

INGEIS RADIOCARBON LABORATORY DATES III

ROBERTO CORDERO, N. G. GUIDA and J. L. NOGUEIRA

INGEIS, Pabellón INGEIS, Ciudad Universitaria, 1428 Buenos Aires, Argentina

INTRODUCTION

The following list presents results of dating of 55 paleoenvironmental and archaeological samples from Argentina, processed between 1984 and 1986 by M. A. Albero and F. Angiolini. Procedures for sample pretreatment, counting, statistical analysis and age calculation were essentially the same as previously described by Albero and Angiolini (1985). Results are reported as conventional ^{14}C dates in years before AD 1950. They are corrected for isotopic fractionation.

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PALEOENVIRONMENTAL SAMPLES

La Poma Series

Peat samples from Río Grande holocenic terraces of La Poma, Humahuaca, Jujuy ($23^{\circ}17'S$, $65^{\circ}42'W$), 3600 m asl. Collected and submitted 1983 by J. Fernández.

AC-691	3280 ± 90
Depth 4.30 m	$\delta^{13}\text{C} = -25.9 \pm 0.2\text{‰}$
AC-692	3460 ± 120
Depth 4.50 m	$\delta^{13}\text{C} = -26.0 \pm 0.2\text{‰}$

Comment (J.F.): Dates related to leaf-shaped stemless points. The paleoenvironmental interpretation and chronology have been published in Coleman (1973) and Fernández (1973).

Guayatayoc Series

Peat samples from Guayatayoc stream, Guayatayoc, Rinconada Jujuy ($22^{\circ}18'S$, $66^{\circ}02'W$), 3500 m asl. Collected and submitted 1983 by J. Fernández.

AC-0733	9170 ± 170
Depth 1.82 m	$\delta^{13}\text{C} = -27.4 \pm 0.2\text{‰}$
AC-0734	10,390 ± 190
Depth 1.97 m	$\delta^{13}\text{C} = -26.5 \pm 0.2\text{‰}$

Comment (J.F.): Data belonging to this same profile were published in Albero and Angiolini (1985: 333). Human occupation, *ca.* 2800 yr BP, is indicated by quartzitic artifacts.

Leuto Caballo Series

Peat, marl and other carbonatic sediments from terraces of the Bordo Leuto Caballo stream (37°05'S, 70°15'W), 1670 m asl, Chos Malal, Neuquén. Collected and submitted 1983 by J. Fernández. All samples belong to peat layers.

AC-0980	12,280 ± 160
Depth 9.67 m	$\delta^{13}C = -25.0 \pm 0.2\text{‰}$
AC-0981	11,940 ± 160
Depth 8.57 m	$\delta^{13}C = -27.9 \pm 0.2\text{‰}$
AC-0979	11,300 ± 160
Depth 7.67 m	$\delta^{13}C = -25.0 \pm 0.2\text{‰}$
AC-0983	11,070 ± 140
Depth 7.52 m	$\delta^{13}C = -25.0 \pm 0.2\text{‰}$
AC-1048	10,180 ± 130
Depth 7.32 m	$\delta^{13}C = -7.0 \pm 0.2\text{‰}$

Comment (J.F.): Dates are related to a Late Pleistocenic marshy environment with megafaunal remains (*Megatherium*, *Hippidion* and *Paleolama*); see Panarello and Fernández (1992).

Barro Negro Series

Peat, marl and collagen of several profiles from Barro Negro (23°S, 65°37'W), 3.820 m asl, Humahuaca, Jujuy. Collected and submitted 1980–1986 by J. Fernández. All samples belong to peat layers.

