

CRITICAL REMARKS ON THE SURINAME SPECIES OF THE GENUS SECURIDACA (POLYGALACEAE).

by

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(with plate XIII and XIV).

Whilst studying the material of the genus *Securidaca* for the "Flora of Suriname", I found it in most cases extremely difficult or even impossible to identify the species. The original descriptions are, as a rule, very short, and they have been based for a good deal on incomplete material: mature fruits, for instance, are often missing. Hence it is not surprising that on quite a number of species the opinions of taxonomists disagree. Accordingly on the one hand we may find in the various collections the most different species lumped together under the same name, while on the other hand one and the same species may appear under several names. A study of the type specimens therefore, was obviously very desirable. I am indebted to the "VAN EEDEN Fonds" for enabling me to visit the Herbarium in Paris, where I could clear up some misunderstandings with regard to the Suriname species.

This study includes all the Suriname specimens preserved in the Herbaria of Utrecht, Leiden, Kew, Brussels, Geneva and Berlin, together with the material collected outside Suriname and available in the Utrecht and Paris collections, and the British Guiana plants of the Kew Herbarium. To get an impression of the genus as a whole, several species not occurring in Suriname have been studied, but a thorough investigation was made of the Suriname ones only. The results of this investigation will be given below.

First some remarks must be made on the taxonomical value of the different characters of the plant. In my opinion the leaf properties, viz. shape and size, consistency, nervature and indumentum, are of greatest importance. In many instances it has been possible to distinguish the species on the leaf characters alone. The stipules also are important, for they may be either well developed or reduced to glands. Further important differences between the species occur in the fruit. For practical purposes, however, the latter are of minor importance, since in many specimens fruits are either missing or sterile, and the latter differ often appreciably from fertile ones;

only the shape and size of the primary wing are fairly constant. It is unfortunate that fruits are so often wanting, for a greater taxonomical value must be attached to them than to the flowers, which, on the contrary, are present in nearly all the specimens. Generally the structure of the flower is rather uniform, and differences in shape, size and hairyness of the various parts, to which one would be inclined to attach some value, may be found as well in specimens belonging to one and the same species as in those belonging to different species. The only important floral character is the presence or absence of a crest on the lower petal or keel.

1. The generic name *Securidaca* and the type species *Securidaca volubilis* L.

The genus *Securidaca* was based on *S. volubilis* L. The description of the genus was first given by LINNÉ in *Genera Plantarum* ed. 5, p. 316, 1754; that of the type species in *Species Plantarum* ed. 1, p. 707, 1753.

The type specimen of *S. volubilis* is preserved in the Herbarium of LINNÉ (Linnean Society, London). Dr. F. P. JONKER, who kindly examined the type material for me, informs me that the latter consists of three sheets, two of which contain plants provided with flowers and fruits belonging to a *Polygalacea* whereas the third sheet contains a tiny fragment of a Leguminous plant (*Nissolia*) consisting of three fruits and two leaves, but without flowers.

Owing to the fact that LINNÉ mentions 10 instead of 8 stamens, the question has been raised whether the name *Securidaca* really refers to the *Polygalaceous* plant. However, the abundant and complete material of the latter filling two of the three type sheets, and the correction made by LINNÉ himself in his *Systema Naturae* (ed. 10, p. 1155, 1759) on the one hand, and the fragmentary character of the *Nissolia* material on the other hand, leave, in my opinion, no doubt that the name *Securidaca* belongs to the *Polygalaceous* plant. Moreover, in the brief description in *Spec. Plant.* mention is made of the flowers, which are abundant in the material of the *Polygalacea*, whereas they are wanting on the *Nissolia* branchlet. It is, therefore in my opinion sufficiently clear that the name *Securidaca* refers to the *Polygalaceous* and not to the *Leguminous* plant, and the proposal of the British Botanists (*Prop. Brit. Bot. Congr. Cambridge* p. 173/74, 1929) to preserve this name for the *Polygalaceous* genus, therefore, seems superfluous.

