



A narrative review of *Myrsine melanophloeos* (L.) R.Br. ex Sweet: Wild fruit species with therapeutic and nutritional relevance

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Review

Abstract

Background: Fruits of *Myrsine melanophloeos* (L.) R.Br. ex Sweet are edible and various organs of the species are used in traditional medicine. This study explores the traditional medicinal knowledge and assesses the nutritional and ethnopharmacological properties of *M. melanophloeos*.

Methods: This study is based on literature retrieved from scientific databases such as ScienceDirect, PubMed, Google Scholar, Scopus, Web of Science, SpringerLink and SciELO, as well as literature obtained from pre-electronic sources such as books, book chapters and other scientific publications obtained from the university library.

Results: This research showed that the fruit pulp of *M. melanophloeos* is a good source of energy, classic nutrients and minerals. The crude extracts of *M. melanophloeos* are used as anthelmintic, emetic, expectorant, charm and ethnoveterinary medicine, and traditional medicine against diabetes, fever, fungal infections, gastro-intestinal problems, gonorrhoea, headache, muscular pain, respiratory infections, sores and wounds. The species is characterized by alkaloids, phenolics, cardiac glycosides, phlobatannins, tannins, terpenoids, saponins and flavonoids. The crude extracts of *M. melanophloeos* bark, leaves, fruits, shoots and twigs, and phytochemical compounds isolated from the species demonstrated alpha-amylase inhibition, anthelmintic, antibacterial, antimycobacterial, antifungal, antiviral, anticancer, anti-inflammatory, anti-platelet, antioxidant, antiplasmodial, immunomodulatory, molluscicidal, tyrosinase-inhibiting and cytotoxicity activities.

Conclusions: *Myrsine melanophloeos* has potential to enhance nutrition and primary healthcare of local communities in tropical Africa. Future research involving *M. melanophloeos* should focus on detailed nutritional, phytochemical, pharmacological and toxicological evaluations of the species.

Keywords: Cape beech; *materia medica*; *Myrsine melanophloeos*; Primulaceae family; traditional ecological knowledge

Background

Myrsine melanophloeos (L.) R.Br. ex Sweet (Fig. 1), commonly known as Cape beech is a medium to large evergreen tree belonging to the primrose or Primulaceae family. The family Primulaceae consisting of about 53 genera and 2790 species (Christenhusz & Byng 2016, Xu & Chang 2017) underwent significant taxonomic revisions in the last 50 years and current circumscription includes disbanded families such as Theophrastaceae, Myrsinaceae and Maesaceae (APGIII 2009, APGIV 2016). Members of this family are annual or perennial herbs, shrubs, lianas and trees (Xu & Chang 2017). The genus *Myrsine*

L. is now more broadly circumscribed to include the former *Rapanea* Aubl. genus (Conn 2018, Jackes 2005, Ricketson & Pipoly 2013, Takeuchi & Pipoly 2009, Utteridge & Lepschi 2020) with approximately 280 species found nearly worldwide, primarily in tropical and subtropical areas (Utteridge & Lepschi 2020). *Myrsine melanophloeos* is an important medicinal plant in tropical Africa (Arnold *et al.* 2002, Bussmann *et al.* 2021, Van Staden & Lall 2020, Van Wyk *et al.*, 2022) and due to increasing demand for its bark as a source of traditional medicines, the species is often cultivated in home gardens in South Africa (Mbongwa *et al.* 2021). In the wild in South Africa, populations of *M. melanophloeos* are threatened due to harvesting for medicinal products, changes in land use, habitat loss or fragmentation (Botha *et al.* 2004, Cunningham 1988, Geldenhuys 2004, Vermeulen *et al.* 2012). The bark of *M. melanophloeos* is one of the most commonly stocked herbal medicine products in the informal herbal medicine markets in South Africa (Botha *et al.* 2001, Cocks & Dold 2004, Cunningham, 1993, Dold & Cocks 2001a, 2002, Grace *et al.* 2002, 2003a, Kepe 2007, Leaver & Cherry 2020, Marshall 1998, Rasethi *et al.*, 2019, Williams *et al.* 2000, 2001, 2013). *Myrsine melanophloeos* is reported to be of conservation concern in Tanzania (Mahunnah *et al.*, 2012) and its bark is sold as a source of traditional medicines in informal herbal medicine markets in Kenya (Lusweti *et al.* 2018, Mwaura *et al.* 2020). Evaluation of the conservation status of *M. melanophloeos* in South Africa using the IUCN Categories and Criteria Version 3.1 (<https://www.iucnredlist.org/resources/categories-and-criteria>), showed that the species is of Least Concern but its population in the country is declining due to bark harvesting for medicinal trade (Raimondo *et al.* 2009, Williams *et al.* 2016). Other associated threats being faced by *M. melanophloeos* in South Africa include tree mortality due to debarking and vulnerability of the species as a result of fungal and insect attack following bark removal (Raimondo *et al.* 2009, Williams *et al.* 2016).



Figure 1. *Myrsine melanophloeos*: A: entire plant, B: branch showing leaves and C: branch showing fruits (photos: A (A Antonia), B (BT Wursten) and C (T Taylor))

In the face of such growing threats, research shows that traditional ecological knowledge about wild food and medicinal plants like *M. melanophloeos* plays an important role in their management and utilization. Such plant species are adapted to their local natural environment and there is a rich accumulated traditional ecological knowledge about their uses and availability, rendering them culturally appropriate for adoption amongst certain user groups (Botha *et al.* 2020, De Vynck *et al.* 2016, Singels *et al.* 2016). Literature records in South Africa show that availability of wild edible plants is in decline, and this is due to the introduction of exotic plants in home gardens, historical policies, deforestation, stigma attached to consuming wild edible plants, over-harvesting, changes in lifestyles and environmental factors that are reshaping peoples' uses and traditional ecological knowledge of wild edible plants (Mothupi & Shackleton 2025). It is therefore, within this context that the current study was undertaken aimed at assessing the importance of *M. melanophloeos* as wild edible plant, its therapeutic and nutritional properties. This study was undertaken aimed at understanding how traditional ecological

knowledge and uses of *M. melanophloeos* vary across its distributional range, and also assess the nutritional and ethnopharmacological properties of the species.

Materials and Methods

A search for available information on nutritional properties, medicinal uses, biological and pharmacological properties of *M. melanophloeos* was conducted by systematically searching the scientific databases such as ScienceDirect (<https://www.sciencedirect.com/search>), PubMed (<https://pubmed.ncbi.nlm.nih.gov/>), Google Scholar (<https://scholar.google.com/>), Scopus (<http://www.scopus.com/>), Web of Science (<https://www.webofknowledge.com/>), SpringerLink (<https://link.springer.com/>) and SciELO (<https://search.scielo.org/>) and as well as pre-electronic literature sources such as book chapters, books, journal articles, dissertations, theses and other scientific publications obtained from the university library. Investigating nutritional and therapeutical properties of *M. melanophloeos* requires multidisciplinary approach and hence the need to review nutritional, medicinal uses, phytochemical, biological and pharmacological properties of the species, which is widely used as food plant, and also in traditional medicine throughout its distributional range in tropical Africa.

