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A Nomenclatural Review on the Infrageneric Classifications of *Arisaema* (*Araceae*)

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Infrageneric classification systems of the genus *Arisaema* have been diverse in opinions by the different authors. The inconsistency is considered to be partly because of nomenclatural problems including typification. To make the point of discussion clear the history of the nomenclature of the infrageneric taxa of *Arisaema* is thoroughly reviewed. In reference to the International Code of Nomenclature for algae, fungi, and plants (ICN, Melbourne Code) the original publications of infrageneric taxa were critically checked and the typification was reconsidered. Based on the results a revision for the most recent infrageneric classification system of *Arisaema* by Murata (2011) is made enumerating correct names and synonyms. *Arisaema* sect. *Odorata* J. Murata is validly published. Several taxa are newly lectotypified.

Key words: *Arisaema*, classification, lectotype, nomenclature, taxonomy, unranked taxa.

The genus *Arisaema* is one of the major genera of *Araceae* consisting of about 180 species. Infrageneric systems of the genus are, however, diverse in opinions showing considerable disagreements in recent floras, revisions and/or monographs (Li 1979, Murata 1984, Gusman and Gusman 2006, Li et al. 2010, Murata 2011). The inconsistency is considered to be partly because of different circumscriptions of the infrageneric taxa and of nomenclatural problems including typification. To make the point of discussion clear we review the history of the nomenclature of the infrageneric taxa of *Arisaema*. In reference to the International Code of Nomenclature for algae, fungi, and plants (ICN, Melbourne Code) the original publications of infrageneric taxa were critically checked and

the typification, was reconsidered. The taxa in bold face indicate that they were legitimately published at that time.

Discussion

1) Martius (1831): When ***Arisaema Mart.*** was described, the type species was not designated. Three species, *Arum nepenthoides* Wall., *Arum costatum* Wall. and *Arum speciosum* Wall. were referred, but these species were not validly combined with *Arisaema*, because Martius did not associate these epithets of *Arum* with *Arisaema* (ICN, Art. 35.2).

2) Miquel (1856): In this publication *Arisaema* **subgenus *Koryphophore* Miq.** based on a single species, *A. **ornatum*** Miq., was

legitimately published.

3) Schott (1860): In his “*Prodromus Aroidearum*” Schott (1860) gave an infrageneric classification of *Arisaema*, which is summarized in Table 1. The genus was divided into four sections, *Trisecta*, *Pedatisecta*, *Radiatisecta* and *Peltatisecta*, but these sections were not validly published because they accompanied neither diagnosis nor description. Under these invalid sectional names he placed words that indicated geographical regions partly with rank denoting term “subsect.” and partly without. We regard the words in the latter case as unranked infrageneric names based on ICN Arts. 21.1 and 37.3. All the subsectional and unranked epithets, excepting [unranked] *Indica* or [unranked] *Indo-arabica* in sect. *Radiatisecta*, were followed by a description so that they were validly published as summarized below (also in Table 1). These [unranked] *Indica* and [unranked] *Indo-arabica* were not followed by a description but they were also validly published because they were specified by the diagnostic key characters. As he used the same epithets that indicate geographical range in each of the sections, he created some homonyms as summarized below. Schott’s unranked taxa, as well as subsections, have never been adopted in any later publications and priority and types have not been considered for them.

Subsect. Himalaiensia Schott

Subsect. Japonica Schott

[Sect. *Radiatisecta*] [unranked] (*§§b.)

Abyssinica Schott

[Sect. *Trisecta*] [unranked] (c.) **Boreali-**

americana Schott

[Sect. *Pedatisecta*] [unranked] (**§c.)

Boreali-americana Schott

[Sect. *Pedatisecta*] [unranked] (**§§c.)

Boreali-americana Schott (Type: *A. quinatum* Schott)

[Sect. *Pedatisecta*] [unranked] (**§a.)

Indica Schott

[Sect. *Radiatisecta*] [unranked] (*§a.)

Indica Schott (‘*Indo-arabica*’ as an alternative name)

[Sect. *Radiatisecta*] [unranked] (*§§a.)

Indica Schott

[Sect. *Pedatisecta*] [unranked] (**§§a.)

Indo-arabica Schott

[Sect. *Radiatisecta*] [unranked] (*§a.)

Indo-arabica Schott (‘*Indica*’ as an alternative name)

[Sect. *Pedatisecta*] [unranked] (**§b.)

