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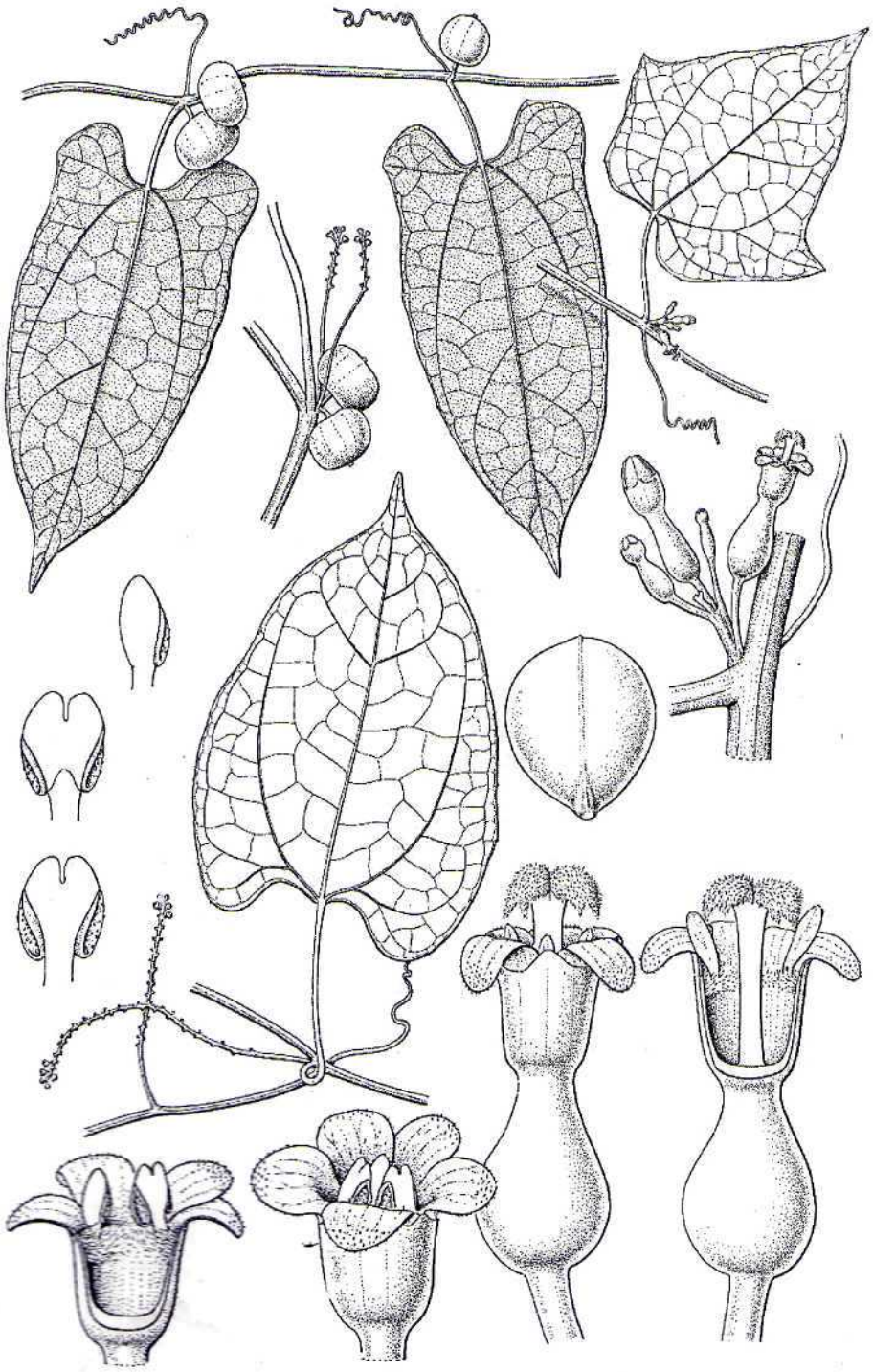
A JOURNAL ON TAXONOMIC BOTANY, PLANT SOCIOLOGY AND ECOLOGY



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A REVISION OF MALESIAN ISACHNE SECT. ISACHNE (GRAMINEAE, PANICOIDEAE, ISACHNEAE)

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ABSTRACT
ISKANDAR, E.A.P. & VELDKAMP, J.F. 2004. A revision of Malesian *Isachne* sect. *Isachne (Gramineae, Panicoideae, Isachneae). Reinwardtia* 12 (2): 159 – 179. – There are ca. 23 species of *Isachn*e in Malesia of which the seven belonging to sect. *Isachne* are treated here. *Isachne miliacea* Roth has been misapplied to *I. minutula* (Gaudich.) Kunth, as its type belongs to *I. globosa* (Thunb.) Kuntze. *Isachne pulchella* Roth is the correct name for *I. dispar* Trin.

Key words: *Isachn*e, *Gramineae*, Malesia.

ABSTRAK
ISKANDAR, E.A.P. & VELDKAMP, J.F. 2004. Revisi *Isachne* sect. *Isachne (Gramineae, Panicoideae, Isachneae)* di Malesia. *Reinwardtia* 12 (2): 159 – 179.– Tujuh jenis *Isachne* sect. *Isachne* di dalam 23 jenis *Isachne* di Malesia dibahas di sini. *Isachne miliacea* Roth merupakan sinonim dari *I. globosa* (Thunb.) Kuntze, dan nama tersebut selama ini disalahterapkan pada *I. minutula* (Gaudich.) Kunth. *Isachne pulchella* Roth merupakan nama yang benar untuk *I. dispar* Trin.

Kata kunci: *Isachne*, *Gramineae*, Malesia.

INTRODUCTION

In this study we have revised the Malesian species of *Isachne* R. Br. sect. *Isachne* (Gramineae) which have heteromorphous florets, i.e. the lemma and palea of the lower florets are different in shape, sometimes also in pubescence, and much less indurated than those of the upper ones.

HISTORY

The first species attributuable to *Isachne* appears to be the pre-Linnean *Meneritana. Gramen miliaceum folio hirsuto* of Hermann (1717: 24). It was later casually mentioned by Linnaeus (1747: 18, in a note). This has been identified as *Isachne globosa* (Thunb.) Kuntze.

In the Species plantarum (1753) and other publications Linnaeus never mentioned *Meneritana* again and apparently had no material of *Isachne*.

Thunberg (1784-a, -b) described *Milium globosum* from Japan, the basionym of *I. globosa*.

R. Brown (1810) erected *Isachne* with only *I. australis* R. Br., remarking that *Meneritana* Herm. belonged to the same genus. Later authors attributed the combination *I. meneritana* to him, but he did not make it. *Isachne australis* turned out to be a synonym of *I. globosa* as well.

Roemer & Schultes (1817: 475) included *Meneritana* in *Neurachne* R. Br. and added (p. 476) 3 species from Roth's manuscript of the 'Novae plantarum species' (1821) to *Isachne*. One of these, *I. tricarinata* Roth, turned out to be a synonym of *Panicum brevifolium* L., another, *I. miliacea* Roth, is a name widely applied to a SE Asian species. However, we have seen the type, and it turned out to belong to *I. globosa* whereby the correct name for the taxon to which it was misapplied becomes *I. minutula* (Gaudich.) Kunth.

Sprengel (1824) sprinkled the four *Isachne* species then known throughout his concept of *Panicum* L. and so was apparently the first to formally associate both genera.

Trinius (1826) mentioning only *I. miliacea* of the existing species added three new ones, *I. atrovirens* (Trin.) Trin., a synonym of *I. globosa*, *I. rigens* (Sw.) Trin., and *I. panicea* Trin., a

superfluous name for *I. arundinacea* (Sw.) Griseb.

About a year later (1827) he added 2 more: *I. albens* Trin. and *I. dispar* Trin. The first with homomorphous florets was not studied by us, the second with heteromorphous florets is a synonym of *I. pulchella* Roth.

Kunth (1829: 42) enumerated 7 species, among which the first one for the New World [*Isachne dubia* Kunth, nom. superfl. for *Panicum dispermum* Lam. = *I. disperma* (Lam.) Doell.]. Later (1830: 243; 1831: 407) he added two more species. In 1833 he listed 10.

Steudel (1840) included *Isachne* in *Panicum*. By 1853 (p. 38; 1854: 94) the first taxon had increased to 36 species which he regarded as a section of the latter. This was the last overall revision of the genus.

Döll (1877: 273) placed *Isachne* after *Panicum*.

Bentham (1878: 457) included *Isachne* in the subtribe *Milieae* of his '*Poaceae*', but in 1881 (p. 30) 'following out the views of General Munro' recognised the *Isachneae* as a distinct tribe, which included a number of genera now regarded as misplaced there. The '*Panicaceae*' was the other major infra-familiar taxon distinguished by him.

Hackel (1887: 35) placed the genus next to *Panicum* without further comment. He was followed in this by Hooker f. (1896), who said that the genus might belong to the '*Poaceae'*, after all, and that he regarded his 'limitation as most open to question ... (the pubescence of the spikelets) afford no specific character'. Later studies of the Indian species [e.g. by Bor (1960: 576) and Prakash & Jain (1984: 7)] showed that he was too pessimistic; nearly all his taxa are still recognised, although several now of course have different names.

Chase (1911: 149) discussed the history and relationships of the genus. She apparently had little material available, as she regarded *Panicum trachyspermum* Nees 'an exception to the genus in that the lower floret is unlike the upper'. Indeed, in the key (p. 106) she uses 'Florets alike in form and texture' to differentiate *Isachne* against *Heteranthoecia* Stapf.

Stapf (1917: 13, 16) created a subtribe with the alternative names *Isachnastrae* and *Isachninae* in the *Paniceae* which also included *Isachne* and *Heteranthoecia*. *Isachninae* is the correct name.

Hitchcock (1920: 115) revised the 8 species occurring in America, regarding the position 'anomalous' in the *Paniceae* because of the structure and division of sexuality of the spikelets.

Camus (1922) included the genus in the *Paniceae*.

Pilger (1940: 85) included *Isachne* in the subtribe *Panicinae*.

Hubbard (1943) removed the *Isachneae* from the *Paniceae* and included the genera *Coelachne* R. Br., *Heteranthoecia* Stapf, *Limnopoa* C.E. Hubb., and *Sphaerocaryum*. This represents the current circumscription of the tribe.

Potztal (1952: 551) made an extensive anatomical analysis of representatives of the genera included by Hubbard. She observed 'festucoid' leaf anatomy, yet concluded that most of the *Isachneae* should be placed in the *Panicoideae*, but referred *Sphaerocaryum* to the *Sporoboleae*, i.e. the *Eragrosteae*. Tateoka (1957: 119) and Prakash & Jain (1987: 105), however, were in favour of retaining it in the *Isachneae*. They studied the leaves, a pity that they didn't look at the hairs on the lemma and palea. As far as we could discover no one has done so, but a quick survey at the very end of this study showed the presence of different shapes, especially of their tips.

Jansen (1953: 279) gave a survey of the 36 Malesian taxa.

Pilger (1954: 365) accepted Bentham's tribe in the *Panicoideae* no doubt because his student Potztal had concluded so.

Metcalfe (1960: 257) studied the anatomy of the leaves of some species. He concluded that the leaf structure would be panicoid but of a rather special type. The acutely angled silica-bodies, the long narrow assimilatory cells of the mesophyll, and the cubical long-cells are very characteristic of *Isachne* and other related genera of the *Isachneae*. The radiate mesophyll (*Isachne*-type') is also found in many C-3 *Paniceae.*

Bor (1960: 547) retained the tribe in the *Pooideae*.

Jacques-Félix (1962) placed the *Isachneae* next to the *Paniceae*.

The treatment by Keng f. (1965) for China we unfortunately could not read, it is mentioned for completeness' sake here. He apparently accepted the *Isachninae* as a distinct subtribe in the *Paniceae*.

Brown (1977) proposed an evolutionary scheme for the *Paniceae* based on leaf anatomy and photosynthesis. He regarded *Isachne* as the 'modern descendants of the 2-fertile-floret, non-Kranz, pre-Paniceae stage of evolution' (p. 54).

Prakash & Jain (1984) published a revision of the Indian representatives of the tribe. They

recognised 29 species for *Isachne* and as they closely follow the floristic treatment by Bor (1960) the paper may be regarded as providing the descriptions and notes to that. As a follow-up they presented accounts of the phytogeography of the tribe and a survey of the leaf anatomy (1987). They recognised 110 species for *Isachne* with centers of speciation in India and Malesia and therefore suggested that the origin of the tribe might have been there. Curiously on their map the occurrence in the Carolines (2 spp), Fiji (1), Hawai'i (2), Madagascar (9), New Zealand (1), Ponape (2), Réunion (6), and Vanuatu (1) has been omitted, although mention of some of these is made in the text. Note that most of the taxa mentioned for Africa are synonymous, e.g. with *I. buettneri*, or not *Isachne* at all (See Appendix).

Clayton & Renvoize (1986: 309) suggested an origin by reversal of the sexuality of the lower floret from *Panicum* sect. *Verruculosae* Stapf, similar to the situation in *Dissochondrus* (Hillebr.) Kuntze arising from *Setaria* P. Beauv.

