

**BIRBAL SAHNI INSTITUTE RADIOCARBON MEASUREMENTS II**

G RAJAGOPALAN, VISHNU-MITTRE, and B SEKAR

Birbal Sahni Institute of Palaeobotany, Lucknow-226007, India

The radiocarbon dates covered in this list were measured during 1978. Chemical and counting procedures are as reported previously (R, 1978, v 20, p 398-404). Age calculations are based on the conventional  $^{14}\text{C}$  half-life (5570 yr) and on the contemporary value of 95% of the activity of NBS oxalic acid. Errors quoted correspond to  $1\sigma$  value which takes into account the counting statistics, the uncertainty in the half-life, and the instability of the counting system. The ages are not corrected for isotopic fractionation in nature.

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## SAMPLE DESCRIPTIONS

## QUATERNARY SAMPLES

**Himachal Pradesh series**

Varved clay samples from Leedong ( $32^{\circ} 28' \text{N}$ ,  $77^{\circ} 54' \text{E}$ ), Dist Lahul and Spiti. Samples coll from natural exposure and subm by A Bhattacharya, Birbal Sahni Inst Palaeobotany (BSIP), Lucknow to date late Quaternary vegetational changes.

**BS-73. Varved clay** **28,310  $\pm$  3070**  
Depth 43 to 77cm.

**BS-74. Varved clay** **24,030  $\pm$  580**  
Depth 179 to 220cm. *Comment:* BS-73 most likely contaminated with coal particles. Samples found devoid of pollen.

Three profiles of black silt samples from Mari ( $32^{\circ} 15' \text{N}$ ,  $77^{\circ} 15' \text{E}$ ), Dist Kulu. Samples coll from trial trenches and subm by A Bhattacharya to date past vegetational changes of the region.

*Profile 1*

**BS-85. Black silt** **Modern**  
Depth 5 to 7cm.

**BS-86. Black silt** **1975  $\pm$  110**  
Depth 17cm.

## Profile 2

- BS-87. Black-brown clay** **7985 ± 110**  
Depth 40 to 44cm.

## Profile 3

Black brown humus, depth 65cm.

- BS-71a. Lumps of organic matter** **870 ± 110**

- BS-71b. Clay fraction** **1345 ± 110**

*Comment:* BS-71a indicates incorporation of humus of later origin. Pollen analysis of profiles is in progress.

Clay samples from Chottodara (32° 18' N, 77° 33' E), Dist Lahul and Spiti. Sample coll and subm by A Bhattacharya to date past vegetational changes.

- BS-89. Carbonaceous clay** **Modern**  
Depth 5 to 8cm.

- BS-99a. Carbonaceous clay** **Modern**  
Depth 38cm.

*Comment:* carbon content found insufficient in 5 deeper samples of 2.35m profile. Pollen analysis of profile in progress.

- BS-82. Monali** **Modern**

Clay sample from Monali (32° 15' N, 77° 10' E), Dist Kulu. Depth 15cm. Coll and subm by A Bhattacharya to date vegetational sequence.

- BS-84. Chandratat Lake** **1220 ± 350**

Carbonaceous sediments, depth 127 to 132cm from Chandratat lake (32° 28' N, 77° 40' E), Dist Lahul and Spiti. Coll and subm by A Bhattacharya to date vegetational changes. Uppermost two samples of the profile had insufficient carbon.

- BS-55. Batal** **Modern**

Varved silty clay, depth 26 to 43cm from Batal (32° 14' 30" N, 77° 33' 40" E), Dist Lahul and Spiti. Coll and subm by A Bhattacharya. *Comment:* top and bottom samples of the profile, BS-54 and BS-60, are dated at 495 ± 90 and 1370 ± 135 (R, 1978, v 20, p 398-404). Pollen analysis of the profile is in progress.

**Nilgiris series**

Samples from bore hole in peat deposits from Upper Bhawani (11° 21' N, 76° 45' E), Dist Nilgiris, Tamil Nadu. Coll and subm by H P Gupta and K Prasad, BSIP. Samples date pollen diagram.

- BS-76. Peaty clay** **280 ± 100**  
Depth 0 to 5cm.

**BS-75. Peaty clay 1920 ± 100**

Depth 30cm. *Comment:* two deeper samples of the profile, BS-52 and BS-53, have been dated at  $5690 \pm 110$  and  $18,540 \pm 290$  (R, 1978, v 20, p 398-404). Pollen analysis of the profile indicates the occurrence of grasslands with scanty tree elements about  $5690 \pm 110$  yrs BP and the subsequent re-immigration of the shola forest at the site during the last 2000 yrs BP.

Peat from Nanjanad ( $11^{\circ} 22' 52''$  N,  $76^{\circ} 38' 10''$  E), Dist Nilgiris. Coll and subm by K Prasad. Samples to date pollen diagram.

**BS-106. Peat 4005 ± 90**

Depth 20 to 50cm.

