SOME ASPECTS OF WOOD-ANATOMICAL RESEARCH IN THE GENUS INGA (MIMOSACEAE) FROM THE GUIANAS AND ESPECIALLY SURINAME

T. BARETTA-KUIPERS

Instituut voor Systematische Plantkunde, Utrecht

SUMMARY

A key is offered to the wood of 35 out of 38 *Inga* species known from Suriname and the other Guianas. The wood structure indicates that the sections Leptinga, Diadema, Bourgonia and Euinga sensu Bentham are taxonomically sound. Section Pseudinga is unnatural and should be subdivided. The author is in favour of keeping the sections Leptinga and Diadema apart.

1. INTRODUCTION

Inga Scop. is a large genus, new species of which are still being described; by now over 400 names have been published (ELIAS 1967). In my opinion, however, this number may be reduced by fifty percent in a complete monograph. The main area of the genus is in the tropics and subtropics of the New World, the Amazon basin being the centre of speciation (DUCKE 1949). All species are well developed trees and prefer a humid habitat. On the whole the genus is well defined by its once-pinnate leaves, unusual in the Mimosaceae, but still there is a considerable amount of variation. The flowers vary in size from a few millimeters to 10 cm. Shape, size, and structure of the valves (fleshy or thin and dry) of the legume show much variation, as well as the outline, number, and size of the leaflets and the indument of flowers, fruits, and leaves.

Inga species are abundant in some parts of Suriname, and as determination of sterile herbarium material of *Inga* collected for vegetation research is very difficult, we investigated if wood anatomy could possibly give a solution to this problem. Therefore the investigation already started by Dr. A. M. W. Mennega was continued by me.

Another goal was to see if wood anatomy could give a contribution to the taxonomy of this large genus.

2. MATERIAL AND METHODS

Material came chiefly from Suriname and the other Guianas, i.e. 35 species out of the 38 species known by now in this area, completed with the following species not found in the Guianas: *I. cyclocarpa, cylindrica, lentiscifolia, quaternata, sessilis, striata, tenuistipula, uraguensis, velutina, virescens, yacoana.* The wood

from Suriname and the Guianas was always backed by herbarium vouchers, as a rule by flowering material. In cooperation with Mrs. M. JANSEN-JACOBS who is preparing a revision of the Mimosaceae for the Flora of Suriname, the identifications of the herbarium specimens were checked. The reliability of the wood used for the investigation seems therefore guaranteed. The nomenclature used is in accordance with that of the forthcoming regional revision, to appear in 1973 as Additions and Corrections to the Flora of Suriname, vol. II part 1 & 2. In this cooperation for the Flora of Suriname it became apparent that wood anatomy can be a considerable support for taxonomic investigations. For certain sterile herbarium samples the only possibility of identification is offered by the wood samples. Besides by using a handlens for an overall picture, I examined the wood in microtome sections stained with saffranin and by maceration preparations. The wood mostly proved to be so hard and difficult to section that it required treatment with HF before sectioning was possible. The HF treatment lasted from a few weeks to some months.

The terminology used is in accordance with that proposed by the COMMITTEE ON NOMENCLATURE of the I.A.W.A. (1957). Thickness of the fibre walls is indicated according to CHATTAWAY (1932), to the effect that, if differences are slight, an intermediate size is used, viz.: "of moderate thickness"; in it the lumen of the woodfibre equals about 2 wall-thicknesses. Where the number of vessels is mentioned, clusters and radial multiples were counted as a single vessel.

3. DESCRIPTION OF THE WOOD

3.1. General properties

As in the floral characters, there is rather much diversity in the wood of the genus. The diversity exists in the colour, fluctuating from light stramineous to dark reddish brown, in the hardness, from rather soft to extremely hard, and in weight, from light to very heavy. A distinct difference in colour of heart- and sapwood was noticed in three species only, viz. in *I. gracilifolia*, *I. graciliflora*, and *I. dysantha*. The dark reddish-brown heartwood is in transverse section of irregular outline in *I. dysantha*, regular in *I. gracilifolia*. Besides these woods are very hard and heavy.

3.2. Microscopic features

Growth ring boundaries: in most species indicated by crystalliferous fibres, often together with some terminal parenchyma. The rings are formed by radially flattened fibres in *I. acrocephala, cayennensis, edulis, fagifolia, melinonis, nobilis, thibaudiana.*

Vessels: solitary and in short radial multiples of 2–4, sometimes in small clusters; diameter generally from 150–250 μm; number 1–5 per square mm, in *I. stipularis* and *I. disticha* up to 10 per square mm. Intervascular pits alternate, vestured, pit apertures included, but also often coalescent, pit borders rounded or angular, 6–8 μm wide. Vessel members of medium length (350–800 μm).

