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NEW FLOWERING PLANTS FROM THE
GALAPAGOS ISLANDS

BY

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In the course of my studies on the rich collections of flowering plants of the Templeton Crocker Expedition of the California Academy of Sciences, 1932, from the Galapagos Islands, a number of plants have appeared to be new and undescribed. Although some of these must await further study or comparison with critical historical specimens and types, a few have seemed undoubtedly new and worthy of taxonomic recognition. Descriptions of these new plants from the Galapagos Islands are given herewith.

***Drymaria monticola* Howell, spec. nov.**

Herba glabra; caulibus decumbentibus, radicanibus, lignescentibus in senectute; foliis 1-2.5 cm. longis, late ovatis, suborbicularibus, subsessilibus, basi rotundis vel subcordatis, ex basi 3 nervis prominentibus et nonnullis minoribus, abrupte acutis et cuspidatis, integris, stipulis numerosis, filiformibus, subcaducis; inflorescentia pauciflora, pedicellis 2-5 mm. longis, glabris; sepalis 4, 6 mm. longis, elliptico-lanceolatis, 3-nervatis, subcarinatis, acutis; petalis 4 vel 5, 4-5 mm. longis, fissis 3-3.5 mm., lobis circa 1 mm. latis, obtusis, ungui angustissimo; staminibus 5, ovarium subaequantibus, filamentis glabris, antheris oblongis; stylo 1 mm. longo, trifido, capsula vix angulata supra, dura et nitenti, glabra; seminibus 16, muriculato-tuberculatis.

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Creeping, glabrous plant, the old stems becoming woody, rooting; leaves broadly ovate, nearly round, subsessile, subcordate or rounded at base, with 3 prominent and several less prominent nerves, 1-2.5 cm. long, shortly acute and cuspidate, entire; stipules numerous, filiform, more or less caudaceous; inflorescence few-flowered, pedicels 2-5 mm. long, glabrous; sepals 4, 6 mm. long, elliptic-lanceolate, 3-nerved, somewhat carinate along midrib, acute; petals 4 or 5, 4-5 mm. long, cleft 3-3.5 mm., the lobes about 1 mm. wide, obtuse, the claw very narrow; stamens 5, about equalling the ovary, filaments glabrous, anthers oblong; style 1 mm. long, 3-parted $\frac{1}{4}$ - $\frac{1}{3}$ length, capsule scarcely angled above, hard and shining, glabrous, 16-seeded; seeds muriculate-tuberculate.

Type: Herb. Calif. Acad. Sci. No. 213492, collected on the summit of Mt. Crocker, INDEFATIGABLE ISLAND, *Howell No. 9243*.

This *Drymaria* is related to *D. macrantha* Gray but the entire plant is glabrous and the flowers are only $\frac{1}{2}$ to $\frac{2}{3}$ as large. The collection of *Drymaria* made by Miss Rorud on Indefatigable Island at Hacienda Fortuna and doubtfully referred by Christophersen to *D. cordata* (Nyt. Mag. Naturvid. 70:75) may be *D. monticola*. The two species can be readily separated by the pedicels which in *D. cordata* are closely glandular-papillose.

***Euphorbia bisulcata* Howell, spec. nov.**

Herba annua glabra; caulibus 6-8 dm. altis, erectis, ramulis numerosis, subdivaricatis; foliis oppositis, oblongo- vel lineari-lanceolatis, 0.2-1.5 cm. longis, 0.5-2 mm. latis, integris, subacutis, basi obliquis et auriculatis, cinereo-viridibus vel rufescentibus, utrinque subsimilibus, petiolis brevissimis, stipulis parvis, circa 0.5 mm. longis, filiformibus, basi plus minusve coalescentibus; involucris axillaribus, brevissime pedicellatis, campanulatis, 0.5-0.75 mm. longis, lobis involucralibus triangulari-subulatis, sparse ciliatis, glandulis transverse oblongis, atropurpureis, appendicibus non evidentibus vel angustissimis; ovario glabro; stylis brevibus, bifissis ad medium; capsula depresso-globosa, circa 1.5 mm. longa et 2 mm. lata, basi rotundata, apice trilobata, dorso carpelli late bisulcato, sulcis carina abrupta acuta separatis, sulcis carpellorum contiguorum carina lata, plana, septali separatis; seminibus quadrangularibus, suboblongis, 1 mm. longis, cinereis, profunde propinque et transverse rugosis, rugis plus minusve fractis et muriculatis.