Japonica Schott (Type: *A. thunbergii* Blume)

[Sect. *Pedatisecta*] [unranked] (**§§b.)

Japonica Schott

[Sect. *Trisecta*] [unranked] (d.) **Sundaica**

Schott

[Sect. *Pedatisecta*] [unranked] (*a.)

Sundaica Schott

4) Pfeiffer (1873): In his “*Nomenclator botanicus*” Pfeiffer (1873) cited a single species *Arum speciosum* Wall. (= *Arisaema speciosum* (Wall.) Mart. ex Schott), which is considered to be lectotypification for the genus *Arisaema* (Staffleu & Cowan 1983, Rye & Wilson 1999).

5) Engler (1879): In A. L. P. P. de Candolle’s “*Monographiae Phanerogamarum*” Engler (1879) compiled the part of *Araceae* including *Arisaema*. In this treatment Engler divided *Arisaema* into three groups, “A. *Trisecta*”, “B. *Pedatisecta*” and “C. *Radiatisecta*”. These epithets were each followed by a short diagnosis. Although these epithets came after Schott’s (1860) undescribed sectional names, as was indicated in the parenthesis after the epithets, Engler did not intend to recognize them at the rank of section, because he used literal “section” to indicate the rank of section in another parts of the same publication. Consequently [unranked] *Pedatisecta* Engl. and [unranked] *Radiatisecta* Engl. were validly published. However [unranked] *Trisecta* Engl. was not validly published as it included *A. speciosum*, the lectotype of the genus previously selected by

Table 1. Arrangement of *Arisaema* epithets (in italic) in Schott's *Prodtromus Aroidearum* and the validity of taxa

Page	Arrangement in <i>Conspectus sectionum et subsectionum</i>	Page	Arrangement in the text	Taxa validly published	Invalid taxa	Species included
25	Sectio I. Trisecta	27	Sectio I. Trisecta			
25	a. Subsect. <i>Himalaiensis</i> with D.#	27	a. <i>Himalaiensis</i> without D.#	subsect. <i>Himalaiensis</i> Schott	sect. <i>Trisecta</i> Schott, nom. nud.	<i>costatum, dorosum, eminenens, hookerianum, intermedium, mirabile, propinquum, speciosum, stracheyanum, utile, verrucosum</i>
25	b. Subsect. <i>Japonica</i> with D.	31	b. <i>Japonica</i> without D.	subsect. <i>Japonica</i> Schott		<i>praecox, ringens</i>
25	c. <i>Borealia Americana</i> with D.	32	c. <i>Boreali-Americana</i> without D.	[unranked] <i>Boreali-americana</i> Schott		<i>atrorubens (= brasilianum, hastatum)</i>
25	d. <i>Sundaica</i> with D.	33	d. <i>Sundaica</i> without D.	[unranked] <i>Sundaica</i> Schott		<i>laminatum, roxburghii</i>
25	Sectio II. Pedatisecta	34	Sectio II. Pedatisecta		sect. <i>Pedatisecta</i> Schott, nom. nud.	
	* segmenta omnia		* segmenta omnia			
25	a. <i>Sundaica</i> with D.	34	a. <i>Sundaica</i> without D.	[unranked] <i>Sundaica</i> Schott		<i>commutatum, decipiens, filiforme</i>
	** segmenta omnia		** segmenta omnia			
	§. Appendix sigmoidea		§. Appendix sigmoidea			
26	a. <i>Indica</i> with D.	35	a. <i>Indica</i> with D.	[unranked] <i>Indica</i> Schott		<i>curvatum, helloborifolium, neglectum, steudeltii, tortuosum</i>
26	b. <i>Japonica</i> with D.	38	b. <i>Japonica</i> with D.	[unranked] <i>Japonica</i> Schott		<i>thunbergii</i>
26	c. <i>Boreali-Americana</i> with D.	38	c. <i>Boreali-Americana</i> with D.	[unranked] <i>Boreali-americana</i> Schott		<i>dracontium, macrospathum</i>
	§§. Appendix recta		§§. Appendix recta			
26	a. <i>Indo-Arabica</i> with D.	39	a. <i>Indo-Arabica</i> with D.	[unranked] <i>Indo-arabica</i> Schott		<i>abbreviatum, flavum</i>
26	b. <i>Japonica</i> with D.	40	b. <i>Japonica</i> with D.	[unranked] <i>Japonica</i> Schott		<i>japonicum, serratum</i>
26	c. <i>Boreali-Americana</i> with D.	41	c. <i>Boreali-Americana</i> with D.	[unranked] <i>Boreali-americana</i> Schott		<i>quinatum</i>
26	Sectio III. Radiatisecta	42	Sectio III. Radiatisecta		sect. <i>Radiatisecta</i> Schott, nom. nud.	
	* segmenta omnia		* segmenta omnia			
	§. Appendix sigmoidea		§. Appendix sigmoidea			