A) Quebrada Linda Profile (Site A)

AC-0748	510 ± 70
Depth 0.20 m	$\delta^{13}C = -25.3 \pm 0.2\text{‰}$
AC-0740	940 ± 80
Depth 1.42 m	$\delta^{13}C = -27.6 \pm 0.2\text{‰}$
AC-0738	1270 ± 80
Depth 2.10 m	$\delta^{13}C = -25.4 \pm 0.2\text{‰}$
AC-0739	1690 ± 80
Depth 2.80 m	$\delta^{13}C = -27.6 \pm 0.2\text{‰}$
AC-0735	12,530 ± 160
Depth 8.40 m	$\delta^{13}C = -26.8 \pm 0.2\text{‰}$

B) Quebrada de Las Piedras Profile

AC-0747	1000 ± 80
Depth 1.17 m	$\delta^{13}C = -24.0 \pm 0.2\text{‰}$
AC-0673	1140 ± 80
Depth 1.60 m	$\delta^{13}C = -23.7 \pm 0.2\text{‰}$
AC-0682	1680 ± 120
Depth 1.70 m	$\delta^{13}C = -25.0 \pm 0.2\text{‰}$

AC-0680	2890 ± 110
Depth 1.90 m	$\delta^{13}C = -24.3 \pm 0.2\text{‰}$
AC-0746	3470 ± 90
Depth 2.12 m	$\delta^{13}C = -27.5 \pm 0.2\text{‰}$
AC-0745	10,200 ± 140
Basal depth 5.82 m	$\delta^{13}C = -25.0 \pm 0.2\text{‰}$
AC-0744	12,300 ± 170
Basal depth 6.77 m	$\delta^{13}C = -28.7 \pm 0.2\text{‰}$

Comment: Marl and collagen samples were found in basal peat layer

AC-0974	9870 ± 220
Marl 2. depth 5.90 m	$\delta^{13}C = -4.0 \pm 0.2\text{‰}$
AC-0975	13,400 ± 400
Marl 4. depth 6.20 m	
AC-0976	11,600 ± 160
Marl 5. depth 6.80 m	$\delta^{13}C = -3.8 \pm 0.2\text{‰}$
AC-0969 I	9120 ± 130
Collagen from <i>Hippidion</i> bone.	$\delta^{13}C = -18.0 \pm 0.2\text{‰}$
AC-0969 II	11,500 ± 400
Collagen from <i>Hippidion</i> bone.	$\delta^{13}C = -18.0 \pm 0.2\text{‰}$

C) Zanjón Largo Profile

AC-0742	9050 ± 140
Peaty silt with <i>Lymnaea</i> , depth 4.56 m	$\delta^{13}C = -24.8 \pm 0.2\text{‰}$
AC-0743	9200 ± 140
Peaty silt with fragmented camel bones and lithic objects, depth 5.08 m	$\delta^{13}C = -24.8 \pm 0.2\text{‰}$

Comment (J.F.): Important superior Pleistocenic and Holocenic chronostratigraphic record with archaeological contents, fossil animal remains and paleoenvironmental indicators. Published in Alberdi *et al.* (1986); Fernández *et al.* (1991); Fernández (1983–1985).

ARCHAEOLOGICAL SAMPLES

Haichol Series

Charcoal samples from Haichol cave (38°35'S, 70°40'W) 1050 m asl. Pehuenches, Neuquén. Collected and submitted 1979–1981 by J. Fernández.

AC-0896	2350 ± 150
Grid 13B2. depth 0.40–0.50 m	$\delta^{13}C = -25.0 \pm 0.2\text{‰}$
AC-0897	1290 ± 110
Grid 9B1, depth 0.50–0.60 m	$\delta^{13}C = -22.8 \pm 0.2\text{‰}$
AC-0898	1440 ± 90
Grid 14B1, depth 0.50–0.60 m	$\delta^{13}C = -25.0 \pm 0.2\text{‰}$

AC-0899	2290 ± 120
Grid 16B2, depth 0.50–0.60 m	$\delta^{13}\text{C} = -22.6 \pm 0.2\text{‰}$
AC-0900	2130 ± 110
Grid 11B2, depth 0.60–0.70 m	$\delta^{13}\text{C} = -22.9 \pm 0.2\text{‰}$
AC-0901	2440 ± 100
Grid 17B2, 0.80–0.90 m	$\delta^{13}\text{C} = -21.9 \pm 0.2\text{‰}$

Comment (J.F.): Dates belonging to Late Preceramic occupations (2440–2130 yr BP) and Early Pottery occupations (1830–1250 yr BP). Published in Fernández (1988–1990).

