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Phenology of Mosses In Iowa

Henry S. Conard

Grinnell College; State University of Iowa

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PHENOLOGY OF MOSSES IN IOWA

HENRY S. CONARD

As with other groups of plants, the Atracheata observe times and seasons. A few species may be found in all stages of reproduction at almost all times of year, but most of them produce archegonia and antheridia at a certain season, and mature capsules and spores at another season. Spring fruiting mosses are subject to the vagaries of the weather much as the wild flowers and fruit trees are. And there may be straggling stages of almost any species at almost any time. A prolonged drought is likely to delay development.

The following table shows when the different stages may be expected in Iowa, based upon the collections at the State University of Iowa and Grinnell College. The date for capsules is the date on which a collection shows some opercula shed and others still in place. When the calyptra falls long before the capsule is ripe, we have tried to get a date when good calyptras may be collected. Our knowledge of the times of maturity of sperms and eggs is very incomplete; much observation is needed to fill out the dates for fertilization. Young sporophytes before the capsule swells perceptibly we have called spikes. Old spikes show nearly mature calyptras.

Grout's books name the season for spores. This is almost identical with our date for capsules. The data given for authorities outside of Iowa are mostly drawn from Grout.

PHENOLOGY OF ATRACHEATA*

Name of Plant	Perfect capsules	Calyptras	Spikes	Antheridia Archegonia	Spores, outside of Iowa
MUSCI					
Acaulon rubrum					early spring
Acaulon rufescens	April				
Acaulon Schimperianum	Nov.				
Acaulon triquetrum	Apr. 23				
Aloino rigida	Nov.				
Amblystegiella confervoides	July 23				
Amblystegium americanum	Not fruiting in Iowa				
Amblystegium compactum	Not fruiting in Iowa				
Amblystegium Juratzkanum	May 4- June 22				
Amblystegium serpens	June 28	Apr. 8, 13	Mch. 31	Aug. 21	spring spring
Amblystegium varium	May 19				autumn-
Anomodon attenuatus	Sept. 15- Oct. 14				e. winter
Anomodon minor	Oct. 3- Nov. 18				l. autumn- winter
Anomodon rostratus	Oct. 18				autumn
Aphanorhegma patens	October				Sept.-Dec.
Aphanorhegma serratum	Oct. 21- Dec. 1				Apr.-May
Astomum Muhlenbergianum	April				

*The list of species is taken from Bryologist 48:70-82.