Table 1. Continued

Page	Arrangement in <i>Conspectus sectionum et subsectionum</i>	Page	Arrangement in the text	Taxa validly published	Invalid taxa	Species included
26	a. <i>Indica</i> without D.	42	a. <i>Indo-Arabica</i> without D.	[unranked] <i>Indica</i> and [unranked] <i>Indo-arabica</i> (as alternative names)		<i>botatae</i> , <i>exile</i> , <i>jaquemontii</i> , <i>murrayi</i> , <i>wightii</i>
	§§. Appendix abbreviata		§§. Appendix abbreviata			
26	a. <i>Indica</i> with D.	44	a. <i>Indica</i> with D.	[unranked] <i>Indica</i> Schott		<i>alienatum</i> , <i>fraternum</i> , <i>huegelii</i> , <i>papillosum</i>
26	b. <i>Abyssinica</i> with D.	46	b. <i>Abyssinica</i> with D.	[unranked] <i>Abyssinica</i> Schott		<i>ennaphyllum</i> , <i>schimperianum</i> ,
27	Sectio IV. Peltatisecta	48	Sectio III. Peltatisecta		sect. <i>Peltatisecta</i> Schott, nom. nud.	
	* segmenta omnia		* segmenta omnia			
	Indica, Luzonense, Sinense.					
	§. Appendix stipitata	48	§. Appendix stipitata			<i>cornutum</i> , <i>echinatum</i> , <i>nepenthoides</i> , <i>ochraceum</i>
	§§. Appendix haud incrassata	50	§§. Appendix haud incrassata			<i>affine</i> , <i>concinnum</i> , <i>leschenaultii</i>
	§§§. Appendix cylindroidea ex	52	§§§. Appendix cylindroidea ex			<i>consanguineum</i> , <i>cunningii</i> , <i>erubescens</i> , <i>tatarinowii</i> , <i>vituperatum</i>
			Species recognoscendae			
		54	† Foliis trisectis.			<i>gracile</i> , <i>griffithii</i>
		55	† Foliis pedatisectis.			<i>amplissimum</i> , <i>boscii</i> , <i>cochinchinense</i> , <i>heterophyllum</i> , <i>latisectum</i> , <i>pluckenctii</i> , <i>stictopodium</i>
		56	Subgen. <i>Coryphephore</i> Miq. (Flor. Ind. Bat. III. P. 220).			<i>ornatum</i>
		57	Vix cognita			Species (= <i>Arisaema</i> spp.)
		59	Dubia			<i>heptaphyllum</i> , <i>pentaphyllum</i> , <i>pumilum</i>
		60	Excludenda			

with D. = with description, without D. = without description

Pfeiffer (1873).

6) Engler (1920): In his monographic treatments in the series of “*Das Pflanzenreich*” Engler (1920) divided *Arisaema* into 15 groups without referring to Schott (1860) or his own previous publications (Engler 1879). The name of the groups are prefixed with a section sign “§”. In the studies of *Arisaema* this mark was frequently considered to indicate the rank of section (as in Hara 1971) but Engler used literal “section” to indicate the rank of section in other parts of the same publication such as in *Stylochiton*, *Theriphonum* and *Typhonium*. Consequently, Engler (1920) created following 15 unranked infrageneric taxa (Art. 37.5). Most of the taxa are automatically typified with the constituent species which the epithets of the unranked taxa were identical with or derived from (Art. 22.6) or they were monotypic (Art. 40.3). [unranked] *Speciosa* Engl. was illegitimate as it included *A. speciosum*, the lectotype of the genus. [unranked] *Attenuata*, *Lunata*, *Pistillata* and *Tenuipistillata* awaited to be lectotypified.

[unranked] *Attenuata* Engl.

