

A NEW SPECIES OF *POLYMNIA* (COMPOSITAE: HELIANTHEAE) FROM THE OUACHITA MOUNTAIN REGION OF ARKANSAS

ALBERT B. PITTMAN and VERNON BATES

Arkansas Natural Heritage Commission
225 E. Markham, Suite 200
Little Rock, AR 72201, U.S.A.

and

ROBERT KRAL

Department of Biological Sciences
Vanderbilt University
Nashville, TN 37235, U.S.A.

ABSTRACT

A new species, *Polymnia cossatotensis*, is described from the Cossatot Mountains, a range of mountains in the Ouachita Division of the Interior Highlands. It was found growing abundantly on and among cherty novaculite talus. *Polymnia cossatotensis* is most closely related to *P. laevigata* and *P. canadensis* but is easily distinguished by its annual habit, cordate cauline leaves, fewer rays, and larger achenes.

In early October of 1988, during fieldwork along the Little Missouri River in west-central Arkansas, an unusual composite was noticed growing abundantly in an open area of cherty novaculite talus. The plants, approaching two meters in height and exuding a pungent odor, were often directly attached to bare rock surfaces by both adventitious and thickened secondary roots. Also present in the talus were *Ambrosia trifida*, *Hybanthus concolor*, *Phytolacca americana*, *Rhamnus carolinianus*, *Bumelia lanuginosa*, *Asimina triloba*, and several common woody vines, *Toxicodendron radicans*, *Vitis rotundifolia*, *Campsis radicans*, and *Parthenocissus quinquefolia*. The overstory on the terrace below the talus slope consisted primarily of *Fagus grandifolia*, *Carpinus caroliniana*, *Magnolia tripetala*, and *Ilex opaca* while *Quercus muhlenbergii*, *Liquidambar styraciflua*, *Ostrya virginiana*, and *Celtis laevigata* occurred on the adjacent drier slopes. The new *Polymnia* is named after the Cossatot Mountains, a range of mountains in the south-central section of the Ouachita Division of the Interior Highlands.

POLYMNIA cossatotensis A. B. Pittman & V. Bates, sp. nov. Figures 1, 2.

Herba annua, aromatica, erecta, caulescens, robusta, usque ad 15 dm alta, radice palari, foliis solum caulinis. Caules juniores simplices, graciles, humiles, atropurpureis, foliis

vulgo longipetiolatis, oblongis vel ovatis, cordiformibus, acutis, dentatis vel pinnatilobis; caules maturi fistulosi, ramosissimi, teretes, leviter multicostati, basin versus glabris, brunneolis, usque ad 12 mm crassis, sursum parce vel dense glanduloso-puberuli, ramis principalibus elongatis. Folia (praeter inflorescentiam) opposita, decussata, inferiora ante anthesin marcentes; folia principalia grandiora ad medium caulis aut ad basin inflorescentiae, sursum gradatim redacta, petiolis 2–10 cm longis, *laminis membranaceis, rufo-glandulosis, cordiformis* (ovatis vel suborbiculatis), 10–18 cm longis, reticulato-pinnatis (venae simplices in apicem dentatum foliis excurrentes), apicibus rotundatis vel late acutis, marginibus manifeste sinuatis vel crenato-dentatis aut ad apicem caulis integris. Inflorescentia expansa, leviter convexa, diffusa, 5–10 dm lata, ramis arcuato-ascendentibus, elongatis, ramulis gracilibus, purpureis, varie elongatis, varie puberulis. Capitula solitaria aut in parvis cymis ad apicem ramulorum; involucrum campanulatum, 4–6 mm altum 5–7 latum, apparentur biseriatum, bracteis laxo ascendentibus vel erectis, imbricatis, bracteis externis (2-) 3, late vel anguste oblongis, 1.5–3 mm longis, ad apicem viridibus, ciliatis, bracteis interioribus 3, late oblongo-obovatis, 5–6 mm longis, scariosis, luteolis viridibus, late rotundatis vel subtruncatis, ad apicem squarrulosis, ciliolatis, convexis, ad basin subcucullatis, dorsaliter striatulis, multinervis, glabris. Receptaculum leviter convexum, paleaceum, paleis oblongo vel anguste spathulatis aut anguste obovatis, 5–6 mm longis, ad apicem rotundatis vel late acutis, luteolis, ciliolatis. *Flosculi radii epapposi*, (2-) 3, pistillati, bracteis interioribus oppositi, tubo corollae gracili, ca. 1 mm longo, pilulosus, ligula oblongo-obovata, 4–5 mm longa, tridentata, alba, ramis styli divaricati, linearibus, ca. 1 mm longis, leviter compressis. Flosculi disci 12–15, epapposi, fungente masculi, tubo corollae ca. 1.5–2 mm longo, limbo luteolo, campanulato-infundibulari, 1.5–2 mm longo, glabri, lobis 5, erectis vel leviter expansis, *pilis multicellulosis sparsis*, triangulatis, ca. 0.5 mm longis; antherae 5, 1.1–1.3 mm longae, basibus tecarum rotundatis, ramis stylorum erectis. *Fructus obovoideus*, 4.5–6 mm longus, olivaceus vel atrobrunneolus, leviter dorsiventraliter compressus sed biconvexus, subtiliter reticulatus, *valde longitudine 5-costatus*, 2 costae margines facientes, ad apicem cum incrassato-annulato tuberculo 0.8 mm lato, 0.5 mm alto.