The keywords used in the literature search conducted from October 2025 to May 2026 included “*M. melanophloeos*”, “nutritional properties of *M. melanophloeos*”, “biological activities of *M. melanophloeos*”, “pharmacological properties of *M. melanophloeos*”, “ethnobotany of *M. melanophloeos*”, “medicinal uses of *M. melanophloeos*”, “phytochemistry of *M. melanophloeos*” and “traditional uses of *M. melanophloeos*”. The literature selection process was designed to include a wide range of scientific publications focusing on the nutritional properties, medicinal uses, phytochemical, biological and pharmacological properties of *M. melanophloeos*. In the selection process, no limitations were applied regarding the year, geographical region or country of the publication, thus allowing for a comprehensive and unrestricted assessment of the scientific articles. Literature sources excluded from this review are those articles that are partially accessed, that is, accessed as abstracts only, and also published or unpublished nutritional, phytochemical, biological or pharmacological evaluation reports and/or ethnomedicinal or ethnopharmacological surveys lacking information on medicinal uses, nutritional and ethnopharmacological properties of *M. melanophloeos* (Fig. 2). The search covered publications from 1939 to 2026, a long period to capture literature on nutritional, medicinal uses and ethnopharmacological properties of *M. melanophloeos*.

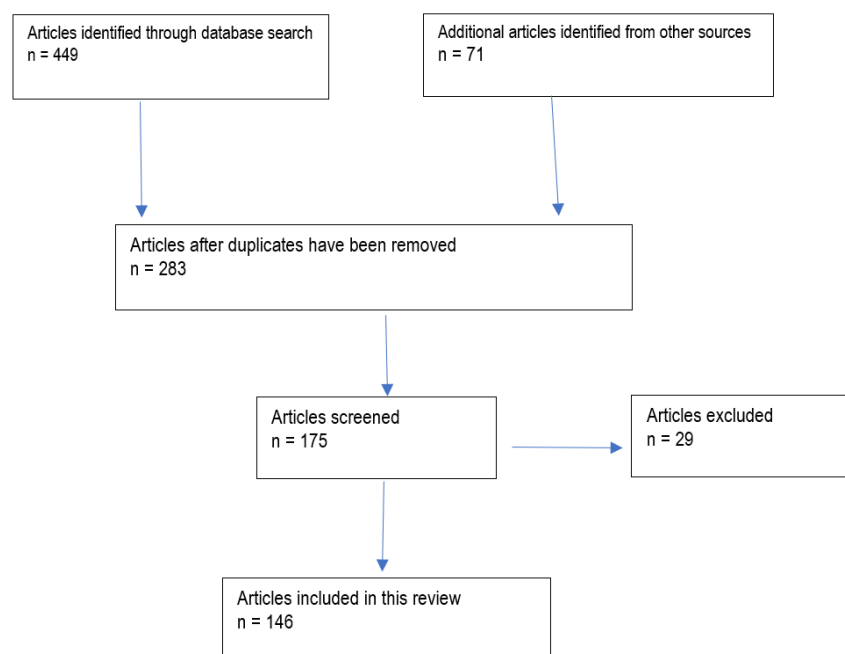


Figure 2. Flow diagram showing identification and screening of articles used in this review.

Results and Discussion

Taxonomy and species description

The genus name “*Myrsine*” is a Greek name given by Pedanius Dioscorides to the common myrtle (Palmer & Pitman 1972) and is an old classical Greek name used for the genus *Myrtus* Tourn. ex L. (Van der Walt 2005). The species name

"*melanophloeos*" is derived from the Greek words, "*melas*" and "*anos*", meaning "black" and "*phloios*" meaning "bark" (Venter 2012), and this is in reference to the species bark which is dark in colour, rough and corky, and fissured longitudinally in old trees (Schmidt *et al.* 2017, Venter & Venter 2015). The English common names of *M. melanophloeos* are "Cape beech" or "Cape beech tree", which is in reference to the wood characteristics of the species which are similar to those of the English and European beeches, but these plant groups are not related (Palmer & Pitman 1972). The synonyms of *M. melanophloeos* include *Chrysophyllum melanophloeos* (L.) Lam., *C. millerianum* Lam., *Heeria melanophloeos* (L.) Meisn., *Manglilla melanophloeos* (L.) Pers., *M. venulosa* Roem. & Schult., *Myrsine neurophylla* Gilg, *M. pentandra* (Aiton) R.Br. ex B.D.Jacks., *M. runssorica* Gilg, *M. rhododendroides* Gilg, *M. samara* R.Br. ex Sweet, *M. simensis* Hochst. ex A.DC., *M. ulugurensis* (Mez) Gilg ex Prain, *M. venulosa* Spreng., *Rapanea bequaertii* De Wild., *R. gracilior* Mildbr., *R. lamiaensis* De Wild., *R. melanophloeos* (L.) Mez, *R. neurophylla* (Gilg) Mez, *R. pulchra* Gilg & G.Schellenb., *R. rhododendroides* (Gilg) Mez, *R. runssorica* (Gilg) Mez, *R. schliebenii* Mildbr., *R. simensis* (Hochst. ex A.DC.) Mez, *R. thomensis* Exell, *R. ulugurensis* Mez, *R. umbratilis* S.Moore, *R. usambarensis* Gilg & G.Schellenb., *R. melanophloeos* (L.) Thunb., *Samara pentandra* Aiton, *Scleroxylum melanophloeum* (L.) Willd., *S. venulosum* Willd., *Sideroxylon laurifolium* Lam. and *S. melanophloeos* L. (Burrows & Willis 2005, Darbyshire *et al.* 2015, Demissew 2003, Figueiredo & Smith 2008, Germishuizen & Meyer 2003, Halliday 1984, Hutchinson & Dalziel 1963, Kupicha 1983). This high number of synonyms demonstrated by *M. melanophloeos* is probably a result of reclassification and taxonomical interest in the species (Führding-Potschkat *et al.* 2026) and/or how taxonomical knowledge about the plant group evolved over time throughout the geographical range of the species.

