

Supplementary material

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Table S1: Data Dictionary with variables considered in the attributes analysis, including measurement units, allowed values, definitions and/or references.

Variable	Measurement units	Allowed values	Description
ID	Numeric	-	ID number assigned to the piece.
Raw material	-	Chert, Quartz, Greywacke, Chalcedony, Schist, Silcrete, Dolerite, Other.	Type of raw material of the piece.
Quartz quality	-	Coarse, Medium, Fine, Rock crystal.	Type of grain and quality of quartz. Coarse quality: large and visible grains (>0.5 mm). Medium quality: small visible grains. Fine quality: absence of visible grains. Rock crystal: absence of visible grains and transparent coloration.
Class	-	Blank, Blank fragment, Retouched piece, Retouched piece fragment, Core, Core fragment, Core preparation product, Core preparation product fragment, Burin spall, Thinn flake, Thinn flake fragment, Anvil, Hammer, Manuport, Shatter, Chip, Crested piece, Core trim, Core tablet, Core front.	Technological class of the piece. According to Andrefsky (1998), Bicho (2011), Debenath and Dibble (1994), Inizan et al. (1999).
Core preparation product	-		Type of core preparation product. According to Inizan et al. (1999).
Retouched piece blank	-	Flake, Elonged blank, Shatter, Other, Indeterminate.	Type of retouched piece blank. According to Inizan et al (1999).
Piece completeness	-	Proximal, Distal, Other.	Part of the piece that is present. Proximal refers to the part which has a bulb and a striking platform; distal is the end of the piece; other refers to mesial.
Cortex	-	0%, 1-30%, 31-60%, 61-99%, 100%.	Percentage of cortex presence in the dorsal face of the piece. According to Andrefsky (2005, pp. 104-105) and Bicho (2011).
Cortex location	-	Proximal, Distal, Mesial, Left lateral, Right lateral, Proximal left lateral, Proximal right lateral, Distal left lateral, Distal right lateral, Mesial left lateral, Mesial right lateral.	Location of cortex in the dorsal surface of the piece.
Cortex type	-	Cobble, Outcrop, Indeterminate.	Type of cortex present on the piece. Cobble refers to rounded clasts of rock; Outcrop is an exposed bedrock or superficial deposits.
Platform type	-	Plain, Dihedral, Faceted, Punctiform, Linear, Winged, Removed, Crushed, Other.	Type of platform. According to Inizan et al (1999, pp. 136).

Table S1: Data Dictionary with variables considered in the attributes analysis, including measurement units, allowed values, definitions and/or references. (*continued*)

Variable	Measurement units	Allowed values	Description
Platform cortex	-	No, Yes complete, Yes partial.	Presence of cortex on the platform.
Lipping	-	No, Yes.	Presence of a lip on the piece. According to Inizan et al (1999, pp. 144).
Blank shape	-	Parallel, Convergent, Divergent, Biconvex, Irregular, Circular, Dejete, Other.	Type of blank shape. According to Almeida (2000, pp. 107).
Cross section	-	Triangular, Trapezoidal, Quadrangular, Irregular, Lenticular, Other.	Type of cross section of the piece. According to Scerri et al (2015, pp. 19).
Blank tip	-	Feather, Hinge, Step, Overshoot, Pointed.	Type of blank tip. According to Almeida (2000, pp. 106).
Profile	-	Straight, Curved, Twisted, Irregular.	Type of blank profile. According to Almeida (2000, pp. 106).
Scar count	Numeric	NA	Count of dorsal flake scars over 5 mm. According to Andrefsky (2005, pp. 106).
Scar pattern	-	Unidirectional, Bidirectional, Crossed, Sub-centripetal, Centripetal, Other.	Type of scar pattern on the dorsal surface of the piece. According to Scerri et al (2015, pp. 19).
Thickness	In mm	-	Measurement of piece maximum thickness.
Max width	In mm	-	Measurement of piece maximum width.
Proximal width	In mm	-	Measurement of piece proximal width.
Mesial width	In mm	-	Measurement of piece mesial width.
Distal width	In mm	-	Measurement of piece distal width.
Length	In mm	-	Measurement of piece central length according to the technological axis.
Platform thickness	In mm	-	Measurement of platform central thickness.
Platform width	In mm	-	Measurement of platform central width.
Weight	In grams	-	Weight measurement of piece.
Exterior platform angle	In degrees	-	Measurement of the angle between the platform and the dorsal surface of the piece. According to Dibble (1997).

Table S1: Data Dictionary with variables considered in the attributes analysis, including measurement units, allowed values, definitions and/or references. (*continued*)

Variable	Measurement units	Allowed values	Description
Core type	-	Single platform, Single prismatic, Single pyramidal, Two single platforms, Opposed, Opposed twisted, Other opposed, Orthogonal, Inform, Bipolar, Globular, Centripedal, Discoidal, Levallois, Chopper, Tested, Other.	Type of core. According to Zilhao (1997, pp. 17).
Core Cross Section	-	Circular, Triangular, Quadrangular, Irregular.	Type of core cross section.
Number of core faces	-	One, Two, Three, Four, More than four.	Count of core debitage surfaces.
Core platform	-	Plain, Dihedral, Faceted, Cortical, Crushed, Other.	Type of core platform. According to Inizan et al (1999, pp. 136).
Main face cortex	-	0%, 1-30%, 31-60%, 61-99%.	Percentage of cortex of the main face. Main face refers to the debitage surface with most scars.
Main face scar count	Numeric	-	Count of scars over 5 mm in the main face of the core.
Main face scar direction	-	Unidirectional, Bidirectional opposed, Bidirectional alternate, Crossed, Sub-centripedal, Centripedal, Other.	Direction of scars in the main face of the core. According to Scerri et al (2015, pp. 19).
Main face aris orientation	-	Parallel, Convergent, Indeterminate.	Orientation of main face aris.
Main face scar length	In mm	-	Central length measurement of the last scar, over 5 mm, in the main face of the core.
Main face scar width	In mm	-	Maximum width measurement of the last scar, over 5 mm, in the main face of the core.
Main face platform angle	In degrees	-	Measurement of the angle between the platform and the main face of the core.
Main face core use	-	Flakes, Blades, Bladelets, Points, Mixed.	Type of products extracted from the main face of the core. Distinction of blade and bladelet according to Tixier (1963).
Alteration	-	None, Patinated, Concretion, Fire, Mix.	Type of alteration of the piece. Patina refers to a layer covering the surface of a piece; concretion is a mass of mineral formed around a nucleus.
Fire	-	Burned, Rubefact, Heat treatment.	Type of fire alteration to the piece. According to Inizan et al (1999, pp. 24).

Table S1: Data Dictionary with variables considered in the attributes analysis, including measurement units, allowed values, definitions and/or references. (*continued*)

Variable	Measurement units	Allowed values	Description
Retouched piece typology	-	-	Retouched piece typology as defined by Sonnevile-Bordes and Perrot (1956), adapted by Zilhao (1997) for the Portuguese Estremadura.
Chip quantity	Numeric	-	Count of chips. According to Andrefsky (2005, pp. 12).
Other notes	-	-	NA

Table S2: Vale Boi. Terrace identified layers with sediment description.

Layer	Description
Layer 1	Reddish dark brown silt/clay matrix sediment, with a granulous texture, possibly disturbed by agricultural processes; ceramics until 30 cm depth, immediately above the transition between layer 1 and 2.
Layer 2	Dark sediment, more compact and with a heavier clay-like component; has a thickness of 25-30 cm and is well preserved; bones and ceramics are often in connection, with restricted spatial distributions; the limestone blocks correlate with the antropical structures dug in 2004; where the level with a Neolithic occupation has been identified.
Layer 3	Silt and clay matrix sediment, with some inclusions, mostly small limestone clasts; this layer is often interrupted by the deposition of levels of clasts with different sizes; presence of lithic artefacts and fauna is constant in all of the deposit, though it is possible to identify two different cultural horizons: Epipaleolithic (3A) and Solutrean (3B).
Layer 4	Identical to layer 3 but separated by the presence of a gravel level; contains sedimentary lateral variations, marked by different intensity of sediment compaction and/or concentration of organic materials (4B, 4C, 4D, 4E); identified two different cultural horizons of Solutrean and Proto-Solutrean chronology.
Layer 5	Silt and clay matrix sediment with a heavy presence of organic elements, such as small, medium and large faunal remains (frequently calcinated), which gives this layer a dark color.
Layer 6	Silt and clay matrix sediment with a heavy presence of organic elements, such as small, medium and large faunal remains (frequently calcinated), which gives this layer a dark color; presence of bigger quantity of small and medium sized limestone clasts.

Table S3: Summary of radiocarbon dates from Portuguese Proto-Solutrean. Adapted from Zilhão (1997), Cascalheira and Bicho (2013), Belmiro (2018) and Benedetti et al. (2019). Calibration curves are IntCal13 and Marine13, using OxCal 4.1.7 (online).

Site	Level	Lab. Ref	Age (BP)	SD	Sample type	Calibrated lower 95%	Calibrated upper 95%
LP	T	Wk-37655c	18960	80	Bone	22620	22998
LP	T	UGAMS-23727	19530	50	Charcoal	23432	23639
LP	T	UGAMS-23718	20240	50	Charcoal	24208	24420
LP	T	Beta-208221e	20240	110	Charcoal	24083	24539
LP	T	UGAMS-23725	20320	50	Charcoal	24300	24490
Vale Boi	5	Wk-42831	20329	90	Shell	23764	24175
Alecrim	6	Beta-203513	20510	150	Bone	24312	25121
LP	T	UGAMS-23726	20530	50	Charcoal	24527	24910
LP	T	UGAMS-23722	20630	60	Charcoal	24601	25062
LP	T	Beta-229781e	20700	100	Bone	24596	25215
LP	T	UGAMS-23721	20710	60	Charcoal	24744	25155
Vale Boi	5	Wk-42830	20818	107	Charcoal	24760	25381
CPM III Inferior	NA	ICEN-541	21080	850	Charcoal	23341	27030
Lagar Velho	6	OxA-8420	21180	240	Charcoal	24937	25876
Lagar Velho	6	Sac-1561	21380	810	Bone	23826	27156
Anecrial	2b	ICEN-964	21560	680	Charcoal	24265	27125
Anecrial	2b	OxA-5526	21560	220	Charcoal	25447	26236
Terra do Manuel	2s	EHT-6038	21770	210	Charcoal	25690	26444
Alecrim	6	Wk-25514	21794	170	Bone	25770	26384
Buraca Escura	2e	OxA-5524	21820	200	Bone	25766	26461
Lagar Velho	6	OxA-8418	22180	180	Charcoal	26060	26928
Vale Boi	5	Wk-44416	22358	80	Shell	26014	26324
LP	U	Beta-234373e	22560	110	Charcoal	26584	27146
LP	U	Beta-234374e	22590	110	Charcoal	26601	27171
LP	U	Beta-208222e	22660	240	Charcoal	26390	27393
LP	T	Wk-37656	23100	130	Charcoal	27218	27571



Figure S1: Dolerite flake removed from a debitage waste piece. Left: ventral side with interior colour and texture of the raw material; Right: dorsal side with patina.

Table S4: Vale Boi - Lower 5 - core attributes frequencies.

