

más, el aumento gradual de características lecheras y refinamiento del ganado, permite un lapso de aclimatación y resistencia a condiciones adversas del trópico entre una y otra generación sobre todo que la sangre criolla se va diluyendo pero no se pierde del todo.

¿Hasta qué grado se puede continuar con cruces recíprocos sin llegar a encontrar un efecto desfavorable en cuanto a producción y adaptación de las vacas encastadas? Dicho fenómeno aún no lo hemos encontrado, a pesar de tener vaquillas 31/32, o sean del F₅ iniciando lactancias. En lo futuro puede llegar a ocurrir dicho cambio retrospectivo y si es que se presenta, nos dará una base para definir el camino a adoptar, ya sea el retrocruce o el uso de sementales con el grado de encaste deseado.

LITERATURA CITADA

1. Hendrick, J. F. 1953. Standardizing Dairy-Herd-Improvement Association Records in Proving Sires. USDA. Washington, D. C.

THE SCROPHULARIACEAE-BUCHNEREAE OF CENTRAL AMERICA

by 700606
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In 1954 I published in *Ceiba* (4: 164-184) a taxonomic account of the tribes and genera of the Scrophulariaceae of Central America. Keys to the tribes and genera were given therein. The present paper includes an enumeration of the Central American representatives of the tribe Buchnereae (including the genera *Escobedia*, *Melasma*, *Alectra*, *Agalinis*, *Anisantherina*, and *Buchnera*), data on distribution, and keys to species of those genera containing more than one species. The herbaria from which specimens were borrowed are indicated by the abbreviations used by Lanjouw and Stafleu (Index Herbariorum, I. The herbaria of the world. 3rd ed. Regnum Vegetabile 6. 1956). Grateful ac-

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knowledge is extended to the curators of these herbaria for loan of material under their care.

ESCOBEDIA Ruiz et Pavon

Key to species

- A. Leaves linear or linear-lanceolate B.
 A. Leaves oblong-lanceolate, ovate, or elliptic-lanceolate C.
 B. Calyx lobes linear-lanceolate 1. *E. laevis*
 B. Calyx lobes triangular, about as broad as long 2. *E. guatemalensis*
 C. Calyx abundantly pustular, harsh between the ribs 3. *E. reticulata*
 C. Calyx not pustular between ribs or rarely with a few scattered pustules D.
 D. Calyx with 5 prominent ribs 4. *E. grandiflora*
 D. Calyx with 10 prominent ribs 5. *E. longiflora*
1. *Escobedia laevis* Schlechtendal et Chamisso, *Linnaea* 5: 108. 1830. Corolla white. Meadows, marshes, sandy pine uplands, hillside bogs.

BRITISH HONDURAS. Mountain Pine Ridge, Conservator of Forests 92 (F), *Lundell* 6692 (MICH, PH).

GUATEMALA. Peten: La Libertad, *Aguilar* 75 (F, GH, MICH, MO, NY). Huehuetenango: Río Pucal, *Standley* 82227 (F, PH); near ruins of Zacaleu, *Standley* 82759 (F); below Miramar, *Steyermark* 51559 (F, PH). Quiche: above Sacapulas, *Standley* 62478 (F, PH). Chimaltenango: near Tecpán, *Skutch* 582 (F, PH, US); southeast of Chimaltenango, *Standley* 81044 (F).

HONDURAS. Comayagua: near Siguatepeque, *Yuncker et al.* 5805 (F, GH, MO).

2. *Escobedia guatemalensis* Loesner, *Verh. Bot. Ver. Brandenburg* 53:83. 1911. Corolla white, with pale green cast on tube. Rocky, grassy slopes.

GUATEMALA. Huehuetenango: between Nentón and Las Palmas, *Steyermark* 51609 (F); Uxac-Canal, *Seler* 2663 (GH).

Guatemala: Dept. Guatemala, *Aguilar* 205 (F); La Aurora, *Ruano* 565 (US). Jalapa: east of San Pedro Pinula, *Steyermark* 32965 (F).

