



Isolation and Screening of Phyto-Chemicals in Traditional Herbal Drug Formulation on Arthritis

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Abstract

The traditional drug formulation is widely used on bone fracture, arthritis and muscular cramps. This drug is mainly found in the Shahuwadi region of Kolhapur district of Maharashtra. The drug formulation is prepared from barks of ten to twelve different plants, but the information about the formulation and phyto-chemicals of this drug is meagre. So it was interesting to study the parameters related to phytochemical assay and heavy metal profile of the drug solutions. Preliminary phytochemical screening was performed using standard chemical reagents. The presences of heavy metals were detected by AAS.

Keywords: Phytochemical screening, heavy metal and inorganic element analysis.

Introduction:

The regions of Shahuwadi, Gaganbawada, Radhanagari, Chandgad and Bhudhargad are regions of The Western Ghats. In the western region hirda, behda, ain, sag, kinjal, narkya, (all local names) plums, cinnamon, mangoes, jackfruits are common habitat. On the lower slopes with heavy rainfall chandan, shisav, kejal, khair, bamboo, babool are found while in region of lesser rainfall we can find bhabli, bori etc. This area also has lots of medicinal plants and herbs. The medicinal plants which are used in combination as a drug on arthritis, are widely found in the above regions of Western Ghats. Arthritis is a form of joint disorder that involves inflammation of one or more joints. There are over 100 different forms of arthritis. The most common form, osteoarthritis, is a result of trauma to the joint, infection of the joint, or age related arthritis. Other arthritis forms are rheumatoid arthritis, psoriatic arthritis, and related autoimmune diseases. Septic arthritis is caused by joint infection. The herbal drug formulation used locally for arthritis is very important. It is prepared from bark of ten to twelve different plants. Accidental injuries to bones or fracture in bone, arthritis and muscular cramps are cured by this formulation. The drug formulation is packed in leaves of Kubha plant. About 500 to 600 gm bark in each packet called Muthala. Its grinded powder is soaked for 24 hour in water and filtered extract is used as medicine. Local tribes from this hilly region avoid going to hospital and they use this traditional herbal medicines. Preliminary phytochemical screening of this formulation is primarily an important aspect in finding the chemical constituents in plant materials used in this traditional herbal drug. Hence the present

study is undertaken. The qualitative analysis regarding phytochemicals and quantitative estimation of heavy metals were carried out.

Materials and Methods

The fresh formulation was collected from Malakapur village, Kolhapur district, Maharashtra. The collected plant material was air-dried and ground into uniform powder using a grinding machine. The aqueous extract of sample was prepared by soaking 100 g of dried powdered samples in 500 ml of distilled water for 24 hour. The extracts were filtered using ordinary filter paper. The methanol extract of sample was prepared by soaking 50 gm dried powdered sample in 400 ml 50% methanol for 24 h and hydrochloric acid extract is also prepared by the same method. For heavy metal detection water extract and HCl extract were filtered with Whatman paper no 42 by Buchner funnel and used for AAS (Perkin Elmer U.S.A)



Fig 1 traditional ayurvedic formulation.

Preliminary Phytochemical Screening

Phytochemical test were carried out adopting standard procedure (Trease et.al 1983, Kokate et.al 1997, Hegde et.al 2010).

The successive hydrochloric acid, methanol and water extracts of formulation were screened for the presence of different phyto constituents like carbohydrates, protein, alkaloids, sterols, phenols and tannins, saponins, flavonoids, quinones, flavonones, fatty acid and amino acids etc.

Table 1. Phyto-chemical Assay

Sr.No	Phytochemicals	Aqueous Extract	Methanolic Extract	Hydrochloric acid Extract
1	Steroids	-	+	-
2	Tannin			
	Gelatin Test	+	+	-
	Ferric chloride	-	-	+



3	Saponin			
	Foam test	+	-	+
	Honey comb test	+	+	-
4	flavanone	+	+	-
5	Coumarins	-	+	+
6	phenolics	+	+	-
7	Alkaloids			
	Wagner Test	+	+	+
	Hager Test	+	-	+
8	Amino acids			
	Ninhydrin Test	-	-	-
	Lead acetate test	+	+	+
9	Carbohydrate			
	Molisch's test	-	-	-
	Benedict's test	+	-	+
	Barfoed test	+	+	-
	Iodine Test	-	-	-
10	Flavonoids			
	Alkaline reagent test	-	+	-
	Mg turning test	-	+	+
	Zn Test	-	-	-
11	Protein			
	Xanthoprotic test	+	-	+
	Biurete test	+	-	+
	Millions test	+	-	+
12	Quinones	+	+	-
13	Triterpenoids	+	+	-
14	Betacyanin	+	-	-
15	Fatty acid	+	+	+
16	Vitamin -c	+	+	+
17	Lignin	+	-	-



18	Fixed oil and fat	-	+	+
19	Chalcones	-	+	-
20	Sterols	-	+	-

Table 2. Heavy Metal Detection:

Element	Water extract(mg/L)	HCL Extract(mg/L)	Element	Water extract(mg/L)	HCL Extract(mg/L)
Cu	0.095	0.499	Pb	Absent	0.075
Fe	3.996	6.260	Ni	0.055	0.114
Mn	0.423	1.404	Co	Absent	0.11
Zn	1.546	1.746	Mg	0.203	0.274
Cr	0.122	0.087	Ca	2806.0	1098
Cd	Absent	Absent	Pb	Absent	0.075

Result And Discussion

In the present investigation twenty phytochemicals and eleven metals was isolated from the extract of formulation. These results were useful for determination of quantitative analysis of particular secondary metabolites and heavy metals from the extract of formulation. Standardization is an important means for herbal drugs in order to ascertain their identity, purity, safety and quality. Heavy metal analysis discloses the safety of herbal drugs. Preliminary phytochemical screening provides information about the presence of the phyto-constituents in the extracts. Such simple but reliable standards are valuable to implement the drug as a home remedy. The above analytical study of this formulation shows that, the drug contained safe levels of the heavy metals and hence may have no adverse effects. Presence of high concentration Ca supports the effectiveness of drug. The phytochemicals such as carbohydrates, proteins, alkaloids, sterols, phenols and tannins, saponins, flavonoids, quinones, flavonones, fatty acid and amino acids present in formulation also enhance the activity of the drug against arthritis .

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