Tecnological attributes	Quartz	Chert	Greywacke	Other
CoreType, n (%)				
Opposed	1 (6.7)	0 (0.0)	0 (0.0)	0 (0.0)
SinglePlat	11 (73.3)	8 (50.0)	2 (100.0)	0 (0.0)
SinglePrismatic	2 (13.3)	6 (37.5)	0 (0.0)	0 (0.0)
SinglePyramidal	1 (6.7)	1 (6.2)	0 (0.0)	1 (100.0)
TwoSinglePlat	0 (0.0)	1 (6.2)	0 (0.0)	0 (0.0)
NumberCoreFaces, n (%)				
Four	3 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)
MoreThanFour	0 (0.0)	2 (12.5)	0 (0.0)	0 (0.0)
One	4 (26.7)	7 (43.8)	2 (100.0)	1 (100.0)
Three	3 (20.0)	3 (18.8)	0 (0.0)	0 (0.0)
Two	5 (33.3)	4 (25.0)	0 (0.0)	0 (0.0)
CorePlatform, n (%)				
Cortical	3 (20.0)	1 (6.2)	2 (100.0)	0 (0.0)
Faceted	1 (6.7)	1 (6.2)	0 (0.0)	0 (0.0)
Plain	11 (73.3)	14 (87.5)	0 (0.0)	1 (100.0)
MainFaceCoreUse, n (%)				
Bladelets	1 (6.7)	2 (12.5)	0 (0.0)	0 (0.0)
Blades	1 (6.7)	4 (25.0)	0 (0.0)	0 (0.0)
Flakes	13 (86.7)	10 (62.5)	2 (100.0)	0 (0.0)
Mixed	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)

Table S5: Vale Boi - Upper 5/4E - core attributes frequencies.

Tecnological attributes	Quartz	Chert	Other	Total
CoreType, n (%)				
Opposed	0 (0.0)	3 (11.1)	0 (0.0)	3 (5.1)
Other	0 (0.0)	3 (11.1)	0 (0.0)	3 (5.1)
SinglePlat	21 (72.4)	9 (33.3)	2 (100.0)	32 (54.2)
SinglePrismatic	6 (20.7)	3 (11.1)	0 (0.0)	10 (16.9)
SinglePyramidal	1 (3.4)	4 (14.8)	0 (0.0)	5 (8.5)
TwoSinglePlat	1 (3.4)	5 (18.5)	0 (0.0)	6 (10.2)
NumberCoreFaces, n (%)				
Four	1 (3.4)	2 (7.4)	0 (0.0)	3 (5.1)
MoreThanFour	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.7)
One	14 (48.3)	12 (44.4)	2 (100.0)	28 (47.5)
Three	2 (6.9)	4 (14.8)	0 (0.0)	6 (10.2)
Two	12 (41.4)	9 (33.3)	0 (0.0)	21 (35.6)
CorePlatform, n (%)				
Cortical	9 (31.0)	1 (3.7)	1 (50.0)	11 (18.6)
Crushed	1 (3.4)	2 (7.4)	0 (0.0)	3 (5.1)
Dihedral	0 (0.0)	2 (7.4)	0 (0.0)	2 (3.4)
Faceted	1 (3.4)	5 (18.5)	0 (0.0)	6 (10.2)
Other	0 (0.0)	2 (7.4)	0 (0.0)	2 (3.4)
Plain	18 (62.1)	15 (55.6)	1 (50.0)	35 (59.3)
MainFaceCoreUse, n (%)				
Bladelets	3 (10.3)	3 (11.1)	0 (0.0)	6 (10.2)
Blades	2 (6.9)	4 (14.8)	0 (0.0)	6 (10.2)
Flakes	20 (69.0)	16 (59.3)	2 (100.0)	39 (66.1)
Mixed	4 (13.8)	4 (14.8)	0 (0.0)	8 (13.6)

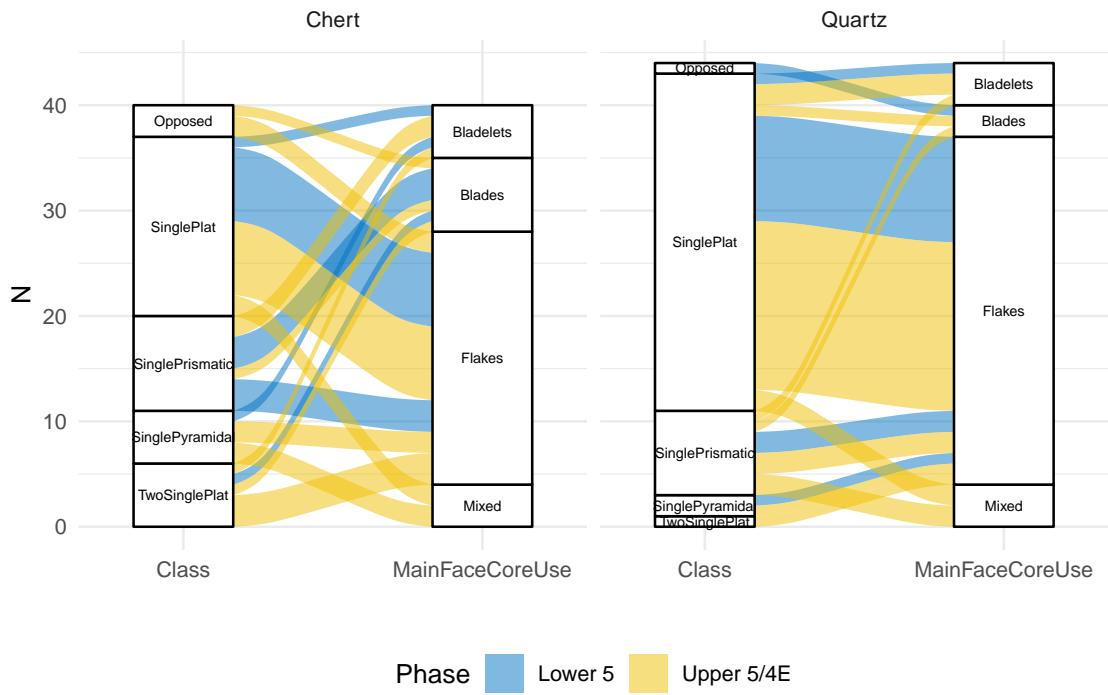


Figure S2: Vale Boi. Interaction of core type with type of extracted products by raw material and phase.

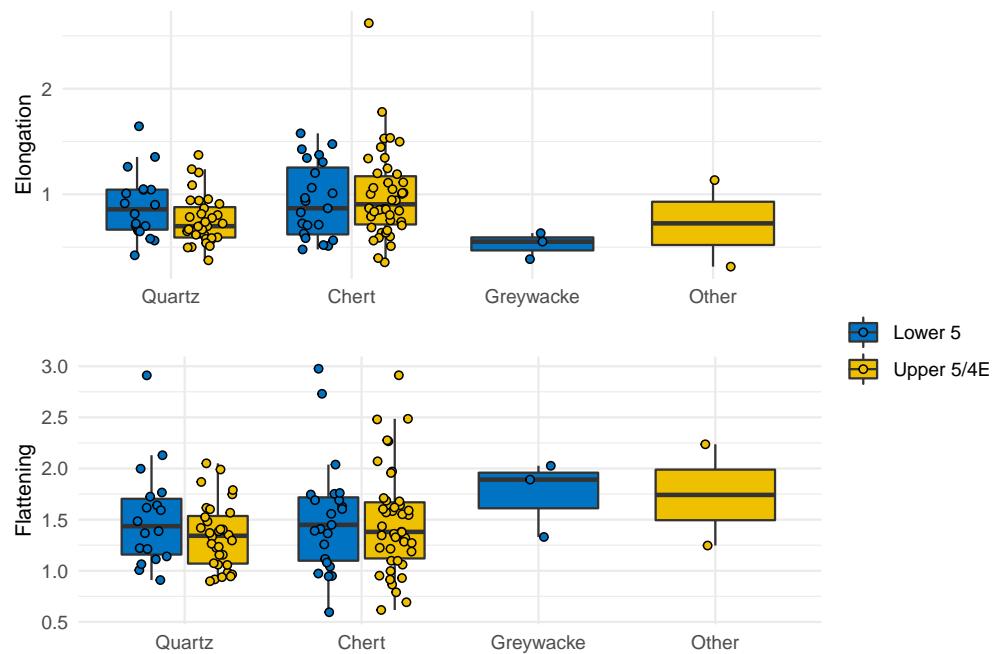


Figure S3: Vale Boi. Boxplots of core elongation and flattening by raw material and phase.

Table S6: Vale Boi - Lower 5 - mean and standard deviation of core measurements (in mm).

Core metrics	Quartz	Chert	Greywacke	Other	Total
MedWidth, M (SD)	31.6 (14.0)	30.3 (15.2)	59.7 (28.1)	41.0 (NA)	32.8 (16.7)
Length, M (SD)	26.6 (7.2)	29.1 (12.9)	32.4 (10.5)	36.3 (NA)	28.7 (10.5)
Thickness, M (SD)	23.4 (11.8)	22.8 (6.6)	36.1 (8.0)	32.6 (NA)	24.1 (9.5)
PlatformWidth, M (SD)	32.1 (13.2)	29.2 (11.6)	64.6 (26.3)	35.6 (NA)	32.6 (15.5)
PlatformThickness, M (SD)	22.1 (11.3)	21.4 (7.0)	40.3 (9.4)	23.9 (NA)	22.9 (9.9)
MainFacePlatformAngle, M (SD)	68.1 (32.8)	56.2 (40.2)	56.5 (52.2)	83.1 (NA)	60.2 (38.0)
Weight, M (SD)	35.0 (44.7)	35.0 (64.4)	107.5 (80.0)	84.8 (NA)	40.7 (58.6)

Table S7: Vale Boi - Upper 5/4E - mean and standard deviation of core measurements (in mm).

Core metrics	Quartz	Chert	Greywacke	Other	Total
MedWidth, M (SD)	33.4 (13.0)	26.5 (8.7)	18.5 (NA)	51.4 (6.8)	29.9 (11.7)
Length, M (SD)	25.8 (10.2)	26.5 (8.9)	33.9 (NA)	36.9 (26.3)	26.6 (9.9)
Thickness, M (SD)	27.0 (9.9)	21.6 (10.0)	18.1 (NA)	32.6 (9.4)	24.1 (10.3)
PlatformWidth, M (SD)	34.4 (13.1)	25.9 (9.0)	17.5 (NA)	43.1 (16.7)	29.8 (11.9)
PlatformThickness, M (SD)	26.8 (10.3)	20.1 (9.5)	16.1 (NA)	19.5 (2.5)	22.8 (10.2)
MainFacePlatformAngle, M (SD)	70.4 (26.0)	52.2 (42.5)	86.7 (NA)	89.8 (18.3)	61.2 (37.0)
Weight, M (SD)	41.2 (50.9)	20.8 (15.1)	14.7 (NA)	99.8 (79.2)	31.2 (38.6)

Table S8: Vale Boi - Lower 5 - flake attributes frequencies.