Annual, glabrous, herb; stems 6-8 dm. tall, erect, branchlets numerous, somewhat divaricate; leaves opposite, oblong- or linear-lanceolate, 0.2-1.5 cm. long, 0.5-2 mm. broad, entire, subacute, oblique and auriculate at base, gray-green or reddish-brown, the upper and lower surfaces nearly the same, petioles very short, stipules small, circa 0.5 mm. long, filiform, more or less coalescent below; involucre axillary, very shortly pedicellate, campanulate, 0.5-0.75 mm. long, involucral lobes triangular-subulate, sparsely ciliate, gland transversely oblong, purplish-black, appendage not evident or very narrow; ovary glabrous; style short, cleft to the middle into 2 broad branches; capsule depressed-globose, about 1.5 mm. long and 2 mm. wide, rounded at base, 3-lobed at summit, back of each carpel broadly bisulcate, the grooves on the carpels separated by an abrupt sharp ridge, the grooves of adjacent carpels separated by a broad, flattened, septal ridge; seeds quadrangular, oblongish, 1 mm. long, ashy, deeply and closely transversely wrinkled, the wrinkles more or less broken and muriculate.

Type: Herb. Calif. Acad. Sci. No. 220745, north side, INDEFATIGABLE ISLAND, *Howell No. 9880*, June 9, 1932.

This *Euphorbia* is most closely related to *E. diffusa* Hook. f. but it differs from this and all the other Galapagian species of *Euphorbia* in the bisulcate backs of the carpels which together form the peculiar 6-ridged fruit.

***Malvastrum dimorphum* Howell, spec. nov.**

Planta herbacea, perennis (?); caulibus erectis, 2 m. altis; foliis ovatis, dentatis vel crenato-dentatis, acutis, latissime cuneatis vel subcordatis basi, cinereo-viridibus supra, pallidioribus incanisque subter, foliis primariis magnis, 4-7 cm. longis, 3-5.5 cm. latis, petiolis 3-5 cm. longis, foliis superioribus et secundis parvis, 1.5 cm. longis, 1 cm. latis, petiolis 2-4 mm. longis; floribus primo solitariis in pedicellis longis ex axillis foliorum magnorum primariorum, pedicellis 1-2 cm. longis, vel tardius subsessilibus congestis solitariisve in ultimis caulibus vel in ultimis ramulis contractis axillaribus peduncularibus; bracteolis 3, filiformibus, 0.5 cm. longis; calyce 1.5-2 cm. lato, in fructu stellato-rotato, fisso infra medium, lobis ovato-lanceolatis, subacuminatis, utrinque pubescentibus; corolla lutea, 1-5 cm. diametro, petalis subintegris, late obovatis basi barbatis; tuba staminali stellato-pubescenti; stylis staminibus aequilongis; carpellis circa 12, stellato-depressis, 4 mm. longis, in exteriori angulo cornibus 2, gracilibus, prominentibus, horizontalibus, radialiter extendentibus et in interiori angulo puncta brevissima erecta, pubescentibus circum undique, dense supra; seminibus oblique reniformibus, subopacis, laevibus.

Plant herbaceous, probably from a perennial base, clothed with dense, close stellate pubescence; stems erect, 2 m. tall; leaves ovate, dentate or crenate dentate, acute, very broadly cuneate to subcordate at base, gray-green above, paler and incanous below, primary leaves large, 4-7 cm. long, 3-5.5 cm. wide, petioles 3-5 cm. long, the upper leaves and secondary leaves small, 1.5 cm. long, 1 cm. wide, petioles 2-4 mm. long; flowers at first solitary on long pedicels from the axils of the large primary leaves, pedicels 1-2 cm. long, or later subsessile congested or solitary near the ends of stems or at the ends of abbreviated peduncle-like axillary branchlets; bractlets 3, filiform, 0.5 cm. long; calyx 1.5-2 cm. broad, subrotate in fruit, cleft to below the middle, lobes ovate-lanceolate, subacuminate, pubescent above and below; corolla yellow, 1.5 cm. in diameter, petals subentire, obovate, bearded at base; stamen-tube stellate-hairy; styles equalling stamens; carpels 4 mm. long with 2 prominent horizontal, outwardly pointing horns at outer angle and a very short, inconspicuous, erect point at the inner angle; pubescent on all sides, densely so above; seed obliquely reniform, somewhat dull, smooth.