Myrsine melanophloeos is an evergreen tree reaching 20 metres in height (Palgrave 2002), growing into straight, much-branched, wide-spreading and shapely tree (Fig. 1A). The main stem is short and crooked to tall and upright, often fluted at base or with very small buttresses, growing up to 50 cm in diameter (Schmidt *et al.* 2017) with branches that are short and thick, rough with scars of leaves and fruit stalks (Fig. 1C). The bark is light grey to grey-brown in colour, smooth, becoming rough with age and covered in raised lenticels. The old twigs are conspicuously knobbly but the young ones are thick and soft. The leaves are simple and alternate, clustered and crowded at ends of branches (Fig. 1B), lanceolate to oblong in shape, smooth, leathery, with untoothed and in-rolled margins (Van Wyk & Van Wyk 2013). The leaves are dark green above and duller green below, minutely and inconspicuously gland-dotted with a distinct midrib on both sides and lateral veins running rather steeply upwards, apex and base broadly tapering to rounded (Fig. 1B). The petiole is usually reddish purple in colour, with a brownish secretion oozing from the broken base (Fig. 1A). The flowers are greenish-white in colour and borne in small clusters usually on leaf scars on old wood. The fruit is a round, fleshy berry turning reddish to deep purple when ripe, distinctly clustered on short stalks along old branches (Fig. 1C). *Myrsine melanophloeos* has been recorded in evergreen, Afromontane, riverine fringe, coastal, swamp and mountain forests, rocky outcrops, thickets on mountain tops, wooded ravines, bush clumps, stream banks, usually in damp areas, from sea level to 3800 m above sea level (Dharani 2019). In the wild, *M. melanophloeos* is often confused with *Sideroxylon inerme* L. (Sapotaceae family), a primarily coastal tree species (Palmer & Pitman 1972). *Myrsine melanophloeos* has been recorded in Angola, Burundi, Cameroon, South Africa, Comoros, Congo Brazzaville, Democratic Republic of Congo (DRC), Eswatini, Ethiopia, São Tomé et Príncipe, Gulf of Guinea Island, Kenya, Madagascar, Malawi, Mozambique, Nigeria, Rwanda, Sudan, South Sudan, Tanzania, Uganda, Zambia and Zimbabwe (Burrows *et al.* 2018, Da Silva *et al.* 2004, Darbyshire *et al.* 2015, Demissew 2003, Dowsett-Lemaire 1989, Drummond 1975, Figueiredo & Smith 2008, Germishuizen & Meyer 2003, Halliday 1984, Hutchinson & Dalziel 1963, Kupicha 1983, Mapaura & Timberlake 2004, Phiri 2005) (Fig. 3).

Cultural and medicinal uses of *Myrsine melanophloeos*

Myrsine melanophloeos is regarded as an important multipurpose species in tropical Africa, and used as a source of charcoal, firewood, furniture, construction material, fencing poles, animal enclosures and source of traditional medicines (Burkill 1997, Dale & Greenway 1961, Katende *et al.* 1995, Lusweti *et al.* 2018, Cuni-Sanchez *et al.* 2019, Morka & Duressa 2021, Nuro *et al.* 2024a). Its wood is pinkish brown in colour, hard, heavy, fine-grained, very attractive, polishing well and durable (Asamoah *et al.* 2012, Dharani, 2019, Schmidt *et al.* 2017, Van Wyk & Van Wyk 2013). The wood is often used for furniture, flooring, railway sleepers, carvings, veneer, plywood, cabinet work, agricultural implements, tool handles and musical instruments such as violins (Oryem-Origa *et al.* 1995, Asamoah *et al.* 2012, Dharani, 2019, Venter & Venter 2015). But in the Eastern Cape province in South Africa, it is a taboo to use *M. melanophloeos* as fuelwood or construction timber (Murata & Thondhlana 2025). It is believed that the fire made from *M. melanophloeos* causes the testicles of male family members to swell and female members to experience menstrual problems (Murata & Thondhlana 2025).

In South Africa, *M. melanophloeos* plays an important role as a stream or river bank stabilizer and often used for flood regulation and retention (Wentzel & Van Ginkel 2012). *Myrsine melanophloeos* is categorized as an important bee forage species (Adal *et al.* 2015) and its flowers attract many insect species and they, in turn, attract many insect-eating birds (Venter

& Venter 2015). Similarly, the ripe fruits of *M. melanophloeos* are eaten by birds, colobine and vervet monkeys, baboons and bushpigs (Ibrahim *et al.* 2017, Schmidt *et al.* 2017, Venter & Venter 2015). *Myrsine melanophloeos* can be successfully planted as a garden plant or ornamental tree (Asamoah *et al.* 2012, Schmidt *et al.* 2017, Venter & Venter 2015).



Figure 3. Distribution of *Myrsine melanophloeos* in tropical Africa

The bark, roots, stem bark, stems, fruits, leaves, seeds and branches of *M. melanophloeos* (Fig. 4) are widely used as sources of traditional medicines throughout the distributional range of the species. The bark (34 use reports), followed by fruits and leaves (16 use reports each) and roots (14 use reports) are the main plant parts of *M. melanophloeos* that are used to prepare traditional medicines (Fig. 4). Field studies show that plants in general usually die after bark or underground parts such as bulbs, corms, rhizomes, roots or tubers are harvested, while collection of flowers, leaves, seeds, fruits or other aerial parts are considered to be less destructive (Van Andel & Havinga 2008, Van Wyk & Prinsloo 2018).

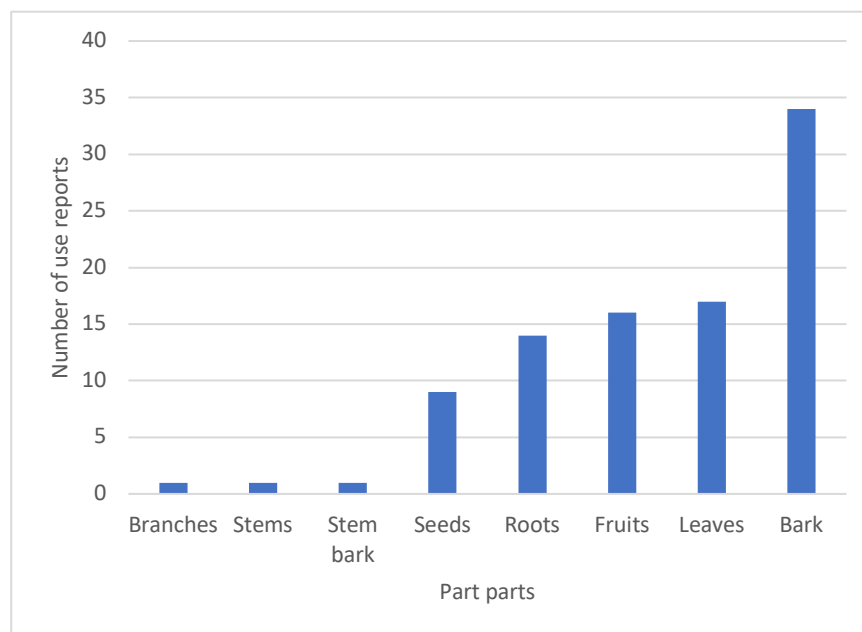


Figure 4. Plant parts of *Myrsine melanophloeos* used as sources of traditional medicines in tropical Africa

In traditional medicine, *M. melanophloeos* is associated with a wide range of medicinal applications (Tables 1 and 2), and the species is used as charm, magical or for ritual purposes. The medicinal use categories include the mono and multi-therapeutic

applications of the species against both human and animal ailments and diseases (Tables 1 and 2). The medicinal uses of *M. melanophloeos* have been recorded in Eswatini, Kenya, South Africa, Namibia, Rwanda, Ethiopia, Uganda, Zimbabwe and Tanzania, representing 39.1% of the countries where the species is indigenous. Herbal medicines prepared from *M. melanophloeos* extracts are used for treating and managing 59 human and animal diseases and ailments (Tables 1 and 2). The main ailments and diseases treated by *M. melanophloeos* extracts include its use as anthelmintic, emetic, expectorant, charm and ethnoveterinary medicine, and traditional medicine against diabetes, fever, fungal infections, gastro-intestinal problems, gonorrhoea, headache, muscular pain, pain, respiratory infections, sores and wounds (Fig. 5). *Myrsine melanophloeos* is used in different combinations with other medicinal plants in Kenya, Tanzania, Eswatini, Ethiopia and South Africa to manage both human and animal diseases or ailments (Table 2).

