



Short communication

Voloshinoides sonorensis n. sp. (Cretaceous benthic foraminifera): A potential lower Albian marker of shallow-water carbonates in northern Mexico

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ABSTRACT

The benthic foraminifera *Voloshinoides sonorensis* n. sp. is described from the lower Albian Mural Formation of northern Sonora, Mexico. Chronostratigraphically it is intermediate between the early Aptian *V. murgensis* Luperto Sinni and Masse and the latest Albian/Cenomanian to Maastrichtian species described. *V. sonorensis* is distinguished from all other representatives of the genus above all by its thin wall and delicate, simple exoskeleton. *V. sonorensis* is a potential index fossil for lower Albian shallow-water carbonates in the Gulf of Mexico and adjacent regions.

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1. Introduction

During the Early Cretaceous carbonate platforms surrounded the ancestral Gulf of Mexico. The uppermost Aptian-lower Albian shelf stratigraphic unit is the Mural Formation (former Mural Limestone) that crops out in the basin-and-range mountains of southeastern Arizona and Sonora, and northwestern Mexico (Stoyanow, 1949; Gilluly, 1956; Scott, 1979, 1987; Monreal et al., 1994). The name refers to Mural Hill near Bisbee, Arizona. Orbitolinids and other benthic foraminifera are common constituents of the Mural Formation (e.g., Douglass, 1960; Scott, 1987; Rosales-Domínguez, 1989; Lawton et al., 2004). Lawton et al. (2004) illustrated a benthic foraminifer as *Voloshinoides* sp. cf. *murgensis* Luperto Sinni and Masse from the Mural Formation of Sonora, Mexico (Fig. 1), which has been recognized to represent a new species. The objective of the present communication is to describe this new taxon, *Voloshinoides sonorensis* n. sp.

2. Geological setting

The Aptian-Albian Comanche shelf spanned the northern margin of the proto-Gulf of Mexico (Scott, 1993). A west-northwest trending rift basin extended northwest from the Gulf (Mack, 1987) forming the Chihuahua trough with the Sonoran shelf on its western side (Fig. 2). During the late Aptian to early Albian transgression the mixed siliciclastic-carbonate Mural Formation was deposited on both the western and northern rift shoulders.

2.1. Lithostratigraphy

The Mural Formation in north-central Sonora, Mexico, is part of the Bisbee Group (Ransome, 1904), which overlies Jurassic and older strata in Arizona and New Mexico as well as in Sonora (Cantu-Chapa, 1976; Bilodeau and Lindberg, 1983; Mack et al., 1986; Dickinson et al., 1989; Jacques-Ayala, 1995; Lawton et al., 2004). The Bisbee Group is composed of basal siliciclastics overlain by the uppermost Aptian-lower Albian Mural Formation, which records the latest Aptian-earliest Albian transgression into Sonora, southern Arizona and New Mexico (Scott, 1987; Warzeski, 1983; González-León et al., 2008). The Bisbee Group is the basal unit of

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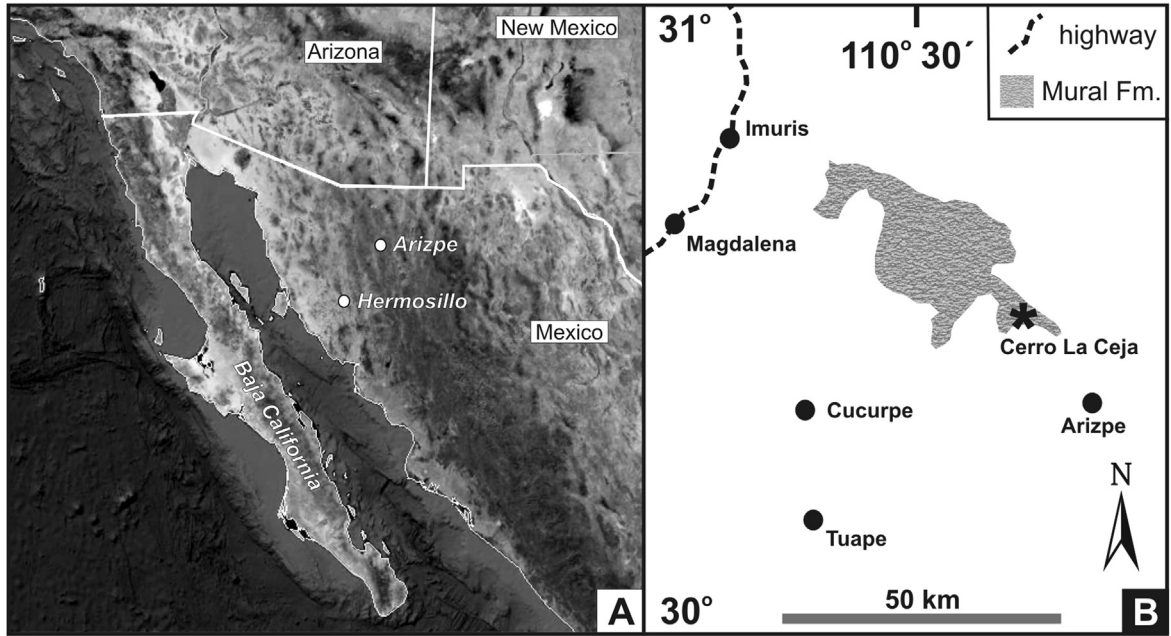


