

Appendix B: Outcrop photographs

In the following pages we show some photographs from the outcrops for the Area II. We ordered the picture according to formations. The location of each section is given in Appendix A.

Appendix B1: Petaca Formation

B1.1:

The picture shows the three facies associations of the Petaca base along the Angostura section: paleosols, muddled fine-grained sandstone, and a reworked pedogenic unit.

B1.2:

B1.2 illustrates the reworked pedogenic unit of the Petaca base along the Angostura section (close-up from B.1.1).

B1.3:

B1.3 pictures the muddled fine-grained sandstone of the Petaca base along the Angostura section (close-up from B.1.1).

B1.4:

Picture B1.4 shows well preserved trace fossils along the Oquitas section.

B1.5:

B1.5 demonstrates a close-up from a trace fossil.

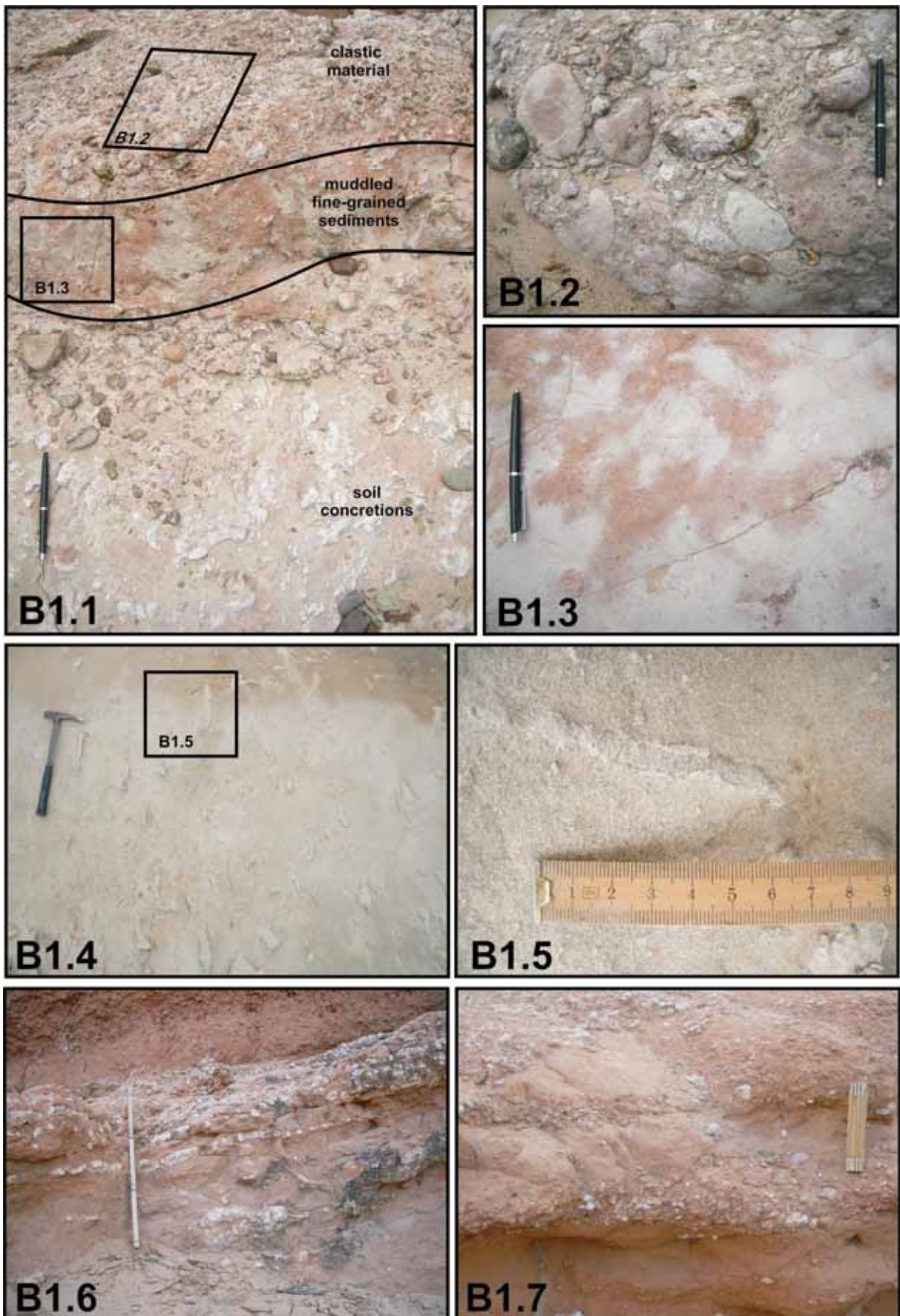
B1.6:

The picture B1.6 has been made at the base of the Petaca Formation along the Iguamirante-West section and shows the basal paleosol unit. The paleosol appear in the demonstrated photograph as stringer.