[unranked] *Auriculata* Engl. (Type: *A. auriculatum* Buchet, Art. 22.6)

[unranked] *Barbata* Engl. (Type: *A. barbatum* Buchet, Art. 22.6)

[unranked] *Clavata* Engl. (Type: *A. clavatum* Buchet, Art. 22.6)

[unranked] *Decipientia* Engl. (monotypic with *A. decipiens* Schott)

[unranked] *Fimbriata* Engl. (Type: *A. fimbriatum* Masters, Art. 22.6)

[unranked] *Franchetiana* Engl. (Type: *A. franchetianum* Engl., Art. 22.6)

[unranked] *Lunata* Engl.

[unranked] *Nepenthoidea* Engl. (monotypic with *A. nepenthoides* (Wall.) Schott)

[unranked] *Pistillata* Engl.

[[unranked] *Speciosa* Engl., nom. illegit. Type: *A. speciosum* (Wall.) Schott]

[unranked] *Ringentia* Engl. (monotypic

with *A. ringens* Schott)

[unranked] *Tenuipistillata* Engl.

[unranked] *Tortuosa* Engl. (Type: *A. tortuosum* (Wall.) Schott, Art. 22.6)

[unranked] *Wallichiana* Engl. (Type: *A. wallichianum* Hook. f., Art. 22.6)

7) Nakai (1929): In enumerating Japanese and Korean species of *Arisaema*, Nakai (1929) used Engler's (1920) two unranked taxa at the rank of section. Consequently, two **sections** *Tortuosa* (Engl.) Nakai and *Ringentia* (Engl.) Nakai were established.

8) Nakai (1950): In this paper Nakai (1950) published the following three new sections including a new combination in the genus *Arisaema* and also three new genera that were separated from *Arisaema*. Sect. *Pistillata* (Engl.) Nakai was legitimately combined at the rank of section. He designated the type for each taxon.

Sect. *Colocasiarum* Nakai (type: *A. ternatipartitum* Makino)

Sect. *Pistillata* (Engl.) Nakai (lectotypified with *A. serratum* (Thunb.) Schott)

Sect. *Sinarisaema* Nakai (type: *A. formosanum* Hayata)

Gen. ***Flagellarisaema* Nakai** (type: *Flagellarisaema thunbergii* (Blume) Nakai ≡ *Arisaema thunbergii* Blume)

Gen. ***Heteroarisaema* Nakai** (type: *Heteroarisaema heterophyllum* (Blume) Nakai ≡ *Arisaema heterophyllum* Blume)

Gen. ***Ringentiarum* Nakai** (type: *Ringentiarum ringens* (Schott) Nakai ≡ *Arisaema ringens* Schott)

9) Hara (1971): In this revision of the Eastern Himalayan species of *Arisaema* Hara (1971) made a contemporary classification of the genus. He created only a single infrageneric taxon, *Arisaema* **sect. *Exappendiculata* H. Hara** (monotypic with *A. exappendiculatum* H. Hara), but made several new combinations as mentioned below. Two new combinations, **sect.**

***Flagellarisaema* (Nakai) H. Hara and sect. *Dochafa* (Schott) H. Hara** (monotypic with *A. flavum* (Forssk.) Schott) were positively made.

Hara (1971) regarded Engler's (1920) unranked infrageneric taxa as sections and lectotypified them whether or not they were cited as correct names or synonyms. This typification is effective for the Engler's unranked taxa. As most of these names are followed by a full and direct reference given to their author and the place of valid publication they are considered to be published as new combinations (Art 41.6). The combinations are valid when they are used as correct names, whereas the combinations are invalid in cases where they are used as synonyms (Art. 36.1). Hara also designated types and lectotypes by underlining the proposed type species in the diagram that showed relationships among the sections (Hara 1971, page 324). But lectotypification with *A. fargesii* Buchet for [unranked] *Auriculata* Engl. (as sect. *Auriculata*), which had been automatically typified with *A. auriculatum*, should be cancelled.

Consequently the following two accepted names were validly combined to the rank of section:

Sect. *Franchetiana* (Engl.) H. Hara

Sect. *Tenuipistillata* (Engl.) H. Hara
(lectotypified with *A. jacquemontii* Blume)

Incidental combinations for the infrageneric unranked taxa *Clavata*, *Lunata*, *Nepenthoidea*, *Speciosa* and *Wallichiana* to the rank of section were not valid because they were cited as synonyms.

Sections *Attenuata* Engl., *Decipientia* Engl. and *Fimbriata* Engl. were used only in the diagram and sect. *Barbata* Engl. was mentioned only in the text. As they did not accompany full and direct references given to their authors and the places of valid publication these names were not validly combined at the rank of section. Designation of lectotype for [unranked] *Attenuata* Engl. with *A. laminatum* Blume was effective.