Fig. 1. A–B. Location of the study area in Sonora, northeastern Mexico (from Google Earth, modified).

the provincial Comanchean Series, which spans from the intra-Aptian unconformity below up to the lower-middle Cenomanian unconformity, a duration of about 22 myr.

The Mural Formation is exposed in northern Sonora, northwest Mexico in a 300 km long transect that extends from Sierra El Chanate on the west to Cerro El Caloso Pitaycachi on the north-east (González-León et al., 2008). In Sonora and Arizona it overlies the

Morita Formation (Fig. 3). The base of the Mural Formation is a sharp ravinement surface and it grades upward into the overlying Cintura Formation. The Mural Formation in north–central Sonora is composed of six members and the Morita Formation is divided into three members (Lawton et al., 2004). The depositional environments of the Mural Formation varied from restricted shelf with deltaic and fluvial influence to open shelf with coral-rudist

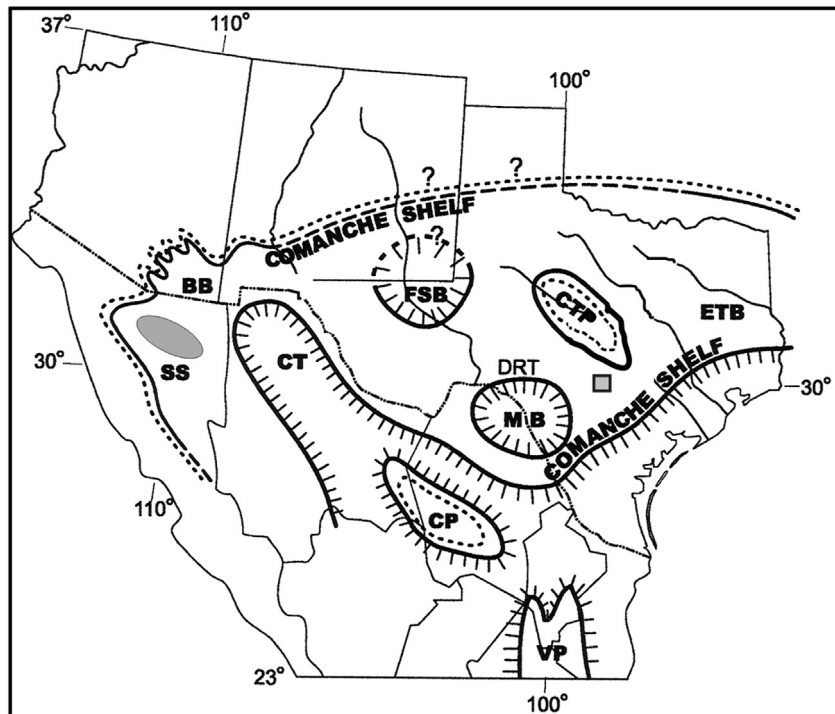


Fig. 2. Early-middle Albian palaeogeographic map of the Comanchean and Sonoran shelves, North America (Scott, 2003). The Cerro la Caja section, type-locality of *Voloshinoides sonorensis* n. sp., is within the shaded area on the Sonoran Shelf (SS). Abbreviations: BB = Bisbee Basin, CP = Coahuila Platform, CT = Chihuahua Trough, CTP = Central Texas Platform, DRT = Devils River Trend, ETB = East Texas Basin, FSB = Fort Stockton Basin, MB = Maverick Basin, SS = Sonoran Shelf, VP = Valles Platform. Early Albian shoreline is approximated by the parallel solid and dashed lines. State boundaries are thin lines; international border is dashed-dotted line.

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