As BLAKE (*Contr. U.S. Nat. Herb.* 23.3.594, 1923) has already pointed out, the widely distributed species, which up to that time had generally been confused with *S. volubilis* L., agrees on the contrary

with *Polygala diversifolia* L. BLAKE referred this species to the genus *Securidaca*, so that at present it is known under the name *S. diversifolia* (L.) BLAKE (see below). It appears already from a superficial inspection, that this species differs in several respects from *S. volubilis* L. The question now arises, which material ought to be placed under the name *S. volubilis* L.? Here again I am indebted to Dr. F. P. JONKER, who, after comparing the Suriname material with the type, came to the conclusion that several Suriname specimens formerly referred to *S. volubilis* L. var. *mollis* H.B.K., entirely agree with the type of *S. volubilis* L. A comparison with the type of *S. affinis* Bernh. ex Turcz. (Bull. Soc. Mosc. 27. II. 360. 1854; type: Kappler ed. Hohenacker 1407a (P)) made it clear, that this name too should be referred to the synonymy of *S. volubilis* L.

An emended description is given here.

***Securidaca volubilis* L. emend.** Oort; L. Spec. Plant. ed. 1, p. 707 (1753), non Benn. in Mart. Fl. Bras. 13. 3, p. 61 (1874); — *S. volubilis* L. var. *mollis* auct. (non H.B.K.) Pulle, Enum. p. 253 (1906); — *S. affinis* Bernh. ex Turcz. in Bull. Soc. Mosc. 27. II, p. 360 (1854).

Frutex scandens, partibus novellis dense puberulis. Folia petiolis 2—4 mm longis munita, elliptico-ovata, apice rotundata, basi subcuneata, 1.5—3.5 cm lata et 3—6 cm longa, supra opaca, molliter puberula, nervis non prominentibus, infra opaca, dense mollissimeque puberula, nervis prominentibus, margine paulo incrassato et involuto. Racemi terminales aut axillares, elongati, subtaxiflori. Pedicelli 4—5 mm longi. Flores 8—10 mm longi, incarnati; sepalis exterioribus puberulis, alis inaequilateralibus aut subaequilateralibus, obtusis, margine ciliato; petalis exterioribus spathulato-ovatis, obtusis; carina cristata. Fructus 4.5—6 cm longus; parte seminifera globosa, 10—12 mm diametiente, appendicibus membranaceis reticulatis. Ala prima (ventralis) 3.5—5 cm longa margine interiore recurvata, apice acuta aut obtusa. Ala secunda (dorsalis) parva aut subparva, membranacea, partim cum ala prima connata.

Distribution: Brazil, French Guiana, Suriname and Peru.

Type specimen in the Linnean Herbarium, Linnean Society, London, without locality and number.

I have seen the following specimens:

Brazil: Claussen 503 (sub nomine *S. tomentosa* St. Hil.) (P).

French Guiana: Sagot 982 (P); Sagot s.n. (P); Wachenheim 453 (P); Rech s.n. (P).

Suriname: Versteeg 921 (U); Stahel 42 (U); Wulfschlaegel 17 (sub nomine *S. mollis* H.B.K., determ. A. W. Bennett) (BR); Kappler 71 (L) and s.n. (U); Kappler ed Hohenacker 1407a (type of *S. affinis* Bernh.) (P) and 1965 (P, U).

Peru: Poeppig 1484 (sub nomine *S. corymbosa* Poepp. = *tomentosa* Poepp.) (P); Poeppig 1384 (or 1868 n. 34) (P).

Remarks: This species is readily distinguished from *S. diversifolia* (L.) Blake by the shape of the leaves and their indumentum, and by the size and shape of the fruits. Nevertheless there are some specimens which show almost the same type of fruit as *S. volubilis*, but whose leaves resemble those of *S. diversifolia*: these forms have provisionally, been placed under the last-named species.

From the other species examined *S. volubilis* differs in several respects. *S. rufescens* Pl. et Linden is the only one that appears to be closely related. *S. rivinifolia* H.B.K. var. *parvifolia* Benn. agrees with *S. volubilis* in the softness of its leaves, but the latter are much smaller.

2. *Securidaca diversifolia* (L.) Blake. in Contr. U.S. Nat. Herb. 23.3, p. 594 (1923); — *Polygala diversifolia* L., Spec. Plant. ed. 1. p. 703 (1753); — *Securidaca volubilis* (non L.) Benn. in Mart. F. Bras. 13.3, p. 61 (1874); Pulle, Enum. p. 252 (1906); — *Securidaca pubescens* DC *β ovata* DC, Prodr. I, p. 341 (1824).

