APHYLLON LUDOVICIANUM (OROBANCHACEAE), NEWLY REPORTED IN COASTAL ALABAMA AND FLORIDA, U.S.A.

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ABSTRACT

We describe the first records of the parasitic plant *Aphyllon ludovicianum* in Alabama and Florida, a range extension and disjunction of over 400 miles eastward and over 500 miles southward. A key to the two species of *Aphyllon* in Alabama and Florida is included.

RESUMEN

Describimos los primeros registros de la planta parásita *Aphyllon ludovicianum* en Alabama y Florida, una extensión y disyunción más de 400 millas hacia el este y 500 millas hacia el sur. Se incluye una clave para identificar las dos especies de *Aphyllon* presentes en Alabama y Florida.

Key Words: *Aphyllon ludovicianum,* noteworthy collection, new record, Alabama, Florida

In April 2021, *Aphyllon ludovicianum* (Nutt.) A. Gray was discovered by the second author in Perdido Key State Park, Florida (https://www.inaturalist.org/observations/75355655; Ueda 2021) and nearby locations. Subsequent field surveys revealed that these initial reports comprised a significant collection of populations distributed between Gulf Shores, Alabama and Perdido Key, Florida, centered along 15 miles of the coastal highway Alabama 182/Florida 292 (Fig. 1). Along some stretches of the road, contiguous patches of *A. ludovicianum* composed of thousands of individuals extend at least one-half to two-thirds of a mile. Preliminary attempts to locate the plant further north and west in Alabama (Lilian boat ramp [30.406327°N, 87.436851°W] and city of Gulf Shores along Highways 180 and 182) and east in Florida (Fig. 1D, Southwind Marina [30.327540°N, 87.357126°W], city of Pensacola Beach, areas of Gulf Islands National Seashore, and John Beasley Park, Okaloosa Island) were unsuccessful.

Where present, *Aphyllon ludovicianum* was most abundant in moderately disturbed areas with loose sand, including roadsides adjacent to sand dunes (typically within 5 m of pavement), vacant lots, and the vicinity of parking lots. By mid-June, when voucher collections were made, the plants were mostly in fruit or senescent (Fig. 1C) but occasionally in flower or immature inflorescences that had not yet emerged from the ground. The elevation of collection localities was less than 4 m above sea level. Elsewhere in its range, *Aphyllon ludovicianum* is most commonly found in sandy soils that are wind or water eroded, but occasionally in heavier prairie soils. In Alabama and Florida, individuals were always co-occurring with *Heterotheca subaxillaris* (Lam.) Britton & Rusby, its only apparent host in this area. At five sites we verified host association by gently excavating the parasite, host root, and host shoot as a single unit; in all cases the host was *H. subaxillaris*.

Voucher Specimens: **ALABAMA. Baldwin Co.:** along State Hwy 180, just W of mile marker 9, 30.25437°N, 87.64794°W, 12 Jun 2021, *Schneider 1270* (FLAS, UWAL); Intersection of Campground Rd. and state Hwy 182, 30.25256°N, 87.65442°W, 12 Jun 2021, *Schneider 1271* (ALNHS, UC); Perdido Key, side of Perdido Beach Blvd, 30.2792°N, 87.5284°W, 13 Jun 2021, *Benton 21-003* (UNA); Perdido Key, side of