B1.7:

Stratigraphic upward of photograph B1.6, coarse-grained bas sorted sandstone and reworked pedogenic material overly the basal paleosol unit.

Appendix B1: Petaca Formation



Appendix B2: Yecua Formation

B2.1:

The picture shows a shallow marine facies of the Yecua Formation exposed along the Rio Piray in the Angostura section. The facies contains of calcareous sandstones, shell hash and green to red mudstones.

B2.2:

B2.2 demonstrates a close-up view of the top from the illustration B2.1. The close-up shows the shell hash, green mudstones, and calcareous sandstones. The top of the calcareous sandstone beds show symmetrical ripples.

B2.3:

An up to 30 cm thick shell hash bed from the Angostura section is illustrated in picture B2.3. The shell hash is overlying a thin bed of calcareous sandstone and a red mudstone bed is underlying the shell hash. The shell contains of bivalves, ostracodes, and foraminifera.

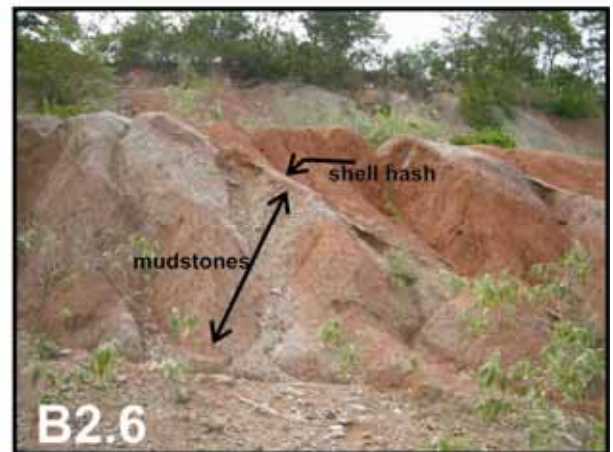
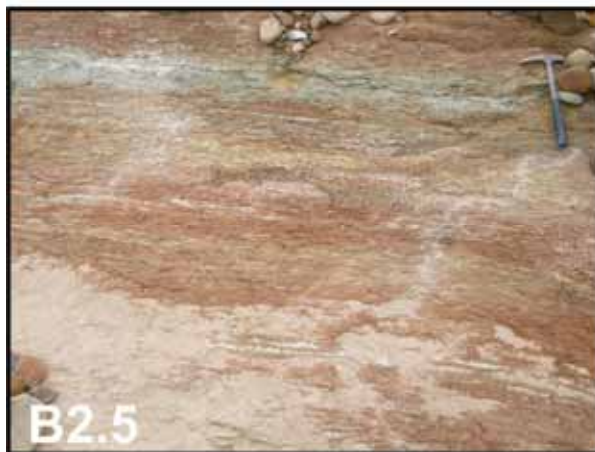
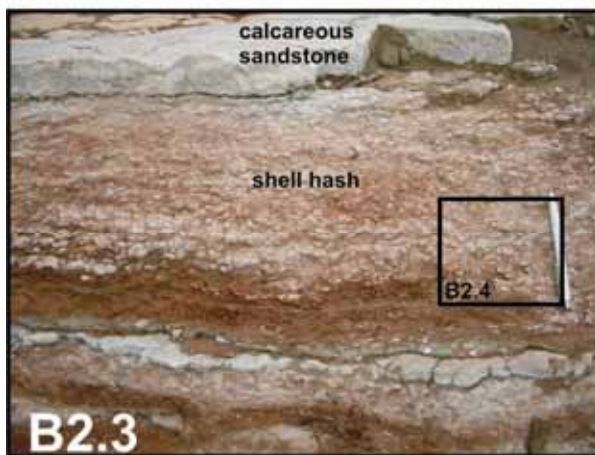
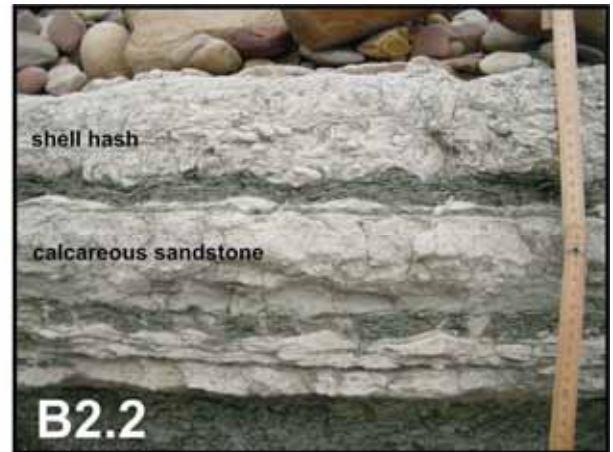
B2.4:

