Bothalia 37,1: 75–77 (2007)

The concept of '*Musa-pelo* and the medicinal use of shrubby legumes (Fabaceae) in Lesotho

A. MOTEETEE*† and B-E. VAN WYK*

Keywords: adaptogen, bitter tonic, Fabaceae, immune stimulant, sedative, traditional medicine

ABSTRACT

In the Kingdom of Lesotho, 20 plant species are commonly known as '*Musa-pelo*. The term literally means 'the one who brings back or turns around the heart'. '*Musa-pelo* is traditionally used as a sedative and is given as a first aid treatment to bereaved people who are under severe psychological duress or stress. Of the 20 species known as '*Musa-pelo*, 17 belong to nine genera of the Fabaceae (*Argyrolobium*, *Crotalaria*, *Indigofera*, *Lessertia*, *Lotononis*, *Melolobium*, *Sutherlandia*, *Tephrosia* and *Trifolium*). The three remaining species namely *Cleome monophylla*, *Heliophila carnosa* and *Cysticapnos pruinosa*, belong to the families Capparaceae, Brassicaceae and Fumariaceae, respectively. In this paper, the concept of '*Musa-pelo* in traditional medicine is explored.

INTRODUCTION

The concept of '*Musa-pelo* is an important part of traditional medicine in Lesotho. '*Musa-pelo* and its cultural significance is described and explained here for the first time in a scientific context. Watt & Breyer-Brandwijk (1962) did not discuss '*Musa-pelo* in their comprehensive review of medicinal plants of southern and eastern Africa. The aim of this paper is to present and discuss the identity and uses of 20 plant species that are known as '*Musa-pelo* or that have been reported in the literature as '*Musa-pelo*.

METHODS

The study was based mainly on a literature survey and observations made by the first author on traditional practices at home and in the community; the first author has also used some of these remedies. Some traditional healers were consulted with regards to the use of *Cleome monophylla* as '*Musa-pelo*—the plant was shown to them in the field.

DISCUSSION

The concept of 'Musa-pelo

'*Musa-pelo* is used to treat fits, circulation problems, stress-related ailments and chronic illnesses (Maliehe 1997). As a traditional healer, Eric Maliehe (pers. comm.) pointed out: 'for ages and ages the Basotho have been using '*Musa-pelo* for trauma because trauma is considered to affect the heart first'. The term '*Musa-pelo* literally means 'one who brings back or turns around the heart' and according to him, it means 'bringing back health to the heart'. It is a term given to several plant species traditionally used to cure or ease a 'sore heart' or dropsy of the heart (Phillips 1917; Jacot Guillarmod 1971). In the first author's own experience, '*Musa-pelo* is administered as a sedative to bereaved people who are under severe psychological duress or stress. It is given to recently widowed women for spasms and heart disease. Most of the traditional uses point to possible sedative and/or stress-relieving activity for the plants involved.

Plants known to be used as 'Musa-pelo

Detailed information on the Sesotho names and the traditional uses (where known) of the 20 species known to be '*Musa-pelo* plants are given in Appendix 1. Authorities for the scientific names are included in Appendix 1 and will not be given elsewhere. In all, 20 plant species, including 17 belonging to the family Fabaceae are called '*Musa-pelo*. These include two species of *Argyrolobium*, one of *Crotalaria*, four of *Indigofera*, two of *Lessertia* and one of *Sutherlandia*. Three other species *Cleome monophylla* (Capparaceae), *Cysticapnos pruinosa* (Fumariaceae) and *Heliophila carnosa* (Brassicaceae), have also been listed as '*Musa-pelo*. *Heliophila carnosa* is used for auscultation (Phillips 1917); and is also known in Sesotho as *Semameloana*, meaning 'the small one who listens'. *Cysticapnos pruinosa* is used as a 'charm to comfort and drug the sorrowing' (Jacot Guillarmod 1971). Phillips (1971) recorded '*Musa-pelo* as a Sesotho name for *Cleome monophylla*, but did not provide any details of its usage. After consultation with several traditional healers in Lesotho regarding the use of *C. monophylla*, none of them could confirm that it is used as '*Musa-pelo*.

