INTRODUCTION

Most of the $^{14}$C measurements reported here were made between October 1986 and June 1987. Equipment, measurement, and treatment of samples are as reported previously (R, 1968, v 10, p 36–37; 1976, v 18, p 290; 1986, v 28, no. 3, p 1111).

Age calculations are based on a contemporary value equal to 95% of the activity of NBS oxalic acid standard (No. 4990A) and on the conventional half-life for $^{14}$C of 5568 yr. Results are reported in years before 1950 (years BP). Errors quoted with the dates are based on counting statistics alone and are equivalent to $\pm 1$ standard deviation ($\pm \sigma$).

Corrections for deviations from $\delta^{13}$C = $-25.0\%$ in the PDB scale are applied for all samples; also for marine shells. The apparent age for marine material due to the reservoir effect must be subtracted from our dates on such samples.

The remark “undersized; diluted,” in Comments means the sample did not produce enough CO$_2$ to fill the counter to normal pressure and “dead” CO$_2$ from anthracite was introduced to make up the pressure. “% sample” indicates amount of CO$_2$ derived from the sample present in the diluted counting gas; the rest is “dead” CO$_2$. Organic carbon content reported for bone samples is calculated from the yield of CO$_2$ by combustion of gelatine remaining after treatment. Organic carbon lost during treatment is not included in the calculated percentage.

The description of each sample is based on information provided by the submitter.

ACKNOWLEDGMENTS

The author thanks Kerstin Lundahl for sample preparation and routine operation of the dating equipment, and Owe Gustafsson, Dept Marine Geol, Univ Göteborg, for mass-spectrometric determination of $\delta^{13}$C.

GEOLOGIC SAMPLES

Sweden

Kurarps Mosse series

Lu-2587A. Kurarps Mosse, 3.45–3.48m

\[\delta^{13}C = -30.9\%\]

Acid-precipitated part of NaOH-soluble fraction from fine detritus gyttja. Sample just below Elm decline according to pollen analysis. Treated with HCl before extraction with NaOH. Comment: sample undersized; diluted; 81% sample. Hardwater error ca 600 yr.

Lu-2620. Kurarps Mosse, 0.96–0.99m

\[\delta^{13}C = -28.3\%\]

Coarse detritus gyttja. Early Subatlantic time according to pollen analysis. Comment: pretreated with HCl. Hardwater error probably ca 1000 yr.

Lu-2658A. Skottorp

\[\delta^{13}C = -27.3\%\]

Acid-precipitated part of NaOH-soluble fraction of buried fossil soil horizon at Skottorp, S Halland (56° 27' N, 12° 59' E). Sample from wedge-shaped downbending 75 to 80cm below present surface and covered by sand; presumably from Postglacial transgression. Alt 8m. Coll July 1986 and subm by H Svensson, Dept Phys Geog, Univ Lund. Relict polygon patterns from area studied previously by submitter (Svenson, 1974, 1982). Sample treated with HCl before extraction with NaOH. Comment: presence of root hairs indicates risk of contamination with younger material. (HS): somewhat later than expected.

Sandsjön Series I

Sediment from Sandsjön, 5km NW Vrå, S Småland (56° 45' N, 13° 24' E), alt 155m. Coll 1985 and subm by M Thelaus, Dept Quaternary Geol, Univ Lund. Dated as part of study of paleohydrol changes in raised bogs and lake basins in S and central Småland. Depths refer to sediment surface. Samples were taken with Livingstone piston corer, diam 10cm. Water depth at sampling point ca 2.15m. Pollen analysis by submitter. All samples pretreated with HCl.

Lu-2697. Sandsjön, 8.675–8.725m

\[\delta^{13}C = -25.8\%\]

Sandy gyttja with 0.9% CaCO₃. Transition Younger Dryas/Preboreal according to pollen analysis. Comment: expected date: ca 10,000 BP.

Lu-2698. Sandsjön, 8.525–8.575m

\[\delta^{13}C = -28.7\%\]

Sandy gyttja with 2% CaCO₃. Transition Younger Dryas/Preboreal. Comment: expected date: ca 10,000 BP.

Lu-2699. Sandsjön, 8.125–8.175m

\[\delta^{13}C = -31.0\%\]

Sandy fine detritus gyttja with 2.9% CaCO₃. Transition Preboreal/Early Boreal. Comment: expected date: ca 9500 BP.
Lu-2700.  **Sandsjön, 7.975–8.025m**  
δ\(^{13}\)C = −27.6‰  
Fine detritus gyttja with 1.9% CaCO\(_3\). Transition Early/Late Boreal.  
*Comment:* expected date: ca 8700 BP.