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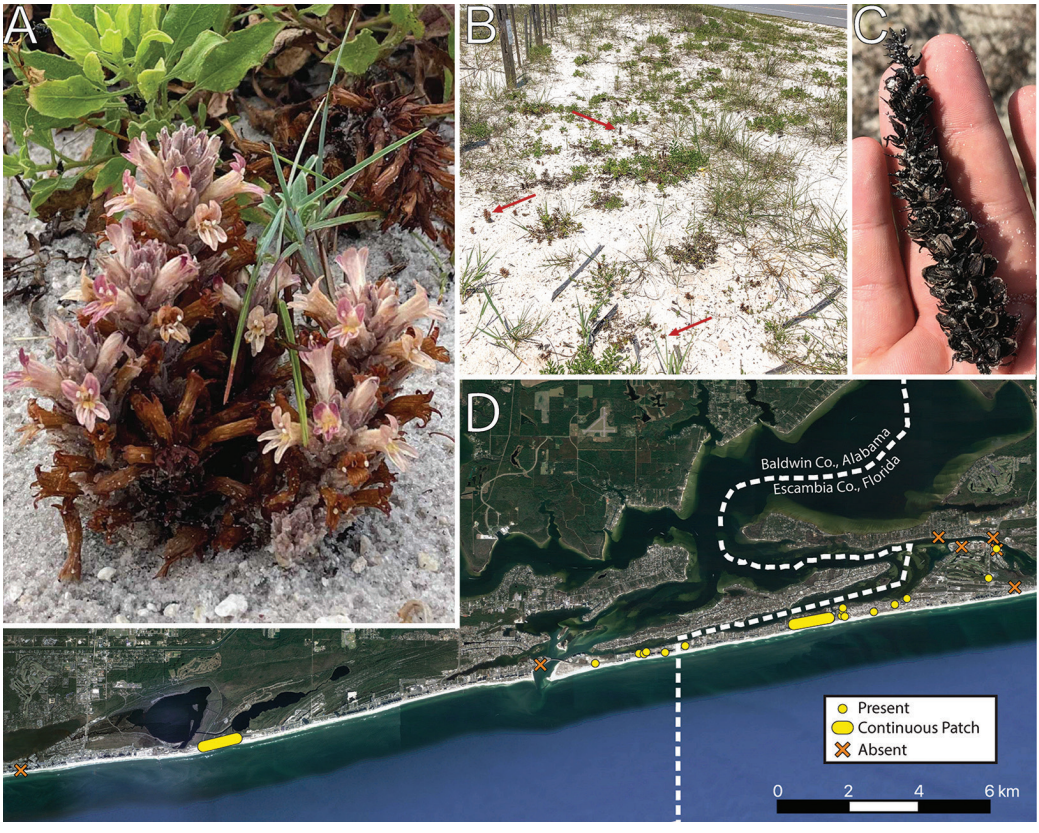

Fig. 1. ***Aphyllon ludovicianum*** **along the Gulf Coast of Florida and Alabama. A. Flowering individuals with exserted stamens growing in vacant lot on Perdido Key Drive with host** ***Heterotheca subaxillaris*** **in background (3 June 2021; population vouchered by** ***Schneider & Williams 1266)*****. B. Typical habitat. Red arrows indicate three of the hundreds of individuals observed between the highway and Perdido Key State Park boundary fence (14 June 2021;** ***Schneider, Bickell, & Benton 1273*****). C. Senesced and weathered infructescence. D. Map of localities (yellow) and known absences (orange ×).**

Perdido Beach Blvd, 30.2806°N, 87.5241°W, 14 Jun 2021, *Benton 21-004* (ALNHS); Perdido Key, side of Perdido Beach Blvd, 30.2798°N, 87.5277°W, 14 Jun 2021, *Benton 21-005* (MO). **FLORIDA. Escambia Co.:** Perdido Key, empty lot on corner of State Hwy 292 and Lafitte Reef Rd., 30.29136°N, 87.47022°W, 11 Jun 2021, *Schneider & Williams 1266* (UC); Perdido Key, River Rd, approx. 500 ft NE of Perdido Key Rd. 30.29559°N, 87.45101°W, 11 Jun 2021, *Schneider 1267* (UWAL); East side of Eden Condominiums, 16281 Perdido Key Dr., 30.28766°N, 87.48479°W, 11 Jun 2021, *Schneider 1269* (MO); Perdido Key State Park, beach access opposite Sharp Reef Rd., 30.29011°N, 87.47385°W, 14 Jun 2021, *Schneider, Benton & Bickell 1273* (FLAS, FSU).

