *austro-americanum* Thell., Bull. Herb. Boiss. 1908: 814. 1908. TYPE: Argentina. Región entre lago Buenos Aires Norte y Codo Río Mayer, 46°10' -48°15' S, 71-72°20' W, Río Lista, 700 m, 5-III-1903, *L. Platen & U. Greiner 60* (holotype Z; isotype SI!).

**Distribution.** Patagonian Argentina and Chile.

**Lepidium fraseri** Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 217. 1906. *Lepidium abrotanifolium* Turcz. var. *fraseri* (Thell.) C. L. Hitchc., Lilloa 11: 91. 1945. TYPE: Ecuador. Sine locus, 1860, *Fraser s.n.* (holotype G-DC!).

*Lepidium fraseri* subsp. *decepiens* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 217. 1906. TYPE: Ecuador. Pichincha, 3000-3800 m, 1873, *A. Sodiro 55* (holotype B!).

**Distribution.** Endemic to Ecuador.

**Observations.** *Lepidium fraseri* is a very distinc-

tive species reduced by Hitchcock (1945) to a variety of *L. abrotanifolium*. From the latter, it differs by always having glabrous (vs. puberulent), entire (vs. pinnatifid) basal leaves 0.5-3 mm (vs. 7-15 mm wide), entire (vs. 3-5-lobed) cauline leaves, and broadly ovate to obovate (vs. oblong to narrowly oblong-ovate) fruits 2.5-3 (vs. 2-2.3) mm wide.

**Lepidium gracile** (Chodat & Hassl.) Boelcke, Parodiana 4(1): 36. 1986. *Lepidium bonariense* L. var. *gracile* Chodat & Hassl., Bull. Herb. Boissier 2, 3: 795. 1903. *Lepidium calycinum* var. *gracile* (Chodat & Hassl.) Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 245. 1906. TYPE: Paraguay. Concepción, 1901/1902, *E. Hassler 7545* (holotype G!; isotypes G!, GH!, P!, UC!).

**Distribution.** Argentina and Paraguay.

**Observations.** Thellung (1906) treated this species as a variety of *Lepidium bonariense*, whereas Hitchcock (1945) reduced it to synonymy of the latter. As shown by Boelcke (1986) the differences between the two species are substantial to merit their recognition as independent.

**Lepidium grandifrutum** C. L. Hitchc., Lilloa 11: 82. 1945. TYPE: Brazil, Upper Río Negro River, 3-III-1906, *Weiss & Schmidt s.n.* (holotype NY!).

**Distribution.** Endemic to Brazil and known thus far only from the type collection.

**Lepidium heterophyllum** Benth., Cat. Pl. Pyrénées 95. 1826. TYPE: France. Vallée d'Eynes, sine data, no collector name or date (holotype K!).

**Distribution.** Native to Europe; naturalized in North America and South America (Chile).

**Lepidium hickenii** Al-Shehbaz, sp. nov. TYPE: Argentina. Buenos Aires, Mar del Plata, puerto,

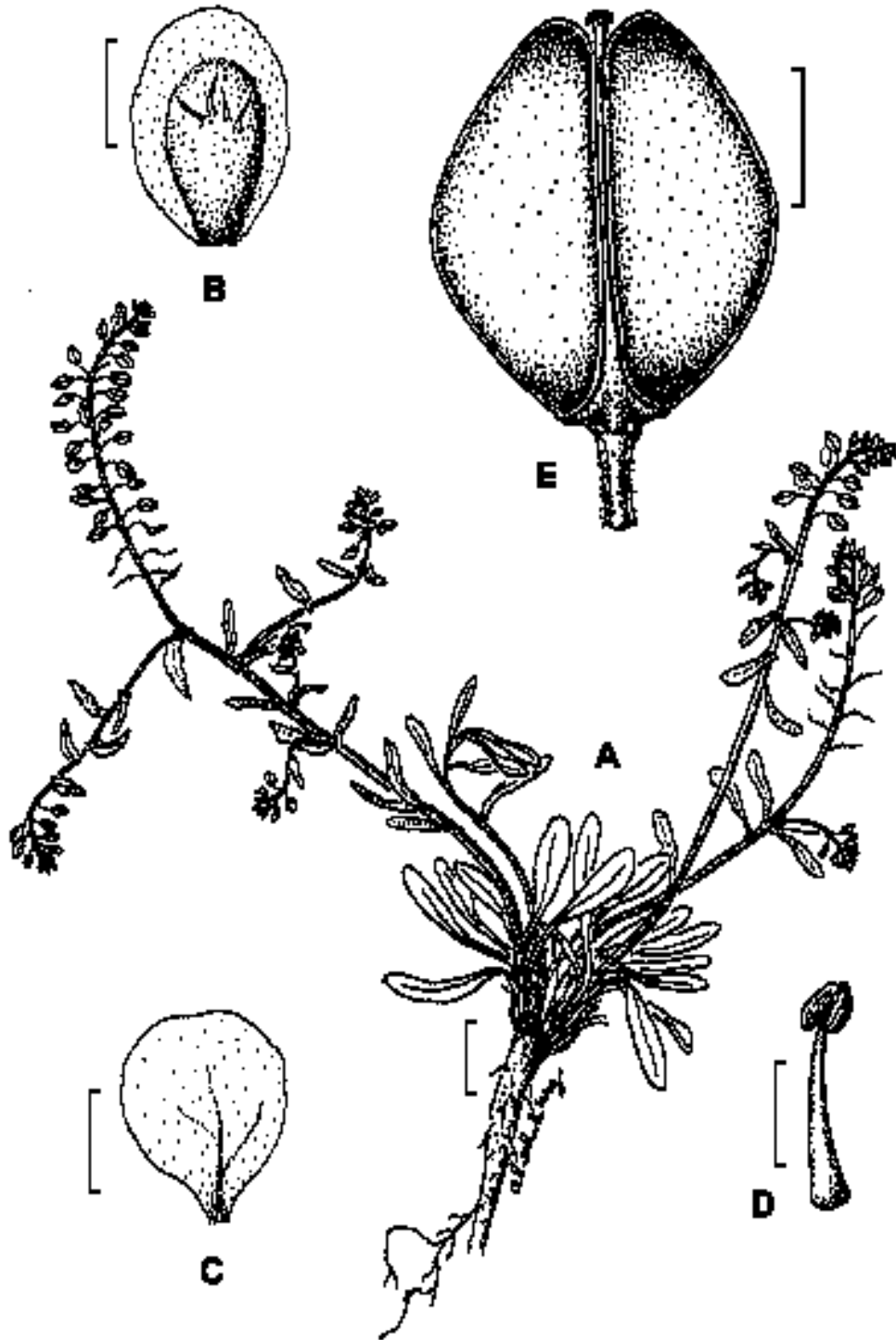


Fig. 1. *Lepidium cuzcoensis*. A, plant. B, sepal. C, petal. D, stamen. E, fruit. Scales: A = 1 cm, B-E = 1 mm. Drawn by the author from C. Vargas 14111 (holotype US).

cantera & altiplano, 15-XI-1932, *C. M. Hicken s.n.* (holotype SI-21077b; isotypes SI-21077a, c). Fig. 2.

*Differt a* *Lepidium burkartii* et *L. parodii foliis basalibus serrato-crenatis, fructibus obovato-sub-orbicularis 3,5-5 mm latis, reticulatis, apice emarginatibus 0,5-1 mm longis.*

Herbs, perennial, with thick, simple or few-branched caudex. Stems 10-45 cm, erect, striate, often simple, glabrous below, strigillose above, simple or divaricately branched above. Basal leaves with petioles 1-2 cm, persistent well after fruit maturity; leaf blade elliptic-lanceolate, 2-4 × 1-2 cm, densely strigillose, serrate-crenate, not ciliate; cauline leaves sessile, 1-1.8 × 0.2-0.4 cm, linear-lanceolate, auriculate, entire, densely strigillose, uppermost sparsely so. Racemes dense in fruit; rachis retrorsely strigillose; fruiting pedicels slightly arcuate to nearly straight, divaricate-ascending, 4-6 mm, strigillose adaxially. Sepals ovate, 0.8-1 mm, margin white, subapically strigillose, caducous; petals white, linear, 0.5-0.7 mm; stamens 2, median; filaments ca. 0.5 mm; anthers 0.2-0.3 mm. Fruits dehiscent, obovate-suborbicular, 4.2-5.3 × 3.5-5 mm, glabrous, slightly reticulate, winged apically, apex deeply emarginate; apical notch 0.5-1 mm; style obsolete, included in apical notch. Seeds brown, ovate, narrowly winged or margined, ca. 2 × 1.5 mm; cotyledons incumbent.

