

THE STATUS OF *PHYSALIS HEDERIFOLIA* (SOLANACEAE)  
IN LOUISIANA, U.S.A.

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ABSTRACT

*Physalis hederifolia* A. Gray (Solanaceae) has been attributed to the state of Louisiana in the U.S.A. None of the specimens upon which this attribution is based actually belong to this taxon, and the vast majority of them have been determined to belong to a new obligate psammophyte *Physalis* species with large calyces and seeds that ranges from south-central Texas north and east to southwestern Arkansas and central Louisiana.

RESUMEN

*Physalis hederifolia* A. Gray (Solanaceae) se ha atribuido al estado de Louisiana, EE. UU. Se ha determinado que ninguno de los especímenes en los que se basa esta atribución pertenece a este taxón, y la gran mayoría de ellos pertenecen a una nueva especie psammofita obligada de *Physalis* con cálices y semillas grandes que habita desde el centro-sur de Texas al norte y desde el este hasta el sudoeste de Arkansas y el centro de Louisiana.

KEY WORDS: *Physalis*, calyx, Louisiana, groundcherry

INTRODUCTION

*Physalis hederifolia* A. Gray (Solanaceae) is a groundcherry species that ranges from northern Mexico and Texas north to Oklahoma, Kansas, Nebraska, and Montana, and west to New Mexico, Arizona, southern Nevada, and southern interior California. Waterfall (1958, 1967, 1970) cites specimens from the U.S. states of Arizona, California, Colorado, Kansas, Nebraska, Nevada, New Mexico, Oklahoma, South Dakota, Texas, and Utah; and from the Mexican states of Baja California, Chihuahua, Coahuila, Durango, Nuevo León, Sonora, and Zacatecas. It may be treated as including up to five varieties, the easternmost of which is var. *hederifolia* (Waterfall 1970; Kartesz 2015). Waterfall (1958) lists three varieties (*P. hederifolia* A. Gray var. *hederifolia*, var. *comata* (Rydberg) Waterfall, and var. *cordifolia* (A. Gray) Waterfall. This latter taxon has been variously synonymized as *P. fendleri* A. Gray (Sullivan in press), *P. fendleri* A. Gray var. *cordifolia* A. Gray, and *P. hederifolia* var. *fendleri* (A. Gray) Cronquist. Waterfall (1968) noted that var. *puberula* A. Gray was also worthy of recognition; it had previously been included as part of var. *hederifolia* (Waterfall 1958).

An additional variety is var. *palmeri* (A. Gray) C.L. Hitchcock (Cronquist 1984), which may be treated as a variety, as a species, or included in var. *hederifolia*. Cronquist (1984) also recognizes var. *hederifolia* and var. *fendleri*. The Solanaceae treatment in the *Flora of the Great Plains* (McGregor et al. 1986) lists var. *hederifolia*, var. *comata*, and var. *cordifolia*. The complete taxonomy of the *P. hederifolia* complex and the proper disposition of the various taxa included in it is beyond the scope of this paper.

Waterfall (1958) cited a shorter pedicel length (3–8 mm) as a key character separating the members of the *P. hederifolia* complex from all other members of the genus. Sullivan (in press) also used this character in her key, but provided somewhat more latitude (4–8[–13] mm pedicel length in flower, 5–15 mm pedicel length in fruit) in the designated pedicel length for *P. hederifolia* and *P. fendleri*, thereby making this character less useful in determining a clean morphological separation from other similar *Physalis* taxa (particularly *P. heterophylla*). This possible lack of a definitive morphological separation between *P. hederifolia* and *P. fendleri* versus other similar taxa is noted here, but this is not crucial to the proposed exclusion of *P. hederifolia* from the Louisiana flora.