Attributes	Quartz	Chert	Greywacke	Dolerite	Chalcedony	Other	Total
CrossSection, n (%)							
Irregular	118 (49.8)	50 (35.7)	12 (31.6)	1 (33.3)	2 (40.0)	2 (50.0)	185 (43.3)
Lenticular	24 (10.1)	32 (22.9)	7 (18.4)	0 (0.0)	0 (0.0)	1 (25.0)	64 (15.0)
Other	5 (2.1)	3 (2.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	8 (1.9)
Quadrangular	13 (5.5)	3 (2.1)	3 (7.9)	0 (0.0)	0 (0.0)	1 (25.0)	20 (4.7)
Trapezoidal	11 (4.6)	5 (3.6)	4 (10.5)	0 (0.0)	0 (0.0)	0 (0.0)	20 (4.7)
Triangular	66 (27.8)	47 (33.6)	12 (31.6)	2 (66.7)	3 (60.0)	0 (0.0)	130 (30.4)
BlankShape, n (%)							
Circular	9 (3.8)	4 (2.9)	1 (2.6)	0 (0.0)	0 (0.0)	1 (25.0)	15 (3.5)
Convergent	60 (25.3)	20 (14.3)	8 (21.1)	1 (33.3)	1 (20.0)	0 (0.0)	90 (21.1)
Dejete	4 (1.7)	5 (3.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	9 (2.1)
Divergent	9 (3.8)	19 (13.6)	2 (5.3)	0 (0.0)	1 (20.0)	1 (25.0)	32 (7.5)
Irregular	108 (45.6)	68 (48.6)	20 (52.6)	0 (0.0)	3 (60.0)	0 (0.0)	199 (46.6)
Parallel	47 (19.8)	24 (17.1)	7 (18.4)	2 (66.7)	0 (0.0)	2 (50.0)	82 (19.2)
Profile, n (%)							
Curved	32 (13.5)	62 (44.3)	7 (18.4)	1 (33.3)	0 (0.0)	3 (75.0)	105 (24.6)
Irregular	47 (19.8)	14 (10.0)	9 (23.7)	0 (0.0)	2 (40.0)	0 (0.0)	72 (16.9)
Straight	154 (65.0)	60 (42.9)	21 (55.3)	2 (66.7)	2 (40.0)	1 (25.0)	240 (56.2)
Twisted	4 (1.7)	4 (2.9)	1 (2.6)	0 (0.0)	1 (20.0)	0 (0.0)	10 (2.3)
BlankTip, n (%)							
Feather	65 (27.4)	68 (48.6)	15 (39.5)	0 (0.0)	2 (40.0)	1 (25.0)	151 (35.4)
Hinge	107 (45.1)	28 (20.0)	10 (26.3)	2 (66.7)	1 (20.0)	1 (25.0)	149 (34.9)
Overshoot	1 (0.4)	4 (2.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5 (1.2)
Pointed	31 (13.1)	9 (6.4)	2 (5.3)	0 (0.0)	0 (0.0)	0 (0.0)	42 (9.8)
Step	33 (13.9)	31 (22.1)	11 (28.9)	1 (33.3)	2 (40.0)	2 (50.0)	80 (18.7)
PlatformType, n (%)							
Crushed	79 (33.3)	21 (15.0)	2 (5.3)	1 (33.3)	2 (40.0)	0 (0.0)	105 (24.6)
Dihedral	2 (0.8)	6 (4.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	8 (1.9)

Table S8: Vale Boi - Lower 5 - flake attributes frequencies. (*continued*)

Attributes	Quartz	Chert	Greywacke	Dolerite	Chalcedony	Other	Total
Faceted	0 (0.0)	2 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.5)
Linear	0 (0.0)	5 (3.6)	1 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	6 (1.4)
Other	2 (0.8)	0 (0.0)	1 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	3 (0.7)
Plain	154 (65.0)	97 (69.3)	34 (89.5)	2 (66.7)	3 (60.0)	3 (75.0)	293 (68.6)
Winged	0 (0.0)	9 (6.4)	0 (0.0)	0 (0.0)	0 (0.0)	1	10 (25.0) (2.3)
PlatformCortex, n (%)							
No	233 (98.3)	121 (86.4)	34 (89.5)	3 (100.0)	5 (100.0)	4 (100.0)	400 (93.7)
YesComplete	3 (1.3)	15 (10.7)	4 (10.5)	0 (0.0)	0 (0.0)	0 (0.0)	22 (5.2)
YesPartial	1 (0.4)	4 (2.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5 (1.2)
ScarCount, n (%)							
0	2 (0.8)	2 (1.4)	2 (5.3)	0 (0.0)	0 (0.0)	0 (0.0)	6 (1.4)
1	89 (37.6)	39 (27.9)	17 (44.7)	1 (33.3)	1 (20.0)	3 (75.0)	150 (35.1)
2	100 (42.2)	49 (35.0)	11 (28.9)	1 (33.3)	3 (60.0)	1 (25.0)	165 (38.6)
3	38 (16.0)	32 (22.9)	4 (10.5)	1 (33.3)	0 (0.0)	0 (0.0)	75 (17.6)
4	7 (3.0)	12 (8.6)	3 (7.9)	0 (0.0)	1 (20.0)	0 (0.0)	23 (5.4)
5	0 (0.0)	5 (3.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5 (1.2)
6	1 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.2)
7	0 (0.0)	1 (0.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.2)
8	0 (0.0)	0 (0.0)	1 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.2)
ScarPattern, n (%)							
Bidirectional	3 (1.3)	13 (9.3)	2 (5.3)	0 (0.0)	0 (0.0)	0 (0.0)	18 (4.2)
Centripetal	0 (0.0)	0 (0.0)	1 (2.6)	0 (0.0)	1 (20.0)	0 (0.0)	2 (0.5)
Crossed	1 (0.4)	1 (0.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.5)
None	2 (0.8)	2 (1.4)	2 (5.3)	0 (0.0)	0 (0.0)	0 (0.0)	6 (1.4)
Other	0 (0.0)	2 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.5)
Unidirectional	231 (97.5)	122 (87.1)	33 (86.8)	3 (100.0)	4 (80.0)	4 (100.0)	397 (93.0)
Cortex, n (%)							
0%	227 (95.8)	115 (82.1)	31 (81.6)	3 (100.0)	5 (100.0)	4 (100.0)	385 (90.2)
1-30%	4 (1.7)	13 (9.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	17 (4.0)
100%	2 (0.8)	2 (1.4)	2 (5.3)	0 (0.0)	0 (0.0)	0 (0.0)	6 (1.4)
31-	3 (1.3)	6 (4.3)	3 (7.9)	0 (0.0)	0 (0.0)	0 (0.0)	12
60%							(2.8)
61-	1 (0.4)	4 (2.9)	2 (5.3)	0 (0.0)	0 (0.0)	0 (0.0)	7 (1.6)
99%							

Table S9: Vale Boi - Upper 5/4E - flake attributes frequencies.

Attributes	Quartz	Chert	Greywacke	Dolerite	Chalcedony	Other	Total
CrossSection, n (%)							
Irregular	191 (49.4)	121 (36.4)	30 (39.5)	5 (38.5)	6 (42.9)	1 (16.7)	354 (42.8)
Lenticular	44 (11.4)	45 (13.6)	19 (25.0)	1 (7.7)	2 (14.3)	1 (16.7)	112 (13.5)
Other	6 (1.6)	7 (2.1)	2 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	15 (1.8)
Quadrangular	14 (3.6)	4 (1.2)	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	19 (2.3)
Trapezoidal	12 (3.1)	24 (7.2)	2 (2.6)	3 (23.1)	2 (14.3)	0 (0.0)	43 (5.2)
Triangular	120 (31.0)	131 (39.5)	22 (28.9)	4 (30.8)	4 (28.6)	4 (66.7)	285 (34.4)
BlankShape, n (%)							
Circular	16 (4.1)	7 (2.1)	2 (2.6)	1 (7.7)	1 (7.1)	0 (0.0)	27 (3.3)
Convergent	113 (29.2)	67 (20.2)	13 (17.1)	1 (7.7)	3 (21.4)	0 (0.0)	197 (23.8)
Dejete	6 (1.6)	15 (4.5)	8 (10.5)	0 (0.0)	0 (0.0)	0 (0.0)	29 (3.5)
Divergent	32 (8.3)	55 (16.6)	6 (7.9)	2 (15.4)	2 (14.3)	0 (0.0)	97 (11.7)
Irregular	111 (28.7)	118 (35.5)	41 (53.9)	9 (69.2)	4 (28.6)	5 (83.3)	288 (34.8)
Other	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.1)
Parallel	108 (27.9)	70 (21.1)	6 (7.9)	0 (0.0)	4 (28.6)	1 (16.7)	189 (22.8)
Profile, n (%)							
Curved	75 (19.4)	146 (44.0)	24 (31.6)	6 (46.2)	6 (42.9)	4 (66.7)	261 (31.5)
Irregular	60 (15.5)	24 (7.2)	10 (13.2)	1 (7.7)	2 (14.3)	0 (0.0)	97 (11.7)
Straight	246 (63.6)	157 (47.3)	42 (55.3)	5 (38.5)	6 (42.9)	2 (33.3)	458 (55.3)
Twisted	6 (1.6)	5 (1.5)	0 (0.0)	1 (7.7)	0 (0.0)	0 (0.0)	12 (1.4)
BlankTip, n (%)							
Feather	76 (19.6)	139 (41.9)	34 (44.7)	6 (46.2)	9 (64.3)	3 (50.0)	267 (32.2)
Hinge	220 (56.8)	64 (19.3)	22 (28.9)	2 (15.4)	1 (7.1)	2 (33.3)	311 (37.6)
Overshoot	3 (0.8)	8 (2.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	11 (1.3)
Pointed	49 (12.7)	29 (8.7)	8 (10.5)	0 (0.0)	2 (14.3)	0 (0.0)	88 (10.6)
Step	39 (10.1)	92 (27.7)	12 (15.8)	5 (38.5)	2 (14.3)	1 (16.7)	151 (18.2)

Table S9: Vale Boi - Upper 5/4E - flake attributes frequencies. (*continued*)

Attributes	Quartz	Chert	Greywacke	Dolerite	Chalcedony	Other	Total
PlatformType, n (%)							
Crushed	139 (35.9)	53 (16.0)	5 (6.6)	2 (15.4)	2 (14.3)	0 (0.0)	201 (24.3)
Dihedral	2 (0.5)	23 (6.9)	1 (1.3)	1 (7.7)	3 (21.4)	0 (0.0)	30 (3.6)
Faceted	0 (0.0)	8 (2.4)	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	9 (1.1)
Linear	2 (0.5)	10 (3.0)	3 (3.9)	1 (7.7)	0 (0.0)	0 (0.0)	16 (1.9)
Other	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.1)
Plain	243 (62.8)	217 (65.4)	66 (86.8)	9 (69.2)	7 (50.0)	6 (100.0)	548 (66.2)
Winged	1 (0.3)	20 (6.0)	0 (0.0)	0 (0.0)	2 (14.3)	0 (0.0)	23 (2.8)
PlatformCortex, n (%)							
No	377 (97.4)	270 (81.3)	65 (85.5)	12 (92.3)	14 (100.0)	5 (83.3)	743 (89.7)
YesComplete	6 (1.6)	35 (10.5)	11 (14.5)	1 (7.7)	0 (0.0)	1 (16.7)	54 (6.5)
YesPartial	4 (1.0)	27 (8.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	31 (3.7)
ScarCount, n (%)							
0	5 (1.3)	16 (4.8)	2 (2.6)	0 (0.0)	0 (0.0)	1 (16.7)	24 (2.9)
1	156 (40.3)	78 (23.5)	25 (32.9)	3 (23.1)	5 (35.7)	0 (0.0)	267 (32.2)
2	160 (41.3)	125 (37.7)	30 (39.5)	6 (46.2)	4 (28.6)	3 (50.0)	328 (39.6)
3	60 (15.5)	79 (23.8)	14 (18.4)	4 (30.8)	2 (14.3)	2 (33.3)	161 (19.4)
4	5 (1.3)	26 (7.8)	2 (2.6)	0 (0.0)	1 (7.1)	0 (0.0)	34 (4.1)
5	1 (0.3)	5 (1.5)	2 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	8 (1.0)
6	0 (0.0)	3 (0.9)	1 (1.3)	0 (0.0)	1 (7.1)	0 (0.0)	5 (0.6)
8	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (7.1)	0 (0.0)	1 (0.1)
ScarPattern, n (%)							
Bidirectional	11 (2.8)	26 (7.8)	2 (2.6)	2 (15.4)	2 (14.3)	0 (0.0)	43 (5.2)
Centripetal	1 (0.3)	5 (1.5)	3 (3.9)	1 (7.7)	0 (0.0)	0 (0.0)	10 (1.2)
None	5 (1.3)	16 (4.8)	2 (2.6)	0 (0.0)	0 (0.0)	1 (16.7)	24 (2.9)
Other	2 (0.5)	1 (0.3)	2 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	5 (0.6)
Unidirectional	368 (95.1)	284 (85.5)	67 (88.2)	10 (76.9)	12 (85.7)	5 (83.3)	746 (90.1)
Cortex, n (%)							