Fibres: always septate. Walls thick, moderately thick, or thin. Sometimes a

distinct difference in wall thickness is found in the same section, in which thin-walled as well as thick-walled fibres or fibres with a moderate wall thickness occur; this is found in, i.a., *I. fagifolia, heterophylla, lateriflora, rhynchocalyx, rubiginosa, splendens,* and *umbellifera.* The diameter is 18–20 μm; in the thin-walled fibres the wall is 3 μm thick, in those with moderately thick walls about 5 μm. Thick-walled fibres with a wall of 6 μm or more are found in *I. calanthoides, capitata, cayennensis, cinnamomea, disticha, dysantha, gracilifolia, leptingoides, pilosula,* and *virgultosa.* Very thin-walled are the fibres of *I. alba, bourgonii, edulis, ingoides, marginata* and *pezizifera.* As a rule a greater or smaller number of the fibres has gelatinous walls, regardless of the diameter of the wall. On the radial walls slit-like pits, mostly with a vestigial border, are present. The fibres are of medium length (900–1600 μm). Chambered fibres containing rhombic crystals are almost always present; either chiefly at the growth ring boundary or scattered among the fibres; sometimes mainly on the border of parenchyma and fibre tissue. They contain from 10 up to 30 "chambers".

Rays: nearly always homocellular, composed of procumbent cells, sometimes with a row of nearly square cells at the margin.

The rays may be either uniseriate or mostly uniseriate and partly multiseriate, or multiseriate (i.e. 2–3 cells wide, or exceptionally 4 cells wide). In some species these different kinds of rays occur together, in others only two of the three kinds are found. The ratio of the three kinds of rays can be used for differentiating between the species. There are four different combinations, viz.

a. combination I, in which the *uniseriates dominate* and the partly or entirely multiseriates constitute a small part of the whole (*fig. 1a, plate II, fig. 5*)
b. combination II, in which *most* of the rays are *uniseriate,* but quite a number are partly or wholly multiseriate (*fig. 1b, plate II fig. 6*)
c. combination III, in which *most* of the rays are *multiseriate,* but a considerable number are partly or entirely uniseriate (*fig. 1c, plate II, fig. 7*)
d. combination IV, in which the *multiseriate* rays dominate and the partly or wholly uniseriates constitute but a small part of the total number (*fig. 1d*; *plate II fig. 8*)

Combinations I and IV are easily distinguished, combinations II and III are rather difficult to distinguish if one is not familiar with the anatomy of the genus, as the differences are only gradual.

Combination I is found in: *I. calanthoides, coriacea, dysantha, graciliflora, heterophylla, huberi, jenmanii, stipularis.*

Combination II is found in: *I. capitata, cayennensis, lateriflora, leptingoides, stipularis, thibaudiana, umbellifera, virgultosa.*

Combination III is found in: *I. acrocephala, alba, bourgonii, disticha, fagifolia, marginata, nobilis, pezizifera, umbellifera.*

Combination IV occurs in: *I. acreana, alba, bourgonii, cinnamomea, edulis, gracilifolia, ingoides, leiocalycina, nobilis, pilosula, rubiginosa, splendens, strigillosa, velutina.*

The height of the rays fluctuates and is more or less specific, but infraspecific variation is sometimes rather large. Their mean height is in general extremely low