With the bias towards American species in present molecular analyses the genus appears to have been much neglected. Kellogg & Campbell (1986: 321, t. 28.2, -3) have included *Coelachne*, *Heteranthoecia*, and *Isachne* in a phylogenetic analysis of the family and found that *Isachne* and the *Panicoideae* have a sister relationship, while *Coelachne* and *Heteranthoecia* were associated with the *Centotheceae*. This suggests that the *Isachneae* in the current circumscription might be polyphyletic. Unfortunately we have not found another instance where the genera have been included in a similar analysis.

They defined the *Panicoideae* by the presence 'of a single incomplete floret proximal to a single female fertile floret'. Actually the wording is misleading, what is meant is that the proximal floret is usually reduced [but not always!, bisexual in e.g. *Dissochondrus* and *Urochloa piligera* (F. Muell. ex Benth.) R.D. Webster] ranging from male to completely epaleate (e.g. in *Digitaria* Haller), while the upper floret is bisexual. In *Isachne* the situation is quite variable, as is discussed under morphology, but the principal structure of the spikelet of *Isachne* very much resembles that of the *Panicoideae*. Simple starch grains were mentioned as another synapomorphy.

Soreng & S.J. Pennington (2003: 274) included the subtribe *Isachninae* in the synonymy of the *Isachneae*, and that in the *Panicoideae*. As the other genera are not American the actual circumscription of their *Isachninae* is not clear, nor what its sister might be: to accept one subtribe implies there is another one.

INFRA-GENERIC DELIMITATIONS

Steudel (1854: 94) distinguished 3 informal and unnamed groups: both florets glabrous, both florets pubescent, both florets pubescent or scabrous, the latter two thus with rather confusing diagnoses. This division was not accepted by later authors; to us an infra-generic subdivision based on pubescence at present seems untenable, but it should be looked into.

Post & Kuntze (1903: 301) included *Sphaerocaryum* Nees ex Hook. f. as a section in *Isachne*, calling the latter sect. *Typisachna*, an invalid name, as an autonym is required.

Honda (1930: 278) apparently was the first to formally name sections within *Isachne* s.s.: *Euisachne* Honda for species with homomorphous florets. As he included the heteromorphously flowered *I. globosa* in it, the correct name for the type of the genus, this name is invalid, as an autonym is now required. *Paraisachne* Honda was erected for species with heteromorphous ones, with *Isachne dispar* as the only species, and so the type of it. According to his circumscription *I. globosa* is to be included in *Paraisachne* whereby that section must be called *Isachne*, and thus leaving the section with homomorphous florets without a name.

Stapf & Hubbard (1934: 1091) in a continuation of Stapf's 1917 work accepted Honda's classification.

Pilger (1940: 85) also followed Honda.

Jansen (1953: 290) recognised the two sections, calling that for the heteromorphous species *Eu-Isachne* Honda, and that for the homomorphous ones *Pseudo-Isachne* Ohwi. Both names are invalid, the first because an autonym is required, the second because there is no latin description (and no type, either). It will be obvious that the *Eu-Isachne* as employed here is not Honda's taxon at all (except for the presence of *I. globosa*), but his *Paraisachne*, while *Pseudoisachne* is his *Eu-Isachne*.

Pseudoisachne Ohwi was accepted, but not validated by T. Koyama (1987: 12).

Meanwhile, Prakash & Jain (1984: 8) had described *Isachne* sect. *Albentes* for this group with homomorphous florets, citing *Pseudo-isachne* as a synonym, and appointing *Isachne albens* as the type.

As our study included only the 'heteromorphous species' we can offer no opinion whether these sections are 'natural', i.e. monophyletic, only that the differences in shape and texture of the lemmas and paleas are useful in identification, while the situation within species is not always immediately clear (as in *I. globosa*).

MORPHOLOGY

Glands

Curious in some species (*I. diabolica* Ohwi, *I. globosa, I. minutula, I. pulchella, Isachne villosa* (Hitchc.) Reeder is the presence of glandular bands on the culms below the nodes, and on the branches of the inflorescence, while the longest pedicel of the pair is glandular, the shorter one usually is not.

'The significance of the yellow viscid bands on the pedicels is unknown' [Judziewicz (1990: 294)]. Similar bands are also known in species of *Eragrostis*, *Panicum brevifolium, P. hirtum* Lam., *Sporobolus* spp., and no doubt elsewhere. One can speculate that they deter insects from moving about, or perhaps offer an attraction to ants to keep other insects off. No notes have made on any secretion of nectar, though.

Spikelet structure

As has already mentioned above the spikelets are bi-flowered and dehisc above the glumes. In the *Panicoideae* they generally fall as a whole with the glumes, but exceptions exist, e.g. in *Ichnanthus* P. Beauv. where the upper floret may fall from the spikelet. The spikelets are abaxial, an important character in the *Panicoideae*.

They are, as in the *Panicoideae*, determinate, that is, there is no rhachilla process beyond the upper floret. Occasionally a third floret may be developed, as happens also in the *Panicoideae*, but this seems best regarded as an 'error of enthusiasm' and not an indication of a previous situation. As also has been mentioned above in one section the lower florets differ from the upper ones in shape and texture of the lemmas and paleas. As in the *Panicoideae* the lower ones are thinner (and often longer) than the indurated upper ones. Whether this is an indication of a 'deep split' in the phylogeny as has been implied or actually stated by previous students of the genus by the recognition of two sections based on this, was not the subject of this study.

Floret sexuality

The two florets show a remarkable variation in sexuality. In the *Panicoideae* the general tendency is to have a reduction of the lower floret. Exceptionally both florets are bisexual and this may be a reversal to an original state, but more usually the plants are androdioecious with the lower floret paleate and male, or paleate and sterile, or epaleate, whereby the spikelet appears to be uniflorous with three glumes. In *Isachne* there seems to be a state of what may be called indecision: both florets may be bisexual, presumably the plesiomorphic condition, but the situation may be inconstant in the same taxon.

In all but one of the species (*I. villosa*) of the present study the lower floret is male, in five the upper one female: *I. brassii, I. diabolica, I. globosa* (the upper one rarely bisexual), *I. minutula, I. pulchella.* The upper floret is always bisexual in *I. langkawiensis* and *I. villosa*.

The epithet in *E. dioica* Swallen is misleading, as the plants are described as monoecious: the lower floret being male, the upper one female.

Lemma pubescence

Lack of time made it impossible to study the kind of hairs on the lemmas (and paleas) but a cursory survey suggested that there are very curious types which may aid in specific delimitations, if not in infrageneric ones, as are known to be present in *Digitaria* Haller and *Panicum*.

Anatomy

Notes on the influence of the anatomy on tribal and generic delimitation have been mentioned in the preceding, it seems superfluous to summarise this here. The reader is referred to the studies made by Potztal (1952), Tateoka (1957), Metcalfe (1960), Hsu (1965), W. V. Brown (1977), and Prakash & Jain (1987).

ISACHNE R. Br.

Isachne R. Br., Prodr. 1 (1810) 196; Ved Prakash & S.K. Jain, Fasc. Fl. India 14 (1984) 7. – *Panicum* L. sect. *Isachne* R. Br. ex Steud., Syn. Pl. Glumac. 1 (1853) 38; (1854) 94. – [*Isachne* R. Br. sect. *Euisachne* Honda, J. Fac. Sci. Univ. Tokyo III, 3 (1930) 278, *nom. inval.*]. – Type: *Isachne australis* R. Br. [= *Isachne globosa* (Thunb.) Kuntze].

Isachne R. Br. sect. *Paraisachne* Honda, J. Fac. Sci. Univ. Tokyo III, 3 (1930) 278, 282. – Type: *Isachne dispar* Trin. (= *Isachne pulchella* Roth).

[*Isachne* R. Br. sect. *Pseudoisachne* Ohwi ex

Jansen, Reinwardtia 2 (1953) 290, *nom. inval*. in clave); ex T. Koyama, Grasses Japan (1987) 126, id.]. – *Isachne* R. Br. sect. *Albentes* Ved Prakash & S.K. Jain, Fasc. Fl. India 14 (1984) 8. – Type: *Isachne albens* Trin.

Plants annual or perennial. Culms hollow. Nodes glabrous to pubescent with bulbous hairs, glandular or eglandular below it. Ligules setose. Panicle contracted to lax, glandular or eglandular. Spikelets paired to distally solitary, pedicelled, glandular or eglandular, disarticulating above the glumes. Glumes subequal, 5-9-nerved. First lemma at anthesis grooved or not, 5-nerved. Lower floret male or bisexual. Rhachilla between florets developed or not. Upper floret female or bisexual. Lodicules two. Stamens three. Styles two. Ovary glabrous. Hilum punctiform. Basic chromosome number x =10.

Distribution – Ca. 95 spp. (see Appendix), mainly in Asia, c. 23 in Malesia, of which the 7 of sect. *Isachne* are treated here.

KEY TO *ISACHNE* SECT. *ISACHNE* IN MALESIA

1 a. Culms with annular glands below the nodes ... 2
b. Culms without annular glands below the nodes ... 3

2 a. Culm nodes glabrous. Sheaths 5.5–8.5 cm long, margin glabrous. Blades lanceolate, 10.5–14 cm by 15–20 mm, smooth, 13-nerved. Base rounded. Margins not white, not undulate. Panicle loosely contracted, 22 by 11 cm. Spikelets not secund, not yawning, globular, 1.5–1.9 mm wide. Lower glume 1.8–2 by 1.1–1.8 mm, 7-nerved. Upper glume 1.8–1.9 mm long, 9-nerved. Lower floret ellipsoid and planoconvex. – W Sumatra ... 2. *I. diabolica*
b. Culm nodes pubescent. Sheaths 0.6–1.5 cm long, margin pubescent to pubescent with bulbous hairs. Blades ovate-oblong to ovate-lanceolate, 1.2–3 cm by 3.5–11 mm, scaberulous, 7-nerved. Base cordate, clasping, and pectinate. Margins white cartilaginous, undulate. Spikelets secund, yawning at maturity, obovoid, 1–1.1 mm wide. Lower glume 1.2–1.3 by 0.7–0.8 mm, 5-nerved. Upper glume 1.2–1.3 mm long, 7-nerved. lower floret flattened ellipsoid ... 6. *I. pulchella*

3 a. Blades margins not white cartilaginous ... 4
b. Blades margins white cartilaginous ... 6

4 a. Culms nodes glabrous. Blades 7–9-nerved ... 5
b. Culms nodes pubescent. Blades 5-nerved. – Spikelets 1.3–2 mm long, obovoid. Lower glume 0.7–0.9 mm wide. Upper glume 1.4–1.9 by 0.75–1.3 mm. Rhachilla between florets distinctly obdeltoid. First lemma oblong, 1.25–2 by 0.8–0.85 mm ... *5. I. minutula*

5 a. Spikelets 1.2–1.5 mm long, obovoid. Lower glume 0.5–0.7 mm wide. Upper glume 1.3–1.6 by 0.7–0.8 mm. Rhachilla between florets flattened and parallel-sided. First lemma elliptic, 1.2–1.25 by 0.6–0.8 mm ... 1. *I. brassii*
b. Spikelets 1.75–2.7 mm long, globular or ellipsoid. Lower glume 0.9–1.4 mm wide. Upper glume 1.7–2.7 by 1–1.5 mm. Rhachilla between florets distinctly obdeltoid. First lemma oblong, 1.9–2.5 by 0.9–1.2 mm ... 3. *I. globosa*

6 a. Spikelets 1.75–2.7 mm long, globular or ellipsoid. First lemma oblong to obovate oblong, 1.75–2.55 mm long, glabrous ... 7
b. Spikelets 1.2–1.5 mm long, obovoid. First lemma elliptic, 1.1–1.2 mm long, puberulous. – Blades 5-nerved, scaberulous. Base narrowed, pectinate. Panicle lowermost branch naked in the lowermost 0.06–0.2-th. Lower glume elliptic, 0.75–1 mm wide, 7-nerved, glabrous, obtuse. Upper glume obovate, 1.25–1.6 mm long, glabrous, obtuse. First lemma 0.7–0.75 mm wide. Rhachilla between florets terete. Upper floret bisexual. Second palea elliptic. New Guinea ... 7. *I. villosa*

7 a. Sheaths glabrous to distally pubescent without bulbous hairs. Panicle lowermost branch naked in the lowermost 0.1–0.3-th. Lower glume 0.85–1.4 mm wide, 7-nerved, glabrous, obtuse. Upper glume elliptic to obovate, 1.6–2.7 mm long, glabrous, obtuse. First lemma oblong, 0.8–1.25 mm wide. – Blades (7-)9 nerved, base abruptly narrowed. Rhachilla between florets distinctly obdeltoid. Upper floret female. Second palea elliptic ... 3. *I. globosa*
b. Sheaths pubescent with bulbous hairs. Panicle lowermost branch naked in the lowerm ost 0.02–0.06-th. Lower glume 0.75–0.8 mm wide, 5-nerved, distally pubescent with bulbous hairs, acute. Upper glume obovate oblong, 1.5–1.6 mm long, pubescent with bulbous hairs, acute. First lemma obovate oblong, 0.7–0.75 mm wide. – Blades 5-nerved, base narrowed. Rhachilla between florets terete. Upper floret bisexual. Second palea obovate oblong. Langkawi Isl. ... 4. *I. langkawiensis*

1. ISACHNE BRASSII Hitchc. – Fig. 1.

Isachne brassii Hitchc., Proc. Linn. Soc. New S Wales 54 (1929) 146. – Type: *Brass 1018* (US!, holo; A).