Table S9: Vale Boi - Upper 5/4E - flake attributes frequencies. (*continued*)

Attributes	Quartz	Chert	Greywacke	Dolerite	Chalcedony	Other	Total
0%	369 (95.3)	231 (69.6)	66 (86.8)	11 (84.6)	14 (100.0)	4 (66.7)	695 (83.9)
1-30%	5 (1.3)	55 (16.6)	5 (6.6)	1 (7.7)	0 (0.0)	1 (16.7)	67 (8.1)
100%	5 (1.3)	16 (4.8)	2 (2.6)	0 (0.0)	0 (0.0)	1 (16.7)	24 (2.9)
31-60%	7 (1.8)	11 (3.3)	1 (1.3)	1 (7.7)	0 (0.0)	0 (0.0)	20 (2.4)
61-99%	1 (0.3)	19 (5.7)	2 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	22 (2.7)

Table S10: Vale Boi - Lower 5 - mean and standard deviation of flake measurements (in mm).

Measurements	Quartz	Chert	Greywacke	Dolerite	Chalcedony	Other	Total
MedWidth, M (SD)	18.4 (6.8)	16.6 (6.3)	28.8 (13.5)	14.7 (3.9)	15.0 (5.7)	23.0 (3.5)	18.7 (8.1)
Length, M (SD)	23.0 (7.6)	19.4 (7.3)	32.9 (13.5)	18.0 (5.0)	20.6 (10.2)	26.3 (7.4)	22.7 (8.9)
Thickness, M (SD)	8.9 (3.8)	5.5 (2.6)	10.9 (6.0)	5.5 (1.3)	6.6 (3.5)	6.6 (3.0)	7.9 (4.1)
PlatformWidth, M (SD)	15.2 (7.4)	10.9 (5.6)	21.9 (12.1)	11.1 (3.4)	8.8 (4.7)	12.6 (5.1)	14.3 (7.9)
PlatformThickness, M (SD)	7.84 (4.20)	4.58 (2.44)	9.84 (5.07)	4.86 (1.17)	4.45 (2.87)	5.27 (3.46)	6.86 (4.16)
ExteriorPlatformAngle, M (SD)	78.1 (34.2)	73.0 (32.0)	80.0 (32.1)	76.9 (8.6)	101.6 (27.6)	84.5 (7.4)	76.9 (33.0)

Table S11: Vale Boi - Upper 5/4E - mean and standard deviation of flake measurements (in mm).

Measurements	Quartz	Chert	Greywacke	Dolerite	Chalcedony	Other	Total
MedWidth, M (SD)	18.1 (7.2)	16.7 (6.2)	25.9 (10.8)	21.1 (7.1)	17.7 (5.1)	25.6 (11.0)	18.3 (7.7)
Length, M (SD)	23.2 (8.0)	21.0 (7.3)	28.6 (11.1)	23.1 (8.0)	21.1 (8.4)	39.3 (13.7)	22.9 (8.5)
Thickness, M (SD)	8.7 (3.5)	5.9 (3.0)	9.2 (4.5)	6.1 (2.9)	6.3 (2.1)	10.6 (2.8)	7.6 (3.7)
PlatformWidth, M (SD)	15.3 (7.7)	11.4 (5.1)	20.3 (9.3)	17.7 (10.5)	13.3 (4.7)	16.4 (5.5)	14.2 (7.4)
PlatformThickness, M (SD)	7.56 (3.71)	4.93 (2.74)	7.83 (4.24)	5.45 (3.09)	5.43 (2.11)	8.23 (3.10)	6.47 (3.62)
ExteriorPlatformAngle, M (SD)	84.3 (30.4)	70.6 (33.6)	77.1 (31.0)	86.7 (17.4)	77.4 (26.3)	80.1 (18.1)	78.0 (32.1)

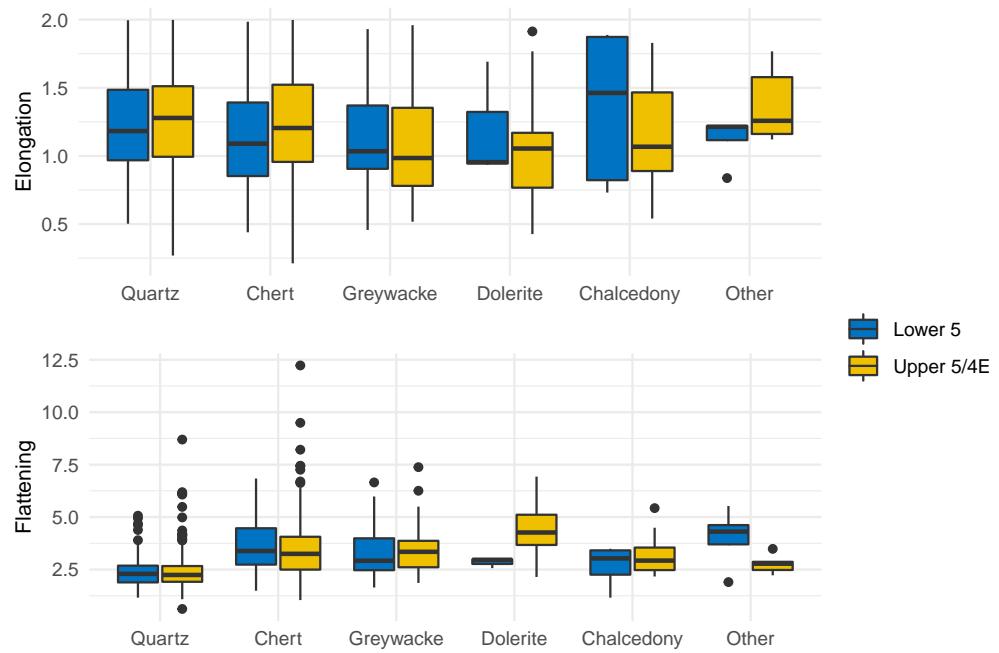


Figure S4: Vale Boi. Boxplots of flake elongation and flattening by raw material and phase.

Table S12: Vale Boi - Lower 5 - elongated products attributes frequencies.

Attributes	Quartz	Chert	Greywacke	Chalcedony	Total
CrossSection,					
n					
(%)					
Irregular	12 (27.3)	2 (6.5)	2 (33.3)	1 (100.0)	17 (20.7)
Lenticular	2 (4.5)	2 (6.5)	0 (0.0)	0 (0.0)	4 (4.9)
Quadrangular	3 (6.8)	1 (3.2)	1 (16.7)	0 (0.0)	5 (6.1)
Trapezoidal	1 (2.3)	2 (6.5)	1 (16.7)	0 (0.0)	4 (4.9)
Triangular	26 (59.1)	24 (77.4)	2 (33.3)	0 (0.0)	52 (63.4)
BlankShape,					
n					
(%)					
Convergent	11 (25.0)	16 (51.6)	3 (50.0)	0 (0.0)	30 (36.6)
Dejete	0 (0.0)	1 (3.2)	1 (16.7)	0 (0.0)	2 (2.4)
Divergent	1 (2.3)	1 (3.2)	0 (0.0)	0 (0.0)	2 (2.4)
Irregular	4 (9.1)	4 (12.9)	1 (16.7)	1 (100.0)	10 (12.2)
Parallel	28 (63.6)	9 (29.0)	1 (16.7)	0 (0.0)	38 (46.3)
Profile,					
n					
(%)					
Curved	10 (22.7)	12 (38.7)	1 (16.7)	0 (0.0)	23 (28.0)
Irregular	1 (2.3)	2 (6.5)	0 (0.0)	0 (0.0)	3 (3.7)
Straight	32 (72.7)	15 (48.4)	4 (66.7)	1 (100.0)	52 (63.4)
Twisted	1 (2.3)	2 (6.5)	1 (16.7)	0 (0.0)	4 (4.9)
BlankTip,					
n					
(%)					
Feather	16 (36.4)	5 (16.1)	2 (33.3)	0 (0.0)	23 (28.0)
Hinge	13 (29.5)	7 (22.6)	4 (66.7)	0 (0.0)	24 (29.3)
Pointed	11 (25.0)	11 (35.5)	0 (0.0)	0 (0.0)	22 (26.8)
Step	4 (9.1)	8 (25.8)	0 (0.0)	1 (100.0)	13 (15.9)
PlatformType,					
n					
(%)					

Table S12: Vale Boi - Lower 5 - elongated products attributes frequencies. (*continued*)

Attributes	Quartz	Chert	Greywacke	Chalcedony	Total
Crushed	18 (40.9)	5 (16.1)	1 (16.7)	0 (0.0)	24 (29.3)
Dihedral	0 (0.0)	4 (12.9)	0 (0.0)	0 (0.0)	4 (4.9)
Linear	4 (9.1)	3 (9.7)	0 (0.0)	0 (0.0)	7 (8.5)
Plain	20 (45.5)	19 (61.3)	5 (83.3)	1 (100.0)	45 (54.9)
Punctiform	1 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.2)
Winged	1 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.2)
PlatformCortex, n (%)					
No	44 (100.0)	27 (87.1)	5 (83.3)	1 (100.0)	77 (93.9)
YesComplete	0 (0.0)	3 (9.7)	1 (16.7)	0 (0.0)	4 (4.9)
YesPartial	0 (0.0)	1 (3.2)	0 (0.0)	0 (0.0)	1 (1.2)
ScarCount, n (%)					
1	7 (15.9)	3 (9.7)	3 (50.0)	0 (0.0)	13 (15.9)
2	26 (59.1)	12 (38.7)	0 (0.0)	0 (0.0)	38 (46.3)
3	10 (22.7)	11 (35.5)	2 (33.3)	1 (100.0)	24 (29.3)
4	1 (2.3)	4 (12.9)	1 (16.7)	0 (0.0)	6 (7.3)
5	0 (0.0)	1 (3.2)	0 (0.0)	0 (0.0)	1 (1.2)
ScarPattern, n (%)					
Bidirectional	0 (0.0)	4 (12.9)	0 (0.0)	0 (0.0)	4 (4.9)
Unidirectional	44 (100.0)	27 (87.1)	6 (100.0)	1 (100.0)	78 (95.1)
Cortex, n (%)					
0%	42 (95.5)	23 (74.2)	6 (100.0)	1 (100.0)	72 (87.8)
1-	2	2	0	0	4
30%	(4.5)	(6.5)	(0.0)	(0.0)	(4.9)
61-	0	6	0	0	6
99%	(0.0)	(19.4)	(0.0)	(0.0)	(7.3)

Table S13: Vale Boi - Upper 5/4E - elongated products attributes frequencies.

