

A Checklist of Sexual System of Angiosperm Species and Genera in the Japanese Flora IV

Kiyoshi MATSUI¹, Eiichiro KINOSHITA², Junko OKAZAKI³, and
Norikazu YAMANAKA⁴

Key words : angiosperms, Japanese flora, sexual system.

The sex expression of all angiosperm species known to Japan was surveyed by scrutinizing literatures and/or field observation. The checklist is continued from the No.20 of this Annual Report, and a part of the results, from Poaceae to Orchidaceae, is shown.

Sexual type is classified into the following eight categories. The abbreviations are shown in a parenthesis

Cosexuality :

Hermaphroditism (CH); Monoecy (CM); Andromonoecy (CA); Gynomonoecy (CG).

Dioecy:

Dioecy (DD); Androdioecy (DA); Gynodioecy (DG).

Polygamy:

Polygamomonoecy, Polygamodioecy and other miscellaneous sexual types (PG).

In the table, A indicates no disagreement for sexual type among the literatures; B, disagreement among the literatures; C, sexual type was determined by direct field observations; *, no information. When no difference is found in a genus, then the number of species is written, for convenience' sake, after the genus name (for example, *Agropyron* 4spp.). The checklist includes only native plants and recently naturalized species are excluded. The families are arranged according to Engler's system (Melchior 1964), and genera and species are arranged in alphabetical order.

	CH	CM	CA	CG	DD	DA	DG	PG
Poaceae								
<i>Agropyron</i> 4spp.	A							
<i>Agrostis</i> 7spp.	A							
<i>Alopecurus</i> 2spp.	A							

¹ Department of Biology, Faculty of Science, Tohoku University, Sendai 980, Japan

² Botanic Garden, Faculty of Science, Kanazawa University, Kanazawa 920-11, Japan

³ Department of Biology, Osaka Kyoiku University, Kashiwara 582, Japan

⁴ Arid Land Research Center, Tottori University, Tottori 680, Japan

	CH	CM	CA	CG	DD	DA	DG	PG
Spinifex 1sp.					A			
Spodiopogon 2spp.	A							
Sporobolus 4spp.	A							
Stipa 2spp.	A							
Themeda triandra Forsk. var. japonica (Willd.) Makino,							B	
Torreyochloa 2spp.	A							
Tripogon 6spp.	A							
Zizania 1sp.		A						
Zoysia 5spp.	A							
Areaceae								
Arenga 1sp.		A						
Clinostigma 1sp.		A						
Livistona 1sp.	A							
Nypa 1sp.		A						
Satakentia 1sp.	A							
Trachycarpus fortunei (Hook.) H. Wendl.								B
Araceae								
Acorus 2spp.	A							
Alocasia 3spp.		A						
Amorphophalus 1sp.		A						
Arisaema amurense Maxim. ssp. robustum (Engler) Ohashi et J. Murata			C					
Arisaema cucullatum M. Hotta			C					
Arisaema heterocephalum Koidz.			C					
Arisaema heterophyllum Blume								B
Arisaema ishizuchiense Murata			C					
Arisaema iyoanum Makino			C					
Arisaema kishidae Makino ex Nakai			C					
Arisaema kiushianum Makino			C					
Arisaema lonbipedunculatum M. Hotta			C					
Arisaema maximowiczii Nakai			C					
Arisaema monophyllum Nakai			C					
Arisaema negishii Makino			C					
Arisaema nikoense Nakai			C					
Arisaema ogatae Koidz.			C					
Arisaema ringens (Thunb.) Schott			C					
Arisaema sazensoo (Blume) Makino			C					
Arisaema seppikoense Kitamura			C					
Arisaema serratum (Thunb.) Schott			C					