Plants perennial. Culms loosely tufted to geniculate, rooting in decumbent nodes, 0.1–0.35 m long, nodes glabrous (rarely pubescent), without annular glands below them, internodes 1.5–6 cm long. Sheaths 1–2 cm long, glabrous (rarely pubescent), margin pubescent to pubescent with bulbous hairs. Ligule setose, hairs 0.75–1.5 mm long. Blades linear-lanceolate to

linear, 1.25–5.25 cm by 2–6 mm, base narrowed and pectinate, scaberulous, glabrous to pubescent, 7-nerved, margins not white, not undulate, scaberulous, pectinate. Panicle loosely contracted, 2.2–7.5 by 1–4.5 cm. Panicle branches 7–13, eglandular, smooth; lowermost branch 1.1–3.5 cm long, naked in the lowermost 0.04–0.1-th, with 2–6 branches and 9–20 spikelets. Pedicels eglandular, smooth; of the lower spikelet shorter than the spikelet; of the upper spikelet longer than the spikelet. Spikelets not secund, paired to distally solitary, not yawning, obovoid, 1.2–1.5 by 0.75–1.4 mm. Lower glume elliptic to obovate, 1.3–1.65 mm long, 0.55–0.75 mm wide, membranous, (5- or) 7-nerved, glabrous, smooth to distally scaberulous, obtuse; upper glume obovate to elliptic, 1.3–1.6 by 0.7–0.8 mm wide, membranous, 7-nerved, glabrous, smooth to distally scaberulous, obtuse. Rhachilla between florets flattened and parallel-sided. Lower floret flattened ellipsoid, male. Lemma elliptic, at anthesis longitudinally grooved, 1.2–1.25 by 0.65–0.8 mm, chartaceous, glabrous, apex rounded. Palea elliptic, 1.2–1.25 by 0.6–0.7 mm, chartaceous, glabrous, apex rounded. Anthers 0.6–0.9 mm long. Upper floret planoconvex and gibboid, female. Lemma elliptic, 0.9–1.2 by 0.8–1 mm, 0.7–1 times as long as the first lemma, at anthesis chartaceous, glabrous to puberulous .

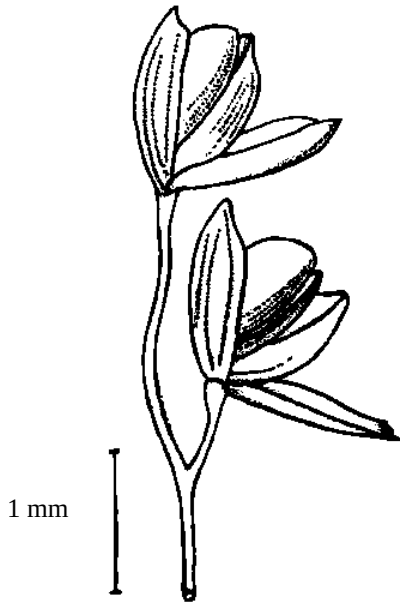

Fig. 1. *Isachne brassii* Hitchc. Spikelets. From *Gjellerup 33* (L)

along the margin, apex rounded. Palea elliptic, 0.8–1 by 0.6–0.75 mm, chartaceous, glabrous to glabrescent, apex rounded.

DISTRIBUTION. Malesia: C Celebes, Moluccas (Buru, E. Ceram), New Guinea: Irian Jaya (Mamberamo, Eta River, Tami River, Taritatu River), Papua New Guinea (Western Province, Central Province).

HABITAT. On sand drifts in river, sago swamps, by the edges of a small pond in partly felled primary forest, cultivated ground, roadsides, up to 100 m alt.

COLLECTOR'S NOTES. Flowers white.

2. ISACHNE DIABOLICA Ohwi – Fig. 2.

Isachne diabolica Ohwi, Bull. Tokyo Sci. Mus. 18 (1947) 14. – Type: *Bünnemeijer 8739* (BO!, holo; K, K000290191).

Plants perennial. Culms geniculate, rooting in decumbent nodes, c. 0.5 m long, nodes glabrous, with annular glands below them, internodes 5.5–12 cm long. Sheaths 5.5–8.5 cm long, glabrous, margin glabrous. Ligule setose, hairs 3.8–4.5 mm long. Blades lanceolate, 10.5–14 cm by 15–20 mm, base rounded, smooth, glabrous, 13-(–15)-nerved; margins not white, not undulate, scaberulous, not pectinate. Panicle loosely contracted, c. 22 by 11 cm; branches more than 20, glandular, smooth; lowermost branch c. 8 cm long, naked in the lowermost 0.125-th, with c. 6 branches, and c. 30 spikelets. Pedicels smooth; of the lower spikelet eglandular, shorter than the spikelet; of the upper spikelet glandular, longer than the spikelet. Spikelets not secund, paired to distally solitary, not yawning, globular, 1.5–1.8 by 1.5–1.9 mm. Lower glume elliptic, 1.8–2 by 1.1–1.8 mm, membranous, 7-nerved, glabrous, smooth, obtuse; upper glume obovate to elliptic, 1.8–1.9 by 0.7–1.5 mm, membranous, 9-nerved, glabrous, smooth, obtuse. Rhachilla between florets terete. Lower floret ellipsoid and planoconvex, male. Lemma elliptic, at anthesis not longitudinally grooved, 1.7–1.75 by 1.1–1.2 mm, chartaceous, glabrous, obtuse. Palea elliptic, 1.6–1.65 by 0.9–1 mm, chartaceous, glabrous, obtuse. Anthers 0.7–1 mm long. Upper floret planoconvex, female. Lemma elliptic, 1.4–1.5 by 1.2–1.25 mm, 0.8–0.9 times as long as the first lemma, at anthesis chartaceous, puberulous, obtuse. Palea elliptic, 1.25–1.3 by 0.8–1 mm, chartaceous, puberulous, obtuse.

DISTRIBUTION. Malesia: W Sumatra (Mt. Kerinci)

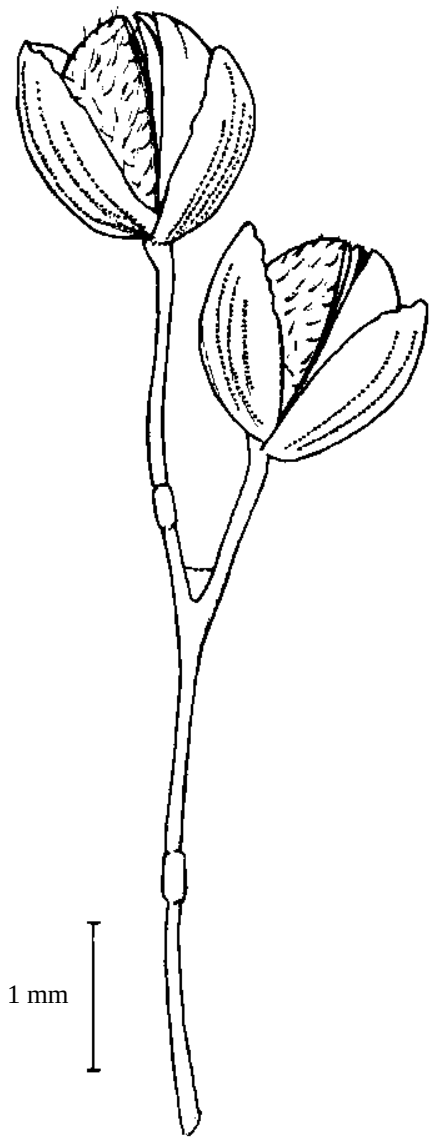

Fig. 2. *Isachne diabolica* Ohwi. Spikelets. From *Bűnnemeijer 8739* (BO type).

HABITAT. 1600 m alt.

NOTE. Only known from the type specimen.

3. ISACHNE GLOBOSA (Thunb.) Kuntze – Fig. 3.

Isachne globosa (Thunb.) Kuntze, Rev. Gen. Pl. 2 (1891) 778. – *Milium globosum* Thunb. in Murray, Syst. Veg., ed. 14 (May–June 1784) 109; Fl. Jap. (Aug 1784) 49. – *Agrostis globosa* Poir. in Lam., Encycl., Suppl. 1 (1810) 257. – Type: *Herb. Thunberg 2041* (UPS, holo, microfiche IDC 1036).

Isachne australis R. Br., Prodr. 1 (1810) 196. – *Panicum antipodum* Spreng., Syst. Veg. 1 (1824) 314, non *Panicum australe* Spreng. (1824). – *Panicum australe* Raspail, Ann. Sci. Nat. (Paris) 5 (1825) 299, non Spreng. (1824). – Lectotype: *R. Brown 6129* (BM!, holo; US, fragm.), designated by Davidse (1994: 265).

Isachne meneritana Poir. in Lam., Encycl., Suppl. 3 (1813) 185, excl. syn. Burm. f. & Pluk. – [*Meneritana. Gramen miliaceum folio hirsuto* Herm., Mus. Zeylan. (1717) 24, *nom. inval.*; L., Fl. Zeyl. (1747) 18, *in passim*]. – *Panicum meneritana* Spreng., Syst. Veg. 1 (1824) 321. – *Neurachne meneritana* R. Br. ex Roem. & Schult., Syst. Veg. 2 (1817) 475; ex Bojer, Hortus Maurit. (1837) 366, pro comb., isonym. – Lectotype: *Herb. Hermann vol. 2, fol. 43* (BM), designated by Trimen (1885: 271).

Isachne miliacea Roth in Roem. & Schult., Syst. Veg. 2 (1817) 476; Nov. Pl. Sp. (1821) 58. – *Panicum benjamini* Steud., Syn. Pl. Glumac. 1 (1854) 96, non *Panicum miliaceum* L. (1753). – Type: *Heyne 1814* (B!, holo, photo in K).

Panicum lepidotum Steud., Flora 29 (1846) 19. – *Isachne lepidota* Walp., Ann. Bot. Syst. 1 (1849) 924. – Type: *Goering 9* (P, holo), (n.v.)

Isachne miliacea Roth var. *obscura* Buse in Miq., Pl. Jungh. 3 (Feb 1854) preprint: 38; (Aug 1854) 378. – *Isachne globosa* (Thunb.) Kuntze var. *obscura* Henrard, Blumea 3 (1940) 465. – Type: *Junghuhn s.n.* (*sh. 908.90-2013*, L!, holo).

Panicum adstans Steud., Syn. Pl. Glumac. 1 (Mar 1854) 94. – *Isachne adstans* Miq., Fl. Ned. Ind. 3 (1857) 461. – Type: *Cuming 2288* (P, holo, K, L!, iso).

Panicum gonatodes Steud., Syn. Pl. Glumac. 1 (1854) 95. – Type: *d'Urville s.n.* (P, holo), (n.v.)

Isachne australis R. Br. var. *effusa* Trimen ex Hook. f., Fl. Brit. India 7 (1896) 25. – *Isachne globosa* (Thunb.) Kuntze var. *effusa* Senaratna, Grass. Ceyl. (1956) 109. – Type: *Trimen s.n.* (K, holo), (n.v.)

Isachne ponapensis Hosok., Trans. Nat. Hist. Soc. Formosa 24 (1934) 200. – Type: *Hosokawa 5989* (FU, holo; US) (n.v.)

Isachne globosa (Thunb.) Kuntze var. *ciliaris* Ohwi, Bot. Mag. (Tokyo) 55 (1941) 540. – Type: *Hatusima 10710* (FU, holo), (n.v.)

Isachne globosa (Thunb.) Kuntze var. *brevispicula* Ohwi, Acta Phytotax. Geobot. 11 (1942) 54. –- Type: *Hatusima 2695* (TI, holo), (n.v.)

Isachne lutaria Santos, J. Wash. Acad. Sci. 33 (1943) 140. – Type: *Erlanson 5190* (MICH!, holo, US).

Isachne globosa (Thunb.) Kuntze var. *daviumbuensis* Jansen, Reinwardtia 2 (1953) 282 ('*daviumbense*'). – Type: *Brass 7602* (L!, holo; A; US).

Isachne miliacea auct. non Roth.

Isachne pangerangensis auct. non Zoll. & Moritzi.

Plants perennial or annual. Culms erect, geniculate, rooting in decumbent nodes, 0.15–0.75 m long, nodes glabrous, without annular glands below them, internodes 1.4–13 cm long.