Name of Plant	Perfect capsules	Calyptras	Spikes	Antheridia, Archegonia	Spores, outside of Iowa
MUSCI					
<i>Atrichum angustatum</i>	Oct.-May	Oct. 13			1. autumn-e. spring
<i>Atrichum crispum</i>	Not fruiting in Iowa				
<i>Atrichum Macmillani</i>	Not fruiting in Iowa				
<i>Atrichum undulatum</i>	Sep.-Oct.	Sep. 8			1. autumn-e. spring 1. autumn-e. spring e. spring e. summer 1. autumn-winter
<i>Aulacomnium heterostichum</i>	May 10		Nov. 17		
<i>Aulacomnium palustre</i>	Not fruiting in Iowa				
<i>Barbula fallax</i>	Oct.-Mch.				
<i>Barbula reflexa</i>	Not fruiting in Iowa				
<i>Barbula unguiculata</i>	Oct.-Apr.		Aug. 30		1. autumn-e. spring Apr.-May
<i>Bartramia pomiformis</i>	May		Mch. 22		
<i>Brachythecium campestre</i>	Oct.-Nov.				
<i>Brachythecium flagellare</i>	October				
<i>Brachythecium flexicaule</i>	October				autumn-e. winter autumn-e. winter
<i>Brachythecium oxycladon</i>	Oct.-Dec.				
<i>Brachythecium populeum</i>	Nov. 13				
<i>Brachythecium rivulare</i>	Oct. 25				
	Nov. 8				
<i>Brachythecium rutabulum</i>	November				e. autumn e. winter
<i>Brachythecium salebrosum</i>	Oct.-Nov.			May?	autumn-e. winter March
<i>Brachythecium velutinum</i>	Not fruiting in Iowa				
<i>Brothera Leana</i>	Not fruiting in Iowa				
<i>Brotherella recurvans</i>	June				Sep.-Nov.
<i>Bruchia Sullivanti</i>	May				
<i>Bryhnia graminicolor</i>	Not fruiting in Iowa				
<i>Bryum argenteum</i>	All year				autumn aut.-wint. e. spring May-June
<i>Bryum caespiticium</i>	May			April	
<i>Bryum capillare</i>	Not fruiting in Iowa				
<i>Bryum uliginosum</i>	May 12				August early summer spring- summer summer
	June 28				
<i>Bryum pendulum</i>	June-				
	July 19				
<i>Bryum pseudotriquetrum</i>	June				summer
<i>Bryum uliginosum</i>	July 1				June- Sept.
	Aug. 25				
<i>Calliergonella cuspidata</i>	Not fruiting in Iowa				
<i>Calliergonella Schreberi</i>	Not fruiting in Iowa				
<i>Campyllum chrysophyllum</i>	May 7	Apr. 17	Apr. 17		e. summer summer summer summer
<i>Campyllum hispidulum</i>	May 13	April	April		
<i>Campyllum polygamum</i>	Not fruiting in Iowa				
<i>Campyllum stellatum</i>	Not fruiting in Iowa				
<i>Catascopium nigratum</i>	Not fruiting in Iowa				
<i>Ceratodon purpureus</i>	May-July		Sep.-Apr.	Aug. 5	autumn
<i>Chamberlainia acuminata</i>	Oct.-Nov.				
<i>Chamberlainia cyrtophylla</i>	Oct. 29				
<i>Cirriphyllum Boscii</i>	Not fruiting in Iowa				
<i>Climacium americanum</i>	May 8				autumn autumn spring
<i>Climacium dendroides</i>	Not fruiting in Iowa				
<i>Cratoneuron filicinum</i>	Not fruiting in Iowa				
<i>Desmatodon coloradensis</i>	May				
<i>Desmatodon obtusifolius</i>	June	Apr. 13	Apr. 13		
<i>Desmatodon plinthibius</i>	June				spring
<i>Desmatodon Porteri</i>	June- July				
<i>Dicranella heteromalla</i>	Sep.-Apr.	Aug.-Apr.			Nov.-Dec.
<i>Dicranella rufescens</i>	Oct.-Nov.				
<i>Dicranella varia</i>	Oct.-Nov.				autumn- winter
<i>Dicranum Bonjeani</i>	Not fruiting in Iowa				
<i>Dicranum condensatum</i>	Not fruiting in Iowa				
<i>Dicranum flagellare</i>	July				spring summer
<i>Dicranum fulvum</i>	Not fruiting in Iowa				