BLAKE, who must have seen the type of *Polygala diversifolia* L. in the Herbarium of LINNÉ in London, transferred this species to *Securidaca*. Probably owing to the fact that plants belonging to it had been misidentified by BENNETT as *S. volubilis* L., the latter name, as stated above, has often been used for this species. Dr. F. P. JONKER reinvestigated the type of *P. diversifolia*, and came to the conclusion that this specimen agrees entirely with the very common Suriname plants which up to now have been quoted as *S. volubilis* L. The opinion of BLAKE therefore was confirmed.

S. pubescens β ovata DC is a synonym, as I found when I examined the type in the Paris Herbarium.

According to several authors *S. scandens* L. also should be regarded as a synonym, but as I did not see the type specimen, I do not know whether this is correct or not.

S. latifolia Benth. and *S. pubiflora* Benth., of which I saw the type specimens (they are both labelled: Schomburgk 714) may also be regarded as synonyms: they only differ from the other specimens by the extraordinary large size of the leaves. Of *S. longifolia* Poepp. et Endl. with which, according to BENNETT, *S. latifolia* and *pubiflora* Benth. are synonymous, I did not see the type specimen.

S. diversifolia is a rather variable species, especially with regard to shape and size of the leaf. In my opinion it is best characterized by the slightly, but nevertheless distinctly, reticulated upper side of

TABLE XIII.

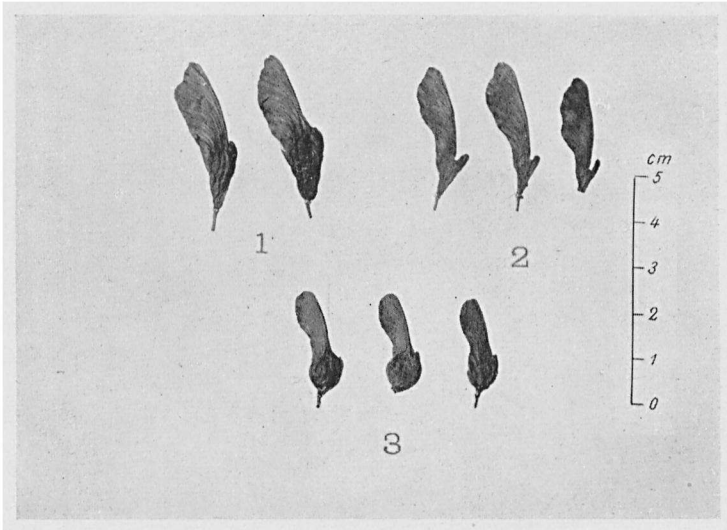


Fig. 1. Fruits of *Securidaca paniculata* Rich. 1. Le Blond s.n. (fert.), Cayenne, French Guiana (P), Type a; 2. Le Blond s.n. (ster.), Cayenne, French Guiana (P), Type b; 3. Unknown collector s.n. (fert.), French Guiana (P).

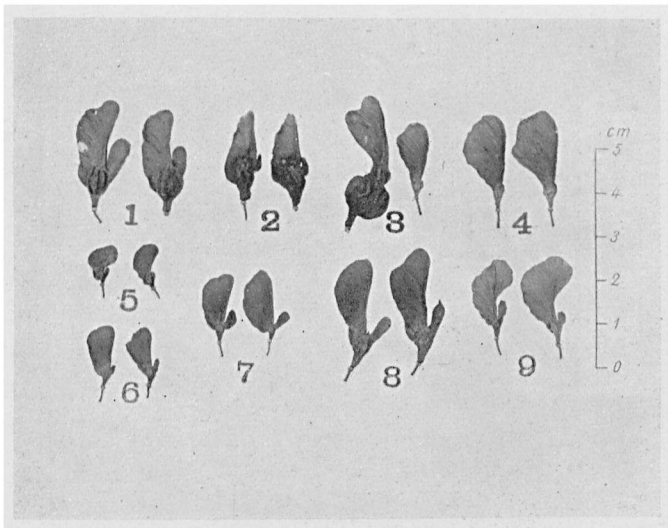


Fig. 2. Fruits of *Securidaca paniculata* Rich. 1. Focke 1162 (fert.), Suriname (U); 2. Tessmann 5335 (fert.), East Peru (U); 3. Spruce 2557 (fert. and ster. fruits on the same branch), Brazil (K); 4. Spruce 2557 (ster.), Brazil (G); 5. Hostmann 207 (ster.), Suriname (U); 6. B. W. 5285 (ster.), Suriname (U); 7. Focke 1408 (ster.), Suriname (U); 8. Boldingh 3827 (ster.), Suriname (U); 9. Versteeg 534 (ster.), Suriname (U).