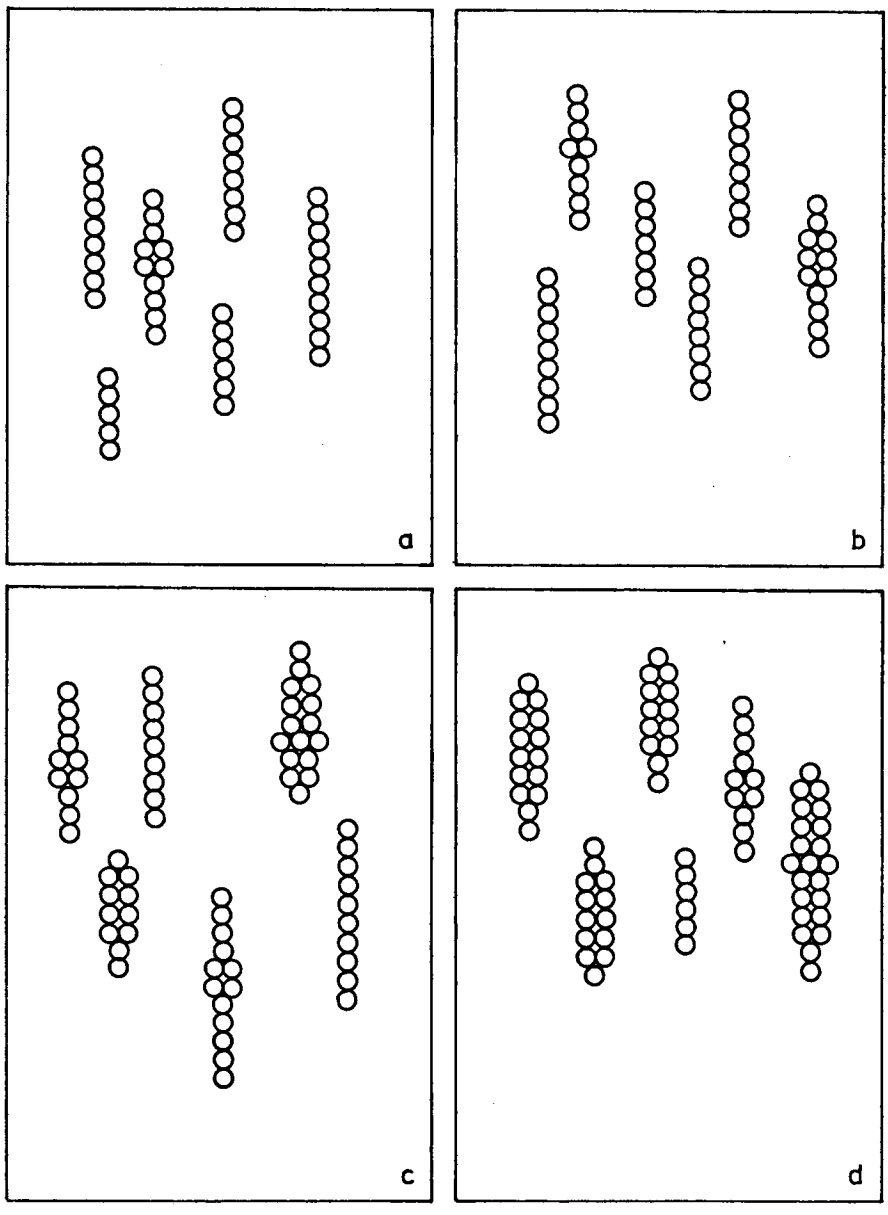

Fig. 1
a. combination I: uniseriates dominate
b. combination II: most rays uniseriate
c. combination III: most rays multiseriate
d. combination IV: multiseriates dominate

(about 250 μm), but in *I. cinnamomea, gracilifolia, rubiginosa,* and *splendens* they are about 400 μm or more high.

Ray-vessel pits are like the intervascular pits. The number of rays per mm varies from 4 to 10, exceptionally more than 10 per mm.

Parenchyma: always paratracheal; in a few species apotracheal parenchyma is also present as islands amongst the fibres, as is the case in *I. disticha, gracilifolia, ingoides, jenmanii, leiocalycina, leptingoides.* The paratracheal parenchyma always forms a complete, more or less aliform sheath around the vessel, in many species only 1 or 2 cells broad on the ad- and/or abaxial side, also often locally confluent and at the growth boundaries often much drawn out.

The author's impression, not yet confirmed by quantitative data, is that parenchyma in wood with a smaller diameter (for instance 3 or 4 cm instead of 10 cm or more) has a tendency to be more aliform and aliform confluent.

Parenchyma strands consist as a rule of 2–4 cells, in some species a few strands of 6 and more cells occur.

3.3. Key to the wood of Inga species from Suriname and the other Guianas

1. a) uniseriate rays dominating, partly or entirely multiseriates less than half of the total (comb. I and II) 2
   b) multiseriate rays dominating 10

2. a) most of the rays uniseriate, but a good deal partly or wholly multiseriate (comb. II) 7
   b) very few partly or wholly multiseriate rays (comb.I). 3

3. a) thin-walled (± 3 μm) as well as moderately thick-walled (4–6 μm) fibres occuring together 4
   b) walls of all fibres of nearly equal thickness. 6

4. a) sapwood and heartwood of a distinctly different colour. **I. graciliflora**
   b) heartwood not of a distinctly different colour 5

5. a) parenchyma as a rule confluent . . . . . **I. coriacea**
   I. huberi
   b) parenchyma mostly not confluent. . . . . **I. heterophylla**
   I.stipularis

6. a) growth-ring boundaries not distinct; parenchyma confluent, partly banded . . . . . **I. jenmanii**
   b) growth-ring boundaries distinct, fibres thick-walled (6–8 μm)
   I. calanthoides
   I. dysantha

7. a) fibres all thick-walled, wall 5–8 μm 8
   b) fibres all thin-walled, or only locally thick-walled 9

