Las Loicas section

(this study, López-Martinez et al., 2017; Vennari et al., 2014)

(a)

Formation | Age | Ammonites | Nannofossils | Calpionellids

Vaca Muerta Formation

Early Berriasian

Late Tithonian

Spiticeras damesi

Argentiniceras noduliferum

Substeueroceras koeneni

Calpionella Zone

Crassicollaria Zone

FO Nannoconus steinmannii minor

FO N. wintereri

FO Rhagodiscus asper

FO Umbria granulosa

Age-depth modeling

139.238 ± 0.049 Ma
Bed LL3

139.956 ± 0.063 Ma
Bed LL9

140.22± 0.13 Ma

140.338 ± 0.083 Ma
Bed LL10

140.54± 0.34 Ma

140.6 ± 0.4 Ma

141.31 ± 0.56 Ma

142.040 ± 0.058 Ma
Bed LL13

70 65 60 55 50 45 40 35 30 25 20 15 10 5 0

142.500 141.500 140.500 139.500

Age (Ma)

Mazatepec section

(this study & López-Martinez et al., 2013)

(b)

Age | Formation | Calpionellid | Nannofossils

Late Tithonian | Early Berriasian

Lower Tamaulipas Formation

Pimienta Formation

Crassicollaria Zone

Calpionella Zone

C.S Zone

Oblonga subzone

Elliptica Subzone

Ferasini Subzone

Alpina Subzone

FO Nannoconus steinmannii steinmannii

FO Nannoconus kamptneri minor

Bed MZT-87

140.512 ± 0.031Ma
Bed MZT-81

~140.7 Ma
Bed MZT-65

~140.9 Ma

Tithonian duration ~7 Myr

~148 Ma

30 25 20 15 10 5

La Yesera section

(this study; Aguirre-Urreta et al., 2014)

(c)

Age | Formation | Ammonites

Early Tithonian

Late Tithonian

Vaca Muerta Formation

Tordillo Fm.

Km

Virg. andesen. zone

Pseudolisso. zitteli

Aulacosph. proximus

Windhause. internispino.

Substeuroceras koeneni

A. nod zone

Spiticeras damesi

Minor fault

Bed LY5

147.112 ± 0.078 Ma

180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10