For *Arisaema* sect. *Pistillata* (Engl.) Nakai (as sect. *Pistillata* Engl.) that had been typified with *A. serratum* by Nakai (1950), Hara (1971) re-chose *A. triphyllum* (L.) Schott as lectotype with a comment "judging from Engler's treatment it is more proper to regard *A. triphyllum* as the lectotype". But this cannot be considered a proper reason to change the lectotype.

Hara designated *A. nepenthoides* as the type species of the genus *Arisaema* but this is against the preceding typification by Pfeiffer (1873) with *A. speciosum*. Hara (1971) recognized "sect. *Trisecta*" (as sect. *Trisecta* Schott, p.p. (a. *Himalaiensia*)) as a correct name but this is invalid because Hara selected *A. speciosum* as the type of this taxon.

10) Li (1979): In this publication, "*Flora Reipublicae Popularis Sinicae*", Li basically adopted Hara's (1971) classification system. As in the case of Hara (1971), following three sections each with a full and direct reference given to the author and place of valid publication are considered to be established as new combinations.

Sect. *Fimbriata* (Engl.) H. Li

Sect. *Attenuata* (Engl.) H. Li

Sect. *Decipientia* (Engl.) H. Li

11) Ohashi and Murata (1980): In this study on the taxonomy of Japanese *Arisaema* the unranked infrageneric taxon *Clavata* Engl. was recognized as a correct name at the rank of section. Then a new combination **sect. *Clavata* (Engl.) H. Ohashi & J. Murata** was made legitimately.

12) Murata (1984): In this study the circumscription of the infrageneric taxa of *Arisaema* was thoroughly revised but nomenclatural changes were few. New combinations **subject. *Flagellarisaema* (Nakai) J. Murata** and **subject. *Exappendiculata* (H. Hara) J. Murata** were made.

13) Murata (1991): In this study [unranked] *Pedatisecta* Engl. was used at the rank of section with full and direct reference given to the author and place of valid publication and lectotypified with *A. japonicum* Blume. This name was used for sect. *Arisaema* in the sense of previous treatments such as Hara (1971), Li (1979) and Murata (1984).

Sect. *Pedatisecta* (Engl.) J. Murata (lectotypified with *A. japonicum* Blume)

14) Gusman & Gusman (2002): In this monograph the authors basically adopted Murata's system proposed in Murata (1984) and emended in Murata (1991), but they modified the system to some extent. They used sections *Anomala* Gusman & L. Gusman and *Lobata* Gusman & L. Gusman, but these were *nomina nuda*. As they used "sect. *Nepenthoidea* Engl." without reference this name was still unranked.

15) Hetterscheid & Gusman (2003): **Sect. *Anomala* Gusman & L. Gusman** was legitimately published with *A. anomalum* Hemsl. as the type.

16) Gusman & Gusman (2006): This edition stands on more mature nomenclatural framework than the previous edition (Gusman and Gusman 2002). A monotypic **section *Lobata* Gusman & L. Gusman** was legitimately published. They typified sect. *Pistillata* with *A. triphyllum* but this is against the previous designation with *A. serratum* by Nakai (1929). They typified sect. *Attenuata* with *A. prazeri* Hook. f. but this is also against the previous designation with *A. laminatum* by Hara (1971).

17) Murata (2011): This monograph of Japanese *Arisaema* whose text is written in Japanese accompanies an infrageneric classification of the whole genus. A new combination **sect. *Nepenthoidea* (Engl.) Gusman & L. Gusman ex J. Murata** was made. Sect. *Odorata* J. Murata was proposed

for sect. *Attenuata* in the sense of Gusman & Gusman (2006), which is to be validly described below.

Taxonomic treatment

Arisaema Mart., Flora **14**: 459 (1831). Lectotype (designated by Pfeiffer 1873): *Arisaema speciosum* (Wall.) Mart. ex Schott.

= *A.* [sect. *Pedatisecta*] [unranked] (*a.) *Sundaica* Schott, Prodr. Syst. Aroid.: 25 & 34 (1860). Type: Not designated.

= *A.* [sect. *Radiatisecta*] [unranked] (*§a.) *Indo-arabica* Schott, Prodr. Syst. Aroid.: 42, in p. 26 '*Indica*' as an alternative name (1860). Type: Not designated.

