



Research Reactor Center
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Dear Tom:

Below is a report of the 69 samples submitted to MURR in July 2006. I have also included the samples (pottery and clay) submitted in 2005 because at the time we were unable to confidently assign any of those samples to composition groups. The combination of the two datasets has allowed us to identify three preliminary compositional groups and to assign some of the clay/sand samples to those groups.

Sample preparation, irradiation, and statistical manipulation of these data are more or less identical to those reported to you in previous reports and are not repeated in this email. However, if you like, I can email a copy of our boilerplate which contains these details.

Compositional affiliations (when possible) of the pottery and clay/sand samples were made creating three new compositional groups listed in Table 1. Table 2 displays the Mahalanobis-distance based probabilities of sample membership in Groups 2 and 3. Table 3 presents the samples assigned to Group 1, the probability of clay samples belonging to Compositional Groups 2 and 3, and the samples that remain unassigned and their probability of membership in the previously established reference groups. Principal component eigenvalues and explained variance are presented in Table 4. Figures 1 and 2 are principal component plots demonstrating the various elements that contributed to the substructure. Figures 3-8 plot the three compositional groups with the clay and sand samples submitted from 2005 and 2006. Figures 9-11 are bivariate plots of elemental logged concentrations that further demonstrate the subgroup partitioning discussed below and shown in Figures 1-8.

Compositional Group 1: This group is composed of five sherds (three from PU 165, one from PU 21 and one from PU 132b). The majority of the sherds represent ware 6 and the remainder were

classified as wares 3 and 9. Compositional Group 1 is defined by having high concentrations of arsenic, chromium, cesium, and titanium.

Compositional Group 2: Sixty-five samples comprise this compositional group. The majority of the sherds were excavated from PU 165, PU 122, PU 157, and PU 120 (in order of relative frequency). Sites PU 36, PU 123, PU 264, PU 21, PU 51, LU 69 and LU 42 are also represented in this group. Ware 2 is the most commonly represented ware, although wares 1, 6, 7, 10, and 11 are also represented in approximately equal quantities. Wares 3, 4, and 8 occur in minor quantities. Chemically, Group 2 is distinguishable from Groups 1 and 3 by its higher concentrations of hafnium, zirconium, and potassium. This may suggest sand tempering. Probabilities of group membership are listed in Table 2.

Compositional Group 3: The majority of assignable samples (n=113) are members of Compositional Group 3 and were excavated from PU165. Sherds assigned to Group 3 were also excavated from PU 36, PU 122, PU 249, and LU 69 (with similar quantities ca. 5 sherds per site) and from PU 123, PU 136, PU 157, PU 264, PU 21, PU 118, PU 65, PU 4, PU 52, PU 49, LU 42, and LU 41 (with similar quantities 1-3 sherds per site). Similar to Group 2, the majority of the sherds in Group 3 represent ware 2 (n=56). Group 3 also consists of sherds that represent wares 1, 3, 6, and 11 in equal proportions (n=11-16 sherds per site), and wares 8 and 9 in equal proportions (n=4), and wares 4 and 10 in equal proportions (n=1-2 sherds per site). Group 3 sherds are enriched in first-row transition metals and the lanthanide series elements. Probabilities of group membership are listed in Table 2. Based on bivariate plots of these data, it is possible that there may be some sub-group structure (high vs. low chromium; Figure 9); however, more samples need to be submitted to verify the sub-structure with Mahalanobis distance calculations. Additionally, thin section analysis may be able to further parse the groups.

Clay/Sand Samples (TDD191-TDD259): In general, the clay/sand samples form two groups: those higher in arsenic and chromium and those diluted of the first-row transition metals and lanthanide series elements but enriched in tantalum and uranium. Of the previously submitted sand/clay samples, samples TDD233, TDD238, and TDD242 demonstrate statistical membership in Compositional Group 3 (Table 3). It is possible that sample TDD239 is also a member of Group 3; however, the probability of membership is lower. The remaining clay/sand samples are unassigned as to the three compositional groups described above; however, bivariate plots of remaining samples show some affinity to Group 1 and Group 3. To securely assign clay/sand samples to Group 1, the sample size must be larger.

Clay Samples (TDD324-TDD328): Clay sample TDD326 is a member of Group 3. The remaining samples statistically cannot be assigned to a compositional group. Again, principal component plots (Figures 5 and 6) of the three compositional groups and these clay samples suggest that TDD 325, TDD327, and TDD 328 may represent clays used to manufacture Group 1 pottery; however, bivariate plots (e.g., Figure 9) do not show this trend.

Unassigned Samples: Seventy-one ceramic samples remain unassigned. Table 3 provides the probability that they are not statistical members of Compositional Group 2 or Compositional Group 3. A few samples could be members of both groups therefore they were left unassigned.

While the samples remain unassigned, plots of these data (Figures 2 and 9) show that many of sherds plot within Compositional Group 3.

Given that the clay samples that are members of Compositional Group 3 are located near PU165, we would suggest that clays used to manufacture this pottery came from within the Rio Lumaco valley. Clays with higher chromium values tend to have been collected from around the site of PU 165 and those with lower chromium values tend to have been collected from locations further north (this is a **very** general trend). This trend suggests that with further clay sampling it may be possible to detect a north-south gradient in chromium levels in clays.

The majority of samples in Compositional Groups 2 and 3 were excavated from PU165 suggesting that potters at PU165 produced the pottery (based on the criterion of abundance) and exchanged the vessels to other settlements in the study. It is possible that Compositional Group 2 may also have been manufactured at or near PU122 given that almost equal quantities of pottery from Compositional Group 2 occur at PU165 and PU122. Too few samples comprise Compositional Group 1 to suggest a place of manufacture, but the majority of those samples were excavated from PU165.

Petrography may be able to further divide these compositional groups and well as provide information about the clays of the region. As always is the case, more samples will create a more robust dataset and more specific divisions in the underlying compositional groups may be possible.

Acknowledgments

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Table 1: Chemical Group Assignments for Pottery from Butarincon and Huitranlebu, Puren, Southern Chile

ANID	Chem_05	Subregion	Site Name	material	Ware
TDD171	Group 1	Butarincon	PU21.2.2.1	ceramic	6
TDD173	Group 1	Butarincon	PU 165	ceramic	6
TDD174	Group 1	Butarincon	PU 165	ceramic	6
TDD175	Group 1	Butarincon	PU 165	ceramic	3
TDD302	Group 1	Huitranlebu	PU 132b	ceramic	9
TDD004	Group 2	Butarincon	PU21.5.5	ceramic	7
TDD010	Group 2	Butarincon	PU 165	ceramic	2
TDD013	Group 2	Butarincon	PU 165	ceramic	1
TDD018	Group 2	Butarincon	PU 165	ceramic	2
TDD019	Group 2	Butarincon	PU 165	ceramic	7
TDD023	Group 2	Butarincon	PU 165	ceramic	8
TDD025	Group 2	Butarincon	PU 165	ceramic	2
TDD033	Group 2	Butarincon	PU 165	ceramic	1
TDD038	Group 2	Butarincon	PU 165	ceramic	2
TDD044	Group 2	Butarincon	PU 165	ceramic	2
TDD045	Group 2	Butarincon	PU 165	ceramic	2
TDD050	Group 2	Butarincon	PU 165	ceramic	6
TDD056	Group 2	Butarincon	PU 165	ceramic	11
TDD057	Group 2	Butarincon	PU 165	ceramic	11
TDD060	Group 2	Butarincon	LU69 10-3	ceramic	11
TDD061	Group 2	Butarincon	PU 165	ceramic	6
TDD062	Group 2	Butarincon	PU 165	ceramic	6
TDD063	Group 2	Butarincon	PU 165	ceramic	3
TDD070	Group 2	Butarincon	PU 165	ceramic	11
TDD084	Group 2	Butarincon	PU 165	ceramic	2
TDD095	Group 2	Butarincon	PU 165	ceramic	11
TDD100	Group 2	Butarincon	PU 165	ceramic	
TDD104	Group 2	Butarincon	PU 165	ceramic	2
TDD109	Group 2	Butarincon	PU 165	ceramic	2
TDD114	Group 2	Butarincon	PU165	ceramic	6
TDD119	Group 2	Butarincon	PU 165	ceramic	8
TDD125	Group 2	Butarincon	PU 165	ceramic	6
TDD129	Group 2	Butarincon	PU 165	ceramic	4
TDD130	Group 2	Butarincon	PU 165	ceramic	1
TDD145	Group 2	Butarincon	LU42.5.21	ceramic	7
TDD147	Group 2	Butarincon	PU 165	ceramic	
TDD148	Group 2	Butarincon	PU101/PU49.5.5	ceramic	2

TDD167	Group 2	Butarincon	PU51.S.1	ceramic	7
TDD177	Group 2	Butarincon	PU 165	ceramic	7
TDD183	Group 2	Butarincon	PU 165	ceramic	7
TDD260	Group 2	Huitranlebu	PU 36	ceramic	2
TDD267	Group 2	Huitranlebu	PU 120	ceramic	2
TDD268	Group 2	Huitranlebu	PU 120	ceramic	10
TDD269	Group 2	Huitranlebu	PU 120	ceramic	10
TDD270	Group 2	Huitranlebu	PU 120	ceramic	10
TDD271	Group 2	Huitranlebu	PU 122	ceramic	2
TDD272	Group 2	Huitranlebu	PU 122	ceramic	2
TDD273	Group 2	Huitranlebu	PU 122	ceramic	2
TDD274	Group 2	Huitranlebu	PU 122	ceramic	8
TDD275	Group 2	Huitranlebu	PU 122	ceramic	1
TDD276	Group 2	Huitranlebu	PU 122	ceramic	1
TDD278	Group 2	Huitranlebu	PU 122	ceramic	2
TDD282	Group 2	Huitranlebu	PU 122	ceramic	2
TDD286	Group 2	Huitranlebu	PU 122	ceramic	11
TDD290	Group 2	Huitranlebu	PU 122	ceramic	2
TDD291	Group 2	Huitranlebu	PU 122	ceramic	2
TDD292	Group 2	Huitranlebu	PU 122	ceramic	2
TDD296	Group 2	Huitranlebu	PU 122	ceramic	6
TDD297	Group 2	Huitranlebu	PU 123	ceramic	2
TDD298	Group 2	Huitranlebu	PU 123	ceramic	2
TDD299	Group 2	Huitranlebu	PU 123	ceramic	3
TDD304	Group 2	Huitranlebu	PU 157	ceramic	2
TDD305	Group 2	Huitranlebu	PU 157	ceramic	2
TDD306	Group 2	Huitranlebu	PU 157	ceramic	2
TDD307	Group 2	Huitranlebu	PU 157	ceramic	2
TDD308	Group 2	Huitranlebu	PU 157	ceramic	2
TDD309	Group 2	Huitranlebu	PU 157	ceramic	2
TDD311	Group 2	Huitranlebu	PU 157	ceramic	2
TDD322	Group 2	Huitranlebu	PU 264	ceramic	10
TDD001	Group 3	Butarincon	PU 165	ceramic	1
TDD002	Group 3	Butarincon	PU 165	ceramic	8
TDD003	Group 3	Butarincon	PU 165	ceramic	2
TDD005	Group 3	Butarincon	PU 165	ceramic	2
TDD006	Group 3	Butarincon	PU 165	ceramic	2
TDD008	Group 3	Butarincon	PU 165	ceramic	2
TDD011	Group 3	Butarincon	PU 165	ceramic	1
TDD012	Group 3	Butarincon	PU 165	ceramic	2
TDD014	Group 3	Butarincon	PU 165	ceramic	4