Type: Herb. Calif. Acad. Sci. No. 220768, Academy Bay, INDEFATIGABLE ISLAND, *Howell No. 9294*, May 13, 1932. Other collections, all from Indefatigable Island: southeast side at 600 ft., *Stewart No. 2014* and *No. 2015* (reported as *M. spicatum*); Academy Bay, *Schimpff No. 35* (determined as *M. scoparioides*). Almost without doubt, the flowering collection reported by Dr. H. K. Svenson as ?*Sida* sp. (*Amer. Journ. Bot.* 22: 244, —1935) is to be referred here.

This *Malvastrum*, whose name connotes the diverse aspect of habit, leaves, and inflorescence in youth and age, is related to *M. scoparium* (L'Her.) Gray and to *M. scoparioides* Ulbr. (*Notizbl. Bot. Gart. Berlin*, 11: 525, —1932). Like the latter, *M. dimorphum*

differs from *M. scoparium* in the much larger flowers and fruit, but *M. dimorphum* appears very distinct from *M. scoparioides* in the dimorphic characters of leaves and inflorescence and in the very different carpellary horns. A specimen of *M. scoparium* (Chosica, Peru, *Macbride & Featherstone* No. 531) and a photograph of the type of *M. scoparioides* (Peru, *Weberbauer* No. 3196, ex Mus. Bot. Berol.) were kindly loaned for study by the Field Museum of Natural History.

***Salvia floriana* Howell, spec. nov.**

Perennis, suffrutescens, humilis; caulibus 1.5-9 dm. altis, puberulis, erectis; foliis deltoideo-ovatis, 1-2.5 cm. longis, 0.5-2 cm. latis, obtusis subacutisve, truncatis vel late rhomboideis basi, prominenter crenato-serratis, petiolis 0.5-1.5 cm. longis; verticillastris 7-20-floris, racemosis, distantibus subter, contiguis supra, bracteis deciduis, oblongo-linearibus, pubescentibus, 1.5 mm. longis, pedicellis canescentibus, circa 2 mm. longis; calyce tubulato-campanulato, subturbinato, subtruncato supra, 3 mm. longo in flore, 4-5 mm. longo in fructu, striate 13-nervato, pubescenti, glanduloso, ciliato, bilabiato, labio superiore late subquadrilaterali et vix apiculato, inferiore bilobato, lobis asymmetricis late ovato-triangularibus, breviter acutis; corolla alba, conspicue exserta, labio inferiore 4 mm. longo, trilobato, lobis lateralibus 2, parvis, medio magno, subquadrangulato, labio superiore obcordato, 1.5 mm. longo; filamentis subglabris, connectivo longe producto, filamento longiore, rudimentis staminum superiorum parvis; stylo clavellato, lobo inferiore obsoleto; nuculis subobovatis, opacis, brunneis, trigonis, dorso plano-convexo, faciebus ventralibus planis.