Attributes	Quartz	Chert	Greywacke	Dolerite	Other	Chalcedony	Total
CrossSection, n (%)							
Irregular 14 (27.5) 6 (8.0) 1 (25.0) 0 (0.0) 0 (0.0) 1 (25.0) 22 (16.1)							
Lenticular 1 (2.0) 3 (4.0) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 4 (2.9)							
Other 1 (2.0) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 1 (0.7)							
Quadrangular 3 (5.9) 2 (2.7) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 5 (3.6)							
Trapezoidal 3 (5.9) 10 (13.3) 0 (0.0) 0 (0.0) 1 (50.0) 0 (0.0) 14 (10.2)							
Triangular 29 (56.9) 54 (72.0) 3 (75.0) 1 (100.0) 1 (50.0) 3 (75.0) 91 (66.4)							
BlankShape, n (%)							
Convergent 14 (27.5) 28 (37.3) 1 (25.0) 1 (100.0) 2 (100.0) 1 (25.0) 47 (34.3)							
Dejete 1 (2.0) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 1 (0.7)							
Divergent 4 (7.8) 6 (8.0) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 10 (7.3)							
Irregular 2 (3.9) 10 (13.3) 0 (0.0) 0 (0.0) 0 (0.0) 3 (75.0) 15 (10.9)							
Parallel 30 (58.8) 31 (41.3) 3 (75.0) 0 (0.0) 0 (0.0) 0 (0.0) 64 (46.7)							
Profile, n (%)							
Curved 6 (11.8) 26 (34.7) 0 (0.0) 1 (100.0) 0 (0.0) 0 (0.0) 33 (24.1)							
Irregular 3 (5.9) 5 (6.7) 0 (0.0) 0 (0.0) 1 (50.0) 2 (50.0) 11 (8.0)							
Straight 39 (76.5) 35 (46.7) 4 (100.0) 0 (0.0) 1 (50.0) 2 (50.0) 81 (59.1)							
Twisted 3 (5.9) 9 (12.0) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 12 (8.8)							
BlankTip, n (%)							
Feather 11 (21.6) 27 (36.0) 1 (25.0) 0 (0.0) 0 (0.0) 2 (50.0) 41 (29.9)							
Hinge 24 (47.1) 17 (22.7) 1 (25.0) 1 (100.0) 0 (0.0) 0 (0.0) 43 (31.4)							
Overshoot 1 (2.0) 4 (5.3) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 5 (3.6)							
Pointed 14 (27.5) 17 (22.7) 0 (0.0) 0 (0.0) 2 (100.0) 2 (50.0) 35 (25.5)							

Table S13: Vale Boi - Upper 5/4E - elongated products attributes frequencies. (*continued*)

Attributes	Quartz	Chert	Greywacke	Dolerite	Other	Chalcedony	Total
Step	1 (2.0)	10 (13.3)	2 (50.0)	0 (0.0)	0 (0.0)	0 (0.0)	13 (9.5)
PlatformType, n (%)							
Crushed	24 (47.1)	11 (14.7)	0 (0.0)	0 (0.0)	0 (0.0)	2 (50.0)	37 (27.0)
Dihedral	0 (0.0)	3 (4.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (2.2)
Faceted	0 (0.0)	1 (1.3)	0 (0.0)	1 (100.0)	0 (0.0)	0 (0.0)	2 (1.5)
Linear	3 (5.9)	7 (9.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	10 (7.3)
Plain	24 (47.1)	52 (69.3)	3 (75.0)	0 (0.0)	2 (100.0)	2 (50.0)	83 (60.6)
Winged	0 (0.0)	1 (1.3)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.5)
PlatformCortex, n (%)							
No	51 (100.0)	65 (86.7)	4 (100.0)	1 (100.0)	2 (100.0)	4 (100.0)	127 (92.7)
YesComplete	0 (0.0)	10 (13.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	10 (7.3)
ScarCount, n (%)							
0	0 (0.0)	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.7)
1	6 (11.8)	5 (6.7)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	12 (8.8)
2	35 (68.6)	34 (45.3)	2 (50.0)	0 (0.0)	0 (0.0)	2 (50.0)	73 (53.3)
3	8 (15.7)	32 (42.7)	0 (0.0)	1 (100.0)	2 (100.0)	2 (50.0)	45 (32.8)
4	0 (0.0)	2 (2.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.5)
5	1 (2.0)	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.5)
6	1 (2.0)	0 (0.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.5)
ScarPattern, n (%)							
Bidirectional	1 (2.0)	3 (4.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (25.0)	5 (3.6)
None	0 (0.0)	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.7)
Unidirectional	50 (98.0)	71 (94.7)	4 (100.0)	1 (100.0)	2 (100.0)	3 (75.0)	131 (95.6)

Table S13: Vale Boi - Upper 5/4E - elongated products attributes frequencies. (*continued*)

Attributes	Quartz	Chert	Greywacke	Dolerite	Other	Chalcedony	Total
Cortex, n (%)							
0%	48 (94.1)	54 (72.0)	3 (75.0)	1 (100.0)	2 (100.0)	4 (100.0)	112 (81.8)
1-	2	10	0	0	0	0	12
30%	(3.9)	(13.3)	(0.0)	(0.0)	(0.0)	(0.0)	(8.8)
100%	0 (0.0)	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.7)
31-	1	6	1	0	0	0	8
60%	(2.0)	(8.0)	(25.0)	(0.0)	(0.0)	(0.0)	(5.8)
61-	0	4	0	0	0	0	4
99%	(0.0)	(5.3)	(0.0)	(0.0)	(0.0)	(0.0)	(2.9)

Table S14: Vale Boi - Lower 5 - mean and standard deviation of elongated products measurements (in mm).

Measurements	Quartz	Chert	Greywacke
MaxWidth, M (SD)	8.8 (4.2)	10.3 (4.4)	20.8 (8.0)
Length, M (SD)	21.6 (10.0)	26.1 (9.8)	50.2 (16.7)
Thickness, M (SD)	5.6 (3.4)	5.4 (2.8)	11.0 (7.5)
PlatformWidth, M (SD)	6.7 (3.8)	7.4 (3.4)	17.9 (8.4)
PlatformThickness, M (SD)	4.1 (2.4)	4.5 (2.6)	10.5 (6.5)
ExteriorPlatformAngle, M (SD)	64.4 (46.7)	75.3 (37.8)	39.6 (50.0)

Table S15: Vale Boi - Upper 5/4E - mean and standard deviation of elongated products measurements (in mm).

Measurements	Quartz	Chert	Greywacke	Dolerite	Chalcedony	Other
MaxWidth, M (SD)	9.3 (3.6)	10.4 (4.4)	11.7 (3.5)	16.0 (NA)	16.1 (9.2)	17.4 (1.4)
Length, M (SD)	21.1 (7.4)	26.1 (10.1)	36.2 (12.6)	36.6 (NA)	38.7 (16.1)	40.1 (7.6)
Thickness, M (SD)	5.47 (2.82)	4.26 (2.27)	8.55 (6.22)	7.15 (NA)	7.49 (5.33)	7.55 (2.38)
PlatformWidth, M (SD)	7.0 (3.1)	7.1 (3.3)	10.5 (3.1)	16.4 (NA)	11.7 (7.8)	7.0 (0.5)
PlatformThickness, M (SD)	4.79 (2.88)	3.29 (1.89)	6.04 (3.97)	5.40 (NA)	5.79 (4.24)	4.13 (1.12)
ExteriorPlatformAngle, M (SD)	57.3 (47.0)	66.1 (37.8)	79.8 (11.3)	78.3 (NA)	101.9 (18.1)	83.8 (6.9)

Table S16: Lapa do Picareiro identified layers with sediment description and associated cultural horizons, whenever existent. After Benedetti et al. (2019).

Zone	Level	Depth interval (mbd)	Matrix color (Munsell)	Sediment description a, b, c	Lithic assemblage
1	D	0.87–1.12	Brown (10YR5/3)	Medium clasts in very muddy matrix, friable to slightly hard, common fine charcoal and bone fragments, chalky appearance	Epipaleolithic
	E	1.12–1.86	Grayish brown(10YR5/2)	Small to medium clasts in very muddy matrix, friable to slightly hard, abundant charcoal and bone fragments, chalky appearance	Late Magdalenian
	F	1.86–2.17	Dark grayish brown (10YR4/2)	Medium to large clasts with little fine sediment, loose, muddy dark brown lenses with abundant charcoal and bone fragments	Late Magdalenian
	I	2.17–2.37	Light yellowish brown (10YR6/4)	Large to very large clasts with very little fine sediment, loose to friable, few bones	Late Magdalenian
	J	2.37–2.55	Yellowish brown (10YR5/4)	Medium to large clasts with very little fine sediment, loose, few bones	Late Magdalenian
	K	2.55–2.75	Strong brown (7.5YR5/6)	Small clasts, friable, few bones	Early Magdalenian
	L	2.75–3.13	Strong brown (7.5YR5/6)	Small to medium clasts in muddy matrix, friable to slightly hard, few bones and fragments, few boulders up to 100<U+2009>cm	Early Magdalenian
	M	3.13–3.19	Strong brown (7.5YR5/6)	Very small clasts in muddy matrix, friable	None
	N	3.19–3.53	Strong brown (7.5YR4/6)	Medium to large clasts, loose to friable, common medium-large bones and bone fragments	None
	O	3.53–3.81	Strong brown (7.5YR4/6)	Medium clasts, friable, common charcoal, and bones	Solutrean
2	P	3.81–3.93	Brown (7.5YR4/4)	Medium to large clasts, loose to friable	None
	R	3.93–4.01	Brown (7.5YR5/4)	Small to medium clasts, friable, common charcoal, and small bones	Solutrean
	S	4.01–4.13	Light brown (7.5YR6/4)	Small clasts, friable, common charcoal, and bones	Solutrean
	T	4.13–4.86	Strong brown (7.5YR4/6)	Medium to large clasts, friable, common boulders up to 80<U+2009>cm, muddy in lower half with abundant charcoal and bones	Solutrean and Proto-Solutrean

Table S16: Lapa do Picareiro identified layers with sediment description and associated cultural horizons, whenever existent. After Benedetti et al. (2019). (*continued*)

Zone	Level	Depth interval (mbd)	Matrix color (Munsell)	Sediment description a, b, c	Lithic assemblage
3	U	4.86–5.02	Strong brown (7.5YR5/6)	Small to medium clasts in muddy matrix, friable, includes lenses with abundant small animal bones and bone fragments	Terminal Gravettian
	V	5.02–5.12	Strong brown (7.5YR5/6)	Medium to large clasts, little fine sediment, loose to friable, abundant small animal bones	Gravettian
	W	5.12–5.25	Strong brown (7.5YR4/6)	Small to medium clasts in very muddy matrix, friable to slightly hard, abundant small animal bones and bone fragments	Gravettian
	X	5.25–5.32	Strong brown (7.5YR5/6)	Medium clasts, little fine sediment, friable, abundant small animal bones	Gravettian
	Y	5.32–5.53	Strong brown (7.5YR5/6)	Medium to large clasts, little fine sediment, common bones	None
	Z	5.53–5.71	Strong brown (7.5YR5/6)	Medium clasts in muddy matrix, friable, common bones	None
	BB	5.71–5.96	Strong brown (7.5YR5/6)	Large clasts, friable, common bones, few boulders up to 60<U+2009>cm	Early Upper Paleolithic
	CC	5.96–6.03	Strong brown (7.5YR5/6)	Very small clasts, friable	None
	DD	6.03–6.14	Strong brown (7.5YR4/6)	Medium clasts in very muddy matrix, slightly to moderately hard	Early Upper Paleolithic
	EE	6.14–6.27	Reddish brown (5YR4/4)	Small clasts in muddy matrix, friable to slightly hard, common bones	None
	FF	6.27–6.45	Dark reddish brown (5YR3/4)	Medium clasts, slightly to moderately hard, abundant charcoal and bones	Early Upper and/or Middle Paleolithic
4	GG	6.45–6.62	Strong brown (7.5YR5/6)	Large clasts, extremely hard, cemented by calcite crystals filling voids, common bones, and bone fragments	Aurignacian
	HH	6.62–6.76	Strong brown (7.5YR4/6)	Medium clasts in muddy matrix, slightly hard, common bones	Aurignacian
	II	6.76–6.87	Strong brown (7.5YR5/6)	Medium to large clasts in muddy matrix, very hard, calcite cement filling voids	Aurignacian