Table 1. Mono-therapeutic applications of *Myrsine melanophloeos*

Medicinal use	Parts	Country	Reference
Abortion	Not specified	Tanzania	Lindh 2015
Acidity	Bark	South Africa	Gerstner 1939, Grace <i>et al.</i> 2003b, Hutchings <i>et al.</i> 1996, Pujol 1990, Thomas & Grant 2013
Anthelmintic	Bark, fruits, leaves or seeds	Kenya, Namibia, South Africa and Tanzania	Adams <i>et al.</i> 2021, Amuka <i>et al.</i> 2014, Asamoah <i>et al.</i> 2012, Chinsembu & Hedimbi 2010, Clement <i>et al.</i> 2024, Dharani 2019, Glover <i>et al.</i> 1966, Kathambi <i>et al.</i> 2020, Kokwaro 2009, Lye <i>et al.</i> 2008, Mbuni <i>et al.</i> 2020, Muthee <i>et al.</i> 2011, Mwaura <i>et al.</i> 2020, Nanyingi <i>et al.</i> 2008
Anti-lice and shampoo	Bark	South Africa	Philander 2011
Arthralgia (joint pains)	Bark or seeds	Kenya	Kathambi <i>et al.</i> 2020
Astringent	Leaves	South Africa	Watt & Breyer-Brandwijk 1962, Hutchings <i>et al.</i> 1996, Thomas & Grant 2013
Blood-clotting	Leaves	South Africa	Mosa <i>et al.</i> 2011, Thomas & Grant 2013
Boils	Bark or roots	Kenya	Kamau 2020
Cancer	Roots	South Africa	Rasethe <i>et al.</i> 2019
Charm	Bark	Eswatini and South Africa	Amusan <i>et al.</i> 2005, Dold & Cocks 2005, Gerstner 1939, Grace <i>et al.</i> 2003b, Hutchings <i>et al.</i> 1996, Mosa <i>et al.</i> 2011, Palmer & Pitman 1972, Philander 2011, Pujol 1990, Schmidt <i>et al.</i> 2017, Thomas & Grant 2013, Xaba 2005, Zukulu <i>et al.</i> 2012
Cosmetic	Bark	South Africa	Dold & Cocks 2005
Detoxification	Bark or roots	Kenya	Kamau 2020
Diabetes	Bark, leaves, roots or seeds	South Africa and Tanzania	Lotter <i>et al.</i> 2017, Roman <i>et al.</i> 2026
Diuretic	Fruits	Tanzania	Clement <i>et al.</i> 2024
Emetic	Bark	Eswatini, South Africa and Tanzania	Asamoah <i>et al.</i> 2012, Grace <i>et al.</i> 2003b, Hutchings 1989, Hutchings <i>et al.</i> 1996, Loffler & Loffler 2005, Lotter <i>et al.</i> 2017, Palgrave 2002, Palmer & Pitman 1972, Philander 2011, Van Wyk <i>et al.</i> 2013, Venter & Venter 2015, Watt & Breyer-Brandwijk 1962, Zukulu <i>et al.</i> 2012
Expectorant	Bark	South Africa and Tanzania	Asamoah <i>et al.</i> 2012, Grace <i>et al.</i> 2003b, Hutchings <i>et al.</i> 1996, Lotter <i>et al.</i> 2017, Lovett <i>et al.</i> 2007, Palgrave 2002, Palmer & Pitman 1972, Philander 2011; Thomas & Grant 2013, Van Wyk <i>et al.</i> 2013, Venter & Venter 2015, Watt & Breyer-Brandwijk 1962
Fever	Bark, fruits or leaves	Kenya, Rwanda and South Africa	Asamoah <i>et al.</i> 2012, Gerstner 1939, Grace <i>et al.</i> 2003b, Hutchings <i>et al.</i> 1996, Khumalo <i>et al.</i> 2021, Lotter <i>et al.</i> 2017,

			Mwaura <i>et al.</i> 2020, Palmer & Pitman 1972, Pujol 1990, Schmidt <i>et al.</i> 2017, Thomas & Grant 2013, Uwamariya <i>et al.</i> 2025
Fungal infections	Bark, leaves, seeds or stem bark	Namibia and Tanzania	Chinsembu & Hedimbi 2010, Hamza <i>et al.</i> 2006
Gastro-intestinal problems (diarrhoea and stomachache)	Bark, fruits, leaves or roots	Ethiopia, Kenya, South Africa and Uganda	Amuka <i>et al.</i> 2014, Asamoah <i>et al.</i> 2012, Dzoyem <i>et al.</i> 2016, Gerstner 1939, Gibango <i>et al.</i> 2020, Gijan & Dalle 2019, Grace <i>et al.</i> 2003b, Hamill <i>et al.</i> 2000, Hutchings 1989, Hutchings <i>et al.</i> 1996, Khumalo <i>et al.</i> 2021, Lotter <i>et al.</i> 2017, Lye <i>et al.</i> 2008, Madikizela <i>et al.</i> 2012, Mosa <i>et al.</i> 2011, Mwaura <i>et al.</i> 2020, Nuro <i>et al.</i> 2024b, Okello <i>et al.</i> 2010, Palmer & Pitman 1972, Philander 2011, Pujol 1990, Schmidt <i>et al.</i> 2017, Sewani-Rusike & Mammen 2014, Stapelberg <i>et al.</i> 2019, Thomas & Grant 2013, Van Wyk <i>et al.</i> 2013, Watt & Breyer-Brandwijk 1962, Xaba 2005
Gonorrhoea	Fruits	Kenya and Tanzania	Clement <i>et al.</i> 2024, Muthee <i>et al.</i> 2011
Haematemesia	Bark or roots	South Africa	Grace <i>et al.</i> 2003b, Hutchings <i>et al.</i> 1996, Khumalo <i>et al.</i> 2021
Headache	Leaves	Kenya and South Africa	Sewani-Rusike & Mammen 2014, Wanjohi <i>et al.</i> 2020
Heartburn	Fruits	Kenya	Muthee <i>et al.</i> 2011
Heart problems	Bark, leaves or roots	South Africa	Dzoyem <i>et al.</i> 2016, Gerstner 1941, Gibango <i>et al.</i> 2020, Grace <i>et al.</i> 2003b, Hutchings 1989, Hutchings <i>et al.</i> 1996, Khumalo <i>et al.</i> 2021, Mosa <i>et al.</i> 2011, Palmer & Pitman 1972, Philander 2011, Pujol 1990, Schmidt <i>et al.</i> 2017, Thomas & Grant 2013, Van Wyk <i>et al.</i> 2013, Watt & Breyer-Brandwijk 1962, Xaba, 2005
Kidney problems	Fruits	Tanzania	Clement <i>et al.</i> 2024
Malaria	Bark, roots or seeds	Kenya	Kamau 2020, Kathambi <i>et al.</i> 2020
Menstrual problems	Bark or seeds	Kenya	Kigen <i>et al.</i> 2017
Mouthwash	Bark	Zimbabwe	Chinemana <i>et al.</i> 1985
Muscular pain	Bark, leaves or roots	South Africa and Uganda	Dzoyem <i>et al.</i> 2016, Gerstner 1939, Grace <i>et al.</i> 2003b, Hutchings <i>et al.</i> 1996, Khumalo <i>et al.</i> 2021, Lotter <i>et al.</i> 2017, Lye <i>et al.</i> 2008, Mosa <i>et al.</i> 2011, Philander 2011, Pujol 1990, Schmidt <i>et al.</i> 2017, Thomas & Grant 2013, Van Wyk <i>et al.</i> 2013, Watt & Breyer-Brandwijk 1962, Xaba 2005
Nausea	Leaves	South Africa	Sewani-Rusike & Mammen 2014
Nervous system disorders	Leaves or stems	South Africa	Stapelberg <i>et al.</i> 2019
Pain	Bark, fruits, leaves or seeds	Kenya and South Africa	Adams <i>et al.</i> 2021, Asamoah <i>et al.</i> 2012, Kathambi <i>et al.</i> 2020
Palpitations	Bark or roots	South Africa	Asamoah <i>et al.</i> 2012, Hutchings <i>et al.</i> 1996
Pesticides	Leaves or branches	Zimbabwe	Makaza & Mabhegedhe 2016
Purgative	Fruits or roots	Kenya	Amuka <i>et al.</i> 2014, Asamoah <i>et al.</i> 2012, Dharani 2019, Mwaura <i>et al.</i> 2020