**Etymology.** *Lepidium hickenii* is named in honor of Cristóbal María Hicken (1 January 1875 - 11 March 1933), a renowned Argentinean botanist who collected the type cited above.

**Distribution.** Nothing is known about the habitat in which the species grows. It appears to be highly restricted in Buenos Aires Province.

**Observations.** From the closely related perennial and Argentinean-endemic *Lepidium* with auriculate cauline leaves, *L. hickenii* is easily distinguished from *L. burkartii* and *L. parodii* by having serrate-crenate (vs. pinnatifid or pinnatisect) basal leaves, broader, obovate-orbicular fruits 3.5-5 mm wide (vs. elliptic-ovate to obovate fruits 2.4-3.5 mm) with, reticulate (vs. smooth) valves, and deeper

apical notch 0.5-1 (vs. 0.1-0.3) mm. The new species also resembles *L. pedersenii* in having undivided basal and cauline leaves. However, it is readily distinguished by its perennial (vs. annual) habit, densely strigillose leaf surfaces (vs. glabrous or puberulent midvein and leaf margin), longer fruiting pedicels 4-6 (vs. 2-3) mm, caducous (vs. persistent) sepals, larger fruits 4.2-5.3 × 3.5-5 mm (vs. 2.5-3.5 × 2-3 mm), and deeper apical fruit notch 0.5-1 (vs. 0.4-0.5) mm.

#### Paratypes

ARGENTINA. **Buenos Aires.** Partido Necochea, 19-XII-1944, *Rodríguez 857* (LIL); Partido Guaminí, Guaminí, Laguna del Monte, *Nicora 4214* (SI); Partido Gral. Pueyrredón, Mar del Plata, *Hicken 2304* (SI).

***Lepidium horstii*** Johow ex Skotts., Handl. K. Vetensk. Vitterh.-Samhales., Goteborgs V. ser. B, 6: 33. 1937. TYPE. Chile. [Región V (Valparaíso)]: San Ambrosio Island, 7 X 1896, *F. R. A. Johow s.n.* (holotype not seen).

**Distribution.** Endemic to Chile.

***Lepidium johnstonii*** C. L. Hitchc., Lilloa 11: 108. 1945. TYPE: Chile. [Región II (Antofagasta)], Prov. Antofagasta, 5-6 km NE of Taltal, 300 m, 14-X-1938, *C. R. Worth & J. L. Morrison 15845* (holotype UC!; isotype DS!).

**Distribution.** Endemic to Chile.

***Lepidium jujuyanum*** Al-Shehbaz, Ann. Missouri Bot. Gard. 76: 1189. 1989. TYPE: Argentina. Jujuy, Depto. Humahuaca, Tres Cruces, 3750 m, 6-IV-1973, *Barbara Ruthsatz 506/7* (holotype GH!; isotype BAA!).

**Distribution.** Endemic to Argentina.

***Lepidium latifolium*** L., Sp. Pl. 2: 644. 1753. TYPE: "Habitat in Galliae, Angliae umbrosis,

succulentis" [lectotype Herb. Linn. No. 824.11a (LINN) designated by S. M. H. Jafri, in Nasir & Ali, Fl. W. Pakistan 55: 60. 1973].

**Distribution.** Native to Africa, Asia, and Europe; naturalized in North America, South America (Argentina), Australia.

***Lepidium marginatum*** Griseb., Abh. König. Ges. Wiss. Göttingen. 19: 72. 1874. *Lepidium meyenii* subsp. *marginatum* (Griseb.) Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 204. 1906. TYPE: Argentina. Catamarca, Sierra de Belen, Vayas altas, 9-11,000 ft, I-1872, *P. G. Lorentz 598* (holotype GOET!; isotypes B!, CORD! [2]).

*Lepidium boelckei* Al-Shehbaz, Ann. Missouri Bot. Gard. 76: 1189. 1989, syn. nov. TYPE: Argentina. Jujuy, Depto. Humahuaca, Cerro La Soledad, 3500 m, 23-I-1929, *S. Venturi 8859* (holotype US!; isotype LIL!).

**Distribution.** Endemic to Argentina.

**Observations.** Hitchcock (1945) treated *Lepidium marginatum* as a synonym of *L. meyenii*, but the species is substantially distinct for having lanceolate to elliptic and puberulent (vs. rhombic to rhombic-elliptic or rhombic-suborbicular and glabrous) fruits 5-8 [vs. (2.5-)3-4.5(-5)] mm, fruiting pedicels puberulent all around (vs. often only adaxially), strongly curved (vs. usually straight) trichomes, and at least some undivided (vs. always pinnatifid or pinnatisect) basal leaves. Thellung (1906) reduced *L. marginatum* to a subspecies of *L. meyenii*, but the differences above strongly support the recognition of both as distinct species.

When *Lepidium boelckei* was described over 20 years ago (Al-Shehbaz, 1989), the type collection and adequate material of *L. marginatum* were available for that study. Both Hitchcock (1945) and Thellung (1906) did not recognize the latter as a distinct species. The study herein of ample collections clearly reveals that the two plants are conspecific.

***Lepidium meyenii*** Walp., Nov. Act. Nat. Cur. 19. Suppl. 1: 249. 1843. TYPE: Peru. "In planis

circa Pisacomam," 15,000 ft, IV-1831, *F. J. F. Meyen 33* (holotype B!).

*Lepidium gelidum* Wedd., Ann. Sci. Nat. V, 1: 283. 1864. *Lepidium meyenii* subsp. *gelidum* (Wedd.) Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 203. 1906. *Lepidium meyenii* var. *gelidum* (Wedd.) Hosseus, Bol. Acad. Nac. Ci. Córdoba 26: 101. 1921. TYPE: Bolivia. Chuquisaca, Prov. Cinti, I-1846, *H. A. Weddell 3955* (lectotype P! designated by A. Thellung, Neue Denkschr. Schweiz. Naturf. Ges. 41: 203. 1906; duplicate P!).

*Lepidium affine* Wedd., Ann. Sci. Nat., Bot. sér. 5, 1: 284. 1864, non *Lepidium affine* Ledeb., Index Sem. Hort. Dorpat. 22. 1821. *Lepidium meyenii* Walp. var. *affine* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 204. 1906. *Lepidium weddellii* O. E. Schulz, Notizbl. Bot. Gart. Berlin-Dahlem 11: 391. 1932. TYPE: Bolivia. Prov. Omasuyos, vicinis Achacace, Taypichuru, in glareosis, 4000 m, 1857, *G. Mandon 927* (lectotype P! partially designated by C. L. Hitchcock, Lilloa 11: 86. 1945, and herein; duplicates G-BOIS!, G-DC!).

*Lepidium peruvianum* G. Chacón, Revista Peru. Biol. 3(2): 202. 1990, syn. nov. TYPE: Peru. Pasco, Depto. Pasco, Huarancaca, dentro de la ciudad de Cerro de Pasco, 4300 m, 9-IX-1989, *G. Chacón s.n.* (holotype USM; isotypes B!, UC!, Z!).

**Distribution.** Argentina, Bolivia, and Peru.

**Observations.** The cultivated *Lepidium* of the Peruvian highlands, better known as "maca," have correctly been assigned to *L. meyenii* by various authors. However, their recognition by Chacón (1990) as *L. peruvianum* has no morphological support other than the production of fleshy roots in the cultivated (vs. nonfleshy roots in the wild) forms of this species. One can draw so many similar parallels among the cultivated vs. wild forms of radish (*Raphanus sativus* L.), turnip (*Brassica rapa* L.), and rape (*B. napus* L.), all of which produce fleshy roots in cultivation but do not produce them when they become naturalized. Therefore, *L. peruvianum* does not have any merits. *L. weddellii* J. F. Macbr., Candollea 5: 357. 1934, is nom. superfl.