Table S16: Lapa do Picareiro identified layers with sediment description and associated cultural horizons, whenever existent. After Benedetti et al. (2019). (*continued*)

Zone	Level	Depth interval (mbd)	Matrix color (Munsell)	Sediment description a, b, c	Lithic assemblage
	JJ (upper)	6.87–7.73	Reddish brown (5YR4/4)	Medium to large clasts in muddy matrix, slightly hard, common bones; up to 20<U+2009>cm thick lenses of dark reddish brown fine sediment with dispersed charcoal	Mousterian
5	JJ (lower)	7.73–8.35	Reddish brown (5YR4/4)	Medium clasts in very muddy matrix, slightly hard, lenses of dark reddish-brown fine sediment with dispersed charcoal and large animal bones	Mousterian
	KK	8.35–8.64	Yellowish red (5YR5/8)	Medium to large clasts, slightly to moderately hard, few bones	None
	LL	8.64–9.15	Reddish brown (5YR4/4)	Large clasts, slightly hard, concentration of angular boulders up to 60<U+2009>cm in lower part	None
	MM	9.15–9.98	Reddish brown (5YR5/4)	Medium to large clasts in muddy matrix, moderately hard, few small animal bones	None
62	NN	9.98–10.62	Reddish brown (5YR5/4)	Very large clasts and boulders up to 70<U+2009>cm in muddy matrix, slightly hard, few bones	None

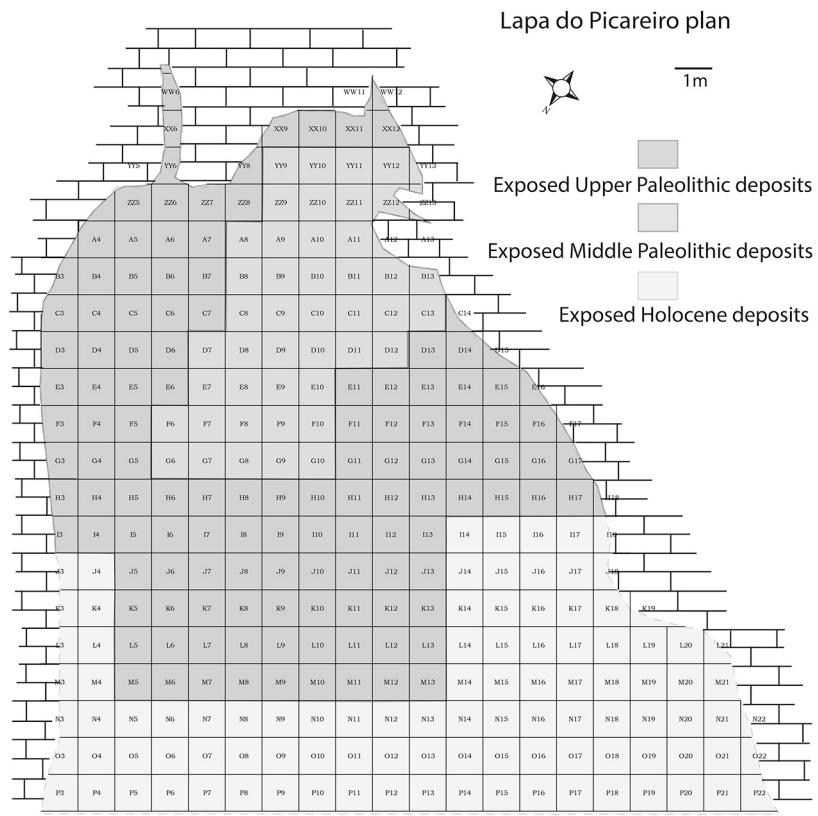


Figure S5: Lapa do Picareiro excavation plan with identification of exposed deposits.

Table S17: Lapa do Picareiro - U/Lower T - core attributes frequencies.

Attributes	Quartz n(%)
CoreType	
Other	1 (50.0)
SinglePlat	1 (50.0)
NumberCoreFaces	
Three	1 (50.0)
Two	1 (50.0)
CorePlatform	
Crushed	1 (50.0)
Dihedral	1 (50.0)
MainFaceCoreUse	
Flakes	2 (100.0)

Table S18: Lapa do Picareiro - Middle T - core attributes frequencies.

Attributes	Quartz	Chert	Other	Total
CoreType, n (%)				
SinglePlat	1 (50.0)	1 (50.0)	1 (100.0)	3 (60.0)
SinglePrismatic	1 (50.0)	0 (0.0)	0 (0.0)	1 (20.0)
SinglePyramidal	0 (0.0)	1 (50.0)	0 (0.0)	1 (20.0)
NumberCoreFaces, n (%)				
Four	0 (0.0)	2 (100.0)	0 (0.0)	2 (40.0)
One	1 (50.0)	0 (0.0)	0 (0.0)	1 (20.0)
Three	1 (50.0)	0 (0.0)	0 (0.0)	1 (20.0)
Two	0 (0.0)	0 (0.0)	1 (100.0)	1 (20.0)
CorePlatform, n (%)				
Dihedral	0 (0.0)	1 (50.0)	0 (0.0)	1 (20.0)
Plain	2 (100.0)	1 (50.0)	1 (100.0)	4 (80.0)
MainFaceCoreUse, n (%)				
Flakes	1 (50.0)	2 (100.0)	1 (100.0)	4 (80.0)
Mixed	1 (50.0)	0 (0.0)	0 (0.0)	1 (20.0)

Table S19: Lapa do Picareiro - U/Lower T - mean and standard deviation of core measurements (in mm).

Core metrics	Quartz
MedWidth, M (SD)	29.0 (4.2)
Length, M (SD)	28.4 (9.1)
Thickness, M (SD)	25.2 (11.9)
PlatformWidth, M (SD)	24.6 (1.3)
PlatformThickness, M (SD)	24.9 (10.3)
MainFacePlatformAngle, M (SD)	82.7 (21.1)
Weight, M (SD)	40.2 (37.5)

Table S20: Lapa do Picareiro - Middle T - mean and standard deviation of core measurements (in mm).

Core metrics	Quartz	Chert	Other	Total
MedWidth, M (SD)	42.2 (8.2)	22.0 (10.3)	71.8 (NA)	40.0 (21.5)
Length, M (SD)	30.1 (2.2)	27.9 (14.1)	29.9 (NA)	29.2 (7.2)
Thickness, M (SD)	25.9 (13.8)	17.4 (3.6)	48.9 (NA)	27.1 (14.8)
PlatformWidth, M (SD)	38.4 (3.9)	21.6 (9.3)	75.5 (NA)	39.1 (22.6)
PlatformThickness, M (SD)	28.3 (15.6)	16.7 (1.3)	50.6 (NA)	28.1 (15.9)
MainFacePlatformAngle, M (SD)	74.3 (14.9)	80.4 (1.3)	75.8 (NA)	77.1 (8.1)
Weight, M (SD)	46.5 (14.8)	28.0 (32.7)	154.3 (NA)	60.7 (56.1)

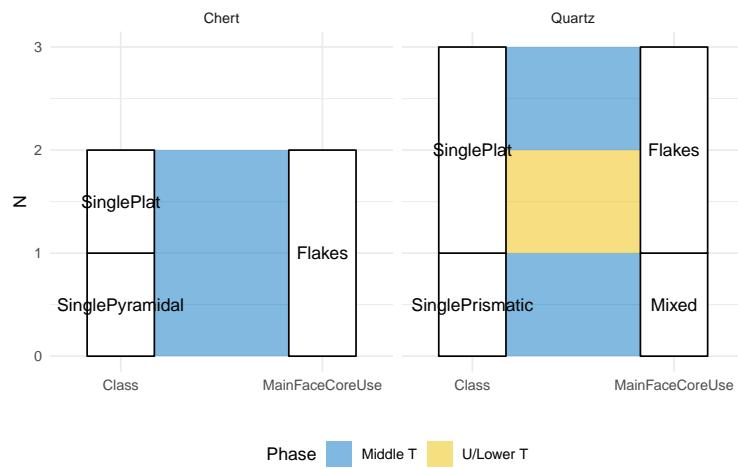


Figure S6: Lapa do Picareiro. Interaction of core type with type of extracted products by raw material and phase.

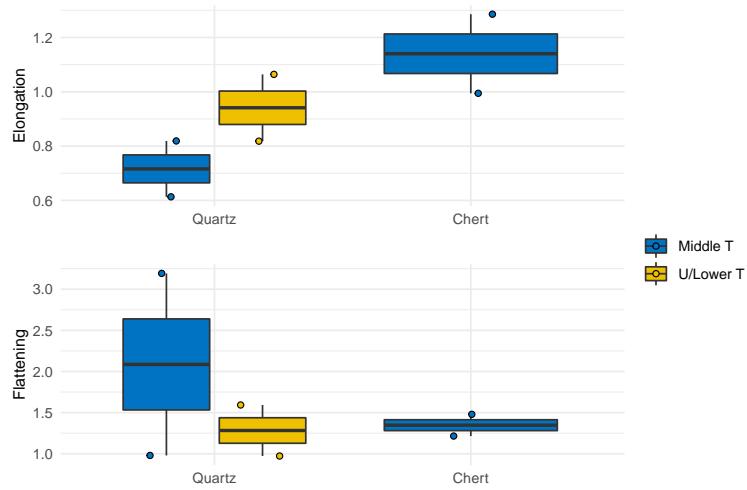


Figure S7: Lapa do Picareiro. Boxplots of core elongation and flattening by raw material and phase.

Table S21: Lapa do Picareiro - U/Lower T - flake attributes frequencies.