Respiratory infections (asthma, chest pains, colds, sore throat and tuberculosis)	Bark, fruit, leaf or roots	Kenya, Rwanda and South Africa	Dzoyem <i>et al.</i> 2016, Gibango <i>et al.</i> 2020, Grace <i>et al.</i> 2003b, Hutchings 1989, Khumalo <i>et al.</i> 2021, Lall & Meyer 1999, Lotter <i>et al.</i> 2017, Mabogo 1990, Mosa <i>et al.</i> 2011, Ngari <i>et al.</i> 2010, Philander 2011, Schmidt <i>et al.</i> 2017, Semenya & Maroyi 2018, Stapelberg <i>et al.</i> 2019, Thomas & Grant 2013, Uwamariya <i>et al.</i> 2025, Venter & Venter 2015, Xaba 2005
Skin disorders	Bark or fruits	South Africa	Lotter <i>et al.</i> 2017
Skin lightener	Bark	South Africa	Grace <i>et al.</i> 2003b, Khumalo <i>et al.</i> 2021, La Cock & Briers 1992
Snakebite	Not specified	Ethiopia	Morka & Duressa 2021
Sores and wounds	Bark, fruits, leaves or roots	South Africa and Tanzania	Adams <i>et al.</i> 2021, Asamoah <i>et al.</i> 2012, Clement <i>et al.</i> 2024, Grace <i>et al.</i> 2003b, Khumalo <i>et al.</i> 2021, Mabogo 1990, Rasethe <i>et al.</i> 2019, Stapelberg <i>et al.</i> 2019, Venter & Venter 2015
Toothache	Bark	Zimbabwe	Chinemana <i>et al.</i> 1985
Wasting	Bark	Ethiopia	Nuro <i>et al.</i> 2024b
Womb problems	Roots	South Africa	Rasethe <i>et al.</i> 2019
Ethnoveterinary medicine (anthelmintic, blackleg and ectoparasites)	Fruits or seeds	Ethiopia, Kenya and South Africa	Asamoah <i>et al.</i> 2012, Beentje 1994, Cimi & Campbell 2017, Gachathi 1993, Githiori <i>et al.</i> 2003, Lotter <i>et al.</i> 2017, Midiwo <i>et al.</i> 2002, Muthee <i>et al.</i> 2011, Tadesse 2020

Table 2. Medicinal uses of *Myrsine melanophloeos* in combination with other species

Medicinal use	Other species used	Country	Reference
Anthelmintic	Fruits mixed with bark of <i>Embelia schimperi</i> Vatke	Tanzania	Clement <i>et al.</i> 2024
Anthelminthic	Seeds mixed with <i>Cenchrus americanus</i> (L.) Morrone and <i>Eleusine coracana</i> (L.) Gaertn.	Kenya	Amuka <i>et al.</i> 2014
Blood purification	Bark mixed with rhizome of <i>Pentanisia prunelloides</i> (Klotzsch ex Eckl. & Zeyh.) Walp. and bark of <i>Pterocelastrus echinatus</i> N.E.Br.	Eswatini	Lukhele <i>et al.</i> 2021
Body pains	Bark mixed with bark of <i>P. echinatus</i>	Eswatini	Amusan <i>et al.</i> 2002, Grace <i>et al.</i> 2003b
Cancer (leukemia)	Leaves mixed with those of <i>Olea capensis</i> L.	Ethiopia	Tuasha <i>et al.</i> 2018
Diarrhoea	Fruits mixed with bark of <i>E. schimperi</i>	Tanzania	Clement <i>et al.</i> 2024
Joint pains	Fruits mixed with bark of <i>E. schimperi</i>	Tanzania	Clement <i>et al.</i> 2024
Skin lightener	Bark mixed with bark of <i>Cassipourea flanaganii</i> (Schinz) Alston, <i>C. malosana</i> (Baker) Alston, <i>Sideroxylon inerme</i> L., <i>O. capensis</i> and <i>Curtisia dentata</i> (Burm.f.) C.A.Sm.	South Africa	Lukhele <i>et al.</i> 2021
Tuberculosis	Bark mixed with rhizome of <i>Allium sativum</i> L., <i>Camphora officinarum</i> Boerh. ex Fabr. and roots of <i>Daucus carota</i> L.	South Africa	Famewo <i>et al.</i> 2017a,b
Tuberculosis	Bark mixed with rhizome of <i>Centella eriantha</i> (A.Rich.) Drude, <i>Hypoxis argentea</i> Harv. ex Baker (corms), <i>Kniphofia drepanophylla</i> Baker (root), <i>P. prunelloides</i> (rhizome) and <i>Strychnos decussata</i> (Pappe) Gilg (bark)	South Africa	Famewo <i>et al.</i> 2017a,b
Ethnoveterinary medicine (heartwater)	Bark mixed with bark of <i>C. dentata</i>	South Africa	Dold & Cocks 2001b