Picture B2.4 shows a close-up of B2.3.

B2.5:

The base of the Yecua Formation in the Angostura sections is built of vary-colored mudstone beds which change the color from red-brown to yellow and later green-grey.

Appendix B2: Yecua Formation



Appendix B2: Yecua Formation

B2.6:

The top of the Yecua Formation in the Angostura sections is built of vary-colored mudstone beds interbedded very thin shell hash beds. The shell hash is composed mainly of ostracodes and subordinated bivalves.

B2.7:

Ooid limestones are developed along the Abapó section in thin beds which are interbedded with grey-green mudstones.

B2.8:

Picture 2.8 shows thin coarsening-upward sequences from green to red mudstone beds to calcareous coarse-grained sandstones of Abapó section.

B2.9:

The mudstones within the Abapó section can reach several meters in thickness while color-change is frequently, ranging from red-brown to grey-green.

B2.10:

Picture B2.10 illustrates shell hash within the Abapó section with bivalves, ostracodes, and foraminifera.

B2.11:

The transition from the Petaca to the Yecua Formation is characterized by increasing content of mudstone that is interbedded with thin coarse-grained sandstone beds, see Fig. 2.11.

B2.12:

Fig. 2.12 shows a close-up view of the interbedded mudstone-sandstone beds of the Yecua Formation in the Oquitas section.

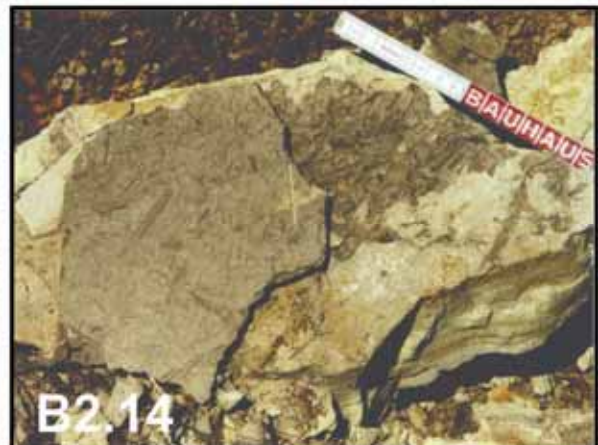
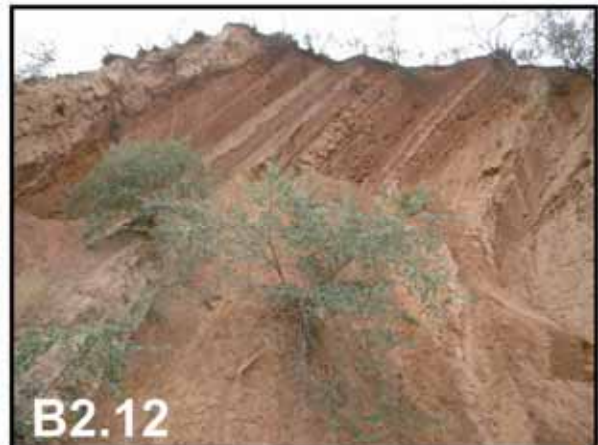
B2.13:

The thinly bedded, coarse-grained sandstone beds, illustrated in picture B2.13, appear within thick beds of mudstones.

B2.14:

A thick bed of laminated interbedded brownish mudstone and yellowish sandstone built up the base of the Yecua Formation along the San Antonio section. This bed contains plant hash within the muddy parts of the bed.

Appendix B2: Yecua Formation



Appendix B3: Tariquia Formation

B3.1:

Thick bedded sandstone beds and interbedded sandstone-mudstone beds characterize the Tariquia Formation within the Aguas Calientes section, see B3.1.

B3.2:

Sandstone bed from the Aguas Calientes section which are several tens meter thick.