Thomas (1989) reported *P. hederifolia* A. Gray (as "*P. hederifolia*") as occurring in Louisiana, citing four collections from Caddo Parish and one from Sabine (Table 1), with the comment "specimens were determined by Janet R. Sullivan." Following Thomas, Cascio (1994) included *P. hederifolia* in his thesis on the Solanaceae of Louisiana, noting it as occurring in the parishes of Caddo, Sabine, Union, Vernon, and Winn (Table 1), and listing *P. hederifolia* var. *puberula* in synonymy. Cascio applies the common name "Large-fruited Groundcherry" to the plant and notes that its "seeds ... are much larger (to 3.6 mm long) than those of *P. heterophylla* (to 2.2 mm long) and much more distinctively pitted." These statements clearly indicate that the concept of "*P. hederifolia*" used by Cascio is the same as the concept of the proposed new species.

This new species will be described in a forthcoming publication by M. Pyne, E.L. Bridges, S. Orzell, and D.B. Poindexter. It is an obligate psammophyte which ranges from south-central Texas east and north along the Sabine Uplift to southwestern Arkansas, and into western and north-central Louisiana. All occurrences are from xeric sands within the West Gulf Coastal Plain including the Post Oak Savannah and Pineywoods ecoregions of Gould (1969), cited in Correll and Johnston (1970). This new species resembles *P. heterophylla* when in flower, but with shorter hairs on its stems and pedicels. In fruit, the new species is very distinctive with calyces and seeds which are substantially larger than those of any other *Physalis* species found in this geographic area.

#### RESULTS AND DISCUSSION

I borrowed 14 sheets, representing 13 collections, cited by Cascio as belonging to "*P. hederifolia*" from LAF, LSU, and NLU, as well as duplicates of a subset of these collections housed in other herbaria (Table 2). It has been determined that 13 of the 14 sheets represent the new species and have been examined and annotated as such. One of the 13 sheets (Thomas 96474, cited by Cascio as "Thomas 9674") was originally determined as *Physalis pumila*, annotated as *P. hederifolia* by Cascio, and has recently been determined by the author to represent *P. heterophylla*.

There are also sheets of additional collections annotated or determined by Cascio to represent *P. heterophylla* that represent the new species. Examples of these include: Caddo Parish: dry sandy hills ½ mi N of Mira, 31 Aug 1976, MacRoberts 1942 (LSU!); Vernon Parish: Pitcher plant bog (note: presumably on deep sands in the vicinity of the bog); 1¼ mi SW of junction Lookout Road and Whiskey Chitto Road, 17 May 1983, Givens 3020 (LSU!).

Volume III of the *Atlas of the Vascular Flora of Louisiana* (Thomas & Allen 1998) also includes *Physalis hederifolia*. The range map in that publication indicates that there are specimens from the parishes of Caddo, Sabine, Union, Vernon, Webster, and Winn in herbaria LAF and NLU. In the text of Thomas & Allen 1998, however, there is no specimen cited from Webster and no relevant specimen from that parish has been located in the holdings of these herbaria (Table 1).

The website of the Biota of North America Program ([www.bonap.org](http://www.bonap.org)) includes the Louisiana parishes of Caddo, Cameron, Sabine, Union, Vernon, and Winn as a part of the range of *Physalis hederifolia* (Kartesz 2015; Table 1). These parishes, in contrast to Cascio, are included in the map for var. *comata*, not the variety *puberula* which Cascio (1994) listed in synonymy in his discussion of this Louisiana material.

In the BONAP map for *P. hederifolia* var. *comata*, the Louisiana parishes of Caddo, Sabine, Union, Vernon, and Winn are marked with diagonal lines to indicate that occurrence of the taxon in those parishes is questionable; for some unknown reason, however, Cameron Parish is not similarly marked. In the map for *P. hederifolia* as a species, none of the parishes are marked with diagonal lines. I have examined the specimens on which the Louisiana reports in Thomas and Allen (1998) are based, which account for five of the six attributed parishes in BONAP, and all of these sheets can be referred to the proposed new species and have been annotated as such by the author.