At present, these newly discovered populations appear to represent a significant disjunction in the distribution of *Aphyllon ludovicianum*. The nearest known locations are over 400 miles to the west in Galveston County, Texas (Brown et al. 2007 as subsp. *multiflora* [misappl.]; https://www.inaturalist.org/observations/77975978). An isolated collection was made over 500 miles northward, in Taney County, Missouri (*T.E. Smith 2903,* MO-2167187). *Aphyllon ludovicianum* has previously been reported east of the Mississippi River only in central Illinois and southwestern Wisconsin. Other reports east of the Mississippi River are most likely misidentified specimens of *Aphyllon riparium* (L.T. Collins) A.C. Schneid. Curiously, the host *Heterotheca subaxillaris* is widely distributed in the intervening area and along the Atlantic and Gulf Coasts (Lonard et al. 2011).

Weathered (blackened) flower stalks (Fig. 1C), the density and extent of specimens (Fig. 1B, D), and that many plants were connected to their host roots at depths of 4–6 inches beneath the soil surface indicate that

this population has been established for multiple years. Available evidence of wind and water dispersal in related species (Reuter 1986; Joel 2013) suggest that coastal storms and hurricanes could be a major dispersal agent of *A. ludovicianum* seeds, which are small (> 0.5 mm) and abundant. Given that populations were centered along the major arterial road and other highly trafficked areas, human activity may also contribute to dispersal.

The morphology of *Aphyllon ludovicianum* plants from Florida and Alabama are typical for the species; however, four observations are worth noting:

1. Flower length was especially variable. Some corollas exceeded 20 mm in length while others were only 10 mm in length.
2. The corollas had reduced pubescence (glabrate) and in some cases were glabrous.
3. Some corolla lobes were as short as 2–3 mm, even on the longer corollas, while others were at the normal length for this species, 3–5 mm.
4. Numerous flowers had exserted stamens, usually only two, but sometimes all four (Fig. 1A). This seemed to be more common in senescent flowers. This phenomenon is sometimes observed in other populations of *A. ludovicianum*, but it is rare.

KEY TO SPECIES OF *APHYLLON* IN ALABAMA AND FLORIDA

1. Bracteoles (not to be confused with the floral bract at the base of the pedicel) present below calyx; inflorescence greater than 10 flowers; pedicles 0–5(–10) mm; calyx lobes 3–4 times longer than cup _____ **A. ludovicianum**
1. Bracteoles absent below calyx; inflorescence 1–3 flowers; pedicels 10–120 mm; calyx lobes equal to or longer than cup _____ **A. uniflorum**

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REFERENCES

Brown, L.E., E.L. Keith, D.J. Rosen, & J. Liggio. 2007. Notes on the flora of Texas with additions and other significant records. III. J. Bot. Res. Inst. Texas 1:1255–1264.

Joel, D.M. 2013. Seed production and dispersal in the Orobanchaceae. In: D.M. Joel, J. Gessel, & L.J. Musselman, eds. Parasitic Orobanchaceae. Springer, New York, U.S.A. Pp. 143–146.

Lonard, R.I., F.W. Judd, & R. Stalter. 2011. Biological flora of coastal dunes and wetlands: *Heterotheca subaxillaris* (J. de Lamarck) N. Britton & H. Rusby. J. Coastal Res. 277:1052–1058.

Reuter, B.C. 1986. The habit, reproductive ecology and host relations of *Orobanche fasciculata* (Orobanchaceae) in Wisconsin. Bull. Torrey Bot. Club 113:110–117.

Ueda, K. 2021. iNaturalist Research-grade Observations. iNaturalist.org. Occurrence dataset https://doi.org/10.15468/ab3s5x accessed via GBIF.org on 2021-08-26.