Review of folklore medicinal plants used in Bobo-Dioulasso, Burkina Faso, for the treatment of hemorrhoids

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ABSTRACT

Background: Hemorrhoids are very common anorectal conditions. Its treatment ranges from dietary and lifestyle modification to radical surgery. In sub-saharan Africa, traditional medicine is a common resource for hemorrhoids management.

Objective: The aim of this study was to assess the potential efficacy and mechanism of action of plants used by Bobo-Dioulasso traditional healers as treatment for hemorrhoids.

Methods: Data were collected through semi-directive interviews among randomly selected traditional healers belonging to traditional healers' associations in Bobo-Dioulasso, Burkina Faso.

Results: Fourteen (14) plant species, belonging to 12 families were cited by traditional healers. The fidelity levels were high for *Tamarix africana* and *Trichilia emetica*, 100% and 76.5% respectively. No references to ethnomedical uses in hemorrhoids were found in the literature for 4 (28.6%) plants: *Lophira alata*, *Opilia celtidifolia, Alchemilla mollis, Tamarix africana*. Only *Khaya senegalensis* and *Parkia biglobosa* have shown anti-hemorrhoidal activity in animal models. Also, all the plants identified except *Pseudocedrela kotschyi*, (92.9%) were reported to exhibit anti-inflammatory, analgesic and antioxidant activities.

Conclusion: Although lack of human studies regarding the mentioned herbs is noted, positive results from experimental findings can be considered for new drug discovery supported by traditional experiences.

Keywords: Hamorrhoids, Traditional medicine, Bobo-Dioulasso, Traditional healers

Examen des plantes médicinales folkloriques utilisées à Bobo-Dioulasso, Burkina Faso pour le traitement des hémorroïdes

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RESUME

Contexte : Les hémorroïdes sont une affection anorectale très courante. Leurs traitements vont de l'amélioration du régime alimentaire et du mode de vie à la chirurgie radicale. En Afrique sub-saharienne, la médecine traditionnelle est une ressource commune pour traitement des hémorroïdes.

Objectifs : Le but de cette étude était d'évaluer l'efficacité et le mécanisme d'action des plantes éventuelles précédemment identifiées par notre équipe, utilisées par les tradipraticiens de Bobo-Dioulasso pour traiter les hémorroïdes.

Méthodes : Les données ont été recueillies par le biais d'entretiens semi-directifs auprès de guérisseurs traditionnels sélectionnés au hasard et appartenant à des associations de guérisseurs traditionnels à Bobo-Dioulasso, Burkina Faso.

Résultats : Nous avons identifié que 14 plantes, appartenant à 12 familles, citées par les guérisseurs traditionnels. Les niveaux de fidélité étaient élevés pour Tamarix africana et Trichilia emetica, 100% et 76,5% respectivement. Aucune référence aux utilisations ethno-médicales dans les hémorroïdes n'a été trouvée dans la littérature pour 4 (28,6%) plantes : Lophira alata, Opilia celtidifolia, Alchemilla mollis, et Tamarix africana. Seuls Khaya senegalensis et Parkia biglobosa ont montré une activité anti-hémorroïdaire sur des modèles animaux. A l'exception de Pseudocedrela Kotschyi, toutes les plantes (92,9%) présentent des activités anti-inflammatoires, analgésiques et antioxydantes ; ce qui justifie leur utilisation dans les hémorroïdes. Toutes ces plantes contiennent des flavonoïdes qui se sont avérés efficaces dans le traitement des hémorroïdes.

Conclusion : Bien qu'il n'y ait pas d'études chez l'homme des plantes mentionnées, les résultats positifs des études expérimentales peuvent être considérés pour la découverte de nouveaux médicaments.

Mots clés : hémorroïdes, médecine traditionnelle, Bobo-Dioulasso?