3. *Escobedia reticulata* Pennell, Proc. Acad. Nat. Sci. Philadelphia 83:420. 1931. Corolla white. Swampy meadows.

COSTA RICA. Alajuela: San Ramon, *Brenes* 4748 (F). Puntarenas: between Boruca and Térraba, *Tonduz* 4595 (US); Ciénaga de Agua Buena *Pittier* 11118 (US).

PANAMA. Chiriquí: vicinity of Boquete, *Woodson et al.* 1163 (F, GH, MO, NY), *Woodson and Schery* 727 (GH, MO, PH).

4. *Escobedia grandiflora* (Linnaeus filius) O. Kuntze, Rev. Gen. 3, II: 231.1893. Corolla white. Prairies and grassy slopes.

COSTA RICA. Alajuela: San Ramón, *Brenes* 20118 (NY), San Pedro de San Ramón, *Brenes* 4310 (F, NY, PH). San Jose: between Santiago and Picacho Mondongo, *Brenes* 16961 (F); Las Cónavas, *Lankester*, s.n. (US), *Lankester* 251 (F).

5. *Escobedia longiflora* Pennell, Proc. Acad. Nat. Sci. Philadelphia 83: 423. 1931. Corolla white. Grassy or oak-pine slopes.

GUATEMALA. Huehuetenango: Cerro Pixpix, *Steyermark* 50575 (F, NY, PH, US); above La Libertad, *Steyermark* 50975 (F, PH); La Sierra, *Steyermark* 51985 (F, PH). Quiché: near Quiché, *Standley* 62444 (F); Joyabáj, *Heyde & Lux* 3057 (US). San Marcos: Tajumulco, *Steyermark* 36565 (F). Chimaltenango: near Tecpán, *Skutch* 570 (PH, US). Sacatepéquez: Santiago, *Gómez* 791 (GH, US); Volcán de Agua, *Shannon* 3618 (US). Jalapa: south of Miramundo, *Steyermark* 32738 (F).

MELASMA Bergius

1. *Melasma physalodes* (D. Don) Melchior, Notizbl. Bot. Gart. Berlin 15:122. 1940.

Scrophularia physalodes D. Don, Trans. Linn. Soc. 15:353. 1827.

Lyncea hispida Schlechtendal et Chamisso, Linnaea 5:109. 1830.

Melasma hispidum (Schlechtendal et Chamisso) Bentham, Comp. Bot. Mag. 1:202. 1835.

Cacabus hondurensis Donnell Smith, Bot. Gaz. 56:60. 1913.

Eutheta hondurensis (Donnell Smith) Standley, Field Mus. Publ. Bot. 8:325. 1931.

Corolla white. Thickets, lava fields, barranca slopes, and forests.

GUATEMALA. Huchuetenango: San Antonio Huista, *McL- bus & Goodman* 3669 (F). Chiquimula: east of Camotán, *Steyer- mark* 31716 (F). Guatemala: Dept. Guatemala, *Aguilar* 279 (F). Santa Rosa: Oratorio, *Standley* 60641 (F).

HONDURAS. Copán: near Copán, *Pittier* 1828 (US).

ALECTRA Thunberg

1. *Alectra melampyroides* (L. C. Richard) O. Kuntze, Rev. Gen. 2: 458. 1891.

Pedicularis melampyroides L. C. Richard, Act. Soc. Hist. Nat. Paris 1: 111. 1792.

Melasma melampyroides (L. C. Richard) Pennell, Sci. Surv. Porto Rico and Virgin Isl. 6: 188. 1925.

Corolla yellow. Savannas, brushy slopes, open places, and swampy areas in grassland.

BRITISH HONDURAS. Forest Home, *Schipp* 1082 (F, GH, MICH, MO, UC).

GUATEMALA. Alta Verapaz: vicinity of Sachaj, *Steyermark* 45156 (F, PH), 45715 (F).

AGALINIS Rafinesque

Key to species

- A. Pedicels to 3 mm. long 1. *A. harperi*
 A. Pedicels 20 - 50 mm. long. 2. *A. peduncularis*

1. *Agalinis harperi* Pennell, in Small, Fl. Miami 167. 1913.