***Lepidium myrianthum*** Phil., Anales Mus. Nac. Chile 8: 5. 1891. *Lepidium ruderales* L. var. *myrianthum* (Phil.) Reiche, Anales Mus. Nac. Chile 90: 96. 1896. TYPE: Chile. Antofagasta,



Cueva de Colorado, 23-I-1885, *F. Philippi 1825* (lectotype SGO-64001 here designated).

*Lepidium spicatum* f. *microcarpum* Hicken, Physis (Buenos Aires) 2: 13. 1915. TYPE: Argentina. Rio Negro, vicinity of General Roca, 250-360 m, IX-1914 / II-1915, *W. Fischer 37* (holotype SI!; isotypes F[2]!, GH[2]!, K!, MO[2]!, NY!, US!).

**Distribution.** Argentina, Chile.

**Observations.** The original description of *Lepidium myrianthum* was based on collections made at 3880 m from Cueva de Colorado. Only two Philippi sheets from that locality are at SGO, and the label of one (SGO 49231) has the altitude 3700 m, whereas that of SGO 64001 has no elevation, though it was entered in the JSTOR database as 3880 m. Thellung (1906), Muñoz-Pizarro (1960), and Boelcke (1964) did not lectotypify the species, and the more complete sheet is designated above as the lectotype.

Hitchcock (1945) reduced this native South American species to synonymy of the Eurasian weed *Lepidium ruderales*, and reported the later from Argentina based on *Fischer 37*, which is cited above. Both species have pinnatisect basal leaves and similar fruit shape and size. However, *L. myrianthum* differs by having 1-pinnatisect (vs. (1)-2-3-pinnatisect) basal leaves, reticulate (vs. non-reticulate) fruits, stems puberulent with curved vs. straight papillae, and fruiting pedicels glabrous or puberulent only adaxially (vs. puberulent all around).

**Lepidium nitidum** Nutt. in Torr. & A. Gray, Fl. N. Amer. 1: 116. 1838. TYPE: United States. California, Santa Barbara, *T. Nuttall s.n.* (holotype BM!; isotype NY!).

*Lepidium chilense* Kunze ex Walp., Nov. Act. Nat. Curr. 19, suppl. 1: 250. 1843. *Lepidium spicatum* var. *chilense* (Kunze ex Walp.) Reiche, Anales Univ. Chile 90: 93. 1895. TYPE: Chile, sine data, *Meyen s.n.* (holotype B!).

*Lepidium tenuifolium* Phil., Anales Univ. Chile. 81: 333. 1892. *Lepidium bipinnatifidum* var. *tenuifolium* (Phil.) Reiche, Anales Univ. Chile 90: 95. 1895. TYPE: Chile. Near Chillán, *M. A. Solis s.n.* (holotype SGO-63989!).

*Lepidium tenuissimum* Steud., Nomen. Bot. 2, 28. 1941. TYPE: Chile. Valparaiso, VII-1830, *C. G. L. Bertero 1081* (holotype P!; isotypes BM!, GH!).

*Lepidium curicoanum* Phil., Anales Univ. Chile 81: 334. 1892. *Lepidium bipinnatifidum* var. *curicoanum* (Phil.) Reiche, Anales Univ. Chile 90: 95. 1895. TYPE: Chile. Curicó, 1891, *M. Vidal s.n.* (holotype SGO-071467!).

**Distribution.** South America (Chile) and disjunct in North America (California).

**Observations.** Hitchcock (1945) recognized *Lepidium curicoanum* both as a distinct species and as a synonym of *L. nitidum*. Examination of the types of both species reveals that they are conspecific.

**Lepidium parodii** Thell., Repert. Spec. Nov. Regni Veg. 21: 254. 1925. TYPE: Argentina. Buenos Aires, Avellaneda, 18-X-1924, *L. R. Parodi 5840* (lectotype Z! here designated; duplicate BAA!).

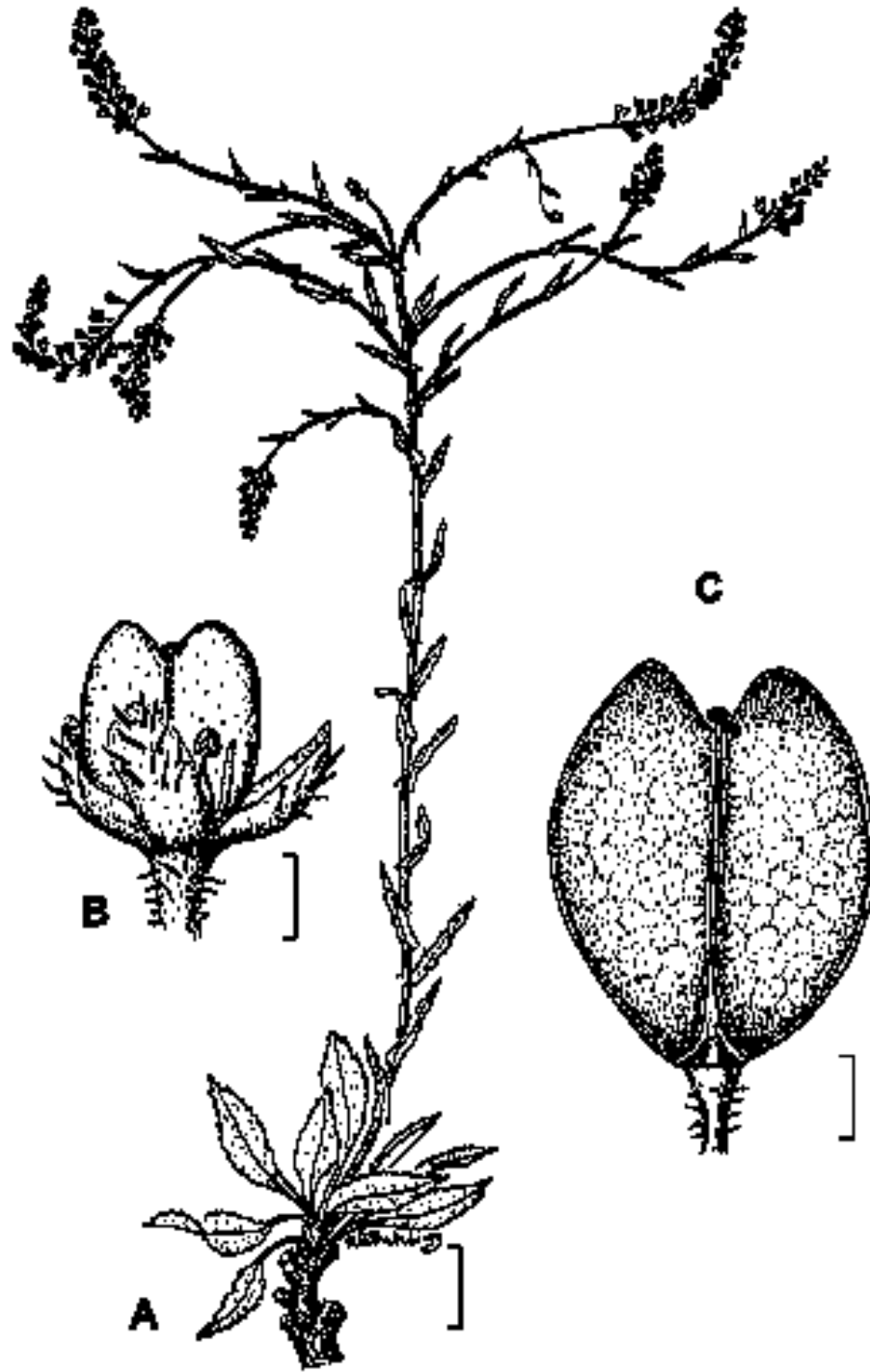
**Distribution.** Endemic to Argentina.

**Observations.** Thellung (1925) listed two syntypes in the original description of the species, and the more complete collection is taken as the lectotype.

**Lepidium pedersenii** Al-Shehbaz, sp. nov. TYPE: Argentina. Chaco, Depto. San Fernando, Isla Soto, low floodable ground, 25-VIII-1967, *T. M. Pedersen 8352* (holotype MO; isotype BAA). Fig. 3.

