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NOTES ON JAMAICAN FLOWERING PLANTS II

Nomenclatural Changes and Additions in Nyctaginaceae

by

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Introduction

Recent floristic studies in Jamaica have revealed the existence there of species not recorded by FAWCETT & RENDLE (1914) and further investigation of known taxa has necessitated some nomenclatural changes and revision of synonymy.

FAWCETT & RENDLE recorded 4 genera in this family for Jamaica, viz *Boerhavia* L., *Mirabilis* L., *Neea* Ruiz & Pav. and *Pisonia* L. The monographic publications of HEIMERL (1896 et seq.) were available to those authors and they followed his nomenclature for the most part. More recently authors have agreed that *Commicarpus* Standl. is distinct from *Boerhavia* and also that the smooth fleshy eglandular-fruited shrubs and trees hitherto placed in *Pisonia* should be removed to their own genus, at some time *Torrubia* Vell., now to be correctly named *Guapira* Aubl. Thus the Jamaican flora has 6 genera of native and naturalized plants belonging to this family as well as several cultivated and sometimes relict varieties of *Bougainvillea*.

Revisions and Check List

I. *Boerhavia* L.

1. *B. erecta* L., Sp.Pl. 1: 3 (1753).

This species is distinguished by the ascending inflorescence-branches, light pink flowers and glabrous fruits.

2. *B. coccinea* Mill., Gard.Dict. ed. 8 (1768).

B. hirsuta Jacq., Hort.Bot.Vindob. 1: 3, t.7 (1770). -
Fawcett & Rendle, Fl.Ja. 3: 149 (1914).

B. caribaea Jacq., Obs.Bot. 4: 5 (1771) nomen illegitimum.

The flowers are dark crimson and numerous in compact heads on short bracteate branches; a weed of open grassy places and dunes.

3. *B. diffusa* L., Sp.Pl. 1: 3 (1753). - Sw.Obs.Bot. : 10 (1791).

B. paniculata L.C.Rich. in Act.Soc.Hist.Nat.Paris 1:
105 (1792). - Fawcett & Rendle, op.cit. 148.

B. coccinea var. *paniculata* (L.C.Rich.)Moscoso, Cat.Fl.
Doming. 1: 180 (1943).

The flowers are dark crimson and few in small heads at the ends of numerous widely divaricating ebracteate branches; a weed of stony cleared and cultivated ground.

Flowers of *B. diffusa* may become infested by a gall midge which has been identified as *Asphondylia* aff. *boerhaaviae* Möhn (1959). *A. boerhaaviae* was described from midges obtained from *Boerhavia erecta* in El Salvador and these were distinctly smaller than the Jamaican flies. Galls have not been observed on *B. erecta* in Jamaica. Occasional galls have been recorded on *B. coccinea* but the most common occurrence is on *B. diffusa* and *B. diffusa* var. *leiocarpa*, presumably with infestation by the same species of midge. The biological relationship is a complicated one usually involving an early fungal attack on the style and ovary of the affected flower which prevents seed formation. Larvae have been seen in galled anthocarps which had no fungal growth and the anthers in the distal chamber were intact. Galls can be detected 4 - 6 days after eggs are deposited in the flowers. The galls are about 4 mm long

by the 3rd instar stage and may reach 6.5 - 7 mm long (exceptionally 9 mm long in the galled fruit illustrated - Plate) before the pupa emerges. Events may be further complicated by the larvae of the midges being parasitized by Pteromalid wasps.

Gall formation usually causes the following changes in the perianth:

- (a) The distal portion is not shed.
- (b) The body of the anthocarp turns dark purplish-red as it increases in size.
- (c) The development of adhesive glands is modified so that they tend to occur more haphazardly instead of being confined to the ridges. The stalks of the glands are longer; they may become massive and lose the gland-tip altogether.
- (d) The gall is retained attached to the pedicel indefinitely.

It is the author's opinion that the artefact created by these enlarged anthocarps has been contributory to the continued taxonomic recognition of *B. paniculata* as distinct from *B. diffusa* in the New World tropics. No mention was made of the size of the fruit by RICHARD in his original diagnosis of *B. paniculata* and no clear reference to this feature has been found in any subsequent work until HEIMERL (1896) described the anthocarps as 4 - 6 mm long. The type, LE BLOND from Cayenne, has not been seen, but the microfiche of the DE CANDOLLE herbarium shows at least two specimens with galled fruits: GAUDICHAUD 413 from Rio de Janeiro and WYDLER from Puerto Rico, the latter sheet having been identified also as *B. diffusa*.