Low suffrutescent perennial; stems 1.5-9 dm. tall, puberulent, erect; leaves deltoid-ovate, 1-2.5 cm. long, 0.5-2 cm. wide, brownish-green and minutely pubescent above, incanous and submentose below, finely but definitely rugulose, obtuse or subacute, truncate or broadly rhomboidal at base, prominently crenate-serrate; petioles 0.5-1.5 cm. long; flowers verticillate, the verticils 7-20-flowered, racemose, distant below, forming a continuous inflorescence above, subtended by early deciduous, oblong-linear, pubescent bracts 1.5 mm. long, pedicels canescent and about 2 mm. long; calyx tubular-campanulate, subturbinate, subtruncate above, 3 mm. long in anthesis, 4-5 mm. long in fruit, striately 13-nerved, pubescent, glandular, ciliate, 2-lipped, the upper lip broadly subquadrilateral and scarcely pointed, the lower lip 2-lobed, the lobes asymmetrical, broadly ovate-triangular, shortly acute; corolla white, conspicuously exserted, the lower lip 4 mm. long, with 2 small lateral lobes and large expanded subquadrangular middle lobe, the upper lip obcordate, 1.5 mm. long; filaments subglabrous, connective long-produced, longer than the free part of the filament, rudiments of upper stamens present; style clavellate, the lower lobe obsolete; nutlets subobovate, dull, brown, trigonous, plano-convex dorsally, the inner faces plane.

Type: Herb. Calif. Acad. Sci. No. 220744, from the summit of Floreana Peak, CHARLES ISLAND, *Howell* No. 9336, May 15, 1932.

This is the plant collected by Stewart (*No.* 3339 and 3340) and reported by him as *S. prostrata* (Proc. Calif. Acad. Sci., ser. 4, 1: 135); and it is probably the plant collected by Darwin and reported by Hooker f. as *S. tiliaefolia* (Trans. Linn. Soc. 20: 200). In habit

and foliage, *S. floriana* looks like a xerophytic form of *S. tiliaefolia* but in the characters of the flower it is very different. The style appears especially remarkable.

***Elvira atripliciformis* Howell, spec. nov.**

Herba annua, caulibus strigosis, decumbentibus, 2-5 dm. longis, raro radicantibus; foliis ovatis, 1-5 cm. longis, 0.5-2.5 cm. latis, acutis, serratis, subflaccidis, sparse pubescentibus et minute scabridulis, petiolis brevibus, 2-5 mm. longis, subcuneate marginatis subter basi rotunda folii; capitulis 1 vel 2 in axillis foliorum, compressis vel saepe tripteris, brevissime pedunculatis, floribus 2 vel 3; bracteis involucrialibus 3, bractea exteriori maxima, foliacea, sparse pubescenti, 5-9 mm. lata, 3-5 mm. longa, truncata vel obcordata, breviter et abrupte acuminata, basi truncata vel tenuiter et late cordata, basi conjuncta cum bracteis minoribus, marginibus bractearum volutis et basi involucri induratis in senectute; flore pistillato 1, corolla ligulata, albida, parva, 1.5 mm. longa, bidentata; floribus staminalibus 1 vel 2, tubulatis, 4-dentatis, 1.5 mm. longis; acheniis nigrescentibus, 2 mm. longis, obovato-cuneatis, superne puberulis, valde compressis, latere exteriori plano-convexo, interiori costato vel carinato, cum involucrio purpurascenti deciduis.

Annual herb with spreading stems 2-5 dm. long, sparsely rooting, strigose; leaves ovate, 1-5 cm. long, 0.5-2.5 cm. wide, acute, serrate, subflaccid, sparsely pubescent and minutely scabridulous, shortly petiolate, petiole 2-5 mm. long, subcuneately winged below the rounded base of the blade; heads 1 to several in the axils of the leaves, compressed or commonly tripterous, very shortly pedunculate, 2- or 3-flowered, involucrial bracts 3, more or less united at base, the exterior one largest, foliaceous, 5-9 mm. broad, 3-5 mm. long, truncate or obcordate and shortly and abruptly acuminate, the base truncate or shallowly and broadly cordate, thinly pubescent, more or less united at the base with the smaller bracts, the edges of the bracts becoming folded and the base of the involucries becoming indurated in age; pistillate flower 1, corolla whitish, minute, 1.5 mm. long, bidentate; staminate flowers 1 or 2, tubular, 4-toothed, 1.5 mm. long; achene slaty-black, 2 mm. long, obovate-cuneate, puberulent above, strongly flattened, exterior face plano-convex, interior face ridged or sharply carinate, deciduous together with the involucrie which becomes purplish in age.

Type: Herb. Calif. Acad. Sci. No. 220339, in sandy soil near the beach, James Bay, JAMES ISLAND, *Howell No. 9635*, June 4, 1932.