As far as can be determined, the first attribution of any Louisiana *Physalis* material to *P. hederifolia* was the 1983 annotation, by Sullivan, of the Sabine Parish specimen cited in Table 2 (Thomas 71612 with Carroll & Thomas; 7 Jun 1980 [NLU!]). It was annotated as "cf. *Physalis hederifolia*" (an orthographic variant of *P. hederifolia*), with her comment "unusual this far east." This determination preceded the 1984 collections of

TABLE 1. Louisiana Parishes cited as part of the range of *Physalis hederifolia* A. Gray (Thomas 1989; Cascio 1994; Thomas & Allen 1998; Kartesz 2015).

Louisiana Parish	Cited in Thomas (1989)	Cited in Cascio (1994)	Cited in Thomas & Allen (1998)	Parish listed in Kartesz (2015)	Comments
Caddo	X	X	X	X	
Cameron	no	no	no	X	[no specimen located]
Sabine	X	X	X	X	
Union	no	X	X	X	
Vernon	no	X	no	X	
Vernon	no	X	X	X	
Webster	no	no	X	no	[no specimen cited by Thomas & Allen; Parish probably listed in error]
Winn	no	X	X	X	

TABLE 2. Louisiana *Physalis* specimens cited as *Physalis hederifolia* A. Gray (Thomas 1989; Cascio 1994; Thomas & Allen 1998); An “X” indicates that the specimen was referenced or cited in the publication, and “no” indicates that it was not cited; all except *Thomas 96474* represent a new species; table includes additional duplicates seen by us but not specifically cited in the relevant publications. Those cited by Cascio designated with \*. Column headings: 1989 = Cited in Thomas (1989). 1994 = Cited in Cascio (1994). 1998 = Cited in Thomas & Allen (1998).

Louisiana Parish	Specimen citation (herbaria)	1989	1994	1998	Comments and Annotations
<b>Caddo</b>	<i>Thieret 31208</i> , 15 Jun 1969 (LAF!*)	no	X	no	Original det. <i>P. heterophylla</i> ; annotated by Cascio (1994) as <i>P. hederifolia</i>
<b>Caddo</b>	<i>Thomas 80845</i> , 7 May 1982 (NLU!*); with Mrs. W.G. Dorris	X	X	X	Original det. “ <i>Physalis</i> ”; annotated by Sullivan (1986) as <i>P. hederifolia</i> and Cascio (1994) as <i>P. hederifolia</i>
<b>Caddo</b>	<i>Thomas 88346</i> , 1 May 1984 (BRIT!, CM!, DUKE!, LSU!*, NLU!*, TENN!, USF!, VDB!)	X	X	no	NLU sheet orig. det. as <i>P. hederifolia</i> by Thomas; confirmed 1986 by Sullivan; annot. as <i>P. hederifolia</i> by Cascio 1994
<b>Caddo</b>	<i>Thomas 88704</i> , 15 May 1984 (NLU!*, USF!)	X	X	no	NLU sheet orig. det. as <i>P. hederifolia</i> by Thomas; confirmed 1986 by Sullivan; annot. as <i>P. hederifolia</i> by Cascio 1994
<b>Caddo</b>	<i>Thomas 89017</i> , 1 Jun 1984 (NLU!* USCH!, VDB?)	X	no	no	NLU sheet orig. det. as <i>P. hederifolia</i> by Thomas; confirmed 1986 by Sullivan; annot. as <i>P. hederifolia</i> by Cascio 1994
<b>Caddo</b>	<i>Thomas 92393</i> , 10 Jun 1985 (NLU!*)	no	X	no	Orig. det. as <i>P. pumila</i> by Thomas; annot. as <i>P. hederifolia</i> by Cascio 1994
<b>Sabine</b>	<i>Thomas 71612</i> , 7 Jun 1980 (NLU!*) with Carroll & Thomas; also labeled as <i>Carroll 1621</i>	X	X	X	Orig. det. as <i>Physalis virginiana</i> var. <i>subglabrata</i> f. <i>macrophysa</i> by ?; annot. as “cf. <i>Physalis hederifolia</i> ” by Sullivan 1983 with comment “unusual this far east”; no annotation by Cascio
<b>Union</b>	<i>Allen 8843</i> , 3 Jun 1979 (LAF!*); also labeled as <i>Vincent 2107</i>	no	X	X	Orig. det. as <i>P. heterophylla</i> by Allen; annot. as <i>P. hederifolia</i> by Cascio 1994
<b>Vernon</b>	<i>Allen 12802</i> , 1 Jun 1983 (LAF!*)	no	X	no	Orig. det. as <i>P. pubescens</i> by Allen; annot. as <i>P. hederifolia</i> by Cascio 1994
<b>Vernon</b>	<i>Allen 17228</i> , 23 May 1991 (NLU!*)	no	X	no	Orig. det. as <i>P. hederifolia</i> by ?; annot. as <i>P. hederifolia</i> by Cascio 1994
<b>Vernon</b>	<i>Thomas 96474</i> , 4 Jun 1986 (NLU!*) with Allen and Bordelon	no	X	no	Orig. det. as <i>P. pumila</i> by ?; annot. as <i>P. hederifolia</i> by Cascio 1994; actually <i>P. heterophylla</i> ; cited by Cascio as “9647”
<b>Vernon</b>	<i>Thomas 96527</i> , 4 Jun 1986 (NLU!*) with Allen and Bordelon	no	X	X	Orig. det. as <i>P. hederifolia</i> by ?; annot. as <i>P. hederifolia</i> by Cascio 1994
<b>Winn</b>	<i>Thomas 79121</i> , 18 Oct 1981 (NLU!*); also labeled as <i>Kessler 1971</i>	no	X	X	Orig. det. as <i>P. pumila</i> by ?; annot. as <i>P. hederifolia</i> by Cascio 1994

