

A NEW SPECIES OF *PHYLLOBROTICA* CHEVROLAT
(COLEOPTERA: CHRYSOMELIDAE) FROM THE PRAIRIES
OF SOUTHWESTERN MISSOURI¹

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ABSTRACT

A new species, *Phyllobrotica physostegiae* (Coleoptera: Chrysomelidae) is described and illustrated. This beetle feeds on *Physostegia angustifolia* Fernald, a mint (Labiatae) found on the prairies of southwestern Missouri.

As part of a continuing Missouri leaf beetle survey, the author undertook a 3 day collecting trip during June, 1978 through several counties of the unglaciated prairie region of southwestern Missouri. A special effort was made to locate a large *Phyllobrotica* species, which a year earlier was observed by Rev. James M. Sullivan on *Physostegia angustifolia* Fernald (Labiatae) in 4 southwestern Missouri counties. Eighty-three specimens were collected from the *Physostegia* and by sweeping prairie habitat where the plant was growing. These specimens are conspecific with 3 others collected earlier by Sullivan and 4 others found in the University of Missouri Research Museum. The latter 7 were recorded by Riley and Enns (in press) as *Phyllobrotica antennata* Schaeffer. Using the key to the North American *Phyllobrotica* by Wilcox (1965), the beetles will key-out to *P. antennata*, but with apparent discrepancies. After consulting Schaeffer's (1932) original description and examining the holotype of *P. antennata*, the Missouri specimens were determined to represent a new species which is described below.

Phyllobrotica physostegiae Riley, **new species**
(Fig. 1)

Male Holotype: Elongate, subparallel. Head, pronotum, and venter entirely yellow-orange; antennae yellow-orange with outer surfaces of segments 2-7 (with antennae held alongside body) darkened; tarsi and apical 2/3 of tibiae black; elytra with broad median black vittae not reaching apex, margins and suture yellow-orange. Head alutaceous, sides tapering inwards behind eyes. Frons inflated and projecting, medially with a narrow impressed longitudinal line extending to shallow depression on vertex, each side of depressed vertex with vague transverse impressions. Antennal sockets large, 2/3 as wide as eye. Eyes appearing small compared to head. Antennae long extending nearly to apical 1/4 of elytra. First segment strongly inflated, punctate, and alutaceous. Remaining segments laterally compressed. Fourth segment as long as 2nd and 3rd combined. Segments 3-7 becoming shorter and slightly more serrate, distal 3 segments rounded. Pronotum alutaceous, slightly wider than long, anterior width equal to that of head and slightly greater than posterior width. Sides nearly straight, faintly sinuate before hind angles. Hind angles rounded, anterior and posterior margins faintly sinuate. Marginal bead distinct on