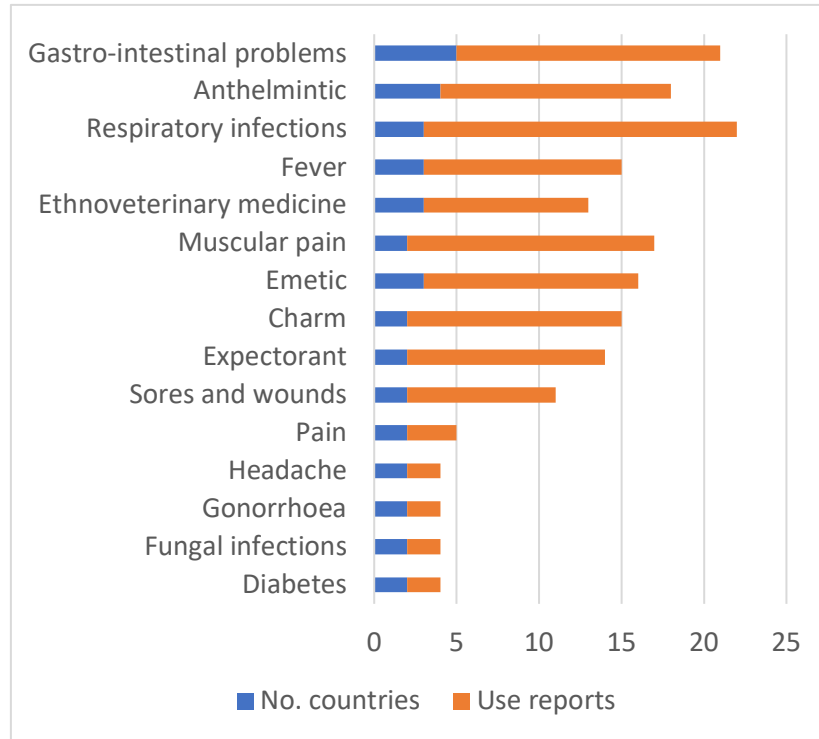


Figure 5. Main ethnomedicinal uses of *Myrsine melanophloeos* in tropical Africa

Chemical and nutritional properties of *Myrsine melanophloeos*

Several researchers such as Wehmeyer (1986), Lotter *et al.* (2017) and Lukhele *et al.* (2021) investigated the nutritional properties of *M. melanophloeos* (Tables 3-5). Analyses of the nutritional properties of the fruit pulp (Table 3) show that *M. melanophloeos* is a good source of energy, classic nutrients and minerals. *Myrsine melanophloeos* is also characterized by nutritionally important fatty acids (Table 4). The nutritional value of *M. melanophloeos* is demonstrated by the presence of essential amino acids such as histidine, leucine, isoleucine, lysine, phenylalanine, methionine, threonine, valine and tryptophan in the bark, fruits and leaves of the species (Table 5). Therefore, such nutritional properties imply that *M. melanophloeos* has potential as a food source in tropical Africa (Nuro *et al.* 2024b, Welcome & Van Wyk 2019), maintaining health and preventing diseases.

Table 3: Nutrients or elements of the fruit pulp of *Myrsine melanophloeos*

Nutrient or element	Value	Reference
Ash (g/100g)	0.9 - 1.5	Lotter <i>et al.</i> 2017, Wehmeyer 1986
Calcium (mg/kg)	48.2	Wehmeyer 1986
Carbohydrates (g/100g)	12.0	Wehmeyer 1986
Copper (mg/kg)	0.08	Wehmeyer 1986
Dry matter (%)	91.29	Lotter <i>et al.</i> 2017
Energy (kj/100g)	310.0	Wehmeyer 1986
Fat (g/100g)	2.2	Wehmeyer 1986
Fibre (g/100g)	1.6	Wehmeyer 1986
Crude fibre (%)	5.71	Lotter <i>et al.</i> 2017
Iron (mg/100 g)	2.07	Wehmeyer 1986
Magnesium (mg/kg)	19.9	Wehmeyer 1986
Moisture (g/100 g)	81.8	Wehmeyer 1986
Phosphorus (mg/100g)	12.0	Wehmeyer 1986
Potassium (mg/kg)	239.0	Wehmeyer 1986
Protein (g/100g)	1.5 - 10.5	Lotter <i>et al.</i> 2017, Wehmeyer 1986
Sodium (mg/kg)	71.7	Wehmeyer 1986
Vitamin C (mg/100 g)	12.2	Wehmeyer 1986
Zinc (mg/100 g)	0.17	Wehmeyer 1986

Table 4. Fatty acid profile of *Myrsine melanophloeos* seed oil (after Lotter *et al.* 2017)

Fatty acid	%
Arachidic acid	0.55
Behenic acid	0.69
Linoleic acid	50.43
α -Linoleic acid	50.43
Oleic acid	36.49
Palmitic acid	14.72
Stearic acid	3.02

Table 5 Amino acid profile of *Myrsine melanophloeos* (after Lukhele *et al.* 2021)

Amino acid	Concentration (mg/g)	Plant parts
Alanine	0.5 - 7.1	Bark, fruits and leaves
α -amino adipic acid	0.1 - 1.0	Bark, fruits and leaves
α -amino butyric acid	0.2	Fruits
β -amino butyric acid	0.9 - 1.0	Bark, fruits and leaves
Asparagine	4.9	Fruits
Aspartic acid	14.2	Fruits
Cystine	0.4 - 1.5	Bark, fruits and leaves
Glutamic acid	0.4 - 30.7	Bark, fruits and leaves
Glutamine	0.5 - 4.5	Bark, fruits and leaves
Glycine	2.1	Fruits
Histidine	3.1 - 3.3	Bark, fruits and leaves
Isoleucine	1.3 - 4.0	Bark, fruits and leaves
Leucine	0.5 - 1.9	Bark, fruits and leaves
Lysine	3.1 - 5.8	Bark, fruits and leaves
Methionine	0.8	Fruits
Phenylalanine	2.2 - 4.5	Bark, fruits and leaves
Proline	0.4 - 33.9	Bark, fruits and leaves
Serine	0.7 - 10.6	Bark, fruits and leaves
Threonine	0.1 - 7.2	Fruits and leaves
Tryptophan	3.9 - 10.4	Bark, fruits and leaves
Tyrosine	1.4 - 9.4	Bark, fruits and leaves
Valine	0.4 - 1.7	Bark, fruits and leaves

Several phytochemical compounds (Table 6) have been identified from the bark, fruits, leaves and seeds of *M. melanophloeos*. Mosa *et al.* (2011) isolated alkaloids, cardiac glycosides, phlobatannins, tannins, terpenoids, saponins and flavonoids from the leaves and twigs of *M. melanophloeos*. Van Staden *et al.* (2017) isolated alkaloids, cardiac glycosides, phenolics, tannins and terpenes from the leaves and twigs of *M. melanophloeos* while Lotter *et al.* (2019) isolated flavonoids, phenols and tannins from the leaves of the species. Some of these phytochemical compounds are associated with multiple beneficial biochemical effects and therefore, with potential phytotherapeutic applications. The crude extracts of *M. melanophloeos* bark, leaves, fruits, shoots and twigs, and phytochemical compounds isolated from the species demonstrated alpha-amylase inhibition, anthelmintic, antibacterial, antimycobacterial, antifungal, antiviral, anticancer, anti-inflammatory, anti-platelet, antioxidant, antiplasmodial, immunomodulatory, molluscicidal, tyrosinase-inhibiting and cytotoxicity activities.

Table 5. Major phytochemical compounds identified from *Myrsine melanophloeos*

Phytochemical compound	Plant part	Reference
α -Cardinol	Bark, fruits and leaves	Lukhele <i>et al.</i> 2021
Caryophyllene oxide	Bark, fruits and leaves	Lukhele <i>et al.</i> 2021
Embelin	Seeds	Mungai <i>et al.</i> 1997
Quercetin-3-O- α -L-rhamnopyranoside	Leaves	Mehrbod <i>et al.</i> , 2018a, 2019
(-) spathulenol	Bark, fruits and leaves	Lukhele <i>et al.</i> 2021
Sakurasosaponin	Leaves	Ohtani <i>et al.</i> 1993

Alpha-amylase inhibition activities

Lotter *et al.* (2019) evaluated the alpha-amylase inhibition activities of aqueous extract of *M. melanophloeos* leaves using the α -amylase inhibition assay. The aqueous extract demonstrated alpha-amylase inhibition activities in a dose dependent manner exhibiting half maximal inhibitory concentration (IC₅₀) value of 123.38 μ g/ml (Lotter *et al.* 2019).

