

## STRUCTURAL ASPECTS OF BIOACTIVE PECTIC POLYSACCHARIDES FROM MALIAN MEDICINAL PLANTS

Berit Smestad Paulsen\*<sup>1</sup>, Cecilie Sogn Nergård<sup>1</sup>, Kari T. Inngjerdingen<sup>1</sup>,  
Drissa Diallo<sup>2</sup>

<sup>1</sup>*Section Chemistry, Department of Pharmacognosy,  
P.O.Box 1068 Blindern, 0316 Oslo, Norway.*

<sup>2</sup>*Department of Traditional Medicine, INRSP, B.P. 1576, Bamako, Mali  
b.s.paulsen@farmasi.uio.no*

Pectic polysaccharides have been shown to be responsible for different types of bioactivities, especially related to the immune system. Ethnopharmacology is one method for identification of plants that may contain bioactive polysaccharides, especially when the interviewing is concentrated on plants used for woundhealing. Mali has a long and still living tradition for the use of medicinal plants for treatment of different types of illnesses and one of these are treatments of wounds of different types, both external and internal. The latter often defined as gastric ulcer. As part of the collaboration program between Department of Pharmacognosy, UiO, and the Department of Traditional Medicine, Bamako, Mali (DMT) a survey has been conducted in order to record plants used for woundhealing in different parts of Mali. So far the survey has been performed in the south west part, including Bamako, the area north of Bamako, the Kangaba region, and in Dogonland, north east in Mali. It was observed that many of the plants used for woundhealing were rich in polysaccharides, and a screening for effect on the complement system of polysaccharides isolated from the plants investigated showed a high activity for many of the polysaccharides investigated. This study identified plants containing polysaccharides that were further studied for their structure, effect in various bioassays, and structure activity studies were also performed. The results reported in the talk will be based on studies on the different bioactive pectins isolated from the following plants: *Vernonia kotschyana*, *Cochlospermum tinctorium*, *Glinus oppositifolius* and *Biophytum petersianum*.

*V. kotschyana* and *C. tinctorium* are both used against gastric ulcer and are important ingredients in products sold on the market in Mali for the treatment of gastric ulcer, the first is also registered as an Improved Traditional Medicine, ITM, called Gastrocedal by the government in Mali.

All plants contain different types of pectic polymers. The water extracts have been fractionated by anion exchange chromatography, further purified by gel filtration. The MW has been determined by gel filtration or SEC-MALLS. The monomeric composition was determined by GC, linkage analysis performed by GC-MS on partly methylated, partly acetylated alditol obtained after methylation of the polymers followed by hydrolysis, reduction and acetylation. The polymers are degraded further by different enzymatic methods and the structure of the obtained fractions determined. The bioactivity of the products obtained are determined in the complement system as well as in other systems involved in the immune system. The results form the basis for the structure activity relations that are proposed. The hairy region appears to be an important part for the bioactivity, but also the galacturonan regions, and especially if they are substituted appear to play an important role for the overall activity.