	CH	CM	CA	CG	DD	DA	DG	PG
<i>Arisaema sikokianum</i> Franch. et Savat		C						
<i>Arisaema tashiroi</i> Kitamura		C						
<i>Arisaema ternatipartitum</i> Makino		C						
<i>Arisaema thunbergii</i> Blume		C						
<i>Arisaema tosaense</i> Makino		C						
<i>Arisaema undulatifolium</i> Nakai		C						
<i>Arisaema yamatense</i> (Nakai) Nakai		C						
<i>Calla palustris</i> L.								B
<i>Epipremnum pinnatum</i> Engl.	*							
<i>Raphidophora liukuensis</i> Hatus.	*							
<i>Lysichiton</i> 1sp.		A						
<i>Pinellia</i> 2spp.			A					
<i>Symplocarpus</i> 2spp.		A						
<i>Typhonium</i> 1sp.			A					
Lemnaceae								
<i>Lemna</i> 3spp.			A					
<i>Spirodela</i> 2spp.			A					
<i>Wolffia</i> 1sp.			A					
Pandanaceae								
<i>Freycinetia</i> 2spp.					A			
<i>Pandanus</i> 2spp.					A			
Sparganiaceae								
<i>Sparganium</i> 8spp.			A					
Typhaceae								
<i>Typha</i> 3spp.			A					
Cyperaceae								
<i>Bulbostylis</i> 2spp.		A						
<i>Carex aequalta</i> Kükenth.			A					
<i>Carex albata</i> Boott			A					
<i>Carex alliiformis</i> C. B. Clarke			A					
<i>Carex angustisquama</i> Franch.			A					
<i>Carex aphanolepis</i> Franch. et Savat.			A					
<i>Carex aphyllopus</i> Kükenth.			A					
<i>Carex arenicola</i> F. Schmidt			A					
<i>Carex atrata</i> L. var. <i>japonalpina</i> T. Koyama			A					
<i>Carex atroviridis</i> Ohwi			A					
<i>Carex augustinowiczii</i> Meinsh.			A					
<i>Carex autumnalis</i> Ohwi			A					

	CH	CM	CA	CG	DD	DA	DG	PG
<i>Carex bigelowii</i> Torr.		A						
<i>Carex bipartita</i> All.		A						
<i>Carex biwensis</i> Franch.		A						
<i>Carex blepharicarpa</i> Franch.		A						
<i>Carex bohemica</i> Schreber		A						
<i>Carex bostrychostigma</i> Maxim.		A						
<i>Carex breviculmis</i> R. Br.		A						
<i>Carex brownii</i> Tuckerm.		A						
<i>Carex brunnea</i> Thunb.		A						
<i>Carex brunnescens</i> (Pers.) Poir.		A						
<i>Carex buxbaumii</i> Wahlenb.		A						
<i>Carex caespitosa</i> L.		A						
<i>Carex capillacea</i> Boott		A						
<i>Carex capillaris</i> L.		A						
<i>Carex capricornis</i> Meinsh.		A						
<i>Carex caryophyllea</i> Latour. var. <i>microtricha</i> (Franch.) Kükenth.		A						
<i>Carex chinoi</i> Ohwi et T. Koyama		A						
<i>Carex chrysolepis</i> Franch. et Savat.		A						
<i>Carex ciliato-marginata</i> Nakai		A						
<i>Carex cinerascens</i> Kükenth.		A						
<i>Carex clivorum</i> Ohwi		A						
<i>Carex conica</i> Boott		A						
<i>Carex cruciata</i> Wahlenb.		A						
<i>Carex curta</i> Gooden.		A						
<i>Carex curvicollis</i> Franch. et Savat.		A						
<i>Carex daisenensis</i> Nakai		A						
<i>Carex deweyana</i> Schwein. var. <i>senanensis</i> (Ohwi) T. Koyama		A						
<i>Carex diandra</i> Schrank		A						
<i>Carex dickinsii</i> Franch. et Savat.		A						
<i>Carex dimorpholepis</i> Steud.		A						
<i>Carex dispalata</i> Boott		A						
<i>Carex disperma</i> Dewey		A						
<i>Carex dissitiflora</i> Franch.		A						
<i>Carex doenitzii</i> Böckl.		A						
<i>Carex dolichostachya</i> Hayata var. <i>glaberrima</i> (Ohwi) T. Koyama		A						
<i>Carex doniana</i> Spreng.		A						
<i>Carex drymophila</i> Turcz. var. <i>abbreviata</i> (Kükenth.) Ohwi		A						
<i>Carex duvaliana</i> Franch. et Savat.		A						