Gerardia harperi (Pennell) Pennell, Monogr. Acad. Nat. Sci. Philadelphia 1: 441. 1935.

Corolla pink, with red or purple spots. Sedgey uplands, swamps, wet pine barrens.

BRITISH HONDURAS. All Pines, *Schipp* 614 (F, GH, MICH, MO, NY, PH, UC); Mountain Pine Ridge, *Lundell* 6643 (GH, MICH, NY, PH, US), *Bartlett* 11595 (MICH, PH); Manatee Pine Ridge, *Gentle* 103 (MICH).

2. *Agalinis peduncularis* (Bentham) Pennell, *Rhodora* 20: 135. 1918.

Gerardia peduncularis Bentham, in Hooker, *Comp. Bot. Mag.* 1: 209. 1836.

Corolla pink. Pine-oak or pine forests.

GUATEMALA. Huehuetenango: 10 km. east of Huehuetenango, *Standley* 82086 (F). Sacatepéquez: Volcán de Agua *Shannon* 3651 (US); Santiago, *Gómez* 835 (GH, NY, US).

ANISANTHERINA Pennell

1. *Anisantherina hispidula* (Martius) Pennell, *Mem. Torr. Bot. Club* 16: 106. 1920.

Gerardia hispidula Martius, *Nov. Gen. et Sp.* 3: 13. 1829.

Corolla pink. Savannas, Swampy grasslands, pinelands.

BRITISH HONDURAS. Belize, *Bartlett* 11242 (MICH); All Pines, *Schipp* 591 (F, GH, MICH, MO, UC); Honey Camp, *Lundell* 587 (F, MO, NY, US); Boomtown, *O'Neill* 8745 (MICH); Maskall Pine Ridge, *Gentle* 1359 (F, GH, MICH, MO, NY, US); Gracie Rock, Sibun River, *Gentle* 1791 (MICH, PH); Swasey Branch, Monkey River, *Gentle* 3751 (GH, MICH, MO, NY, US).

PANAMA. Veraguas: west of Soná, *Allen* 1070 (MO). Coclé: Aguadulce, *Pittier* 4857 (US); Nata, *Allen* 821 (MO, NY, PH, US). Panamá: near Chepo, *Pittier* 4664 (US).

BUCHNERA Linnaeus

None of the genera of New World Scrophulariaceae is in more acute need of monographic treatment than *Buchnera*. The following synopsis of Central American *Buchnera* is offered as a provisional one that will probably be modified somewhat when a monograph of the genus is finally undertaken.

Key to species

A. Calyx tube glabrous 1. *B. weberbaueri*

- A. Calyx tube hispid or strigose B.
 B. Stem leaves much reduced below the inflorescence; well-developed leaves mostly confined to lower half of stem. C.
 B. Stem with well developed or but little reduced leaves to the inflorescence D.
 C. Calyx with 10 prominent or obscure primary veins (those running into tips of lobes and into sinuses), secondary veins obscure or lacking; stem with scattered, upwardly strongly appressed strigose hairs; usually 2 — 7 (average 4) pairs of well developed leaves; well developed leaves flat, though margins sometimes revolute; leaves not rigid, often wrinkling in drying, lanceolate to ellipsoid, veins not markedly prominent 2. *B. elongata*
 C. Calyx with 10 prominent primary veins, secondary veins also prominent; stem more densely pubescent, hairs mostly erect or spreading; usually 4 — 15 (average 10) pairs of well developed leaves; leaves thick, rigid, usually revolute in drying, mostly lanceolate, with 3 — 5 prominent parallel veins 3. *B. virgata*
 D. Calyx glabrous between the nerves 4. *B. pusilla*
 D. Calyx hispid between the nerves 5. *B. pilosa*

1. *Buchnera weberbaueri* Diels, Bot. Jahrb. 37:430. 1906.
Buchnera leiantha Standley, Field Mus., Publ. Bot. 22: 105. 1940.