Attributes	Quartz	Chert	Other	Total
CrossSection, n (%)				
Irregular	3 (15.0)	0 (0.0)	0 (0.0)	3 (10.7)
Lenticular	1 (5.0)	1 (14.3)	0 (0.0)	2 (7.1)
Other	2 (10.0)	0 (0.0)	0 (0.0)	2 (7.1)
Quadrangular	1 (5.0)	0 (0.0)	0 (0.0)	1 (3.6)
Trapezoidal	2 (10.0)	3 (42.9)	0 (0.0)	5 (17.9)
Triangular	11 (55.0)	3 (42.9)	1 (100.0)	15 (53.6)
BlankShape, n (%)				
Circular	2 (10.0)	0 (0.0)	0 (0.0)	2 (7.1)
Convergent	6 (30.0)	1 (14.3)	1 (100.0)	8 (28.6)
Déjeté	1 (5.0)	0 (0.0)	0 (0.0)	1 (3.6)
Divergent	1 (5.0)	3 (42.9)	0 (0.0)	4 (14.3)
Irregular	3 (15.0)	2 (28.6)	0 (0.0)	5 (17.9)
Parallel	7 (35.0)	1 (14.3)	0 (0.0)	8 (28.6)
Profile, n (%)				
Curved	4 (20.0)	1 (14.3)	0 (0.0)	5 (17.9)
Irregular	2 (10.0)	0 (0.0)	0 (0.0)	2 (7.1)
Straight	12 (60.0)	6 (85.7)	1 (100.0)	19 (67.9)
Twisted	2 (10.0)	0 (0.0)	0 (0.0)	2 (7.1)
BlankTip, n (%)				
Feather	7 (35.0)	1 (14.3)	0 (0.0)	8 (28.6)
Hinge	8 (40.0)	1 (14.3)	1 (100.0)	10 (35.7)
Pointed	1 (5.0)	3 (42.9)	0 (0.0)	4 (14.3)
Step	4 (20.0)	2 (28.6)	0 (0.0)	6 (21.4)
PlatformType, n (%)				
Crushed	6 (30.0)	2 (28.6)	1 (100.0)	9 (32.1)
Dihedral	0 (0.0)	2 (28.6)	0 (0.0)	2 (7.1)
Faceted	1 (5.0)	1 (14.3)	0 (0.0)	2 (7.1)
Plain	13 (65.0)	1 (14.3)	0 (0.0)	14 (50.0)
Winged	0 (0.0)	1 (14.3)	0 (0.0)	1 (3.6)
PlatformCortex, n (%)				
No	17 (85.0)	7 (100.0)	1 (100.0)	25 (89.3)
YesComplete	3 (15.0)	0 (0.0)	0 (0.0)	3 (10.7)
ScarCount, n (%)				
0	1 (5.0)	0 (0.0)	0 (0.0)	1 (3.6)
1	3 (15.0)	1 (14.3)	0 (0.0)	4 (14.3)
2	7 (35.0)	1 (14.3)	0 (0.0)	8 (28.6)
3	8 (40.0)	3 (42.9)	1 (100.0)	12 (42.9)
4	1 (5.0)	1 (14.3)	0 (0.0)	2 (7.1)
5	0 (0.0)	1 (14.3)	0 (0.0)	1 (3.6)
ScarPattern, n (%)				
Centripetal	0 (0.0)	1 (14.3)	0 (0.0)	1 (3.7)
Other	1 (5.3)	0 (0.0)	0 (0.0)	1 (3.7)
Unidirectional	18 (94.7)	6 (85.7)	1 (100.0)	25 (92.6)
Cortex, n (%)				
0%	18 (90.0)	5 (71.4)	1 (100.0)	24 (85.7)
1-30%	1 (5.0)	2 (28.6)	0 (0.0)	3 (10.7)
100%	1 (5.0)	0 (0.0)	0 (0.0)	1 (3.6)

Table S22: Lapa do Picareiro - Middle T - flake attributes frequencies.

Attributes	Quartz	Chert	Other	Total
CrossSection, n (%)				
Irregular	3 (23.1)	5 (15.6)	0 (0.0)	8 (17.0)
Lenticular	2 (15.4)	4 (12.5)	0 (0.0)	6 (12.8)
Other	0 (0.0)	2 (6.2)	0 (0.0)	2 (4.3)
Trapezoidal	0 (0.0)	7 (21.9)	0 (0.0)	7 (14.9)
Triangular	8 (61.5)	14 (43.8)	2 (100.0)	24 (51.1)
BlankShape, n (%)				
Circular	0 (0.0)	2 (6.2)	0 (0.0)	2 (4.3)
Convergent	5 (38.5)	4 (12.5)	1 (50.0)	10 (21.3)
Déjeté	1 (7.7)	1 (3.1)	0 (0.0)	2 (4.3)
Divergent	0 (0.0)	3 (9.4)	0 (0.0)	3 (6.4)
Irregular	7 (53.8)	7 (21.9)	1 (50.0)	15 (31.9)
Other	0 (0.0)	2 (6.2)	0 (0.0)	2 (4.3)
Parallel	0 (0.0)	13 (40.6)	0 (0.0)	13 (27.7)
Profile, n (%)				
Curved	2 (15.4)	12 (37.5)	1 (50.0)	15 (31.9)
Irregular	1 (7.7)	1 (3.1)	0 (0.0)	2 (4.3)
Straight	10 (76.9)	19 (59.4)	1 (50.0)	30 (63.8)
BlankTip, n (%)				
Feather	5 (38.5)	13 (40.6)	0 (0.0)	18 (38.3)
Hinge	6 (46.2)	9 (28.1)	2 (100.0)	17 (36.2)
Overshoot	0 (0.0)	1 (3.1)	0 (0.0)	1 (2.1)
Pointed	1 (7.7)	1 (3.1)	0 (0.0)	2 (4.3)
Step	1 (7.7)	8 (25.0)	0 (0.0)	9 (19.1)
PlatformType, n (%)				
Crushed	6 (46.2)	5 (15.6)	0 (0.0)	11 (23.4)
Dihedral	0 (0.0)	6 (18.8)	0 (0.0)	6 (12.8)
Faceted	1 (7.7)	1 (3.1)	0 (0.0)	2 (4.3)
Plain	6 (46.2)	20 (62.5)	2 (100.0)	28 (59.6)
PlatformCortex, n (%)				
No	12 (92.3)	31 (96.9)	1 (50.0)	44 (93.6)
YesComplete	0 (0.0)	0 (0.0)	1 (50.0)	1 (2.1)
YesPartial	1 (7.7)	1 (3.1)	0 (0.0)	2 (4.3)
ScarCount, n (%)				
1	3 (23.1)	4 (12.5)	1 (50.0)	8 (17.0)
2	8 (61.5)	11 (34.4)	0 (0.0)	19 (40.4)
3	1 (7.7)	11 (34.4)	1 (50.0)	13 (27.7)
4	1 (7.7)	5 (15.6)	0 (0.0)	6 (12.8)
7	0 (0.0)	1 (3.1)	0 (0.0)	1 (2.1)
ScarPattern, n (%)				
Bidirectional	0 (0.0)	3 (9.4)	0 (0.0)	3 (6.4)
Other	1 (7.7)	0 (0.0)	0 (0.0)	1 (2.1)
Unidirectional	12 (92.3)	29 (90.6)	2 (100.0)	43 (91.5)
Cortex, n (%)				
0%	10 (76.9)	31 (96.9)	0 (0.0)	41 (87.2)
1-30%	0 (0.0)	1 (3.1)	1 (50.0)	2 (4.3)
31-60%	2 (15.4)	0 (0.0)	0 (0.0)	2 (4.3)
61-99%	1 (7.7)	0 (0.0)	1 (50.0)	2 (4.3)

Table S23: Lapa do Picareiro - U/Lower T - mean and standard deviation of flake measurements (in mm).

Measurements	Quartz	Chert	Other	Total
MedWidth, M (SD)	15.3 (10.4)	17.0 (8.7)	38.8 (NA)	16.6 (10.6)
Length, M (SD)	21.8 (14.3)	27.3 (14.2)	76.0 (NA)	25.1 (17.1)
Thickness, M (SD)	7.4 (6.0)	5.3 (3.1)	11.8 (NA)	7.0 (5.4)
PlatformWidth, M (SD)	13.4 (9.0)	12.9 (9.5)	14.2 (NA)	13.3 (8.8)
PlatformThickness, M (SD)	7.15 (6.23)	4.51 (2.82)	4.70 (NA)	6.40 (5.53)
ExteriorPlatformAngle, M (SD)	83.7 (32.8)	59.6 (41.4)	101.4 (NA)	78.3 (35.7)

Table S24: Lapa do Picareroio - Middle T - mean and standard deviation of flake measurements (in mm).

Measurements	Quartz	Chert	Other	Total
MedWidth, M (SD)	12.2 (5.6)	16.3 (8.1)	31.2 (8.4)	15.8 (8.3)
Length, M (SD)	16.3 (4.1)	20.9 (8.5)	38.4 (11.9)	20.4 (8.7)
Thickness, M (SD)	5.0 (2.8)	5.0 (2.3)	10.3 (1.4)	5.3 (2.6)
PlatformWidth, M (SD)	10.0 (5.4)	10.5 (4.9)	27.4 (1.6)	11.1 (6.0)
PlatformThickness, M (SD)	4.7 (3.2)	4.2 (2.1)	12.9 (1.0)	4.7 (3.0)
ExteriorPlatformAngle, M (SD)	81.5 (39.3)	74.2 (31.9)	71.7 (24.3)	76.1 (33.4)

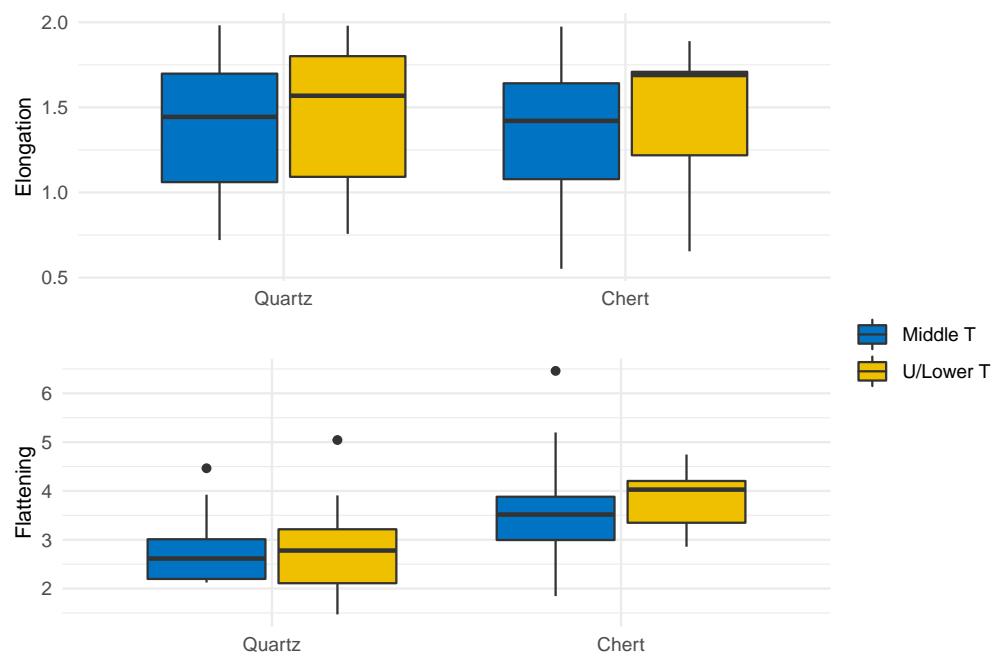


Figure S8: Lapa do Picareiro. Flake elongation and flattening by phase and raw material.

Table S25: Lapa do Picareiro - U/Lower T - elongated blanks attributes frequencies.