1. Sect. ***Tenuipistillata*** (Engl.) H. Hara, Univ. Mus. Univ. Tokyo Bull. **2**: 346 (1971). ≡ *A.* [unranked] *Tenuipistillata* Engl., Pflanzenr. (Engler) IV 23F (Heft **73**): 195 (1920). Lectotype (designated by Hara 1971): *A. jacquemontii* Blume.

= *A.* [sect. *Radiatisecta*] [unranked] (§§b.) *Abyssinica* Schott, Prodr. Syst. Aroid.: 26 & 46 (1860). Type: Not designated.

2. Sect. ***Dochafa*** (Schott) H. Hara, Univ. Mus. Univ. Tokyo Bull. **2**: 344 (1971). ≡ *Dochafa* Schott, Syn. Aroid.: 24 (1856). Type: *Dochafa flava* Schott (≡ *A. flavum* (Forssk.) Schott).

= *A.* [sect. *Pedatisecta*] [unranked] (**§§a.) *Indo-arabica* Schott, Prodr. Syst. Aroid.: 26 & 39 (1860). Type: Not designated.

3. Sect. ***Tortuosa*** (Engl.) Nakai, Bot. Mag. (Tokyo) **43**: 524 (1929). ≡ *A.* [unranked] *Tortuosa* Engl., Pflanzenr. (Engler) IV 23F (Heft **73**): 185 (1920). Type: *A. tortuosum* (Wall.) Schott.

= *A.* [sect. *Pedatisecta*] [unranked] (**§a.) *Indica* Schott, Prodr. Syst. Aroid.: 26 & 35 (1860). Type: Not designated.

= *A.* [sect. *Radiatisecta*] [unranked] (*§a.) *Indica* Schott, Prodr. Syst. Aroid.: 26, in p. 42

‘*Indo-arabica*’ as an alternative name (1860).
Type: Not designated.

4. Sect. *Arisaema*

≡ [*A. sect. Trisecta* Schott, Prodr. Syst. Aroid.: 25 & 27 (1860) nom. nud. ≡ *A.* [unranked] *Trisecta* Engl., Monogr. Phan. (A. DC. & C. DC.) 2: 534 (1879), nom. inval. superfl. (by including the lectotype of the genus selected by Pfeiffer 1873) (Art. 22.2). Lectotype (designated by Hara 1971) : *A. speciosum* (Wall.) Mart. ex Schott].

= *A. subsect. Himalaiensia* Schott, Prodr. Syst. Aroid.: 25 & 27 (1860). Lectotype (**here designated**) : *Arisaema speciosum* (Wall.) Mart. ex Schott.

= [*A. sect. Speciosa* Engl., Pflanzenr. (Engler) IV 23F (Heft 73): 151 & 193 (1920), nom. inval. superfl.]. Type: *A. speciosum* (Wall.) Mart. ex Schott.

= *A.* [unranked] *Wallichiana* Engl., Pflanzenr. (Engler) IV 23F (Heft 73): 151 & 211 (1920). Type: *A. wallichianum* Hook.f.

= *A.* [unranked] *Lunata* Engl., Pflanzenr. (Engler) IV 23F (Heft 73): 151 & 215 (1920). Lectotype (**here designated**) : *A. costatum* (Wall.) Schott.

5. Sect. *Attenuata* (Engl.) H. Li, Fl. Reipubl. Popul. Sin. 13(2): 127 (1979). ≡ *A.* [unranked] *Attenuata* Engl., Pflanzenr. (Engler) IV 23F (Heft 73): 155 (1920). Lectotype (designated by Hara 1971) : *A. laminatum* Blume.

= *A.* [sect. *Trisecta*] [unranked] (d.) *Sundaica* Schott, Prodr. Syst. Aroid.: 25 & 33 (1860). Type: Not designated.

= *A. sect. Fimbriata* (Engl.) H. Li, Fl. Reipubl. Popul. Sin. 13(2): 123 (1979). ≡ *A.* [unranked] *Fimbriata* Engl., Pflanzenr. (Engler) IV 23F (Heft 73): 151 (1920). Type: *A. fimbriatum* Mast.

= *A.* [unranked] *Barbata* Engl., Pflanzenr. (Engler) IV 23F (Heft 73): 150 & 162 (1920). Type: *A. barbatum* Buchet.