TABLE XIV.

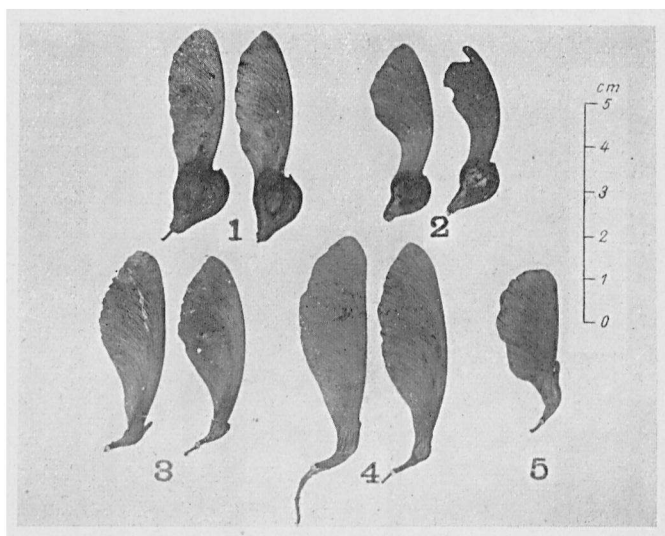


Fig. 3. Fruits of *S. paniculata* Rich. var. *lasiocarpa* Oort; 1. Gonggrijp and Stahel 1 (fert.), Suriname (U); 2. Parker s.n. (fert.), Br. Guiana (K); 3. Gleason 533 (ster.), Br. Guiana (K); 4. Sandwith 269 (ster), Br. Guiana (U); 5. Wulschlägel s.n. (ster.), Suriname (BR).

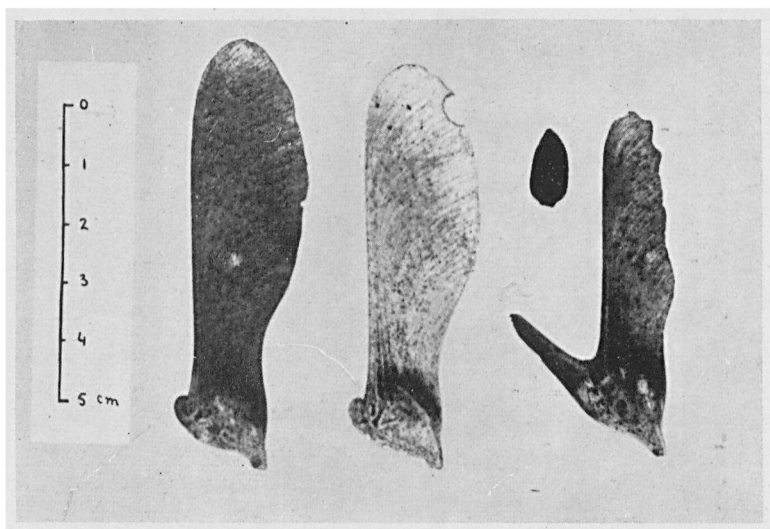


Fig. 4. Fruits and seed of *Securidaca uniflora* Oort, Sandwith 1365 (fert.), Br. Guiana (K).

the leaf, and by the fruit, which is thin-walled and slightly reticulated.

S. mollis H.B.K. (type in Herb. Humboldt and Bonpland n. 1387 (P)), (non Benn. in Mart. Fl. Bras. 13.3, p. 62, 1874, sub nomine *S. volubilis* L. var. *mollis* H.B.K.) must be considered as a variety of *S. diversifolia*, to which it comes very near. *S. diversifolia* (L.) Blake var. *mollis* (H.B.K.) Oort n. comb. differs from the type by the broader leaves with their very short petioles (1—2 mm), and their more densely and softer puberulous lower side. With the exception of the type specimen I found no other example of this variety among all the material, which I could study. Ule 7914 from British Guiana shows, however, very short petioles, and its leaves are softer than usual, so that this specimen comes very near to the var. *mollis* (H.B.K.) Oort.