Other specimens that have been seen showing galled fruits are:

Little Cayman: KINGS LC 59 (BM).
St. Thomas, Virgin Is.: 'Frederichstahe' (K)
St. Vincent: COOLEY 8458 (BM).
Venezuela: FENDLER 1083 (K).
Pernambuco, Brazil: GARDNER 1116 (K).

The present distinction of *B. coccinea* (or *B. hirsuta*) from *B. diffusa* (or *B. paniculata*) has not always been maintained. BRITTON & WILSON (1924), following STANDLEY (1918), combined these two taxa under *B. coccinea*. LEÓN & ALAIN (1951) adopted the same concept under a broadly construed *B. diffusa*.

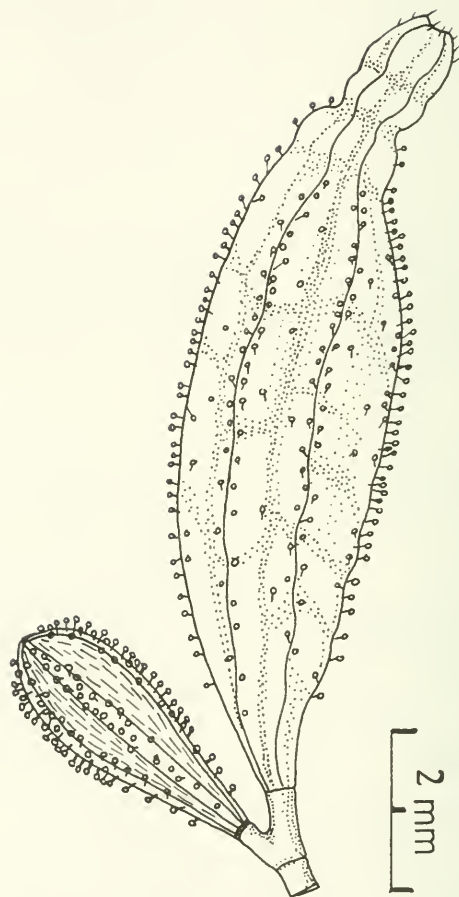


Plate: Normal (left) and galled (right) fruits of *Boerhavia diffusa*

3a. B. diffusa var. leiocarpa (Heimerl) Adams, comb. nov.

B. paniculata fa. leiocarpa Heimerl in Österr. Bot. Zeitschr. 56: 252 (1906).

B. paniculata var. leiocarpa Heimerl in Ann. Jard. Bot. Genève 17: 225 (1913).

B. paniculata var. guaranitica Heimerl loc. cit. (1906).

B. friesii Heimerl op. cit. 253 (1906).

B. coccinea var. leiocarpa (Heimerl) Standl. in Field Mus. Bot. 11(3): 108 (1931).

In Jamaica this variety has greater affinity with *B. diffusa* from which it may be distinguished by its having fruits without stalked glands; it is distinguished from *B. erecta* by the absence of brown punctate glands on the undersurfaces of the leaves and in having a more spreading inflorescence. It is rare and local, being recorded only from a few gravelly waste places in the parishes of St. Andrew and St. Catherine at low elevations.

Exsiccatae from Jamaica and a selection from other areas are:

Jamaica: ADAMS 7097 (M, UCWI); PRIOR 340 (K); WEAVER 1079 (UCWI); R. E. & S. WEAVER 1286 (BM, K, M, UCWI, US); YUNCKER 17358 (BM).

Dominican Republic: R. A. & E. S. HOWARD 8356 (BM).

Mexico: GENTRY 1582 (K); PALMER 182 (BM, K).

Colombia: H. H. SMITH 1320 (BM, K); Herb. TRIANA 2000/4 (BM).

Bolivia: BANG 957 (K); FRIES 1206 (Type of *B. friesii*, not seen).

Paraguay: BALANSA 2634 (Type of *B. paniculata* fa. leiocarpa, K); HASSLER 3524 (Type of *B. paniculata* var. guaranitica, BM, K).

Argentina: VENTURI 8250 (BM, K).

Uruguay: Without collector's name, No. 53 (K).

