



Flora of North America

Rhinanthus (Orobanchaceae)

Gordon C. Tucker and Bradley M. Daugherty

23 April 2012

Notice About Flora of North America Provisional Publications

Preparation of each volume of the Flora of North America is a multi-year process involving dozens of authors and editors. To facilitate access to taxonomic treatments that meet specific editorial criteria but that otherwise might not appear in printed volumes for months or possibly years, the Flora of North America Association (FNAA) electronically publishes treatments. These “Provisional Publications” have been peer-reviewed and are formatted for eventual publication in print copy by Oxford University Press. Provisional Publications are versions of treatments that minimally meet the following editorial standards:

Any 03 level manuscript that has been

- 1) accepted and approved by the taxon editor as an official FNA submission;
- 2) initially tech-edited (i.e., has been formatted and edited by the volume technical editor);
- 3) through regional review, with regional review comments and any additional tech-editing comments addressed by the author and corrections made to the manuscript; and
- 4) reviewed once by the bibliographic editor;
- 5) approved by the author(s) and taxon editor for posting as a Provisional Publication.

Major corrections, additions, and other modifications are allowed to 03 version manuscripts, and significant changes are published as new versions become available. Provisional Publications at the 04 level (second bibliographic pass completed, reviews by nomenclature and reviewing editors completed, genus description checked for parallelism against other genera in the family) and 05 level (all major checks completed, treatment ready for indexing and application of styles) are closer to publication form.

Readers are encouraged to submit comments and corrections for Provisional Publications to the author(s) and taxon editor, especially comments concerning the geographic distributions of taxa. Contact information can be found at <http://floranorthamerica.org/review> under the appropriate volume. The header portion of each Provisional Publication contains the taxon name and manuscript version, book volume number, taxon editor surname, manuscript page number, and date when then the posted version was published provisionally.

All provisional publications are copyrighted by the Flora North America Association and are to be cited as follows:

Author, Date, Title (e.g. Genus name, Flora of North America, Provisional Publication), Publishing institution, Date of publication, URL, Date actually viewed.

Example: Whittemore, A. T. and E. McClintock. 2008. Pittosporaceae. Flora of North America, Provisional Publication. Flora of North America Association. September 14, 2007. fna.huh.harvard.edu/files/Pittosporaceae.pdf. Accessed [date actually viewed].

Questions about FNA Provisional Publications may be directed to Ms. Heidi Schmidt, Managing Editor, Flora of North America Association, at heidi.schmidt@mobot.org.

X. RHINANTHUS Linnaeus, Sp. Pl. 2: 603. 1753; Gen. Pl. ed. 5, 263. 1754 *

Yellow rattle [Greek *rhis*, nose or snout, and *anthos*, flower, alluding to protruding adaxial lip of corolla]

Gordon C. Tucker

Bradley M. Daugherty

Herbs, annual; hemiparasitic, rhizomes and stolons absent. **Stems** erect, (4-angled), not succulent, glabrous, hairy on 2 opposite sides. **Leaves** cauline, opposite, not fleshy to +/- fleshy; petiole present or absent; blade margins coarsely toothed distally, (surface with short stiff hairs). **Inflorescences** terminal, racemes, (+/- secund); bracts present (gradually reduced upward). **Pedicels** present; bracteoles absent. **Flowers**: sepals 4, calyx bilaterally symmetric, laterally flattened, ovate to suborbiculate, lobes deltate, (becoming accrescent in fruit); petals 5, corolla yellow, yellowish, [bronze to bluish], laterally compressed, narrowly campanulate, abaxial lobes 3, adaxial lobes 2, adaxial lip arched, ovate, obtuse, entire but with tooth (nipple or galea) on each side proximal to apex; stamens 4, adnate to corolla, didynamous, (lobes hairy), filaments lanate, (anthers transverse), staminode 0; ovary 2-locular, placentation axile; stigma capitate. **Capsules** bilaterally symmetric, longitudinally dehiscent, loculicidal. **Seeds** 2--10[+], brown, kidney-shaped, flattened, winged (not winged in some *R. major*; wing extending about 3/4 of margin of seed). $x = 11$.

Species ca. 50 (2 in the flora): North America, Europe, n Asia.

While the taxonomy of *Rhinanthus* is complex, taxa occurring in North America are reasonably distinct. The subapical teeth on the adaxial corolla lip have been described as galea or nipples; the term teeth is used in this account. Leaf measurements are for mid stem leaves; calyx features are for calyces enclosing more or less mature capsules.

The European species *Rhinanthus serotinus* (Schönheit ex Halácsy & H. Braun) Oborný has been reported from Maine (E. Hultén and M. Fries 1986); we have found no specimens to substantiate this record. The species might, however, yet be found in North America; it would key to *R. major*, from which it can be distinguished by having narrowly triangular bracts and glabrous calyces as in *R. minor*.

1. Corollas 15--20 mm; teeth of adaxial lip of corolla 1.5--2.5 mm; calyces villous1. *Rhinanthus major*
1. Corollas 13--15 mm; teeth of adaxial lip of corolla 0.6--1 mm; calyces glabrous, scabrid or puberulent 2. *Rhinanthus minor*

1. *Rhinanthus major* Linnaeus, *Amoen. Acad.* 3: 53. 1756 * European yellow rattle I

Rhinanthus alectorolophus (Scopoli) Pollich

Stems without black streaks, simple or branched, 15--40(--80) cm. **Leaves** (3.5--5--10 mm wide, lanceolate to ovate, margins crenate-serrate. **Bracts** rhombic-triangular, puberulent, teeth not bristle-tipped, basal teeth scarcely longer than others. **Calyces** 15--20 mm, villous with long white hairs, partly glabrescent in fruit (round-ovate in fruit). **Corollas** 15--20 mm; tube slightly curved; teeth of adaxial lip 1.5--2.5 mm; throat closed. **Capsules** 8--12 mm. **Seeds** 2--6, 4--5 mm.