Vizcayachoc Peat

Peat from lower part of Vizcachayoc peat bog, north of Miyuyoc (22°55'S, 65°20'W) 4000 m asl, Humahuaca, Jujuy. Collected and submitted 1983 by J. Fernández.

AC-0982	9540 ± 170
	$\delta^{13}\text{C} = -21.2 \pm 0.2\text{‰}$

Comment (J.F.): Lower part of peat bed 7 m width, on western slope of Cordillera Oriental.

Pluma De Pato

Eggshell of *Pterocnemia pennata* (choique) from Pluma del Pato, Añelo, Neuquén (38°10'S, 69°5'W) 250 m asl. Collected and submitted 1979 by J. Fernández.

AC-1049	1700 ± 90
	$\delta^{13}\text{C} = -8.0 \pm 0.2\text{‰}$

Comment (J.F.): Associated with ceramics and triangular stemless projectile points with concave base, made of obsidian.

Ojo De Agua

Interbedded wood at 2.10 m depth in a small fluvial terrace in Ojo de Agua, near Susques (23°23'S, 66°22'W, 3700 m asl. Collected and submitted 1983 by J. Fernández.

AC-1053	870 ± 85
Wood	$\delta^{13}\text{C} = -22.6 \pm 0.2\text{‰}$
Calcium carbonate biostromal accretion from Pastos Chicos (23°45'S, 66°23'W) 3900 m asl. Collected and submitted 1983 by J. Fernández.	

AC-1056	16,250 ± 290
	$\delta^{13}\text{C} = +8.8 \pm 0.2\text{‰}$

Comment (J.F.): Stromatolite (oncolite) from ancient Pastos Chicos stream flood terrace.

Anillaco Series

Charcoal samples from Faldeos del Anillaco, La Rioja (28°46'S, 66°57'W.) 1500 m asl. Collected and submitted 1984 by R. Raffino.

AC-919	1160 ± 120
Depth 0.60 m	

AC-920 Depth 0.70 m	1200 ± 120
AC-921 Depth 0.80 m	2080 ± 120
AC-922 Depth 0.90 m	1330 ± 120
AC-923 Depth 1.00 m	1330 ± 120 $\delta^{13}C = -22.9\text{‰}$
AC-924 Depth 1.10 m	1150 ± 140 $\delta^{13}C = -21.0\text{‰}$
AC-925 Depth 1.20 m	1440 ± 120 $\delta^{13}C = -23.8\text{‰}$
AC-926 Depth 1.30 m	1270 ± 120

La Huerta Series

Bone and charcoal samples from La Huerta, Jujuy, (23°20'S, 65°20'W) 2700 m asl. Collected and submitted 1985 by R. Raffino and published by Raffino *et al.*(1993).

AC-960 Bone collagen, between 0.22 and 0.32 m	480 ± 100 $\delta^{13}C = -16.5\text{‰}$
AC-1069 Charcoal, depth 0.12 m	540 ± 90

Valle De La Ciénaga Series

Charcoal samples from La Ciénaga valley, Tucumán (26°49'S, 65°39'W) 2700 m asl. Collected and submitted 1984 by B. Cremonte.

AC-720 Depth 1.40 m	1560 ± 80 $\delta^{13}C = est. 0$
AC-721 Depth 0.80 m	1240 ± 80 $\delta^{13}C = -24.80\text{‰}$

Dates related to large settlements of early potter and agricultural societies from the northwest of Argentina, especially with those of Tafí valley. Published by Cremonte (1988).

Puesto El Rodeo Series

Vegetal remains and charcoal samples from La Magdalena estancia, Río Pinturas area, Santa Cruz, (46°53'S, 70°27'W) 240 m asl. Collected and submitted 1985 by C. Gradin and A. Aguerre.

