Oklahoma Native Plant Record
Volume 9, December 2009

Whatever Happened to *Cheilanthes horridula* and *Cheilanthes lindheimeri* in Oklahoma?

Dr. Bruce A. Smith
McLoud High School
McLoud, Oklahoma
E-mail: fronds02@yahoo.com

INTRODUCTION

Oklahoma is where several ferns reach their northern or eastern range limits. Among them are two species of lip ferns in the family Pteridaceae, *Cheilanthes horridula* Maxon and *Cheilanthes lindheimeri* Hook (Hoagland et al. 2007). *C. horridula* (prickly lip fern) is primarily found on dry limestone slopes in the Chihuahuan Desert region of northeastern Mexico. Its range extends northward to southwestern Oklahoma. *C. lindheimeri* Hook (fairy swords) is widespread in central and northern Mexico as well as the southwestern United States (Mickel and Smith 2004). In Oklahoma, the distributions of both are limited, and the numbers of individual plants of each species are likely to be relatively small, compared with other Oklahoma members of the genus *Cheilanthes*.

The last record of these two plants in Oklahoma goes back to 1980 for *Cheilanthes horridula* (Figs. 1 and 2) and 1942 for *Cheilanthes lindheimerii* (Figs. 3 and 4). There are only four herbarium sheets of fairy swords in Oklahoma herbaria. All four specimens are from the same collector on the same date:

Cheilanthes lindheimeri Hooker.

- Comanche CO: F.B. McMurry #1273 (OKL). 8/23/1942.
- one s.n. (OKL). 8/23/1942.
- two s.n. (OKLA). 8/23/1942.

Only four collections of the prickly lip fern from the Arbuckle Mountains are known:

Cheilanthes horridula Maxon.

- Murray CO: Unknown, s.n. (OKLA) 11/28/1926.
- Murray CO: H.I. Featherly, s.n. (OKLA) 8/21/1932.
- Murray CO: M. Huft, D. Johnson, and R. Cranfill, #1002. (OKL) 3/7/1980.
- Murray CO: J. and C. Taylor, #28907. (BRIT) 5/15/1980.

As the citations show, the Bebb Herbarium (OKL) in Norman and Oklahoma State University Herbarium (OKLA) in Stillwater have holdings of both species.

If you have seen them, you have seen two of Oklahoma's rarest ferns. According to Amy Buthod at the Bebb Herbarium (pers.com. Nov. 11, 2009), both have been designated SH, since all records are older than 20 years. SH refers to a species that is possibly extirpated and known only from historical records. However, while they are in danger of being extirpated in Oklahoma, both are globally secure in more southern regions. These designations have recently been revised (NatureServe 2008).

Smith, B.A.
https://doi.org/10.22488/okstate.17.100070

What could explain this rarity? These ferns could still be out there growing in nature but botanists are simply not looking where they are, or do not recognize them, have overlooked them, or perhaps they no longer exist in Oklahoma; they are gone! I prefer the first scenario.

WHERE TO LOOK

Cheilanthes horridula has previously only been reported in the Arbuckle Mountains (Hoagland et al.). I have looked and not found it at Camp Classen and Turner Falls. Both locations are in Murray County in the Arbuckle Mountains. Their rarity there may lie in the fact that these areas are popular sites to visit and send young people to YMCA and church camps. Thus, development and other human impacts may have contributed to the rarity of this species.

Cheilanthes lindheimeri has only been reported in the Wichita Mountains in Comanche County. While both species are xeric ferns growing in rock crevices, *C. horridula* is almost always found on calcareous substrates, whereas plants of *C. lindheimeri* occur on a variety of acidic and mildly basic rock types (Windham and Rabe 1993).

WHAT THEY LOOK LIKE

You will not have a problem getting a positive identification of *Cheilanthes horridula* if you view the adaxial (upper) surface with magnification. The blades are scabrous; with white, pustulate hairs (see Fig. 1). *Cheilanthes lindheimeri* is a little more difficult to identify. It can easily be confused with *Cheilanthes wootonii* Maxon (Figs. 5 and 6), which has a much larger Oklahoma range and has been found in at least four Oklahoma counties including Comanche County (Hoagland et al. 2007)

The quickest way to distinguish between the two is by examining the fronds with magnification. Though technically glabrous, *C. lindheimeri* appears tomentose (hairy) on its adaxial (upper) surface because the scales on the adaxial (lower) surface have relatively long wooly hairs along the margins with tips extending between the beadlike segments onto their upper surface (see Fig. 4). In *C. wootonii*, the beadlike segments of the adaxial surface appear glabrous and the scales on the abaxial surface have fine marginal hairs that are not woolly (see Fig. 5; Windham and Rabe 1993).

CONCLUSION

I hope you will keep a keen eye open for both these ferns when you visit the Arbuckle and Wichita Mountains. Remember that these are rare species and it is important to practice good conservation. If you think you have found either of these two ferns, take careful notes on the number of plants you see and their exact location. Take a set of habit and habitat photos as well as shots of both the abaxial and adaxial frond surfaces. Please contact the Oklahoma Biological Survey at the University of Oklahoma or myself if you think you have found them. I would love to see them.

SOURCES

Hoagland, BW, AK Buthod, IH Butler, P Callahan-Crawford, WE Elisens, and R Tyrl. 2007. Oklahoma Vascular Plants Database, University of Oklahoma, Norman. www.biosurvey.ou.edu (October 2009).

Mickel, JT and AR Smith. 2004. The pteridophytes of Mexico. *Memoirs of the New York Bot. Gard.* 88:1-1055.

NatureServe. 2008. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0 NatureServe,

Arlington, VA USA Available www.natureserve.org/explorer (11 November 2009).

USDA Plants Database 2009, Natural Resources Conservation Service. http://plants.usda.gov (October 2009).

Windham, MD, and EW Rabe. 1993. *Cheilanthes* Swartz. p.p. 152-169 *n* Flora of North America. Editorial Committee eds. *Flora of North America, north of Mexico.* Oxford University Press, New York.

ACKNOWLEDGEMENTS

The author wishes to thank Wayne Elisens, Curator, and Amy Buthod, Collections Manager, Bebb Herbarium (OKL), Norman, Oklahoma, as well as Ron Tyrl, former Director of the OSU Herbarium (OKLA) for their technical assistance; David Combs, Canyon Camp and Conference Center near Hinton for access and permission to take photos; Patrick Alexander, of the New Mexico State University Herbarium for allowing use of his wonderful photos; and the editors and reviewers who offered key information for the article.

Oklahoma Native Plant Record
Volume 9, December 2009

Figure 1 Adaxial view of *cheilanthes horridula.* Photo courtesy of P. J. Alexander

Figure 2 Abaxial view of *Cheilanthes horridula.* Photo courtesy of P. J. Alexander

Figure 3 Adaxial view of *Cheilanthes lindheimeri.* Photo courtesy of P. J. Alexander

Figure 4 Abaxial view of *Cheilanthes lindheimeri.* Photo courtesy of P. J. Alexander

Oklahoma Native Plant Record
Volume 9, December 2009

Figure 5 Adaxial view of *Cheilanthes wootonii.* Photo by author.

Figure 6 Abaxial view of *Cheilanthes wootonii.* Photo by author.