6. Sect. *Odorata* J. Murata [*Arisaema* in Japan: 58 (2011), nom. nud. descr. jap.] ex J. Murata, **sect. nov.**

Tuberous winter-dormant herbs. Phyllotaxis quincuncial. Pseudostem less than half of total height. Leaves trifoliolate or pedate to radiate. Spadix female or monoecious when mature; appendix short or long whip-like, usually depending from the mouth of spathe. Female flowers bottle-shaped or rarely spindle shaped (in *A. saxatile*). Infructescence upright. Chromosome numbers $2n = 16, 22, 24, 26$, or 48.

Type (**here designated**): *A. odoratum* J. Murata & S. G. Wu.

Species included: *A. aridum* H. Li, *A. lidaense* J. Murata & S. G. Wu, *A. mairei* H. Lév. (= *A. wumengense* H. Li), *A. odoratum* J. Murata & S. G. Wu, *A. prazeri* Hook. f., *A. quinquelobatum* H. Li & J. Murata, *A. saxatile* Buchet (= *A. bathycoleum* Buchet), *A. yunnanese* Buchet.

Distribution: SW China and adjacent subtropical regions.

7. Sect. *Anomala* Gusman & L. Gusman, Aroideana 26: 40 (2003). Type: *A. anomalum* Hemsl.

= *A. subg. Koryphephore* Miq., Fl. Nederl. Ind. 3(2): 220 (1856); Schott, Prodr. Syst. Aroid. 56 (1860), ‘*Coryphephore*’. Type: *A. ornatum* Miq.

8. Sect. *Flagellarisaema* (Nakai) H. Hara, Univ. Mus. Univ. Tokyo Bull. 2: 326 (1971). ≡ *Flagellarisaema* Nakai, J. Jpn. Bot. 25: 6 (1950). Type: *Flagellarisaema thunbergii* (Blume) Nakai (≡ *A. thunbergii* Blume).

= *A.* (sect. *Pedatisecta*) [unranked] (**§b.) *Japonica* Schott, Prodr. Syst. Aroid.: 26 & 38 (1860). Type: *A. thunbergii* Blume.

= *A.* [sect. *Pedatisecta*] [unranked] (**§c.) *Boleari-americana* Schott, Prodr. Syst. Aroid.: 26 & 38 (1860). Type: Not designated.

= *Muricauda* Small, Fl. S.E. U.S.: 227

(1903). Type: *Muricauda dracontium* (L.) Small (≡ *Arum dracontium* L.).

= *Heteroarisaema* Nakai in J. Jpn. Bot. **25**: 6 (1950). Type: *Heteroarisaema heterophyllum* (Blume) Nakai (≡ *A. heterophyllum* Blume).

9. Sect. ***Clavata*** (Engl.) H. Ohashi & J. Murata, J. Fac. Sci. Univ. Tokyo. Sect. III **12**: 283 (1980). ≡ *A.* [unranked] *Clavata* Engl., Pflanzenr. (Engler) IV 23F (Heft **73**): 171 (1920). Type: *A. clavatum* Engl.

10. Sect. ***Decipientia*** (Engl.) H. Li, Fl. Reipubl. Popul. Sin. **13**(2): 166 (1979). ≡ *A.* [unranked] *Decipientia* Engl., Pflanzenr. (Engler) IV 23F (Heft **73**): 195 (1920). Type: *A. decipiens* Schott.

11. Sect. ***Nepenthoidea*** (Engl.) Gusman & L. Gusman [The Genus *Arisaema*: 61 (2002), comb. nud.] ex J. Murata, *Arisaema* in Japan: 63 (2011). ≡ *A.* [unranked] *Nepenthoidea* Engl., Pflanzenr. (Engler) IV 23F (Heft **73**): 208 (1920). Type: *A. nepenthoides* (Wall.) Schott.

= *A.* [unranked] *Auriculata* Engl., Pflanzenr. (Engler) IV 23F (Heft **73**): 163 (1920). Type: *A. auriculatum* Buchet.

12. Sect. ***Franchetiana*** (Engl.) H. Hara, Univ. Mus. Univ. Tokyo Bull. **2**: 326 (1971). ≡ *A.* [unranked] *Franchetiana* Engl., Pflanzenr. (Engler) IV 23F (Heft **73**): 184 (1920). Type: *A. franchetianum* Engl.

13. Sect. ***Sinarisaema*** Nakai, J. Jpn. Bot. **25**(1): 6 (1950). Type: *A. formosanum* Hayata.

= [*A.* sect. *Radiatisecta* Schott, Prodr. Syst. Aroid.: 26 & 42 (1860), nom. nud.] ≡ *A.* [unranked] *Radiatisecta* Engl., Monogr. Phan. (A. DC. & C. DC.) **2**: 550 (1879). Type: Not designated.