**Bjärsjölagårds Mosse series**

Peat from bog, S Scania (55° 45’ N, 13° 40’ E). Coll 1985 and subm by G Digerfeldt, Dept Quaternary Geol, Univ Lund. Dated as check on chronology of some S Scanian Holocene pollen-zone boundaries and levels with important vegetational changes. Depths refer to bog surface. All samples pretreated with HCl. Lu-2678, -2679 and -2680 were charred in nitrogen atmosphere before burning.

Lu-2676.  **Bjärsjölagårds Mosse, 210–215cm**  
δ\(^{13}\)C = −26.1‰  
Highly humified *Sphagnum* peat. Transition Late Atlantic/Early Subboreal (*Ulmus* decline) according to pollen analysis.

Lu-2677.  **Bjärsjölagårds Mosse, 200–205cm**  
δ\(^{13}\)C = −27.0‰  
Highly humified *Sphagnum* peat. Min of *Ulmus* pollen.

Lu-2678.  **Bjärsjölagårds Mosse, 165–170cm**  
δ\(^{13}\)C = −25.5‰  
Highly humified *Sphagnum* peat. Regeneration of *Ulmus* during Early Subboreal.

Lu-2679.  **Bjärsjölagårds Mosse, 125–130cm**  
δ\(^{13}\)C = −26.5‰  
Highly humified *Sphagnum* peat.

Lu-2680.  **Bjärsjölagårds Mosse, 70–75cm**  
δ\(^{13}\)C = −26.0‰  
Highly humified *Sphagnum* peat. Empirical *Fagus* limit.

**Mullsjön series**

Sediment from Mullsjön, ca 3km WNW of Hjo, E Västergötland (58° 17’ N, 14° 14’ E). Coll 1986 by S Björck and G Digerfeldt; subm by G Digerfeldt. Dated as part of paleoecol study of S Swedish lakes as basis for interpretation of Holocene landscape development and shore displacement. Samples were taken with Russian-type corer, diam 10cm. Depths refer to sediment surface. Water depth at sampling point ca 3m. All samples pretreated with HCl.

Lu-2682.  **Mullsjön, 508–513cm**  
δ\(^{13}\)C = −27.0‰  
Clay gyttja.
Lu-2681. Mullsjön, 495–500cm
FeS-colored clayey gyttja.

\[ \delta^{13}C = -26.1\% \]

Lu-2683. Mullsjön, 480–485cm
Gyttja.

\[ \delta^{13}C = -27.8\% \]

**Dalsland series**

Sediment and water moss from Bovatnet (58° 34′ N, 12° 04′ E) and N Madbergagölen (58° 36′ N, 12° 10′ E), SW Dalsland. Coll 1986 and subm by G Digerfeldt. Dated as part of study of Late Weichselian-Early Holocene shore displacement in area (cf Digerfeldt, 1979; Björck & Digerfeldt, 1982). Samples were taken with Russian-type corer, diam 10cm. All sediment samples pretreated with HCl; no pretreatment of small moss samples.

**Bovatnet**

Water depth 6.5m at sampling point. Depths refer to sediment surface.

\[ \delta^{13}C = -27.4\% \]

Lu-2702. Bovatnet, 281–286cm
Clayey gyttja.

\[ \delta^{13}C = -39.4\% \]

Lu-2703. Bovatnet, 286–293cm
Water moss. Comment: sample undersized; diluted; 28% sample. (3 1-day counts.)

**N Madbergagölen**

Samples taken from overgrown part of lake. Depths refer to present surface.

\[ \delta^{13}C = -20.8\% \]

Lu-2705. N Madbergagölen, 817–822cm
Clayey gyttja.

\[ \delta^{13}C = -21.0\% \]

Lu-2706. N Madbergagölen, 822–827cm
Clayey gyttja.

\[ \delta^{13}C = -23.1\% \]

Lu-2707. N Madbergagölen, 827–832cm
Clay gyttja.

\[ \delta^{13}C = -23.5\% \]

Lu-2708. N Madbergagölen, 832–837cm
Clay gyttja.
Lu-2709.  N Madbergagölen, 837–842cm
Clay gyttja.

**10,520 ± 100**
\(\delta^{13}C = -24.2\%\)

Lu-2710.  N Madbergagölen, 842–847cm
Clay gyttja.

**10,590 ± 100**
\(\delta^{13}C = -24.5\%\)

Lu-2711.  N Madbergagölen, 847–852cm
Clay gyttja.

**10,710 ± 100**
\(\delta^{13}C = -23.6\%\)

Lu-2712.  N Madbergagölen, 852–857cm
Clay gyttja.

