

PARTICIPANTS

- Cities
- and
- Areas in Europe where houses are built on piles because of weak soil.

RENÉ KLAASSEN, SHR FOUNDATION OF TIMBER RESEARCH

Post Box 496
NL-6700 AL Wageningen
The Netherlands
Tel: +31 317 425422,
Fax: +31 317 425 783
E-mail: r.klaassen@SHR.NL

HERMAN KEIJER, FUGRO INGENIEURSBUREAU BV

Cyroscoopweg 94
NL-1042 AX AMSTERDAM
The Netherlands
Tel: + 31 20 6133446
Fax: + 31 20 6145931
E-mail: h.keijer@fugro.nl

ROD EATON, UNIVERSITY OF PORTSMOUTH, SCHOOL OF BIOLOGICAL SCIENCES KING HENRY BUILDING

King Henry 1st street
UK-P01 2DY PORTSMOUTH
United Kingdom
Tel: + 44 23 92 842027
Fax: + 44 23 92 842070
E-mail: rod.eaton@port.ac.uk

MARTIJN MANDERS, NISA NETHERLANDS INSTITUTE FOR SHIP AND UNDERWATER ARCHAEOLOGY

Post Box 510
NL-8200 AM LELYSTAD
The Netherlands
Tel:+ 31 320 269700
Fax: + 31 320 269750
E-mail: m.manders@archis.nl

ROB National Service for Archaeological Heritage Kerkstraat 1
NL-3811 CV AMERSFOORT
The Netherlands
Tel: +31 33 422 76 06
Fax:+31 33 422 77 99

UTE SASS-KLAASSEN, RING CENTRE FOR DENDROCHRONOLOGY

P.O.Box 1600
NL-3800 BP AMERSFOORT
The Netherlands
Tel: + 31 33 422 75 13
Fax: + 31 33 422 77 99
E-mail: u.sass@archis.nl

GIOVANNI ABRAMI, ECOPIANO ENGINEERING SRL

Via Furlanetto 12
35132 PADOVA
Italy
Tel: +39 049 611630
Fax: +39 049 600450
E-mail: ecopiano@tin.it

CHARLOTTE BJÖRDAL, SWEDISH UNIVERSITY OF AGRICULTURAL SCIENCES, DEPARTMENT OF WOOD SCIENCE

Post Box 7008 S
E-75007 UPPSALA
Sweden
Tel: + 46 18 672583
Fax: + 46 18 673489
E-mail: charlotte.bjordal@trv.slu.se

SVEN MÅRDH, PHAGEN AB

AB Berzelius Science Park
S-582 25 LINKÖPING
Sweden
Tel: +46 13 22 42 54,
Fax: +46 13 22 42 54
E-mail: sven.mardh@mcb.liu.se

HOLGER MILITZ, GEORG-AUGUST-UNIVERSITY GÖTTINGEN, INSTITUTE OF WOOD BIOLOGY AND TECHNOLOGY

Büsgenweg 4
D-37077 GÖTTINGEN
Germany
Tel: + 49 551 393541
Fax: + 49 551 393543
E-mail: hmilitz@gwdg.de

NORBERT LAMBERSDORF, GEORG-AUGUST-UNIVERSITY GÖTTINGEN, INSTITUTE OF SOIL SCIENCE AND FOREST NUTRITION

Büsgenweg 2
D-37077 GÖTTINGEN
Germany
Tel: + 49 551 393500
Fax: + 49 551 393310
E-mail: n.lambers@gwdg.de



Picture made by Ing. Bureau Rotterdam.

Preserving cultural heritage by preventing bacterial decay of wood in foundation piles and archaeological sites

BACPOLES

An EC funded program (Energy, Environment and Sustainable Development - "The City of Tomorrow and Cultural Heritage") EVK4-CT-2001-00043

PERIOD: 2002 – 2005

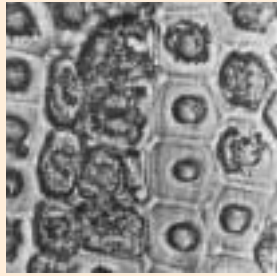


EUROPEAN COMMISSION RESEARCH - DIRECTORATE-GENERAL
Directorate I - Preserving the Ecosystem: Environmental Research
"City of Tomorrow and Cultural Heritage"

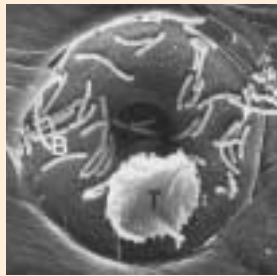
This project is coordinated by SHR

Ms. J. Leissner office: LUX 1/45. B- 1049 Brussels Belgium
Tel: +32 2 296 21 47 Fax: +32 2 296 30 24 www.bacpoles.nl





Cross section of Pine with bacterial degradation (Liese 1950).