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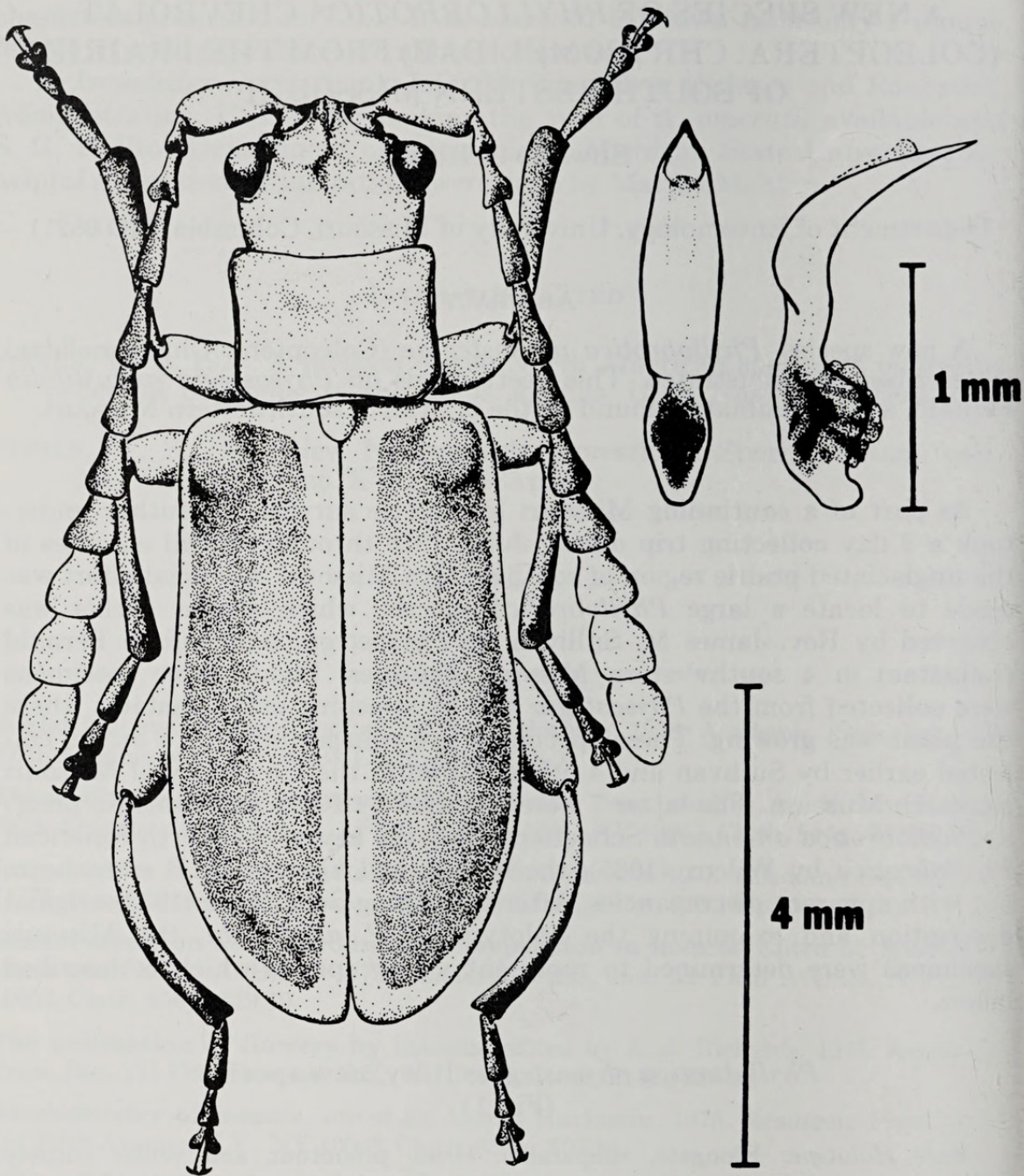


Fig. 1. Holotype, *Phyllobrotica physostegiae* n. sp., habitus and aedeagus.

lateral and hind margins. Disc with vague impressions. Scutellum broadly rounded, subtruncate, alutaceous. Elytral sides nearly parallel, strongly alutaceous, vaguely punctate with minute punctures, a few sparse setae present near apex. Bases of elytra with umbones distinct, wider than base of pronotum. Abdomen with surface finely reticulate, clothed with sparse pubescence, apical sternite truncate posteriorly and sinuate inward forming a small, narrow, shallowly impressed triangular area. Aedeagus tapering to acute, drawn-out tip, strongly constricted before basal piece, evenly curved in lateral view. Orifice small, located near tip. Endophallus with minute granules difficult to see near orifice, however, appearing dense and dark in basal piece where endophallus appears to be coiled or folded. Hind femur in middle armed ventrally with large blunt tooth. Hind tibiae evenly arcuate. Tarsi with 1st segment as long as 2nd and 3rd combined. Length: 7.6 mm. Humeral width: 2.7 mm.