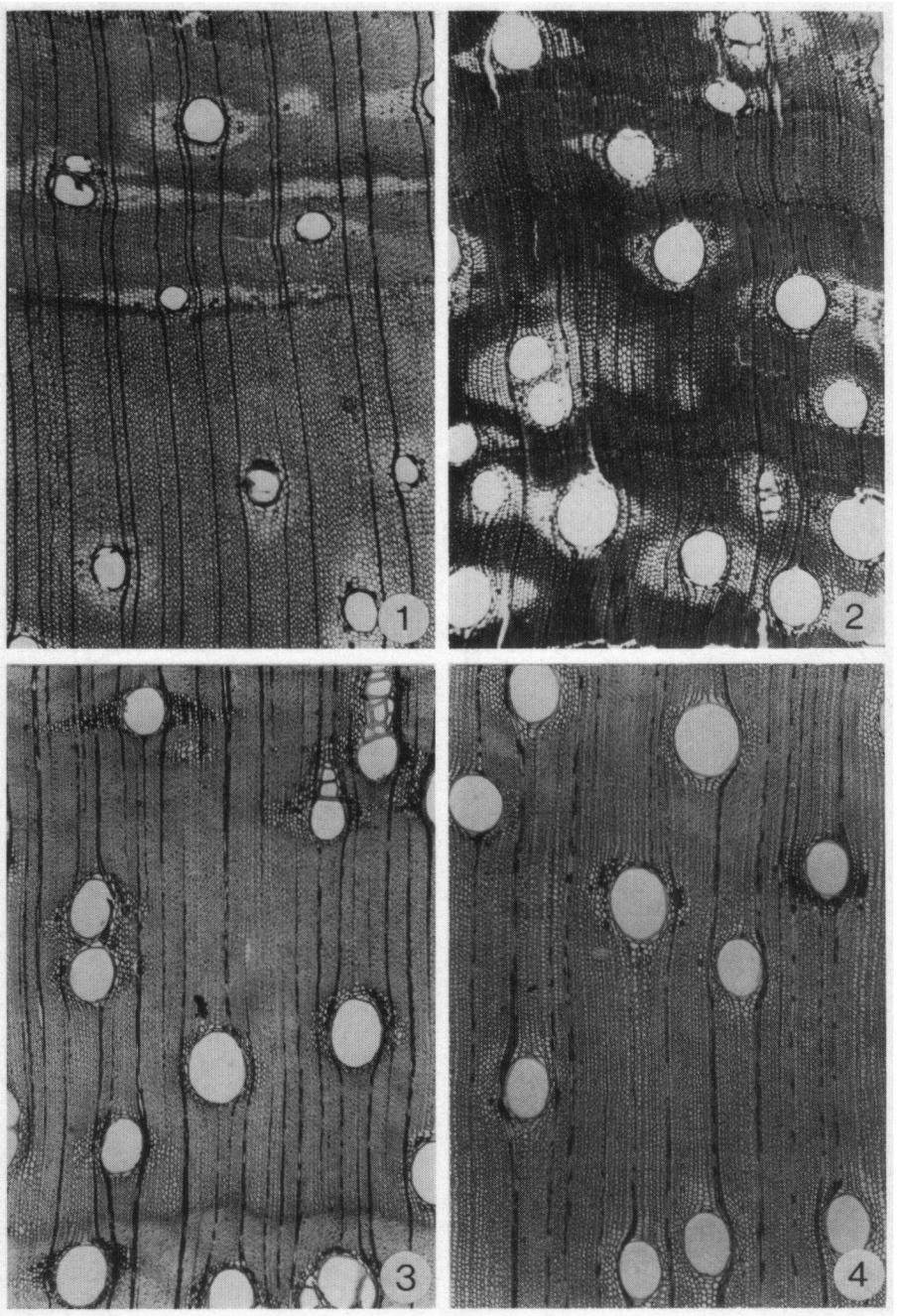

Plate I

1. *Inga coriacea* (Pers.) Desv. Uw 16113 transv. section 32 ×
2. *Inga cayennensis* Sagot Uw 2455 transv. section 32 ×
3. *Inga pezizifera* Benth. Uw 1769 transv. section 32 ×
4. *Inga edulis* Mart. Uw 315 transv. section 32 ×