**10,860 ± 100**
\(\delta^{13}C = -23.8\%\)

Lu-2713.  N Madbergagölen, 857–862cm
Clay gyttja.

**11,260 ± 100**
\(\delta^{13}C = -23.0\%\)

Lu-2715.  N Madbergagölen, 853.5–857.5cm
Water moss. **Comment:** Sample undersized; diluted; 28% sample. (4 1-day counts.)

Lake Fiolen series

Littoral sediment from Fiolen, S Småland (57° 05' N, 14° 32' E). Coll 1986 by G Digerfeldt and M Enell; subm by G Digerfeldt. Dating is part of study of Late Quaternary development of S Swedish reference lakes and their drainage areas, assoc with IGCP Proj 158B (Berglund, 1979). Depths refer to sediment surface. Water depth ca 1m at sampling point. All samples pretreated with HCl.

Lu-2693.  Fiolen, 130–135cm
Gyttja.

**4890 ± 60**
\(\delta^{13}C = -29.2\%\)

Lu-2694.  Fiolen, 90–95cm
Gyttja.

**3610 ± 60**
\(\delta^{13}C = -28.1\%\)

Lu-2695.  Fiolen, 55–60cm
Gyttja.

**2810 ± 60**
\(\delta^{13}C = -27.6\%\)

Lu-2696.  Fiolen, 45–50cm
Iron ocher with some organic content.

**2180 ± 50**
\(\delta^{13}C = -26.6\%\)
Eastern Småland series (III)

Sediment from lakes Bastgölen (57° 13' N, 16° 19' E), Vingölen (57° 08' N, 15° 57' E), Skvarran (57° 12' N, 16° 09' E), and Flågö (57° 13' N, 16° 20' E), Kalmar län, E Småland. Coll 1982-1985 and subm by N-O Svensson, Dept Quaternary Geol, Univ Lund. Dated as complement to previous series (R, 1986, v 28, no. 1, p 141–143; v 28, no. 3, p 1114–1115). Depths refer to sediment surface or present surface (Flågö). Samples were taken with Russian-type corer, diam 10 cm. All samples pretreated with HCl. Organic carbon given in Comments is calculated as described previously (R, 1986, v 28, no. 3, p 1114). Pollen analysis by submitter.

Bastgölen

Water depth 1.2 m at sampling point.

**Lu-2661. Bastgölen 5, 3.465–3.495 m**

Clayey gyttja. Transition Preboreal/Early Boreal according to pollen analysis.

\[ \delta^{13}C = -23.1\% \]

**Lu-2666. Bastgölen 6, 3.19–3.25 cm**

Clayey gyttja.

Vingölen

Water depth 2.6 m at sampling point.

**Lu-2659. Vingölen 1, 5.61–5.65 m**

Clay gyttja. Comment: organic carbon content: ca 1%. Sample undersized; diluted; 84% sample. (3 1-day counts.)

\[ \delta^{13}C = -20.1\% \]

**Lu-2660. Vingölen 2, 5.56–5.60 m**

Clay gyttja. Comment: organic carbon content: ca 3%. (3 1-day counts.)

\[ \delta^{13}C = -23.1\% \]

**Lu-2662. Vingölen 3, 5.505–5.535 m**

Clay gyttja. Comment: organic carbon content: ca 3.5%.

**Lu-2663. Vingölen 4, 5.375–5.425 m**

Clay gyttja. Comment: organic carbon content: ca 2%.

**Lu-2664. Vingölen 5, 5.285–5.315 m**

Clayey gyttja. Early Preboreal. Comment: organic carbon content: ca 5%.
University of Lund Radiocarbon Dates XXI

9410 ± 90

Lu-2665. Vingölen 6, 5.17–5.21m
δ¹³C = −30.7‰
Gyttja and dy. Transition Preboreal/Early Boreal. Comment: organic carbon content: ca 10%.

Skvarran
Water depth ca 4.6m at sampling point.

Lu-2727. Skvarran 6, 4.310–4.372m
δ¹³C = −21.3‰
Clay gyttja. Comment: organic carbon content: ca 4.5%.

Flågöll
Samples taken from overgrown part of lake.

Lu-2728. Flågöll 3, 7.45–7.48m
δ¹³C = −22.5‰
Clayey silty gyttja. Early Boreal pollen zone.

Lu-2729. Flågöll 4, 3.59–3.71m
δ¹³C = −30.8‰
Gyttja. Transition Early/Late Boreal.