TDD016	Group 3	Butarincon	PU 165	ceramic	2
TDD020	Group 3	Butarincon	PU 165	ceramic	6
TDD021	Group 3	Butarincon	PU 165	ceramic	8
TDD022	Group 3	Butarincon	PU 165	ceramic	6
TDD026	Group 3	Butarincon	PU 165	ceramic	9
TDD027	Group 3	Butarincon	PU 165	ceramic	1
TDD028	Group 3	Butarincon	PU 165	ceramic	2
TDD029	Group 3	Butarincon	PU 165	ceramic	2
TDD031	Group 3	Butarincon	PU 165	ceramic	2
TDD035	Group 3	Butarincon	PU 165	ceramic	2
TDD036	Group 3	Butarincon	PU 165	ceramic	2
TDD037	Group 3	Butarincon	PU 165	ceramic	1
TDD039	Group 3	Butarincon	PU 165	ceramic	2
TDD040	Group 3	Butarincon	PU 165	ceramic	2
TDD041	Group 3	Butarincon	LU 69	ceramic	2
TDD042	Group 3	Butarincon	PU 165	ceramic	1
TDD043	Group 3	Butarincon	PU 165	ceramic	2
TDD046	Group 3	Butarincon	PU 165	ceramic	1
TDD047	Group 3	Butarincon	PU 165	ceramic	9
TDD048	Group 3	Butarincon	PU21.8.19	ceramic	2
TDD049	Group 3	Butarincon	PU 165	ceramic	2
TDD051	Group 3	Butarincon	PU 165	ceramic	3
TDD054	Group 3	Butarincon	PU 165	ceramic	10
TDD055	Group 3	Butarincon	PU 165	ceramic	3
TDD058	Group 3	Butarincon	PU 165	ceramic	clay daubs
TDD059	Group 3	Butarincon	PU 165	ceramic	11
TDD066	Group 3	Butarincon	PU 165	ceramic	6
TDD067	Group 3	Butarincon	PU 165	ceramic	2
TDD068	Group 3	Butarincon	PU 165	ceramic	2
TDD071	Group 3	Butarincon	PU 165	ceramic	2
TDD072	Group 3	Butarincon	PU 165	ceramic	2
TDD074	Group 3	Butarincon	PU 165	ceramic	11
TDD075	Group 3	Butarincon	PU 165	ceramic	11
TDD076	Group 3	Butarincon	PU 165	ceramic	11
TDD077	Group 3	Butarincon	LU 69 3-4	ceramic	2
TDD078	Group 3	Butarincon	PU 165	ceramic	11
TDD079	Group 3	Butarincon	PU 165	ceramic	2
TDD080	Group 3	Butarincon	PU 165	ceramic	2
TDD082	Group 3	Butarincon	PU 165	ceramic	11
TDD085	Group 3	Butarincon	PU 165	ceramic	2
TDD086	Group 3	Butarincon	PU 165	ceramic	11

TDD088	Group 3	Butarincon	LU 69 10-11	ceramic	2
TDD089	Group 3	Butarincon	PU 165	ceramic	3
TDD090	Group 3	Butarincon	PU 165	ceramic	1
TDD091	Group 3	Butarincon	PU 165	ceramic	2
TDD096	Group 3	Butarincon	PU 165	ceramic	11
TDD097	Group 3	Butarincon	PU 165	ceramic	2
TDD098	Group 3	Butarincon	PU 165	ceramic	1
TDD099	Group 3	Butarincon	PU 165	ceramic	11
TDD101	Group 3	Butarincon	PU 165	ceramic	2
TDD103	Group 3	Butarincon	PU 165	ceramic	11
TDD110	Group 3	Butarincon	PU 165	ceramic	11
TDD111	Group 3	Butarincon	PU 165	ceramic	2
TDD112	Group 3	Butarincon	PU 165	ceramic	9
TDD113	Group 3	Butarincon	PU165	ceramic	6
TDD115	Group 3	Butarincon	LU69 10-8	ceramic	6
TDD116	Group 3	Butarincon	PU 165	ceramic	1
TDD117	Group 3	Butarincon	LU69 3-3	ceramic	1
TDD118	Group 3	Butarincon	PU 165	ceramic	2
TDD120	Group 3	Butarincon	PU 165	ceramic	1
TDD123	Group 3	Butarincon	PU 165	ceramic	2
TDD124	Group 3	Butarincon	PU 165	ceramic	10
TDD126	Group 3	Butarincon	PU 165	ceramic	6
TDD127	Group 3	Butarincon	PU 165	ceramic	3
TDD131	Group 3	Butarincon	PU 165	ceramic	2
TDD132	Group 3	Butarincon	PU 165	ceramic	1
TDD134	Group 3	Butarincon	PU118.5.111	ceramic	9
TDD136	Group 3	Butarincon	PU65.3.16	ceramic	3
TDD137	Group 3	Butarincon	PU65.3.3	ceramic	2
TDD138	Group 3	Butarincon	PU118.5.3	ceramic	2
TDD139	Group 3	Butarincon	LU41-S	ceramic	2
TDD141	Group 3	Butarincon	LU42.5.17	ceramic	1
TDD142	Group 3	Butarincon	PU4.5.18	ceramic	2
TDD144	Group 3	Butarincon	PU52.5.46	ceramic	3
TDD149	Group 3	Butarincon	PU 165	ceramic	1
TDD153	Group 3	Butarincon	PU 165	ceramic	2
TDD154	Group 3	Butarincon	PU49.5.7	ceramic	2
TDD155	Group 3	Butarincon	PU 165	ceramic	2
TDD156	Group 3	Butarincon	PU52.S.31	ceramic	3
TDD157	Group 3	Butarincon	PU 165	ceramic	2
TDD158	Group 3	Butarincon	PU52.5.116	ceramic	2
TDD159	Group 3	Butarincon	PU 165	ceramic	1

TDD164	Group 3	Butarincon	LU69	ceramic	3
TDD166	Group 3	Butarincon	PU165	ceramic	2
TDD185	Group 3	Butarincon	PU 165	ceramic	6
TDD233	Group 3	Butarincon	Puren-Lumaco	Sand	n/a
TDD238	Group 3	Butarincon	Puren-Lumaco	Sand	n/a
TDD242	Group 3	Butarincon	Puren-Lumaco	Sand	n/a
TDD262	Group 3	Huitranlebu	PU 36	ceramic	2
TDD263	Group 3	Huitranlebu	PU 36	ceramic	2
TDD264	Group 3	Huitranlebu	PU 36	ceramic	2
TDD265	Group 3	Huitranlebu	PU 36	ceramic	2
TDD279	Group 3	Huitranlebu	PU 122	ceramic	2
TDD287	Group 3	Huitranlebu	PU 122	ceramic	2
TDD289	Group 3	Huitranlebu	PU 122	ceramic	2
TDD293	Group 3	Huitranlebu	PU 122	ceramic	2
TDD300	Group 3	Huitranlebu	PU 123	ceramic	6
TDD301	Group 3	Huitranlebu	PU 123	ceramic	8
TDD303	Group 3	Huitranlebu	PU 136	ceramic	2
TDD310	Group 3	Huitranlebu	PU 157	ceramic	1
TDD312	Group 3	Huitranlebu	PU 157	ceramic	2
TDD314	Group 3	Huitranlebu	PU 157	ceramic	11
TDD315	Group 3	Huitranlebu	PU 249	ceramic	2
TDD317	Group 3	Huitranlebu	PU 249	ceramic	6
TDD318	Group 3	Huitranlebu	PU 249	ceramic	6
TDD319	Group 3	Huitranlebu	PU 249	ceramic	8
TDD320	Group 3	Huitranlebu	PU 249	ceramic	8
TDD321	Group 3	Huitranlebu	PU 264	ceramic	2
TDD326	Group 3	Huitranlebu		clay sample	
TDD007	Unassign.	Butarincon	PU 165	ceramic	2
TDD009	Unassign.	Butarincon	PU 165	ceramic	9
TDD015	Unassign.	Butarincon	PU 165	ceramic	2
TDD017	Unassign.	Butarincon	PU 165	ceramic	10
TDD024	Unassign.	Butarincon	PU 165	ceramic	2
TDD030	Unassign.	Butarincon	PU 165	ceramic	3
TDD032	Unassign.	Butarincon	PU 165	ceramic	2
TDD034	Unassign.	Butarincon	PU 165	ceramic	8
TDD052	Unassign.	Butarincon	PU 165	ceramic	1
TDD053	Unassign.	Butarincon	PU 165	ceramic	
TDD064	Unassign.	Butarincon	PU 165	ceramic	3
TDD065	Unassign.	Butarincon	PU 165	ceramic	6
TDD069	Unassign.	Butarincon	PU 165	ceramic	2
TDD073	Unassign.	Butarincon	PU 165	ceramic	2