Annual, aromatic, erect, caulescent, robust herb to 15 dm tall from a taproot, the leaves strictly cauline. Young stems simple, slender, low deep purple, the leaves commonly long-petioled, oblong to ovate, cordiform, acute, dentate or pinnatilobed; mature stems fistulose, much-branched, terete, with many low ribs, brownish and smooth toward base, to 12 mm thick, upstem slightly to densely glandular-puberulent, the principal branches elongate. Leaves (except those of the inflorescence) opposite and decussate, the lower ones withering prior to anthesis; main foliage leaves largest at midstem or at inflorescence base, upstem gradually reduced, the petioles 2–10 cm long, *the blades membranaceous, reddish-glandular, cordiform* (ovate to suborbicular), 10–18 cm long, pinnate-reticulate (with veinlets short-excurrent from tips of leaf teeth), the tips rounded or broadly acute, the margin manifestly sinuate to crenate-dentate or entire at or toward stem tips. Inflorescence broad, somewhat convex, diffuse, 5–10 dm wide, the branches arched-ascending, elongate, the branchlets slender, purplish, variously elongate, variously puberulent. Heads solitary or in

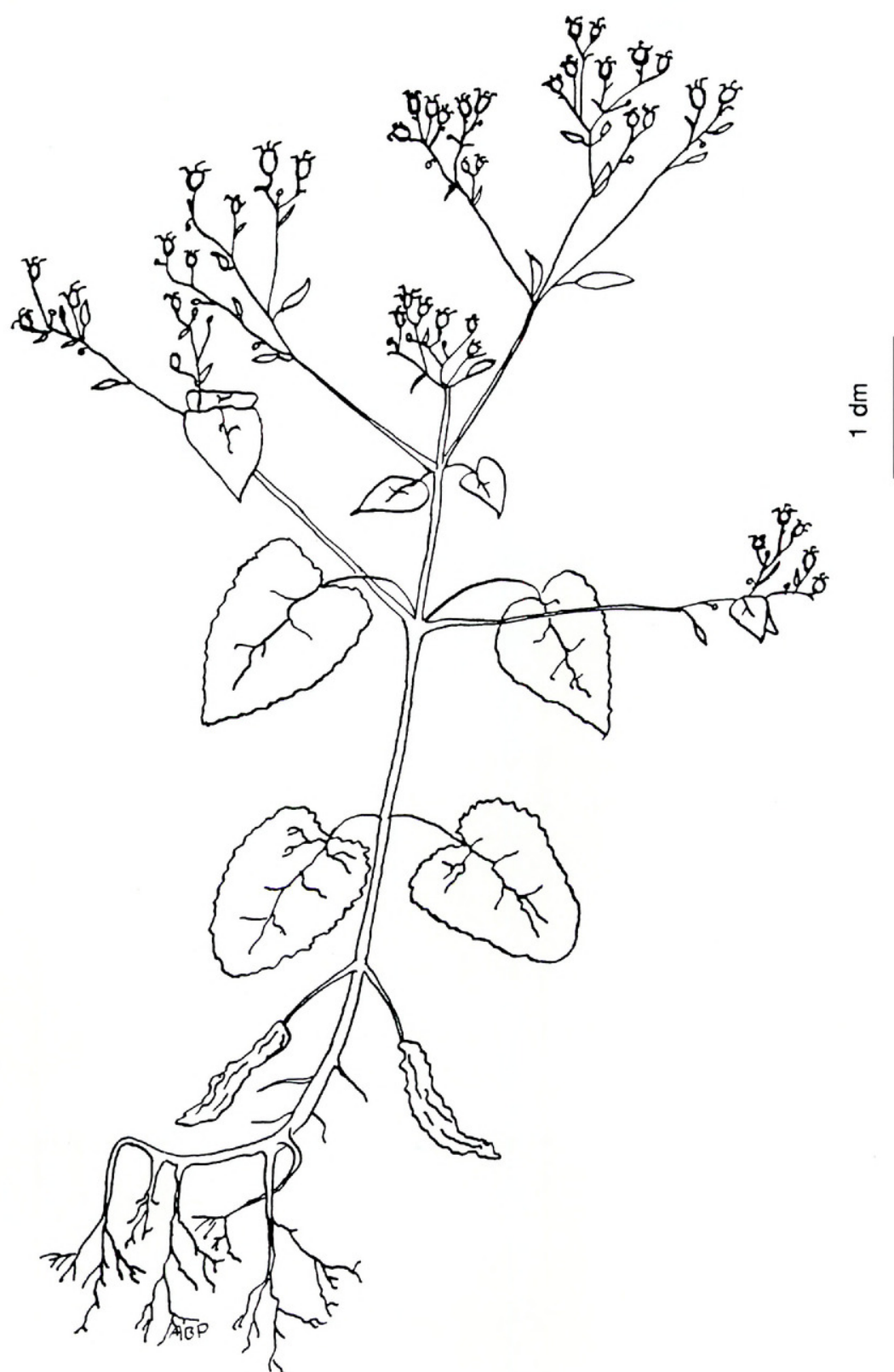


FIG. 1. Habit of *Polymnia cossatotensis*.

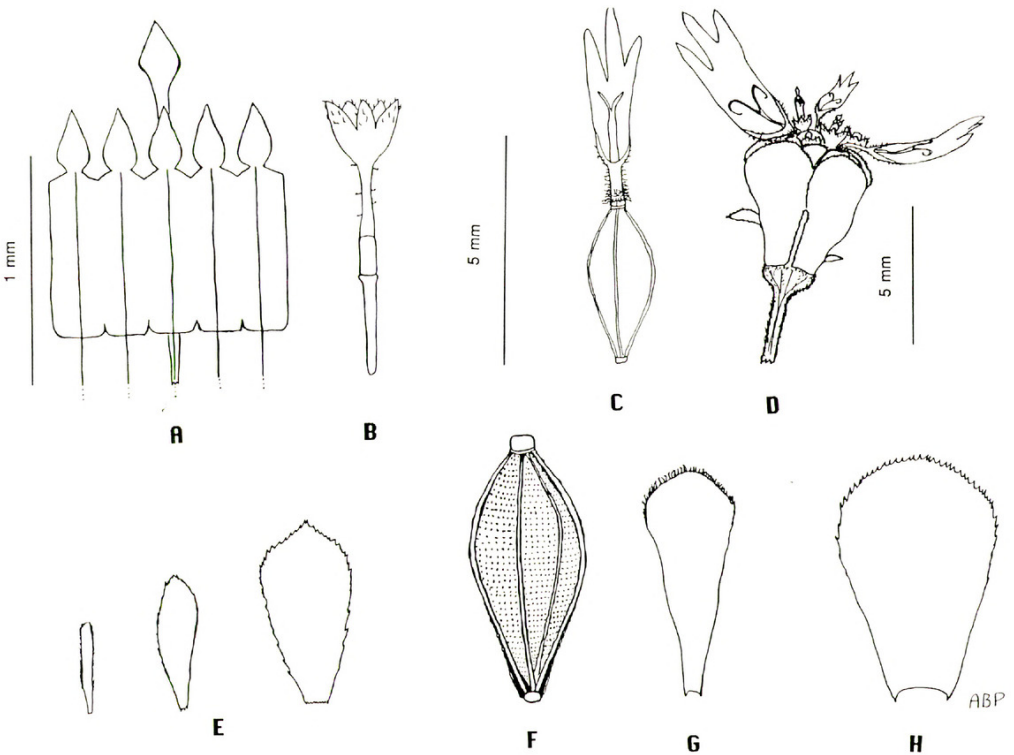


FIG. 2. Illustration of *P. costaricensis*. A. Anthers and stigma of disk floret. B. Disk floret. C. Ray floret. D. Head. E. Outer involucral bracts. F. Achene. G. Pata. H. Inner involucral bract. The same scale applies to B, C, and E–H.