INTRODUCTION

Hemorrhoids are very common anorectal conditions defined as the symptomatic enlargement and distal displacement of the normal anal cushions.[1,2] They affect millions of people around the world, and represent a major medical and socioeconomic problem. The abnormal dilatation and distortion of the vascular channel, together with destructive changes in the supporting connective tissue within the anal cushion, is a paramount finding of hemorrhoidal disease. The causes of hemorrhoidal disease (HD) are unknown; though constipation and abnormal bowel habits are commonly blamed despite largely contrary evidence.[1,2]

An online survey among a national representative population of adults from Brazil, Czech Republic, France, Hungary, Italy, Romania, Russia and Spain found the prevalence to be about 11% (1725/16015); with low severity of the disease condition in most respondents (71%).[3] Self-reported incidence of hemorrhoids in the United States is 10 million per year, corresponding to 4.4% of the population. Both genders report peak incidence from ages 45 to 65 years. Notably, Caucasians are affected more frequently than African Americans, and higher socioeconomic status is associated with increased prevalence.[4]

The epidemiology is the same in sub-Saharan Africa. In Togo, hemorrhoids were the most frequent lesion of endoscopic cases (69.9%).[5] In Mali, the prevalence of hemorrhoidal disease was 36.6%, and in Nigeria, among outpatients, hemorrhoids were found in 3.7% of cases.[6]

In Burkina Faso, at the Yalgado Ouédraogo Teaching Hospital in Ouagadougou, the hemorrhoidal pathology constituted about 45.6% of anorectal disorders, 6% colonoscopies[7] and 6.1% of hepato-gastroenterology consultations.[8] At the CHU Sourô Sanou from Bobo Dioulasso, 60% of the anorectoscopies performed in one year revealed hemorrhoidal disease.[9]

Therapeutic treatment of hemorrhoids ranges from dietary and lifestyle modification to radical surgery, depending on degree and severity of symptoms.[1] Lifestyle modification should also be offered as advise to patients with any degree of hemorrhoids as a part of treatment and as a preventive measure. These changes include increasing the intake of dietary fibers and oral fluids, reducing consumption of fat, having regular exercise, improving anal hygiene, abstaining from both straining and reading in the toilet, and avoiding medications that cause constipation or diarrhoea.[1,10]

The medical treatment includes oral flavonoids and calcium dobesilate and topical treatment aiming at treating the symptoms.[1,10] In addition to medical treatment, there is non-operative management. These techniques include sclerotherapy, rubber band ligation, infrared coagulation, radiofrequency ablation and cryotherapy. When non-operative approaches have failed or complications have occurred, surgical treatment is adopted.[1,2,11]

Besides these conventional treatments, there are traditional treatments which are the most used recourse in Sub-Saharan Africa. Traditional treatments include the use of plants mainly. Studies have found evidence for the efficacy of plants flavonoids, not only in reducing pain, bleeding, anal discharge, and prolapse in acute hemorrhoidal disease, but also in preventing relapse and reducing the duration and severity of acute attacks in chronic hemorrhoids.[12-14] About 80% of African population use traditional medicine as a means of treating and managing their health issues.[15-17] This study aimed to evaluate the scientific evidence of medicinal plants used in the management of hemorrhoidal disease in Bobo-Dioulasso, Burkina Faso.

MATERIAL AND METHODS

Study area

The study was carried out in Bobo-Dioulasso. Bobo-Dioulasso is the second largest city in Burkina Faso with an estimated population of 860,426 inhabitants in 2019.[18] It is located in the Southwestern part of the country (11°10'7.31"N, 4°17'52.24"W).

Data collection

The data for this study were obtained from 1st of June to 30th of November 2018.

The traditional healers were selected randomly among members of their associations in the city of Bobo-Dioulasso. A semi directive questionnaire was administered to traditional healers in the local language to identify plants used to treat hemorrhoids. The plants names were identified by their vernacular names and confirmed by a senior botanist from the University Nazi Boni, Burkina Faso. A literature review was performed to evaluate the rationality of the usage including assessment of the part used and their pharmacological effects.