TDD081	Unassign.	Butarincon	PU 165	ceramic	9
TDD083	Unassign.	Butarincon	PU 165	ceramic	2
TDD087	Unassign.	Butarincon	PU 165	ceramic	11
TDD092	Unassign.	Butarincon	PU 165	ceramic	1
TDD093	Unassign.	Butarincon	PU 165	ceramic	11
TDD094	Unassign.	Butarincon	PU 165	ceramic	11
TDD102	Unassign.	Butarincon	LU69 2-3	ceramic	3
TDD105	Unassign.	Butarincon	PU 165	ceramic	11
TDD106	Unassign.	Butarincon	PU 165	ceramic	11
TDD108	Unassign.	Butarincon	PU 165	ceramic	11
TDD121	Unassign.	Butarincon	PU 165	ceramic	6
TDD122	Unassign.	Butarincon	PU 165	ceramic	2
TDD128	Unassign.	Butarincon	PU 165	ceramic	1
TDD133	Unassign.	Butarincon	PU 165	ceramic	9
TDD135	Unassign.	Butarincon	PU118.5.8	ceramic	2
TDD140	Unassign.	Butarincon	LU4.5.22	ceramic	2
TDD143	Unassign.	Butarincon	LU4.5.56	ceramic	7
TDD146	Unassign.	Butarincon	PU40.5.2	ceramic	1
TDD150	Unassign.	Butarincon	PU 165	ceramic	1
TDD151	Unassign.	Butarincon	PU 165	ceramic	2
TDD152	Unassign.	Butarincon	PU 165	ceramic	2
TDD160	Unassign.	Butarincon	PU 165	ceramic	3
TDD161	Unassign.	Butarincon	PU61.3.15	ceramic	2
TDD162	Unassign.	Butarincon	PU 165	ceramic	1
TDD163	Unassign.	Butarincon	PU51.3.5	ceramic	2
TDD165	Unassign.	Butarincon	PU 165	ceramic	2
TDD168	Unassign.	Butarincon	PU51.S.2	ceramic	5
TDD169	Unassign.	Butarincon	PU51.S.3	ceramic	7
TDD170	Unassign.	Butarincon	PU51.S.4	ceramic	5
TDD172	Unassign.	Butarincon	PU21.2.2.2	ceramic	6
TDD176	Unassign.	Butarincon	PU 165	ceramic	1
TDD178	Unassign.	Butarincon	PU 165	ceramic	5
TDD179	Unassign.	Butarincon	PU21 SE-1	ceramic	3
TDD180	Unassign.	Butarincon	PU21 SE-2	ceramic	1
TDD181	Unassign.	Butarincon	PU21 SE-3	ceramic	7
TDD182	Unassign.	Butarincon	PU21 SE-4	ceramic	6
TDD184	Unassign.	Butarincon	PU 165	ceramic	1
TDD186	Unassign.	Butarincon	PU 165	ceramic	6
TDD187	Unassign.	Butarincon	PU 165	ceramic	1
TDD188	Unassign.	Butarincon	PU 165	ceramic	1
TDD189	Unassign.	Butarincon	PU 165	ceramic	1

TDD190	Unassign.	Butarincon	PU 165	ceramic	5
TDD259	Unassign.	Butarincon	Puren-Lumaco	Sand	n/a
TDD261	Unassign.	Huitranlebu	PU 36	ceramic	2
TDD266	Unassign.	Huitranlebu	PU 38	burnt clay	Burnt Clay
TDD277	Unassign.	Huitranlebu	PU 122	ceramic	2
TDD280	Unassign.	Huitranlebu	PU 122	ceramic	2
TDD281	Unassign.	Huitranlebu	PU 122	ceramic	6
TDD283	Unassign.	Huitranlebu	PU 122	ceramic	2
TDD284	Unassign.	Huitranlebu	PU 122	ceramic	2
TDD285	Unassign.	Huitranlebu	PU 122	ceramic	6
TDD288	Unassign.	Huitranlebu	PU 122	ceramic	6
TDD294	Unassign.	Huitranlebu	PU 122	ceramic	2
TDD295	Unassign.	Huitranlebu	PU 122	ceramic	6
TDD313	Unassign.	Huitranlebu	PU 157	ceramic	1
TDD316	Unassign.	Huitranlebu	PU 249	ceramic	6
TDD323	Unassign.	Huitranlebu	PU 264	ceramic	12
TDD191		Butarincon	Lu-69/(T.1/U:2)	Sand	n/a
TDD192		Butarincon		Sand	n/a
TDD193		Butarincon	Pu-166/Bloque A/Kuel 8/	Sand	n/a
TDD194		Butarincon	Pu-166/Bloque A/Kuel 8/	Sand	n/a
TDD195		Butarincon	Pu-166/BloqueA/Kuel 8/Rasgo 3	Sand	n/a
TDD196		Butarincon	Lu-69/(T.1)/Capa7/Bolsa37	Sand	n/a
TDD197		Butarincon	Lu-69/Pozo1/Capa3/Bolsa13	Sand	n/a
TDD198		Butarincon	U.5/Capa 5	Sand	n/a
TDD199		Butarincon	Lu-54/Pozo 2/Suelo Rojo	Sand	n/a
TDD200		Butarincon	Pu-166/BloqueA/Kuel8/	Sand	n/a
TDD201		Butarincon	Lu-69/(T.1/U:3)/Capa10/Bolsa38	Sand	n/a
TDD202		Butarincon	Lu-69/Pozo 1/Capa 2	Sand	n/a
TDD203		Butarincon	Lu-69/Bolsa 46/Camino	Sand	n/a
TDD204		Butarincon	Lu-69/Pozo 3/Capa4	Sand	n/a
TDD205		Butarincon	Pu-166/BloqueA/Kuel8/Capa6	Sand	n/a
TDD206		Butarincon	Pu-166/Kuel8/T.1/Capa2	Sand	n/a
TDD207		Butarincon	Lu-69/(T.1/U:1)/Capa10/Bolsa34	Sand	n/a
TDD208		Butarincon	Lu-69/(T.1/U:1)/Capa13/N. 4.71	Sand	n/a
TDD209		Butarincon	Lu-69/(T.1/U:1)/Capa 10	Sand	n/a
TDD210		Butarincon	Lu-69/Pozo2/Capa1/Bolsa23	Sand	n/a
TDD211		Butarincon	Lu-69/Pozo 2/Capa 2	Sand	n/a
TDD212		Butarincon	Lu-69/(T.1/U:1)/Capa11/	Sand	n/a
TDD213		Butarincon	Lu-69/(T.1/U:1)/Capa 11/	Sand	n/a
TDD214		Butarincon	Pu-166/BloqueA/KueL8/Capa2	Sand	n/a
TDD215		Butarincon	Lu-69/Tren-Tren/Capa2	Sand	n/a

TDD216		Butarincon	Lu-69/Pozo3/N. 40-60	Sand	n/a
TDD217		Butarincon	Lu-69/Pozo1/Capa1/10-20cm	Sand	n/a
TDD218		Butarincon	Lu-69/(T.1/U:1)/Bolsa 59	Sand	n/a
TDD219		Butarincon	Lu-69/Pozo 3/Capa 2	Sand	n/a
TDD220		Butarincon	Lu-69/(T.1/u:4)/Capa4/Bolsa5	Sand	n/a
TDD221		Butarincon	Lu-69/Pozo2/Capa1/0-20cm	Sand	n/a
TDD222		Butarincon	Lu-69/(T.1/U:1)/Capa10/3-3.5	Sand	n/a
TDD223		Butarincon	Lu-69/Trin.1/N.4.40cm/Bolsa47	Sand	n/a
TDD224		Butarincon	Lu-69/(T.1/U:1)/N.9.80/Bolsa62	Sand	n/a
TDD225		Butarincon	Lu-69(T.1/U:1)/Capa 7/Bolsa 38	Sand	n/a
TDD226		Butarincon	Lu-69/Pozo 3/N. 137	Sand	n/a
TDD227		Butarincon	Lu-69/(T.1/U:4)/Capa9/Bolsa40	Sand	n/a
TDD228		Butarincon	Puren-Lumaco	Sand	n/a
TDD229		Butarincon	Puren-Lumaco	Sand	n/a
TDD230		Butarincon	Puren-Lumaco	Sand	n/a
TDD231		Butarincon	Puren-Lumaco	Sand	n/a
TDD232		Butarincon	Puren-Lumaco	Sand	n/a
TDD234		Butarincon	Puren-Lumaco	Sand	n/a
TDD235		Butarincon	Puren-Lumaco	Sand	n/a
TDD236		Butarincon	Puren-Lumaco	Sand	n/a
TDD237		Butarincon	Puren-Lumaco	Sand	n/a
TDD239		Butarincon	Puren-Lumaco	Sand	n/a
TDD240		Butarincon	Puren-Lumaco	Sand	n/a
TDD241		Butarincon	Puren-Lumaco	Sand	n/a
TDD243		Butarincon	Puren-Lumaco	Sand	n/a
TDD244		Butarincon	Puren-Lumaco	Sand	n/a
TDD245		Butarincon	Puren-Lumaco	Sand	n/a
TDD246		Butarincon	Puren-Lumaco	Sand	n/a
TDD247		Butarincon	Puren-Lumaco	Sand	n/a
TDD248		Butarincon	Puren-Lumaco	Sand	n/a
TDD249		Butarincon	Puren-Lumaco	Sand	n/a
TDD250		Butarincon	Puren-Lumaco	Sand	n/a
TDD251		Butarincon	Puren-Lumaco	Sand	n/a
TDD252		Butarincon	Puren-Lumaco	Sand	n/a
TDD253		Butarincon	Puren-Lumaco	Sand	n/a
TDD254		Butarincon	Puren-Lumaco	Sand	n/a
TDD255		Butarincon	Puren-Lumaco	Sand	n/a
TDD256		Butarincon	Puren-Lumaco	Sand	n/a
TDD257		Butarincon	Puren-Lumaco	Sand	n/a
TDD258		Butarincon	Puren-Lumaco	Sand	n/a
TDD324		Huitranlebu		clay sample	

TDD325		Huitranlebu		clay sample	
TDD327		Huitranlebu	PU 132	clay sample	
TDD328		Huitranlebu	PU 132	clay sample	

Table 2: Mahalanobis Distance Calculation and Posterior Classification from Butarincon and Huitranlebu, Puren, Southern Chile

Groups are:

1 Group 2
2 Group 3

Variables used:

AS	LA	LU	ND	SM	U	YB
CE	CO	CR	CS	EU	FE	HF
RB	SB	SC	TA	TB	TH	ZN
ZR	AL	BA	DY	K	MN	NA
TI	V					

Probabilities are jackknifed for specimens included in each group.

