Palmarumycins are biologically active natural products. The representatives of this new family are MK3018 (**2**) and bibendensis (**3**). In 1989, Ogishi and his coworkers isolated antibiotic MK3018 from the fungus *Tetraploa aristata* IR 25 and Bibendensis (**3**) was isolated in 1990 by Connolly from the timber *Afzelia bibendensis*. In general, all members of this family are composed of two naphthalene entities that are linked via oxygen. Depending on the number of different oxygen-carbon bonds, three different configurations of spirobisnaphthalenes are known. They are called palmarumycine, spiroxine and preussomerine. In palmarumycine, the two naphthalene moieties are interconnected with two oxygens e.g. palmarumycin CP1 (**4**) and in preussomerins they are linked together with three oxygens e.g. preussomerin A (**5**) . In case of spiroxine there is one carbon and two oxygen bridges e.g. spiroxin A (**6**). These natural products show antibacterial, antifungal, herbicidal, and cytotoxic properties. Because of their broad biological spectrum of activity and their interesting structural features, the focus of our work is to synthesize palmarumycins and similar compounds of this class. In this context several Palmarumycins and its derivatives are synthesized by transformation reactions such as aromatization, isomerization of double bonds and acid-catalyzed cleavage of the methoxy group eliminations. The epoxidation of these compounds yielded interesting products. Furthermore using benzoquinoneketal **76**, Diels-Alder product **90** and its derivatives **85**, **94** and **95** were produced by dihydroxylations, the formation of the acetonides and esterification reactions. After these reactions, the diols **103-107**, the acetonide **108 110-112** and the monoacetate **141** and diacetate **114-117** were synthesized. The illustrated compounds were tested for their biological activity against Gram-negative *Escherichia coli* (Ec), the Gram-positive bacterium *Bacillus megaterium* (Bm) and the fungus *Microbotryum violaceum* (Mv). All investigated substances were bioactive against these microorganisms and showed good to excellent results. In addition to the synthesis of Palmarumycins, two further projects were carried out. In the first project, the dimerization of the monomer **118** was investigated. For this purpose, an attempt was made to produce the synthetic natural products **119**, **120** and **121**. The dimerization reaction of the monomer **118** gave the desired para-para dimer daldinol (**119**), the ortho-para dimer nodulisporin A (**120**) and the side product orthomethyljuglon (**142**). In the third and final project, the reactions of 1,4-phenanthrene quinone, due to their interesting biological activities, were investigated which yielded interesting and surprising products.