Fidelity level (FL)

Fidelity level is used for identifying the most preferred

species used for treating certain ailments by the informants. The medicinal plants that are widely used by the local people have higher FL values than those that are less popular. Fidelity level shows the percentage of informants claiming the use of a certain plant species for the same major purpose. This is designed to quantify the importance of the species for a given purpose. Before calculating the values of FL, all of the ailments that were reported are grouped into major classes.

$$Fl = \frac{Np}{N \times 100}$$

In the Fl, Np is the number of informants that reported the use of a plant species to treat a particular disease, and N is the number of informants that used the plants as a medicine to treat any given disease. It is assumed that those medicinal plants which are used in some recurring manner for the same disease category are more likely to be biologically active.[19,20]

RESULTS AND DISCUSSION

A total of Sixty-eight (68) traditional healers participated in the survey. Fourteen species were mentioned as having been used to treat hemorrhoids. The most used plants were *Trichilia emetica* (74.5% of responses) followed by Nauclea latifolia (16,2%), and *Senna sieberiana* (13,2%). The other plants are *Senna sieberiana*, *Tetrandra africana, Opilia centifolia, Alchemillia mollis, Lophira alata, Parkia biglobosa, Bridelia ferruginea, Pseudocedrela kotschyi, Khaya senegalensis*, Annona senegalensis, *Terminalia macroptera* and *Cochlospermum planchonii.*

1. *Trichilia emetica* (Meliaceae)

Trichilia emetica is an evergreen tree, native to Africa.[21,22]

Part used

In this survey, we found that the leaves, stem barks and roots of *Trichilia emetica* were used for the treatment of hemorrhoidal disease.

Ethnomedicinal use

An ethnopharmacological survey carried out in rural areas in the nearby regions of Bamako, Mali found that 6.2 % of the uses of *Trichilia emetica* was to treat hemorrhoids.[23] Also, in Mali, in Dioula District, a survey of 32 traditional healers found that aqueous extract in association with *Ximenia americana* and *Cochlospermum tinctorium* stem barks were used to treat hemorrhoids. The roots were also used either as ointment with Shea butter, or as water suspension for hemorrhoids.[24] The plant is also used for the same purpose in Cameroon.[25] *Trichilia emetica*, locally known as "Adjindjinkpizou" in Togo, is used in the treatment of hemorrhoidal diseases. The main parts used are the leaves and the roots in the form of powder, decoctions, and maceration. The concoctions are administered through oral route or by direct application on the skin or as a body bath.[26]

Ouedraogo et al. (2020) also found that in Burkina Faso, *Trichilia emetica* was used by several communities to treat hemorrhoids.[27]

Anti-hemorrhoidal activities

We fail to find a study that investigated the anti-hemorrhoidal activity of *Trichilia emetica.* However, the studies on its biological effects gave insight into its potential benefits as treatment for hemorrhoidal disease. In the seeds, leaves, stem barks and roots flavonoids were found to be the major phytoconstituents.[28-31] This can therefore explain its effects on and use as treatment for hemorrhoidal disease. In addition, the plant has antioxidant, anti-nociceptive and anti-inflammatory activities[28,29,31-33] which also support its traditional use to treat hemorrhoidal disease.

2. *Nauclea latifolia* (Rubiaceae)

The taxon *Nauclea latifolia*, commonly known as the African peach or African pincushion tree, is widely distributed through Sub-Saharan regions. This plant grows as an evergreen shrub or small tree present in wooded savannah and on the margins of tropical forests.[21,34]

Parts used

In this survey, we found that the leaves, stem barks and roots of *Nauclea latifolia* were used by Bobo-Dioulasso Traditional healers.

Ethnomedicinal use

In Sub-Saharan Africa, the roots and bark stems of *Nauclea latifolia* are pounded and/or boiled to treat haemorrhoids in Burkina Faso,[35] Nigeria[36] and Democratic Republic of the Congo.[37] The leaves are also used to treat hemorrhoidal diseases in Mali[38] and Togo.[26,39]

Anti-hemorrhoidal activities

No study has investigated its anti-hemorrhoidal activities. However, it has been reported that the plant possesses anti-inflammatory[34,40-42] and antioxidant[43-46] effects. The plant has been shown to exhibit remarkable

analgesic effects. The first analgesic activity of an extract of *N. latifolia* was reported by Okiemy-Andissa *et al*., in 2004 on acetic acid-induced writhing and hot plate mice models using aqueous and hydro-ethanolic extracts of aerial parts. Aqueous and hydro-alcoholic extracts at 800 mg/kg lowered the number of writhing movements to 32 and 28 respectively. Administration of paracetamol at 50 mg/kg resulted in 20 writhing movements while the untreated group presented with 65 writhing movements.[40,42,47] Several studies using different models have demonstrated the analgesic effects.[40-42] The active principle of an analgesic fraction of *N. latifolia* was recently identified as the known drug tramadol, reported for the first time as a natural product in 2013.[48] Marketed in 1977, tramadol exhibits about 10% of the potency of morphine and has been widely used as an analgesic for moderate to severe acute pain. Its presence in the roots of Nauclea latifolia could be associated with the traditional indication of the plant as a painkiller.