The type of *B. weberbaueri*, collected in Peru by Weberbauer No. 4595) in 1904, was destroyed in Berlin in 1943. Unsuccessful attempts to locate a duplicate of the type were made at Chicago Natural History Museum and, through correspondence, at United States National Herbarium, Gray Herbarium, Conservatoire et Jardin Botaniques de Genève, Herbario San Marcos (Lima), and Herbario La Molina (Lima). Fortunately, a photograph of the type specimen is extant (Chicago Natural History Museum negative No. 12330),

Corolla white, bluish, lavender, or purple. Pastures, savannas, and sandy pine uplands.

BRITISH HONDURAS. Mountain Pine Ridge, *Lundell* 6783 (PH).

PANAMA, Coclé: El Valle, *Allen* 2238 (MO); Picacho de Ola, *Pittier* 5069 (GH, US). Chiriquí: Boquete, *Pittier* 3364 (GH, NY, US), *Terry* 1273 (F, GH, MO); Cerro Vaca, *Pittier* 5359 (US).

2. *Buchnera elongata* Swartz, Prod. Veg. Ind. Occ. 92. 1788.

Buchnera floridana Gandoger, Bull. Soc. Bot. France 66: 217. 1919.

Corolla violet or sometimes white. Clearing, beaches, savannas, pastures, and plains.

BRITISH HONDURAS. Corozal, *Gentle* 430 (F, MICH), 4866 (F, GH, MICH, MO, NY); Gracie Rock, Sibun River, *Gentle* 1773 (MICH).

GUATEMALA. Peten: Lake Petén, *Lundell* 3157 (PH); La Libertad, *Lundell* 2304 (F, MICH), 2310 (MICH), 2397 (MICH), 3674 (PH), 3743 (MICH). Izabal: Cristina, *Blake* 7566 (GH, US).

HONDURAS. Copán: La Florida, *Blake* 7431 (US). Comayagua: Siguatepeque, *Standley & Chacón* 6389 (F), *Yuncker et al.* 5591 (GH).

3. *Buchnera virgata* Humboldt, Bonpland, et Kunth, Nov. Gen. et Sp. 2:342. 1818. Corolla white, pink, mauve, or purple. Grassy slopes.

PANAMA. Isla Taboga, *Allen* 1281 (GH, MO, PH, US), *Killip* 3171 (US), *Macbride* 2819 (F, PH, US), *Miller* 2032 (US), *Pittier* 3594 (US), *Standley* 28024 (US), *Woodson et al.* 1466 (MO). Canal Zone. Ancon Hill, *Killip* 12076 (PH, US), *Pennell* 10000 (NY), *Piper* 5542 (US), 5546 (US), 5577 (US), *Standley* 26346 (US), Hacienda la Joya, *Dodge et al.* 16881 (MO).

4. *Buchnera pusilla* Humboldt, Bonpland, et Kunth, Nov. Gen. et Sp. 2:340. 1818.

Buchnera tinctoria Bertoloni, Fl. Guatim. 26. 1840.

Buchnera major Polakowsky, Linnaea 41:588. 1877.

Buchnera mexicana Hemsley, Biol. Centr. Amer. Bot. 2:457. Corolla white, pink, blue, or purple. Meadows, savannas, grassy, brushy, or rocky slopes, and pine and oak forests.

BRITISH HONDURAS. Honey Camp, *Lundell* 147 (F), 644 (F, GH, NY, PH, UC, US); Monkey River, *Gentle* 3635 (GH, MICH, MO, NY); Belize, *Bartlett* 11246 (MICH); Manatee Lagoon, *Peck* 148 (GH, NY); Gracie Rock, Sibun River, *Gentle* 1773 (MO, PH); Maskall Pine Ridge, *Gentle* 951 (F, MICH, MO, NY, PH); between Mullins River and Manatee, *Gentle* 3391 (GH, MICH, NY); Seine Bight, *Schipp* 138 (F, MO); Mountain Pine Ridge, *Bartlett* 11630 (MICH, PH), *Lundell* 6783 (MICH, PH).