To distinguish between the 20 species with one common name, variations to the name are applied either to describe a striking feature of the plants, their size or their habitat. For example, *Melolobium alpinum* is '*Musa-pelo-o-moholo-oa-thaba* (the big mountain '*Musa-pelo*) because it is indeed an alpine species. To differentiate *Crotalaria distans*, flower colour is added to the name, i.e. '*Musa-pelo-o-mosehlanyana* (the yellowish '*Musa-pelo*). *Lotononis sericophylla* is characterized by whitish hairs and is known as '*Musa-pelo-o-mosoeu* (the white '*Musa-pelo*).

Members of the Fabaceae are well known as rich sources of nitrogen compounds. Some of the species in Appendix 1 have been investigated (summarized in Harborne 1994): *Argyrolobium lotoides* and *Melolobium*

* Department of Botany and Plant Biotechnology, University of Johannesburg, P.O. Box 524, Auckland Park 2006, Johannesburg.
† Corresponding author e-mail address: amoteetee@uj.ac.za
MS. received: 2006-08-31.

APPENDIX 1.—Medicinal plants commonly known in Sesotho as '*Musa-pelo*. Note: the word '*Musa-pelo* means 'the one who brings back the heart (*pelo*)' and since it is the base name for the Sesotho names of all these species, its meaning will not be repeated in the table. References are given in brackets, details at end of table

Taxon	Sesotho Name	Meaning	Uses
Brassicaceae			
Heliophila carnosa (Thunb.) Steud.	'*Musa-pelo-oa-mangope/ semamelo*ana (1, 2, 6)	'*Musa-pelo* of the dongas/ the small one who listens.	Unspecified parts used for auscultation to locate pain in chest complaints (1, 2, 6).
Capparaceae			
Cleome monophylla L.	'*Musa-pelo-o-monyenyane* (2)	The small (*monyenyane*; from adjective *nyane*) '*Musa-pelo*.	Details not provided (2).
Fabaceae			
Argyrolobium collinum Eckl. & Zeyh.	'*Musa-pelo-oa-matlapa* (2)	'*Musa-pelo* of the flat stones (*matlapa*).	Details not provided (2).
A. lotoides Harv.	'*Musa-pelo-o-monyenyane* (2)	The small (*monyenyane*; from adjective *nyane*) '*Musa-pelo*.	Details not provided (2).
Crotalaria distans Benth.	'*Musa-pelo-o-mosehlanyana* (2)	The yellowish (*mosehlanyana*; from adjective *tšehla*) '*Musa-pelo*.	Details not provided (2).
Indigofera dimidiata Vogel ex Walp.	'*Musa-pelo-oa-thaba* (1, 2, 4)	The mountain (*thaba*) '*Musa-pelo*.	Roots used to treat fever and neuralgia and as a sedative (1, 2, 4).
I. hedyantha Eckl. & Zeyh.	'*Musa-pelo-oa-mafika* (2, 4)	'*Musa-pelo* of the rocks.	Same as above.
I. tristis E.Mey.	'*Musa-pelo-o-monyenyane* (1, 2, 4)	The small (*monyenyane*; from adjective *nyane*) '*Musa-pelo*.	Same as above.
I. zeyheri Spreng. ex Eckl. & Zeyh.	'*Musa-pelo-o-monyenyane* (1, 2, 4)	Same as above.	Same as above.
Lessertia depressa Harv.	'*Musa-pelo* (1, 2, 4)		Infusion of above-ground parts used for heart palpitations and as sedative (4).
L. perennans (Jacq.) DC.	'*Musa-pelo-oa-liliba* (1, 2, 4)	'*Musa-pelo* of the springs (*liliba*).	Infusion of above-ground parts used for dropsy of heart (1, 4).
L. stricta L.Bolus	'*Musa-pelo-oa-matlapa-o-moholo* (1, 2, 4)	The big (*moholo*; from adjective *kholo*) '*Musa-pelo* of the flat stones.	Decoction 'drunk every day by a person who has passed through some affliction until he is better' (1). Decoction of leaves and stems used for heart palpitations and as sedative (4).
Lotononis laxa Eckl. & Zeyh.	'*Musa-pelo-oa-matlapa-o-monyenyane* (2, 4)	The small (*monyenyane*) '*Musa-pelo* of the flat stones.	Details not provided (2).
L. sericophylla Benth.	'*Musa-pelo-o-mosoeu* (1, 4)	The white (*mosoeu*; from adjective *tšoeu*) '*Musa-pelo*.	Details not provided (2).
Melolobium alpinum Eckl. & Zeyh.	'*Musa-pelo-o-moholo-oa-thaba* (1, 2)	The big (*moholo*; from adjective '*kholo*') mountain (*thaba*) '*Musa-pelo*.	Leaves used as a sedative (1, 4).
Sutherlandia montana E.Phillips & R.A.Dyer	'*Musa-pelo* (1, 2, 4)/ '*Musa-pelo-oa-nōka* (6)	'*Musa-pelo* of the river (*nōka*).	Infusion of leaves used for dropsy of heart (1) and as sedative (4).
Tephrosia capensis (Jacq.) Pers.	'*Musa-pelo* (1, 2, 4)		Decoction of roots used to ease heart palpitations (1, 2, 4). Pulverized, dried roots sniffed for headaches (5).
Trifolium africanum Ser.	'*Musa-pelo* (1 ,4)		Whole plant is infused or chewed raw for sore throat or heart trouble and as a sedative (1, 2, 3, 4, 6). Used as diuretic and sweating agent (2). Used as cure for cancer and for cleansing blood (3).
T. burchellianum Ser.	'*Musa-pelo* (1, 3, 4, 6)		Same as above.
Fumariaceae			
Cysticapnos pruinosa (Bernh.) Lidén	'*Musa-pelo-oa-nōka* (1)	'*Musa-pelo* of the river (*nōka*).	Used as a charm to comfort and drug the sorrowing (1).