The species is distributed all over Brazil, the Guianas, Venezuela, the Antilles, Colombia and Peru, and perhaps Panama. According to BLAKE l.c. it also occurs from Ecuador to Central America.

Specimens examined by the author:

Brazil: Gardner 921 (P) and 922 (P); Glaziou 9620 (P), 11600 (P) and 13538 (P).

French Guiana: Sagot 35 (K, P) and s.n. (sub nomine *S. densifolia*) (P); Jelski s.n. (P); Leguillon s.n. (P); Leprieux s.n. (sub nomine *S. densifolia*) (P).

Suriname: Hostmann 481 (K, P); Focke 677 (U); Splitgerber 93 (L); Wulfschlaegel 16 (BR) and s.n. (BR); Weigelt 163 (BR); Went 409 (U); Kuyper 39 (U); B.W. 535 (U); Soeprata 17D (U) and 23F (U); Samuels 219 (K, P).

British Guiana: Schomburgk 208 (P); Jenman 1537 (K, P), 1867 (K) and 5005 (leaves not convincing) (K); Appun 1782 (K) and 2376 (K).

Venezuela: Otto 543 (P); Funck et Schlim 320 (broader leaves) (P)

Antilles: Duperrey s.n. (P); without collector 65 (P); Bonpland 1387 (P); Broutet s.n. (P).

Colombia: Smith 2036 (P); Triana s.n., hab. Prov. Mariquita (broader leaves) (P).

Peru: Pavon s.n. (P).

Without locality: without collector's name s.n. in Herb. Lamarck (P).

Several specimens differed more or less from the main form. I have placed them provisionally under *S. diversifolia*, but a more detailed investigation will probably show that they are to be distributed over several smaller species, forms and varieties.

a. Forms with fruits which are more or less intermediate between those of *S. diversifolia* and *S. volubilis*, viz. fruits larger than those of *S. diversifolia* and with more pronounced reticulation: Brazil: Glaziou s.n. (leaves of *diversifolia*) (P); Ecuador: Spruce 6258 (leaves more and softer puberulous) (P); British Guiana: Archer 2349 (leaves of *diversifolia*, below more densely puberulous) (K).

b. Forms with broader and softer leaves and with very short petioles (= var. *mollis* (H.B.K.) Oort). Brazil: Herb. Humb. et Bonpl. 1387 (P); British Guiana: Ule 7914 (K).

c. Forms with broader and (or) softer leaves, but with petioles of normal length. British Guiana: Appun 1279 (leaves densely puberulous) (K); Colombia: Goudot s.n. (P); Triana s.n. hab. Prov. Bogota (P); Panama: Duchassing s.n. (P).

d. Forms with very big leaves (= *S. latifolia* Benth. and *S. pubiflora* Benth.). British Guiana: Schomburgk 714 (type of *S. latifolia*) (K) and Jenman 1868 (K).

3. *Securidaca paniculata* Rich. in Acta Soc. Hist. nat. Paris I. 1, p. 111 (1792); — *S. Hostmanni* Miq., Stirp. Surinam. p. 30 (1851); Bennett in Mart. Fl. Bras. 13.3, p. 68 (1874); Pulle, Enum. p. 253 (1906); — *S. paniculata* Poir., Encycl. 7, p. 52 (1806); Lam. Ill., pl. 599, f. 2 (1823).

This species has been described by RICHARD l.c. in a paper entitled: „Catalogus plantarum, ad societatem, ineunto anno 1792, e Cayenna missarum a domino Le Blond”. The description reads: „*S. (Paniculata) foliis oblongo-ovatis, acuminatis, paniculis axillari-bus et terminalibus, multifloris*”. No specimen with a label in RICHARD’s handwriting could be found. It is, however, very probable that the specimens investigated by RICHARD were the same as those on which the description of POIRET and the figure in LAMARCK’s Ill. have been based, since these specimens, which are preserved in the Herbarium of LAMARCK in Paris, have also been collected by Mr. LE BLOND in Cayenne (comp. title of RICHARD’s publication). The specimens in the herb. of LAMARCK, therefore, may be considered as the types of *S. paniculata* Rich. An examination of the type material of *S. Hostmanni* Miq. (Hostmann 207, with young sterile fruits (K), without fruits (G)) revealed the identity of this species with *S. paniculata* Rich.