The following specimens are in Group 2

ID. NO.	Probabilities:		From:	Into:
	Group 2	Group 3		
TDD004	93.095	0.031	1	1
TDD010	59.245	1.130	1	1
TDD013	85.541	1.877	1	1
TDD018	56.491	0.189	1	1
TDD019	6.453	0.000	1	1
TDD023	0.121	0.009	1	1
TDD025	82.397	0.003	1	1
TDD033	0.501	0.000	1	1
TDD038	94.089	0.688	1	1
TDD044	91.925	0.725	1	1
TDD045	5.615	0.051	1	1
TDD050	97.900	0.299	1	1
TDD056	99.670	27.530	1	1
TDD057	98.054	18.497	1	1
TDD060	77.844	0.334	1	1
TDD061	58.382	0.060	1	1
TDD062	0.523	0.000	1	1
TDD063	49.160	0.004	1	1
TDD068	29.385	0.014	1	1
TDD070	53.891	2.462	1	1
TDD084	64.541	2.470	1	1
TDD095	68.927	0.315	1	1
TDD100	56.664	0.943	1	1
TDD104	93.069	3.833	1	1
TDD109	27.275	0.379	1	1
TDD114	1.376	0.590	1	1
TDD119	0.292	0.002	1	1
TDD125	96.355	2.005	1	1
TDD129	0.195	0.000	1	1
TDD130	9.891	1.807	1	1
TDD145	87.646	0.102	1	1
TDD147	99.647	17.965	1	1
TDD148	13.639	0.006	1	1
TDD167	70.957	0.000	1	1
TDD177	72.221	0.000	1	1
TDD183	51.295	0.000	1	1
TDD260	0.798	0.000	1	1
TDD267	49.086	0.001	1	1
TDD268	93.777	0.364	1	1
TDD269	72.191	0.079	1	1
TDD270	97.146	0.054	1	1
TDD271	99.186	0.006	1	1
TDD272	7.844	0.000	1	1
TDD273	89.660	0.016	1	1
TDD274	38.113	0.010	1	1

TDD275	32.361	0.064	1	1
TDD276	0.356	0.000	1	1
TDD278	0.516	0.001	1	1
TDD282	29.978	0.022	1	1
TDD286	97.363	1.809	1	1
TDD290	24.067	0.001	1	1
TDD291	21.689	0.001	1	1
TDD292	80.458	5.171	1	1
TDD296	14.011	0.047	1	1
TDD297	21.842	0.000	1	1
TDD298	20.470	0.202	1	1
TDD299	51.374	0.872	1	1
TDD304	99.402	0.019	1	1
TDD305	68.283	0.007	1	1
TDD306	23.456	0.036	1	1
TDD307	95.076	0.000	1	1
TDD308	54.581	0.000	1	1
TDD309	1.761	0.000	1	1
TDD311	98.489	0.070	1	1
TDD322	12.135	0.000	1	1

The following specimens are in Group 3

Probabilities:

ID. NO.	Group 2	Group 3	From:	Into:
TDD001	0.000	64.002	2	2
TDD002	0.000	47.989	2	2
TDD003	0.000	49.071	2	2
TDD005	0.000	85.800	2	2
TDD006	0.001	75.549	2	2
TDD008	0.007	99.229	2	2
TDD011	0.000	21.778	2	2
TDD012	0.000	82.752	2	2
TDD014	0.000	99.294	2	2
TDD016	0.000	96.314	2	2
TDD020	0.000	99.762	2	2
TDD021	0.004	95.606	2	2
TDD022	0.000	99.097	2	2
TDD026	0.000	45.647	2	2
TDD027	0.000	88.474	2	2
TDD028	0.000	3.292	2	2
TDD029	0.000	63.029	2	2
TDD031	0.000	36.062	2	2
TDD035	0.014	16.082	2	2
TDD036	0.000	99.338	2	2
TDD037	0.000	26.367	2	2
TDD039	0.000	99.966	2	2
TDD040	0.000	87.690	2	2
TDD041	0.000	10.214	2	2
TDD042	0.000	51.054	2	2
TDD043	0.004	42.062	2	2
TDD046	0.000	6.526	2	2
TDD047	0.000	4.611	2	2
TDD048	0.000	48.370	2	2
TDD049	0.001	82.916	2	2
TDD051	0.000	73.613	2	2
TDD054	0.000	75.790	2	2
TDD055	0.006	7.723	2	2
TDD058	0.000	0.872	2	2
TDD059	0.000	94.523	2	2
TDD066	0.000	90.286	2	2
TDD067	0.000	11.565	2	2
TDD071	0.048	37.797	2	2
TDD072	0.000	97.433	2	2
TDD074	0.001	77.860	2	2

TDD075	0.005	98.834	2	2
TDD076	0.001	99.774	2	2
TDD077	0.000	8.944	2	2
TDD078	0.000	29.051	2	2
TDD079	0.000	0.046	2	2
TDD080	0.013	11.161	2	2
TDD082	0.030	91.999	2	2
TDD085	0.000	4.137	2	2
TDD086	0.000	87.857	2	2
TDD088	0.000	13.844	2	2
TDD089	0.000	64.463	2	2
TDD090	0.000	47.686	2	2
TDD091	0.000	87.724	2	2
TDD096	0.000	34.066	2	2
TDD097	0.000	10.198	2	2
TDD098	0.000	32.519	2	2
TDD099	0.000	60.019	2	2
TDD101	0.002	93.200	2	2
TDD103	0.000	20.729	2	2
TDD110	0.000	7.332	2	2
TDD111	0.000	98.819	2	2
TDD112	0.000	81.687	2	2
TDD113	0.000	46.316	2	2
TDD115	0.000	57.858	2	2
TDD116	0.000	0.210	2	2
TDD117	0.000	12.959	2	2
TDD118	0.000	12.430	2	2
TDD120	0.000	5.116	2	2
TDD123	0.000	87.504	2	2
TDD124	0.002	3.753	2	2
TDD126	1.282	79.528	2	2
TDD127	0.000	58.875	2	2
TDD131	0.004	16.483	2	2
TDD132	0.000	1.370	2	2
TDD134	0.000	36.977	2	2
TDD136	0.050	14.560	2	2
TDD137	0.020	21.590	2	2
TDD138	0.000	5.072	2	2
TDD139	0.000	42.654	2	2
TDD141	0.000	93.545	2	2
TDD142	0.003	77.292	2	2
TDD144	0.003	96.820	2	2
TDD149	0.000	3.065	2	2
TDD153	0.572	52.876	2	2
TDD154	0.622	29.927	2	2
TDD155	0.010	22.576	2	2
TDD156	0.000	35.379	2	2
TDD157	0.000	99.862	2	2
TDD158	0.000	66.770	2	2
TDD159	0.000	1.532	2	2
TDD164	0.000	33.732	2	2
TDD166	0.000	92.163	2	2
TDD185	0.000	2.742	2	2
TDD262	0.022	57.459	2	2
TDD263	0.000	21.986	2	2
TDD264	0.001	19.803	2	2
TDD265	0.000	30.476	2	2
TDD279	0.000	13.570	2	2
TDD287	0.090	98.475	2	2
TDD289	0.000	42.560	2	2
TDD293	0.000	38.865	2	2
TDD300	0.000	26.274	2	2
TDD301	0.001	92.209	2	2
TDD303	0.000	83.274	2	2

TDD310	0.063	46.273	2	2
TDD312	0.056	92.136	2	2
TDD314	0.000	2.802	2	2
TDD315	0.005	58.566	2	2
TDD317	0.000	48.468	2	2
TDD318	0.000	61.952	2	2
TDD319	0.002	74.946	2	2
TDD320	0.000	19.027	2	2
TDD321	0.000	8.940	2	2

Table 3: Mahalanobis Distance Calculation for Miscellaneous Specimens [Group 1, Sand (TDD191-258), Clay (TDD324-328), and Unassigned) Projected Against Two of More Groups (Group 2 and Group 3) from Butarincon and Huitranlebu, Puren, Southern Chile

Reference groups and numbers of specimens:

1	Group 2	65
2	Group 3	113

Variables used:

AS	LA	LU	ND	SM	U	YB
CE	CO	CR	CS	EU	FE	HF
RB	SB	SC	TA	TB	TH	ZN
ZR	AL	BA	DY	K	MN	NA
TI	V					

The following specimens are in Group 1

ID. NO.	Probabilities:		BEST GP.
	Group 2	Group 3	
TDD171	0.000	0.000	2
TDD173	0.000	0.000	2
TDD174	0.000	0.000	2
TDD175	0.000	0.000	2
TDD302	0.000	0.000	2

The following specimens are Sand/Clay samples

ID. NO.	Probabilities:		BEST GP.
	Group 2	Group 3	
TDD191	0.000	0.000	1
TDD192	0.000	0.000	1
TDD193	0.000	0.000	2
TDD194	0.000	0.000	1
TDD195	0.000	0.000	2
TDD196	0.000	0.000	2
TDD197	0.000	0.000	2
TDD198	0.000	0.000	2
TDD199	0.000	0.000	2
TDD200	0.000	0.000	2
TDD201	0.000	0.000	2
TDD202	0.000	0.000	2
TDD203	0.000	0.000	1
TDD204	0.000	0.000	2
TDD205	0.000	0.000	2
TDD206	0.000	0.000	2
TDD207	0.000	0.000	1
TDD208	0.000	0.000	2
TDD209	0.000	0.000	1
TDD210	0.000	0.000	1
TDD211	0.000	0.000	2
TDD212	0.000	0.000	2
TDD213	0.000	0.000	2
TDD214	0.000	0.000	2
TDD215	0.000	0.000	2
TDD216	0.000	0.000	2
TDD217	0.000	0.000	2
TDD218	0.000	0.000	2
TDD219	0.000	0.000	2
TDD220	0.000	0.000	1
TDD221	0.000	0.000	2
TDD222	0.000	0.000	1
TDD223	0.000	0.000	2
TDD224	0.000	0.000	1
TDD225	0.000	0.000	2