Anthelmintic activities

Githiori *et al.* (2003) evaluated the anthelmintic activities of *M. melanophloeos* fruit extract against *Heligmosomoides polygyrus* infections in mice by determining the faecal egg count reduction using commercial anthelmintics pyrantel, ivermectin and piperazine as positive controls. The extract demonstrated weak anthelmintic activities (Githiori *et al.* 2003).

Antibacterial activities

Madikizela *et al.* (2012) evaluated the antibacterial activities of aqueous, dichloromethane, petroleum ether and 70% ethanol extracts of *M. melanophloeos* leaves against *Staphylococcus aureus*, *Escherichia coli* and *Shigella flexneri* using the microdilution method with neomycin and streptomycin as positive controls. The extracts demonstrated activities against the tested pathogens exhibiting minimum inhibition concentration (MIC) values ranging from 0.1 mg/ml to 6.25 mg/ml (Madikizela *et al.* 2012). Khumalo *et al.* (2021) evaluated the antibacterial activities of methanol and dichloromethane extracts of *M. melanophloeos* leaves against *Staphylococcus epidermidis*, *Moraxella catarrhalis*, *S. aureus*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* using the microdilution assay with ciprofloxacin as a positive control. The extracts showed activities against the tested pathogens exhibiting MIC values ranging from 0.25 mg/ml to 0.66 mg/ml (Khumalo *et al.* 2021). Lukhele *et al.* (2021) evaluated the antibacterial activities of ethyl acetate, methanol and petroleum ether extracts of *M. melanophloeos* bark, fruits and leaves against *Bacillus cereus*, *Enterococcus faecalis*, *S. epidermidis*, *E. coli*, *K. pneumoniae* and *P. aeruginosa* using the microdilution assay with ciprofloxacin as a positive control. The extracts demonstrated activities against the tested pathogens exhibiting MIC values ranging from 0.01 mg/ml to 3.0 mg/ml (Lukhele *et al.* 2021).

Antimycobacterial activities

Lall & Meyer (1999) evaluated the antimycobacterial activities of acetone extract of *M. melanophloeos* bark against drug-resistant (CCKO28469V) and drug-sensitive (H37Rv) strains of *Mycobacterium tuberculosis* using the agar plate method with streptomycin as a positive control. The extract demonstrated activities against the tested pathogens exhibiting MIC value of 5.0 mg/ml (Lall & Meyer 1999). Dzoyem *et al.* (2016) evaluated the antimycobacterial activities of acetone extract of *M. melanophloeos* bark against *M. tuberculosis*, *M. aurum*, *M. smegmatis* and *M. fortuitum* using a tetrazolium violet based broth microdilution method with rifampicin and isoniazid as positive controls. The extract demonstrated activities against the tested pathogens exhibiting MIC values ranging from 0.16 mg/ml to 1.3 mg/ml (Dzoyem *et al.* 2016). Gibango *et al.* (2020) evaluated the antimycobacterial activities of hexane extract of *M. melanophloeos* leaves and shoots against *M. smegmatis* using the microtitre Alamar blue assay with ciprofloxacin as a positive control. The extracts demonstrated activities against the tested pathogen exhibiting IC₅₀ value of 128.25 μ g/ml (Gibango *et al.* 2020).

Antifungal activities

Ohtani & Hostettmann (1992) and Ohtani *et al.* (1993) evaluated the antifungal activities of the phytochemical compound sakurasaponin isolated from *M. melanophloeos* leaves against *Cladosporium cucumerinum* using the thin layer chromatography (TLC) bioautography assay. The phytochemical compound demonstrated activities against the pathogen at 1.0 μ g (Ohtani & Hostettmann 1992, Ohtani *et al.* 1993).

Antiviral activities

Mehrbod *et al.* (2017, 2018b) evaluated the antiviral activities of methanol extract of *M. melanophloeos* leaves against the influenza A virus using the hemagglutination inhibition assay. The extract demonstrated activities against the tested pathogen exhibiting half maximal effective concentration (EC₅₀) value of 113.3 μ g/ml (Mehrbod *et al.* 2017, 2018b). Uwamariya *et al.* (2025) evaluated the antiviral activities of methanolic and aqueous extracts of *M. melanophloeos* leaves against respiratory syncytial virus using the plaque reduction technique with ribavirin as a positive control. The extracts demonstrated activities against the tested pathogen exhibiting EC₅₀ value of 10.8 μ g/ml (Uwamariya *et al.* 2025).

Anticancer activities

Fouché *et al.* (2006) evaluated the anticancer activities of dichloromethane extract of *M. melanophloeos* leaves against human cancer cell lines organized into subpanels representing melanoma, leukemia and cancer of the lung, ovary, kidney,

colon and central nervous system. The extract demonstrated anticancer activities exhibiting moderate growth inhibition of above 50% for two or more of the cell lines (GI_{50}) with values ranging from above zero to 1.1 $\mu\text{g/ml}$ (Fouché *et al.* 2006).

Anti-inflammatory activities

Madikizela *et al.* (2012) evaluated the anti-inflammatory activities of aqueous, dichloromethane, petroleum ether and 70% ethanol extracts of *M. melanophloeos* leaves using the cyclooxygenase inhibition bioassay (COX-1) with indomethacin as a positive control. The extracts demonstrated high anti-inflammatory activities exhibiting 70% to 100% inhibition (Madikizela *et al.* 2012).

Anti-platelet activities

Mosa *et al.* (2011) evaluated the anti-platelet activities of chloroform, hexane, ethyl acetate, aqueous and methanol extracts of *M. melanophloeos* bark using enzyme treated platelets, blood platelets, anti-platelet aggregation activity and tannin removal. The extracts exhibited a concentration dependent anti-platelet aggregation inhibitory activities (Mosa *et al.* 2011).

Antioxidant activities

Mosa *et al.* (2011) evaluated the antioxidant activities of chloroform, hexane, ethyl acetate, aqueous and methanol extracts of *M. melanophloeos* bark using 2,2'-azino-bis(3 ethylbenzothiazoline-6-sulphonic acid) (ABTS) and 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assays, reducing power and chelating activity on Fe^{2+} with ascorbic acid and butylated hydroxytoluene as positive controls. The extracts exhibited activities with IC_{50} values for ABTS, DPPH and Fe^{2+} chelating ranging from 0.93 mg/ml to >5.0 mg/ml (Mosa *et al.* 2011). Lotter *et al.* (2019) evaluated the antioxidant activities of methanolic and aqueous extracts of *M. melanophloeos* leaves using the DPPH free radical scavenging assay with ascorbic acid as a positive control. The methanolic and aqueous extracts demonstrated antioxidant activities exhibiting IC_{50} values of 2.58 $\mu\text{g/ml}$ and 11.21 $\mu\text{g/ml}$, respectively which were lower than 71.11 $\mu\text{g/ml}$ exhibited by the positive control (Lotter *et al.* 2019).