= *A.* [sect. *Radiatisecta*] [unranked] (*§§a.) *Indica* Schott, Prodr. Syst. Aroid.: 26 & 44 (1860). Type: Not designated.

= [*A.* sect. *Peltatisecta* Schott, Prodr. Syst.

Aroid.: 27 & 48 (1860), nom. nud.]

= *A.* sect. *Exappendiculata* H. Hara, Univ. Mus. Univ. Tokyo Bull. **2**: 353 (1971). ≡ *A.* subsect. *Exappendiculata* (H. Hara) J. Murata, J. Fac. Sci. Univ. Tokyo. Sect. III **13**: 475 (1984). Type: *A. exappendiculatum* H. Hara.

14. Sect. ***Pistillata*** (Engl.) Nakai, Bot. Mag. (Tokyo) **43**: 525 (1929). ≡ *A.* [unranked] *Pistillata* Engl., Pflanzenr. (Engler) IV 23F (Heft **73**): 199 (1920). Lectotype (designated by Nakai 1950): *A. serratum* (Thunb.) Schott.

= [*A.* sect. *Pedatisecta* Schott, Prodr. Syst. Aroid.: 34 (1860), nom. nud.] ≡ *A.* [unranked] *Pedatisecta* Engl., Monogr. Phan. (A. DC. & C. DC.) **2**: 541 (1879). ≡ *A.* sect. *Pedatisecta* (Engl.) J. Murata, Kew Bull. **46**: 127 (1991). Lectotype (designated by Murata 1991): *A. japonicum* Blume.

= *A.* subsect. *Japonica* Schott, Prodr. Syst. Aroid.: 25 & 31 (1860). Lectotype (**here designated**): *Arisaema ringens* Schott.

= *A.* [unranked] *Ringentia* Engl., Pflanzenr. (Engler) IV 23F (Heft **73**): 209 (1920). ≡ *A.* sect. *Ringentia* (Engl.) Nakai, Bot. Mag. (Tokyo) **43**: 526 (1929). Type: *A. ringens* Schott.

= *Ringentiarum* Nakai, J. Jpn. Bot. **25**: 6 (1950). Type: *A. ringens* Schott.

= *A.* [sect. *Trisecta*] [unranked] (c.) *Boreali-americana* Schott, Prodr. Syst. Aroid.: 25 'Borealia Americana' & 32 (1860), p.p. Type (**here designated**): *A. atrorubens* Blume.

= *A.* [sect. *Pedatisecta*] [unranked] (**§§b.) *Japonica* Schott, Prodr. Syst. Aroid.: 26 & 40 (1860). Type: Not designated.

= *A.* [sect. *Pedatisecta*] [unranked] (**§§c.) *Boreali-americana* Schott, Prodr. Syst. Aroid.: 26 & 41 (1860). Type: *A. quinatum* Schott.

= *A.* sect. *Colocasiarum* Nakai, J. Jpn. Bot. **25**: 6 (1950). Type: *A. ternatipartitum* Makino.

= *A.* sect. *Lobata* Gusman & L. Gusman [The Genus *Arisaema*: 215 (2002), nom. nud.] ex Gusman & L. Gusman, The Genus *Arisaema*, ed. 2: 260 (259) (2006). Type: *A. lobatum* Engl.

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邑田 仁^a, 永益英敏^b, 大橋広好^c: テンナンショウ属 (サトイモ科) の属内分類の再検討

Martius (1831) により設立されたテンナンショウ属 (サトイモ科) には現在約 180 種が知られている。この属について Schott (1860) のモノグラフ以来、いくつもの分類体系が発表されてきたが、属内分類群の扱いはまだ定まったとはいえない。その原因は、分類群の生物学的なまとまりに諸説があることにもよるが、どの学名を適用すべきかの判断が研究者によって異なることにもよると考えられる。そこで本論文では、テンナンショウ属の分類の歴史を見直すことにより、学名の適用についての議論に客観的な根拠を与えることを目的とした。そ

のために、国際藻類・菌類・植物命名規約 (メルボルン規約) に基づいて、原著の学名の有効性を検討し、タイプを確定するとともに、その結果に基づいて最新の分類体系 (Murata 2011) に対する正名と異名を定めた。また、Murata (2011) で提案されたが未記載であったニオイマムシグサ節 *Arisaema* sect. *Odorata* J. Murata を正式に記載した。

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