	CH	CM	CA	CG	DD	DA	DG	PG
<i>Carex echinata</i> Murr.		A						
<i>Carex eleusinoides</i> Turcz.		A						
<i>Carex fedia</i> Nees var. <i>miyabei</i> (Franch.) T. Koyama		A						
<i>Carex fernaldiana</i> H.Lév. et Van.		A						
<i>Carex fibrillosa</i> Franch. et Savat.		A						
<i>Carex filipes</i> Franch. et Savat.		A						
<i>Carex flabellata</i> H.Lév. et Van.		A						
<i>Carex flavocuspis</i> Franch. et Savat.		A						
<i>Carex foliosissima</i> F. Schmidt		A						
<i>Carex forficula</i> Franch. et Savat.		A						
<i>Carex formosensis</i> H.Lév. et Van.		A						
<i>Carex fulva</i> Franch.		A						
<i>Carex genkaiensis</i> Ohwi		A						
<i>Carex gibba</i> Wahlenb.		A						
<i>Carex gifuensis</i> Franch.		A						
<i>Carex gmelinii</i> Hook. et Arn.		A						
<i>Carex grallatoria</i> Maxim.								B
<i>Carex gynocrates</i> Wormskj.								B
<i>Carex hachijoensis</i> Akiyama		A						
<i>Carex hakkodensis</i> Franch.								B
<i>Carex hakonensis</i> Franch. et Savat.		A						
<i>Carex hashimotoi</i> Ohwi		A						
<i>Carex heteroclita</i> Franch.		A						
<i>Carex heterolepis</i> Bunge		A						
<i>Carex hondoensis</i> Ohwi		A						
<i>Carex humilis</i> Leyss. var. <i>nana</i> (H.Lév. et Van.) Ohwi		A						
<i>Carex hymenodon</i> Ohwi		A						
<i>Carex idzuroei</i> Franch. et Savat.		A						
<i>Carex impura</i> Ohwi		A						
<i>Carex incisa</i> Boott		A						
<i>Carex insanae</i> Koidz.		A						
<i>Carex ischnostachya</i> Steud.		A						
<i>Carex jacens</i> C. B. Clarke		A						
<i>Carex japonica</i> Thunb.		A						
<i>Carex kabanovii</i> V. Krecz.								B
<i>Carex kiotensis</i> Franch. et Savat.		A						
<i>Carex kobomugi</i> Ohwi								B
<i>Carex kujuzana</i> Ohwi		A						

	CH	CM	CA	CG	DD	DA	DG	PG
<i>Carex laevis</i> Nakai		A						
<i>Carex lanceolata</i> Boott		A						
<i>Carex lasiocarpa</i> Ehrh. var. <i>occultans</i> (Franch.) Kükenth.		A						
<i>Carex lasiolepis</i> Franch.		A						
<i>Carex laticeps</i> C. B. Clarke		A						
<i>Carex latisquamea</i> Komar.		A						
<i>Carex laxa</i> Wahlenb.		A						
<i>Carex lehmannii</i> Drejer		A						
<i>Carex lenta</i> D. Don		A						
<i>Carex ligulata</i> Nees		A						
<i>Carex limosa</i> L.		A						
<i>Carex lithophila</i> Turcz.		A						
<i>Carex livida</i> (Wahlenb.) Willd.		A						
<i>Carex loliacea</i> L.		A						
<i>Carex longerostrata</i> C. A. Mey.		A						
<i>Carex lyngbyei</i> Hornem.		A						
<i>Carex maackii</i> Maxim.		A						
<i>Carex mackenziei</i> V. Krecz.		A						
<i>Carex macrandrolepis</i> H. Lév.		A						
<i>Carex macrocephala</i> Willd.					A			
<i>Carex maculata</i> Boott		A						
<i>Carex makinoensis</i> Franch.		A						
<i>Carex matsumurae</i> Franch.		A						
<i>Carex maximowiczii</i> Miq.		A						
<i>Carex mayebarana</i> Ohwi		A						
<i>Carex melanocarpa</i> Cham.		A						
<i>Carex mertensii</i> Presc. var. <i>urostachys</i> (Franch.) Kükenth.		A						
<i>Carex metallica</i> H. Lév.		A						
<i>Carex meyeriana</i> Kunth		A						
<i>Carex michauxiana</i> Bocklr. var. <i>asiatica</i> (Hult.) Ohwi		A						
<i>Carex middendorffii</i> F. Schmidt		A						
<i>Carex mira</i> Kükenth.		A						
<i>Carex mitrata</i> Franch.		A						
<i>Carex mollicula</i> Boott		A						
<i>Carex morrowii</i> Boott		A						
<i>Carex nachiana</i> Ohwi		A						
<i>Carex nemostachys</i> Steud.		A						
<i>Carex nemurensis</i> Franch.		A						