Lu-2667. Lina Myr, 2.755–2.885m
δ¹³C = −21.3‰
Calcareous clay gyttja from ancient lake at Lina Myr, Central Gotland (57° 33' N, 18° 37' E). Coll 1982 and 1985 and subm by N-O Svensson. Depth refers to present surface. Pretreated with HCl for complete removal of carbonates. Comment: expected age based on pollen analysis: 8600 BP. Sample pooled from same level in 2 separate cores taken with Russian-type corer, diam 7cm.

Nässja series
Charcoal, bark, and peat from 2 secs in peat-filled kettle hole at Nässja, W Östergötland (58° 28.3' N, 14° 50' E). Coll 1982–1986 and subm by H Göransson, Dept Quaternary Geol, Univ Lund. Dating important for study of human activities in area, especially in assoc with nearby Alvastra Pile Dwelling. Sec Nässja II ca 150m S of Nässja I. For previous date from Nässja I, see R, 1986, v 28, no. 3, p 1118. Peat samples pretreated with HCl and charred in nitrogen atmosphere before burning. Charcoal and bark pretreated with HCl and NaOH.

Nässja I
Samples taken in wall of newly dug trench. Depths (cm) refer to present peat surface.

Lu-2691. Nässja I, Sample 2, 118–127cm
δ¹³C = −26.1‰
Charcoal from 9cm thick layer of clay gyttja.
Lu-2735. Näässja I, ca 118cm
Bark from top of clay gyttja. Cf Lu-2691, above.

Lu-2692. Näässja I, Sample 4, 75–80cm
Peat.

Lu-2736. Näässja I, Sample 5, 60–65cm
Peat.

Lu-2737. Näässja I, Sample 6, 50–55cm
Peat.

Lu-2738. Näässja I, Sample 7, 35–40cm
Peat.

Näässja II
Samples were taken with Russian-type corer, diam 5cm. Depths refer
to present peat surface.

Lu-2621. Näässja II, 318–330cm
Radicel peat.

Lu-2734. Näässja II, 300–310cm
Peat.

Bjärsjöholmssjön series
Sediment from ancient Bjärsjöholmssjön, ca 3km NW of Ystad, S
Scania (55° 27' N, 13° 47' E). Coll 1986 and subm by H Göransson. Dated to
look for possible hardwater effect. Pollen study of lake sediment pub by
Nilsson (1961). Depths refer to present surface. New pollen analysis by sub-
mitter. Samples pretreated with HCl.

Lu-2716. Bjärsjöholmssjön, 471–476cm
Algal gyttja. Elm decline level according to pollen analysis. One pollen
grain of Spergula arvensis at 475cm. Comment: expected age: 5150 ± 50 BP.
(3 1-day counts.)

Lu-2717. Bjärsjöholmssjön, 463–466.5cm
grain of Triticum-type at 465cm. Comment: expected age: 5000 ± 25 BP.
General Comment: hardwater error $170 \pm 70$ yr and $260 \pm 65$ yr, respectively.

**Lu-2761. Toppeladugårds Mosse**

Collagen from antler of Alces alces, LUZN82/LZZ, coll 1869 at 6ft depth just W of farm building belonging to Toppeladugårds estate, S Scania (ca 55° 40’ N, 13° 23’ E); subm by B Liedberg Jönsson, Dept Quaternary Geol, Univ Lund. Find mentioned by Holst (1911, p 108) and Gertz (1926, p 29–30). Collagen extracted as described previously (R, 1976, v 18, p 290) without NaOH treatment. Comment: organic carbon content: 6.7%.

$8350 \pm 80$

$\delta^{13}C = -21.6\%$

**Lu-2762. Björkeröds Mosse, Wood 32B**

Small wood fragments from silty algal gyttja, 286 to 292cm below fen surface in core Bjö BP1 (56° 17’ N, 12° 30’ E). Coll 1984 and subm by B Liedberg Jönsson. Dated as complement to Björkeröds Mosse series (R, 1987, v 29, no. 3, p 353–379). Wood washed from sediment sample taken with 10cm Livingstone piston corer. Comment: expected age: ca 11,000 BP. No pretreatment; sample undersized; diluted; 60% sample; (3 1-day counts.)

$10,890 \pm 120$

$\delta^{13}C = -27.3\%$

**Iceland**

**NE Iceland marine shell series**

Marine bivalve shells from NE Iceland. Coll 1986 by C Hjort and H Norddahl; subm by C Hjort, Dept Quaternary Geol, Univ Lund. Dated as part of study of glacial chronology and paleoclimatology in Iceland.