*Lepidium calycinum* Godron var. *integrifolium* Thell., Repert. Spec. Nov. Regni Veg. 11: 309. 1913. *L. aletes* J. F. Macbr. var. *integrifolium* (Thell.) Boelcke, Parodiana 4: 58. 1986; not *L. integrifolium* Nutt. ex Torr. & A. Gray, Fl. N. Amer. 1: 116. 1838. TYPE: Paraguay. Pilcomayo, 1906, *T. Rojas 368* (lectotype B! here designated; duplicate BM!).

*Differt a* *Lepidium auriculato foliis basalibus serratis vel serrulatis (non 1-3-pinnatifidis vel -pinnatisectis), foliis caulinis subintegris vel serratis, et pedicellis fructiferibus abaxialiter glabris.*



**Fig. 2.** *Lepidium hickenii*. A, plant. B, flower. C, fruit. Scales: A = 3 cm, B = 0.5 mm, C = 1 mm. Drawn by the author from C. M. Hicken s.n. (holotype SI).

Herbs, annual, often strigillose with trichomes 0.2-0.5 mm. Stems 1.5-4.5 dm, erect, usually divaricately branched above, strigillose with retrorse or rarely spreading trichomes. Basal leaves 2-8(-11) × 0.3-1.5(-2.5) cm; petioles 0.5-3.5(-5) cm; leaf blade oblanceolate, glabrous or pubescent only along midvein, margin serrate to serrulate along entire length, ciliate; middle cauline leaves 1-2.5 × 0.2-0.6 cm, sessile, base auriculate, margin subentire to serrate. Racemes dense, retrorse or rarely spreading strigillose; fruiting pedicels slender, strongly recurved about middle, ascending at base, divaricate distally, 2-3 mm, narrowly winged, strigillose adaxially and ciliate at margin. Sepals oblong, 0.5-0.8 mm, persistent, apex white, puberulent outside; petals white, 0.3-0.5 × 0.03-0.05 mm; stamens 2, median; filaments 0.5-0.9 mm; anthers 0.1-0.2 mm. Fruits dehiscent, obovate-orbicular, 2.5-3.5 × 2-3 mm, winged apically, glabrous, apex deeply and broadly emarginate; apical notch 0.4-0.5 mm; style obsolete or to 0.05 mm, included in apical notch. Seeds reddish brown, ovate-oblong, usually narrowly margined or winged at least distally, 1.2-1.4 × 0.7-0.8 mm, margined; cotyledons incumbent.

**Etymology.** The species is named in honor of Troels Myndel Pedersen (26 September 1916 - 5 May 2000) who collected the type gathering and several paratypes cited below.

**Distribution and habitat.** *Lepidium pedersenii* grows on flood plains and along roadsides and river banks in northeastern Argentina (Chaco, Corrientes, Formosa, Misiones, Santa Fé, and Tucumán) and adjacent Paraguay.

**Observations.** *Lepidium pedersenii* was treated by Thellung (1906) and Boelcke (1986) as variety *integrifolium* of *L. calycinum* and *L. aletes*, respectively. As shown above, the latter two species are synonymized herein under *L. auriculatum*. Both *L. pedersenii* and *L. auriculatum* are erect annuals with persistent sepals and similar fruit morphology. However, the new species is easily distinguished by having primarily serrate to serrulate [vs. (1 or 2 (or 3)-pinnatifid or -pinnatisect to pectinate] basal leaf margin, subentire or serrate (vs. pinnatifid to pinnatisect or pectinate) cauline leaves, and fruiting pedicels glabrous abaxially

(vs. puberulent all around). In three collections, *Serafin & Pierotti 6545* (GH, LIL), *Zardini et al. 860* (LP), and *Schwindt 710* (GH, LIL), both species are mounted on the same sheet, but in others (e.g., *Montes 1086* vs. *Montes 1087* and *Schwindt 502* vs. *Schwindt 503*) the first and second accession of each collection are *L. pedersenii* and *L. auriculatum*, respectively.

The collection of *Lepidium calycinum* var. *integrifolium* designated herein as the lectotype is by far the most complete of all syntypes cited by its original author.

### Paratypes

ARGENTINA. **Chaco.** Depto. 1 de Mayo, *Boelcke & Correa 14479* (BAA, BACP); Colonia Benítez, *Schulz 145* (BAB). **Corrientes.** Barranca del río Paraná, *Rojas 11525* (LIL). Depto. Bella Vista: Ruta 27, 10 km S of Bella Vista, Toropí, *Schinini & Cristóbal 9839* (G, SI). Depto. Empeñado, El Pollo 2 leguas al Este, *Ibarrola 3168* (GH, LIL); Estancia La Yela, *Pedersen 12975* (BACP). Depto. Itatí, *Pedersen 7067* (MO). Depto. Mburucuyá: Estancia Santa Teresa, *Pedersen 1813* (LP, MO); Estancia Santa Teresa, *Burkart 19329* (BACP, SI, US), *Pedersen 2* (MO). Depto. Santo Tomé, Río Uruguay y Arroyo Chimiray, *Schinini & Ahumada 20843* (BAA). **Formosa.** Formosa, *Jørgensen 2596* (MO); Depto. Laishi, Ruta Nac. 11, Río Salado, 4 km S Tatané, *Boelcke 13342* (BAA), *Boelcke 13338* (BAA). **Misiones.** San Javier, Aug 1902, *Burmeister s.n.* (BAB); Posadas, La Granja, *Ekman 1996* (F, P). Depto. Candelaria: Santa Ana, *Montes 1086* (GH, LIL); Loreto, *Montes 14670* (CAS, NY); Loreto, *Montes 508* (BAA, BAB). Depto. Caingúas: Mineral, *Schwindt 710* (GH, LIL); Puerto Rico, *Schwindt 502* (LIL). Depto. Capital: Garupá, *Grondona & Spegazzini 1310* (BAB). Depto. Bernardo de Irigoyen, San Antonio, *Serafin & Pierotti 6545* (GH, LIL). Depto. Iguazú: Victoria, *Schwindt 2835* (LIL); Parque Nacional Iguazú, *Zardini et al. 852, 860* (LP); Parque Nacional Bañado, *Múlgura et al. 577* (BAA). **Santa Fe.** Depto. Vera, Arroyo Golondrinas, *Cristóbal et al. 2007* (BAA). **Tucumán.** Depto. Leales: Chañar Pozo, *Venturi 420* (LIL). PARAGUAY. **Boquerón,** Eas. Pozo Once, Colonia Menno, *Vanni et al. 1785* (CTES, F);

Capitán Miranda, *Lurvey* 212 (MO). Depto. A. Paraná-Viv. Ftal. Itaipú, *Itaipú Binacional* 24 (MO); Puerto Stroessner, *Krapovickas & Cristóbal* 13392 (BAA).

**Lepidium perfoliatum** L., Sp. Pl. 2: 643. 1753. TYPE: "Habitat in Persia, Syria." [Lectotype Herb. Clifford: 331, *Lepidium* 3 (BM-000646274) designated by B. Jonsell & C. Jarvis, Nord. J. Bot. 22: 70. 2002].

**Distribution.** Native to N Africa, Asia, and Europe; introduced into South America (Argentina), North America, and Australia.

**Lepidium philippianum** (Kuntze) Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 200. 1906. *Nasturtium philippianum* Kuntze, Revis. Gen. Pl. 1: 937. 1891. Based on *Lepidium suffruticosum* Phil., Linnaea 20: 670. 1856, non L., Mant. 1: 91. 1767. TYPE: Chile. Cordillera de Yerba Loca, *R. Philippi* s.n. (holotype SGO-63998!).

*Lepidium philippianum* var. *brachystylum* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 200. 1906. TYPE: Chile, Cordillera de Santiago, *R. Philippi* 630 (holotype LE; isotype K!).

*Onuris reichei* Gilg & Muschl., Bot. Jahrb. Syst. 42: 467. 1909. TYPE: Chile. Cordillera de Santiago, 2700 m, *C. Reiche* s.n. (holotype B!).

**Distribution.** Endemic to Chile.

**Observations.** The limits of *Lepidium philippianum* were broadly delimited by both Thellung (1906) and Hitchcock (1945) to also include (as var. *boliviense*) the Bolivian endemic *L. beckii*.