Sheaths 1–5.5 cm long, glabrous to distally pubescent, margin glabrous to pubescent with bulbous hairs. Ligule setose, hairs 1.25–4 mm long. Blades linear-lanceolate to linear, 1.5–9.5 cm by 2.5–6 mm, base abruptly narrowed and pectinate, scaberulous, glabrous to pubescent with bulbous hairs, (5–)9-nerved; margins white cartilaginous or not, not undulate, scaberulous, pectinate or not. Panicle loosely contracted, 2.5–14 by 1–7 cm; branches 5–17, eglandular or glandular, smooth to scaberulous; lowermost branch 1.3–6.2 cm long, naked in the lowermost 0.1–0.3-th, with 2–5-branches and 6–25 spikelets. Pedicels smooth to scaberulous; of the lower spikelet eglandular, shorter than the spikelet (rarely longer); of the upper spikelet eglandular or glandular, longer than the spikelet (rarely shorter). Spikelets not secund, paired to distally solitary, not yawning, globular to ellipsoid, 1.75–2.7 by 1–1.85 mm. Lower glume elliptic to obovate, 1.6–2.7 by 0.85–1.4 mm, membranous, 7-nerved, glabrous, smooth to scaberulous, obtuse; upper glume obovate to elliptic, 1.6–2.7 by 0.9–1.5 mm, membranous, 7(–9)-nerved, glabrous, smooth to scaberulous, obtuse. Rhachilla between florets distinctly obdeltoid. Lower floret flattened ellipsoid, male. Lemma oblong, at anthesis longitudinally grooved, 1.75–2.5 by 0.8–1.25 mm, at anthesis membranous, glabrous, obtuse. Palea oblong, 1.65–2.3 by 0.7–1.15 mm wide, membranous, glabrous, obtuse. Anthers 0.8–1.8 mm long. Upper floret planoconvex, female or rarely bisexual. Lemma elliptic, 1.25–1.85 by 0.75–1.3 mm, 0.5–1.05 times as long as the first lemma, at anthesis chartaceous, glabrous to puberulous, obtuse. Palea elliptic, 1.2–1.55 by 0.75–1.2 mm, chartaceous, glabrous to puberulous, obtuse. Anthers 3, 0.5–1 mm long.

DISTRIBUTION. India, Sri Lanka to Japan, China, Solomon Islands, New Caledonia, Australia, New Zealand; Malesia: Malay Peninsula (Negeri Sembilan, Malacca, Langkawi, Perlis, Pahang, Selangor), Singapore, Sumatra (Aceh, N-, W Sumatra, Palembang, Bangka, Lingga Island), Java (widespread), Borneo (Sarawak, E Kalimantan), Philippines (Manila), N-, S. Celebes, Lesser Sunda Islands (Sumba, Timor), Papua New Guinea (Western Highlands province, East Sepik Province).

HABITAT. Marshy places, waterside, wet places, sawah, inundated rice fields, riverbanks, lakeshores, edge of ditch, can be submerged ca. 6 cm under water, swamps, sunny area, dune swards, 0–1400 m alt.

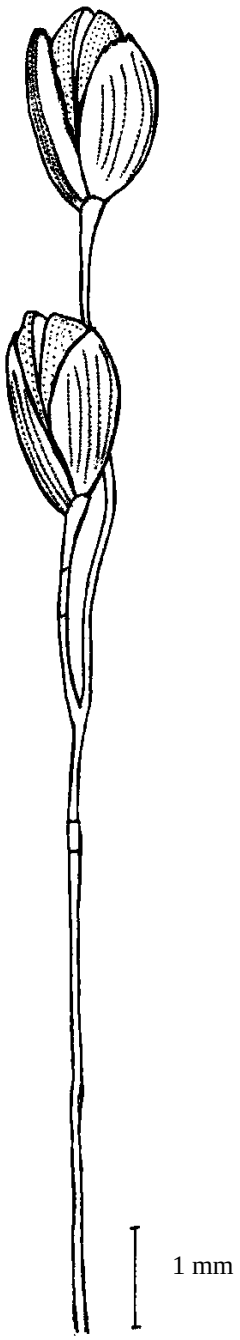

Fig. 3. *Isachne globosa* (Thunb.) Kuntze. Spikelets. From *NSM 382 (Ohwi)* (L)

USES. Excellent fodder.

COLLECTOR'S NOTES. Flowers light violet. Stamens (stigmas) purple.

NOTE. *Ramos 12230* (L) was the only collection seen from the Philippines. This specimen did not quite agree with the rest of the species, for the nodes are sometimes pubescent, and there are annular glands under some of them. Metz in his

manuscript for the Pflanzenreich (unpublished, copy in L) used a duplicate in B to describe a new species, *I. manilensis* Mez (*ined.)*. Yet, we could not decide on a better place for it then here.

4. ISACHNE LANGKAWIENSIS Jansen – Fig. 4.

Isachne langkawiensis Jansen, Reinwardtia 2 (1953) 284. – Type: *SF 37959 (Corner & Nauen)* (SING, holo, L!, iso).

Plants perennial. Culms loosely tufted and erect, 0.3–0.45 m long, nodes glabrous to pubescent, without annular glands below them, internodes 1.5–7.5 cm long. Sheaths 1–3 cm long, pubescent with bulbous hairs, margin pubescent to pubescent with bulbous hairs. Ligule setose, hairs 0.2–0.6 mm long. Blades linear, 2–6.5 cm by 2–6.5 mm, base narrowed and pectinate, scaberulous, pubescent with bulbous hairs, (3–)5(–7)-nerved; margins white cartila-ginous, not undulate, scaberulous, not pectinate. Panicle loosely contracted, 6–10 by 3.5–5.5 cm; branches 6–15, eglandular, smooth; lowermost branch 2–3.5 cm long, naked in the lowermost 0.02–0.06-th, with 2-branches and 6–9 spikelets. Pedicels eglandular, smooth; of the lower spikelet shorter to longer than the spikelet; of the upper spikelet longer than the spikelet. Spikelets not secund, paired to distally solitary, not yawning, ellipsoid, 1.75–2 by 1–1.2 mm. Lower glume elliptic to oblong, 1.75–2.1 by 0.75–0.8 mm, membranous, 5–nerved, distally pubescent with bulbous hairs, smooth, acute; upper glume obovate oblong, 1.5–1.6 by 0.7–0.9 mm, membranous, 7-nerved, pubescent with bulbous hairs, smooth, hairs 0.3–0.8 mm long, acute. Rhachilla between florets terete. Lower floret flattened ellipsoid, male. Lemma obovate oblong, at anthesis longitudinally grooved, 1.6–2 by 0.7–0.75 mm, at anthesis chartaceous, glabrous, obtuse. Palea oblong to lanceolate, 1.6–1.9 by 0.5–0.65 mm, chartaceous, glabrous, obtuse. Anthers 1–1.5 mm long. Upper floret planoconvex, bisexual. Lemma obovate, 1.2–1.4 by 0.6–0.75 mm, 0.6–1 times as long as the first lemma, at anthesis chartaceous, puberulous, obtuse. Palea obovate oblong, 1–1.35 by 0.4–0.6 mm wide, chartaceous, glabrous, obtuse. Anthers 0.6–0.75 mm long.

DISTRIBUTION. Malesia: Malay Peninsula (Langkawi Island).

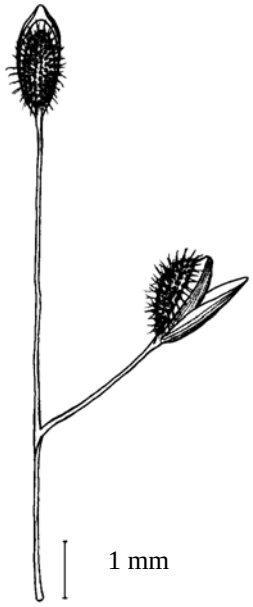

Fig.4. *Isachne langkawiensis* Jansen. Spikelets. From *Corner & Nauen SF 37959* (L- type).

HABITAT. On limestone, in wet depressions in rocks, in a very wet part with trickling ground water, fully exposed to the sun, on low altitude (c. 20 m).

4. ISACHNE MINUTULA (Gaudich.) Kunth – Fig. 5.

Isachne minutula Kunth, Rév. Gram. 2 (1831) 407, t. 117. – *Panicum minutulum* Gaudich. in Freyc., Voy. Uranie (1829) 410. – *Isachne miliacea* Roth var. *minutula* (Gaudich.) Fosberg & Sachet, Micronesica 18 (1984) 55. – (Type: *Gaudichaud s.n.* (P, holo) (n.v.) *Panicum macilentum* J. Presl in C. Presl, Reliq. Haenk. (1830) 310. – Type: *Haenke s.n.* (PR, holo), (n.v.)

Isachne geniculata Griff., Not. Pl. Asiat. 3 (1851) 41; Icon. Pl. Asiat. (1851) t.139, f. 206. – *Panicum geniculatum* Drury, Handb. Ind. Fl. 3 (1869) 584, non Lam. (1798). – Type: *Griffith 27 September 1835* (K, holo). (n.v.; K000245424).

Isachne stigmatosa Griff., Not. Pl. Asiat. 3 (1851) 42; Icon. Pl. Asiat. (1851) t.148, f.2 – *Panicum stigmatosum* Drury, Handb. Ind. Fl. 3 (1869) 585. – Type: *Griffith 3 Oct 1835* (K, holo), (n.v.; K000245425).

Isachne minutula (Gaud.) Kunth var. *javanica* Buse in Miq., Pl. Jungh. 3 (Feb 1854) preprint: 39; (Aug 1854) 379. – *Isachne miliacea* Roth var. *javanica* Henrard, Blumea 3 (1940) 465. – Type: *Zollinger 271* (L!, holo).

Isachne conferta Merr., Philipp. J. Sci. 9 (1914) 261. – Type: *BS 14914 (Ramos)* (PNH, lost; US).

(n.v.)

Isachne miliacea Roth var. *madurensis* Jansen, Reinwardtia 2 (1953) 285. – Type: *Backer 20102* (BO, holo). (n.v.)

Isachne miliacea Roth var. *ovalifolia* Jansen, Reinwardtia 2 (1953) 285. – Type: *BS 46990 (Ramos & Edaño)* (UC!, holo).

Isachne miliacea auct. non Roth.

Plants perennial. Culms loosely tufted or erect or geniculate, rooting in decumbent nodes, 0.05–0.45 m long, nodes pubescent (rarely glabrous), without annular glands below them, internodes 0.6–6.5 cm long. Sheaths 0.4–1.75 cm long, glabrous to pubescent with bulbous hairs, margin pubescent. Ligule setose, hairs 0.7–1.5 mm long. Blades ovate-lanceolate to linear, 0.9–3.5 cm by 2–5 mm wide, base narrowed and pectinate, scaberulous, glabrous to pubescent, 5-nerved (rarely 3 or 7); margins not white, not undulate, scaberulous, not pectinate. Panicle loosely contracted, 2.5–5 by 1–3 cm wide; branches 3–12, eglandular or glandular, smooth to scaberulous; lowermost branch 1–1.8 cm long, naked in the lowermost 0.05–0.17-th, with 2–5-branches and 6–17 spikelets. Pedicels smooth to scaberulous; of the lower spikelet eglandular or glandular, shorter to longer than the spikelet; of the upper spikelet glandular, longer than the spikelet. Spikelets not secund, paired, not yawning, obovoid, 1.3–2 by 0.8–2 mm. Lower glume elliptic, 1.4–1.9 by 0.7–0.9 mm, membranous, 7-nerved, glabrous, distally scaberulous, obtuse; upper glume obovate to rarely elliptic, 1.4–1.9 by 0.75–1.3 mm, membranous, 7–(9)-nerved, glabrous, distally scaberulous, obtuse. Rhachilla between florets distinctly obdeltoid. Lower floret flattened ellipsoid, male. Lemma oblong, at anthesis longitudinally grooved, 1.25–2 by 0.8–0.85 mm, at anthesis membranous, glabrous, obtuse. Palea oblong, 1.2–-1.85 by 0.5–0.75 mm, mem-branous, glabrous, obtuse. Anthers 0.45–1.05 mm long. Upper floret planoconvex, female. Lemma elliptic, 0.9–1.4 by 0.65–1.05 mm, 0.45–1.1 times as long as the first lemma, at anthesis chartaceous, puberulous, obtuse. Palea elliptic, 0.75–1.3 by 0.6–0.95 mm, chartaceous, puberulous, obtuse.

DISTRIBUTION. India, Sri Lanka to Vietnam, Australia; Malesia: Sumatra (Aceh, N. Sumatra, W Sumatra, Bangka, Enggano Isl.), Java, Madura, Kangean, Bawean, Borneo (Sarawak), Philippines (Luzon, Biliran, Panay Isl., Guimaras Isl., Basilan Isl., Mindanao), N Celebes, Lesser Sunda Islands (Sumba, Alor, Timor, Tanimbar Isl.), Moluccas (Buru, Ambon).

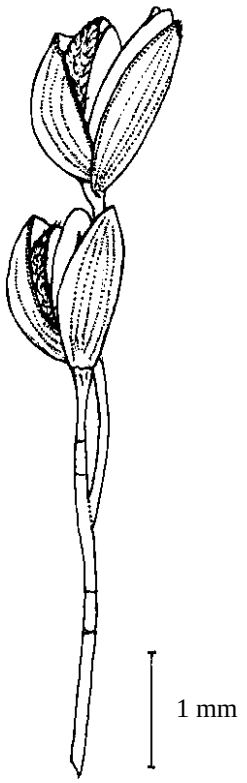

Fig.5. *Isachne minutula* (Gaudich.) Kunth. Spikelets. From *J.V. Santos 4635* (L)

HABITAT. Low wet areas, forested ridge, along the river, side of canal, marshy paddy field after harvest, swampy and muddy places, sawah dike, in occasionally flooded shallow ditch, edge and roadside, open and damp grassy places, on sandy soil with periodic flood, 10–400 m alt.

COLLECTOR'S NOTES. Inflorescence green.