**Lu-2673. Fell 2**

Shells (Mya truncata, Hiatella arctica) from silt overlain by transgression sediment at Fell, Hofsjáralur, Vopnafjörður (65° 41’ N, 14° 56’ W). Sample coll at ca +23m, probably corresponding to marine level of +35 to 45m. Comment: outer 30% removed by acid leaching. (3 1-day counts.)

$9980 \pm 70$

$\delta^{13}C = +0.3\%$

**Lu-2674. Fell 3a**

Shells (Mya truncata, Hiatella arctica) from silt overlain by regression sediment at same site as Lu-2673, above. Sample coll at ca +7m, corresponding to marine level of ±33m. Comment: outer 30% removed by acid leaching.

$10,230 \pm 90$

$\delta^{13}C = +1.1\%$

**Lu-2675. Skógæyri 1**

Thin shell fragments (Mya truncata, Hiatella arctica) from bottom-set beds of delta (silt-very find sand) at Skógæyri, Vesturáðalur, Vopnafjörður (65° 45’ N, 14° 52’ W). Coll at ca +12m, corresponding to marine level of ca +45m. Comment: outer 11% removed by acid leaching.

$10,050 \pm 90$

$\delta^{13}C = +0.4\%$
General Comment: corrections for deviations from $\delta^{13}C = -25\%$ PDB are applied. No corrections are made for reservoir age of living marine mollusks. Reservoir age for waters of Iceland pub by Håkansson (1983).

**Tunisia**

**Bahiret el Bibane series (II)**


4370 ± 60

*Lu-2652. Bahiret el Bibane, No. 1515*

$\delta^{13}C = +5.2\%$

Beach rock composed of ooids and mollusk shell fragments, depth 27cm, 4m from shoreline (landwards) (33° 18’ N, 11° 07’ E).

3340 ± 50

*Lu-2653. Bahiret el Bibane, No. 1516*

$\delta^{13}C = +2.8\%$

Beach rock composed of mollusk shells and shell fragments and small part of ooids, depth 62cm, 4m from shoreline (landwards). Same site as Lu-2652, above.

1670 ± 45

*Lu-2654. Bahiret el Bibane, No. 1534*

$\delta^{13}C = +2.9\%$

Non-cemented coquina composed of *Cerithium* shells, depth 65cm, 6m from shoreline (landwards) (33° 14’ N, 11° 10’ E).

3820 ± 60

*Lu-2655. Bahiret el Bibane, No. 1535*

$\delta^{13}C = +4.6\%$

Non-cemented ooids, depth 55cm, 6m from shoreline (landwards). Same site as Lu-2654, above.

3470 ± 50

*Lu-2656. Bahiret el Bibane, No. 1537*

$\delta^{13}C = +4.6\%$

Beach rock composed of ooids, mollusk shell fragments, and foraminifera tests, depth 45cm, 6m from shoreline (landwards). Same site as Lu-2654, above.

**Czechoslovakia**

**Sivárňa series**

Peak from bog at Sivárňa, E of High Tatra Mts, Slovakia (49° 20’ N, 20° 35’ E), alt ca 600m. Coll Aug 1984 by V Jankovská and J Lazebniček, Inst Experimental Phytotech, Czechoslovak Acad Sci, Brno; subm by B Berglund. Dating is part of paleoecol study belonging to IGCP Proj 158B (Berglund, 1979). Samples were taken from wall of excavated trench (Profile SK-6-A). Depths refer to bog surface. All samples pretreated with HCl.
Lu-2672. Sivárna 1, 45–47cm 5130 ± 60
Moderately humified peat. Max in Picea pollen curve.

Lu-2671. Sivárna 2, 64.5–65.5cm 8380 ± 80
Highly humified peat. Max in Tilia pollen curve.

Lu-2670. Sivárna 4, 127–130cm 12,360 ± 110
Highly humified peat. Pinus silvestris-Pinus cembra-Larix pollen assemblage zone.

Lu-2669. Sivárna 6, 162–165cm 13,710 ± 100
Calcereous highly humified peat. Juniperus-Larix pollen assemblage zone. Max in Juniperus pollen curve. Comment: prolonged HCl treatment for total removal of carbonate. (3 1-day counts.)

Lu-2668. Sivárna 8, 189.5–190.5cm 13,670 ± 130
Highly humified basal peat with small wood fragments. Pollen assemblage zone with Juniperus, Salix, Betula, Pinus silvestris, and P. cembra.

