ABOUT JPP

The Journal of Pharmacognosy and Phytotherapy (JPP) is published monthly (one volume per year) by Academic Journals.

The Journal of Pharmacognosy and Phytotherapy (JPP) is an open access journal that provides rapid publication (monthly) of articles in all areas of the subject such as ethnobotany, phytochemistry, ethnopharmacology, zoopharmacognosy, medical anthropology etc.

The Journal welcomes the submission of manuscripts that meet the general criteria of significance and scientific excellence. Papers will be published shortly after acceptance. All articles published in JPP are peer-reviewed.

Submission of Manuscript

Submit manuscripts as e-mail attachment to the Editorial Office at: jpp@academicjournals.org. A manuscript number will be mailed to the corresponding author shortly after submission.

The Journal of Pharmacognosy and Phytotherapy (JPP) will only accept manuscripts submitted as e-mail attachments.

Please read the Instructions for Authors before submitting your manuscript. The manuscript files should be given the last name of the first author.
Editors

Dr. (Mrs) Banasri Hazra  
Research Scientist (U.G.C.)  
Department of Pharmaceutical Technology  
Jadavpur University  
Calcutta - 700032  
India

Dr. Yuanxiong Deng  
Dept of Pharmaceutical Science  
School of Medicine  
Hunan Normal University  
Tongzipo Road 371, Changsha 410013,  
Hunan China

Prof. Maha Aboul Ela  
Beirut Arab University, Faculty of Pharmacy, Beirut  
Campus

Dr. S. RAJESWARA REDDY  
Assistant Professor, Division of Animal Biotechnology  
Department of Biotechnology, School of Herbal Studies and Naturo Sciences,  
Dravidian University, Kuppam – 517 425, A.P.  
India

Dr. Mekhfi Hassane  
University Mohammed the First, Faculty of Sciences,  
Department of biology, Oujda, Morocco  
Morocco

Dr. Ilkay Erdogan Orhan  
Faculty of Pharmacy, Gazi University,  
Ankara, Turkey  
Turkey

Dr. Arun Kumar Tripathi  
Central Institute of Medicinal and Aromatic Plants  
P.O. CIMAP, LUCKNOW-226015,  
India

Dr. Wesley Lyeverton Correia Ribeiro  
Universidade Estadual do Ceará, Faculdade de Veterinária/Laboratório de Doenças  
Parasitárias Av. Paranjana, 1700  
Itaperi - Fortaleza  
60740-903, CE - Brazil

Dr. Maryam Sarwat  
C/O A.M. Khan, House No. 195

Dr. Yong-Jiang Xu  
Saw Swee Hock School of Public Health,  
National University of Singapore, Singapore.

Prof. Dr. Adeolu Alex Adedapo  
Department of Veterinary Physiology,  
Biochemistry and Pharmacology  
University of Ibadan, Nigeria

Dr. Joana S. Amaral  
Campus de Sta Apolónia,  
Ap. 1134, 5301-857 Bragança,  
Portugal

Dr. Asad Ullah Khan  
Interdisciplinary Biotechnology UNIT  
Aligarh Muslim University,  
India

Dr. Sunday Ene-ojo Atawodi  
Biochemistry Department  
Ahmadu Bello University  
Zaria, Nigeria

Prof. Fukai Bao  
Department of Microbiology and Immunology,  
Kunming Medical College  
China

Dr. Bhaskar C Behera  
Agharkar Research Institute  
Dept. of Science &Technology,  
Plant Science Division  
India

Prof. R. Balakrishna Bhat  
Walter Sisulu University  
Department of Botany  
Mthatha, South Africa

Dr. Mohammad Nazrul Islam Bhuiyan  
BCSIR Laboratories;  
Chittagong cantonment;  
Chittagong-4220;  
Bangladesh
Dr. Baojun Bruce Xu  
Beijing Normal University-Hong Kong Baptist University United International College Zhuhai, Guangdong Province, China

Dr. Hamad H. Issa  
Department of Physical Sciences, School of natural Sciences, The University of Dodoma, Tanzania

Dr. Gagan Deep  
Department of Pharmaceutical Sciences School of Pharmacy, University of Colorado Denver, Colorado, USA

Dr. Fengguo Xu  
Dept of Epidemiology and Public Health, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Dr. Haitao Lv  
Medicine and Endocrinology, Albert Einstein College of Medicine, Yeshiva University, USA

Hassane MEKHFI  
University Mohammed the First, Faculty of Sciences, Department of biology, Laboratory of Physiology and Ethnopharmacology, Morocco

Dr. Subhash C. Mandal  
Division of Pharmacognosy Pharmacognosy and Phytotherapy Research Laboratory, Department of Pharmaceutical Technology, Jadavpur University, India.

Dr. Adibe Maxwell Ogochukwu  
Clinical Pharmacy and Pharmacy Management, Faculty of Pharmaceutical Sciences, University of Nigeria, Nsukka Enugu state, Nigeria.

Dr. Odukoya, Olukemi Abiodun  
Department of Pharmacognosy, Faculty of Pharmacy University of Lagos. Nigeria.