NOTE. This taxon was previously erroneously called *I. miliacea* or *I. pulchella* Roth.

6. ISACHNE PULCHELLA Roth – Fig. 6.

Isachne pulchella Roth in Roem. & Schult., Syst. Veg. 2 (1817) 476; Nov. Pl. Sp. (1821) 58 – *Panicum pulchellum* Spreng., Syst. Veg. 1 (1824) 322, non Raddi (1823). – *Panicum bellum* Steud., Syn. Pl. Glumac. 1 (1854) 96 – *Sphaerocaryum pulchellum* Merr., Philipp. J. Sci. 11 (1916) 52, pro comb.; Druce, Bot. Soc. Exch. Club Brit. Isles Rep. 1916 (1917) 648; A. Camus, Fl. Indo-Chine 7 (1922) 514, isonyms. – *Steudelella pulchella* Honda, J. Fac. Sci. Tokyo, Bot. 3 (1930) 258, pro comb. – Type: *Heyne s.n.* (B!, holo), depicted by Bor (1952: 321, t.).

Isachne dispar Trin., Sp. Gram. 1 (1826) t. 86. –

Panicum dispar Trin. ex Steud., Syn. Pl. Glumac. 1 (1854) 96. – *Isachne meneritana* Poir. var. *dispar* F.N. Williams, Bull. Herb. Boissier II, 4 (1904) 222. – *Isachne miliacea* Roth var. *dispar* Hack. in Schmidt, Bot. Tidsskr. 24 (1901), 96. – Type: *Herb. Trinius 678.1* (LE, holo, microfiche IDC BT-16 71-B5!).

Isachne heterantha Hayata, Icon. Pl. Formos. 7 (1918) 56, t. 28. – Type: *Kawakami & Shimada Oct. 1913 no. 1* (not in TI, maybe in TAIF, holo).

[Panicum patens auct. non L.: Roxb., Fl. Ind. 1 (1820) 308, non L. (1753)] – *Panicum aequatum* Nees ex Steud., Syn. Pl. Glumac. (1854) 98. – Syntypes: *'Ind. or., Nepal*' (P, n.v.) [see voucher *Herb. Roxb. s.n.(*BM), *Icon. ined. 803* (CAL, K].

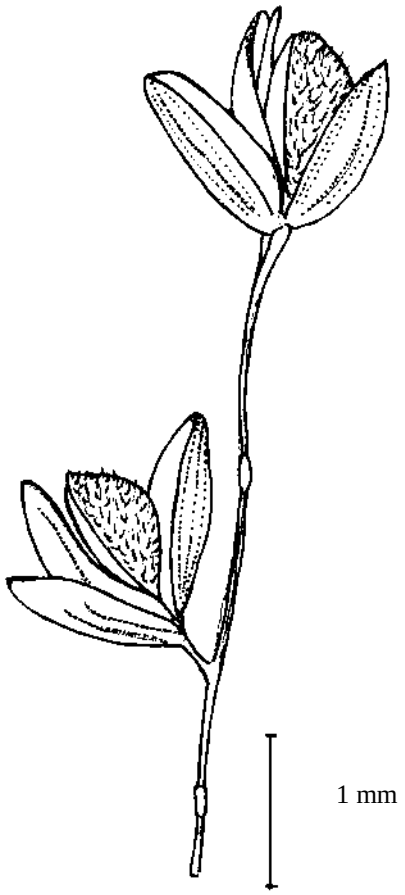

Fig. 6. *Isachne pulchella* Roth. Spikelets. From *Larsen & Larsen 34511* (L)

Plants perennial or annual. Culms tufted to loosely tufted, geniculate, rooting in decumbent nodes or straggling, 0.1–0.4 m long, nodes pubescent, with annular glands below them, internodes 1.4–4 cm long. Sheaths 0.6–1.5 cm long, glabrous to pubescent with bulbous hairs, margin pubescent to pubescent with bulbous hairs. Ligule setose, hairs 0.9–1.1 mm long. Blades ovate-oblong to ovate-lanceolate, 1.2–3 cm by 3.5–11 mm, base cordate, clasping, pectinate, scaberulous, glabrous to pubescent with bulbous hairs, 7–(–9)nerved; margins white cartilaginous, undulate, scaberulous, not pectinate. Panicle contracted to lax, 3–5 by 0.5–3.2 cm; branches 7–18, glandular, smooth; lowermost branch 0.6–1.7 cm long, naked in the lowermost 0.02–0.08-th, with 2–4-branches and 6–13 spikelets. Pedicels smooth; of the lower spikelet eglandular, shorter than the spikelet; of the upper spikelet glandular, longer than the spikelet. Spikelets secund, paired to distally solitary, yawning at maturity, obovoid, 1.1–1.5 by 1–1.1 mm. Lower glume elliptic, 1.2–1.3 by 0.7–0.8 mm, membranous, 5-nerved (sometimes 7), glabrous, smooth, obtuse; upper glume obovate, 1.2–1.3 by 0.7–1 mm, membranous, 7-nerved, glabrous, smooth, obtuse. Rhachilla between florets terete. Lower floret flattened ellipsoid, male. Lemma elliptic, at anthesis not longitudinally grooved, 1.2–1.5 by 0.6–0.75 mm, membranous, glabrous, obtuse. Palea elliptic, 1.1–1.3 by 0.6–0.7 mm, membranous, glabrous, obtuse. Anthers 0.5–0.6 mm long. Upper floret planoconvex, female. Lemma obovate, 1.1–1.2 by 1–1.2 mm wide, 0.6–0.9 times as long as the first lemma, at anthesis chartaceous, puberulous, obtuse. Palea obovate, 1–1.1 by 0.6–0.7 mm wide, chartaceous, puberulous.

DISTRIBUTION. India, Nepal to SW China, Malesia: Sumatra (W-, N, Samosir Isl., Selayar Isl.), W Java, Borneo (Sabah, E. Kalimantan), Philippines (Mindanao), S Celebes.

HABITAT. Marshy places, on banks of ponds, tobacco fields, 0–1000 m alt.

COLLECTOR'S NOTES. Leaves slightly purplish underneath, anthers purple.

NOTES. The combination *Isachne pulchella* Roth has generally been equated with *Sphaerocaryum malaccense* (Trin.) Pilg., but the type, depicted by Bor (1952) actually is what is known as *Isachne dispar* Trin., and being older must replace it.

The taxon is easily recognised by the presence of an annular gland below the nodes, the blade with a cordate base, and white-cartilaginous and undulated margins.

Some authors have mentioned the presence of *Isachne polygonoides* (Lam.) Döll in SE Asia, but their application appears to be heterogeneous. Bentham (1849: 560) wrote: 'The Timor plant,

which Decaisne identified with Lamarck's *Panicum polygonoides*, is certainly this species'. We have not seen it.

Balansa [1880: 137] made the isonym *Isachne trachysperma* (Nees) Balansa, i.e. Nees (1857), which is a synonym of *I. polygonoides*. His collection (*Balansa 1675*, L) belongs to *I. globosa* (Thunb.) Kuntze.

Hooker f. (1896: 25) has it in the synonymy of *I. miliacea*, which in the present paper is called *I. minutula*. Being the oldest epithet A. Camus (1922: 413) regarded *I. polygonoides* as the correct name for Balansa's collection, but Schmid (1958: 327) again used *I. miliacea* for it.

Keng's use of the combination (1959: 639, 648, t. 585) was a misapplication to specimens belonging to *I. dispar* according to Chen (1990: 191), in the present paper replaced by *I. pulchella*.

In fact the two are rather similar but differ:

-. Ligule hairs 1.5–2.5 mm long. Spikelets not yawning at maturity, 1.25–1.75 mm wide. Upper glume 1.6–2.2 mm long. – S America ..... *I. polygonoides*
-. Ligule hairs 0.9–1.1 mm long. Spikelets yawning at maturity, 1–1.1 mm wide. Upper glume 1.2–1.3 mm long. – SE Asia ..... *I. pulchella*

7. ISACHNE POLYGONOIDES (Lam.) Döll.

Isachne polygonoides (Lam.) Döll in Mart., Fl. Bras. 2, 2 (1877) 742. – *Panicum polygonoides* Lam., Encycl. 4 (1798) 742. – Type: *Leblond s.n.* (P, holo, fragm. in US, IDC microfiche 6207).

Panicum trachyspermum Nees in Mart., Fl. Bras. Enum. Pl. 2 (1829) 212. – *Isachne trachyspermum* Nees in Seem., Bot. Voy. Herald (1857) 224; Balansa, J. Bot. (Morot) 4 (1890) 137, pro comb., isonym. – Type: *Martius s.n.* (M, holo; US, fragm.).

DISTRIBUTION. America: S Mexico to Brazil, Peru.

8. ISACHNE VILLOSA (Hitchc.) Reeder – Fig. 7.

Isachne villosa (Hitchc.) Reeder, J. Arnold Arbor. 29 (1948) 314. – *Isachne brassii* Hitchc. var. *villosa* Hitchc., Brittonia 2 (1936) 123. – Type: *Brass 4132* (US!, iso; A).

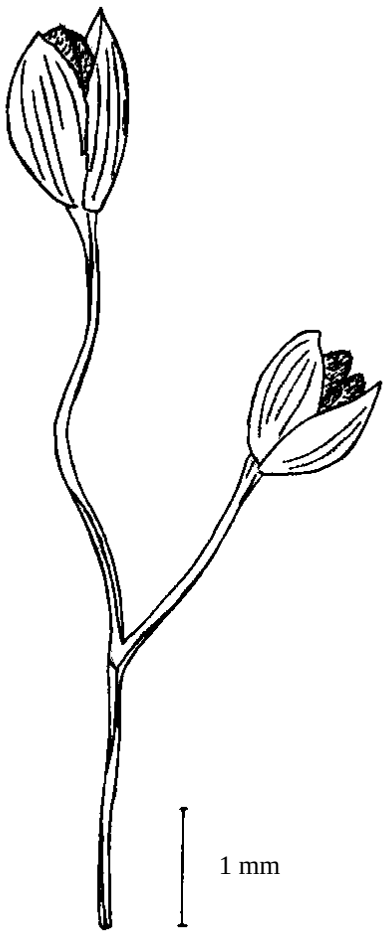

Fig. 7. *Isachne villosa* (Hitchc.) Reeder. Spike-lets. From *Brass 12370* (L).

Plants perennial. Culms tufted and erect, 0.1–0.3 m long, nodes pubescent, without annular glands below them, internodes 0.8–6 cm long. Sheaths 0.6–3 cm long, glabrous to pubescent with bulbous hairs, margin pubescent to pubescent with bulbous hairs. Ligule setose, hairs 1.8–2 mm long. Blades linear-lanceolate to linear, 1.3–5.5 cm by 2–8 mm, base narrowed and pectinate, scaberulous, pubescent to pubescent with bulbous hairs, 5-nerved; margins white cartilaginous, not undulate, scaberulous, not pectinate. Panicle loosely contracted, 4.2–9 by 2–4.2 cm; branches 8–18, eglandular, scaberulous; lowermost branch 1.2–4 cm long, naked in the lowermost 0.06–0.2-th, with 2–8-branches and 6–39 spikelets. Pedicels eglandular, scaberulous; of the lower spikelet shorter to longer than the spikelet; of the upper spikelet longer than the spikelet, scaberulous. Spikelets not secund, paired to distally solitary, not yawning, obovoid, 1.25–1.5 by 0.75–1 mm. Lower glume elliptic, 1.35–1.75 by 0.75–1 mm, membranous, 7-nerved, glabrous, smooth, obtuse; upper glume obovate,

1.25–1.6 by 0.65–0.8 mm, membranous, (5–)7-nerved, glabrous, smooth, obtuse. Rhachilla between florets terete. Lower floret flattened ellipsoid, bisexual. Lemma elliptic, at anthesis longitudinally grooved, 1.1–1.2 by 0.7–0.75 mm, at anthesis chartaceous, puberulous, obtuse. Palea elliptic, 1–1.05 by 0.55–0.6 mm, chartaceous, puberulous, obtuse. Anthers 0.55–0.75 mm long. Upper floret planoconvex, bisexual. Lemma elliptic, 0.9–1.1 by 0.6–0.75 mm, 0.6–1.1 times as long as the first lemma, at anthesis chartaceous, glabrous to puberulous, obtuse. Palea elliptic, 0.75–0.8 by 0.4–0.65 mm, chartaceous, glabrous to puberulous, obtuse. Anthers 0.5–0.6 mm long.

DISTRIBUTION. Malesia: New Guinea: Irian Jaya (Taritatu River), Papua New Guinea (Morobe Province, Central Province).

HABITAT. Cleared hill, on steep slopes of road cutting, open places, on sand on bed of small stream, on an open rock-slide, in ditch on roadside, open ridge top, 1500–2300 m alt.

ADDITIONAL NOTES. Jansen (1953) thought that *Isachne surgens* Jansen had heteromorphous florets, and would thus belong to *'Eu-Isachne'*. There are indeed some spikelets with somewhat heteromorphous florets, but in the majority the main difference is caused by the pubescence, which makes them look more different than they really are. As there is only a brief original description, we include a more lengthy one here.

9. ISACHNE SURGENS Jansen – Fig. 8.

Isachne surgens Jansen, Reinwardtia 2 (1953) 281. – Type: *Bünnemeijer 11268* (BO, holo).