The type material of *S. paniculata* Rich. consists of two collections, the first showing fertile fruits, practically without a secondary wing, the second sterile fruits, with a distinct secondary wing. Among the many specimens provided either with fertile or sterile fruits, not one possesses fruits completely agreeing with those of the type material. As is shown in the figures 1 and 2, (plate XIII) the shape and size of the fruit, and especially the shape and the size of the primary and the secondary wing vary very much. The fruits are characterized by 4—6 longitudinal ribs, which are, at least in the fertile ones, very prominent, and by the shortness of the primary wing, which is never longer than 22 mm.

Specimens seen by the author:

Brazil: Spruce 1591 (P) and 2557 (G, K, P); Krukoff 4836 (U); Glaziou 13532 (P).

French Guiana: Le Blond s.n. (P); Sagot 1167 (teste Sandwith) (K).

Suriname: Hostmann 207 (type of *S. Hostmanni*) (G, K, P) and 1086 (G, K, P, U); Wulfschlaegel 18 (BR), 1360 (BR) and s.n. (BR); Versteeg 534 (U) and 883 (U); Pulle 500 (U); Tresling 423 (U); B.W. 2197 (U), 2240 (U), 5285 (U), 5693 (U) and 7210 (U); Focke 1162 (U) and 1408 (U); Boldingh 3827 (U); Splitgerber 760 (L).

British Guiana: Schomburgk 40 (P).

Peru: Tessmann 3598 (U) and 5335 (U).

Without locality: without collector's name, s.n. in Herb. Guyan. — Antill. de Richard (P).

4. ***Securidaca paniculata* Rich. var. *lasiocarpa* Oort nov. var.** (fig. 3, plate XIV).

Among the Surinam material of *S. paniculata* Rich. there has been found one specimen, viz. Gonggrijp and Stahel 1, which differs considerably from the others with regard to the size of the fruit and to its surface relief. The ribs on the lower part of the fruit are almost wanting, whereas the big wing measures c. 30 mm. Mr. SANDWITH, Kew, drew my attention to the fact, that the leaves in the specimens labelled Gonggrijp and Stahel 1, as well as the leaves of some specimens collected in British Guiana (e.g. Parker s.n.; Gleason 533 and Sandwith 269) — though in shape and size absolutely identical with *S. paniculata* — show a slightly different indumentum and colour. This observation added to the fact that the fruits of the above named specimens are more or less identical, but differ from those of the true *S. paniculata*, made it desirable to separate them from this species as a variety, for which I propose the name var. *lasiocarpa*.

The Latin diagnosis follows here.

***S. paniculata* Rich. var. *lasiocarpa* Oort nov. var.**

A typo recedit foliis in vena media supra pauco sed conspicue puberulis, infra subopacis, colore singulari pallide flavido; fructu parte inferiore globulari ecostata aut subecostata, ala prima (ventrali) longiore, 25—45 mm longa.

Midnerve of the upper surface of the leaf slightly but distinctly puberulous (in the main form glabrous or nearly glabrous). Lower surface more or less dull, in herbarium material with a particular, pale yellowish colour. Lower part of fruit either without ribs or indistinctly ribbed. Primary ventral wing 25—45 mm long (in the main form never more than 22 mm), secondary wing very small or wanting.

Distribution: Suriname and British Guiana.

Seen by the author:

Suriname: Gonggrijp and Stahel 1 (type) (U); Wulfschlaegel 18a (BR) and s.n. (intermediate form, see below) (BR).

British Guiana: Parker s.n. (K); Gleason 533 (K); Sandwith 269 (K); Persaud 96 (K); De La Cruz 2903 (K).

Remarks: Wulfschlaegel s.n. (BR) from Suriname forms a transition to the main form. The lower surface of the leaf, on the whole, agrees with that of the variety, but on one and the same leaf sometimes deviations occur, which suggest the main form. The size of the big wing is intermediate; its shape recalls more or less the main form. (Table XIV, fig. 3 : 5).