In morphology, *E. atripliciformis* closely resembles *E. repens* (Hook. f.) Rob. but it is adequately distinct in its more robust habit and in the larger size of all its parts. The peculiar winged involucrie enveloping the solitary achene is reminiscent of the ripened fruit and persistent bracts of certain western American species of *Atriplex*, notably *A. canescens* (Pursh) James.

***Pectis glabra* Howell, spec. nov.**

Herba annua; caulibus 0.5-2.5 dm. longis, diffuse ramosis et decumbentibus, glabris puberulisve, purpureo-fuscis; foliis linearibus, 0.5-2 cm. longis, 0.5-1.5 mm. latis, glabris vel minute scabrido-ciliatis margine et basi, apicibus mucronatis vel setigeris, margine 2 vel 3 setis remotis utrinque ciliata, subtus glanduloso-punctatis,

glandulis subbiseriis; capitulis in pedunculis bracteatis 0.5-2.5 cm. longis; bracteis involucri 5, oblongo-oblancheolatis, serratis, obtusis subacutisve, 5 mm. longis, 1.5 mm. latis, purpurascens, glanduloso-punctatis, carinatis sub medio et rotundatis basi; ligulis 4-5 mm. longis, 1-1.5 mm. latis, luteis super, rufescentibus subter; floribus disci 8, corollis 3-3.5 mm. longis; acheniis 2-3 mm. longis, sparse pubescentibus superne, pappo radii nullo vel minute paleaceo-disciformi vel raro 1-2-setoso (in f. *setuloso* multisetoso), disci 20-30-setoso, setis gracilibus, inaequalibus, 2-3 mm. longis, saepius brevioribus quam corolla disci.

Annual herb; stems 0.5-2.5 dm. long, diffusely branching and spreading, glabrous or minutely puberulent, purplish-brown; leaves linear, tapering from the base to a mucronate or setigerous tip, 0.5-2 cm. long, 0.5-1.5 mm. wide, glabrous or minutely scabrous-ciliate on the margin and near the base, bearing 2 or 3 pairs of bristles on the margin, glandular-dotted, the glands nearly biserial; heads on slender bracteate peduncles terminating branches, 0.5-2.5 cm. long; involucri bracts 5, oblong-oblancheolate, serrate, obtuse or subacute, 5 mm. long, 1.5 mm. wide, purplish and gland-dotted, keeled below the middle and rounded at base; ligules 4-5 mm. long, 1-1.5 mm. wide, yellow above, ruddy-brown below; disk-flowers 8, corolla 3-3.5 mm. long; achenes 2-3 mm. long, lineate, sparsely hairy above; pappus of ray-achenes none or a minute paleaceous disk, or rarely 1 or more bristles, pappus of disk-achenes of 20-30 slender bristles, the bristles unequal, 2-3 mm. long, generally a little shorter than the disk-corolla.

Type: Herb. Calif. Acad. Sci. No. 220743, Sullivan Bay, JAMES ISLAND, *Howell No. 10040*, June 13, 1932.

Pectis glabra is most nearly related to *P. tenuifolia* Hook. f. from which it differs not only in its annual habit but in its smaller flower parts and shorter pappus. *Pectis tenuifolia* is apparently an evolutionary modification adapted to the rigorous conditions of its home on relatively fresh lava flows, while *P. glabra* is an annual adapted for rapid growth in loose alluvial and volcanic soils during a brief rainy season. Field observations and herbarium studies indicate beyond doubt that these plants do not represent different habitat aspects of the same species but rather two distinct entities admirably adapted for special situations.

***Pectis glabra* f. *calvescens* Howell, f. nov.**

Pappus acheniorum radii et disci nullo vel brevissimo et paleaceo-squamulato.

Pappus of both ray-achenes and disk-achenes none or reduced to minute paleaceous scales.

Type: Herb. Calif. Acad. Sci. No. 220740, Conway Bay, INDEFATIGABLE ISLAND, *Howell No. 9870*, June 8, 1932.

Plants of the type collection have achenes without pappus but in a collection made at Wreck Bay, Chatham Island, *Howell No. 8615*, a few minute paleaceous scales are frequently present on the disk-achenes.