Calcite nodules series
Calcite nodules from loess deposits at Tylisos (35° 18’ N, 25° 01’ E), Zaros (35° 08’ N, 24° 53’ E), Anu Mulia (35° 05’ N, 24° 58’ E), and charcoal from Damasta (35° 21’ N, 24° 58’ E), Crete. Coll 1986 and subm by T Nihlén, Dept Phys Geog, Univ Lund. Dating is part of study of eolian deposits in N Africa and Mediterranean area (Nihlén, 1985; Nihlén & Solyom, 1986; Rapp & Nihlén, 1986). No pretreatment of carbonate samples; charcoal pretreated with HCl and NaOH.

Lu-2718. Tylisos 1:1986 4520 ± 60
Small calcite nodules coll 1.2m below ground surface and 0.4m from profile surface in 3m thick pale yellow loess deposit at Tylisos. Alt ca 200m.

Lu-2719. Tylisos 2:1986 3440 ± 60
Small calcite nodules coll 1.8m below ground surface and 0.7m from profile surface. Same site as Lu-2718, above.

Lu-2720. Zaros 3:1986 3050 ± 100
Small calcite nodules coll 1.1m below ground surface and 0.2m from
profile surface in 1.8m thick pale yellow loess deposit at Zaros. Alt ca 400m. *Comment:* sample undersized; diluted; 28% sample (3 1-day counts.)

**Lu-2721. Anu Mulia 4:1986**

Small calcite nodules coll 1.2m below ground surface and 0.2m from profile surface in 1.8m thick pale yellow loess deposit at Anu Mulia. Alt ca 400m. *Comment:* sample undersized; diluted; 77% sample.

**Lu-2722. Damasta 5:1986**

Charcoal coll 0.5m below ground surface and 0.2m from profile surface in 1.7m thick reddish yellow loess deposit at Damasta. Alt ca 300m.

**RECENT PLANT SAMPLES**

Results are given as difference, \( \Delta \), from our radiocarbon standard (95% activity of NBS oxalic acid standard No. 4990A, age corrected to 1950):

\[
\Delta = \delta^{14}C - (2\delta^{13}C + 50) \left( 1 + \frac{\delta^{14}C}{1000} \right)
\]

where \( \delta^{14}C \) is observed deviation from radiocarbon standard in per mil and \( \delta^{13}C \) deviation from PBD standard in per mil.

**Terrestrial plant series (III)**


**Lu-2685. Måryd 1978**


\[ \Delta = 342 \pm 5.9\%_{\text{o}} \]
\[ \delta^{13}C = -28.9\%_{\text{o}} \]

**Lu-2686. Måryd 1982**

*Juncus* sp coll Sept 17, 1982.

\[ \Delta = 254 \pm 5.7\%_{\text{o}} \]
\[ \delta^{13}C = -27.8\%_{\text{o}} \]

**Lu-2687. Måryd 1983**

*Juncus* sp coll Sept 24, 1983.

\[ \Delta = 234 \pm 5.7\%_{\text{o}} \]
\[ \delta^{13}C = -28.0\%_{\text{o}} \]

**Lu-2688. Måryd 1984**


\[ \Delta = 223 \pm 5.6\%_{\text{o}} \]
\[ \delta^{13}C = -28.6\%_{\text{o}} \]
Lu-2689. Måryd 1985

\[ \Delta = 206 \pm 5.6\%o \]
\[ \delta^{13}C = -29.2\%o \]


Lu-2690. Måryd 1986

\[ \Delta = 189 \pm 5.5\%o \]
\[ \delta^{13}C = -28.7\%o \]

Juncus sp coll Oct 18, 1986.

ARCHAEOLOGIC SAMPLES

Sweden

Lu-2657. Gammelstad 6:1

\[ 430 \pm 45 \]
\[ \delta^{13}C = -24.7\%o \]


Ystad project series (II)


Lu-2644. Köpinge 21:2, A 20A

\[ 1350 \pm 45 \]
\[ \delta^{13}C = -25.1\%o \]


Lu-2645. L:a Köpinge 3:15, A 23

\[ 1310 \pm 45 \]
\[ \delta^{13}C = -25.5\%o \]

Charcoal (Populus sp) from hearth (B3 Pt 50) at L:a Köpinge 3:15 (55° 27' N, 13° 56' E). Coll 1985 by P Karsten. No assoc artifacts. Comment: normal pretreatment with HCl and NaOH.