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Name of Plant	Perfect capsules	Calyptras	Spikes	Antheridia Archegonia	Spores, outside of Iowa.
<i>Dicranum montanum</i>	Not fruiting in Iowa				a. autumn
<i>Dicranum rugosum</i>	Not fruiting in Iowa				summer
<i>Dicranum scoparium</i>	Aug. 10				l. summer
<i>Dicranum viride</i>	Not fruiting in Iowa				l. summer-
<i>Didymodon recurvirostris</i>	July		May 27		autumn
<i>Didymodon rigidulus</i>	Not fruiting in Iowa				summer-
<i>Didymodon tophaceus</i>	Not fruiting in Iowa				autumn
<i>Didymodon trifarius</i>	Not fruiting in Iowa				spring
<i>Distichium capillaceum</i>	June- July				winter
<i>Ditrichum lineare</i>	Sept.				winter
<i>Ditrichum pallidum</i>	May				e. summer
<i>Ditrichum pusillum</i>	Oct.-Dec.				autumn
<i>Drepanocladus aduncus</i>	Not fruiting in Iowa				June
<i>Drepanocladus intermedius</i>	Not fruiting in Iowa				autumn
<i>Drepanocladus revolvens</i>	Not fruiting in Iowa				summer
<i>Drepanocladus Sendtneri</i>	Not fruiting in Iowa				spring
<i>Drepanocladus uncinatus</i>			May 9		spring
<i>Drummondia prorepens</i>	Not fruiting in Iowa				spring
<i>Encalypta ciliata</i>	May 27	May 27			l. summer
<i>Encalypta streptocarpa</i>	Not fruiting in Iowa				l. summer
<i>Entodon cladorrhizans</i>	October				autumn
<i>Entodon compressus</i>	Oct.-Apr.				
<i>Entodon seductrix</i>	October				autumn-
<i>Ephemerum cohaerens</i>	November				e. winter
<i>Ephemerum crassinervium</i>	Oct.-Dec.				l. autumn-
<i>Ephemerum spinulosum</i>	Sept.-Nov.				e. winter
<i>Eurhynchium hians</i>	Oct. 18- Nov. 3	Oct.-Nov.			l. autumn-
<i>Eurhynchium serrulatum</i>	Oct. 12- 20	Oct. 12			e. winter
<i>Eurhynchium strigosum</i>	Not fruiting in Iowa				l. autumn-
<i>Fabronia ciliaris</i>	Not fruiting in Iowa				e. spring
<i>Fissidens cristatus</i>	Dec. 9	Dec. 9			l. autumn-
<i>Fissidens exiguus</i>	Sept. 27				winter
<i>Fissidens Julianus</i>	Not fruiting in Iowa				summer
<i>Fissidens minutulus</i>	Sept.				summer
<i>Fissidens obtusifolius</i>	June-Oct.				l. autumn
<i>Fissidens subbasilaris</i>					autumn
<i>Fissidens taxifolius</i>	March				January
<i>Fontinalis Duriaei</i>	Not fruiting in Iowa				Nov.-Mch.
<i>Funaria calvescens</i>	Nov. 16				summer
<i>Funaria flavicans</i>	May				May-July
<i>Funaria hygrometrica</i>	October		Mch.-May		e. June
<i>Grimmia alpicola</i>					winter-
<i>Grimmia apocarpa</i>	April	Apr. 13			e. spring
<i>Grimmia laevigata</i>	April		October		e. spring
<i>Grimmia pillifera</i>					spring
<i>Grimmia plagiopodia</i>	Apr. 13	Apr. 13			April
<i>Grimmia pulvinata</i>	Apr. 13	Apr. 13			spring
<i>Grimmia Raui</i>					winter-
<i>Gymnostomum aeruginosum</i>					spring
<i>Gymnostomum calcareum</i>	July- Sept.				winter-
<i>Gymnostomum recurvirostrum</i>	Sept.- Oct.				spring
<i>Gyroweisia tenuis</i>	July 3				winter-

Name of Plant MUSCI	Perfect capsules	Calyptras	Spikes	Antheridia Archegonia	Spores, outside of Iowa
Haplohymenium triste	Not fruiting in Iowa				Unknown
Hedwigia ciliata	May 26		Sept. 14		spring
Helodium Blandowii	Not fruiting in Iowa				July
Helodium paludosum	Not fruiting in Iowa				winter
Heterophyllum Haldanianum	Oct. 13				1. fall
	Nov. 13				winter
Homomallium adnatum	July	June	May		summer
Hygroamblystegium irriguum	May	Mch.-Apr.	November		summer
Hygroamblystegium noterophilum	Not fruiting in Iowa				
Hygroamblystegium orthocladon	May 12	March			
	June 24				
Hygorhynchium ochraceum	Not fruiting in Iowa				spring- e. summer
Hylocomium splendens					e. spring
Hyophila Tortula	Not fruiting in Iowa				
Hypnum crista-castrensis	May 9				1. summer- autumn
Hypnum cupressiforme	Not fruiting in Iowa				1. autumn e. winter
Hypnum curvifolium	May 12				spring
Hypnum imponens	Not fruiting in Iowa				autumn- e. winter
Hypnum Patientiae	June 12				spring
Hypnum reptile	Aug. 15	Aug. 15			mid- summer
Leptobryum pyriforme	June-July		November		June-July
Leptodictyum brevipes	Not fruiting in Iowa				
Leptodictyum riparium	May-June		Mch. 31		spring summer
Leptodictyum trichopodium	May 31	Apr. 22			e. summer summer
Leskea gracilescens	Sept.-Oct.				e. summer
Leskea nervosa	Not fruiting in Iowa				summer
Leskea obscura	Sept.-Oct.				e. summer
Leskea polycarpa					e. summer
Leucobryum glaucum	Oct.-Nov.				Sept.- June
Leucodon julaceus	Not fruiting in Iowa				1. fall- e. winter
Leucodon sciuroides	Not fruiting in Iowa				
Lindbergia brachyptera var. Austinii	Sept. 15				
	Nov. 13				
Mnium affine	May-June		January	June	May
Mnium cuspidatum	Apr.-June		Sept.-Apr.	October?	May
Mnium longirostrum	Not fruiting in Iowa				e. spring
Mnium medium	June		October	June	May
Mnium orthorhynchum	August			August	July-Aug.
Mnium punctatum	Not fruiting in Iowa				
Mnium serratum			June 22		June May
Mnium stellare	Not fruiting in Iowa				
Myurella Careyana	August				
Nanomitrium synoicum	November				
Neckera pennata	Not fruiting in Iowa				summer
Oncophorus Wahlenbergii	May 9				
Orthotrichum anomalum	June				July-Sept. spring
Orthotrichum Lescurii					
Orthotrichum obtusifolium	Not fruiting in Iowa				
Orthotrichum pumilum	Apr.-June	June	November		spring
Orthotrichum stellatum	June		October		May
Orthotrichum strangulatum	May-June		May 5		
Phascum cuspidatum var. americanum	March				e. spring May-June
	June				
Philonotis fontana	Not fruiting in Iowa				
Philonotis longiseta	May				
Philonotis marchica	Not fruiting in Iowa				
Physcomitrium Hookeri	May				
Physcomitrium immersum	Oct.-Nov.				fall
Physcomitrium Kellermani	June				
Physcomitrium turbinatum	Apr.-June	April	March		spring May summer
Plagiopus Oederi	May				
Plagiothecium denticulatum					