Bacteria in a bordered pit of a pine tracheid (Peek & Leise 1979).

Submerged wood was previously considered safe from decay due to low oxygen content under water. About 3 decades ago it became clear that bacteria can cause degradation in such wood. Degradation under waterlogged conditions is a slow process and for wooden piles under monumentale buildings or for archaeological wood the exposure time is typically very long which makes this cultural heritage vulnerable for degradation by bacteria.

WOOD DEGRADING BACTERIA IDENTIFICATION

Little is known about the process of bacterial degradation and until now it has not been possible to isolate or identify any of the wood attacking bacteria. One main target that is crucial for the project is the identification of the bacteria by an innovative approach of new isolation techniques in combination with molecular DNA technology.

IN SITU MEASUREMENTS

The second target is to asses the relationship between environmental conditions and wood quality in foundation piles as well as archaeological wood from marine and terrestrial sites. Equipment for

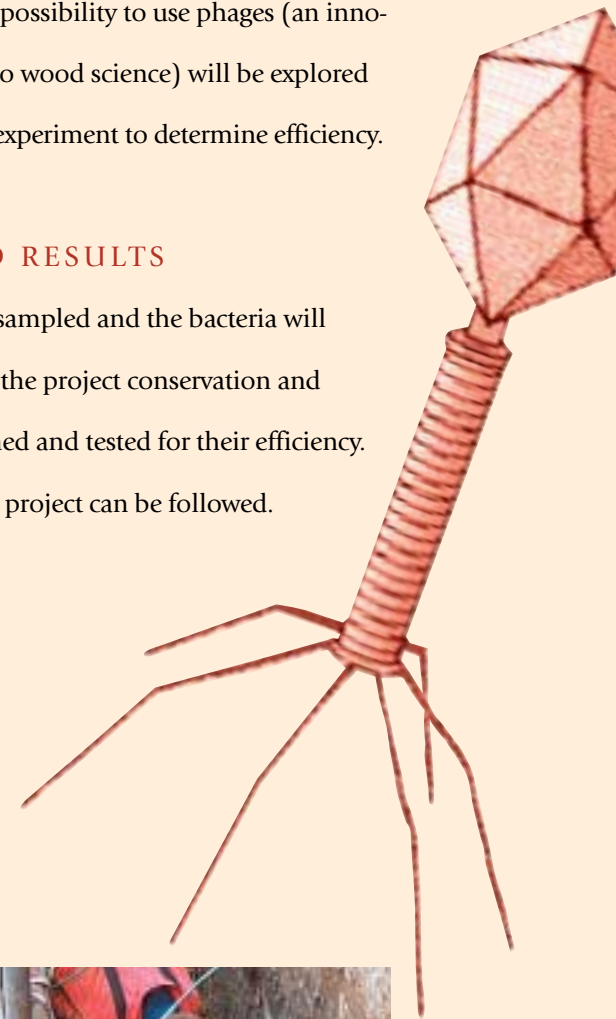


An oak clamp for holding a rope of the Stora Sophia, a Danish admiralty ship sunk outside Gothenburg, Sweden 1645.

measuring oxygen at very low concentrations will be developed and used at all sampling sites. Laboratory trials will be used to identify the key factors of bacterial degradation of wood. Foundation piles on more than 10 locations all around Europe will be sampled or fully extracted. Also European archaeological terrestrial sites and ship wrecks will be sampled. All sample site conditions will be correlated with the degradation of the wood and the identified bacteria. On the base of these results protection strategies will be developed based on the ecology of the bacteria and the possibility to use phages (an innovative medical technique but new to wood science) will be explored and tested in a running laboratory experiment to determine efficiency.

TIME SCHEDULE AND RESULTS

In the first 1.5 year all sites will be sampled and the bacteria will be identified. In the second half of the project conservation and preservation strategies will be defined and tested for their efficiency. On the web-site the progress of the project can be followed.



Site showing position of piles from a medieval house. Only the outlines of the piles can be seen in the sandy soil, no wood is preserved.



Medieval foundation pile in sandy soil. Most of it has disappeared because of degradation processes in the soil.



Excavated foundation piles in Amsterdam.



Foundation inspection pit in Haarlem (the Netherlands), piles are measured and sampled.