Lu-2646. L:a Köpinge 9:1, A 22

\[ 2060 \pm 80 \]
\[ \delta^{13}C = -25.7\%o \]

Charcoal (Corylus, Alnus, Quercus, & Tilia) from pit house (B3 Pt 45 A 22) at L:a Köpinge 9:1 (55° 27' N, 13° 56' E). Coll 1985 by P Karsten. Assoc with pottery indicating Late Iron Age. Comment: no pretreatment; sample undersized; diluted; 35% sample. (3 1-day counts.)
Lu-2647. L:a Köpinge 12:1, A 80

Charcoal (Quercus, Betula, Fraxinus, Salix, Alnus, & Acer) from hearth (B3 Pt 41 A 80) at L:a Köpinge 12:1 (55° 27' N, 13° 56' E). Coll 1985 by P Karsten. Assoc with pottery indicating Early Iron Age. Comment: no pretreatment; sample undersized; diluted; 71% sample.

1700 ± 60

δ¹³C = -25.4‰

Lu-2648. Ystad, N Bellevue, A 9


2190 ± 70

δ¹³C = -25.7‰

Lu-2649. Herrestad 68:88, F7

Charcoal (Quercus, Fraxinus, Alnus, Acer, Salix, & Rhamnus cathartica) from hearth (F 7) by refuse layer at Herrestad 68:88 (55° 27' N, 13° 54' E). Coll 1984 by S Tesch. Assoc with pottery indicating Roman Iron Age. Comment: normal pretreatment with HCl and NaOH. Sample undersized; diluted; 51% sample.

2970 ± 80

δ¹³C = -26.5‰

Lu-2650. Herrestad 68:88, A 105

Charcoal (Betula) from cooking pit (A 105) at same site as Lu-2649, above. Coll 1985 by S Tesch. Assoc with bronze fragment indicating Bronze or Iron Age. Comment: no pretreatment; sample undersized; diluted; 40% sample.

3000 ± 90

δ¹³C = -25.6‰

Mossby series

Charcoal from Iron Age settlement at Mossby 10:4A (55° 00' N, 13° 37.5' E) and 12:12 (55° 00' N, 13° 38' E), S Scania. Subm by D Olausson, Inst Archaeol, Univ Lund. Dating is part of study belonging to Ystad Proj, above. Charcoal id by T Bartholin.

1180 ± 45

δ¹³C = -26.5‰

Lu-2635. Mossby 10:4A, Anl 1

Charcoal (Pomoideae) from hearth? (Anl 1). Coll 1985 by E Ryberg. Assoc with firecracked rock, burned clay, and undecorated potsherds. Artifact assemblage from site indicates Late Iron Age. Comment: normal pretreatment with HCl and NaOH.

1260 ± 45

δ¹³C = -25.8‰

Lu-2636. Mossby 12:12, Anl 16

Lu-2637.  Mossby 12:12, Anl 29 1270 ± 45  
δ^13C = -26.5‰  

Lu-2638.  Mossby 12:12, Anl 42 1210 ± 45  
δ^13C = -25.8‰  

Lu-2639.  Mossby 12:12, X38 Y33.5 7340 ± 70  
δ^13C = -25.6‰  
Charcoal (Pinus) from concentration of sooty sand underlying presumed culture layer, Sq X = 38 Y = 33.5. Coll 1985 by S Svensson. No assoc artifacts. Archaeol estimate: Stone Age.

Lu-2684.  Ö Vemmenhög 7:40/1985 4920 ± 90  
δ^13C = -26.1‰  
Charcoal from hearth pit below culture layer in settlement area (Late Middle Neolithic Funnel Beaker culture) at Ö Vemmenhög 7:40, S Scania (55° 23' 30" N, 13° 29' 20" E). Coll 1985 and subm by L Larsson, Inst Archaeol, Univ Lund. Assoc with flint implement and pottery. For other dates from site, see R, 1986, v 28, no. 3, p 1128. Comments: mild pretreatment with NaOH and HCl; sample undersized; diluted; 58% sample. (LL): older than expected from assoc archaeol finds.

Lu-2724.  Storegård 3020 ± 110  
δ^13C = -26.2‰  
Charcoal from fireplace (x = 6; y = 24) near passage grave at Storegård, Barsebäck parish, W Scania (55° 45' 06" N, 12° 59' 04" E). Coll 1986 and subm by B Hårdh, Inst Archaeol, Univ Lund. Assoc with flint waste and pottery indicating Middle Neolithic age. Comment: no pretreatment; sample undersized; diluted; 33% sample.

Skanör series  

Lu-2725.  Skanör 1986:1 550 ± 45  
δ^13C = -26.0‰  
Charcoal from Tr A, Layer D, at Hovbacken, Skanör (55° 25' N, 12° 50' E).
Lu-2726. Skanör 1986:2
\[ \delta^{13}C = -23.8\% \]
Charcoal from Tr A, Layer 9, at Stg 3:2, Skanör (55° 26’ N, 12° 51’ E).