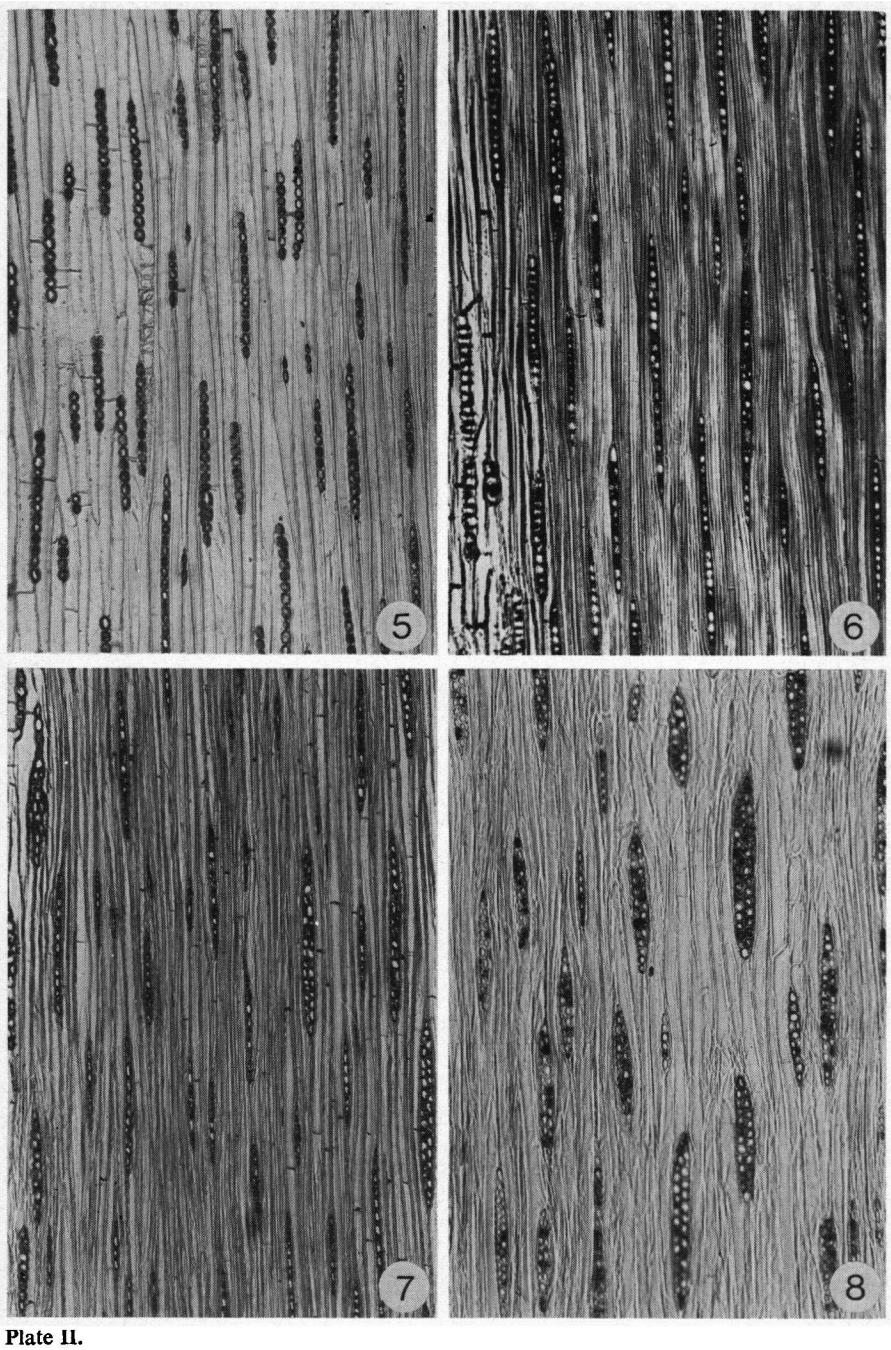

Plate II.

5. *Inga coriacea* (Pers.) Desv. Uw 16113 tang. section 80 ×
6. *Inga cayennensis* Sagot Uw 2455 tang. section 80 ×
7. *Inga pezizifera* Benth. Uw 1769 tang. section 80 ×
8. *Inga edulis* Mart. Uw 315 tang. section 80 ×

8. a) wood of a dark golden-brown colour, very heavy; parenchyma mostly not confluent . . . . . **I. leptingoides**
I. virgultosa
b) wood not so coloured; parenchyma mostly confluent. . . **I. capitata**
I. cayennensis

9. a) fibres all thin-walled . . . . . **I. stipularis**
I. thibaudiana
b) fibres thin-walled as well as locally, at the growth-ring boundaries or not, more thick-walled . . . . . **I. lateriflora**
I. thibaudiana
I. umbellifera

10. a) multiseriate rays dominating, very few partly or entirely uniseriate rays present (comb. IV) 11
b) most of the rays multiseriate, but quite a number partly or entirely uniseriates present, or about equal numbers of both kinds (comb. III) 18

11. a) large, vesicular cells present in the parenchyma . . . . . **I. alba**
b) no vesicular cells present 12

12. a) many rays 4- or even 5-seriate . . . . . **I. velutina**
b) no 4- or 5-seriate rays present 13

13. a) growth-ring boundary manifest by several rows of radially flattened fibres and locally more numerous vessels; on the boundary mostly fibres somewhat more thick-walled, elsewhere thin walled . **I. acreana**
I. edulis
b) not so 14

14. a) all fibres thin-walled (wall $\pm$ 2–3 μm) . . . . . **I. bourgonii**
I. edulis
b) not all fibres thin-walled 15

15. a) heartwood a dark reddish brown; confluent parenchyma abundant **I. gracilifolia**
b) no dark reddish brown heartwood 16

16. a) apotracheal parenchyma and parenchyma strands with more than 4 cells present . . . . . **I. pilosula**
b) no parenchyma strands with more than 4 cells present; fibres moderately thick-walled or thin-walled as well as thick-walled fibres present. 17

17. a) fibres thick-walled or moderately thick-walled . . . . **I. cinnamomea**
I. leiocalycina
I. nobilis
I. rubiginosa
I. strigillosa

b) thin-walled fibres as well as fibres with thick walls or walls of moderate thickness . . . . . **I. ingoides**
I. rubiginosa
I. splendens

18. a) all fibres thick-walled (6 μm or more) . . . . . **I. disticha**
b) fibres not thick-walled. 19

19. a) all fibres thin-walled 20
b) not all fibres alike or none thin-walled 21

20. a) rays locally to 3 cells wide. . . . . **I. alba**
I. marginata
b) rays not over 2 cells wide . . . . . **I. pezizifera**

21. a) fibres partly thin-walled, partly more or less thick-walled **I. acrocephala**
I. fagifolia
I. pezizifera
I. umbellifera
b) fibre walls of moderate thickness . . . . . **I. bourgonii**
I. nobilis

4. DISCUSSION

4.1. Anatomy

Within the genus there is rather much variation in the anatomy of the wood. One should, however, keep in mind that in wood diversities on the species level as a rule are slight or non-existent, so "much variation" should be understood in this sense. Also one should always keep one's mind open to the possibility that existing differences between species may be caused by ecological factors as well as by real genetic differences.