	CH	CM	CA	CG	DD	DA	DG	PG
Carex nervata Franch. et Savat.		A						
Carex neurocarpa Maxim.		A						
Carex nubigena Don var. franchetiana Ohwi		A						
Carex oahuensis C. A. Mey. var. robusta Franch. et Savat.		A						
Carex oligosperma Michx.		A						
Carex olivaceae Boott. var. angustior Kükenth		A						
Carex omiana Franch. et Savat.		A						
Carex omurae T. Koyama		A						
Carex onoei Franch. et Savat.		A						
Carex oshimensis Nakai		A						
Carex otaruensis Franch.		A						
Carex oxyandra (Franch. et Savat.) Kudo		A						
Carex pachygyna Franch. et Savat.		A						
Carex pallida C. A. Mey.		A						
Carex papulosa Boott		A						
Carex parciflora Boott var. macroglossa (Franch. et Savat.) T. Koyama		A						
Carex pauciflora Lightf.		A						
Carex paupercula Michx.		A						
Carex paxii Kükenth.		A						
Carex peiktusanii Komar.		A						
Carex persistens Ohwi		A						
Carex phacota Spreng.		A						
Carex phaeodon T. Koyama		A						
Carex pilosa Scop.		A						
Carex pisiformis Boott		A						
Carex planata Franch. et Savat.		A						
Carex planiculmis Komar.		A						
Carex poculisquama Kükenth.		A						
Carex podogyna Franch. et Savat.		A						
Carex polyschoena H. Lév. et Van.		A						
Carex pseudo-cyperus L.		A						
Carex pseudo-loliacea F. Schmidt		A						
Carex pseudocuraica F. Schmidt		A						
Carex pudica Honda		A						
Carex pumila Thunb.		A						
Carex pyrenaica Wahlenb.		A						
Carex quadriflora (Kükenth.) Ohwi		A						
Carex reinii Franch. et Savat.		A						

	CH	CM	CA	CG	DD	DA	DG	PG
<i>Carex remotiuscula</i> Wahlenb.		A						
<i>Carex rhizopoda</i> Maxim.		A						
<i>Carex rhynchophysa</i> C. A. Mey.		A						
<i>Carex rochebrunii</i> Franch. et Savat.		A						
<i>Carex rostrata</i> Stokes var. <i>borealis</i> (Hartm.) Kükenth.		A						
<i>Carex rugata</i> Ohwi		A						
<i>Carex rugulosa</i> Kükenth.		A						
<i>Carex rupestris</i> Bell. ex All.		A						
<i>Carex sabynensis</i> Less.		A						
<i>Carex sachalinensis</i> F. Schmidt		A						
<i>Carex sacrosancta</i> Honda		A						
<i>Carex sadoensis</i> Franch.		A						
<i>Carex satsumensis</i> Franch. et Savat.		A						
<i>Carex scabrifolia</i> Steud.		A						
<i>Carex schmidtii</i> Meinsh.		A						
<i>Carex scita</i> Maxim.		A						
<i>Carex scitaeformis</i> Kükenth.		A						
<i>Carex shimidzensis</i> Franch.		A						
<i>Carex siderosticta</i> Hance		A						
<i>Carex siroumensis</i> Koidz.		A						
<i>Carex sociata</i> Boott		A						
<i>Carex stenantha</i> Franch. et Savat.		A						
<i>Carex stenostachys</i> Franch. et Savat.		A						
<i>Carex stipata</i> Muhlenb.		A						
<i>Carex subcernua</i> Ohwi		A						
<i>Carex subspathacea</i> Wormskj.		A						
<i>Carex subumbellata</i> Meinsh.		A						
<i>Carex teiogyna</i> Boott		A						
<i>Carex tenuiflora</i> Wahlenb.		A						
<i>Carex tenuiformis</i> H. Lév. et Van.		A						
<i>Carex thunbergii</i> Steud.		A						
<i>Carex traiziscana</i> F. Schmidt		A						
<i>Carex transversa</i> Boott		A						
<i>Carex tristachya</i> Thunb.		A						
<i>Carex tsushimensis</i> (Ohwi) Ohwi		A						
<i>Carex tumidula</i> Ohwi		A						
<i>Carex uda</i> Maxim.		A						
<i>Carex vaginata</i> Tausch		A						