TDD226	0.000	0.000	2
TDD227	0.000	0.000	2
TDD228	0.000	0.060	2
TDD229	0.000	0.000	2
TDD230	0.000	0.000	1
TDD231	0.000	0.000	2
TDD232	0.000	0.003	2
TDD233	0.000	2.535	2
TDD234	0.000	0.000	2
TDD235	0.000	0.000	1
TDD236	0.000	0.001	2
TDD237	0.000	0.000	2
TDD238	0.000	1.704	2
TDD239	0.000	0.156	2
TDD240	0.000	0.000	1
TDD241	0.000	0.001	2
TDD242	0.000	1.661	2
TDD243	0.000	0.000	2
TDD244	0.000	0.000	2
TDD245	0.000	0.000	1
TDD246	0.000	0.000	2
TDD247	0.000	0.000	2
TDD248	0.000	0.000	2
TDD249	0.000	0.000	2
TDD250	0.000	0.000	2
TDD251	0.000	0.000	2
TDD252	0.000	0.000	2
TDD253	0.000	0.000	2
TDD254	0.000	0.000	2
TDD255	0.000	0.000	2
TDD256	0.000	0.000	1
TDD257	0.000	0.000	2
TDD258	0.000	0.000	2

The following specimens Clay Samples
Probabilities:

ID. NO.	Group 2	Group 3	BEST GP.
TDD324	0.000	0.000	2
TDD325	0.000	0.001	2
TDD326	0.000	75.026	2
TDD327	0.000	0.000	2
TDD328	0.000	0.000	2

The following specimens are Unassigned Samples
Probabilities:

ID. NO.	Group 2	Group 3	BEST GP.
TDD007	0.009	0.017	2
TDD009	15.850	3.027	1
TDD015	23.493	15.870	1
TDD017	0.000	0.001	2
TDD024	0.000	0.052	2
TDD030	0.000	0.012	2
TDD032	20.486	9.912	1
TDD034	0.000	0.000	1
TDD052	0.000	0.000	2
TDD053	0.000	0.004	2
TDD064	0.000	0.041	2
TDD065	0.000	0.000	2
TDD069	16.109	28.238	2
TDD073	51.780	46.750	1
TDD081	0.000	0.131	2
TDD083	50.790	17.975	1
TDD087	31.591	50.782	2
TDD092	0.009	1.099	2

TDD093	0.010	0.115	2
TDD094	0.006	0.000	1
TDD102	0.000	0.000	2
TDD105	0.000	0.000	2
TDD106	80.631	18.042	1
TDD108	0.000	0.232	2
TDD121	0.000	1.109	2
TDD122	0.020	0.247	2
TDD128	0.000	1.289	2
TDD133	1.625	2.567	2
TDD135	7.328	0.004	1
TDD140	0.000	1.610	2
TDD143	0.000	0.080	2
TDD146	0.000	0.123	2
TDD150	56.805	60.448	2
TDD151	0.000	0.000	1
TDD152	38.371	14.625	1
TDD160	0.000	0.000	2
TDD161	0.007	0.929	2
TDD162	0.000	0.000	2
TDD163	0.000	0.715	2
TDD165	0.000	0.000	1
TDD168	0.000	0.000	1
TDD169	0.000	0.000	1
TDD170	0.000	0.000	1
TDD172	0.000	0.057	2
TDD176	0.000	0.000	1
TDD178	0.000	0.000	1
TDD179	0.000	0.000	1
TDD180	0.000	0.000	2
TDD181	0.001	0.190	2
TDD182	0.000	0.000	2
TDD184	0.000	0.000	1
TDD186	0.000	0.000	2
TDD187	0.000	0.002	2
TDD188	0.000	0.000	2
TDD189	0.000	0.000	1
TDD190	0.000	0.046	2
TDD259	0.000	0.000	2
TDD261	0.000	0.065	2
TDD266	0.000	0.000	2
TDD277	0.266	0.788	2
TDD280	0.031	0.066	2
TDD281	0.018	0.000	1
TDD283	0.166	0.161	1
TDD284	0.001	0.006	2
TDD285	0.025	0.000	1
TDD288	0.000	0.000	2
TDD294	0.000	0.001	2
TDD295	95.733	64.226	1
TDD313	0.000	0.000	1
TDD316	0.000	0.073	2
TDD323	0.000	0.424	2

Table 4: Principal Components Analysis of Butarincon and Huitranlebu, Puren, Southern Chile Pottery and Clay Samples (R-Q Factor Analysis Based on Variance-Covariance Matrix).

Ei genval ues and Percentage of Variance Expl ai ned:

	Ei genval ue	%Vari ance	Cum. %Var.
1	0. 2132	25. 0299	25. 0299
2	0. 1623	19. 0452	44. 0751
3	0. 1349	15. 8290	59. 9041
4	0. 0895	10. 5000	70. 4041
5	0. 0575	6. 7469	77. 1511
6	0. 0346	4. 0586	81. 2097
7	0. 0281	3. 2979	84. 5076
8	0. 0215	2. 5178	87. 0254
9	0. 0171	2. 0063	89. 0317
10	0. 0154	1. 8089	90. 8406

Ei genvectors (largest to smallest):

As	0. 2711	0. 3126	0. 0043	-0. 0509	0. 3039	0. 0066	-0. 5195	0. 4191	-0. 2560	-0. 0547
La	-0. 0984	0. 1439	-0. 3107	0. 0600	0. 0271	0. 0367	0. 0221	0. 1616	0. 0353	0. 2049
Lu	0. 0259	0. 1222	-0. 1561	0. 1215	-0. 1017	0. 0760	0. 0543	0. 0675	0. 0884	-0. 0856
Nd	-0. 1216	0. 1658	-0. 2516	0. 0859	-0. 0430	0. 0210	-0. 0120	0. 1172	-0. 0021	0. 1250
Sm	-0. 1128	0. 1684	-0. 2022	0. 0891	-0. 0798	0. 0521	-0. 0176	0. 0717	-0. 0113	0. 0571
U	0. 1004	-0. 0498	-0. 2579	0. 1420	0. 1387	-0. 0860	-0. 2825	-0. 4681	-0. 0430	0. 3332
Yb	0. 0085	0. 1299	-0. 1750	0. 1133	-0. 1223	0. 0939	0. 0639	0. 0929	0. 0834	-0. 0532
Ce	-0. 0554	0. 1838	-0. 2050	0. 1335	0. 1572	-0. 0244	0. 0254	-0. 0099	-0. 0812	0. 2433
Co	0. 0404	0. 4294	0. 2750	0. 0700	0. 1508	-0. 1849	0. 0886	-0. 2993	-0. 1471	0. 0696
Cr	0. 2900	0. 2844	0. 0324	-0. 2307	-0. 5403	-0. 2474	-0. 1526	-0. 2164	0. 2383	0. 3284
Cs	0. 0930	0. 1193	-0. 2041	-0. 3814	0. 1070	0. 3026	0. 1905	-0. 0644	0. 0689	-0. 2452
Eu	-0. 1775	0. 1535	-0. 1699	0. 1201	-0. 1051	0. 0358	-0. 0383	0. 0358	-0. 1158	0. 0130
Fe	-0. 0459	0. 2371	0. 1279	-0. 0606	0. 0503	-0. 0526	-0. 0453	-0. 0487	-0. 2639	-0. 1600
Hf	0. 0342	-0. 1275	-0. 1186	0. 3468	-0. 0489	-0. 1957	-0. 1152	-0. 1927	-0. 0164	-0. 3561
Rb	-0. 0005	0. 0290	-0. 2050	-0. 1747	0. 1635	0. 0897	0. 1294	-0. 1932	0. 1488	-0. 0756
Sb	0. 2948	0. 0780	-0. 1027	-0. 1200	0. 2346	-0. 0039	-0. 3469	-0. 0077	0. 5111	-0. 2555
Sc	-0. 0850	0. 1821	-0. 0124	-0. 1077	-0. 1679	-0. 0099	0. 0139	-0. 1129	-0. 1414	-0. 2847
Ta	0. 1004	-0. 0200	-0. 1950	0. 1071	0. 0456	0. 0280	0. 0275	-0. 0131	0. 1927	0. 0171
Tb	-0. 0816	0. 1649	-0. 2312	0. 1563	-0. 1630	0. 1046	0. 0119	0. 1126	0. 0229	-0. 0388
Th	-0. 0533	0. 0297	-0. 2353	-0. 0571	0. 2250	0. 0795	-0. 0537	-0. 2448	-0. 2720	0. 0589
Zn	-0. 0464	0. 1841	-0. 0345	-0. 1594	-0. 0443	0. 0217	0. 1285	-0. 1221	-0. 0612	-0. 0938
Zr	0. 0399	-0. 1317	-0. 1300	0. 3664	-0. 0560	-0. 1881	-0. 1489	-0. 2021	-0. 0516	-0. 3605
Al	-0. 1161	0. 0992	-0. 0805	-0. 1544	-0. 0398	0. 0007	-0. 0118	-0. 1895	-0. 2681	-0. 1612
Ba	-0. 3027	0. 0679	-0. 1155	-0. 1666	0. 2471	-0. 7805	0. 1626	0. 2156	0. 1795	-0. 0500
Dy	-0. 0894	0. 1379	-0. 1845	0. 0816	-0. 1925	-0. 0068	0. 0654	0. 1288	0. 0462	-0. 0874
K	-0. 1286	-0. 0354	-0. 1910	-0. 2160	0. 2058	0. 0279	0. 0843	-0. 2488	0. 1524	-0. 0178
Mn	0. 0664	0. 4069	0. 2995	0. 4370	0. 2666	0. 1509	0. 3182	-0. 0948	0. 3039	-0. 0199
Na	-0. 6962	0. 0997	0. 2402	-0. 0330	-0. 0446	0. 2013	-0. 4877	-0. 1174	0. 2951	-0. 0239
Ti	0. 0879	0. 0664	-0. 0508	0. 0470	-0. 2226	-0. 0445	0. 0125	0. 0271	0. 0827	-0. 1847
V	0. 0495	0. 2183	0. 0100	-0. 1285	-0. 1685	-0. 0790	-0. 0222	-0. 0509	-0. 0787	-0. 2505