**Lepidium pinnatifidum** Ledeb., Fl. Ross. 1: 206. 1841. TYPE: Russia, "Inter plantas astra-chanensi," *Blume* D19 (holotype LE!, plant on the left).

**Distribution.** Native to Central Asia and Europe; naturalized in South America (Argentina) and North America (California).

**Lepidium pseudodidymum** Thell. ex Druce, Bot. Exch. Club Soc. Brit. Isles 3: 388. 1914. TYPE: [Argentina]. Plants alien to Scotland, Twedside, Galashields, Sekrikshire, 3-IX-1913, *I. M. Hayward* s.n. (holotype E!).

*Senebiera australis* Hook.f., Fl. Antarct. 2: 241. 1843, not *L. australe* Kirk, Trans. N. Z. Inst. 14: 381. 1882. *Coronopus pinnatifidus* (DC.) Gaertn. var. *australis* (Hook.f.) Reiche, Fl. Chile 1: 67. 1896. *Coronopus australis* (Hook.f.) Speg., Ann. Mus. Nac. Hist. Nat. Bs. Aires 7: 227. 1902. *Senebiera pinnatifida* DC. var. *australis* (Hook.f.) Wildman, Exp. Antarct. Belge, Voyage S. Y. Belgica, Bot. 95. 1905. *Coronopus didymus* (L.) Sm. subsp. *australis* (Hook.f.) Gilg & Muschl., Bot. Jahrb. Syst. 42: 449. 1909. TYPE: Chile. Chonos Archipiélago, XII-1834, *C. Darwin* 34.bis (holotype K!).

*Lepidium inclusum* O. E. Schulz, Repert. Sp. Nov. Regni Veg. 33: 189. 1933. TYPE: Argentina. Tierra del Fuego, Río Grande, 12-I-1933, *A. Castellanos* 7757 (holotype B!).

**Distribution.** Patagonian Argentina and Chile.

**Lepidium pubescens** Desv., J. Bot. Agric. 3: 180. 1915. TYPE: Peru. Para, *Dombey* s.n. (holotype P!).

*Lepidium rainmondii* O. E. Schulz, Notizbl. Bot. Gart. Berlin-Dahlem 10: 727. 1929, syn. nov. TYPE: Peru. Cajamarca, Prov. Contumazá, Cascas, Cerro de Catache, 5500 ft [ca. 1800 m], 25-V-1875, *A. Raimondi* 7538 (holotype B!).

*Lepidium demissum* C. L. Hitchc., Lilloa 11: 121. 1945, syn. nov. TYPE: Bolivia. La Paz, 3800 m, 3-IV-1919, *O. Buchtien* 4475 (holotype GH!; isotypes US!).

*Lepidium scabrifractum* C. L. Hitchc., Lilloa 11: 119. 1945, syn. nov. TYPE: Bolivia. Atocha, 20-III-1921, 3700 m, *E. Asplund* 6205 (holotype US!; isotype S!).

**Distribution.** Bolivia and Peru.

**Observations.** Neither Schulz (1929) nor Hitchcock (1945) examined the type of *Lepidium pubescens*. The types of *L. rainmondii*, *L. demissum*, and *L. scabrifractum* are indistinguishable from that of *L. pubescens* in every aspect of foliage, flowers and fruits. The only difference is the presence in *L. demissum* of nearly persistent sepals and in *L. scabrifractum* only slightly smaller (ca.

3.5 × 3 mm vs. 3.5-5 × 3-4.5 mm) fruits. The presence of minute trichomes on the margin of fruit valve, annual habit, and pinnatifid or pinnatisect leaves should readily distinguish *L. pubescens* (including its new three synonyms) from the other congeners.

**Lepidium quitense** Turcz., Bull. Soc. Imp. Naturalistes Moscou 27(2): 39. 1854. TYPE: Ecuador. Quito, Plains of Pomasqui, 1850, *Jameson 892* (holotype KW; isotypes G-BOIS!, G-DEL!, US!; fragment F!).

*Lepidium quitense* var. *integrifolium* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 213. 1906. TYPE: Ecuador. Guallabamba, XII-1886, *A. Sodiro 56* (holotype B!).

*Lepidium quitense* var. *microphyllum* Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 213. 1906. TYPE: Ecuador. Sine data, *A. J. A. Bonpland s.n.* (holotype B-W!; isotypes B!, P!).

**Distribution.** Endemic to Ecuador.

**Lepidium rahmeri** Phil., Anales Mus. Nac. Chile 1891: 5. 1891. TYPE: Chile. [Región I], Tarapacá, Calchahuai, *C. Rahmer s.n.* (holotype SGO-63996!; isotype SGO-71461!).

**Distribution.** Argentina (new), Chile.

**Observations.** The species is reported for the first time from Argentina based on the many collections cited below, all of which were previously undetermined. The species resembles *L. argentinum* in having acute fruit valves and often minutely puberulent valve keel. However, it differs in the perennial (vs. annual) habit and in having orbicular to ovate-orbicular (vs. oblong to oblong-ovate) fruits.

#### Specimens examined

ARGENTINA. **Jujuy.** San Antonio de los Pibes, *Sleumer 3241* (BAA, LIL, SI); Huacalera, *Cabrera 12066* (LP). Depto. Cochinos, Cerro Huaucá, *Charpin & Novara 23129* (G). Depto. Humahuaca, Azul Pampa, *Cabrera et al. 21411*

(LP, MO); Humahuaca, *Parodi 9668* (BAA); Cuesta de Azul Pampa, *J. H. Hunziker et al. 10465* (SI); Mina Aguilar, *Cabrera et al. 15439* (LP), *J. H. Hunziker et al. 10482* (SI); de Pucará a Palca de Aparzo, *Kiesling 3512, 3633* (SI); Tres Cruces, *Cabrera et al. 27455* (SI). Depto. Santa Bárbara, Santa Bárbara, Co. Pereyra, *Gualianone et al. 1915* (SI). Depto. Santa Catalina, Santa Catalina, *Morrone et al. 2678* (SI). Depto. Tilcara, Quebrada de Huasamayo, *Cabrera et al. 31571* (SI, US). Depto. Tumbaya, Quebrada de Lipán, *Zuloaga & Deginani 3573* (SI); camino de Purmamarca al Abra de Lipán, *R. Kiesling et al. 5192* (SI), *Kielsing et al. 5221* (SI); 32 km de Purmamarca, *Morrone et al. 2730* (SI); Abra de Lipán, *Cabrera et al. 31674* (SI), *Cabrera et al. 27408* (SI); Volcán, Chilcayo, camino a Abra Morada, *Kiesling et al. 5819* (SI); Ciénaga Grande, 11 km S El Moreno, *Nicora et al. 8911* (SI); camino de Purmamarca a Abra de Lipán, Abra Blanca, *Kiesling et al. 5303* (SI), *Kiesling 5310* (SI); subida de Purmamarca a Abra de Pives, *Cabrera et al. 26356* (SI); El Moreno, Angosto del Chañi, ca. Incahuasi, *Kielsing et al. 5255* (SI). Depto. Yavi, La Quiaca, *Novara 8259* (G); Pumahuasi, *Giusti et al. MC551* (BAA). **Salta.** Puerto Tastil, Feb 1943, *Pedraluerca s.n.* (BAA). Depto. Cachi, ruta 33, km 44 después de Cachi, *Charpin & Lazare 23995* (G).

**Lepidium reichei** Phil. ex Reiche, Fl. Chile 1: 64. 1896. TYPE: Chile. Andes de Santiago, Valle Largo, II-1892, *C. Reiche s.n.* (holotype SGO-63994!; isotype B!).

*Lepidium brevicaule* Barn. in Gay, Hist. Chile Bot. 1: 165. 1845, syn. nov. Non *Lepidium brevicaule* Hoppe ex W. D. J. Koch, Deutschl. Fl., ed. 3, 4: 519. 1833. *Nasturtium brevicaule* Kuntze, Revis. Gen. Pl. 2: 937. 1891. *Lepidium barneoudianum* Sukorý, Gayana Bot. 60(2): 135. 2003. TYPE: Chile. Cordilleras de Coquimbo, 3300 m, 1839, *C. Gay 335* (holotype P!).