	CH	CM	CA	CG	DD	DA	DG	PG
<i>Carex vanheurckii</i> Mull. Arg.		A						
<i>Carex vesicaria</i> L.		A						
<i>Carex viridula</i> Michx.		A						
<i>Cyperus</i> 1sp.	A							
<i>Cladium chinense</i> Nees								B
<i>Cyperus</i> 28spp.	A							
<i>Eleocharis</i> 16spp.	A							
<i>Eriophorum</i> 3spp.	A							
<i>Fimbristylis</i> 19spp.	A							
<i>Fuirena</i> 1sp.	A							
<i>Kobresia</i> 1sp.		A						
<i>Lipocarpa</i> 1sp.	A							
<i>Machaerina rubigonosa</i> (Spreng.) T. Koyama								B
<i>Rhynchospora alba</i> (L.) Vahl								B
<i>Rhynchospora brownii</i> Roem. et Schult.								B
<i>Rhynchospora faberi</i> C. B. Clarke								B
<i>Rhynchospora fauriei</i> Franch.								B
<i>Rhynchospora fujiana</i> Makino								B
<i>Rhynchospora malasica</i> C. B. Clarke								B
<i>Rhynchospora rubra</i> (Lour.) Makino								B
<i>Rhynchospora rugosa</i> Gale								B
<i>Rhynchospora yasudana</i> Makino								B
<i>Schoenus apogon</i> Roem. et Schult.								B
<i>Scirpus</i> 24spp.	A							
<i>Scleria</i> 6spp.		A						
Zingiberaceae								
<i>Alpinia</i> 8spp.	A							
Orchidaceae								
<i>Acanthophippium</i> 1sp.	A							
<i>Amitostigma</i> 4spp.	A							
<i>Androcorys</i> 1sp.	A							
<i>Anoectochilus</i> 2spp.	A							
<i>Aphyllorchis</i> 1sp.	A							
<i>Apostasia</i> 1sp.	A							
<i>Arundina</i> 1sp.	A							
<i>Bletilla</i> 1sp.	A							
<i>Bulbophyllum</i> 6spp.	A							
<i>Calanthe</i> 18spp.	A							

	CH	CM	CA	CG	DD	DA	DG	PG
Calypso 1sp.	A							
Cephalanthera 3spp.	A							
Cheirostylis 2spp.	A							
Coeloglossum 1sp.	A							
Corymborkis 2spp.	A							
Cremastra 2spp.	A							
Cymbidium 8spp.	A							
Cypripedium 4spp.	A							
Dactylostalix 1sp.	A							
Dendrobium 2spp.	A							
Didymoplexis 2spp.	A							
Disperis 1sp.	A							
Eleorchis 1sp.	A							
Ephippianthus 2spp.	A							
Epipactis 2spp.	A							
Epipogium 3spp.	A							
Eria 3spp.	A							
Eulophia 3spp.	A							
Galeola 2spp.	A							
Gastrodia 4spp.	A							
Geodorum 1sp.	A							
Goodyera 13spp.	A							
Gymnadenia 4spp.	A							
Habenaria 7spp.	A							
Hancockia 1sp.	A							
Herminium 2spp.	A							
Hetaeria 4spp.	A							
Kitigorchis 1sp.	A							
Lecanorchis 9spp.	A							
Liparis 13spp.	A							
Listera 5spp.	A							
Luisia 2spp.	A							
Malaxis 6spp.	A							
Microtis 1sp.	A							
Myrmechis 2spp.	A							
Neofinetia 1sp.	A							
Neottia 2spp.	A							
Nervilia 2spp.	A							