Name of Plant	Perfect capsules	Calyptras	Spikes	Antheridia Archegonia	Spores, outside of Iowa
MUSCI					
Plagiothecium deplanatum	autumn				
Plagiothecium geophilum	Not fruiting in Iowa				spring-summer
Plagiothecium Roeseanum	Aug. 14-October				
Plagiothecium sylvaticum	Not fruiting in Iowa				
Platygyrium repens	October				e. autumn
Pleuridium subulatum	May 12-June 9	April 7			Apr.-June
Pogonatum pensilvanicum	Oct.-Nov.				l. autumn
Pohlia annotina var. decipiens	Not fruiting in Iowa				summer
Pohlia atropurpurea	November				
Pohlia cruda	July				summer
Pohlia delicatula	May				May
Pohlia elongata	July				August
Pohlia nutans	May-June	April	October		spring-summer
Pohlia pulchella	May				May
Pohlia Wahlenbergii	Not fruiting in Iowa			June	spring-summer
Polytrichum commune	June			July	June
Polytrichum juniperinum	June		Oct.-Apr.		
Polytrichum ohioense	June		May		
Polytrichum piliferum	Not fruiting in Iowa				
Pottia Randii	July				
Ptychomitrium incurvum	May	April 13	April 13		l. winter
Pylaisia Jamesii	August				e. spring
Pylaisia Selwynii	August				autumn
Pylaisia subdenticulata					
Pyramidula tetragona	March				
Rhodobryum roseum	Sep.-Nov.			Aug.-Sep.	autumn
Rhytidadelphus triquetrus	June				winter-e. spring
Rhytidium rugosum	Not fruiting in Iowa				
Saelania glaucescens	Not fruiting in Iowa				
Seligeria calcarea	June				
Seligeria campylopoda	May				
Seligeria pusilla	June				
Sematophyllum adnatum	Not fruiting in Iowa				summer-autumn
Sematophyllum carolinianum	all year	June			summer
Sphagnum capillaceum	Not fruiting in Iowa				
Sphagnum magellanicum	Not fruiting in Iowa				
Sphagnum palustre	July 5	August			
Sphagnum subsecundum	Not fruiting in Iowa				
Sphagnum tenerum	Not fruiting in Iowa				
Tetraphis pellucida	August	August	August		l. autumn
Thelia asprella	October	Sept.			e. autumn
Thelia hirtella	Not fruiting in Iowa				autumn
Thuidium abietinum	Not fruiting in Iowa				
Thuidium delicatulum	October	Sept.			winter
Thuidium microphyllum	Not fruiting in Iowa				summer
Thuidium minutulum	November				autumn
Thuidium Philiberti	Not fruiting in Iowa				October
Thuidium pygmaeum					autumn
Thuidium recognitum	October	July 12			July
Thuidium virginianum	August	Apr. 13	April 13		spring
Timmia megapolitana	Apr.-June		Aug.-May		May
Tortella fragilis	Not fruiting in Iowa				summer
Tortella tortuosa*	Not fruiting in Iowa				spring
Tortella humilis	October				summer
Tortula mucronifolia	May-June				
Tortula muralis				spring	
Tortula pagorum	Not fruiting in Iowa				
Tortula ruralis	Not fruiting in Iowa			spring	
Trichostomum cylindricum	Not fruiting in Iowa				
Weisia viridula	Apr.-Nov.			spring	

