cellular cations in bacteria. Their concentrations are strictly controlled and are related to the overall growth rate of the cells and the latter is in turn related to the concentrations of ribosomes[10]. Although there may be a substantial intracellular concentration of sodium ions this appears to be less strictly controlled and much more dependent on the concentration of sodium ions in the growth medium[11]. The intracellular concentration of potassium ions in bacteria, excluding halophiles, ranges from 0.05 M to 0.6 M[9,11,12,14,16] and most of this appears to be unbound[15]. The intracellular concentration of magnesium ions is usually about 0.03 M[17–19] of which about 10% is unbound[18], and the intracellular sodium ion concentration varies between 0.005 M and 0.2 M[9,11,14,15].

Since the effects of sodium ions and of potassium ions on the stabilization of the secondary structure of nucleic acids are similar[20], in the present work thermal denaturation profiles were measured in the presence of potassium ions as the only monovalent ion. The monovalent ion concentrations used here, 0.15 M and 0.3 M, thus represent the middle of the range of physiological concentrations of monovalent ions, and the magnesium ion concentration, 0.01 M, probably represents the upper range of concentration for unbound magnesium which is likely to occur in a bacterial cell. Under these conditions a physiological concentration of spermine stabilizes rRNA against thermal denaturation, but it has a less pronounced effect on ribosomes, the extent of which depends particularly on the concentration of magnesium ions. The presence of spermine in a procaryotic organism appears to be unusual, but, in *B. stearothermophilus* the occurrence of spermine may be related to the ability of this organism to grow at high temperatures, and more particularly, the ability to assemble ribosomes from rRNA at these temperatures.

Zusammenfassung. Nachweis, dass Spermin die rRNS von *B. stearothermophilus* bei Thermaldenaturierung in Gegenwart physiologischer Konzentrationen von Kalium- und Magnesiumionen stabilisiert.

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Flavonoids of *Metrosideros polymorpha* (Myrtaceae)

In the course of a survey of some Hawaiian plants for flavonoids we were made aware, by Professor S. Siegel and Miss Caroline Corn of the University of Hawaii, of the existence of distinct varieties of 'Ohia' (*Metrosideros polymorpha* Gaud. (Myrtaceae)), which is endemic to the islands. One variety bears shovel-shaped leaves with a white, tomentose dorsal surface and a second, which we also examined, has smooth, ovate leaves. The only previous studies on the chemistry of this genus are concerned with the identification of the triterpenoid, arjunolic acid, in *M. umbellata*[1] and the identification of methyl gallate and gallic, ellagic, ursolic and betulic acids in flowers of *M. excelsa*[2].

Fresh leaves of *M. polymorpha* wer first extracted with 70% ethanol followed by fractionation on a polyamide column using water with increasing concentrations of ethanol as an eluent. The column fractions were further fractionated and purified by paper chromatography yielding 5 major and 2 minor flavonoids. Acid hydrolysis of 3 of the major components yielded quercetin (3,3',4',5,7-pentahydroxyflavone), while the remaining major components gave myricetin (3,3',4',5,5',7-hexahydroxyflavone) as the aglycones. The sugar moieties of the 3 quercetin glycosides were identified as arabinose, galactose and rhamnose, respectively. The 2 myricetin glycosides gave on acid hydrolysis arabinose and rhamnose. Ultraviolet data indicated that glycosylation of all 5 flavonoids occurred in position 3. This was further confirmed by H_2O_2 oxidation[3] giving rise to the same monosaccharides previously mentioned. The glycosides were thus identified as quercetin-3-arabinoside, quercetin-3-galactoside, quercetin-3-rhamnoside, myricetin-3-arabinoside and myricetin-3-rhamnoside.

The 2 minor flavonoids gave, on acid hydrolysis, quercetin and myricetin, respectively, as well as galactose in both cases. The UV-spectra of both flavonoids were similar to those of the 3-galactosides of quercetin and myricetin but, at the same time, exhibiting the presence of a strong acyl group. Alkaline hydrolysis failed to afford any recognisible acylating groups. The chromatographic properties of these compounds are not indicative of polyglycosides. Although larger amounts of plant material (5 kg) were re-extracted and fractionated, only trace amounts of both flavonoids were obtained which prevented any further studies. We found that all 7 flavonoids are present in both varieties of *Metrosideros* and that therefore this feature of their chemistry is not useful in distinguishing them.

Résumé. Dans deux variétés de *Métrosideros polymorpha* Gaud. (Myrtaceae), nous avons trouvé les favanoides suivants: arabinoside-3, galactoside-3, rhamnoside-3-quercetine, et arabinoside-3, thamnoside-3-myricetine; en outre, deux glycosides en moindre quantité.

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