small cymes at branch tips; involucre campanulate, 4–6 mm high, 5–7 mm wide, evidently biseriate, the bracts loosely ascending to erect, imbricate, the outer bracts (2-) 3, broadly to narrowly oblong, 1.5–3 mm long, scarious-based and herbaceous-tipped, ciliate, the inner bracts 3, broadly oblong-obovate, 5–6 mm long, scarious, yellow green, broadly rounded or subtruncate, the tips squarrose, ciliolate, the backs convex, toward base subcucullate, dorsally striate, multinerved, smooth. Receptacle slightly convex, paleaceous, the pales oblong to narrowly spatulate or narrowly obovate, 5–6 mm long, rounded or broadly acute at tip, yellowish, ciliolate. *Ray florets epappose*, (2-) 3, pistillate, opposite the interior bracts, the corolla tube slender, ca. 1 mm long, pilosulous, the ligule oblong-obovate, 4–5 mm long, tridentate, white the style branches divaricate, linear, ca. 1 mm long, slightly compressed, thick-edged. Disc florets 12–15, epappose, functionally male, the corolla tube ca. 1.5–2 mm long, the limb yellowish, campanulate-funnelform, 1.5–2 mm long, smooth, the lobes 5, erect or slightly spreading, *with multicellular hairs*, triangular, ca. 0.5 mm long; anthers 5, 1.1–1.3 mm long, the thecal bases rounded, the style branches erect. *Fruit obovoid*, 4.5–6 mm long, olivaceous to deep brown, somewhat compressed dorsiventrally but biconvex, finely reticulate, *strongly longitudinally 5-costate*, 2 costae making margins, the apex with an incrassate-annulate tubercle 0.8 mm wide, 0.5 mm high.

TYPE. UNITED STATES. ARKANSAS. Montgomery Co.: growing on cherty novaculite talus along the Little Missouri River, E-facing side of Blaylock Mtn., ca. 1.6 mi downstream from Albert Pike Recreation Area, T4S R27W Sect 32, 6 Oct 1988, *Pittman & Bates* 7222 (HOLOTYPE: GH; ISOTYPES: MICH, MO, NCU, NY, OSU, TENN, TEX, UARK, US, VDB). Young specimens which were collected the following spring were distributed along with the type specimens (*Pittman & Bates* 8923, 9 Apr 1989).

The genus *Polymnia* L. has been variously treated by Wells (1965), Robinson (1978), and Cronquist (1980). Three species are present in the southeastern United States, *P. canadensis* L., *P. laevigata* Beadle, and *P. uvedalia* (L.) L.. The latter species has been placed in the genus *Smallanthus* (MacKenzie in Small 1933; Robinson 1978). According to Robinson, *Polymnia sensu stricto* has short multicellular hairs on the disk corollas that are unique in the Heliantheae. Our new species shares this character with *P. canadensis* and *P. laevigata* and, therefore, clearly fits into his narrow concept of *Polymnia*.

Polymnia cossatotensis is easily distinguished from other species in the genus by its annual habit, cordate cauline leaves, fewer rays, and larger achenes. Both *P. laevigata* and *P. canadensis* are perennials with large deeply pinnatifid cauline leaves. The achenes of *P. cossatotensis* are 5-ribbed as in *P. laevigata* while *P. canadensis* is 3-ribbed. The achenes of *P. cossatotensis* can be

further differentiated from *P. laevigata* by their size, shape, and ornamentation.

ACKNOWLEDGEMENTS

We gratefully acknowledge the support of the Arkansas Nature Conservancy, the Arkansas Natural Heritage Commission, and the U. S. Forest Service in the form of a sensitive plant survey contract to the second author. We also appreciate the supportive comments from Arthur Cronquist, Guy Nesom, Tod Steussey, and James R. Wells. We thank the curators of Harvard University Herbaria and Missouri Botanical Garden for allowing us to examine their *Polymnia* collections.

REFERENCES

- CRONQUIST, A. 1980. Vascular flora of the southeastern United States. Vol. 1. Asteraceae. The University of North Carolina Press. Chapel Hill. 261 p.
- MACKENZIE, K. K. 1933. Carduaceae 56. *Smallanthus*. In J. K. Small, Manual of the southeastern flora. 1406 p.
- ROBINSON, H. 1978. Studies in the Heliantheae (Asteraceae). XII. Re-establishment of the genus *Smallanthus*. *Phytologia* 39(1):47–52.
- WELLS, J. R. 1965. A taxonomic study of *Polymnia* (Compositae). *Brittonia* 17:144–159.



Pittman, Albert B , Bates, Vernon, and Kral, Robert. 1989. "A NEW SPECIES OF POLYMNIA (COMPOSITAE: HELIANTHEAE) FROM THE OUACHITA MOUNTAIN REGION OF ARKANSAS." *SIDA, contributions to botany* 13, 481–486.

View This Item Online: <https://www.biodiversitylibrary.org/item/34595>

Permalink: <https://www.biodiversitylibrary.org/partpdf/162914>

Holding Institution

Missouri Botanical Garden, Peter H. Raven Library

Sponsored by

Missouri Botanical Garden

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.