Flowering summer. Grassland and clearings; 0--100 m; introduced; Mass., N.Y.; Europe; Asia.

The name *Rhinanthus alectorolophus* has been applied to this species, on the grounds that *R. major* is an ambiguous name (R. Soó and D. A. Webb 1972); however, such status has never been formally supported by a vote taken at an International Botanical Congress. Variants with wingless seeds are found throughout the range of the species.

2. *Rhinanthus minor* Linnaeus, *Amoen. Acad.* 3: 54. 1756 * Little yellow rattle F W

Alectorolophus minor (Linnaeus) Dumortier

Stems sometimes with black streaks, simple or slightly branched, 5--20(--55) cm. **Leaves** (2--5--15 mm wide, ovate-oblong to linear-lanceolate or +/- oblong, margins crenate-serrate or coarsely dentate. **Bracts** triangular, glabrous or puberulent, sometimes somewhat scabrid, teeth bristle-tipped or not, basal teeth slightly longer than others. **Calyces** 13--16 mm, glabrous, scabrid or puberulent. **Corollas** 13--15 mm; tube straight; teeth of adaxial lip (0.4--0.6--1 mm; throat +/- open. **Capsules** 10--12 mm. **Seeds** 8--10, 4 mm.

Subspecies 4 (2 in the flora): North America, Europe.

1. Leaves ovate-oblong to linear-lanceolate, margins crenate-serrate (distal leaves sometimes dentate); teeth of adaxial lip of corolla bluish or bluish gray; stems glabrous

..... 2a. *Rhinanthus minor* subsp. *minor*

1. Leaves +/- oblong, margins coarsely dentate; teeth of adaxial lip of corolla whitish; stems hairy on 2 opposite sides

..... 2b. *Rhinanthus minor* subsp. *groenlandicus*

2a. *Rhinanthus minor* Linnaeus subsp. *minor* * Little yellow rattle, petit rhinanthe F

Rhinanthus borealis (Sterneck) Chabert subsp. *kyrollae* (Chabert) Pennell; *R. crista-galli* Linnaeus var. *fallax* W. D. J. Koch ex E. F. Linton; *R. stenophyllus* (Schur) Schinz & Thellung

Stems sometimes with black streaks, 5--20(--55) cm, glabrous. **Leaves** dark green, ovate-oblong to linear-lanceolate, margins crenate-serrate (distal leaves sometimes dentate). **Bracts** longer than to slightly shorter than calyx, glabrous, sometimes somewhat scabrid, teeth bristle-tipped. **Corollas** 13--15 mm; teeth of adaxial lip bluish or bluish gray, apex rounded, acute, or truncate-acute; throat +/- open. **2n** = 22.

Flowering summer. Clearings, meadows, rocky slopes, open, grassy slopes at edges of mixed woods, roadsides, often on calcareous soils or rocks; 0--600(--2700) m; Greenland; St. Pierre and Miquelon; Alta., B.C., Man., N.B., Nfld. and Labr., N.W.T., N.S., Ont., P.E.I., Que., Sask.; Alaska, Ariz., Colo., Idaho, Maine, Mass., Mich., Mont., N.Mex., N.Y., Oreg., Wash., Wis.; Europe.

The name *Rhinanthus crista-galli* has been misapplied to *R. minor* by numerous European and American authors. All reports of *R. crista-galli* from eastern North America appear to be based on subsp. *minor*. Reports of subsp. *minor* from Connecticut, North Dakota, and Rhode Island are probably erroneous; confirming specimens could not be found. Populations of subsp. *minor* usually are associated with some type of anthropogenic disturbance.

2b. *Rhinanthus minor* Linnaeus subsp. *groenlandicus* (Chabert) Neuman, *Bot. Not.* 1905: 257. 1905 * Arctic yellow rattle, rhinanthe du Groenland

Rhinanthus groenlandicus Chabert, Bull. Herb. Boissier 7: 515. 1899; *Alectorolophus groenlandicus* (Chabert) Ostenfeld; *R. arcticus* (Sterneck) Pennell; *R. borealis* (Sterneck) Chabert; *R. minor* Linnaeus subsp. *borealis* (Sterneck) Á. Löve

Stems with or without black streaks, 13--30 cm, hairy on 2 opposite sides. **Leaves** bright yellowish green, +/- oblong, margins coarsely dentate. **Bracts** longer than calyx, glabrous or puberulent, teeth not bristle-tipped. **Corollas** 15 mm; teeth of adaxial lip whitish, apex rounded to blunt; throat open. **2n** = 22.

Flowering summer. Meadows, clearings in forests, shores, slopes, on sandy or rocky soils, alpine and subalpine habitats, dry hillsides, wet banks, clearings in floodplain woods, swamps, edges of lakes, damp roadsides, riverbanks, margins of muskeg, sometimes on calcareous substrates; 0--2100 m; Greenland; Alta., B.C., Man., N.B., Nfld. and Labr., N.W.T., N.S., Nunavut, Ont., Que., Yukon; Alaska, N.H., N.Y., Oreg., Wash.; n Europe.

Reports of subsp. *groenlandicus* from Nunavut, Maine, Montana, and Vermont appear to be erroneous; reports from Manitoba and from Northwest Territory are questionable.