As more species and more samples of the same species were studied, it became clear that only one feature occurred so consistently that it could be regarded as reliable and specific. The quantity and the distribution pattern of the parenchyma may be very variable, even in the same wood sample; consequently this characteristic, though easy to see, could hardly ever be used. Differences in structure of growth ring boundaries have not been used as specific characters; far more samples would have been required to permit doing this with any certainty. Characters like wall thickness of the fibres and the simultaneous presence of thin walled and thick walled fibres have been used, with allowances for natural variation.

It appeared, however, that the character of the ray combination as described on page 4 could be used for identifying the species. This feature was described and used by REINDERS-GOUWENTAK & RIJSDIJK (1955), in connection with the characterization of the leguminous taxa. To a lesser extent COZZO (1951) also made use of it. Reinders-Gouwentak and Rijsdijk stated in their paper that in the Mimosaceae only ray combinations II or III are found. This does not apply

to *Inga*, as there are many species with a ray combination I or IV; the majority of the species, however, has combination II or III. Subsequently Reinders-Gouwentak found some difference between the character "ray combination" in the pith of the wood and in the outer wood. This difference is only gradual; wood of a certain species may have combination I near the pith and combination II in the wood on the outer side, according to data of REINDERS-GOUWENTAK & RIJSDIJK (1968). As I used only wood from the exterior of the trunk, and, moreover, allowed a margin for normal variation, which I also found in a few species, I think the character of the ray combination may be used with reasonable certainty. For example, the variation in samples of different size is illustrated by *I. edulis* Uw 14536, a sample with a diameter of 4½ cm, showing in the same way predominantly multiseriate rays (combination IV) as the other 7 samples of this species, all with a much larger diameter. (Exact diameters cannot be given, as most samples were parts of large trunks).

4.2. Taxonomy

BENTHAM'S (1874) "Revision of the suborder Mimoseae" is still the only work in which the genus is treated in its entirety. The revisions of PITTIER (1916, 1929) and LEÓN (1966) deal chiefly with the Central American species. Likewise, BRITTON & KILLIP'S (1936) and SCHERY'S (1950) revisions are limited to a certain area. Bentham distinguished the sections *Leptinga*, *Diadema*, *Bourgonia*, *Pseudinga*, and *Euinga*, chiefly based on floral or inflorescence characters, not on characters of the legumes. Over the years, however, there have been several shifts in Bentham's sections, as Bentham knew only part of the species and the pods of many species were not yet known in his time, the pods being of paramount importance in classification. Especially the sections *Pseudinga* and *Euinga* are rather heterogeneous, as in these sections several species were incorporated whose legumes were unknown at the time.

LEÓN (1966) on the whole followed Bentham's sections, but united *Leptinga* and *Diadema* to section *Leptinga*, characterized by a globose inflorescence with or without pedicels, as was done, i.a., by DUCKE (1949) and SCHERY (1950).

Bentham separated the two sections by means of the character: flowers distinctly pedicellate (*Leptinga*) vs. flowers sessile or extremely short-pedicellate (*Diadema*). León, however, stated that there is a gradual rather than a fundamental difference between pedicellate and sessile single flowers.

DUCKE (1925, 1949) gave a total of 85 species for the Brazilian Amazon territory, the assortment of which has some affinity to that of the Guianas. They are distributed among the sections sensu Bentham as follows:

Leptinga + *Diadema*	25 spp (16 spp.)
Bourgonia	20 spp (8 spp.)
Pseudinga	33 spp (20 spp.)
Euinga	7 spp (5 spp.)

Between brackets number of species studied from the various sections; as a rule more than half of the number of species from the area.

It becomes obvious now that in the structure of the wood there is a difference between the sections *Leptinga* and *Diadema* sensu Bentham, namely in the ray combination. Species from section *Leptinga*, i.e. *I. coriacea, graciliflora, heterophylla, huberi, jenmanii, lateriflora, leptingoides, paraensis, quaternata, tenuistipula, umbellifera,* and *virgultosa,* show a ray combination I or II: uniseriate rays predominate more or less. Species from the small section *Diadema* i.e. *I. cinnamomea, gracilifolia* and *lentiscifolia,* on the other hand, are characterized by a ray combination III or IV: pluriseriates dominate more or less.

Section *Bourgonia,* characterized by spikes of small flowers with an extremely small, campanulate calyx is retained by all other investigators. There is unanimous agreement that this section is a natural one. This concept is confirmed by the wood structure. All species investigated, i.e. *I. alba, bourgonii, cyclocarpa, cylindrica, fagifolia, marginata, pezizifera* and *yacoana,* have a good mutual likeness in their wood structure, in macroscopic features as colour and hardness as well as in microscopic features like ray combination, thickness of the fibres, etc. The ray combination is as a rule III, sometimes IV, meaning that multiseriate rays predominate.

