LOCALIZATION OF LATEX IN RUBBERWOOD

by

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The Rubbertree (*Hevea brasiliensis* Muell.-Arg., *Euphorbiaceae*) is well known as a rubber or caoutchouc producer for a long time. The trees are widely cultivated now in Southeast Asia, which area produces about 2 million tons yearly. The tapping is starting on seven- to eight-year-old trees, and last from 15 to 25 years. During this time the fast growing trees get diameters of 30 to 40 cm. As the timber is not valuable, and always subject to fungus and insect attack, in general practice old rubber trees are cut down and burned to make a new plantation.

Recent investigations show that rubberwood produces pulp and paper, comparable to poplar. As all countries of Southeast Asia have a more or less demand in pulp and paper products, besides the plantations are extensive with good transporting systems, rubberwood seems to become a very indispensible raw material.

There are two technical difficulties for producing pulp from rubberwood, firstly the attack of fungi and insects during the storage time, and secondly the occurrence of small amounts of caoutchouc in the wood or, after production, in the pulp or paper. The caoutchouc causes the defilement of some machines, and irregularities during the papersheet manufacture.

The occurrence of caoutchouc in the wood is difficult to understand, as it is known that the latex of the rubber tree occurs only in the laticiferous cells, which are placed in the secondary phloem, but not in the xylem (VISCHER 1923); even the chemical analysis of the wood indicated the absence of caoutchouc (SANDERMANN et al. 1963) Therefore it is possible that the latex flows over the cut surfaces during the logging of the trees, as during these operations the latex

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flows out from the bark rather fast before coagulating some minutes later.

The following note describes some chemical analysis from different parts of the stem, which are prepared in different ways. Only the absolutely dry sawdust was used and extracted firstly with ethyl alcohol, afterwards with petroleum ether. The petroleum ether extract was filtered and evaporated; the residue was dissolved in chloroform. Bromine was added under cooling, and after some time petroleum ether. If there is any caoutchouc in the sample, a white precipitate will be evident. This will be eliminated by washing with ethyl alcohol, water and lastly ether. The precipitate is caoutchouc bromide, which contains 70.15% bromine (SANDERMANN et al. 1963).

EXPERIMENTS:

1. A fresh log (d=20 cm., l=60 cm.) was carefully barked. From both cross sections one thin disk (about 5 mm. thick) each was cut.
   Caoutchouc content of disk 1a : 0.063 gm.
   1b : 0.002 gm.
2. An air dry log was cut into three pieces. The middle part was carefully barked, and from both ends of this middle piece one disk each as described before was cut.
   Caoutchouc content of disks 2 a and 2 b : none
3. From the middle part of log 1 and 2 one disk each was cut. From these disks samples taken from the centre (near pith) and from the perimeter (near cambium) were analysed.
   Caoutchouc content of all samples : none
4. From two fresh logs (d=20 cm., b=60 cm.) which were barked by means of hammer (a) and knife (b), scrapings of wood from the surface were obtained.
   Caoutchouc content 4a : 0.006 gm.
   4b : 0.007 gm.
5. From 10 fresh logs (d=18 cm., l=90 cm.) 5 were barked immediately in the usual way, the other 5 seven weeks laler after air drying. From the fresh (5a-5e) and dry samples (5f-5k) scrapings of the surface as described before were obtained.

Caoutchouc content 5a-5e : All +, ranging between 0.010 and 0.079 gm.

5f-5k : All +, ranging between 0.112 and 0.145 gm.

Comparing the results of the experiments conclusion can be-summarized as follows :

Apparently there is no caoutchouc in the wood (xylem) but only in the brak.

During the cutting of the fresh log the saw carried some latex to the cross sections.

The barking of logs by means of hammer and knife will not remove all parts of the bark, and furthermore the flowing latex always spills over the surface of the wood.

If air dry logs were cut, the saw did not carry the latex to the cross sections. If air dry logs were barked in the usual way, certain parts of the bark containing caoutchouc are still remaining on the surface of the wood.

The barking of logs to get the caoutchouc-free wood, ideal for the pulp and paper industry is still a problem. Either air-drying the logs or perhaps poisoning the standing trees before cutting, only solves the problem for the cross section, but not for the whole wood surface. Further investigations, especially with soaked logs, are therefore necessary.

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