Attributes	Quartz	Chert	Total
CrossSection, n (%)			
Irregular	0 (0.0)	1 (5.9)	1 (3.7)
Lenticular	2 (20.0)	2 (11.8)	4 (14.8)
Trapezoidal	0 (0.0)	3 (17.6)	3 (11.1)
Triangular	8 (80.0)	11 (64.7)	19 (70.4)
BlankShape, n (%)			
Convergent	3 (30.0)	3 (17.6)	6 (22.2)
Déjeté	0 (0.0)	1 (5.9)	1 (3.7)
Irregular	0 (0.0)	1 (5.9)	1 (3.7)
Parallel	7 (70.0)	12 (70.6)	19 (70.4)
Profile, n (%)			
Curved	2 (20.0)	5 (29.4)	7 (25.9)
Straight	8 (80.0)	11 (64.7)	19 (70.4)
Twisted	0 (0.0)	1 (5.9)	1 (3.7)
BlankTip, n (%)			
Feather	5 (50.0)	11 (64.7)	16 (59.3)
Hinge	2 (20.0)	1 (5.9)	3 (11.1)
Overshoot	0 (0.0)	1 (5.9)	1 (3.7)
Pointed	1 (10.0)	1 (5.9)	2 (7.4)
Step	2 (20.0)	3 (17.6)	5 (18.5)
PlatformType, n (%)			
Crushed	4 (40.0)	3 (17.6)	7 (25.9)
Dihedral	0 (0.0)	2 (11.8)	2 (7.4)
Linear	1 (10.0)	0 (0.0)	1 (3.7)
Plain	5 (50.0)	12 (70.6)	17 (63.0)
PlatformCortex, n (%)			
No	9 (90.0)	17 (100.0)	26 (96.3)
YesComplete	1 (10.0)	0 (0.0)	1 (3.7)
ScarCount, n (%)			
1	1 (10.0)	0 (0.0)	1 (3.7)
2	7 (70.0)	6 (35.3)	13 (48.1)
3	2 (20.0)	5 (29.4)	7 (25.9)
4	0 (0.0)	4 (23.5)	4 (14.8)
5	0 (0.0)	2 (11.8)	2 (7.4)
ScarPattern, n (%)			
Unidirectional	10 (100.0)	17 (100.0)	27 (100.0)
Cortex, n (%)			
0%	9 (90.0)	15 (88.2)	24 (88.9)
1-30%	1 (10.0)	2 (11.8)	3 (11.1)

Table S26: Lapa do Picareiro - Middle T - elongated blanks attributes frequencies.

Attributes	Quartz	Chert	Total
CrossSection, n (%)			
Irregular	0 (0.0)	2 (14.3)	2 (10.0)
Lenticular	2 (33.3)	1 (7.1)	3 (15.0)
Trapezoidal	1 (16.7)	2 (14.3)	3 (15.0)
Triangular	3 (50.0)	9 (64.3)	12 (60.0)
BlankShape, n (%)			
Convergent	1 (16.7)	5 (35.7)	6 (30.0)
Divergent	1 (16.7)	0 (0.0)	1 (5.0)
Irregular	1 (16.7)	0 (0.0)	1 (5.0)
Parallel	3 (50.0)	9 (64.3)	12 (60.0)
Profile, n (%)			
Curved	4 (66.7)	3 (21.4)	7 (35.0)
Irregular	0 (0.0)	2 (14.3)	2 (10.0)
Straight	2 (33.3)	7 (50.0)	9 (45.0)
Twisted	0 (0.0)	2 (14.3)	2 (10.0)
BlankTip, n (%)			
Feather	4 (66.7)	9 (64.3)	13 (65.0)
Hinge	2 (33.3)	1 (7.1)	3 (15.0)
Pointed	0 (0.0)	3 (21.4)	3 (15.0)
Step	0 (0.0)	1 (7.1)	1 (5.0)
PlatformType, n (%)			
Crushed	3 (50.0)	5 (35.7)	8 (40.0)
Plain	3 (50.0)	9 (64.3)	12 (60.0)
PlatformCortex, n (%)			
No	6 (100.0)	13 (92.9)	19 (95.0)
YesComplete	0 (0.0)	1 (7.1)	1 (5.0)
ScarCount, n (%)			
2	4 (66.7)	4 (28.6)	8 (40.0)
3	2 (33.3)	7 (50.0)	9 (45.0)
4	0 (0.0)	3 (21.4)	3 (15.0)
ScarPattern, n (%)			
Unidirectional	6 (100.0)	14 (100.0)	20 (100.0)
Cortex, n (%)			
0%	6 (100.0)	13 (92.9)	19 (95.0)
1-30%	0 (0.0)	1 (7.1)	1 (5.0)

Table S27: Lapa do Picareiro - U/Lower T - mean and standard deviation of elongated blanks measurements (in mm).

Measurements	Quartz	Chert
MaxWidth, M (SD)	7.9 (4.7)	11.9 (7.6)
Length, M (SD)	17.5 (9.0)	32.3 (17.5)
Thickness, M (SD)	3.17 (3.58)	3.54 (2.81)
PlatformWidth, M (SD)	4.77 (1.43)	7.66 (5.57)
PlatformThickness, M (SD)	2.48 (2.94)	3.04 (2.52)
ExteriorPlatformAngle, M (SD)	68.3 (47.6)	74.1 (45.0)

Table S28: Lapa do Picareiro - Middle T - mean and standard deviation of elongated blanks measurements (in mm).

Measurements	Quartz	Chert
MaxWidth, M (SD)	7.7 (1.5)	14.0 (7.8)
Length, M (SD)	17.0 (2.9)	37.5 (16.5)
Thickness, M (SD)	2.16 (0.69)	4.20 (2.36)
PlatformWidth, M (SD)	5.51 (1.67)	9.04 (4.26)
PlatformThickness, M (SD)	2.07 (0.58)	3.29 (2.39)
ExteriorPlatformAngle, M (SD)	92.8 (8.9)	64.0 (44.1)



Figure S9: Lapa do Picareiro - U/Lower T - Fine quartz and rock crystal blanks and blank fragments.

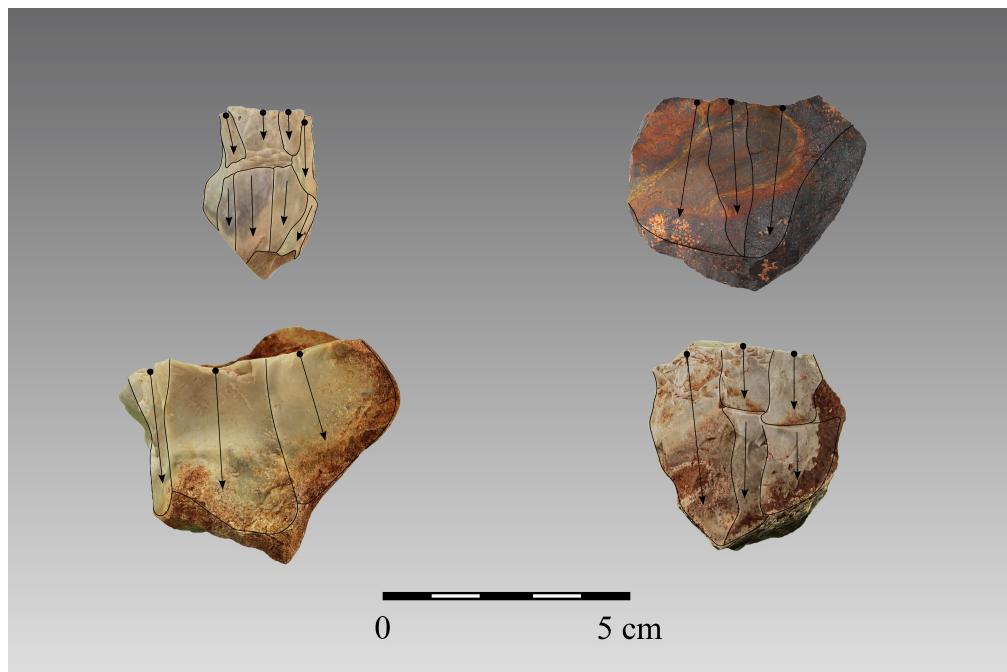


Figure S10: Vale Boi - Lower 5. Chert and iron oxide (upper right) cores with vectorized scar negatives and scar directionality.

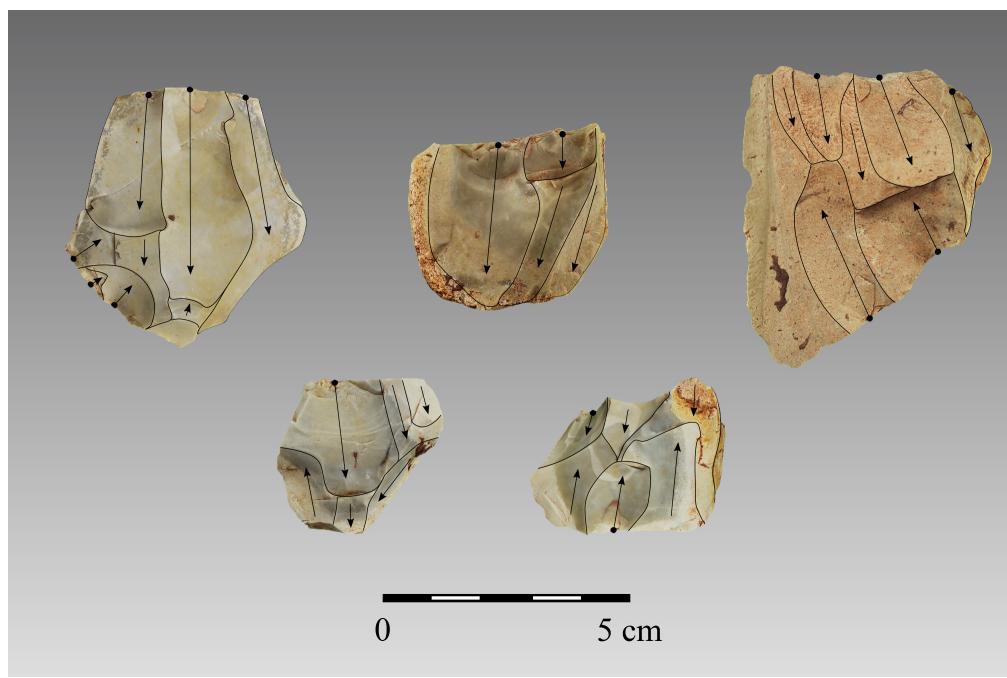


Figure S11: Vale Boi - Upper 5/4E. Chert cores with vectorized scar negatives and scar directionality.

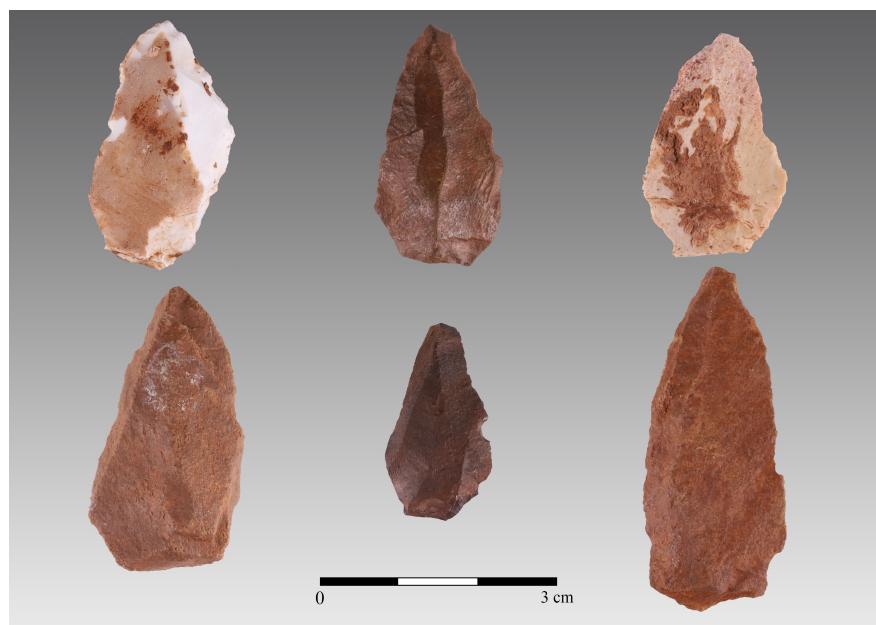


Figure S12: Vale Boi - Vale Comprido points in dolerite, chert and chalcedony.



Figure S13: Vale Boi - Vale Comprido points in dolerite.



Figure S14: Lapa do Picareiro - Middle T - Chert blades with similarities to Vale Comprido technology.