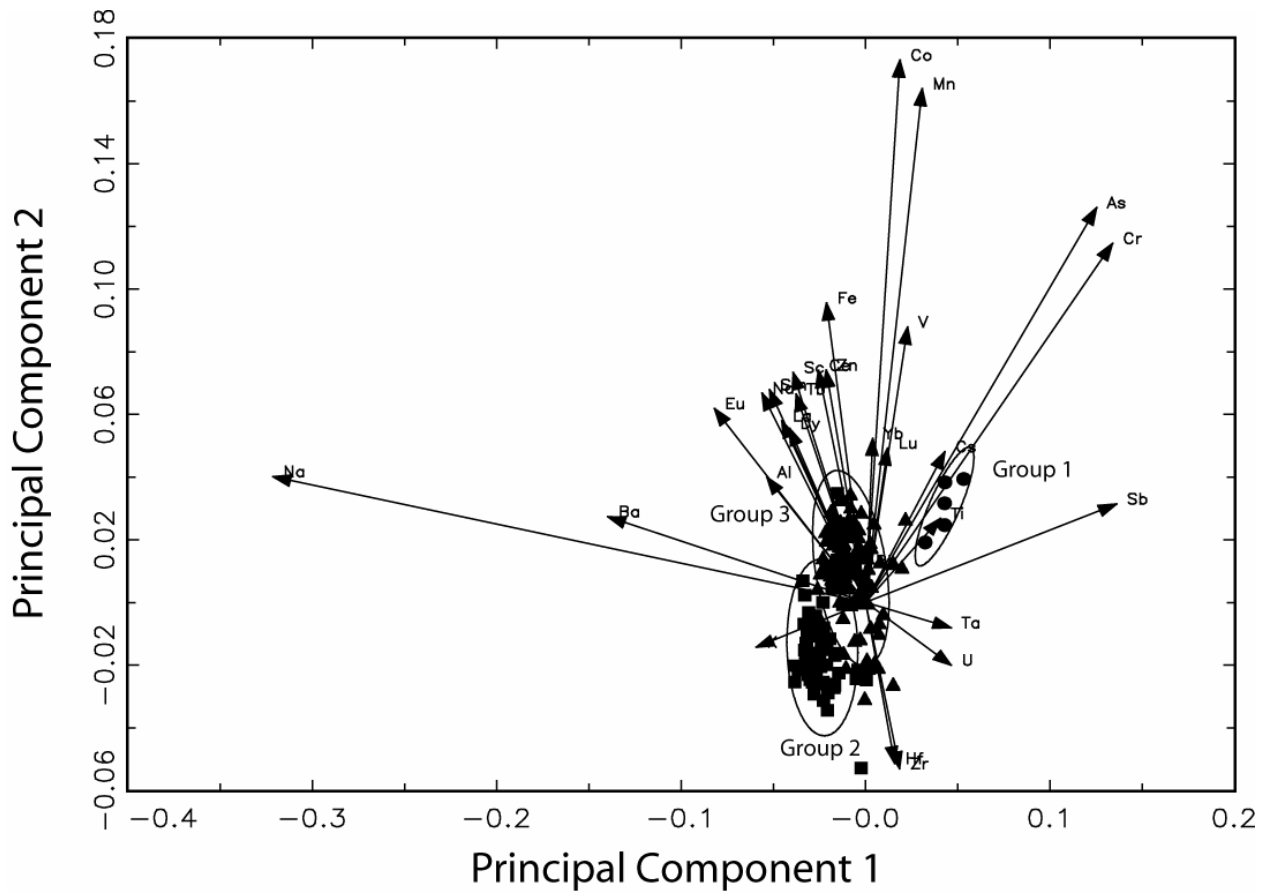


Figure 1: Ceramic samples from Butarincon and Huitranlebu, Puren, Southern Chile projected onto the first two principal components with vectors. Ellipses represent 90% confidence intervals for group membership.

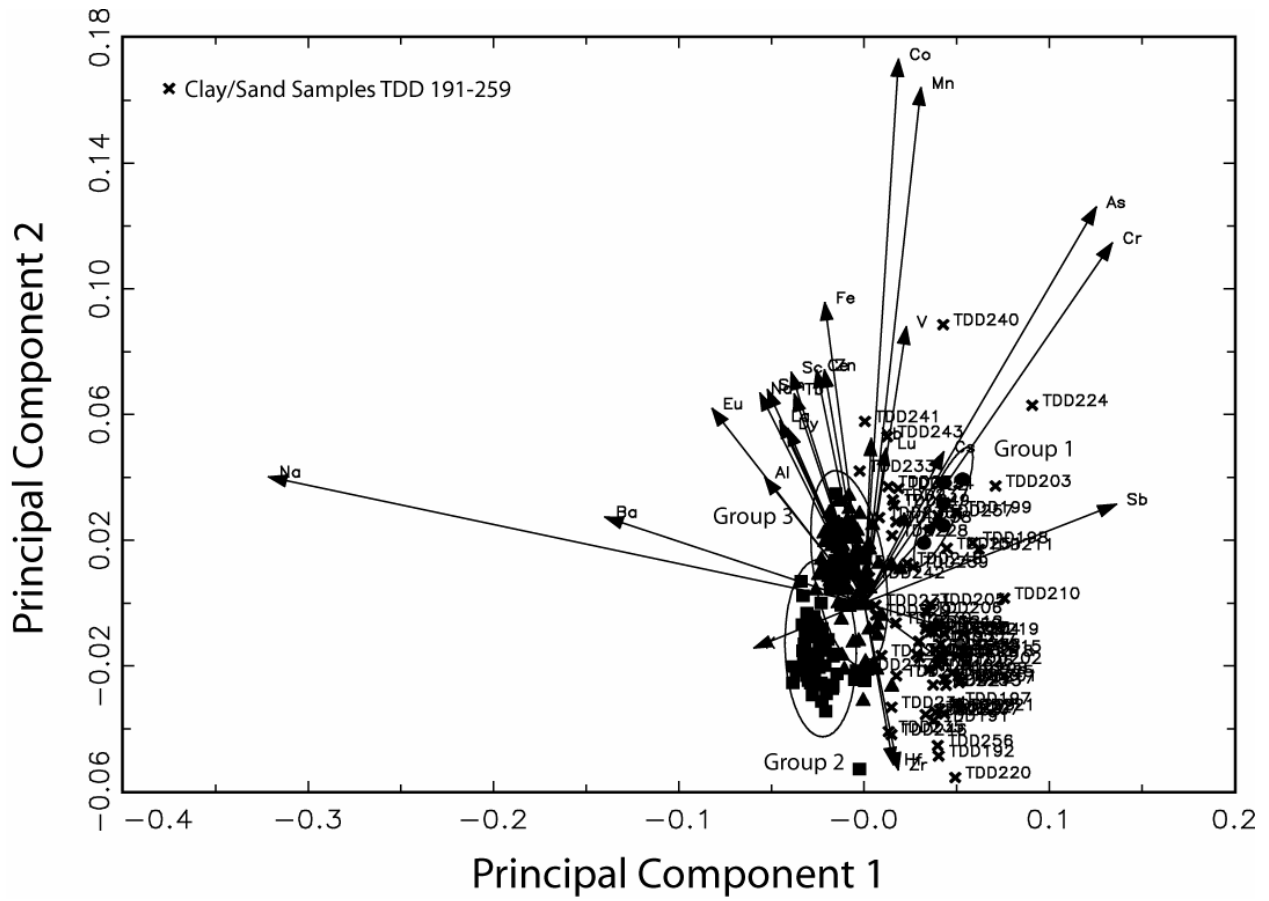


Figure 3: Ceramic samples from Butarincon and Huitranlebu, Puren, Southern Chile projected onto the first two principal components with clay/sand samples submitted in 2005 (TDD191-259). Ellipses represent 90% confidence intervals for group membership.

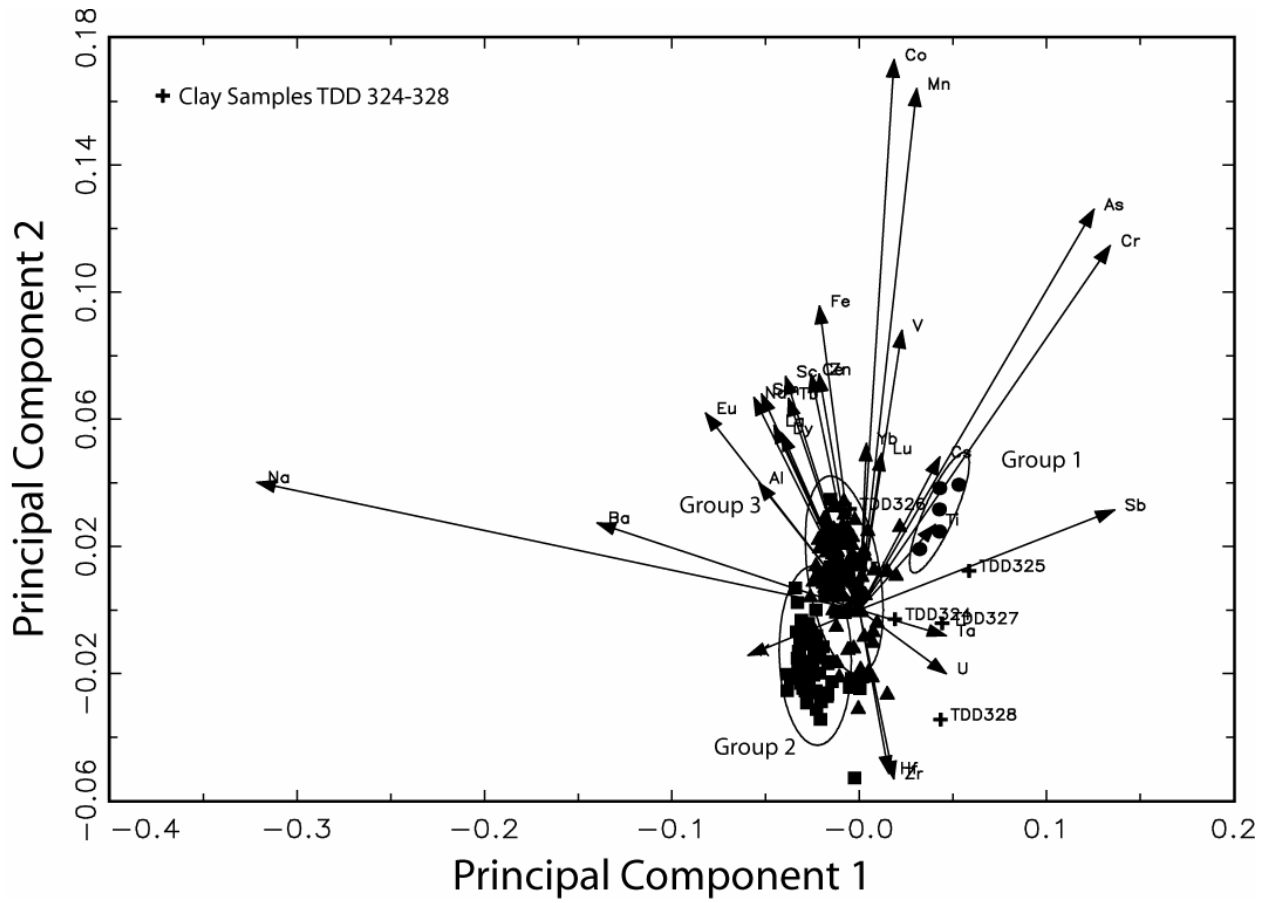


Figure 4: Ceramic samples from Butarincon and Huitranlebu, Puren, Southern Chile projected onto the first two principal components with clay samples submitted in 2006 (TDD324-328). Ellipses represent 90% confidence intervals for group membership.