Plants perennial. Culms tufted, geniculate, rooting in decumbent nodes, 0.25–0.4 m long, nodes glabrous, without annular glands below them, internodes 0.5–5 cm long. Sheaths 0.8–1.5 cm long, glabrous, margin glabrous to pubescent with bulbous hairs. Ligule setose, hairs 0.5–1.1 mm long. Blades linear-lanceolate to linear, 1.5–4.5 cm by 2–4 mm, base narrowed, smooth, glabrous to puberulous above, pubescent underneath, 5-nerved; margins white cartilaginous, not undulate, scaberulous, not pectinate. Panicle loosely contracted, 3.5–5 by 1.5–2.5 cm; branches 3–9, eglandular, smooth; lowermost branch 1.6–2 cm long, naked in the lowermost 0.1–0.5-th, with 2-branches and 3–5 spikelets. Pedicels eglandular, smooth; of the lower spikelet shorter to longer than the spikelet; of the upper spikelet, longer than the spikelet. Spikelets not secund, paired to distally solitary, not yawning, ellipsoid, 2.25–2.5 by 1.7–2 mm wide. Lower glume oblong, 2.3–2.5 by 1–1.2 mm, membranous, 7-nerved, glabrous, smooth, obtuse; upper glume obovate to elliptic, 2–2.3 by 0.9–1.2 mm, membranous, 7-nerved, glabrous, smooth, obtuse. Rhachilla between florets not distinctly developed. Lower floret flattened ellipsoid, bisexual. Lemma oblong, at anthesis longitudinally grooved, 2–2.2 by 0.9–1.1 mm, at anthesis chartaceous, glabrous, obtuse. Palea oblong, 1.8–2.1 by 0.8–0.9 mm, chartaceous, glabrous, obtuse. Anthers 0.75–1 mm long. Upper floret planoconvex, bisexual. Lemma elliptic, 1.7–2 by 1–1.1 mm, 0.8–1 times as long as the first lemma, at anthesis chartaceous, puberulous, obtuse. Palea oblong, 1.6–2 by 0.75–0.9 mm, chartaceous, puberulous, obtuse. Anthers 0.7–0.8 mm long.

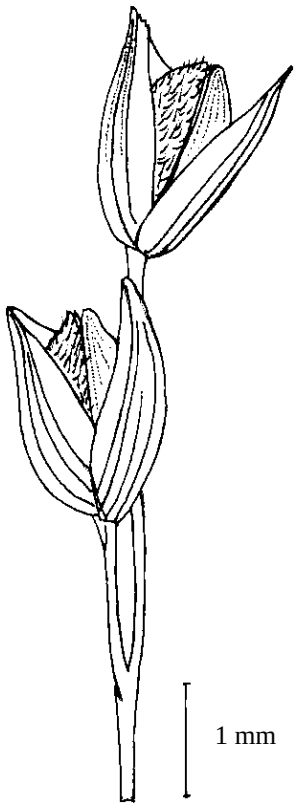

Fig. 8. Isachne surgens Jansen . Spikelets. From *Bűnnemeijer 12207* (L)

DISTRIBUTION. Malesia: Celebes (Mt. Bonthain).

HABITAT. Not recorded, 2750 m alt., probably in subalpine scrub.

NOMINA DUBIA

1. PANICUM BATAVICUM Steud.

Panicum batavicum Steud., Syn. Pl. Glumac. 1 (1854) 96. –- *Isachne javana* Nees ex Miq., Fl. Ned. Ind. 3 (1857) 462, nom. superfl. –- Type: 'Java'. Miquel cited *Junghuhn s.n.* (not found in L). The holotype presumably is in P.

2. ISACHNE SUBGLOBOSA Hatus. & T. Koyama

Isachne subglobosa Hatus. & T. Koyama, J. Jap. Bot. 31 (1956) 237, t. 1c, -d. – Type: *Amano 7531* (TI, holo).

NOTE. This species was described from the Ryukyus. Koyama (1976) extended its distribution to South China, 'Malaysia', and India. However, in 1987 (p. 136) he claimed that it was an endemic species of the Ryukyus. As we have not seen the type nor any other voucher, we exclude it here, but provisionally have accepted it in the Appendix.

INDEX TO SPECIMEN EXAMINED

bra: *Isachne brassii* Hitchc.
dia: *Isachne diabolica* Ohwi
glo: *Isachne globosa* (Thunb.) Kuntze
lan: *Isachne langkawiensis* Jansen
min: *Isachne minutula* Kunth
pul: *Isachne pulchella* Roth
sur: *Isachne surgens* Jansen
vil: *Isachne villosa* (Hitchc.) Reeder

Amdjah 18: glo – Asdat 133: glo.
Backer 4382: glo; 5877: glo; 7021: glo; 7933: min; 12010: min; 12188: glo; 20190: min; 22088: glo; 27057: min; 36831: glo; 36940: glo; 37082: glo – Bakhuizen van den Brink 99: glo; 772: min; 2651: min; 3141: glo; 5163: glo; 5418: pul – Balansa 1081: glo; 1620: glo; 1672: glo; 1674: glo; 1675: glo; 1676: min; 1677: min; 18 Sept. 1883: glo; 11 Sept. 1885: glo; 21 Sept. 1886: glo – Beccari 601: min – Blake 4515: glo; 14466: glo; 14466: glo; 22898: glo – Bor 17835: glo – Borssum Waalkes 689: glo – Brass 1018: bra; 4132: vil; 7364: bra; 7602: glo; 8239: glo; 12370: vil; 12475: vil; 14055: bra – Brooke 9675: glo – Brown 6129: glo – BS 560 (Piper): min; 1654 (Robinson): min; 12230 (Ramos): (glo); 18690 (McGregor): min; 46990 (Ramos & Edaño): min – BSIP 19288 (Leach): glo – Buwalda 3044: min; 3262: min; 4191: min; 4192: min; 4498: min; 5794: bra; 8002: glo; 8036: glo – BW 7358 (Versteegh): glo – Bünnemeijer 1569: glo; 1753: glo; 3264: min; 6833: glo; 7395: pul; 8739: dia; 12207: sur.
Carr 14271: vil; 14565: vil – CCC 10304 (McClure): glo – Clemens 4860: vil; 9302: vil; 21318: min; 21318: pul; 51042: pul – Coert 507: min; 1707: glo – Comanov 1027: glo – Conn 4330: glo – Cuming 2288: glo.
d'Alleizette April 1908: glo – Danser 6464: glo – Darbyshire & Hoogland 7950: min – Davidse 7491: glo; 7590: glo; 7808: glo; 7821: glo; 8569: glo; 8925: glo – De Wilde & de Wilde-Duyfjes 12622: min; 19787: min.
Erlanson 5190: glo – Eyma 1265: pul; 3464: glo; 4004: glo; 4046: glo.
Fosberg 37253: glo; 37826: glo; 37991: glo – Funke Oct. 1915: glo
Gjellerup 33: bra – Goetghebeur & Vyverman 6697: glo – Gould 13207: glo – Griffith 6571: glo.
Hallier 623: glo – Henderson 22903: glo – Hennipman 6162: pul – Heyne 1814: glo – Hohenacker 202: min – Hoogland & Pullen 5358: vil – Hume 7359: glo.
Kjellberg 420: min.
Jaag 990: min – Jarisse 15523-24: min – Johansson, Nybom & Rieke 345: bra
Kawakami & Shimada Oct. 1913: pul – KFN 19812 (Ibrahim): glo – KLU 14348 (Stone): lan; 1787 (Chin): lan – Koelz 26505: glo – Koorders 19792 glo; 19796 min; 23066 min; 40585 glo – Kostermans 28550: glo – K'tung 6411: glo.
LAE 4724 (Womersley): vil; 56736 (Kerenga & Landsberg): glo – Lam 1057: bra – Larsen & Larsen 34511: glo; et al. 32168: glo – Latz 6277: min – Lazarides 8132: glo; 8137: glo; 8815: min; 9202: min –Leefman 165: min – Lörzing 6543: glo; 7296: min; 12657: pul; 12918: min; 15509: glo – Lutjeharms 3820: min; 5260: min – Lwin 257: glo.
Mason 9628: glo; 9832: glo – Maxwell 77-28: glo; 81-218: glo; 85-1164: glo; 86-773: glo; 86-878: glo – McKee 7903: glo; 9954: glo – Meijer (& Kern) 1161: glo; 5743: min; 5978: min; 6017: glo; 11118: glo – Merrill 609/8049: min – Monod de Froideville 820: glo; 821: glo; 1877: min – Murata et al. B 127: pul; B 4546: glo; T-15885: glo.
Nedi (& Idjan) 14: glo; 395: min – NGF 16021 (Van Royen): vil; 38855 (Henty & Streimann): glo – Niyomdham & Sriboonma 1530: glo – NSM 382 (Ohwi): glo – NSW 891 (Coveny): glo; 3554 (Coveny): glo.
Ophof (& De Wit) 4016: glo.
Philipson 10290: glo – Pierrot 246: glo – PNH 9402 (Paniza): min; 11041 (Edaño): min – Polak 6: glo – Pullen 1759: glo.
Rachmat 563: glo – Raynal 16811: min – Robbins 174: glo – Roxb. s.n. (BM 000812641): pul –

Rutten-Kooistra 50: glo.
Santos 4476: min; 4635: min; 4904: pul; 5141: min; 6624: pul; 6636: pul; 8148: min – Seimund 7 Jan. 1921: glo – SF 4664 (Burkill): glo; 29913 (Corner): glo; 37843 (Corner): lan; 37845 (Corner): lan; 37959 (Nauen): lan; 37983 (Corner): glo – Shah 19: glo – Sibuea 5960: glo – Sieber Agrostotheca 68: glo.
Tanaka & Shimada 11101: glo – Thomsen 632: bra – Ting & Shih 943: glo – Tsang 30620: glo.
Van Ooststroom 13781: glo; 13931: glo – Van Steenis 18092: glo – Veldkamp 7158: pul – Verheijen 4466: min – Versteegh 1620: bra – Van Daalen (Pringgo Atmodjo) 384: glo.
Walker et al. 5772: glo – Wallich Cat. 8656D: glo – Winkler (Hubert) 3373: pul – Womersley, Hoogland & Taylor 4921: vil.
Zollinger 271: min.

APPENDIX: A NOMENCLATURAL SURVEY OF ISACHNE

The only global survey of the species of *Isachne* is by Steudel (1854) with a major one for India by Prakash & Jain (1987). Additional names were extracted from the Index kewensis (CD-ROM, vs. 2.0, 1997) and IPNI on the Internet. Local treatments were consulted but no recent ones are present for Madagascar and Réunion. Because of the lack of general information distributions can only be given roughly. This resulted in the following lists of 95 apparently accepted names and of 83 synonymous ones, and 11 uncertain ones. One comb. nov., and 2 nom. nov. are made.

This rough survey shows the presence of 23 species in Malesia (Jansen msc.), 30 in India [Prakash & Jain (1984) 7, plus *I. henryi*, and *I. jayachandranii* later described], 4 in Sri Lanka [Davidse (1994) 264], 15 in Indochina [Schmid (1958) 326, and another 3 unidentified], 16 in China [Chen (1991) 176], 5 in Japan and the Ryukyu Isl. [Ohwi (1965) 186; Walker (1976) 203], 4 in Australia and New Zealand, 7 in the W Pacific (various sources), 2 in Hawai'i [O'Connor, (1990) 1554], 6 in continental tropical West to East Africa (various sources), 2 (8?) in Madagascar, 2 (4?) in Réunion, 2 in Mauritius, 12 in the Americas [Soreng & Pennington (2003) 273]. There appear to be none in Europe.