large-calyced sandhills *Physalis* by Thomas (his numbers 88346, 88704, and 89017 at NLU and other herbaria), who labeled them as "*Physalis hederifolia*." This and the subsequent annotations of these Thomas collections as well as of Thomas 80845 as *P. hederifolia* by Sullivan in 1986, set the stage for subsequent determinations and annotations of additional *Physalis* specimens from western Louisiana as *P. hederifolia* by Cascio, and the inclusion of this taxon in Thomas (1989), Cascio (1994), Thomas and Allen (1998), and BONAP. For unknown reasons, several of the specimens annotated by Cascio in 1994 were not cited in Thomas and Allen (1998) (Table 2).

The documented distribution of *Physalis hederifolia* in eastern Texas is somewhat discontinuous, and its eastern range limit in Texas is not entirely clear. The easternmost Texas counties cited by Waterfall (1958) for *Physalis hederifolia* are Grimes, Leon, and Smith. Of these, Leon (*Cory* 21810, GH) and Grimes (*Tharp s.n.*, 11 Apr 1936, TEX!) are connected to the more (-or-less) continuous range in the west, but Smith is somewhat of an outlier. To the east of these, BONAP (Kartesz 2015) includes Angelina and Newton. It is possible that records from Angelina, Newton, and Smith counties also represent the new species. One example of this is (Allen *et al.* 22343), from Newton County, Texas, which is on the boundary with Louisiana. This specimen was examined, and it is an additional representative of the new species. I have been unable to locate the Angelina County record. The Smith County specimen (*Cory* 25881) is supposed to be at GH, but it does not appear in their online database. Further research would be necessary to firmly establish the eastern range limit of *Physalis hederifolia* in Texas.

With the examination and annotation of the specimens cited in Thomas (1989), Cascio (1994), and Thomas and Allen (1998), I can firmly establish that *Physalis hederifolia* A. Gray is not part of the flora of Louisiana.

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