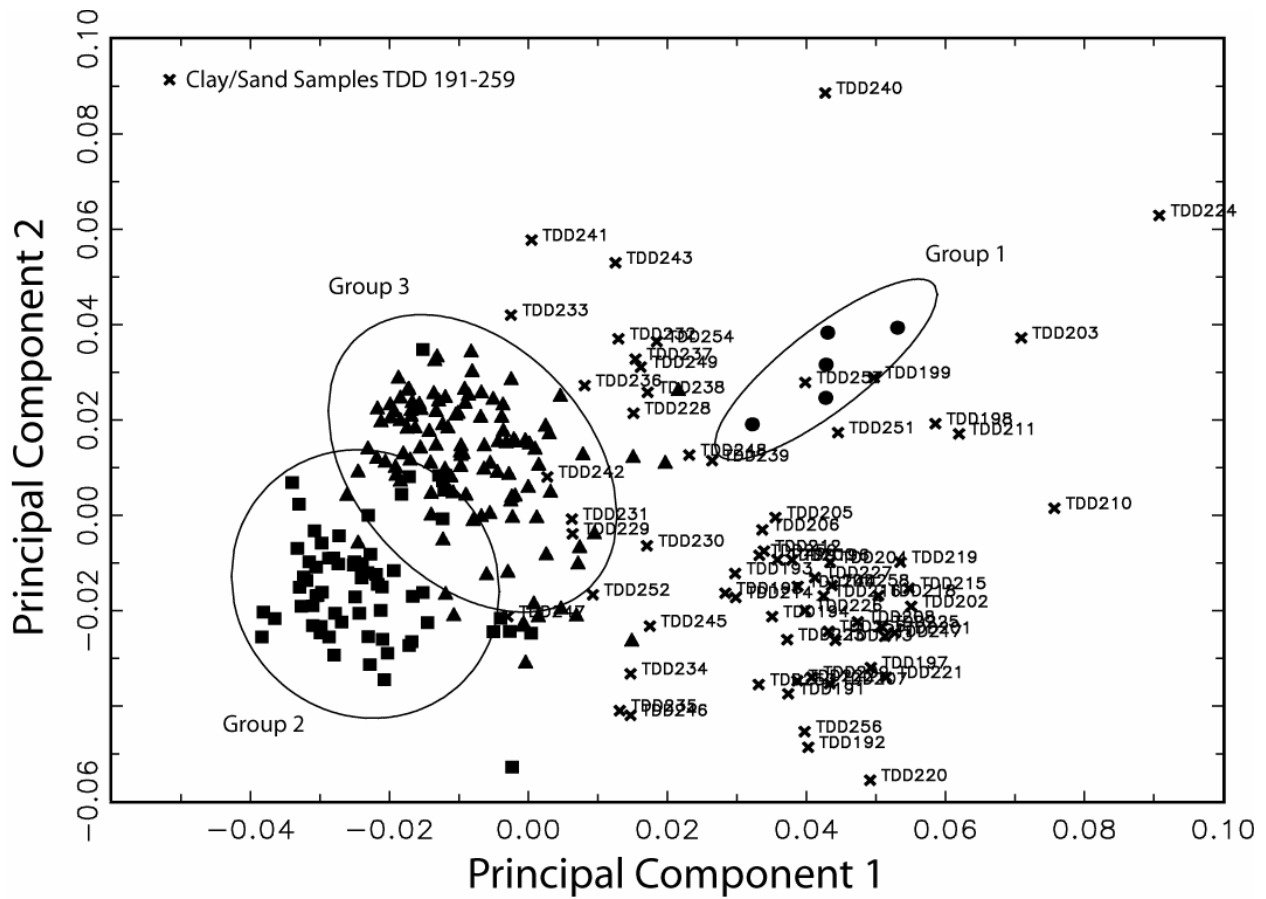


Figure 5: Ceramic samples from Butarincon and Huitranlebu, Puren, Southern Chile projected onto the first two principal components with clay/sand samples submitted in 2005 (TDD191-259) and without vectors. Ellipses represent 90% confidence intervals for group membership.

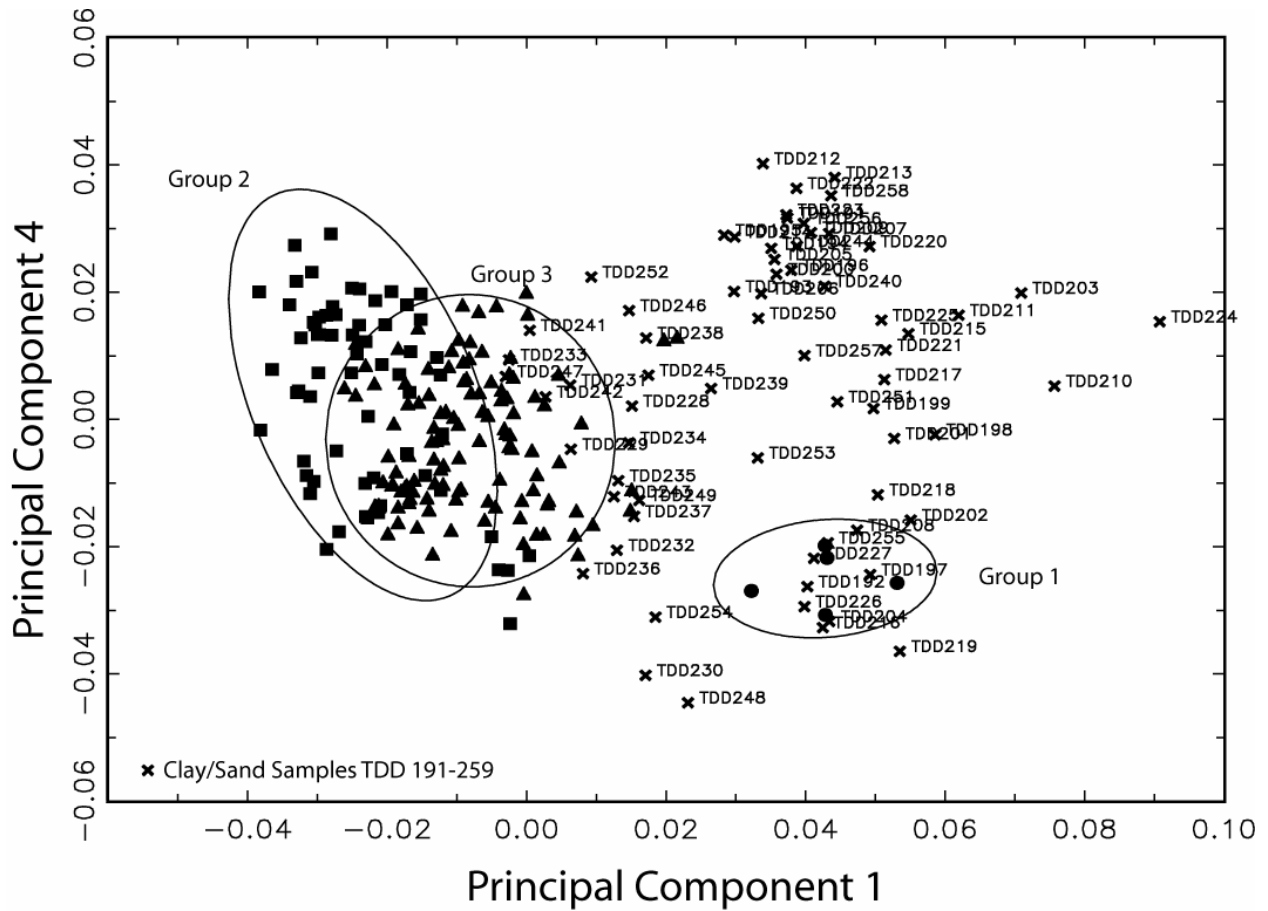


Figure 6: Ceramic samples from Butarincon and Huitranlebu, Puren, Southern Chile projected onto the first and fourth principal components with clay/sand samples submitted in 2005 (TDD191-259). Ellipses represent 90% confidence intervals for group membership.