5. *Securidaca pubescens* D.C., Prodr. 1, p. 341 (1824); — *S. pubescens* DC *a obovata* DC (non *β ovata* DC), l.c. p. 341; — *S. major* Sagot ex Bennett in Mart. Fl. Bras. 13.3, p. 64 (1874); — *S. densiflora* Oort in Novit. Taxon. Herb. Acad. Rheno-Trai. I, in Rec. trav. bot. néerl. 30, fig. 2, p. 175 (1933).

This species, which repeatedly has been misunderstood, is well characterized by the leaves, which are nearly glabrous, nitidulous, greyish green above, and without prominent nerves; the shape is broadly ovate, and but seldom, as described by DE CANDOLLE, obovate. Neither in the material of DE CANDOLLE nor in that of SAGOT fruits are present. Fruits have been described, however, by BENNETT l.c., but it is doubtful, whether they really belong to this species. Fruits, but sterile ones only, were found in B.W. 637 (U). They are characterized by the subrhomboid shape of the primary wing. The secondary wing is very small.

The very dense racemes of B.W. 637 were not met with by the author in any other specimen: in his opinion it is not desirable to base a variety on this character.

S. pubescens β ovata DC is synonymous with *S. diversifolia* (L) Blake (v. sup.).

Distribution: Suriname and French Guiana.

Seen by the author:

Suriname: B.W. 637 (type of *S. densiflora*) (U) and 6699 (U).

French Guiana: Sagot 907 (type of *S. major*) (P); Benoist 239 (P); Martin 72 (P) and s.n. (P); without collector and s.n. in Herb. de Lamarck (P); without collector and s.n. ex Herb. Prodr. sub nomine *S. pubescens* DC *obovata* (type!) (G, P, U).

6. *Securidaca uniflora* Oort in Nov. Taxon. Herb. Acad. Rheno-Trai. I, in Rec. trav. bot. néerl. 30, p. 177, fig. 3 (1933).

Of this species, which was only known from a single locality in Suriname (B.W. 6672), I have traced an unnamed specimen in the Herbarium of Lamarck in Paris. Recently SANDWITH found it in British

Guiana also. SANDWITH' specimen bears very characteristic fruits, of which a description is given below. (Table XIV, fig. 4).

Fruit very large, 7 cm long, glabrous. Lower part ovoid, c. 1 cm wide and 1.5 cm long. Primary (ventral) wing including with the axis of the fruit an angle of c. 30° , rotundate at the apex, broadly attached to the lower part of the fruit, c. 5.5 cm long and c. 2 cm wide. Secondary wing usually very short, sometimes elongated (2 cm long), forming a crest along the lower part of the fruit.

According to notes on the flower made by SANDWITH (the colour of the wings is white, the lateral petals are dark chocolate, white at the base, whereas the keel is pale claret.

Distribution: Suriname and British Guiana.

Suriname: B.W. 6672 (type!) (U).

British Guiana: Sandwith 1365 (type of fruits) (K).

Without locality: without collector and s.n. in Herb. de Lamarck (P).

7. *Securidaca rivinaefolia* St. Hil. var. *parvifolia* Benn. in Mart. Fl. Bras. 13.3, p. 65 (1874); — *S. parvifolia* Spruce Mss. ex Bennett l.c.; — *S. divaricata* Nees et Mart. in Nov. Acta Nat. Cur. 12.1, p. 25 (1824) (aut. Bennett l.c.).

In the Flora Bras. l.c. the following numbers are quoted, viz. Martius; Spruce 1083, 1102 and 1675. In Paris I could examine Martius 1182 (type of *S. divaricata* Nees et Mart., which according to BENNETT is synonymous with the above variety), Spruce 1083 and 1675, all of Brazilian origin.

The specimens of Spruce 1083 and 1675 are identical with the following specimens seen by the author:

Brazil: Glaziou 9622 (P) and 13533 (P).

Suriname: Rombouts 175 (U).

British Guiana: Myers 5686 (K).

Martius 1182 differs more or less in the leaves, which are somewhat larger and evenly puberulous, whereas the above numbers are on the nerves more densely puberulous than elsewhere.

S. rivinaefolia St. Hil. var. *parvifolia* Benn. differs in several respects from the main form *S. rivinaefolia* St. Hil. Probably it would be better to raise this variety to specific rank, but to avoid unnecessary re-naming, it seems advisable to wait till the whole genus will be thoroughly revised.