The organs from the plants, leaves especially, also contain important quantity of flavonoids, which can explain its use in hemorrhoidal disease.[38,44,49,50]

3. *Senna sieberiana* (Fabaceae)

Senna (Cassia) *sieberiana* is a shrub native to Africa. Its distribution spans across Africa including the southern part of the Sahel. Leaves, roots and pods of *Senna sieberiana* are widely used in traditional medicine.[51,52]

Parts used

In this survey, we found that the leaves, stem barks and roots of *Senna sieberiana* were used.

Ethnomedicinal use

There are very limited data about the ethnomedicinal uses of *Senna* (Cassia) *sieberiana* in hemorrhoidal disease. Burkill mentioned its use in Benin Republic's pharmacopeia to treat hemorrhoidal disease[53] and Jazy *et al*.(2018) also found that it was used in Niamey region of Niger to treat hemorrhoidal disease.[54]

Anti-hemorrhoidal activities

No study has investigated its anti-hemorrhoidal activities. However, it has been reported that the different organs of the plant exhibit anti-inflammatory[55-58] and antioxidant[59-62] effects.

The plant also has laxative and purgative effects,[63-65] and is useful for the relief of constipation. This property may be useful in hemorrhoidal disease management.

The plant (root, leaves and stem bark) are rich in flavonoids,[61,66-68] which might have potential veinotonic effects and hence, be useful in treating hemorrhoidal disease.

4. *Tamarix africana* (Tamaricaceae)

The genus Tamarix (commonly known as tamarisk, Tamaricaceae family) comprises green tree halophytes, growing to 1-18 m tall, mainly found in coastal saline soil and desert.[69,70]

Part used

In this survey, we found that the roots of *Tamarix africana* are used by traditional healers.

Ethnomedicinal use

There is no data of the ethnomedicinal use in the treatment of hemorrhoidal disease of *Tamarix africana* in African pharmacopeia.

Anti-hemorrhoidal activities

No study has investigated its direct anti-hemorrhoidal activities. However, it has been reported that *Tamarix africana* leaves and stem bark exhibit anti-inflammatory and antioxidant activities,[69-71] which contributes to managing hemorrhoidal disease. The use of *Tamarix africana* to treat hemorrhoidal disease is also justified by the presence of flavonoids.[70,72]

5. *Opilia celtidifolia* (Opiliaceae)

Opilia celtidifolia is a woody climber, spreading, heavily branched shrub or tree up to 10 m high, common in fringing forest and savanna. It is widespread in the region from Senegal to Nigeria (West Africa) and dispersed over the dried part of Tropical Africa as Burkina Faso.[53]

Part used

The survey revealed that the leaves of *Opilia celtidifolia* were used in the management of hemorrhoidal disease.

Ethnomedicinal use

There is no data of the ethnomedicinal use in the treatment of hemorrhoidal disease of *Opilia celtidifolia* in African pharmacopeia.

Anti-hemorrhoidal activities

No study has investigated its anti-hemorrhoidal activities. However, it has been reported that *Opilia celtidifolia* leaves exhibit anti-inflammatory and antioxidant activities.[73] The leaves contain polysaccharides with complement fixing and macrophage stimulation activity,[74,75] which could

regulate the inflammatory reactions in acute hemorrhoidal disease.

6. *Alchemilla mollis* (Rosaceae)

Alchemilla mollis (common name Lady's Mantle) is a herbaceous perennial plant widespread throughout temperate Europe and Asia as well as in parts of North America and grown throughout the world as an ornamental garden plant.[10,76]

Parts used

In this survey, we found that the leaves and roots of *Alchemilla mollis* were used.