***Pectis glabra* f. *pubescens* Howell, f. nov.**

Caulibus retrorse puberulis; foliis scabrido-pubescentibus supra et in costa subter; bracteis involucralibus acutis vel breve acuminatis, subglabris; pappo acheniorum radii 1-2-paleaceo-aristato vel obsoleto.

Stems retrorsely puberulent; leaves scabrous-pubescent above and on the midrib below; pappus of ray-achenes of 1 or 2 paleaceous awns or obsolete.

Type: Herb. Calif. Acad. Sci. No. 220739, north side of INDEFATIGABLE ISLAND adjacent to South Seymour Island, *Howell No. 9897*, June 9, 1932.

***Pectis glabra* f. *setulosa* Howell, f. nov.**

Herba humilis foliosa; pappo acheniorum radii setoso et simili ei disci.

Low leafy herb; pappus of ray-achenes bristly and similar to that of disk-achenes.

Type: Herb. Calif. Acad. Sci. No. 220742, NORTH SEYMOUR ISLAND, *Howell No. 9991*, June 11, 1932.

Not only does this form differ from the species in the critical character described but it has a different aspect due to the more condensed habit and more leafy stems. In fact, it looks more like a glabrous form of *P. Hookeri* Rob. since the leaves are a trifle broader in proportion to length than is usual in *P. glabra*.

***Pectis Hookeri* f. *stellulata* Howell, f. nov.**

Pappo acheniorum disci brevi, paleaceo, squamulato vel disciformi, disco stellato-dentato vel brevi-setoso, radii simili vel nullo.

Pappus of disk-achenes reduced to a few small scales or to a minute stellate-dentate or short-bristly paleaceous disk; pappus of ray-achenes similar or none.

Type: Herb. Calif. Acad. Sci. No. 220741, JERVIS ISLAND, *Howell No. 9740*, June 6, 1932.

The following key, based on the collections of the Templeton Crocker Expedition of the California Academy of Sciences (except for data relating to *P. subsquarrosa* (Hook. f.) Sch. Bip. and *P. Anderssonii* Rob.), indicates characters by which the species and forms of *Pectis* in the Galapagos Islands may be distinguished:

- A. Pappus of disk-achenes of numerous straight bristles or reduced to minute scales or none; rays conspicuous; endemic species.
- B. Plants perennial, the lower stems distinctly woody.
- C. Leaves narrowly linear, glands more or less biserial.
- D. Heads terminating similar stems and branches; peduncles long.....*P. tenuifolia*
- D¹. Heads terminating short, fasciculate-leafy, lateral branches; peduncles short (ex char.).....*P. subsquarrosa*
- C¹. Leaves linear-lanceolate, glands scattered irregularly (ex char.).....*P. Anderssonii*
- B¹. Plants annual, the stems herbaceous throughout.
- E. Leaves and stems cinereous, hispidulous (see also *P. glabra* f. *pubescens*); leaves linear-oblong to lanceolate; pappus generally a little longer than the disk-corolla (except in *P. Hookeri* f. *stellulata*).
- F. Pappus of disk-achenes of numerous bristles.....*P. Hookeri*
- F¹. Pappus of disk-achenes reduced to a minute stellate-dentate or short-bristly paleaceous disk, rarely a longer bristle present.....*P. Hookeri* f. *stellulata*
- E¹. Leaves glabrous (except in *P. glabra* f. *pubescens*), mostly narrowly linear; pappus equalling or shorter than the disk-corolla.
- G. Pappus of disk-achenes present and conspicuous.
- H. Pappus of ray-achenes of 1 or 2 paleae or none.
- I. Leaves glabrous.....*P. glabra*
- I¹. Leaves pubescent.....*P. glabra* f. *pubescens*
- H¹. Pappus of ray-achenes of numerous bristles...*P. glabra* f. *setulosa*
- G¹. Pappus of disk-achenes none or reduced to very minute scales or bristles.....*P. glabra* f. *calvescens*
- A¹. Pappus of disk-achenes generally present, of 2 or 3 divergent, curved awns; rays short and inconspicuous; widespread in the American tropics.....*P. linifolia*



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