*Detected in Jackson County, Oct. 13, 1945.

HEPATICAЕ	Perianths	Sporo-phytes	Arche-gonia Anthe-ridia
Bazzania trilobata	Not fruiting in Iowa		
Blasia pusilla	April		
Blepharostoma trichophyllum	Not fruiting in Iowa		
Calyptogeia fissa	Not fruiting in Iowa		
Calyptogeia Trichomanis	Not fruiting in Iowa		
Cephalozia bicuspidata	Sept.	April	
Cephalozia connivens	Sept.		
Cephalozia media	Not fruiting in Iowa		
Cephaloziella byssacea	October		
Cephaloziella Hampeana	October		
Cephaloziella pulchella	November		
Chiloscyphus fragilis	Oct. 12	May 2	
Chiloscyphus pallescens			
Chiloscyphus polyanthus	May	Aug. 4	
Cololejeunea Biddlecomiae	November		
Conocephalum conicum		April	
Frullania Bolanderi	Not fruiting in Iowa		June
Frullania eboracensis	Aug.-May	May	October
Frullania inflata	Jan.-July	Apr.-May	
Frullania riparia	Not fruiting in Iowa		
Frullania squarrosa	November		
Harpanthus scutatus	Not fruiting in Iowa		
Jamesoniella autumnalis	August	Aug.-Oct.	
Jungermannia lanceolata	Sept. 7		
Jungermannia pumila	November		
Leiocolea badensis	May		
Lepidozia reptans	June	June 27	
Lophocolea heterophylla	December	Apr.-June	
Lophocolea minor	Not fruiting in Iowa		
Lophozia Mildeana	Not fruiting in Iowa		
Lunularia cruciata	Not fruiting in Iowa		
Mannia fragrans	May-June	May 8	
		June 29	
Mannia pilosa	June	June	
Mannia rupestris	June	June	
Marchantia polymorpha		July	
Nowellia curvifolia	Not fruiting in Iowa		
Odontoschisma prostratum	Not fruiting in Iowa		
Plagiochila aspinioides	March 24		
Plectocolea hyalina	June	Apr. 20	
Porella pinnata	Not fruiting in Iowa		
Porella platyphylla	Not fruiting in Iowa		
Porella platyphylloidea	May		
Preissia quadrata		May 13- June 22	
		May	
Ptilidium pulcherrimum		May	
Radula complanata	May	May	
Reboulia hemisphaerica		May-June	
Riccardia pinguis	October		
Riccia Beyerichiana		October	
Riccia fluitans	Not fruiting in Iowa		
Riccia Frostii		Oct.-Nov.	Sept.-Oct.
Riccia Sullivantii		Sept.-Nov.	
Ricciocarpus natans		April	
Scapania nemorosa	Not fruiting in Iowa		
Tricholea tomentella*	Not fruiting in Iowa		
Tritomaria execta	Not fruiting in Iowa		
Tritomaria exesectiformis	Not fruiting in Iowa		
ANTHOCEROTAE			
Anthoceros laevis	June-Nov.	June-Nov.	
Anthoceros punctatus	October	October	
Anthoceros crispulus	October	October	
Notothylas orbicularis	Sept.-Oct.	Sept.-Oct.	

*Detected in Iowa County, Aug. 10, 1945.

GRINNELL COLLEGE AND
STATE UNIVERSITY OF IOWA