Ethnomedicinal use

There is no data on the ethnomedicinal use of *Alchemilla mollis* to manage hemorrhoidal disease.

Anti-hemorrhoidal activities

No study has investigated its anti-hemorrhoidal activities. However, it has been reported that *Alchemilla mollis* leaves exhibit anti-inflammatory and antioxidant activities,[77,78,79] which contribute to managing hemorrhoidal disease. The plant's leaves are rich in flavonoids,[77-79] which could also be beneficial in the management of hemorrhoidal disease.

7. *Lophira alata* (Ochnaceae)

Lophira alata (Ochnaceae) is a tall tree widely distributed in Tropical west Africa.[80]

Parts used

The survey revealed that the stem barks and roots of *Lophira alata* were used by Bobo-Dioulasso traditional healers in the management of hemorrhoidal disease.

Ethnomedicinal use

There is no data of the ethnomedicinal use of *Lophira alata* in the management of hemorrhoidal disease.

Anti-hemorrhoidal activities

No study has investigated its anti-hemorrhoidal activities. However, it has been reported that *Lophira alata* leaves exhibit anti-inflammatory and antioxidant activities.[81-83] The use of *Lophira alata* to treat hemorrhoidal disease is also justified by the presence of flavonoids.[81,82,84]

8. *Parkia biglobosa* (Mimosaceae)

Parkia biglobosa also known as néré occurs in a belt between 5°N and 15°N, from the Atlantic coast in Senegal to southern Sudan and northern Uganda. The belt is widest in West Africa and narrows to the east [(53,85)].

Part used

The survey found that only the stem bark of *Parkia biglobosa* was used by traditional healers in Bobo-Dioulasso.

Ethnomedicinal use

The roots and stem bark are used across West Africa by traditional healers to treat hemorrhoidal disease.[26,86,87]

The stem bark combined with the stem barks from *Khaya senegalensis, Mitragyna inermis*, is used in Niger in the management of hemorrhoidal disease.[54] It's stem bark is widely used in the treatment of hemorrhoidal disease in central and western parts of Burkina Faso.[27,35,88] In addition, the leaves are boiled and used as an enema in the treatment of hemorrhoids.[35]

Anti-hemorrhoidal activities

Cletus *et al*., (2017) evaluated the anti-haemorrhoid property against Jatropha Oil-induced haemorrhoids in mice. Parkia biglobosa alone or in association with *Khaya senegalensis* and *Euphorbia hirta* presented strong anti-haemorrhoid activity.[89] Furthermore, the bark showed anti-inflammatory and analgesic properties[90] and antioxidant activities.[44,91-93]

The plant contains flavonoids,[87,93,94] which can explain its use in the management of hemorrhoidal disease.

9. *Bridelia ferruginea* (Euphorbiaceae)

The genus *Bridelia* consists of about 60 species. *Bridelia ferruginea Benth*; syn bridelia leaf, belongs to the family Euphorbiaceae, it is a subtropical medicinal plant widely used in traditional African medicine for the treatment of conditions such as rheumatic pains, headaches, gastrointestinal and urogenital disorders.[95]

Parts used

In this survey, we found that the leaves and roots of *Bridelia ferruginea* was used by Traditional healers in Bobo-Dioulasso.

Ethnomedicinal use

There is a paucity of data on its use to treat hemorrhoidal disease in African traditional medicine except for Nigeria where the Ethnobotanical survey of the plant has been reported to be used in the treatment of hemorrhoids in South-Western Nigeria. It was revealed that *Bridelia ferruginea* was used in a recipe that was to be administered orally, twice daily.[36]

Anti-hemorrhoidal activities

No study has investigated its anti-hemorrhoidal activities. However, it has been reported that *Bridelia ferruginea* exhibits anti-inflammatory and anti-oedema[96-99] and antioxidant activities,[97,100,101] which contribute to managing hemorrhoidal disease.

