Syllable-based compression achieves sufficient results on small or middle-sized text documents. Since the majority of XML documents are that size, we suppose that the syllable-based method can give good results on XML documents, especially on documents that have a simple structure (small amount of elements and attributes) and relatively long character data content. In this paper we propose two syllable-based compression methods for XML documents. The first method, XMLSyl, replaces XML tokens (element tags and attributes) by special codes in input document and then compresses this document using a syllable-based method. The second method, XMillSyl, incorporates syllable-based compression into the existing method for XML compression XMill. XMLSyl and XMillSyl are compared with other XML-conscious compression methods as well as with a non-XML syllable-based compression methods.