*Lepidium morrisonii* C. L. Hitchc., Lilloa 11: 116. 1945, syn. nov. TYPE: Chile. Coquimbo, Rio Ojotas, NE of La Vega Redonda, Andes back of Cuncumen, 3000 m, 25-II-1939, *J. L. Morrison & R. Wagenknecht 17418* (holotype UC!; isotypes F!, LIL!, G!, MO!, NA!, SI!).

*Lepidium bonariense* L. var. *gayi* Thell., Bull. Herb. Boissier ser. 2, 8: 914. 1908, syn. nov. TYPE: Chile. Prov. Coquimbo, 1838, *C. Gay s.n.* (holotype P!).

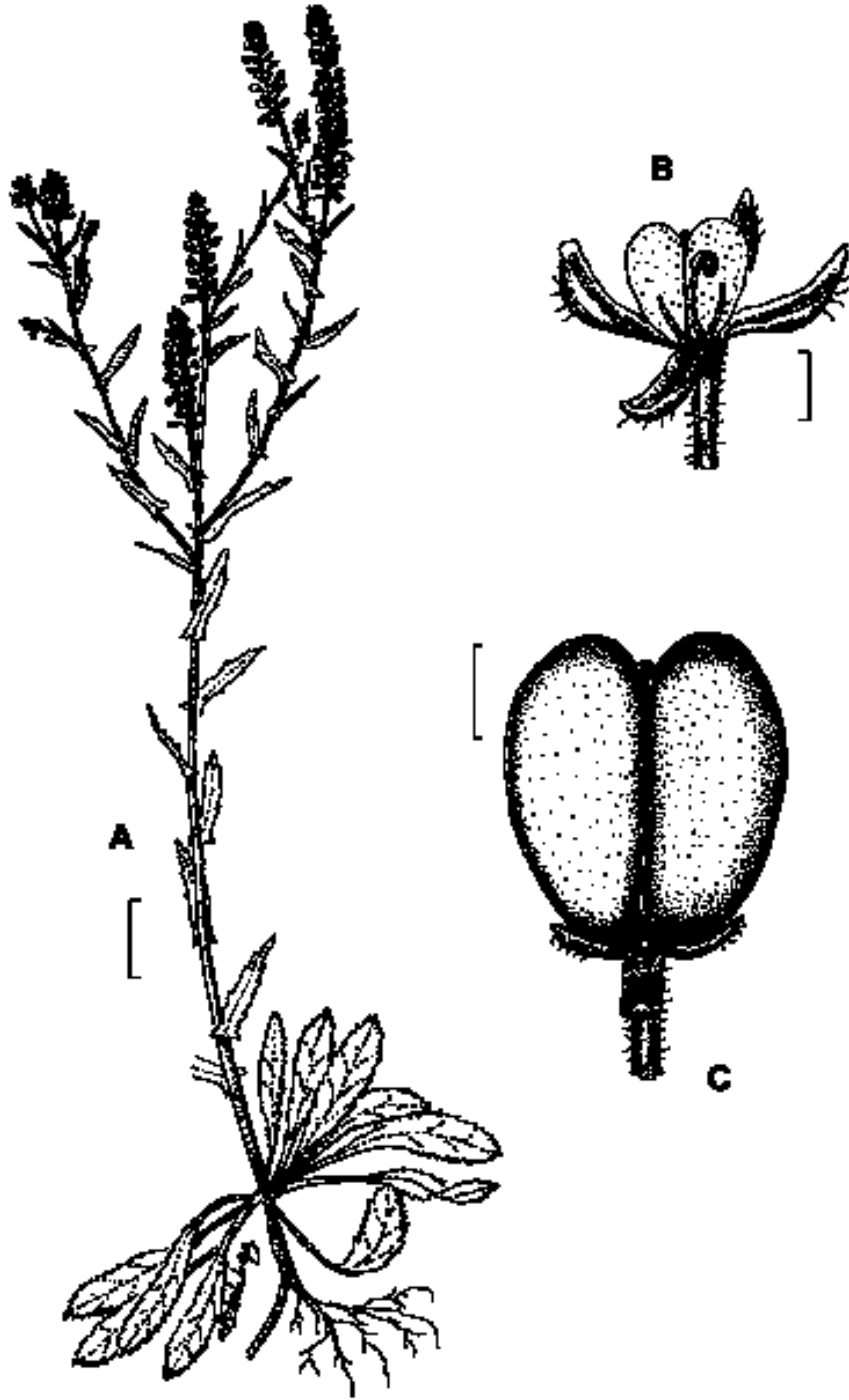


Fig. 3. *Lepidium pedersenii*. A, plant. B, flower. C, fruit. Scales: A = 2 cm, B = 0.5 mm, C = 1 mm. Drawn by the author from *T. M. Pedersen 8352* (holotype MO).

**Distribution.** Endemic to Chile.

**Observations.** A very distinctive species easily distinguished by its small fruits, straight fruiting pedicels subappressed to rachis, perennial habit, and pinnatisect leaves. Hitchcock (1945) suspected that *Lepidium morrisonii* might be conspecific with *L. brevicaulis*, but he refrained from treating them as such because he did not examine the type of the latter.

Teillier (1993) has correctly demonstrated that *Lepidium reichei* is rather distinct morphologically from *L. philippianum*, a species under which Hitchcock (1945) erroneously treated *L. reichei* as a synonym. However, Teillier (1993) failed to synonymize *L. morrisonii* and the later homonym *L. brevicaulis* and its new name *L. bareoudianum* (Sukorý, 2003) with *L. reichei*.

**Lepidium rhytidocarpum** (Hook.) Al-Shehbaz, Novon 12: 9. 2002. *Senebiera rhytidocarpa* Hook., London J. Bot. 2: 506. 1843. *Coronopus rhytidocarpus* (Hook.) Macloskie, Rep. Princ. Univ. Exped. Patagonia, Botany 8: 428. 1905. TYPE: Argentina. "Patagonia", Tweede s.n. (holotype K!).

**Distribution.** Argentina and Uruguay.

**Lepidium santacruzense** Al-Shehbaz, sp. nov. TYPE: Argentina. Santa Cruz, Depto. Deseado, Puerto Deseado, Isla Quiroga, Desembocadura de la Ría, 17-XI-1963, M. N. Correa, L. Mendonza & C. Movia 2541 (holotype BAA; isotype BAB). Fig. 4.

*Differt a Lepidium auriculato et L. pedersenii caulibus prostratis, petalis nullis, fructibus 2.5-2.7 (vs. 3-3.7) mm longis, apice emarginatibus stylo equilongis, et seminibus non-alatis nec marginatis.*

Herbs, annual, hirsutulous on stems, pedicels and sepals with straight trichomes 0.1-0.4 mm. Stems 7-15 cm, prostrate, branched at base and throughout. Basal leaves soon withered, oblanceolate, 1-2.5 cm, narrowed to petiolar base, entire or

few toothed; cauline leaves sessile, 7-15 × 3-7 mm, oblong, coarsely and obtusely dentate, strongly auriculate at base, glabrous. Racemes dense, slightly elongated in fruit; fruiting pedicels strongly recurved about middle, erect at base, flattened, divaricate distally, 2-2.5 mm, puberulent all around, narrowly winged. Sepals ovate, 0.6-0.7 mm, persistent, apex white, pubescent outside; petals absent; stamens 2, median; filaments 0.6-0.8 mm; anthers ca. 0.15-0.2 mm. Fruits dehiscent, obovate-orbicular, 2.5-2.7 × 2.2-2.5 mm, narrowly winged apically, glabrous, apex emarginate; apical notch ca. 0.1 mm; style ca. 0.1 mm, as long as apical notch. Seeds reddish brown, ovate-oblong, wingless, not margined, 1.1-1.2 × ca. 0.7 mm; cotyledons incumbent.