ACCEPTED NAMES

Isachne albens Trin., Sp. Gram. 1 (1826) t. 85. – Bhutan, Sikkim, N India to SE China, Malesia (Sumatra, Malay Pen., Sabah, New Guinea).
Isachne albomarginata Jansen, Reinwardtia 2 (1953) 279. – Malesia (Sabah, Celebes, New Guinea).
Isachne angladei C.E.C. Fisher, Bull. Misc. Inform. (1932) 323. – India (Tamil Nadu).
Isachne angolensis Rendle in Hiern, Cat. Afr. Pl. 2 (1899) 166. – Africa: Angola to Nigeria.
Isachne angustifolia Nash, Bull. Torrey Bot. Club 30 (1903) 377.– Porto Rico, Guadalupe.
Isachne arfakensis Ohwi, Bot. Mag. (Tokyo) 56 (1942) 4. – New Guinea.
Isachne arundinacea (Sw.) Griseb., Fl. Brit. W. I. (1864) 553. – Jamaica, Mexico to Bolivia, Venezuela.
Isachne ascendens Swallen, J. Wash. Acad. Sci. 26 (1936) 537. – Vietnam.
Isachne beneckei Hack., Oesterr. Bot. Z. 51 (1901) 459. – Indochina to China to disjunct in Malesia (Java, Flores, Lombok, Timor, Luzon).
Isachne bicolor V.N. Naik & B.W. Patunkar, Bull. Bot. Surv. India 15 (1976, '1973') 157. – India (Maharashtra).
Isachne borii Hemadri, Indian Forester 97 (1971) 223. – India (Maharashtra).
Isachne bourneorum C.E.C. Fischer, Bull. Misc. Inform. (1932) 324. – India (Kerala, Tamil Nadu).
Isachne brassii Hitchc., Proc. Linn. Soc. New South Wales 54 (1929) 146. – New Guinea.
Isachne buettneri Hack. in Buettn., Verh. Bot. Vereins Prov. Brandenburg 31 (1889) 69. – Africa (W Africa to Angola, Zambia).
Isachne carolinensis Ohwi, Bot. Mag. (Tokyo) 55 (1941) 540. – Pacific (Ponape).
Isachne chevalieri A. Camus, Bull. Mus. Hist. Nat. (Paris) 25 (1919) 367. – Vietnam.
Isachne ciliatiflora Keng ex Keng f., Acta Phytotax. Sin. 10 (1965) 13. – China.
Isachne clarkei Hook. f., Fl. Brit. India 7 (1896) 24. – India (Meghalaya, Nagaland). NB: Sikkim plants belong to *I. albens*.
Isachne clementis Merr., J. Straits Branch Roy. Asiat. Soc. 76 (1917). – Borneo.
Isachne cochinchinensis Balansa, J. Bot. (Morot) 4 (1890)137. – Vietnam.
Isachne comata Munro ex Hackel in Hook., Icon. Pl. 19 (1889) t. 1866. – Pacific (Vanuatu: Aneitum).
Isachne confusa Ohwi, Bull. Tokyo Sci. Mus. 18 (1947) 14. – Burma to the Carolines, Australia, widespread in Malesia.
Isachne deccanensis Bor, Kew Bull. (4) (1949) 95. – India (Tamil Nadu).
Isachne diabolica Ohwi, Bull. Tokyo Sci. Mus. 18 (1947) 14. – Malesia (W Sumatra).
Isachne dimyloides Bor, Kew Bull. (4) (1949) 96. – Sikkim.
Isachne dioica Swallen, J. Wash. Acad. Sci. 26 (1936) 537. – Vietnam.
Isachne disperma (Lam.) Döll in Mart., Fl. Bras. 2, 2 (1877) 274. – Lesser Antilles.
Isachne distichophylla Munro [in H. Mann, J. Bot. 7 (1896) 178, nom. nud.] ex Hillebr., Fl. Hawaiian Isl. (1888) 504. – Hawai'i.
Isachne eberhardtii A. Camus, Bull. Mus. Hist. Nat. (Paris) 25 (1919) 671. – Vietnam.

Isachne elegans Dalzell in Dalzell & A. Gibson, Bombay Fl. (1861) 291; in Hook. f., Fl. Brit. India 7 (1897) 23. – India (W Ghats).

Isachne fischeri Bor, Kew Bull. (4) (1949) 69. – India (Kerala).

Isachne globosa (Thunb.) Kuntze, Revis. Gen. Pl. 2 (1891) 778. – Bhutan, India, Sri Lanka to Japan, New Zealand.

Isachne goiasensis Renvoize, Kew Bull. 42 (1987) 928. – Brazil.

Isachne gossweileri Stapf & C.E. Hubb., Bull. Misc. Inform. (1933) 301. – Africa (Angola).

Isachne gracilis C.E. Hubb., Bull. Misc. Inform. (1927) 77. – India (Madhya Pradesh, Maharashtra, Karnataka).

Isachne guangxiensis W.Z. Fang, Acta Phytotax. Sin. 22 (1984) 306.– China.

Isachne guineensis Stapf & C.E. Hubb., Bull. Misc. Inform. (1933) 302. – Africa (Guinea).

Isachne hainanensis Keng f., Acta Phytotax. Sin. 10 (1965) 23. – China.

Isachne henryi S.R. Srinivasan & P.V. Sreekumar, J. Bombay Nat. Hist. Soc. 84 (1988, '1988') 647. – India (Kerala).

Isachne himalaica Hook. f., Fl. Brit. India 7 (1896) 23. – N India, Nepal, Pakistan, Afghanistan.

Isachne hoi Keng f., Acta Phytotax. Sin. 10 (1965) 11. – China (Guangdong, Zhejiang).

Isachne homonyma Veldk., ***nom. nov***. – *Isachne angusta* Stapf, Bull. Misc. Inform. (1920) 28, non T. Durand & Schinz (1894). – Réunion.

Isachne incrassata Merr., Philipp. J. Sci. 5 (1910) 168. – Malesia (Philippines); doubtfully distinct from *I. myosotis*.

Isachne jayachandranii R. Gopalan & V. Chandrasekaran, Kew Bull. 55 (2000) 1005. – India (Kerala).

Isachne kinabaluensis Merr., J. Straits Branch Roy. Asiat. Soc. 76 (1917) 77. – India (Meghalaya), Burma, to Malesia (Sumatra, Malay Penins., Borneo).

Isachne kunthiana (Wight & Arn. ex Steud.) Nees ex Miq., Fl. Ned. Ind. 3 (1857) 460. – Sri Lanka, S India, to S China, Taiwan, Solomons.

Isachne kiyalaensis (Vanderyst) Robyns, Bull. Jard. Bot. État. 9 (1932) 199. – Africa (Zaïre).

Isachne langkawiensis Jansen, Reinwardtia 2 (1953) 284. – Malesia (Langkawi Isl.).

Isachne leersioides Griseb., Mem. Amer. Acad. Arts n.s. 8 (1863) 533. – Cuba.

Isachne ligulata Swallen, Caldasia 2 (1943) 305. – Colombia, Venezuela to S Peru.

Isachne lisboae Hook. f., Fl. Brit. India 7 (1896) 22. – India (Maharashtra, Karnataka).

Isachne lutchuensis Hatus. & T. Koyama, J. Jap. Bot. 31 (1956) 235. – Ryukyu Isl.

Isachne mauritiana Kunth, Révis. Gramin. 1 (1830) 243, t. 33. – Africa, Madagascar, Mauritius.

Isachne meeboldii C.E.C. Fisch., Bull. Misc. Inform. (1932) 323. – India (Karnataka).

Isachne minutula (Gaudich.) Kunth, Révis. Gram. 2 (1831) 407, t. 117. – Sri Lanka to Pacific (Carolines).

Isachne multiflora (Thwaites) Ferguson, J. Roy. As. Soc., Ceylon Branch 6 (1880) 69; Trimen, Syst. Cat. Fl. Pl. Ceylon (1885) 104, isonym. – Sri Lanka.

Isachne muscicola A. Camus, Bull. Soc. Bot. France 104 (1947) 41. – Madagascar.

Isachne myosotis Nees in Hook. in Hooker's J. Bot. Kew Gard. Misc. 2 (1850) 98. – Indochina to S China, Ryukyu Isl., Malesia (Lesser Sunda Isl., Sabah, Philippines, Moluccas, New Guinea), possibly native in Australia.

Isachne mysorensis Sundararagh., Indian Forester 97 (1971) 304. – India (Karnataka).

Isachne nipponensis Ohwi, Acta Phytotax. Geobot. 4 (1935) 30. – Korea, Japan, China.

Isachne obtecta Reeder, J. Arnold Arbor. 29 (1948) 313. – New Guinea.

Isachne oreades (Domin) Bor, Grasses Burma, etc. (1960) 582. –India (Tamil Nadu).

Isachne pallens Hillebr., Fl. Hawaiian Isl. (1888) 504. – Hawai'i.

Isachne pangerangensis Zoll. & Moritzi in Moritzi, Syst. Verz. (1845) 102. – Malesia (Sumatra to Flores, N Borneo, Luzon, Mindoro).

Isachne petelotii A. Camus, Bull. Soc. Bot. France 75 (1928) 553. – Vietnam.

Isachne polygonoides Döll in Mart., Fl. Bras. 2, 2 (1877) 273. – W Indies, Panama to Brazil.

Isachne ponapensis Hosok., Trans. Nat. Hist. Soc. Formosa 24 (1934) 200. – Pacific (Ponape).

Isachne puberula Bor, Dansk Bot. Ark. 68 (1965) 147. – Thailand.

Isachne pubescens Swallen, Contr. US Natl. Herb. 29 (1950) 426. – C America.

Isachne pulchella Roth in Roem. & Schult., Syst. Veg. 2 (1817) 476; Roth, Nov. Pl. Sp. (1821) 58. – India, Nicobars, Malesia (widespread), to S China.

Isachne pygmaea Griseb., Fl. Brit. W. I. (1864) 558. – Jamaica.

Isachne rigens Trin., Gram. Panic. (1826) 252. – Jamaica, Ecuador to Venezuela.

Isachne rigidifolia (Poir.) Urb., Symb. Antill. 4 (1903) 85. – W Indies.

Isachne salzmannii (Trin. ex Steud.) Renvoize, Kew Bull. 39 (1984) 184.– Brazil.

Isachne saxicola Ridl., Fl. Malay Penins. 5 (1925) 237. – Malay Penins.

Isachne scabrosa Hook. f., Fl. Brit. India 7 (1896) 23. – India (Meghalaya).

Isachne setosa C.E.C. Fisch., Bull. Misc. Inform. (1932) 247. – India (Karnataka, Kerala, Tamil Nadu).

Isachne sharpii B.K. Simon (*ined.*) Australia (Queensland).

Isachne sikkimensis Bor, Kew Bull. (4) (1949) 115. – Bhutan, Nepal, Sikkim, India (W Bengal).

Isachne smitinandiana A. Camus, Notul. Syst. (Paris) 14 (1953) 256. – Thailand.

Isachne stenantha (Steud.) Veldk., ***comb. nov.*** – *Panicum stenanthum* Steud., Syn. Pl. Glumac. 1 (1854) 96, with *Isachne angusta* Nees in syn. – *Isachne angusta* Nees ex T. Durand & Schinz, Consp. Fl. Afric. 5 (1894) 739, nom. superfl. – Madagascar.

Isachne stricta Elmer, Leafl. Philipp. Bot. 2 (1908) 463. – Celebes, Philippines, N Guinea.

Isachne subglobosa Hatus. & T. Koyama, J. Jap. Bot. 31 (1956) 237. – Ryukyu Isl.

Isachne surgens Jansen, Reinwardtia 2 (1953) 281. – Malesia (SW Celebes).

Isachne swaminathanii V. Prakash & S.K. Jain, Proc. Indian Acad. Sci., Pl. Sci. 92 (1983) 19. – India (Maharashtra).

Isachne tenuis Keng ex Keng f., Acta Phytotax. Sin. 10 (1965) 15.– China.

Isachne trachycaula Ohwi, Bull. Tokyo Sci. Mus. 18 (1947) 14. – Malesia (N Sumatra).

Isachne truncata A. Camus, Notul. Syst. (Paris) 2 (1912) 205. – Vietnam, China.

Isachne vaughanii C.E. Hubb., Bull. Misc. Inform. (1927) 360. – Mauritius.

Isachne veldkampii K.G. Bhat & C.R. Nagendran, Curr. Sci. 52 (1983) 258. – India (Karnataka).

Isachne venusta Veldk., ***nom. nov***. – *Isachne elegans* Cordem., Fl. Réunion (1895) 115, non Dalzell (1861). –- Réunion.

Isachne villosa (Hitchc.) Reeder, J. Arnold Arbor. 29 (1948) 314. – New Guinea.

Isachne vitiensis Rendle, J. Linn. Soc., Bot. 39 (1909) 181. – Pacific (Fiji).

Isachne walkeri Arn. ex Steud., Syn. Pl. Glumac. 1 (1854) 97. – Sri Lanka, India (Kerala, Tamil Nadu).

SYNONYMS

Isachne adstans Miq., Fl. Ned. Ind. 3 (1857) 461. = *Isachne globosa* (Thunb.) Kuntze.

Isachne aethiopica Stapf & C. E. Hubb., Bull. Misc. Inform. (1933) 300. = *Isachne mauritiana* Kunth.

Isachne angusta Nees ex T. Durand & Schinz, Consp. Fl. Afric. 5 (1894) 739, nom. superfl. = *Isachne stenantha* (Steud.) Veldk.

Isachne apoensis Elmer, Leafl. Philipp. Bot. 7 (1915) 2676. = *Isachne albens* Trin.

Isachne arisanensis Hayata, Icon. Pl. Formos. 6, Suppl. 96 (1917); Icon. Pl. Formos. 7 (1918) 57. = *Isachne albens* Trin.

Isachne atrovirens (Trin.) Trin., Gram. Panic. (1826) 251. = *Isachne globosa* (Thunb.) Kuntze.

Isachne australis R. Br., Prodr. 1 (1810) 196. = *Isachne globosa* (Thunb.) Kuntze.

Isachne biflora (Lam.) Cordem., Fl. Réunion (1895) 115; Kuntze, Rev. Gen. Pl. 2 (1891) 778, isonym. = *Panicum brevifolium* L.

Isachne bomoensis Vanderyst, Bull. Agric. Congo Belge 16 (1925) 689. = *Isachne buettneri* Hack.

Isachne brachyglumis Hochst. ex Hook. f., Fl. Brit. India 7 (1896) 271 = *Coelachne infirma* Buse.

Isachne brixhei Vanderyst, Bull. Agric. Congo Belge 16 (1925) 688 ('*brixhii*'). = *Isachne buettneri* Hack.