The use of *Bridelia ferruginea* leaves, stem bark and roots to treat hemorrhoidal disease is also justified by the presence of important quantity of flavonoids.[100,102,104]

10. *Pseudocedrela kotschyi* (Meliaceae)

Pseudocedrela kotschyi commonly called dry-zone cedar belongs to the family Meliaceae which grows in the Savannah zone in Tropical Africa from Nigeria, Senegal east to western Ethiopia and Uganda.[21]

Parts used

In this survey, we found that the leaves and roots of *Pseudocedrela kotschyi* were used by traditional healers in Bobo-Dioulasso.

Ethnomedicinal use

The plant is used in West Africa to treat hemorrhoidal disease. Nadembega reported the plant's stem bark is used in the central part of Burkina Faso in the management of hemorrhoidal disease. In different parts of Niger, the roots and stem bark[54] are used alone or in association with other plants.

Anti-hemorrhoidal activities

We failed to find any study that evaluated anti-hemorrhoidal effects of *Pseudocedrela kotschyi* leaves and roots. There are also no data supporting anti-inflammatory or analgesic effects of these parts of the plants in the literature.

While the leaves contain flavonoids,[105-107] the roots contain very little or no flavonoids.[108,109]

11. *Khaya senegalensis* (Meliaceae)

Khaya senegalensis occurs from Mauritania and East Senegal to Northern Uganda.[21,22]

Parts used

Bobo-Dioulasso traditional healers use the leaves, stem barks and roots of *Khaya senegalensis* to treat hemorrhoidal disease.

Ethnomedicinal use

Khaya senegalensis is widely used through West and Central Africa in the management of HD. It is used in the north region of Cameroon,[110] as well as in different parts of Nigeria.[36,89,111] The plant is commonly used in Togo,[26,112] Mali,[113,114] and Niger[54] for the management of hemorrhoidal disease. Nadembega et al. (2011) showed that *Khaya senegalensis* was also used in Burkina Faso to manage the symptoms of hemorrhoidal disease.[88]

Anti-hemorrhoidal activities

Khaya senegalensis possessed anti-haemorrhoid activities in Jatropha oil- induced haemorrhoids in mice. The plant, in combination with Prosopis africana and Euphorbia hirta, showed strong anti-haemorrhoid effects.[89]

Strong anti-inflammatory and analgesic activities have been reported for *Khaya senegalensis*. In vivo and in vitro models have shown anti-inflammatory activities of the stem bark.[115-119] Khayandirobilide A (KLA) extracted from *Khaya senegalensis* possessed anti-inflammatory activity, which was attributed to the inhibition of the release of LPS-stimulated inflammatory mediators via suppressing the activation of NF-?B, AP-1, and upregulating the induction of p38 MAPK/Nrf2-mediated HO-1.[115] Khapregesic, a drug developed from the stem bark of the plant has been approved for the relief of period pain in Australia.[117,120]

Different parts of the plant are reported to be rich in flavonoids.[121-124]

12. *Annona senegalensis* (Annonaceae)

Annona senegalensis, generally known as "African custard apples," is widespread throughout savannah or sub-tropical regions, across all Africa.[22,125]

Part used

In this survey, we found that the roots of *Annona senegalensis* were used.

Ethnomedicinal use

There is paucity of data on the use of *Annona senegalensis* in the management of hemorrhoidal disease. The plant has been reported in the treatment of hemorrhoidal disease in some African pharmacopeia. It is used in Kouritenga Province, Burkina Faso for the management of hemorrhoidal disease.[88] While there are no reports of its use in other parts of Burkina Faso, the plant is reportedly used in the Niger Republic by traditional healers in the management of hemorrhoidal disease.[54]

Anti-hemorrhoidal activities

No study has investigated its anti-hemorrhoidal activities. However, it has been reported that *Annona senegalensis* roots (leaves and stem bark as well) exhibit anti-inflammatory and analgesic activities.[126-130] The plant's roots possess strong antioxidant activities.[131] In addition, the plant has anti-haemorrhagic activity in rats.[132]

The use of *Annona senegalensis* to treat hemorrhoidal disease is also justified by the presence of flavonoids.[133-135]

13. *Terminalia macroptera* (Combretaceae)

Terminalia macroptera Guill. & Perr. is a tree which grows in Western Africa from Senegal to Cameroon, and occasionally as far as Sudan.[22]

Parts used

In this survey, we found that the leaves, stem bark and roots of *Terminalia macroptera* were used by traditional healers.