GUATEMALA. Peten: La Libertad, Dampf s.n. (F), *Lundell* 2458 (MICH). Huehuetenango: Amatenango, *Shannon* 314 (US); Chiantla, *Standley* 82541 (F); east of Huehuetenango, *Standley* 82026 (F). Quiché: Quiché, *Grant* 693 (F, GH). Alta Verapaz: southwest of Lanquin, *Steyermark* 44041 (F, PH); between Cahabon and Secanquim, *Goll* 106 (US), 113 (US); Secanquim, *Cook et al.* 298 (US). Izabal: Cristina, *Blake* 7663 (US); near Izabal, *Steyermark* 38639 (F). Quetzaltenango: Zunil, *Standley* 84822 (F). Chimaltenango: near Chimaltenango, *Standley* 79879 (F, PH), 59102 (F, PH); southeast of Patzún, *Standley* 61598 (F, PH); along road from Chimaltenango to San Martín Jilotepeque, *Standley* 64396 (F). Sacatepéquez: Antigua, *Standley* 60885 (F, GH, MICH, NY, PH, US). Guatemala: Amatitlán, *Morales* 158 (F), *Türckheim* 8718 (GH, US); Guatemala, *Fosberg* 19040 (US); between Guatemala and Fiscal, *Standley* 59730 (F); between Guatemala and San Raimundo, *Standley* 63007 (F, PH). Jalapa: north of Jalapa, *Standley* 76957 (F). Santa Rosa: Cerro Redondo, *Steyermark* 52212 (F); Naranjo, *Heyde & Lux* 4010 (GH, NY, US). Jutiapa: Jutiapa, *Standley* 75317 (F), 76169 (F).

HONDURAS. Santa Bárbara: Los Dragos, *Standley & Lindellie* 7417 (F), 7480 (F). Comayagua: Siguatepeque, *Standley* 56030 (F, US). Morazán: Galeras, *Standley* 23978 (F, NY, US); Las Mesas, *Rodríguez* 3692 (PH); near Santa Clara, *Williams* 15944 (F, GH), *Standley* 23405 (F). El Paraíso: between Danlí and La Granja, *Standley* 16872 (F); Galeras, *Williams & Molina* 10688 (F), *Standley* 14892 (F); Güinope, *Williams & Molina* 15702 (F, GH), *Standley et al.* 2138 (F); Ojo de Agua, *Standley et al.* 1265 (F); northeast of Catacamas, *Standley* 18482 (F).

EL SALVADOR. Santa Ana: northeast of Metapan, *Carlson* 859 (F); Santa Ana, *Standley* 20359 (GH, US, NY). Cuscatlán: Guayabal, *Calderón* 1963 (NY, US). San Salvador: San Salvador,

Calderón 168 (GH, NY, US), *Standley* 19293 (GH, NY, US), *Velasco* 8871 (GH, US); Volcán de San Salvador, *Carlson* 495 (F). La Libertad, *Carlson* 168 (F).

NICARAGUA. Catarina, *Baker* 182 (GH, MO, NY, UC), 598 (US).