Sections *Pseudinga* and *Euinga* sensu Bentham are the most heterogeneous groups. Bentham himself remarked: "the two sections which are as yet much confused, owing to the number of species in which the pod is unknown". The chief difference between the sections, however, is in the pod: flat with glabrous, slightly thickened margins in *Pseudinga,* and tetragonal or subterete and sulcate in *Euinga.* It is intelligible that much confusion has arisen, so that most of the later investigators have united both sections into one, section *Inga,* and have placed the species in different series, as their pods became known. Section *Pseudinga* sensu Bentham is therefore a heterogeneous assemblage. In the investigated species *I. acreana, acrocephala, calanthoides, capitata, cayennensis, disticha, dysantha, falcistipula, grandiflora, leiocalycina, nobilis, pilosula, rubiginosa, splendens, stipularis, striata, strigillosa, thibaudiana, velutina,* and *virescens,* every possible variation in the structure of the wood of the genus is observed.

Section *Inga* series *Inga* however, of which I have studied *I. edulis, ingoides, sessilis,* and *uraguensis,* is reasonably uniform. The ray combination is IV, once in a while combination III is seen, also multiseriate rays predominate.

5. CONCLUSIONS

The possibility of identifying wood samples not accompanied by herbarium material is rather restricted, as appears from the key to the wood. In the presence of herbarium material, even if sterile, the possibilities are much better. The structure of the wood of the species of *Inga* studied support Bentham's division of the genus into 4 sections. The difference in structure of the wood of the sections *Leptinga* and *Diadema* indicate that these sections have a real basis and the author is in favour of keeping them separate. The section *Bourgonia* is clearly the most natural one, as the structure of the wood also indicates. The section *Pseudinga* is heterogeneous and should probably be divided into several

parts. Section *Euinga*, nowadays section *Inga*, series *Inga*, on the other hand, seems to be a natural one.

ACKNOWLEDGEMENTS

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Material studied:

Inga acreana Harms: Suriname – Uw 17407 (*Maguire 54771*)

I. acrocephala Steud.: Suriname – Uw 2454 (*Maguire 24121*, diam. 15 cm)

I. alba Willd.: Suriname – Uw 2113 (*B.B.S. 1072*), Uw 2116 (*B.B.S. 1075*); French Guiana – Uw 5239 (*BAFOG 160 M*); Brazil – Uw 7766 (*Krukoff 6491*, Amazonas), Uw 8214 (*Krukoff 7037*, Amazonas); Peru – Uw 18008 (*Schuncke 22394*)

I. bourgonii (Aubl.) DC.: Suriname – Uw 624 (*B.B.S. 25*), Uw 4740 (*Lindeman 728*, diam. 20 cm); Peru – Uw 8655 (*Ellenberg 2244*)

I. calanthoides Amsh.: Suriname – Uw 2456 (*Maguire 24547*, diam. 18 cm)

I. capitata Desv.: Suriname – Uw 341 (*Stahel 341*), Uw 3746 (*Lindeman 5041*, diam 13 cm), Uw 5004 (*Schulz 7377*, diam. 3 cm); Brazil – Uw 7733 (*Krukoff 6447*, Amazonas)

I. cayennensis Sagot: Suriname – Uw 2455 (*Maguire 24709*, diam. 15 cm), Uw 12151 (*v. Donselaar 3758*, diam. 4 cm)

I. cinnamomea Spruce: Suriname – Uw 17324 (*Maguire 54800*), Uw 17402 (*Maguire 54722*)

I. coriacea (Pers.) Desv.: Brazil – Uw 16113 (*Krukoff 8494*, Amazonas)

I. cyclocarpa Ducke: Brazil – Uw 8184 (*Krukoff 7114*, Amazonas)

I. cylindrica Mart.: Brazil – Uw 20125 (*Krukoff 5688*, Acre)

I. disticha Benth.: Suriname – Uw 1594 (*Lanjouw & Lindeman 2039*, diam. 6 cm), Uw 4139 (*Lindeman 6068*, diam. 5 cm)

I. dysantha Benth.: Suriname – Uw 5014 (*Schulz 7395*, diam. 10 cm), Uw 15304 (*Oldenburger & Norde 345*, diam. 15 cm)

I. edulis Mart.: Suriname – Uw 315 (*Stahel 315*), Uw 2059 (*L.B.B. 1043*), Uw 2060 (*L.B.B. 1044*), Uw 2061 (*L.B.B. 1045*), Uw 17413 (*Maguire c.s. 54900*); French Guiana – Uw 5344 (*BAFOG 269 M*); Brazil – Uw 14536 (*Reitz & Klein 25863*, Santa Catarina)