Hindby Mosse series

Lu-2730. Hindby Mosse, MHM 1386
\[ \delta^{13}C = -26.0\% \]
Charcoal from hearth pit (Anl 1 B) coll 1966. Assoc with pottery, flint and other rock implements, and animal bone. Comments: sample undersized; diluted; 90% sample. (MS): date ca 2000 yr too young. Hearth pit obviously not Neolithic but from Iron Age.

Lu-2731. Hindby Mosse, MHM 1505:1
\[ \delta^{13}C = -25.1\% \]
Charcoal from settlement layer (Sqs 15/69, 16/69, and 15/70). Coll 1968. Same artifact assemblage as for Lu-2730, above. Archaeol estimate: 4250 to 4050 BP.

Lu-2732. Järnxyegatan
\[ \delta^{13}C = -26.6\% \]
Charcoal from black settlement layer (Omr 1) at Järnxyegatan. Site assoc with main site Hindby Mosse. Coll 1968. Comment: sample undersized; diluted; 47% sample.

Hörsås series
Charcoal from 2 settlement areas (Late Neolithic-Bronze Age) at Hörsås 6:1, Getinge parish, Halland (56° 49’ N, 12° 43’ E). Coll 1986 by L Carlie; subm by E Rosengren, Stiftelsen Hallands Länsmuseer, Halmstad. No artifacts or other finds assoc with sample material.
Area A

Lu-2741. Hörsås 6:1, Anl 5  
2890 ± 50  
δ¹³C = -26.7‰  
Charcoal from Anl 5. Alt 24.85m. Comment: mild pretreatment with NaOH and HCl.

Lu-2742. Hörsås 6:1, Anl 17  
2860 ± 50  
δ¹³C = -26.7‰  
Charcoal from Anl 17. Alt 23.40m. Comment: normal pretreatment with HCl and NaOH.

Lu-2743. Hörsås 6:1, Anl 18  
2780 ± 50  
δ¹³C = -27.0‰  
Charcoal from Anl 18. Alt 23.57m. Comment: normal pretreatment with HCl and NaOH.

Area C

Lu-2744. Hörsås 6:1, Anl 4  
2880 ± 50  
δ¹³C = -26.5‰  
Charcoal from Anl 4. Alt 32.90m. Comment: normal pretreatment with HCl and NaOH.

Lu-2745. Hörsås 6:1, Anl 6  
2950 ± 50  
δ¹³C = -26.7‰  
Charcoal from Anl 6. Alt 33.0m. Comment: normal pretreatment with HCl and NaOH.

Lu-2746. Hörsås 6:1, Anl 22  
2900 ± 50  
δ¹³C = -26.4‰  
Charcoal from Anl 22. Alt 32.9m. Comment: normal pretreatment with HCl and NaOH.

Lu-2739. Hörsås 6:1, Anl 36  
4590 ± 60  
δ¹³C = -27.5‰  
Charcoal from Anl 36. Alt 33.4m. Comment: pretreated with HCl only; sample undersized; diluted; 88% sample.

Lu-2747. Hörsås 6:1, Anl 107  
2960 ± 50  
δ¹³C = -26.7‰  
Charcoal from Anl 107. Alt 32.75m. Comment: normal pretreatment with HCl and NaOH.

Lu-2740. Stenstorp 3:6, Anl 2  
1990 ± 50  
δ¹³C = -27.2‰  
Charcoal from Anl 2 at Stenstorp 3:6, Slöinge parish, Halland (56° 49'
Verkeän series (II)

Wood (Fagus silvatica), id by A Bråthen, Lab Dendrochronology, Trollhättan, from series of posts visible at low tide N of mouth of Verkeän, Ravlunda parish, E Scania (55° 43.4' N, 14° 12' E). Coll March 1984 (Lu-2763) and April 1987 and subm by L Hansen, Inst Culture Research, Kivik. Dated as complement to Verkeän series (R, 1987, v 29, no. 3, p 377). Pretreated with HCl and NaOH. Lu-2764 and -2765 were charred in nitrogen atmosphere before burning.

Lu-2763. Verkeän 2

\[ \delta^{13}C = -26.1\% \]

Lu-2764. Verkeän 218

\[ \delta^{13}C = -27.9\% \]

Lu-2765. Verkeän 210

\[ \delta^{13}C = -27.0\% \]

References

Berglund, B E, 1979, Presentation of the IGCP Project 158B Palaeohydrological changes in the temperate zone in the last 15 000 years—Lake and mire environments: Acta Univ Ouluensis, ser A, no. 82, Geology, no. 3, p 39–48.