1, Jacot Guillarmod (1971); 2, Phillips (1917); 3, Maliehe (1997); 4, Own experience of first author; 5, Hutchings & Van Staden (1994); 6, Schmitz (1982). Author abbreviations according to Brummitt & Powell (1992).

alpinum contain quinolizidine alkaloids (anagyrine, cytisine, leontidine and camoensine), *Lotononis sericophylla* is a source of pyrrolizidine alkaloids (integerrimine and senecionine), *Crotalaria distans* has amino acids (2,4-diaminobutanoid acid and N-γ-glutamyltyrosine), and *Trifolium* contains flavonoids (maackiain, medicarpin and vestiol). Of special interest is the closely related *Sutherlandia* and *Lessertia*, both of which contain high levels of free amino acids and canavanine (a non-protein amino acid) in the leaves (Van Wyk & Wink 2004).

Possible mode of action of 'Musa-pelo

Sedatives are drugs which depress the central nervous system. Many plants, including those of *'Musa-pelo*, are also used traditionally as sedatives. The traditional use of *Sutherlandia* species to relieve anxiety and stress is believed to be due to the presence of the amino acid gamma-aminobutyric acid (GABA), a known inhibitory neurotransmitter with mood-elevating properties (Van Wyk & Gericke 2000). It is interesting to note that Smith & Myburgh (2004) have presented evidence that *Sutherlandia* alters the corticosterone response in stressed rats.

Adaptogens are described as agents or biological substances (of plant origin) that help to increase the body's resistance to stress, whether physical, chemical or biological (Schulz *et al.* 2001). For a plant to be adaptogenic, it 'must be innocuous and cause minimal disorders in the physiological functions of an organism, it must have nonspecific action, and it usually has a normalizing action irrespective of the direction of the pathological state' (Brekhman & Dardymov 1969). Some very well-known adaptogenic plants include *Panax ginseng* (Asian ginseng), *P. quinuefolium* (American ginseng), *Eleutherococcus senticosus* (Siberian ginseng), *Rhodiola rosea* (roseroot) and *Withania somnifera* (often called Indian ginseng) (Van Wyk & Wink 2004).

Immune stimulants are substances that help increase the activity of the body's immune system but without any antigenic action against specific pathogens, whether viral or bacterial (Schulz *et al.* 2001). They are therefore similar to adaptogens in that their action is nonspecific and could be multifocal. Two well-known immune stimulant herbs are *Echinacea* spp. (coneflower) and *Viscum album* (mistletoe).