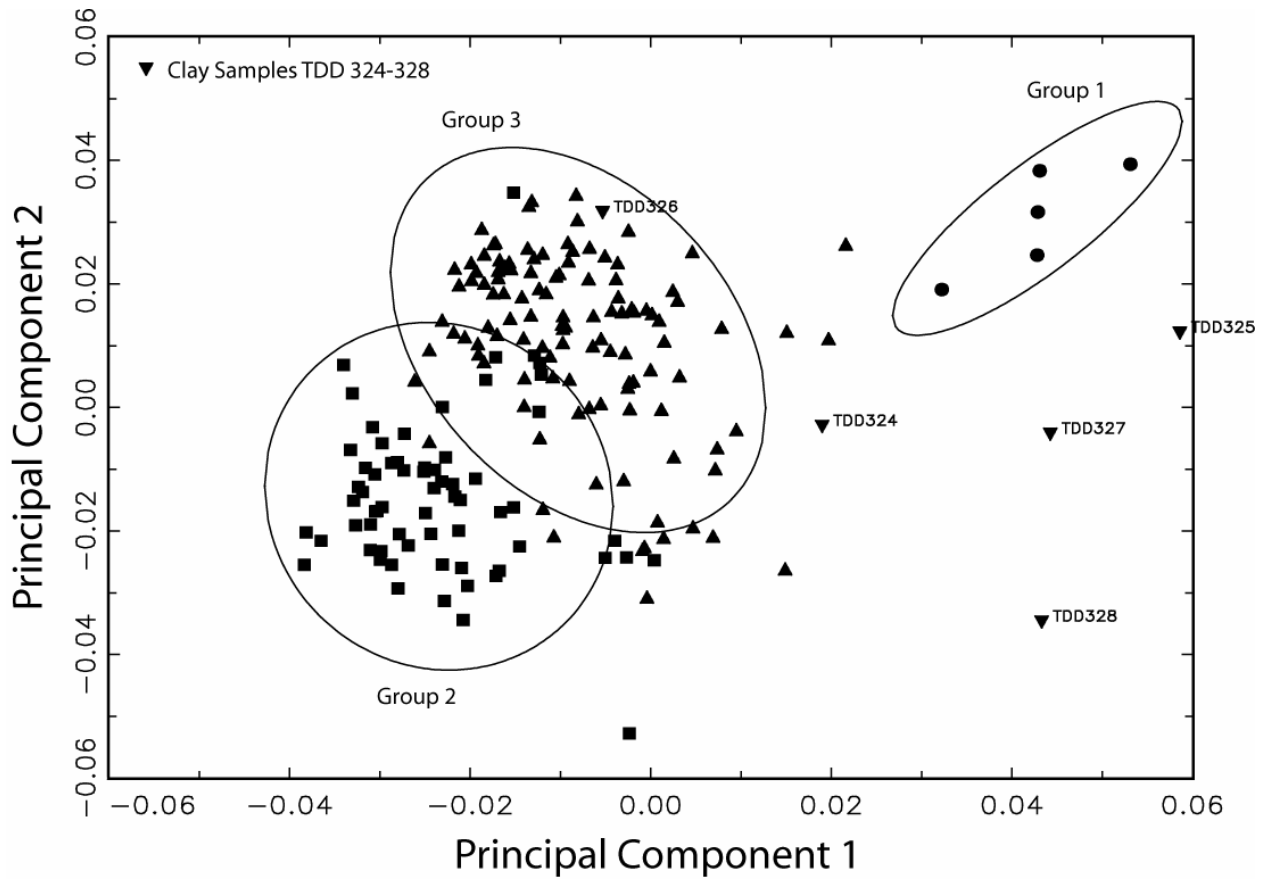


Figure 7: Ceramic samples from Butarincon and Huitranlebu, Puren, Southern Chile projected onto the first two principal components with clay samples submitted in 2006 (TDD324-328). Ellipses represent 90% confidence intervals for group membership.

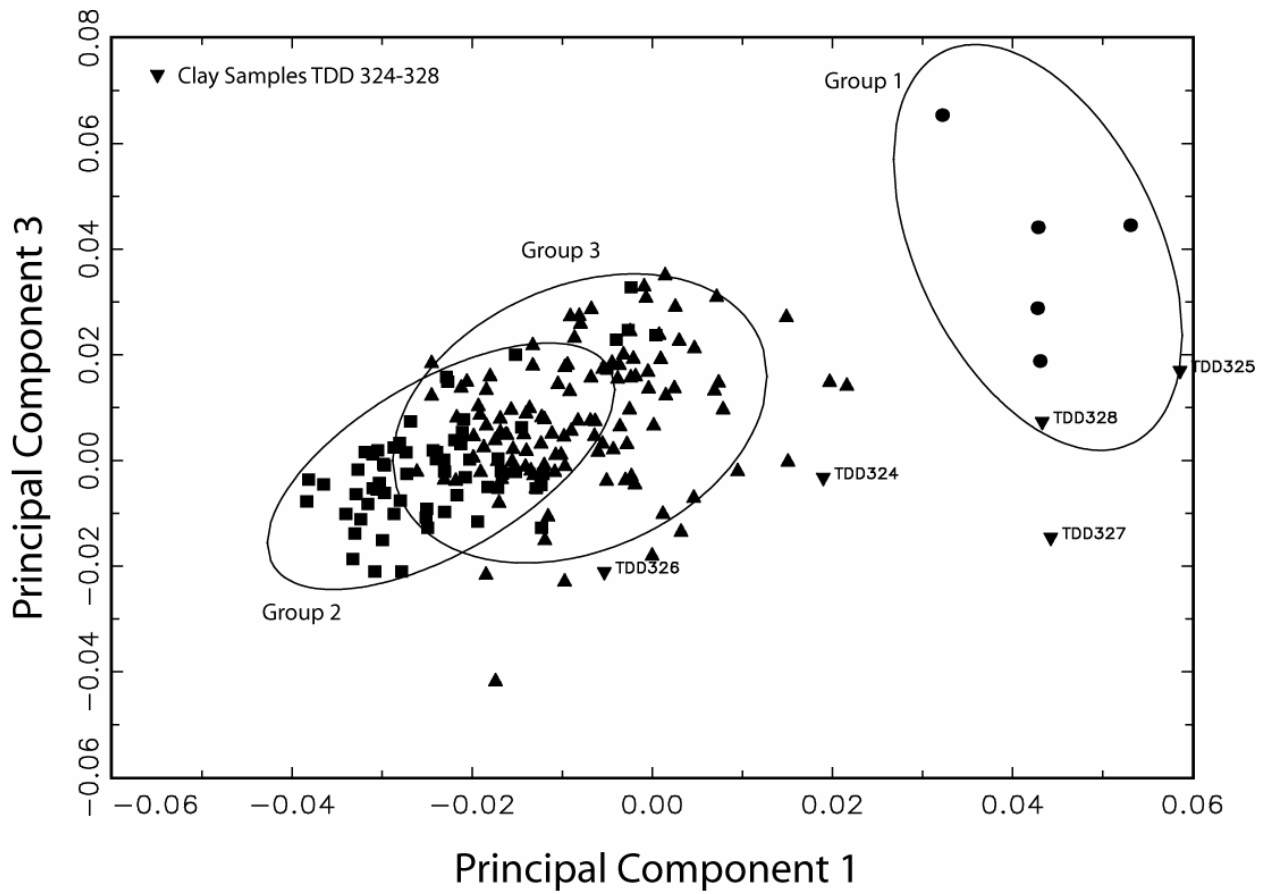


Figure 8: Ceramic samples from Butarincon and Huitranlebu, Puren, Southern Chile projected onto the first and third principal components with clay samples submitted in 2006 (TDD324-328). Ellipses represent 90% confidence intervals for group membership.

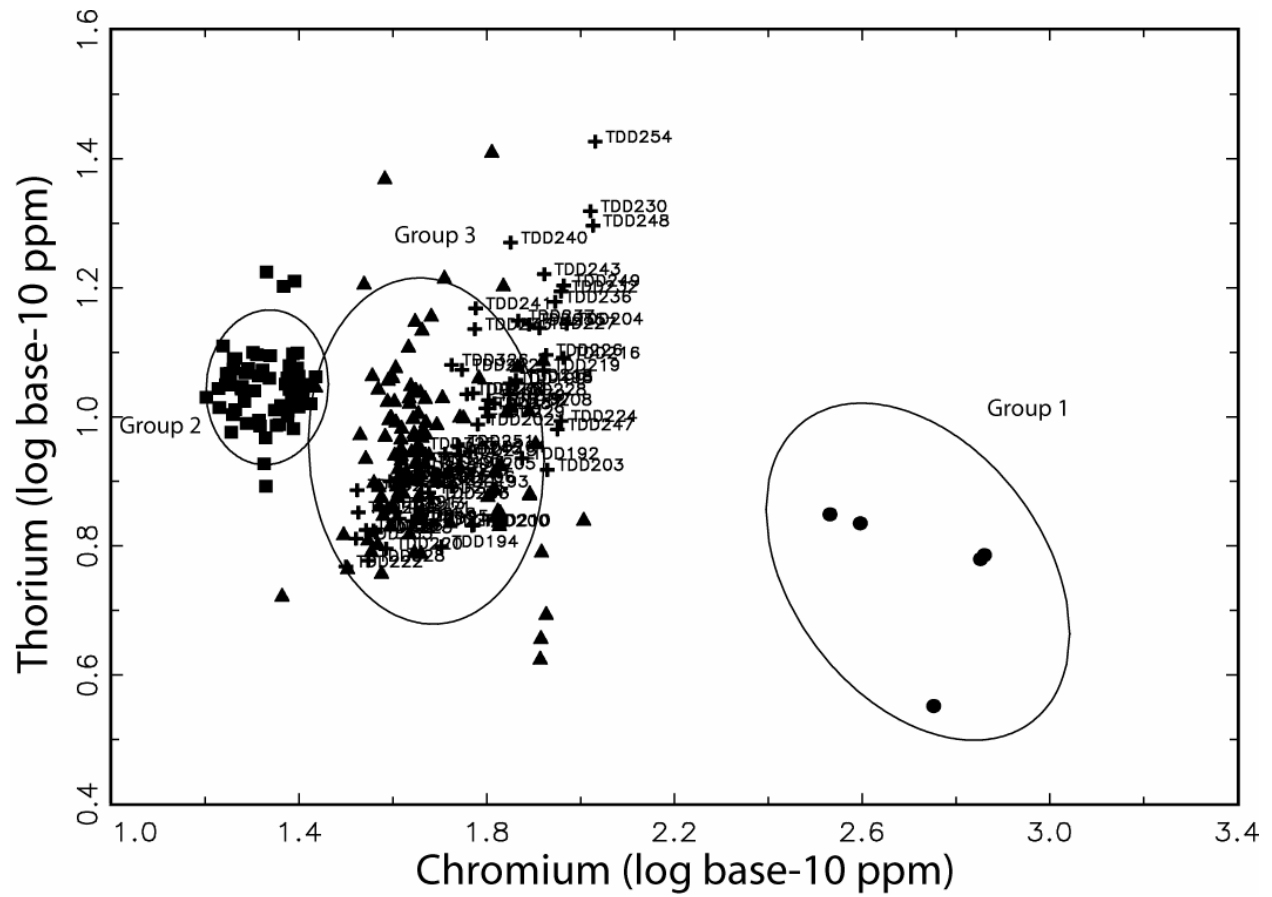


Figure 11: Plot of chromium and thorium base-10 logged concentrations showing the separation of the three groups and clay samples. Ellipses represent 90% confidence intervals for group membership.