

SUB-DIVISION OF THE BOKCHITO FORMATION IN LOVE
COUNTY, OKLAHOMA

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THE BOKCHITO formation of Lower Cretaceous age, a member of the Washita group which occurs above the Caddo formation and below the Bennington limestone (Mainstreet of Texas), outcrops in Love County in a roughly circular area, lying in the trough of the Marietta syncline to the southeast of Marietta.

The Denton, Weno, and Pawpaw formations of North Central Texas, which attain a total thickness of 210 feet and which are equivalent to the Bokchito, are represented in Love County by beds of friable brown sandstone, siliceous shell limestone, and ferruginous concretions of sand and clay totaling approximately 140 feet in thickness.

The Bokchito formation is named from the town of Bokchito, Bryan County, Oklahoma, because of the excellent exposures there. The formation is made up of clay and sandy clay, with beds of friable brown sandstone, siliceous shell limestone, and ferruginous concretions of sand and clay.

The Lower Cretaceous rocks exposed in Love County, reading from older to younger are: Trinity sand, Goodland limestone, Kiamichi formation, Caddo formation, Bokchito formation, and Bennington limestone.

In north central Texas and in Marshall County, Oklahoma, the Caddo and Bokchito formations have been subdivided, as follows:^{1,2}

Bokchito formation	Pawpaw sandy member Weno clay member Denton clay member
Caddo formation	Fort Worth limestone Duck Creek formation

With this classification being used the Bokchito formation is defined as including all the strata above the Fort Worth limestone (top of Caddo formation) and below the Bennington limestone (Main Street limestone of Texas).

The outcrop of the Bokchito formation in Love County is in a roughly circular area lying in the basin of the Marietta syncline to the southeast of Marietta. Due to the character of the formation it is difficult to obtain a clearcut section of the entire formation. In viewing the area for the first time it seems that there is a great deal more sandstone in the section than is really present, which is due to the fact that the sandstone resists weathering to a greater degree than the shale, so the sandstone is left lying about the surface while the shale is carried away. The Bokchito forms a reddish brown soil, which is characterized by a large number of small ironstone fragments and concretions.

¹Stephenson, L. W., A contribution to the geology of northeastern Texas and southern Oklahoma: U.S. Geol. Survey Prof. Paper 120-P. 135, 1918. Bullard, Fred M., Geology of Marshall County, Oklahoma: Oklahoma Geol. Survey Bull. 39, pp. 36-44.

²Bullard, Fred M., Geology of Love County. Oklahoma: Oklahoma Geol. Survey Bull. 33, pp. 36-37, 1925.

Section of Bokchito formation, Love county, measured on the east bank of Red River in the NW. corner of sec. 13, T.85, R³ E., about one-half mile north of Tuck's Ferry.

Top	Thickness	
	Feet	Inches
Marl, blue clay	0	11
Sandstone, brown, hard, calcareous and indurated ("Quarry")	1	6
Shale with iron concretions and shell beds of iron replacements, <i>Protocardia</i> abundant	37	4
Sandstone, brown	0	6
Shell beds, brown (<i>Gryphaea washitaensis</i>) with shale partings	3	6
Shale, blue	34	0
Sandstone, brown, massive, containing many ripplemarks	2	6
Shale, blue	36	8
Total thickness	120	

In the above section the brown shell horizon containing *Gryphaea washitaensis* Hill, which occurs about 70 feet from the base, is probably the Denton-Weno contact. The hard indurated calcareous sandstone which occupies the top of the hill is probably the "Quarry" limestone. It is then evident that the sediments representing the Pawpaw formation have been removed by erosion, since the "Quarry" is considered the top of the Weno.

The Bennington limestone which is the uppermost formation of the Lower Cretaceous in Love County is represented by two small outliers covering only a few hundred square feet, capping the highest hills southeast of Marietta in secs. 27 and 34, T. 7 S., R. 2 E. It is only a few feet thick, the remainder having been removed by erosion. The surrounding sand-covered slopes, made up of strata which underlie the Bennington, represent the Pawpaw member.

In summarizing: the Bokchito formation is the equivalent of the Denton, Weno, and Pawpaw formations of north central Texas which attain a total thickness of 210 feet. This rapid thinning of the sediments to the north (a decrease to 140 feet in Love County) during Bokchito time marks the beginning of the retreat of the Lower Cretaceous sea. It is interesting to note that this thinning did not begin until about the middle of Bokchito time, for the lower 70 feet of the Bokchito, which is equivalent to the Denton formation, has the same thickness in Love County as farther south. Shell beds replaced by iron are characteristic of the Bokchito.

In making the subdivisions of the Bokchito the following points were of importance:

The top of the Denton is marked by brown shell beds with shale partings containing an abundance of *Gryphaea washitaensis*.

The overlying Weno contains a larger amount of iron concretions. The top of the Weno is the "Quarry" limestone and its accompanying ferruginous masses of very fossiliferous material consisting chiefly of the casts of *Turritella* sp. and *Protocardia* sp. Beds of a similar nature occur in the overlying Pawpaw in other areas but carry chiefly a small pelecypod with only an occasional *Turritella*.