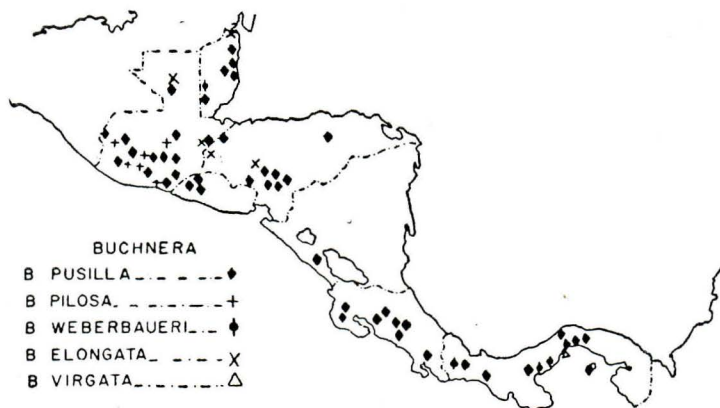
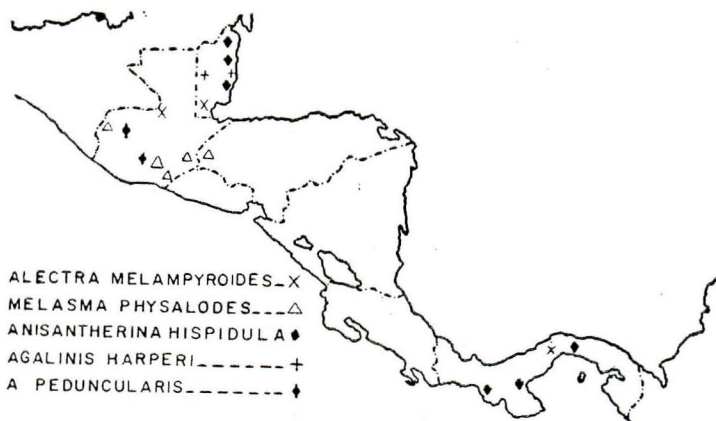
COSTA RICA. Guanacaste: Cerro de San José, *Dodge & Thomas* 6457 (F, MO); El Viejo, *Oersted* 9344 (NY, US). Alajuela: Buenos Aires, *Valerio* 836 (F); hills near San Pedro, *Brenes* 4812 (F, NY); Colinas de San Pedro, *Brenes* 23125 (NY); Zarcero, *Smith* 213 (US); Río Poas, *Brenes* 1220 (F), 17375 (F, NY). San José: San Francisco de Guadalupe, *Tonduz* 1791 (US), 7732 (NY, US); near San José, *Standley* 32198 (US); vicinity of San Sebastián, *Standley* 32721 (US); vicinity of Santa María de Dota, *Standley* 42464 (US), 44028 (PH, US), 43213 (PH, US). Cartago: El Atto, *Allen* 654 (GH, MO); north of Cartago, *Standley* 49399 (US); Dulce Nombre, *Standley* 35826 (US).

PANAMA. Chiriquí: El Boquete, *Pittier* 3364 (GH); Cerro Vaca, *Pittier* s.n. (US). Coclé: between Porto Posada and Penonomé, *Williams* 184 (NY, US). Canal Zone: Balboa, *Standley* 25296 (PH, US), 26409 (US); Chiva-Chiva Trail, *Piper* 5745 (PH, US); Las Cruces Trail, *Standley* 29035 (US). Panamá: north of Panamá, *Paul* 391 (US); between Panamá and Chepo, *Dodge et al.* 16659 (MO); near Chepo, *Hunter & Allen* 33 (MO), *Pittier* 4597 (US); near Pacora, *Allen* 1001 (MO); east of the Río Tecumen, *Standley* 26616 (US); Cocoli Island, vicinity of Miraflores Lake, *White* 289 (GH, MO). Pearl Archipelago: San José Island, *Erlanson* 529 (GH, US), 569 (GH, NY, US), *Harlow* 77 (GH), *Johnson* 180 (GH, MO, US).

5. *Buchnera pilosa* Bentham, Bot. Voy. Sulphur 144. 1844.

Corolla lavender or purple. Oak and pine forests, dry open slopes, and savannas.

GUATEMALA. Huehuetenango: Huehuetenango, *Skutch* 1127 (GH), 1617 (GH), *Steyermark* 48134 (F); Cerro Pixpix, *Steyermark* 50633 (F, PH). Baja Verapaz: Santa Rosa, *Türckheim* 1279 (US), 2330 (US). Sololá: Volcán Santa Clara, *Steyermark* 47083 (F, PH). Chimaltenango: Tecpán, *Skutch* 576 (F, PH, US); Chimaltenango, *Standley* 59090 (F), 64389 (F). Guatemala: Guatemala, *Tonduz* 622 (F, GH, NY, PH, US); Volcán de Pacaya, *Standley* 58318 (F). Sacatepéquez: Antigua, *Standley* 61256 (F, PH). Santa Rosa: Estanzuela, *Heyde & Lux* 4011 (GH, NY, US).



Distribution of Central American Scrophulariaceae-Buchnereae