Ethnomedicinal use

There are some data on the ethnomedicinal use of *Terminalia macroptera* in the management of hemorrhoidal disease. The plant has been reported in the management of hemorrhoidal disease in some African pharmacopeia. It is used in Nigeria[136] and in Bamako, Mali by a few traditional healers.[137] The roots are also used by some traditional practitioners in Burkina Faso.[27]

Anti-hemorrhoidal activities

No study has investigated its direct anti-hemorrhoidal activities. However, studies showed that the plant has anti-inflammatory and analgesic activities in animal models[138,139] and complement fixation activities.[140] The plant also possesses significant antioxidant properties.[141-143]

The use of *Terminalia macroptera* to treat hemorrhoidal disease is also justified by the presence of important quantities of flavonoids.[138,139,144,145]

14. *Cochlospermum planchonii* (Bixaceae)

Cochlospermum planchonii Hook.f. is widely distributed in tropical Africa, especially in the Western Region. *Cochlospermum planchonii* contains golden-yellow flowers and the height of this plant could reach about 2.5 m in the raining season.[146,147]

Parts used

In this survey, we found that the leaves and roots of *Terminalia macroptera* were used by traditional healers.

Ethnomedicinal use

There are very few data on the use of *Cochlospermum planchonii* in African pharmacopeia. Except some disperse use in Niger, there was no record of its traditional use for this indication. The roots are used by traditional healers in Niger in decoction to be taken twice a day for four to five days.[54]

Anti-hemorrhoidal activities

No study has investigated its direct anti-hemorrhoidal activities. Nevertheless, the plant leaves and roots possess anti-inflammatory and analgesic effects in animal models.1[48-150] All parts of the shrub have also shown antioxidant, radical scavenging, and immunomodulating activities,[149,151-153] which are useful in the management of hemorrhoidal disease.

The content of flavonoids in the plant, however, is somewhat a subject of controversy. While some studies concluded that the plant has no flavonoids,[148] other studies have reported significant quantities of the plant metabolite.[152,154-157]

Family names	Botanical names	Parts	FL value %	Ethnomedical uses in HD	In vivo anti-HD	Anti-Inflammatory and analgesic	Antioxidant	Flavonoids contents	Clinical evidences
Annonaceae	*Annona senegalensis*	R	1,5	Yes	No	Yes	Yes	+	No
Bixaceae	*Cochlospermum planchonii*	L, R	4,4	Yes	No	Yes	Yes	+/-	No
Combretaceae	*Terminalia macroptera*	SB, L, R	7,4	Yes	No	Yes	Yes	+	No
Fabaceae	*Senna sieberiana*	SB, L, R	13,2	Yes	No	Yes	Yes	+	No
Meliaceae	*Trichilia emetica*	SB, L, R	76,5	Yes	No	Yes	Yes	+	No
Meliaceae	*Pseudocedrela kotschyi*	L, R	8,8	Yes	No	No	No	+/-	No
Meliaceae	*Khaya senegalensis*	SB, L, R	10,3	Yes	Yes	Yes	Yes	+	No
Mimosaceae	*Parkia biglobosa*	SB	8,8	Yes	Yes	Yes	Yes	+	No
Ochnaceae	*Lophira alata*	SB, R	5,9	No	No	Yes	Yes	+	No
Opiliaceae	*Opilia celtidifolia*	L	5,9	No	No	Yes	Yes	+	No
Phyllanthaceae	*Bridelia ferruginea*	L, R	4,4	Yes	No	Yes	Yes	+	No

CONCLUSION

The current study aimed to evidently investigate the possible mechanism underlying the treatment effect of plants traditionally reported for haemorrhoids in traditional medicine in Bobo-Dioulasso. Almost all (92.9%) of the reported plants have exhibited anti-inflammatory and analgesic effects in previous published *in vivo* and *in vitro* studies. Although lack of human studies regarding all the mentioned plants and their potential pharmacological effects is observed, results from *in vivo* and *in vitro* studies could be considered for new drug development.

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