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A review of ethnobotany, therapeutic value, phytochemistry and pharmacology of *Crinum macowanii* Baker: A highly traded bulbous plant in southern Africa

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Abstract

Ethnopharmacological relevance

Crinum macowanii is a deciduous bulbous plant which grows in east, central and southern Africa. *Crinum macowanii* has been used as herbal medicine by the indigenous people of east and southern Africa has for several centuries. The bulb, leaves and roots of *C. macowanii* are reported to possess diverse medicinal properties and used to treat or manage various human and animal diseases and ailments throughout its distributional range. *Crinum macowanii* is used traditionally as a remedy for boils, diarrhoea, fever, inflammation, respiratory system problems, skin rashes, tuberculosis, wounds and urinary tract problems.

Aim of the review

The present review aims to summarize comprehensively the research that has been done on the ethnomedicinal uses, botany, phytochemistry and pharmacology of *C. macowanii* in different locations throughout its geographical range in east, central and southern African region so as to highlight research gaps and provide a foundation for further investigations on the plant species.

Materials and methods

A review of the literature was undertaken and an in-depth analysis of previous research on ethnobotany, therapeutic value, phytochemistry and pharmacology of *C. macowanii* throughout its distributional range in east, central and southern Africa. Literature sources included papers published in international journals, reports from international, regional and national organizations, conference papers, books, theses, websites and other grey literature. Electronic search engines such as Google, Google scholar, publishing sites such as Elsevier, scienceDirect, BMC, PubMed and other scientific database sites such as ChemSpider, PubChem were used as well as searching the library collections of the National Herbarium and Botanic Gardens (SRGH), Harare, Zimbabwe and the University of Fort Hare, South Africa.

Results

A total of 32 ethnomedicinal uses of *C. macowanii* are documented in literature, which can be grouped into seven major ethnomedicinal general purpose usages, namely "fever", "wounds, sores and skin rashes", "boils and inflammation", "respiratory system problems", "blood cleansing", "urinary tract problem" and "veterinary uses". The chemical composition of *C. macowanii* is dominated by various isoquinoline alkaloids, which have been isolated from the bulbs, flowering stalks, leaves and roots. Major biological activities demonstrated by *C. macowanii* include antifungal, antiviral and antiplasmodial activities, cardiovascular effects as well as effects on the central nervous system. The population of *C. macowanii* is declining in the wild as the bulbs are over-collected for sale in medicinal (*muthi*) markets in southern Africa.

Conclusion

A literature search revealed that *C. macowanii* has a lot of potential as a possible source of pharmaceutical products for the treatment of a wide range of human and animal diseases and ailments. Some of the alkaloids isolated from *C. macowanii* have demonstrated various biological activities when

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