Chapter 9

General Discussion and Conclusion

Medicinal plants represent an almost unexplored reservoir of new substances with potentially useful properties. Indigenous knowledge systems have historically benefited pharmacological research programmes, which deals with future discovery of new drugs (Cox, 1990). Today we still rely on the curative properties of plants for about 75% of our medicines. It has been estimated that 80% of people living in developing countries are almost completely dependent on traditional medicines (Prozesky et al., 2001). In many countries traditional healers, medical doctors and University researchers explore indigenous medicines to record information on the use of medicinal plants, their preparation method, to discover new botanical resources and to identify the constituents responsible for the therapeutic or toxic effects of medicinal plants. Most species of higher plants have never been investigated for their chemical or biologically active constituents, and many interesting bioactive molecules have been discovered (Aquino et al., 1989).

Compounds from higher plants are of great potential value as medicines, as well as starting points for synthetic analogues and industrial raw materials. In contrast to synthetic drugs, medicinal plants play an important role for the basic health care level of various developing countries. Also the WHO encourages all countries to preserve and use the safe and positive elements of traditional medicine in their national health systems (Akerele, 1992).

Previous researchers have reported antimicrobial activity of extracts of P. sidoides and P. reniforme and their constituents against few bacteria and fungal species. Kayser and Kolodziej (1995), isolated highly oxygenated coumarins from P. sidoides and
investigated the antibacterial activity of extracts and constituents of *P. sidoides* and *P. reniforme*. Latté *et al.*, (2000), isolated flavonoids and tannins from *P. reniforme* and also the unusual coumarin patterns of *P. sidoides* and *P. reniforme* were analysed and compared for therapeutic equivalence. The aim of the study was to detect the antibacterial, antifungal and antituberculosis activities of the plant species that are used in preparation of the herbal remedy ‘umckaloabo’ and also to isolate compounds present from the active extract and to subject the isolated compound to biological screening.

In this study, we investigated the selected plants for their antimicrobial assays against the bacteria responsible for bronchitis, fungal pathogens infecting the respiratory tract and also for tuberculosis. The plants selected showed antibacterial, antifungal and antituberculosis activity *in vitro*. Acetone and ethanol extracts of *P. sidoides* and *P. reniforme* were investigated against the causative agents of bronchitis. Only ethanol extract of *P. sidoides* and its combination with *P. reniforme* showed activity. For antifungal activity against fungal pathogens of the respiratory tract were inhibited by the acetone and ethanol extracts of *P. reniforme* and ethanol extract of *P. sidoides*. Antituberculosis assay of the two species showed that the acetone, chloroform and ethanol root and shoot extracts of *P. reniforme* and its combination with *P. sidoides* inhibited *M. tuberculosis*. Our results do confirm the findings of other researchers who evaluated the antibacterial properties of root extracts of these two plants. **However, this is the first report on the investigation of root extracts of these two plants against *M. catarrhalis*, *A. niger*, *F. oxysporum*, *R. stolonifer* and *M. tuberculosis***.

The coumarins and flavonoids isolated from the roots of *P. sidoides* did not show inhibitory activity against *M. tuberculosis*. As Mycobacteria are intracellular pathogens, antimycobacterial activities reported by anecdotal evidences may be due to either direct or indirect effects. In recent studies, chemical constituents and pharmacological studies have demonstrated antibacterial and immunomodulatory activities *in vitro* (Kolodziej *et al.*, 2003). Though the compounds in our study did not show antituberculosis activity, it
can be speculated that the anecdotal evidence of tuberculosis-patients could be due to an immunostimulant. The isolated compounds from *P. sidoides* have not been investigated as yet for intracellular TB activity. It is therefore, recommended that these compounds should be analysed for intracellular activity against *M. tuberculosis* in mice and / or human macrophages.