This variant was recognized first by HEIMERL in material from Paraguay. Subsequently that author described other infra-specific taxa in order to accommodate additional minor variants in this affinity and raised the forma *leiocarpa* to varietal rank

in *B. paniculata* while adding further forms, e.g. *fa. esetos-a*. The intermediate positions which these plants occupy between *B. diffusa* and *B. erecta* suggest their origin as hybrids. Moreover through the broad range of occurrence in tropical and subtropical America it would seem that hybridization has resulted in different combinations of characters in different areas. Southern South American variants resemble more *B. diffusa* but the stems are more hairy and the flowers are larger. At the northern extreme of the range in Mexico the resemblance is more with *B. erecta* and the leaves in this area sometimes even have a few punctate glands on the lower surface. Plants from Colombia resemble those from Jamaica and Dominican Republic and occupy a middle position in the assessment of putative parental characteristics. The range of variation would indicate that if these plants are hybrids, the crosses could have occurred independently on a number of occasions subsequently to the introduction of *B. diffusa*, an Old World plant, into America where it came into contact with *B. erecta*, a New World plant.

B. erecta has become established sparingly in South Africa and to a lesser extent in West tropical Africa. O. A. LEISTNER has annotated South African specimens seen at Kew with an indication of the possibility of hybridization between *B. diffusa* and *B. erecta*.

Variation in plants of the *B. diffusa* affinity is notoriously difficult to analyse and not all of it need be due to hybridization. There is no indication that hybridization occurs between *B. diffusa* and *B. coccinea* in Jamaica, nor that crosses between *B. diffusa* and *B. erecta* are frequent although all three species are closely sympatric in several areas there. FOSBERG (1955) reported putative hybrids on Wake Atoll between *B. diffusa* and *B. tetrandra* Forst.f., but later (FOSBERG, 1959) revised his opinion about the status of the intermediate plants considering them to be possibly a new species.

SRIVASTAVA & MISRA (1968) have demonstrated ecotype differentiation in *B. diffusa* correlated with soils rich or poor in exchangeable calcium.

As *B. paniculata* is now regarded as synonymous with *B. diffusa*, and STANDLEY (1918, 1931) incorrectly adopted the name *B. coccinea* for *B. diffusa* in America, it is necessary to make the further transfer.

Fruits of *B. diffusa* var. *leiocarpa* which become galled by midges of the genus *Asphondylia* may develop hairs which do not become glandular. In the Cane River Gorge, St. Andrew, Jamaica, where this variety has been studied, the larvae of *Asphondylia* are reported as parasitized by *Miscogastrid* rather than *Pteromalid* wasps. Normal fruits of Jamaican plants have adhesive ridges; it is not clear to what extent fruits are adhesive in other parts of the range or tend to resemble those of *B. erecta* which are completely non-glandular.

II. *Commicarpus* Standl.

1. *C. scandens* (L.) Standl. in Contrib. U. S. Nation. Herb. 12: 373 (1909).

Boerhavia scandens L., Sp. Pl. 1: 3 (1753).

The genus *Commicarpus* has 10-ribbed fruits with large stalked adhesive glands subverticillate distally; the pedicels elongate and the anthocarps are deflected downwards.

III. *Guapira* Aubl.

1. *G. discolor* (Spreng.) Adams, comb. nov.

Pisonia discolor Spreng. in L., Syst. Veg., ed. 16, 2: 168 (1825). - Fawcett & Rendle, op. cit. 152.

Torrubia discolor (Spreng.) Britton in Bull. Torr. Bot. Club 31: 613 (1904).

2. *G. fragrans* (Dum. -Cours.) Adams, comb. nov.

Pisonia fragrans Dum. -Cours., Bot. Cult., ed. 2, 7: 114 (1814). - Fawcett & Rendle, op. cit. 152.

Torrubia fragrans (Dum. -Cours.) Standl. in Contrib. U. S. Nation. Herb. 18: 100 (1916).

3. *G. obtusata* (Jacq.) Adams, comb. nov.

Pisonia obtusata Jacq., Hort. Schoenbr. 3: 35, t. 314 (1798). - Fawcett & Rendle, op. cit. 151.

Torrubia obtusata (Jacq.) Britton, op. cit. 612.

Psidium cordatum sensu Griseb., Fl. Brit. W. I. Is.: 242
(1860) quoad exsicc. jam. - Urb., Symb. Ant. 5:
442, obs. 2 (1908).

The genus *Torrubia* Vell. (1825) is antedated by
Guapira Aubl. (1775); as the former name has not been con-
served (Regn. Veg. 60: 102 (1969)) it is appropriate to follow
WOODSON (1961) and LUNDELL (1962) and continue to transfer
of species of *Torrubia* to *Guapira* for our area.