**BS-120. Peat 10,620 ± 160**

Depth 70 to 100cm.

**BS-122. Peat 19,310 ± 360**

Depth 120 to 150cm.

**Rajasthan series**

Samples from trial trenches from Rajasthan. Coll and subm by A K Saxena, BSIP to date pollen diagram.

**BS-99b. Didwana 7210 ± 160**

Dark clay, depth 260 to 267cm from Didwana ( $27^{\circ} 20'$  N,  $74^{\circ} 35'$  E), Dist Nagaur. *Comment:* date consistent with earlier measurements from the profile (R, 1978, v 20, p 398-404).

**BS-81. Kanod 7840 ± 300**

Dark clay, depth 2.3 to 2.4m from Kanod ( $27^{\circ} 9'$  N,  $71^{\circ} 10'$  E), Dist Jaisalmer. *Comment:* sample belongs to a profile different from the one reported earlier (R, 1978, v 20, p 398-404).

Oxidized layer from base of sand dune, depth 76cm, from Budha Pushkár lake ( $26^{\circ} 31'$  N,  $74^{\circ} 35'$  E), Dist Ajmer. Coll from natural exposure and subm by A Prakash, BSIP.

**BS-77a. Lumps of organic matter 425 ± 90****BS-77b. Clay fraction 825 ± 120**

*Comment:* botanical analysis of oxidized layer reveals presence of *Chara nucules* suggesting its deposition under fresh water conditions. A nearly similar deposit in this basin has been dated on typologic evidence to upper Palaeolithic (Allchin, Hegde & Goudie, 1972).

**Gujarat series**

Samples from natural exposure from Rajpipla ( $21^{\circ} 0' 45''$  N,  $73^{\circ} 0' 50''$  E), Dist Broach. Coll and subm by R K Kar, BSIP, to date top fluvial deposit in Pleistocene sections.

<b>BS-95. Charcoal</b>	<b>160 ± 95</b>
Depth 0.9m.	
<b>BS-102. Charcoal</b>	<b>245 ± 90</b>
Depth 1.2m.	
<b>BS-96. Charcoal</b>	<b>330 ± 140</b>
Depth 3.15m.	
<b>BS-100. Charcoal</b>	<b>330 ± 70</b>
Depth 3.3m.	
<b>BS-101. Shells</b>	<b>Modern</b>
Depth 3.0m.	

GEOLOGIC SAMPLES

**BS-88. Chengalpattu, Tamil Nadu** **5210 ± 145**  
 Peat, depth 3.4m, from Chengalpattu (13° 14' 10" N, 80° 16' 30" E), Dist Chengalpattu. Coll and subm by S Subramanian, Geol Survey of India, to date alterations in shore line.

**BS-83. Ambou, Himachal Pradesh** **38,270 ± 2480**  
 Carbonaceous clay, depth 0.3m, from Ambou (30° 32' 30" N, 77° 42' E), Dist Nahan. Subm by Engg Geol Div, Geol Survey of India, to date the neotectonic event.

ARCHAEOLOGIC SAMPLES

**Ayodhya series**

Charcoal samples from Ayodhya (26° 45' N, 82° 10' E), Dist Faizabad. Coll and subm by B B Lal, Indian Inst of Advanced Study, Simla, to date the late phase of Northern Black Polished (NBP) Ware period.

**BS-66. Charcoal** **2065 ± 120**  
 Depth 3.12m.

**BS-69. Charcoal** **1975 ± 100**  
 Depth 4.05m.

**BS-70. Charcoal** **2130 ± 105**  
 Depth 4.31m. *Comment:* dates confirm archaeol estimate (Agrawal *et al*, 1978).

**Peddabankur series**

Peddabankur (18° 35' N, 79° 25' E), Dist Karim Nagar, is an historic site. Subm by S Ramesan, Dir Archaeol and Museums, Andhra Pradesh.

**BS-67. Historic levels** **1920 ± 110**  
 Wood charcoal from Sec II, Div 81, Layer 2, depth 0.65m.

**BS-68. Historic levels 1940 ± 110**

Wood charcoal from Sec I, Div 74, Layer 2, depth 0.75m. *Comment:* dates agree with earlier known dates from the site (Agrawal & Kusumgar, 1973).

**Polakonda series**

Polakonda (17° 42' N, 79° 26' E), Dist Warangal. Subm by Dir Archaeol and Museums, Andhra Pradesh.

**BS-97. Megalithic culture 2045 ± 90**

Wood charcoal, depth 0.87m, submitter's sample no. PKD/2/77. *Comment:* date agrees with archaeol estimate.

**BS-98. Neolithic culture 3255 ± 120**

Wood charcoal, depth 1.15m, submitter's sample no. PKD/1/77. *Comment:* date, close to archaeol estimate, indicates late arrival of a Neolithic people from S Andhra Pradesh or from SW Karnataka.

