

KEY TO THE SPECIES OF *EUTHAMIA* (ASTERACEAE: ASTEREAE)

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ABSTRACT

A key for identification of *Euthamia* species is provided. Morphological differences among the species often are subtle, and the key's usefulness may be minimal without reference to distribution maps and comments on variation and sympatry with other species. With this information on hand, however, most identifications are judged (on average) to be "easy."

In response to perceived disappointment among taxonomic traditionalists regarding the lack of a key to *Euthamia* species in the recently published revision (Nesom 2021), one is provided here. A key might be valued for providing a synoptic outline of relationships (or similarities), an artificial means of identification, or simply an overview of the main groupings and patterns of variation among the species.

This is not a synoptic key and it probably will be of little help in identification beyond what is already provided in the revision by maps and comments on comparative morphology and biology, which I reckoned would be the most critical points of information in identifying a plant of *Euthamia*. Thus the key here is offered mainly in the spirit of the third sort of usefulness.

KEY TO *EUTHAMIA* SPECIES

1. Inflorescence characteristically interrupted-elongate or rounded; inner phyllaries apically acute; western USA (mostly Rocky Mountain region westward) **E. occidentalis**
1. Inflorescence usually corymboid; inner phyllaries apically mostly obtuse; eastern USA and Great Plains.
 2. Leaf surfaces pustulate (pustules are slightly raised, blister-like, translucent) **E. leptcephala**
 2. Leaf surfaces glandular-punctate.
 3. Abaxial leaf veins raised, whitish; ray florets (9–)13–27(–35).
 4. Stems and leaves glabrous; involucre 4–5 mm high **E. graminifolia**
 4. Stems and leaf surfaces hirtellous to hirsutulous, especially along the veins; involucre 3.6–4.2 mm high **E. lanceolata**
 3. Abaxial leaf veins not raised and whitish; ray florets 5–16(–19).
 5. Leaf surfaces hairy.
 6. Axillary shoots present; leaves 1–4 mm wide, 1(–3)-veined; Atlantic Coast from New Jersey to North Carolina **E. floribunda**
 6. Axillary shoots absent; leaves 3–7 mm wide, (1–)3(–5)-veined; southeastern Oklahoma and Gulf Coast.
 7. Southeastern Oklahoma **E. oklahomensis**
 7. Southeastern Louisiana and along the Gulf Coast to Wakulla Co., Florida **E. scabra**

5. Leaf surfaces glabrous.
8. Axillary shoots absent.
9. Leaves not resinous; Atlantic seaboard and Gulf Coast into Alabama and through the Florida Panhandle **E. weakleyi**
9. Leaves often resinous; mostly west of the Mississippi River and north of the Ohio River.
10. Leaves (1.5–)2–5(–7) mm wide; mostly Great Plains south to west and north Texas, and east to Indiana, Ohio, and Michigan **E. gymnospermoides**
10. Leaves 0.5–2(–5) mm wide; east Texas and Louisiana **E. pulverulenta**
8. Axillary shoots usually present (sometime absent in *E. galetorum*).
11. Stems often unbranched until the inflorescence; heads few; ray florets (7–)10–16(–19); disc florets (7–)10–19; Nova Scotia and New England **E. galetorum**
11. Stems highly branched or few-branched; heads few or many; ray florets 5–12(–16); disc florets (2–)3–9(–10); Lake Michigan and eastern USA.
12. Stems usually few-branched and only distally so; leaves 2–4 mm wide; involucre campanulate, 4–5 mm high; disc florets (4–)5–9; borders of Lake Michigan **E. remota**
12. Stems usually many-branched; leaves 1–2.5 mm wide; involucre turbinate, 3–4.5 mm high; disc florets (2–)3–6(–10); Atlantic seaboard and Gulf Coast and Coastal Plain to Louisiana **E. caroliniana**

Degree of difficulty in identification (with a specimen at hand and a dissecting scope) when using distribution maps to be aware of sympatric species.

- * **E. occidentalis** — easy.
- * **E. leptcephala** — easy.
- * **E. graminifolia** — easy, except where it is sympatric with *E. lanceolata* and perhaps hybridizing with it.
- * **E. lanceolata** — easy, except where it is sympatric with *E. graminifolia* and perhaps hybridizing with it.
- * **E. scabra** — easy, emphasizing geography, but plants vary in degree of hairiness and the morphological distinction from glabrous *E. weakleyi* can be subtle. The geography of *E. scabra* and *E. weakleyi* and their biological interaction need to be clarified.
- * **E. oklahomensis** — easy, emphasizing geography and ecology, but putative differences in morphology from *E. scabra* are subtle and nearly subjective.
- * **E. weakleyi** — easy, except (1) perhaps in New England, where plants I have identified as *E. weakleyi* may prove to be a different species (this requires additional study) and (2) along the Gulf Coast where apparently sympatric with *E. scabra* and perhaps hybridizing with it. In most of its range, *E. weakleyi* is unambiguously distinct in morphology and chromosome number and molecular underpinning also set it apart.
- * **E. gymnospermoides** and **E. pulverulenta** — problematic, as the distinction in the revision (as noted there) relies on geography more than anything else. Also, I'm unable to point to a consistent diagnostic morphological difference between *E. gymnospermoides* and the other known *Euthamia* polyploid, *E. weakleyi*.
- * **E. floribunda** — easy in typical (hairy) form but some plants are much less pubescent than others and are similar to *E. caroliniana*. Geographically distinct.

- * ***E. caroliniana*** — easy, but plants in New England may be different from those southward (this requires additional study).
- * ***E. remota*** — a challenge to differentiate from sympatric *E. gymnospermoides*, but evidence indicates that the two are evolutionarily distinct. The question of whether *E. remota* is conspecific with a long-disjunct species in the eastern USA probably will require molecular study for an answer.
- * ***E. galetorum*** — easy in Nova Scotia, Maine, and New Hampshire. Its distinction elsewhere in New England (as in the concept of the revision) has been questioned.

LITERATURE CITED

Nesom, G.L. 2021. Taxonomic revision of *Euthamia* (Asteraceae). *Phytoneuron* 2021-34: 1–182.