Antiplasmodial activities

Clarkson *et al.* (2004) evaluated the antiplasmodial activities of dichloromethane and methanol (1:1) extract of *M. melanophloeos* leaves and twigs against chloroquine-sensitive strain (D10) of *Plasmodium falciparum* using the parasite lactate dehydrogenase (pLDH) assay with chloroquine as a positive control. The leaf and twig extracts demonstrated activities exhibiting IC_{50} values of 44.0 $\mu\text{g/ml}$ and 40.0 $\mu\text{g/ml}$, respectively (Clarkson *et al.* 2004).

Immunomodulatory activities

Mehrbod *et al.* (2018a, 2019) evaluated the immunomodulatory activities of a glycoside flavone, quercetin-3-O- α -L-rhamnopyranoside isolated from *M. melanophloeos* leaves against influenza A virus using the hemagglutination inhibition assay. The compound demonstrated dose-dependent immunomodulatory activities (Mehrbod *et al.* 2018a, 2019).

Molluscicidal activities

Ohtani & Hostettmann (1992) and Ohtani *et al.* (1993) evaluated the molluscicidal activities of the phytochemical compound sakurasosaponin isolated from *M. melanophloeos* leaves against the schistosomiasis-transmitting snail and demonstrated activities at 3.0 ppm (Ohtani & Hostettmann 1992, Ohtani *et al.* 1993).

Tyrosinase-inhibiting activities

Stapelberg *et al.* (2019) evaluated the tyrosinase-inhibiting activities of crude extracts of *M. melanophloeos* leaves using the tyrosinase inhibition assay with kojic acid as a positive control. The extract demonstrated activities with IC_{50} value of 102.8 $\mu\text{g/ml}$, which was higher than the IC_{50} value of 6.45 $\mu\text{g/ml}$ exhibited by the positive control (Stapelberg *et al.* 2019).

Cytotoxicity activities

Dzoyem *et al.* (2016) evaluated the cytotoxicity activities of acetone extract of *M. melanophloeos* bark using the colorimetric tetrazolium based 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay on Vero monkey kidney cells with doxorubicin as a positive control. Compared to the positive control which demonstrated a median lethal concentration (LC_{50}) value of 4.5 $\mu\text{g/ml}$, the extract of *M. melanophloeos* is considered relatively safe with LC_{50} value of 271.6 $\mu\text{g/ml}$ (Dzoyem *et al.* 2016). Stapelberg *et al.* (2019) evaluated the cytotoxicity activities of crude extract of *M. melanophloeos* leaves against mouse melanocyte cells using the 2,3-bis-(2-methoxy-4-nitro 5-sulfophenyl)-2H-tetrazolium-5-carboxanilide (XTT) cell proliferation assay with actinomycin D as the positive control. Compared to the positive control which

demonstrated IC₅₀ value of 0.009 µg/ml, the extract of *M. melanophloeos* is considered relatively safe with IC₅₀ value of 79.2 µg/ml (Stapelberg *et al.* 2019).

Toxicity activities

Amenya *et al.* (2013) evaluated the toxicity activities of aqueous and chloroform extracts of *M. melanophloeos* leaves against nauplii of Brine shrimp (*Artemia salina*). The aqueous and chloroform extracts demonstrated activities and exhibited LC₅₀ value of 59.4 µg/ml and 1250.0 µg/ml, respectively, and therefore, both extracts are not toxic to brine shrimp nauplii (Amenya *et al.* 2013). Similarly, Lotter *et al.* (2019) evaluated the toxicity activities of methanolic and aqueous extracts of *M. melanophloeos* leaves against nauplii of Brine shrimp. The methanolic and aqueous extracts exhibited LC₅₀ values of 34.91 µg/ml and 168.27 µg/ml, respectively, and therefore, both extracts are not toxic to brine shrimp nauplii (Lotter *et al.* 2019).

Conclusion

Myrsine melanophloeos is best known for provision of nutritional and health benefits to local communities in tropical Africa as an important source of wild fruits and traditional medicines. Previous research by Garekai & Shackleton (2020) and Wessels *et al.* (2021) showed that wild edible foods such as *M. melanophloeos* are known to play an important role in the livelihoods of communities in rural, peri-urban and marginalized areas in terms of food and micronutrient provision, diversifying diets, reducing vulnerability to non-communicable diseases and overall health of these communities. Therefore, the dual nutritional and medicinal applications of *M. melanophloeos* throughout its distributional range have significance in the maintenance and promotion of good nutrition, health and protection against diseases in the region.

Medicinal applications of *M. melanophloeos* throughout its distributional range are quite broad, ranging from cultural uses such as charm to treatment of sores and wounds, microbial infections, other applications like muscular pain and diabetes. But it is clear that several medicinal applications of *M. melanophloeos* still require ethnopharmacological validation. There has been little progress in the identification of the active principles of the species. Therefore, any future research on *M. melanophloeos* should consolidate its medicinal applications with its phytochemistry, biological or pharmacological effects if the ethnopharmacological potential of the species is to be fully realized. Such further ethnopharmacological research should assess mechanisms of actions, clinical effectiveness and proper dosage for the documented ethnomedicinal applications and associated phytochemical and pharmacological properties. These future studies also need to focus on standardized quality, toxicology, evidence-based safety and regulatory approvals involving *M. melanophloeos* extracts and phytochemical compounds isolated from the species. The *in vitro*, *in vivo*, pre-clinical and clinical studies are the most convincing scientific methods of proving safety and efficacy of plant-based therapies and natural products involving *M. melanophloeos*. There is also need for ethnopharmacological studies examining the combinational effects of *M. melanophloeos* with other plant species such as *A. sativum*, *C. americanus*, *C. dentata*, *C. eriantha*, *C. flanaganii*, *C. malosana*, *C. officinarum*, *D. carota*, *E. coracana*, *E. schimperii*, *H. argentea*, *K. drepanophylla*, *O. capensis*, *P. echinatus*, *P. prunelloides*, *S. decussata* and *S. inermis*.

Literature studies showed that over-collection of *M. melanophloeos* bark as a source of traditional medicines in tropical Africa is a major threat to the long-term availability of the species. Given the widespread usage of *M. melanophloeos* in traditional medicine resulting in negative impacts on wild populations, this calls for substituting leaves for the bark as a conservation strategy and mechanism for sustainable utilization of the species. Literature records showed that *M. melanophloeos* is widely sold in informal herbal medicine markets, therefore, cultivation of the species should be considered as both a tool for combined species conservation, source of livelihoods and ensuring poverty alleviation via a stable commercial supply to communities in rural, peri-urban and marginalized areas in the region.

Declarations

List of abbreviations: ABTS - 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid); AJOL - African Journals Online; DPPH - 2,2-di-phenyl-1-picrylhydrazyl; DRC - Democratic Republic of Congo; EC₅₀ - half maximal effective concentration; GI₅₀ - growth inhibition of above 50% for two or more of the cell lines; IC₅₀ - half maximal inhibitory concentration; LC₅₀ - median lethal concentration; MIC - minimum inhibitory concentration; MTT - 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide; pLDH - parasite lactate dehydrogenase; TLC - thin layer chromatography; XTT - the 2,3-bis-(2-methoxy-4-nitro 5-sulfophenyl)-2H-tetrazolium-5-carboxanilide

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