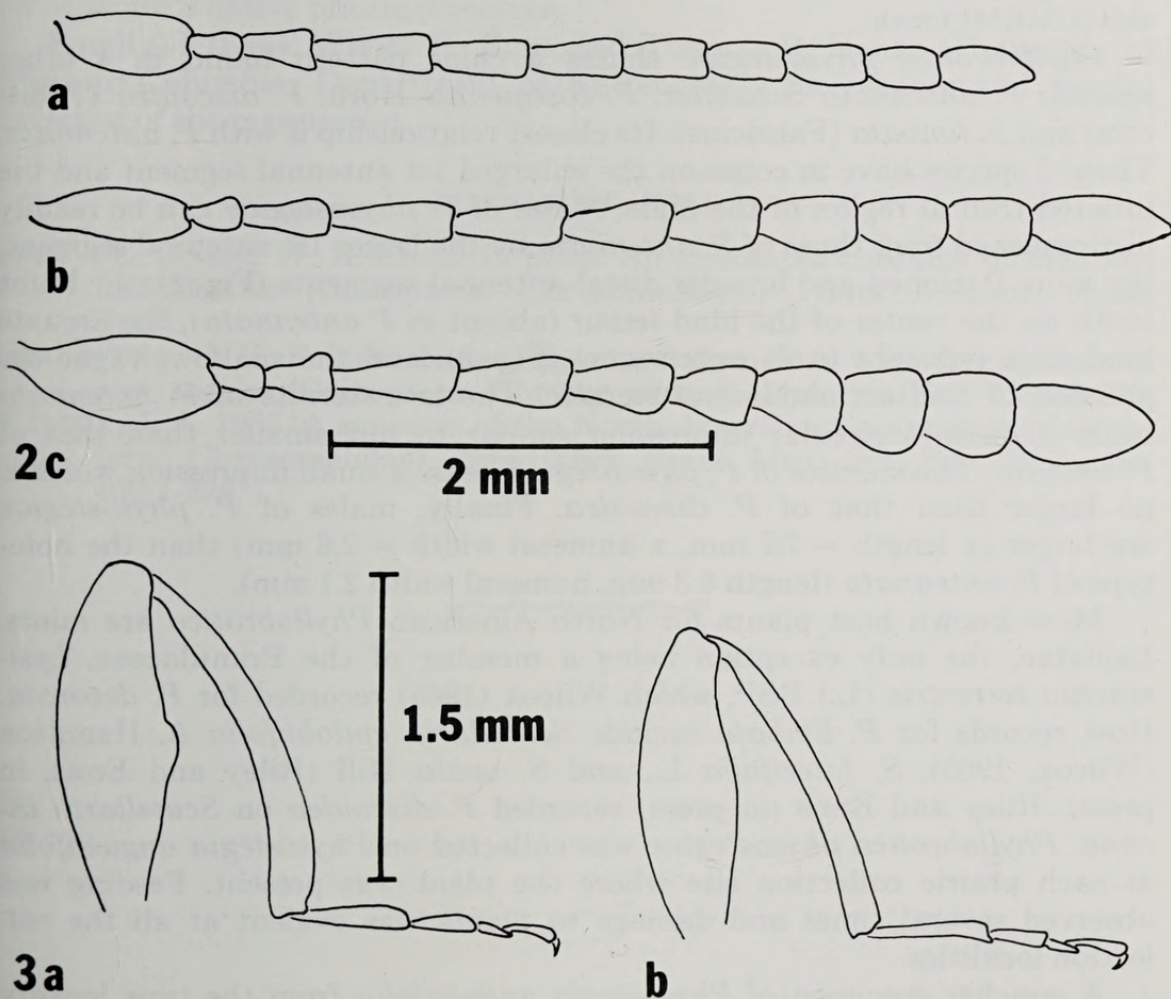
Holotype, Male, USNM type no. 76065.

Type-locality: Missouri, Dade County, Niawathe Prairie, 10 mi. N. Lockwood, June 12, 1978 (E. G. Riley) on *Physostegia angustifolia*.

Female: Considerable sexual dimorphism exists in this species. In the female the frontal region between the eyes and antennae is much less developed and the 1st antennal segment is only vaguely inflated. The distal segments of the antennae are not dilated as those of the males (Fig. 2). The antennae, except for the posterior portions of segments 1-4, are entirely dark. The hind femur is not armed ventrally with a blunt tooth; however, a carina is present for most of its length, and the hind tibia is less arcuate. The last abdominal sternite is evenly rounded. Females average larger (length 7.1-8.3, \bar{x} = 7.8 mm, humeral width 2.5-3.0, \bar{x} = 2.8 mm) than males (length 6.6-7.9, \bar{x} = 7.2 mm, humeral width 2.3-2.8, \bar{x} = 2.6 mm). Averages taken from 20 males and 20 females.

In addition to the holotype, 89 specimens have been examined (all paratypes) and deposited in the following collections:

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|------|--------------------------------------|
| CASC | California Academy of Sciences |
| CUIC | Cornell University Insect Collection |
| EGRC | E. G. Riley Collection |
| FMNH | Field Museum of Natural History |
| GHNC | G. H. Nelson Collection |
| INHS | Illinois Natural History Survey |
| SEMC | Snow Entomological MUSEUM |



Figs. 2-3. Antennae and hind legs of *Phyllobrotica* species: 2a, male holotype, *P. antennata* Schaeffer; 2b, female paratype, *P. physostegiae* n. sp.; 2c, male holotype, *P. physostegiae* n. sp.; 3a, male holotype, *P. physostegiae* n. sp.; 3b, male holotype, *P. antennata* Schaeffer.

TAMU Texas A & M University
 UMRM University of Missouri Research Museum
 USNM United States National Museum

At present this species is known only from Missouri. Data are arranged by county.