**Etymology.** The species is named after Santa Cruz Province.

**Distribution and habitat.** Known only from the type collection.

**Observations.** The type material of *Lepidium santacruzense* was cited by Boelcke & Romanczuk (1984) as *L. aletes* (herein as *L. auriculatum*). However, it resembles that species only in having auriculate cauline leaves, persistent sepals, and fruiting pedicels puberulent all around. From *L. auriculatum* and the related *L. pedersenii*, *L. santacruzense* is readily distinguished by the lack (vs. presence) of petals and by having prostrate (vs. erect) stems branched at the base and throughout (vs. branched only distally), caducous (vs. persistent) basal leaves, smaller fruits 2.5-2.7 (vs. 3-3.7) mm, apical notch ca. 0.1 mm (vs. 0.3-0.5 mm), style as long as the apical notch (vs. obsolete and included in apical notch), and wingless and not margined (vs. at least apically winged or margined) seeds. Furthermore, it differs from *L. auriculatum* by having entire or toothed vs. (1 or 2 (or 3)-pinnatifid or -pinnatisect] leaves. From *L. pedersenii*, the new species differs by the lack (vs. presence) of distinct petiole on basal leaves and entire or few-toothed (vs. serrate or serrulate along entire margin).

**Lepidium sativum** L., Sp. Pl. 2: 644. 1753. TYPE: [lectotype Herb. Linn. 824.11 (LINN)]

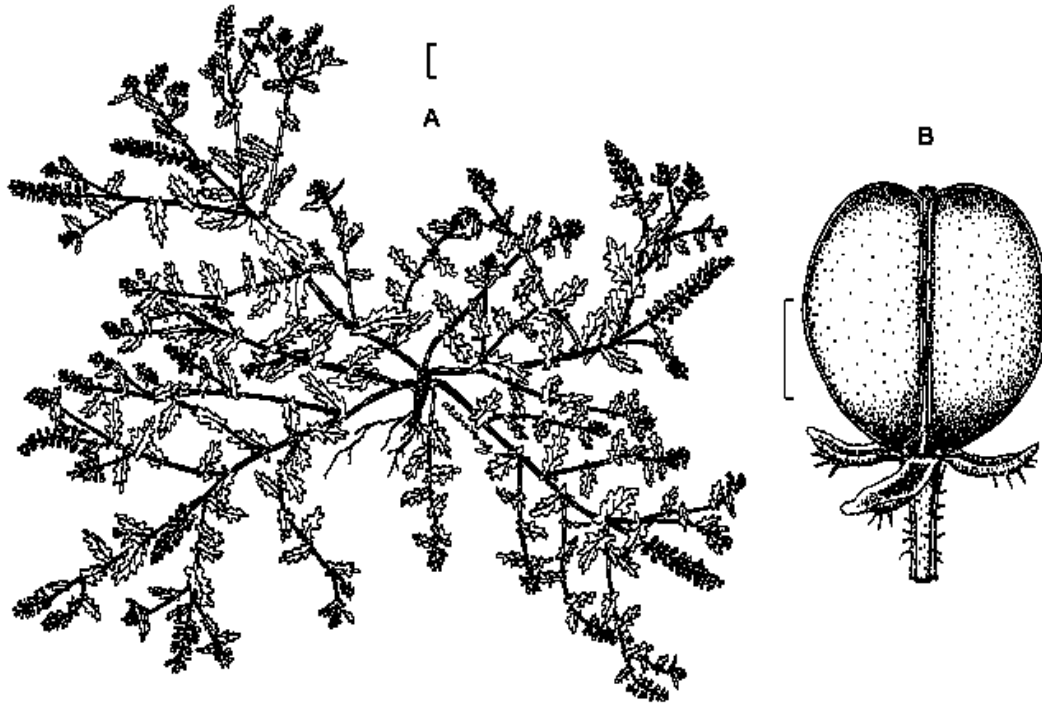


Fig. 4. *Lepidium santaacruzensis*. A, plant. B, fruit. Scales: A = 1 cm, B = 1 mm. Drawn by the author from M. C. Correa et al. 2541 (holotype BAA).

designated by W. Fawcett & A. B. Rendle, Flora of Jamaica 3: 243. 1914].

**Distribution.** Native to N Africa and Eurasia; cultivated and naturalized in South America (Argentina), North America, and Australia.

***Lepidium serratum*** (Poir.) Al-Shehbaz, Novon 12: 9. 2002. *Senebiera serrata* Poir., Encycl. (Lamarck) 7: 76. 1806. *Coronopus serratus* (Poir.) Desv., J. Bot. Agric. 3: 163. 1815. TYPE: Uruguay. Montevideo, *Commerson s.n.* (holotype P-JU; isotypes fragments BAA!, P[3]!).

**Distribution.** Argentina and Uruguay.

***Lepidium solomonii*** Al-Shehbaz, Ann. Missouri Bot. Gard. 73: 830. 1986. TYPE: Bolivia. La Paz, Prov. Los Andes, 6.6 km NW of Batallas

on the principal road along Lake Titicaca, 16°15'S, 68°33'W, 3,850 m, rocky hillside, 5-II-1984, J. C. Solomon 11448 (holotype MO!; isotypes GH!, LPB).

**Distribution.** Endemic to Bolivia.

***Lepidium spathulatum*** Phil., Fl. Atacam. 8. 1860. *Nasturtium spathulatum* (Phil.) Kuntze, Revis. Gen. Pl. 1: 937. 1891. TYPE: Chile. Cachinal de la Costa, *R. Philippi s.n.* (holotype SGO-063990!).

**Distribution.** Endemic to Chile.

***Lepidium spicatum*** Desv., J. Bot. Agric. 3: 178. 1815. TYPE: Magallanes, *Commerson s.n.* (holotype P!; isotype P!). The more complete specimen annotated by Desvaux's handwriting is taken herein as the type.



*Lepidium racemosum* Griseb., Abh. Königl. Ges. Wiss. Göttingen 6: 116. 1854. *Lepidium spicatum* var. *racemosum* (Griseb.) Boelcke, Fl. Patag. 8(4a): 468. 1984. TYPE: Peninsula Brunswick, Oazy Harbor, *W. Lechler 1114* (lectotype GOET! designated by C. L. Hitchcock, Lilloa 11: 101. 1945; duplicates G!, P[2]!).

*Lepidium spicatum* var. *calyx-persistente* Boelcke, Parodiana 3: 26. 1984, syn. nov. TYPE: Argentina. Entre Ríos. Depto. Gualeguaychú, Pto. Constanza, arroyo Carquejas, 9-IV-1960, *A. Burkart & J. C. Gamarro 21749* (holotype SI!; isotype BAA!).

**Distribution.** Argentina and Chilean Patagonia.

**Observations.** Both Thellung (1906) and Hitchcock (1945) reduced *Lepidium racemosum* to synonymy of *L. spicatum*, but Boelcke & Romanczuk (1984) treated it as a variety of the latter. The main differences they used to separate the two varieties is the presence in var. *racemosum* of minute auricles on the upper pinnately divided cauline leaves (vs. non-auriculate and entire or trifid upper leaves). However, this variation is continuous, and mixed plants of both "varieties" are found in many collections.

***Lepidium steinbachii*** O. E. Schulz, Notizbl. Bot. Gart. Berlin-Dahlem 9: 1037. 1926. TYPE: Bolivia. Santa Cruz, Prov. Cercado, Pampitas del Río Piray, 450 m, 24V-VIII-916, *J. Steinbach 2724* (holotype B!; isotypes GH!, LIL!, SI!).

**Distribution.** Endemic to Chile and known only from the type collection above.

***Lepidium strictum*** (S. Wats.) Rattan ex B. L. Rob. in A. Gray, Syn. Fl. N. Amer. 1(1): 129. 1895. *Lepidium oxycarpum* Torr. & A. Gray var. *strictum* S. Wat. in Brewer & S. Watson, Bot. California 1: 46. 1876. TYPE: United States. California. El Dorado County, near Placerville, 1878, *V. Rattan s.n.* (holotype GH!).

**Distribution.** Apparently native to Chile and perhaps Peru, also in the western United States.

The disjunct distribution of *Lepidium strictum* in both the United States (California, Oregon) and

Chile requires studies to show if the species is indeed native to South America as suspected by Hitchcock (1945).

***Lepidium stuckertianum*** (Thell.) Boelcke, Parodiana 4(1): 40. 1986. *Lepidium bonariense* L. var. *stuckertianum* Thell., Repert. Spec. Nov. Regni Veg. 13: 302. 1914. TYPE: Argentina. Santiago del Estero, Salavina, *T. Stuckert 7434* (lectotype Z designated by O. Boelcke, Parodiana 4: 40. 1986; duplicate CORD!).