B3.3:

Trace fossils within the sandstone beds are documented along the Charagua section.

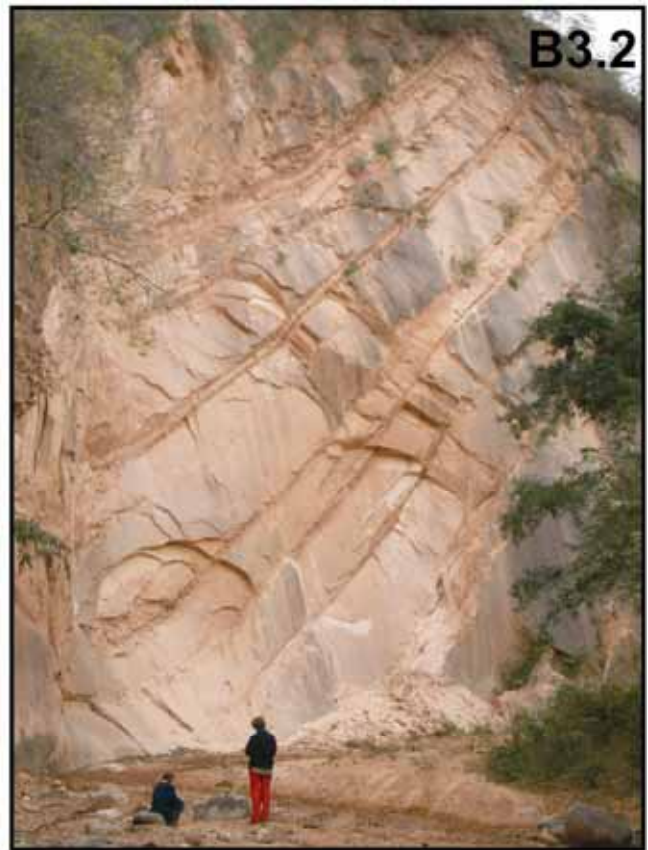
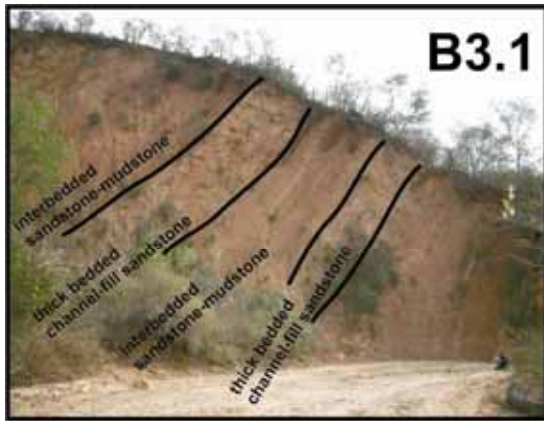
B3.4:

B3.4 shows the transition between thick channelised sandstone, thin sandstone and interbedded sandstone-mudstone of the Itapú section. The thick sandstones occur as channel fill complexes and as crevasse channels.

B3.5:

B3.5 shows the transition between thick channelised sandstone, thin sandstone, and interbedded sandstone-mudstone of the Itapú section. The thick sandstones occur as channel fill complexes.

Appendix B3: Tariquia Formation



Appendix B4: Guandacay and Emborozú Formations

B4.1:

The picture shows typical appearance of the Guandacay Formation in Area II; sandstone bed with subrounded to subangular gravels. This photograph has been made in the uppermost part of the Tatarenda section.

B4.2:

The Guandacay Formation crop out along Abapó section with reddish sandstone beds which contain subangular clasts of different size.

B4.3:

Sandstone beds with few amounts of very well rounded gravels (Abapó section).

B4.4:

The gravel fraction within the Emborozú Formation of the Abapó section are well rounded, good sorted, and the beds are gravel dominated.

B4.5:

B4.5 demonstrates that the thickness of the clast-beds reach up to 2 m within this outcrop in the Abapó section.

B4.6:

The clast-bed pictures channel structure, under- and overlying sandstone beds.

Appendix B4: Guandacay and Emborozú Formations



Appendix B5: Tuff within the Cenozoic sediments

B5.1:

The pictures B5.1, B5.2, and B5.3, show a tuff bed of 1 m thickness, located at the top of the Pirití section. B5.1 shows a general overview of the outcrop.

B5.2:

Laminated structures within the tuff bed.

B5.3:

More massive structure within the tuff bed.

B5.4:

Upper part of the Tariquia Formation within the Iguamirante-West section from a tuff bed.