Isachne caespitosa Backer, Teysmannia 25 (1914) 212. = *Isachne beneckei* Hack.

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Isachne chinensis Merr., Philipp. J. Sci., Bot. 12 (1917) 102. = *Isachne truncata* A. Camus.

Isachne commelinifolia Warb. in Feddes Repert. Spec. Nov. Regni Veg. 16 (1920) 352. = *Isachne myosotis* Nees.

Isachne conferta Merr., Philipp. J. Sci., Bot. 9 (1914) 261. = *Isachne minutula* (Gaudich.) Kunth.

Isachne debilis Rendle in Forbes & Hemsl., J. Linn. Soc., Bot. 36 (1904) 322. = *Isachne myosotis* Nees.

Isachne depauperata Merr., Enum. Philipp. Fl. Pl. 1 (1923) 58. = *Isachne myosotis* Nees.

Isachne dispar Trin., Sp. Gram. 1 (1826) t. 86. = *Isachne pulchella* Roth.

Isachne dubia Kunth, Révis. Gram. 1 (1829) 42, nom. superfl. = *Isachne disperma* (Lam.) Döll.

Isachne elatior Hook. f., Fl. Brit. India 7 (1896) 22. = *Isachne kunthiana* (Wight & Arn. ex Steud.) Nees ex Miq.

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Isachne elegans Cordem., Fl. Réunion (1895) 115, non Dalzell (1861). = *Isachne venusta* Veldk.

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Isachne filifolia Franch., Bull. Soc. Hist. Nat. Autun 8 (1895) 340. –- = *Panicum brazzavillense* Franch.

Isachne firmula Buse in Miq., Pl. Jungh. 3 (Feb 1854) preprint: 39; (Aug 1854) 379. = *Isachne pangerangensis* Zoll. & Moritzi.

Isachne gardneri (Thwaites) Benth. in Benth. & Hook. f., Gen. Pl. 3 (1883) 1100. = *Panicum gardneri* Thwaites.

Isachne geniculata Griff., Not. Pl. Asiat. 3 (1851) 41. = *Isachne minutula* (Gaudich.) Kunth.

Isachne glaucescens (Kunth) Pittier, Bol. Técn. Minist. Agric. 1 (1937) 49 = *Isachne arundinacea* (Sw.) Griseb.

Isachne grisea K. Schum. in K. Schum. & Lauterb. Nachtr. Fl. Deutsch. Sudsee (1905) 57. = *Isachne myosotis* Nees.

Isachne hackelii Lindm., Kongl. Svenska Vetenskapsakad. Handl. 34, 6 (1900) 11, t. 5. = *Poidium poimorphum* (J. Presl) Matthei.

Isachne heterantha Hayata, Icon. Pl. Formos. 6, Suppl. (1917) 96; Icon. Pl. Formos. 7 (1918) 56. =

Isachne pulchella Roth.

Isachne hirsuta (Hook. f.) Keng f., Acta Phytotax. Sin. 10 (1965) 11. = *Isachne albens* Trin.

Isachne hispidula Nees ex Steud., Syn. Pl. Glumac. 1 (1854) 96 = *Coelachne infirma* Buse.

Isachne jardinii (Steud.) T. Durand & Schinz, Consp. Fl. Afric. 5 (1894) 739 (*'jardini'*) = *Cyrtococcum chaetophorum* (Roem. & Schult.) Dandy.

Isachne javana Nees ex Miq., Fl. Ned. Ind. 3 (1857) 462, nom. superfl. = *Isachne globosa* (Thunb.) Kuntze.

Isachne kidumaensis Vanderyst, Bull. Agric. Congo Belge 9 (1918) 247, nom. prov.; 16 (1925) 689; fide Compère, Bull. Jard. Bot. État 33 (1963) 389. = *Panicum nervatum* (Franch.) Stapf.

Isachne kingundaensis Vanderyst, Bull. Agric. Congo Belge 9 (1918) 247; 16 (1925) 689; fide Compère, Bull. Jard. Bot. État 33 (1963) 389. = *Cyrtococcum chaetophoron* (Roem. & Schult.) Dandy.

Isachne kinshasaensis Vanderyst, Bull. Agric. Congo Belge 16 (1925) 689, nomen. = *Panicum brazzavillense* Franch.

Isachne lamarckii Kunth, Révis. Gramin. 1 (1829) 42 = *Panicum brevifolium* L.

Isachne lepidota Walp., Ann. Bot. Syst. 1 (1849) 924 = *Isachne globosa* (Thunb.) Kuntze.

Isachne lutaria Santos, J. Wash. Acad. Sci. 33 (1943) 140. = *Isachne pulchella* Roth.

Isachne magna Merr., Philipp. J. Sci. 5 (1910) 327. = *Isachne albens* Trin.

Isachne margaritifera Chiov., Nuov. Giorn. Bot. Ital., n.s. 26 (1919) 65. = *Panicum margaritiferum* (Chiov.) Robyns.

Isachne mayocoensis Vanderyst, Bull. Agric. Congo Belge 9 (1918) 248, nom. prov.; 16 (1925) 689 ('*mayokoensis*'). = *Panicum trichoides* Sw.

Isachne meneritana Poir. in Lam., Encycl., Suppl. 3 (1813) 185 = *Isachne globosa* (Thunb.) Kuntze.

Isachne metzii Hochst. ex Hook. f., Fl. Brit. India 7 (1896) 21 = *Isachne kunthiana* (Wight & Arn. ex Steud.) Nees ex Miq.

Isachne micrantha Merr., Philipp. J. Sci. 5 (1910) 168. = *Isachne myosotis* Nees.

Isachne miliacea Roth in Roem. & Schult., Syst. Veg. 2 (1817) 476; Roth, Nov. Pl. Sp. (1821) 58, generally misapplied to *I. minutula* = *Isachne globosa* (Thunb.) Kuntze.

Isachne montana Backer, Teysmannia 25 (1914) 298. = *Isachne beneckei* Hack.

Isachne monticola Buse in Miq., Pl. Jungh. 3 (Feb 1854) preprint: 39; (Aug 1854) 379. = *Isachne pangerangensis* Zoll. & Moritzi.

Isachne mortehanii Vanderyst, Bull. Agric. Congo Belg. 16 (1925) 688 ('*mortehani*'). = *Isachne buettneri* Hack.

Isachne muricata Nees ex Steud., Nomencl. Bot., ed. 2, 1 (1840) 823 = *Cyrtococcum patens* (L.) A. Camus.

Isachne neesiana Arn. ex Steud., Syn. Pl. Glumac. 1 (1854) 96, nom. nud. = *Isachne kunthiana* (Wight & Arn. ex Steud.) Nees ex Miq.

Isachne nervata Franch., Bull. Soc. Hist. Nat. Autun 8 (1895) 340 = *Panicum nervatum* (Franch.) Stapf.

Isachne nilagirica Hochst. ex Benth. in Benth. & Hook. f., Gen. Pl. 3 (1883) 1100, nom. nud. = *Isachne walkeri* Arn. ex Steud.

Isachne nodibarbata (Hochst. ex Steud.) Henrard, Blumea 3 (1940) 464. = *Isachne pulchella* Roth.

Isachne obscurans Woodrow, Gard. Chron. III, 23 (1898) 161. = *Panicum hippothrix* K. Schum.

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Isachne perpusilla Wight & Arn. in Wight, Cat. Indian Pl. (1836) 121, nom. nud.; Steud., Syn. Pl. Glumac. 1 (1854) 96, see sub *Panicum perpusillum*, combination not made. = *Coelachne perpusilla* (Arn. ex Steud.) Thwaites.

Isachne pilulifera (Nees ex Steud.) Henrard, Blumea 3 (1940) 471 = *Isachne confusa* Ohwi.

Isachne purpurascens Glassm., Bernice P. Bishop Mus. Bull. 209 (1952) 130. = *Isachne confusa* Ohwi.

Isachne pynaertii Vanderyst, Bull. Agric. Congo Belge 16 (1925) 688. ('*pynaerti*'). = *Isachne buettneri* Hack.

Isachne refracta Hook. f., J. Linn. Soc., Bot. 7 (1864) 227. = *Panicum hochstetteri* Steud.

Isachne repens Keng, Sunyatsenia 1 (1933) 129. = *Isachne kunthiana* (Wight & Arn. ex Steud.) Nees ex Miq.

Isachne rhabdina (Steud.) Henrard, Blumea 4 (1941) 530 [or *I. pangerangensis* Zoll. & Moritzi var. *rhabdina* (Steud.) Henrard, nom. altern., both valid], Ohwi, Bull. Tokyo Sci. Mus. 18 (1947) 1, isonym. = *Isachne pangerangensis* Zoll. & Moritzi.

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Isachne rigida Nees ex Miq., Fl. Ned. Ind. 3 (1857) 461. = *Isachne pangerangensis* Zoll. & Moritzi.

Isachne sapinii Vanderyst, Bull. Agric. Congo Belge 16 (1925) 688 ('*sapini*'). = *Panicum strictissimum* Afzel. ex Sw.

Isachne scandens C.E. Hubb., Kew Bull. (4) (1949) 360. = *Isachne buettneri* Hack.

Isachne schmidtii Hack., Bot. Tidsskr. 24 (1901) 97. = *Isachne kunthiana* (Wight & Arn. ex Steud.) Nees ex Miq.

Isachne semitalis Ridl., Fl. Malay Penins. 5 (1925)

237. = *Isachne kunthiana* (Wight & Arn. ex Steud.) Nees ex Miq.

Isachne stigmatosa Griff., Not. Pl. Asiat. 3 (1851) 42. = *Isachne minutula* (Gaudich.) Kunth.

Isachne streptostachys Nees ex Steud., Syn. Pl. Glumac. 1 (1853) 79, nom. inval. = *Streptostachys asperifolia* Desv.

Isachne sylvestris Ridl., J. Straits Branch Roy. Asiat. Soc. 44 (1905) 206. = *Isachne albens* Trin.

Isachne trachysperma (Nees) Nees ex Seem., Bot. Voy. Herald (1857) 224; Balansa, J. Bot. (Morot) 4 (1890) 137, isonym, pro comb. = *Isachne polygonoides* (Lam.) Döll.

Isachne tricarinata Roth in Roem. & Schult., Syst. Veg. 2 (1817) 476; Roth, Nov. Pl. Sp. (1821) 57 = *Panicum brevifolium* L.

Isachne trochainii A. Camus, Bull. Mus. Hist. Nat. (Paris) II, 5 (1933) 250. = *Panicum lindleyanum* Nees ex Steud.

Isachne ventricosa Döll in Mart., Fl. Bras. 2, 2 (1877) 274. = *Isachne salzmannii* (Trin. ex Steud.) Renvoize.

Isachne virgata Nees ex Steud., Syn. Pl. Glumac. 1 (1854) 96, in syn. sub *Panicum rhabdinum* = *Isachne pangerangensis* Zoll. & Moritzi.

Isachne vulcanica Merr., Philipp. J. Sci. 5 (1910) 169. = *Isachne clementis* Merr.

Isachne wombaliensis Vanderyst, Bull. Agric. Congo Belge 16 (1925) 688. = *Panicum nervatum* (Franch.) Stapf.

NOMINA NUDA DUBIA VEL INQUIRENDA

Isachne altissima Debeaux, Actes Soc. Linn. Bordeaux 30 (1875) 122. –- China. Not in Fl. China. Identity unknown, perhaps not an *Isachne*.

Isachne bennae Jacq.-Fél., Inst. Rech. Agron. Trop. Bull. Sci. 1 (1962) 263, t. 195, presumably from tropical Africa, seems to be a nomen nudum.

Isachne cambodiensis Ohwi, Acta Phytotax. Geobot. 22 (1967) 138. –- Cambodia. There is no second opinion on this name.

Isachne glaziovii Hack. mss., fide Potztal, Bot. Jahrb. Syst. 75 (1952) 555, 568. Nom. nud., voucher *Urban 74400* (B).

Isachne goyazensis Hack. mss., fide Potztal, Bot. Jahrb. Syst. 75 (1952) 555, 568. Nom. nud., voucher *Urban 22533* (B).

Isachne prostrata Hort. Berol. ex Steud., Syn. Pl. Glumac. 1 (1854) 95, nom. in synon. sub *Panicum horticolum* Steud. = quid?

For Réunion there is no second opinion since Cordemoy (1895, n.v.) and for Madagascar there is only a partial treatment by Bosser (1969). The identities of the following taxa therefore need confirmation:

Isachne cernua Cordem., Fl. Réunion (1895) 115. – Réunion.

Isachne ciliaris Boivin ex A. Camus, Bull. Soc. Bot. France 73 (1926) 917. – Madagascar.

Isachne hirtissima A. Camus, Bull. Soc. Bot. France 73 (1926) 916. – Madagascar.

Isachne humbertiana A. Camus, Bull. Soc. Bot. France 99 (1952) 142. – Madagascar.

Isachne humicola A. Camus, Bull. Soc. Bot. France 96 (1949) 52. – Madagascar.

Isachne laevis Boivin ex A. Camus, Bull. Soc. Bot. France 73 (1926) 917. – Madagascar.

Isachne longifolia Cordem., Fl. Réunion (1895) 115. – Réunion.

Isachne perrieri A. Camus, Bull. Soc. Bot. France 72 (1925) 306. – Madagascar.

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