BARTON Co. Golden Prairie 10 mi SW Golden City, 12-VI-78, E. G. Riley [INHS] 1 male, 1 female. Hunkah Prairie 5.5 mi SW Liberal, 13-VI-78, E. G. Riley, on *Physostegia angustifolia*, [EGRC] 8 males, 7 females. McNary Tract 1.2 mi SE Sheldon, 12-VI-78, E. G. Riley [CASC] 3 males, 6 females. Pawhuska Prairie 9 mi N Lamar, 12-VI-78, E. G. Riley [EGRC] 1 male. BENTON Co. Jct hwy 65 & 52, 12-VI-78, E. G. Riley [UMRM] 1 male. DADE Co. Niawathe Prairie 10 mi N Lockwood, 13-VI-78, E. G. Riley, on *Physostegia angustifolia*, [USNM] 5 males (including HOLOTYPE), 4 females. Same Loc. 21-VI-78, S. Quisenberry [UMRM] 1 male. Pennsylvania Prairie 2, 25 mi SE Sylvania, 13-VI-78, E. G. Riley [SEMC] 2 males, 4 females. JASPER Co. Wah-sha-she Prairie 2 mi N Asbury, 13-VI-78, E. G. Riley [GHNC] 2 males, 1 female. ST. CLAIR Co. Taberville Prairie 1.5 mi E Appleton, 12-VI-78, E. G. Riley, on *Physostegia angustifolia* [FMNH] 2 males, 5 females. LAWRENCE Co. Mount Vernon Prairie 4 mi NE Mt. Vernon, 13-VI-78, E. G. Riley [EGRC] 1 male, 2 females. POLK Co. La Petite Gemme Prairie 3 mi W Bolivar, 13-VI-78, E. G. Riley [CUIC] 7 males, 2 females. VERNON Co. 2-VI-59, J. W. Reynolds [UMRM] 2 females. VI-78, J. M. Sullivan on *Physostegia angustifolia* [UMRM] 1 male, 2 females. Wilson Tract 4 mi W Montevallo, 13-VI-78, E. G. Riley [TAMU 6, UMRM 12] 7 males, 11 females. Vieth farm 5 mi E Nevada, 4-VI-54, J. W. Reynolds [UMRM] 1 male.

Phyllobrotica physostegiae shares a color pattern found in 4 other species: *P. antennata* Schaeffer, *P. costipennis* Horn, *P. discoidea* (Fabricius) and *P. limbata* (Fabricius). Its closest relationship is with *P. antennata*. These 2 species have in common the enlarged 1st antennal segment and the inflated frontal region of the male. Males of *P. physostegiae* can be readily distinguished from those of *P. antennata* by the larger 1st antennal segment, the more flattened and broader distal antennal segments (Fig. 2), the blunt tooth on the venter of the hind femur (absent in *P. antennata*), the arcuate hind tibia (straight in *P. antennata*) (Fig. 3), and the shallow, vague depression of the last abdominal sternite. The last sternite of *P. antennata* bears a distinct circular impression similar to but smaller than that of *P. limbata*. The sternite of *P. physostegiae* bears a small impression which is no larger than that of *P. discoidea*. Finally, males of *P. physostegiae* are larger (x length = 7.2 mm, x humeral width = 2.6 mm) than the holotype of *P. antennata* (length 6.3 mm, humeral width 2.1 mm).

Most known host plants for North American *Phyllobrotica* are mints, Labiatae, the only exception being a member of the Primulaceae, *Lysimachia terrestris* (L.) BSP, which Wilcox (1965) recorded for *P. decorata*. Host records for *P. limbata* include *Scutellaria epilobiifolia* A. Hamilton (Wilcox, 1965), *S. laterifolia* L., and *S. ovata* Hill (Riley and Enns, in press). Riley and Enns (in press) recorded *P. discoidea* on *Scutellaria incana*. *Phyllobrotica physostegiae* was collected on *Physostegia angustifolia* at each prairie collection site where the plant was present. Feeding was observed several times and damage to plants was evident at all the collection localities.

A voucher specimen of *Physostegia angustifolia* from the type locality of *Phyllobrotica physostegiae* has been deposited in the University of Missouri Herbarium.

Couplet 14 of Wilcox's (1965) key to the North American species of *Phyllobrotica* is modified below to include *P. physostegiae*.

- 14 Last ventral abdominal segment of male with a deep, nearly circular depression 15
- Last ventral abdominal segment of male with a shallow longitudinal depression 14'
- 14' First antennal segment of male strongly inflated; hind femur armed ventrally with a blunt tooth; larger, 6.6-8.3 mm; Mo.; on *Physostegia angustifolia* *physostegiae* Riley
- First antennal segment of male not strongly inflated; hind femur simple, without blunt tooth; smaller, 3.5-6.5 mm; Conn. to Ga. to Tex.; on *Scutellaria incana* *discoidea* (Fab.)

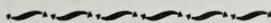
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