Digestive bitters (amara) are tonic herbs with a bitter taste thought to stimulate the taste buds and promote (as a reflex via the vagus nerve) the secretion of saliva, gastric juices and bile (Van Wyk & Wink 2004). The bitterness can be due to a number of chemical constituents including volatile oils, alkaloids and sesquiterpene lactones. Surprisingly, bitters also act on the cardiovascular system, decreasing the heart rate and cardiac stroke volume (Schulz *et al.* 2001). Some commonly used bitter herbs include *Gentiana lutea* (gentian), which occurs in mountains of central and southern Europe, *Centaurium erythraea* (century), primarily distributed in the Mediterranean and *Artemisia absinthium* (wormwood), native to temperate regions of Europe, Asia and northern Africa.

CONCLUSIONS

It appears to be no coincidence that of the 20 plants used as *'Musa-pelo*, 17 plant species are from the Fabaceae, a family known for its rich diversity of nitrogen compounds (Harborne 1994)—alkaloids, phenolic amines, amino acids, nonprotein amino acids and other constituents known to act on the central nervous system. The chemical composition of most *'Musa-pelo* plants and their pharmacological activities (such as possible corticomimetic and neuromodulatory effects), are not yet known, and this opens up a new area of investigation. It should be pointed out, however, that some plants belonging to certain listed genera (*Argyrolobium, Crotalaria, Indigofera* and *Lotononis*) have been reported to have indications of toxic potential (Hutchings *et al.* 1996), therefore, it is advisable that these remedies should not be taken without proper knowledge of required dosages. It is possible that *'Musa-pelo* plants have undiscovered compounds inducing adaptogenic, bitter (amarum) or neuroreceptor responses which are, individually or collectively, responsible for the sedative or mood-enhancing effects reported for these plants. Altogether there are 20 species listed as *'Musa-pelo* plants, however there is no evidence that *Cleome monophylla* is used as *'Musa-pelo* and should perhaps be excluded from the list.

ACKNOWLEDGEMENT

The University of Johannesburg is thanked for financial assistance.

REFERENCES

BREKHMAN, I.I. & DARDYMOV, I.V. 1969. New substances of plant origin which increase nonspecific resistance. *Annual Review of Pharmacology* 9: 419–430.

BRUMMITT, R.K. & POWELL, C.E. 1992. *Authors of plant names*. Royal Botanic Gardens, Kew.

HARBORNE, J.B. 1994. Phytochemistry of the Leguminosae. In F.A. Bisby, J. Buckingham & J.B. Harborne, *Phytochemical dictionary of the Leguminosae, vol. 1. Plants and their constituents*. Chapman & Hall, Cambridge.

HUTCHINGS, A., SCOTT, A.H., LEWIS, G. & BALFOUR-CUNNINGHAM, A. 1996. *Zulu medicinal plants*. University of Natal Press, Pietermaritzburg.

HUTCHINGS, A. & VAN STADEN, J. 1994. Plants used for stress-related ailments in traditional Zulu, Xhosa and Sotho medicine. Part 1: plants used for headaches. *Journal of Ethnopharmacology* 43: 89–124.

JACOT GUILLARMOD, A. 1971. *Flora of Lesotho*. Cramer, Lehre.

MALIEHE, E.B. 1997. *Medicinal plants and herbs of Lesotho*. Mafeteng Development Project, Lesotho (in Sesotho).

PHILLIPS, E.P. 1917. A contribution to the flora of the Leribe Plateau and environs. *Annals of the South African Museum* 16: 1–379.

SCHMITZ, M.O. 1982. *Wild flowers of Lesotho*. ESSA, Roma, Lesotho.

SCHULZ, V., HÄNSEL, R. & TYLER, V.E. 2001. *Rational phytotherapy, a physician's guide to herbal medicine*, edn 4. Springer, Heidelberg.

SMITH, C. & MYBURGH, K.H. 2004. Treatment with *Sutherlandia frutescens* subsp. *microphylla* alters the corticosterone response to chronic intermittent immobilization stress in rats. *South African Journal of Science* 100: 229–232.

VAN WYK, B-E. & GERICKE, N. 2000. *People's plants. A guide to the useful plants of southern Africa*. Briza Publications, Pretoria.

VAN WYK, B-E. & WINK, M. 2004. *Medicinal plants of the world*. Briza Publications, Pretoria.

WATT, J.M. & BREYER-BRANDWIJK, M.G. 1962. *The medicinal and poisonous plants of southern and eastern Africa*. Livingstone, Edinburgh.