

**ESM Table 1** Herbarium photosample used for the morphometric analysis. Herbarium specimens sampled came from the Missouri Botanical Garden herbarium and the National Herbarium

Species, collection season	# of plants sampled	# of achenes (tubercled / smooth / indet.)
<i>P. erectum</i>	21	Total: 153
June 1- August 31		16 (14/0/2)
September		70 (66/4/0)
October 1- November 24		67 (51/16/0)
<i>P. achoreum</i>	10	Total 60
June 1- August 31		23 (21/1/1)
September		24 (24/0/0)
October 1- November 24		13 (6/7/0)
<i>P. ramosissimum</i>	11	Total 100
June 1- August 31		34 (34/0/0)
September		14 (0/14/0)
October 1- November 24		52 (25/27/0)
<i>P. aviculare</i> ssp. <i>buxiforme</i>	10	Total 92
June 1- August 31		30 (25/5/0)
September		34 (31/3/0)
October 1- November 24		28 (6/20/2)
Total	52	405

**ESM Table 2** Formulas used to generate the morphometric measures reported in ESM Table 3. All image analysis was completed using ImageJ open source image analysis software

Measurements	Description	Procedure/Formula
Area	# of pixels within the margins of object	Select image of achene, area measured in mm <sup>2</sup>
Length	#of pixels along major axis of selected object	Draw line to measure length in mm
Width	Number of pixels along minor axis of selected object	Draw line to measure length in mm
<b>Shape Factors</b>		
Aspect Ratio	Degree of elongation; major axis divided by (mean of) minor axis (axes). Axes derived from an ellipse fitted around the selected object.	[Major axis]/[Minor axis]
Roundness	Roughly inverse of aspect ratio, a measure of elongation of the major axis with respect to the object's area. Axis derived from an ellipse fitted around the selected object.	$4 \times ([Area]/(\pi \times [Major \ axis]))$
Circularity	Relationship between perimeter and area; degree of departure from a circle. 1.0 is a perfect circle, 0.0 is a straight line.	$4\pi \times [Area]/[Perimeter]^2$

**ESM Table 3** Summary of the morphometric analysis and non-metric characteristics of the photosample summarized in ESM Table 1. Smooth morphs: \* indicates a significant difference in the mean for that measure between a given species and the Whitney Bluff assemblage (the type specimen for domesticated *P. erectum* ssp. *watsoniae*), according to Welch's unequal variance t-test. See Fig. 1 and *Results* section for discussion of the non-metric character *Deflation*. Tubercled morphs: Mean values for each species are compared to the one measureable tubercled morph from Whitney Bluff, pictured in Fig. 1. A sample of one is not adequate for statistical comparison, so none were made. See Fig. 1 and *Results* for examples and descriptions of surface textures, including striate-tubercled

Species	<i>P. achoreum</i>	<i>P. buxiforme</i>	<i>P. erectum</i>	<i>P. ramosissimum</i>	Whitney Bluff
Smooth morphs					
Area	3.38 ± 0.257*	2.28 ± 0.349*	3.22 ± 0.780*	4.21 ± 1.338*	5.66 ± 0.683
Length	3.20 ± 0.222*	2.69 ± 0.270*	3.23 ± 0.329*	3.64 ± 0.609*	4.16 ± 0.243
Width	1.70 ± 0.095*	1.35 ± 0.163*	1.63 ± 0.190*	1.78 ± 0.366*	2.30 ± 0.257
Circularity	0.54 ± 0.137	0.52 ± 0.154	0.44 ± 0.126	0.49 ± 0.091	0.46 ± 0.073
Aspect Ratio	1.89 ± 0.126*	2.00 ± 0.434*	1.95 ± 0.279*	2.03 ± 0.283*	1.76 ± 0.227
Roundness	0.53 ± 0.034*	0.52 ± 0.108*	0.52 ± 0.072*	0.50 ± 0.07*	0.58 ± 0.069
Deflated/total	9/9	12/15	41/41	1/20	3/200
Tubercled morphs					
Area	3.43 ± 0.651	2.37 ± 0.354	3.49 ± 0.528	2.99 ± 0.761	4.15
Length	2.85 ± 0.309	2.40 ± 0.197	2.92 ± 0.202	2.79 ± 0.433	3.40
Width	1.88 ± 0.222	1.55 ± 0.171	1.88 ± 0.208	1.63 ± 0.181	2.23
Circularity	0.64 ± 0.199	0.65 ± 0.515	0.56 ± 0.104	0.56 ± 0.086	0.55
Aspect Ratio	1.47 ± 0.125	1.52 ± 0.156	1.51 ± 0.147	1.65 ± 0.192	1.51
Roundness	0.69 ± 0.058	0.66 ± 0.063	0.67 ± 0.065	0.61 ± 0.067	0.66
Striate-tubercled/total	10/51	14/62	131/131	7/59	1/1

**ESM Table 4** Summary of evidence demonstrating that a) the Whitney Bluff assemblage is significantly different from any existing species; and b) despite these differences, it is most parsimoniously designated as a ssp. of *P. erectum*, rather than some other species. 0 denotes a non-significant difference. -1 denotes a statistically significant difference, except in the cases of perianth morphology and fruit deflation, which are non-metric characteristics that consistently segregate by species. Additional circumstantial evidence that the Whitney Bluff assemblage is a ssp. of *P. erectum*: 1) the two tubercled achenes recovered from Whitney Bluff are striate-tubercled, a surface texture most common in *P. erectum*; 2) *P. erectum* has been recovered from hundreds of archaeological sites – there is no evidence that any other species was cultivated

Whitney Bluff	<i>P. erectum</i>	<i>P. ramosissimum</i>	<i>P. aviculare</i> ssp. <i>buxiforme</i>	<i>P. achoreum</i>
Seasonality	-1	0	-1	-1
<b>Smooth morph</b>				
Area	-1	-1	-1	-1
Circularity	0	0	0	0
Roundness	-1	-1	-1	-1
Aspect ratio	-1	-1	-1	-1
Perianth morphology	0	-1	0	0
Fruit deflation	0	-1	-1	-1
<b>Total</b>	<b>-3</b>	<b>-4</b>	<b>-4</b>	<b>-4</b>