IV. *Mirabilis* L.

1. *M. jalapa* L., Sp. Pl. 1: 177 (1753).

A well known ornamental cultivated plant and escape in the
subtropics and tropics; native of South America.

V. *Neea* Ruiz & Pav.

1. *N. nigricans* (Sw.) Fawcett & Rendle, Fl. Jam. 3: 153 (1914).

This is the only member of *Nyctaginaceae* which is
endemic to Jamaica. The genus is distinguished from other
dioecious genera represented here by having male flowers with
included stamens and female flowers retaining the distal part of
the perianth in fruit. A second species, *N. rotundifolia*
Heimerl, has been relegated to synonymy in *Pisonia* q.v.

VI. *Pisonia* L.

1. *P. aculeata* L., Sp. Pl. 2: 1026 (1753).

This well known dioecious climbing shrub with hooked spines
at the nodes is widespread throughout the tropics in secondary
formations.

2. *P. subcordata* Sw., Nov. Gen. & Sp. Pl.: 60 (1788). - Britton
& Wilson in Sci. Surv. Porto Rico & Virg. Is. 5: 288 (1924).
- Little & Wadsworth, Common Trees of Porto Rico &
Virg. Is.: 90-91, t. 32 (1964). - D'Arcy in *Rhodora* 69:
404 (1967).

Neea rotundifolia Heimerl in Urb., Symb. Ant. 7: 218 (1912).
- Fawcett & Rendle, op. cit. 154.

This species also occurs from Puerto Rico and the Virgin Islands through the Leeward Islands to Martinique. It is common in Tortola. It is however rare in Jamaica. From July 1911 when WILLIAM HARRIS collected the original specimens, *Neea rotundifolia* was not recognized until collected by the author near the type locality in August 1963, a male plant with fully open flowers. As these flowers had exerted stamens the specimen was at first thought to be a new record of a species of *Pisonia* or *Torrubia*. It was however matched with HARRIS 10985 at Mona and later with a photograph of the holotype at the British Museum (Natural History) and it became apparent that HEIMERL had interpreted wrongly the unopened flower-buds as meaning that the stamens were included.

The problem next arose of the logical determination of the correct genus and that with male material of a dioecious plant depending on fruit characters for diagnosis was clearly impossible. Subsequently further sterile and male material was obtained from other localities but no further progress in identification was made. The plant seemed to be more correctly placed in *Torrubia* (*Guapira*) and publication of the new combination "*Torrubia rotundifolia*" was being contemplated when in July 1968 Mr. G. R. PROCTOR discovered fruiting specimens of the same plant. From that the identification in *Pisonia* followed fairly readily and the present situation became clear.

The following exsiccatae of *P. subcordata* have been studied:

Jamaica: ADAMS 12610 (BM, M, UCWI); HARRIS 10985
(Type of *Neea rotundifolia*, BM photo, UCWI);
PROCTOR 22189, 26393, 27530, 28854, 28901 (all IJ).

Puerto Rico: HELLER & HELLER 1001 (K); SENTENIS 1721
(K, UCWI), 5669 (K).

St. Thomas, Virgin Is.: EGGERS 378 (K).

Antigua: DE PONTHEU (Type of *Pisonia subcordata*,
BM).

In the north-eastern Caribbean, *Pisonia subcordata* is a species of low and higher elevations (BRITTON & WILSON, 1924; D'ARCY, 1967). It seems also to play a part in some minor

evolutionary radiation in that a variant with large thin leaves has been mentioned for Puerto Rico (BRITTON & WILSON, loc. cit.) and *P. albida* (Heimerl) Britton of Puerto Rico and Hispaniola is close taxonomically. In Jamaica, *P. subcordata* is known so far only from interior hills on limestone at elevations from 1200 to 2500 feet. These facts are of some phytogeographical interest because the closest relative of *P. subcordata* outside our area is *P. grandis* R.Br. The latter species differs in having stalked glands distributed along the whole length of the puberulous anthocarp instead of more or less distally only. *P. grandis* has also generally larger leaves. It extends, mostly on small uninhabited islands between which the strongly adhesive fruits are carried by birds, from the coast of Tanganyika, through the islands of the Indian Ocean to Indonesia (AIRY SHAW, 1952) and the Pacific (ST. JOHN, 1951). Other well known and common coastal species of the Old World tropics which have local vicariants in the indigenous inland floras of the Greater Antilles include *Caesalpinia bonduc* (L.) Roxb., *Sophora tomentosa* L. and *Hibiscus tiliaceus* L.

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