I. fagifolia Willd.: British Guiana – Uw 957 (*British Guiana 3536*)

I. graciliflora Benth.: British Guiana – Uw 16761 (*Maguire c.s. 45632*)

I. gracilifolia Ducke: British Guiana – Uw 4874 (*Maguire c.s. 40496*); Brazil – Uw 9035 (*Maguire c.s. 51775*, Amapá)

I. heterophylla Willd.: Suriname – Uw 250 (*Stahel 250*)

I. huberi Ducke: Suriname – Uw 1911 (*Lanjouw & Lindeman 2766*), Uw 2415 (*Lindeman 3663*, diam. 7 cm), Uw 2388 (*Lindeman 3629*, diam. 3 cm)

I. ingoides (Rich.) Willd.: Suriname – Uw 700 (*B.B.S. 107*), Uw 1389 (*Lanjouw & Lindeman 1106*, diam. 10 cm)

I. jenmanii Sandw.: Brazil – Uw 7813 (*Krukoff 6608*, Amazonas)

I. lateriflora Miq.: Suriname – Uw 149 A (*Stahel 149 A*), Uw 8877 (*Schulz 9325*, diam. 12 cm)

I. leiocalycina Benth.: French Guiana – Uw 5270 (*BAFOG 195 M*); Brazil – Uw 18989 (*Prance & Maas 13707*), Rio Purús, Acre)

I. lentiscifolia Benth.: Brazil – Uw 13746 (*Hatschbach, Lindeman & de Haas 13657*, diam. 4 cm, Paraná)

I. leptingoides Amsh.: Suriname – Uw 1823 (*Lanjouw & Lindeman 2552*, diam. 12 cm), Uw 2449 (*Maguire c.s. 24264*, diam. 15 cm)

I. marginata Willd.: Brazil – Uw 13906 (*Lindeman & de Haas 2735*, diam. 12 cm, Paraná), Uw 19098 (*Prance & Maas 14499*, Rio Purús, Acre)

I. melinonis Sagot: British Guiana – Uw 959 (*British Guiana 3989*)
I. nobilis Willd.: Suriname – Uw 3046 (*Lindeman 4081*, diam 11 cm), Uw 3235 (*Lindeman 4703*, diam. 7 cm); Brazil – Uw 7611 (*Krukoff 6278*, Amazonas), Uw 17147 (*Maguire c.s. 51741*, Amapá)
I. pezizifera Benth.: Suriname – Uw 230 (*Stahel 230*), Uw 1769 (*Lanjouw & Lindeman 2450*, diam. 24 cm), Uw 4561 (*Lindeman 6744*, diam. 18 cm)
I. pilosula (Rich.) Macbride: Suriname – Uw 17472 (*Maguire c.s. 55344*); Brazil – Uw 17015 (*Maguire c.s. 50330*, Amapá)
I. quaternata P. et E.: Brazil – Uw 19851 (*Krukoff 5254*, Rio Purús, Acre)
I. rhynchocalyx Sandw.: British Guiana – Uw 960 (*British Guiana 3622*)
I. rubiginosa (A. Rich.) DC.: Suriname – Uw 162 (*Stahel 162*), Uw 4945 (*Schulz 7280*, diam. 50 cm); French Guiana – Uw 5137 (*BAFOG 52 M*)
I. sessilis (Vell.) Mart.: Brazil – Uw 6351 (*Reitz 14894*, Santa Catarina)
I. splendens Willd.: Suriname – Uw 701 (*B.B.S. 108*), Uw 17382 (*Maguire c.s. 54158*)
I. stipularis DC.: Suriname – Uw 1603 (*Lanjouw & Lindeman 2084*, diam. 7 cm); Uw 3392 (*Lindeman 4980*, diam. 9 cm); Brazil – Uw 16818 (*Maguire c.s., 47022*, Amapá)
I. striata Benth.: Brazil – Uw 18049 (*Reitz & Klein 25854*, Santa Catarina)
I. strigillosa Spruce: Brazil – Uw 19099 (*Prance & Maas 14527*, Rio Purús, Acre)
I. tenuistipula Ducke: Brazil – Uw 19593 (*Krukoff 4742*, Amazonas)
I. thibaudiana DC.: Suriname – Uw 2452 (*Maguire c.s. 24549* diam. 12 cm), Uw 2879 (*Lindeman 3906*, diam. 8 cm), Uw 3133 (*Lindeman 4506*, diam. 4 cm), Uw 4582 (*Lindeman 6769*, diam. 8 cm)
I. umbellifera (Vahl) Steud.: Suriname – Uw 1985 (*Lanjouw & Lindeman 3019*, diam. 12 cm), Uw 3123 (*Lindeman 4464*, diam. 8 cm)
I. uraguensis Hook. et Arn.: Brazil – Uw 14001 (*Lindeman & de Haas 3211*, Paraná)
I. velutina Willd.: Brazil – Uw 7554 (*Krukoff 6204*, Amazonas)
I. virescens Benth.: Brazil – Uw 14528 (*Reitz & Klein 25628*, Santa Catarina)
I. virgultosa Desv.: Suriname – Uw 1834 (*Lanjouw & Lindeman 2567*)
I. yacoana Macbride: Brazil – Uw 20105 (*Krukoff 5661*, Rio Purús, Acre).

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