AC-943 Depth 0.47 m	1380 ± 90 $\delta^{13}C = -22.1\text{‰}$
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AC-1075 **4860 ± 90**
Depth 0.90 m

Comment: Dates correspond to vegetal remains found over a bedded burial place containing three skeletons. The first date is related to the Rio Pinturas IV cultural level and the second one to the Rio Pinturas IIb–III cultural level.

Puesto Giles Series

Charcoal samples from Puesto Giles Site, Casa de Piedra, La Pampa (38°11'S, 67°13'W) 250 m asl. Collected and submitted 1983 by C. Gradin and A. Aguerre.

AC-728 **700 ± 100**
Depth 0.53 m $\delta^{13}C = -21.3\text{‰}$

AC-731 **320 ± 120**
Depth 0.40 m $\delta^{13}C = -21.7\text{‰}$

Comment: Dates related to a late human occupation of hunter-gatherers who used ceramics (under investigation).

El Cuy Series

Charcoal sample from El Cuy, Cañadón Santa Victoria, Río Negro (40°S, 68°W) 400 asl. Collected and submitted 1986 by C. Gradin and A. Aguerre.

AC-1074 **420 ± 110**
Depth between 0.05–0.20 m $\delta^{13}C = -21.2\text{‰}$

Comment: Date related to tool remains made of bone and a stemmed point, with small patagoniense-type fins. Investigation was stopped at prospecting stage.

REFERENCES

- Alberdi, M. T., Fernandez, J., Menegaz, A. N. and Prado, J. L. 1986 *Hippidion owen* 1869 (Mammalia, Perissodactyla) en sedimentos del Pleistoceno tardío de la localidad de Barro Negro (Jujuy, Argentina). *Estudios Geológicos* 42: 487–493.
- Albero, M. C., and Angiolini, F. 1985 INGEIS Radiocarbon Laboratory dates II. *Radiocarbon* 27(2B): 314–337.
- Coleman, D. 1973. Illinois State Geological Survey radiocarbon dates IV. *Radiocarbon* 15(1): 314–337.
- Cremonese, M. B. 1988 Comentario acerca de fechados radiocarbónicos del sitio El Pedregal (Qda. La Ciénaga, Tucumán, Argentina). *Revista Chungará* 20: 57–59.
- Fernandez, J. 1973 Primeros fechados radiocarbónicos de formaciones holocenas de la Puna, portadoras de materiales arqueológicos. *Actas del Quinto Congreso Geológico Argentino*, Vol. 3. Buenos Aires, Argentina: 223–226.
- 1983–1985 Cronología y paleoambientes del intervalo 12.550–520 años A.P. (Pleistoceno-Holoceno) de la Puna jujeña. *Anales de Arqueología y Etnología* 38–40: 29–42.
- 1988–1989 Ocupaciones alfareras (2.860 ± 160 años A.P.) en la Cueva de Cristóbal, Puna de Jujuy, Argentina. *Relaciones de la Sociedad Argentina de Antropología* 17(2): 139–182.
- 1988–1990. La cueva de Haichol. Arqueología de los pinares cordilleranos del Neuquén. *Anales de Arqueología y Etnología* 43–45: 1–738.
- Fernandez, J., Markgraf, V., Panarello, H. O., Albero, M., Angiolini, F. E., Valencio, S. and Arriaga, M. 1991 Late Pleistocene / Early Holocene environments and climates, fauna and human occupation in the Argentine altiplano. *Geoarchaeology* 6(3): 251–272.
- Panarello, H. O., and Fernandez, J. (ms.) 1992 First paleotemperature record in arid northwest Patagonia (Neuquén, Argentina) during the late Pleistocene-Holocene transition (12.300–10180 yr B.P.) derived from pallustrine shells (*Lymnaea*) and marl ^{18}O analyses. Report submitted to the International Atomic Energy Agency. Vienna. Austria.
- Raffino, R. A. 1993 *Inka. Arqueología, Historia y Urbanismo del Altiplano Andino*. Buenos Aires, Ed. Corregidor: 318 p.