**Distribution.** Endemic to Argentina.

**Observations.** Thellung (1914) erroneously listed the above lectotype as *Stuckert 7439* instead of 7434.

***Lepidium tandilense*** Boelcke, Darwiniana 13: 521. 1964. TYPE: Argentina. Buenos Aires, Tandil, Sierras de las Ánimas, 14-X-1962, *O. Boelcke, M. N. Correa, N. M. Bacigalupo 2441* (holotype BAA!; isotypes BAB!, SI!).

**Distribution.** Endemic to Argentina.

***Lepidium trianae*** Thell., Neue Denkschr. Schweiz. Naturf. Ges. 41: 214. 1906. TYPE: Colombia. Nouvelle Grenada [Cundinamarca], Bogota, 1851-1857, 2700 m, *J. Triana s.n.* (lectotype G-DC! designated by C. L. Hitchcock, Lilloa 11: 98. 1945 and herein; duplicates BM!, G-DC!, K!, NY!, P!).

**Distribution.** Endemic to Colombia.

**Observations.** Hitchcock did not examine the lectotype he designated, and the more complete plant with flowers and fruits and annotated in Thellung's handwriting as "*Lepidium trianae* Thell. n.sp." is confirmed herein as the lectotype. The G-DC duplicate without flowers and fruits is taken as the isolecotype. Thellung (1906) cited one collection (*Weddell s.n.*; P) from Bolivia, and although I have not examined that collection, it is highly unlikely that the species extends its range that far south.

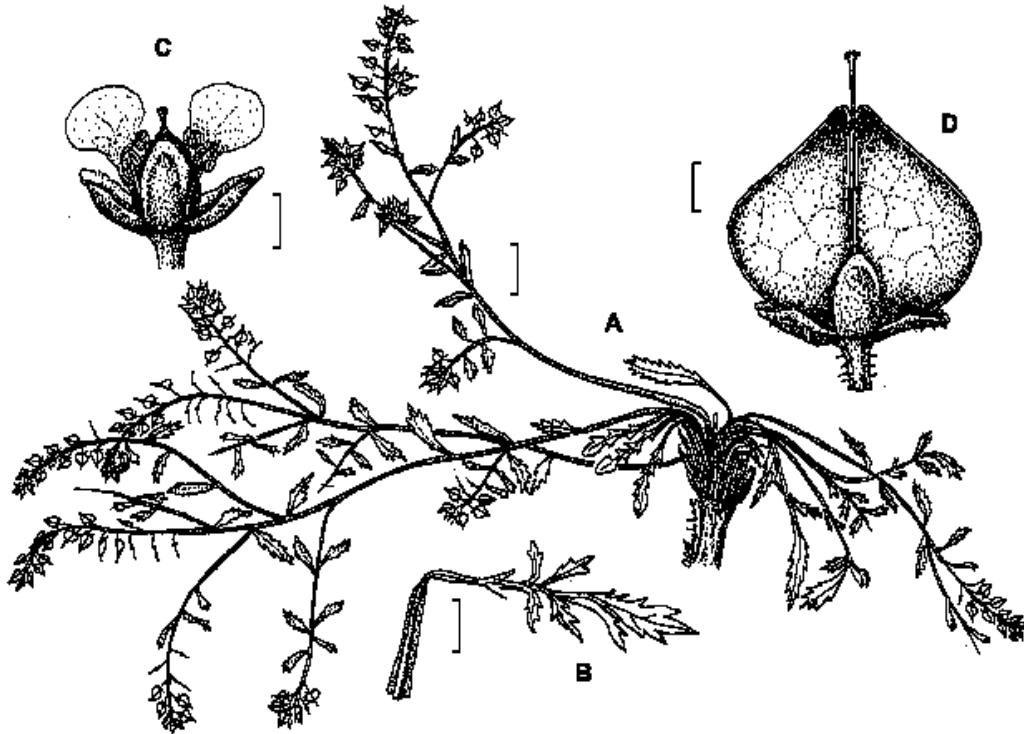


Fig. 5. *Lepidium werffii*. A, plant. B, basal leaf. C, flower (two petals removed). D, fruit. Scales: A, B = 2 cm, C, D = 1 mm. Drawn by the author from *H. van der Werff et al.* 20743 (holotype MO).

***Lepidium virginicum* L.**, Sp. Pl. 2: 645. 1753.  
TYPE: "Habitat in Virginia, Jamaicae glareosis" [lectotype Herb. Linn. # 824.18 (LINN) designated by W. Marais, *Flora of Southern Africa* 13: 94. 1970].

*Lepidium danielsii* C. L. Hitchc., *Lilloa* 11: 123. 1945, syn. nov. TYPE: Colombia. Depto. Antioquia. Medellín, VIII-1933, *H. Daniels s.n.* (holotype NY!).

**Distribution.** Native to North America, introduced into South America (Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, Surinam, Venezuela), Europe, Asia, and Australia.

**Observations.** *Lepidium danielsii* is indistinguishable from the highly variable *L. virginicum* in every aspect of the plant. However, its type has somewhat large fruits, a feature that occurs sporadically throughout the native and naturalized ranges of *L. virginicum*.

***Lepidium werffii* Al-Shehbaz, sp. nov.** TYPE: Peru. Arequipa-Ubinas road, 16°23'13" S, 71°20'47" W, 2600-3400 m, scrub, 17-IV-2006, *H. van der Werff, L. Valenzuela, & E. Sculli* 20743 (holotype MO; isotypes B, CAS, F, GH, K, SI, P, US). Fig. 5.

*Differt a Lepidio meyenii staminibus 4 (vs. 2), petalis obovatis 1.2-2.2 (vs. 0.3-0.5) mm latis, valvis reticulatis, et fructibus 4-5.5 [vs. 2.5-3.8(-4)] mm latis.*

Herbs, perennial, sparsely to densely puberulent with straight, spreading trichomes 0.01-0.2 mm; roots not fleshy; caudex simple, 0.5-2 cm in diam. Stems 4-25 cm, decumbent to ascending, often several from caudex, branched above. Basal leaves 1.7-11 cm; petioles 1-6 cm, persistent, stramineous, flattened at base; blade undivided and oblanceolate with 5-7 subapical teeth, or pinnatifid and with 2-4 dentate to incised lateral lobes on

each side; cauline leaves shortly petiolate to subsessile, lacinate, not auriculate at base. Racemes lax, terminal, elongated considerably in fruit; rachis puberulent with straight trichomes; fruiting pedicels slender, straight, spreading, 4-7 mm, narrowly winged, glabrous abaxially. Sepals oblong, 1.5-2 mm, persistent; petals white, obovate, 2-3.5 × 1.2-2.2 mm, longer than sepals; stamens 4, median; filaments 1-1.5 mm; anthers 0.4-0.5 mm. Fruits dehiscent, broadly rhombic, 2.5-4.5 × 4-5.5 mm, distinctly wider than long, subconstricted below apex, glabrous, distinctly veined, narrowly winged apically, apex emarginate; apical notch 0.05-0.2 mm; style 0.5-1 mm, exerted from apical notch. Seeds brown, ovate-oblong, wingless, 1.4-1.8 × 0.8-1 mm; cotyledons incumbent.

**Etymology.** *Lepidium werffii* is named in honor of Henk van der Werff (1946- ), the world expert on the family Lauraceae and one of the collectors of the type gathering.

**Distribution and habitat.** The species grows in scrub and puna vegetation at 2600-4200 m in southern Peru.

**Observations.** *Lepidium werffii* is most closely related to *L. meyenii*, from which it differs by having obovate (vs. linear to oblanceolate) petals 1.2-2.2 (vs. 0.3-0.5) mm wide, four (vs. two) stamens, broadly rhombic (vs. elliptic to rhombic-suborbicular) fruits 4-5.5 [vs. 2.5-3.8(-4)] mm wide and distinctly wider (vs. narrower) than long, and veined (vs. not veined) fruit valves.

#### Paratypes

PERU. **Arequipa.** Arequipa-Ubinas road, *Werff, et al. 20812* (BM, E, G, MO, NY). **Tacna.** Prov. Tarata, Cord. del Barroso, *Torre et al. 2111* (MO).

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