**Dhulikatta series**

Dhulikatta (18° 35' N, 79° 16' E), Dist Karim Nagar, is an historic site. Subm by Dir Archaeol and Museums, Andhra Pradesh.

**BS-117. Historic levels 1965 ± 90**

Wood charcoal, depth 0.15m. Submitter's sample no. DKT/3/76.

**BS-118. Historic levels 1910 ± 95**

Wood charcoal, depth 0.55m. Submitter's sample no. DKT/1/76.

**BS-119. Historic levels 2210 ± 100**

Wood charcoal, depth 2.25m. Submitter's sample no. DKT/2/76. *Comment:* dates establish inception of early historic phase and chronology of Satvahanas.

**Naikund series**

Naikund (21° N, 79° 6' 7" E), Dist Nagpur. Megalithic habitation site at Naikund assoc with Megalithic stone circles. Subm by S B Deo, Deccan Coll, Pune.

**BS-92. Megalithic culture 2455 ± 100**

Wood charcoal from NKD-Md I, Trench C 1, Layer (3), depth 45 to 50cm.

**BS-94. Megalithic culture 2495 ± 105**

Wood charcoal from NKD-Md I, Trench C 2, Layer (2), depth 30 cm. *Comment:* dates agree with archaeol estimate.

**BS-78. Sangamner, Maharashtra 24,670 ± 710**

Freshwater shells from Sangamner (19° 24' 48" N, 74° 10' 12" E), Dist Ahmed Nagar. Shells were found on surface along with Late Stone age (Upper Palaeolithic) artifacts during excavation. Subm by S N

Rajguru, Deccan College, Pune. *Comment* (SNR): date confirms archaeol estimate for Upper Palaeolithic period obtained from Tapti and Belan Valleys.

**BS-103. Inamgaon, Maharashtra** **3355 ± 105**

Charcoal from Trench D<sub>1</sub> & D<sub>2</sub>, Sq E 6 sealed by layer (8), House no. 70, horizontal excavation. Assoc with early Jorwe culture (Period II of Inamgaon). Coll and subm by Z D Ansari, Deccan College, Pune. *Comment*: date agrees with archaeol estimate (Agrawal & Kusumgar, 1972).

**BS-79. Chennur, Karnataka** **>40,000**

Freshwater shells from Chennur (16° 29' N, 76° 33' E), Dist Gulbarga, probably representing food debris found scattered on surface along with Mesolithic artifacts during excavation. Coll and subm by K Paddayya, Deccan Coll, Pune. *Comment*: date much older than archaeol estimate.

**BS-113. Agroha, Haryana** **1350 ± 95**

Charred rice grains from Agroha (29° 20' N, 75° 38' E), Dist Hissar. From archaeol excavation, sample assoc with Indo-Greek coins. Coll and subm by P N Kaushik, Hisar. *Comment*: date much younger than archaeol estimate.

OCEANOGRAPHIC SAMPLES

Dredge core samples of coral algal limestone from continental shelf between Vengurla and Ratnagiri along W coast of India. Coll and subm by P C Srivastava, Geol Survey of India, and H N Siddique, Natl Inst of Oceanog, Goa, to date climatic and environmental changes on the basis of sedimentologic and microfaunal studies.

*General Comment*: dates suggest early Holocene period.

Lab no.	Location	Age
<b>BS-107.</b>	<b>16° 40' N, 72° 48' E</b>	<b>8395 ± 145</b>
<b>BS-108.</b>	<b>16° 18' N, 73° 2' E</b>	<b>7845 ± 130</b>
<b>BS-109.</b>	<b>16° 9' 39" N, 72° 50' E</b>	<b>9435 ± 145</b>
<b>BS-110.</b>	<b>16° 0' 20" N, 73° 51' E</b>	<b>8380 ± 140</b>
<b>BS-111.</b>	<b>15° 50' N, 73° 12' E</b>	<b>8300 ± 135</b>
<b>BS-112.</b>	<b>15° 15' N, 73° 0' 36" E</b>	<b>7470 ± 135</b>

GEOPHYSICAL SAMPLES

**Minicoy series**

Dead corals from natural exposure near light house, Minicoy I. (8° 0' 18" N, 73° E). Coll and subm by H N Siddique, Natl Inst Oceanog, Goa, to date storm beaches and formation of islands.

<b>BS-58. Surface</b>	<b>475 ± 75</b>
<b>BS-59. 2.5m below cutting</b>	<b>2875 ± 100</b>
<b>BS-61. Top of cutting</b>	<b>2755 ± 105</b>
<b>BS-62. Surface, on shore</b>	<b>595 ± 105</b>

<b>BS-63.</b>	<b>Surface</b>	<b>2215 ± 100</b>
<b>BS-64.</b>	<b>Surface</b>	<b>2455 ± 100</b>
<b>BS-65.</b>	<b>Surface</b>	<b>180 ± 95</b>

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