Dr. Qinxue Richard Ding  
Medical Center at Stanford University, Palo Alto, USA

Dr. Sulejman Redžić  
Faculty of Science of the University of Sarajevo 33-35 Zmaja od Bosne St., Sarajevo, Bosnia and Herzegovina

Dr. Michal Tomczyk  
Medical University of Bialystok, Faculty of Pharmacy, Department of Pharmacognosy, Poland

Dr. Ugur Çakiliçoglu  
Firat University, Faculty of Science and Arts, Department of Biology, Elazig Turkey

Prof. Samson Sibanda  
National University of Science and Technology Cnr Gwanda Road/Cecil Avenue, Ascot, Bulawayo, Zimbabwe
Electronic submission of manuscripts is strongly encouraged, provided that the text, tables, and figures are included in a single Microsoft Word file (preferably in Arial font).

The cover letter should include the corresponding author's full address and telephone/fax numbers and should be in an e-mail message sent to the Editor, with the file, whose name should begin with the first author's surname, as an attachment.

Article Types
Three types of manuscripts may be submitted:

Regular articles: These should describe new and carefully confirmed findings, and experimental procedures should be given in sufficient detail for others to verify the work. The length of a full paper should be the minimum required to describe and interpret the work clearly.

Short Communications: A Short Communication is suitable for recording the results of complete small investigations or giving details of new models or hypotheses, innovative methods, techniques or apparatus. The style of main sections need not conform to that of full-length papers. Short communications are 2 to 4 printed pages (about 6 to 12 manuscript pages) in length.

Reviews: Submissions of reviews and perspectives covering topics of current interest are welcome and encouraged. Reviews should be concise and no longer than 4-6 printed pages (about 12 to 18 manuscript pages). Reviews are also peer-reviewed.

Review Process
All manuscripts are reviewed by an editor and members of the Editorial Board or qualified outside reviewers. Authors cannot nominate reviewers. Only reviewers randomly selected from our database with specialization in the subject area will be contacted to evaluate the manuscripts. The process will be blind review. Decisions will be made as rapidly as possible, and the journal strives to return reviewers' comments to authors as fast as possible. The editorial board will re-review manuscripts that are accepted pending revision. It is the goal of the JPP to publish manuscripts within weeks after submission.

Regular articles
All portions of the manuscript must be typed double-spaced and all pages numbered starting from the title page.

The Title should be a brief phrase describing the contents of the paper. The Title Page should include the authors' full names and affiliations, the name of the corresponding author along with phone, fax and E-mail information. Present addresses of authors should appear as a footnote.

The Abstract should be informative and completely self-explanatory, briefly present the topic, state the scope of the experiments, indicate significant data, and point out major findings and conclusions. The Abstract should be 100 to 200 words in length. Complete sentences, active verbs, and the third person should be used, and the abstract should be written in the past tense. Standard nomenclature should be used and abbreviations should be avoided. No literature should be cited.

Following the abstract, about 3 to 10 key words that will provide indexing references should be listed.

A list of non-standard Abbreviations should be added. In general, non-standard abbreviations should be used only when the full term is very long and used often. Each abbreviation should be spelled out and introduced in parentheses the first time it is used in the text. Only recommended SI units should be used. Authors should use the solidus presentation (mg/ml). Standard abbreviations (such as ATP and DNA) need not be defined.

The Introduction should provide a clear statement of the problem, the relevant literature on the subject, and the proposed approach or solution. It should be understandable to colleagues from a broad range of scientific disciplines.

Materials and methods should be complete enough to allow experiments to be reproduced. However, only truly new procedures should be described in detail; previously published procedures should be cited, and important modifications of published procedures should be mentioned briefly. Capitalize trade names and include the manufacturer's name and address. Subheadings should be used. Methods in general use need not be described in detail.
Results should be presented with clarity and precision. The results should be written in the past tense when describing findings in the authors’ experiments. Previously published findings should be written in the present tense. Results should be explained, but largely without referring to the literature. Discussion, speculation and detailed interpretation of data should not be included in the Results but should be put into the Discussion section.

The Discussion should interpret the findings in view of the results obtained in this and in past studies on this topic. State the conclusions in a few sentences at the end of the paper. The Results and Discussion sections can include subheadings, and when appropriate, both sections can be combined.

The Acknowledgments of people, grants, funds, etc should be brief.

Tables should be kept to a minimum and be designed to be as simple as possible. Tables are to be typed double-spaced throughout, including headings and footnotes. Each table should be on a separate page, numbered consecutively in Arabic numerals and supplied with a heading and a legend. Tables should be self-explanatory without reference to the text. The details of the methods used in the experiments should preferably be described in the legend instead of in the text. The same data should not be presented in both table and graph form or repeated in the text.

Figure legends should be typed in numerical order on a separate sheet. Graphics should be prepared using applications capable of generating high resolution GIF, TIFF, JPEG or Powerpoint before pasting in the Microsoft Word manuscript file. Tables should be prepared in Microsoft Word. Use Arabic numerals to designate figures and upper case letters for their parts (Figure 1). Begin each legend with a title and include sufficient description so that the figure is understandable without reading the text of the manuscript. Information given in legends should not be repeated in the text.

References: In the text, a reference identified by means of an author’s name should be followed by the date of the reference in parentheses. When there are more than two authors, only the first author’s name should be mentioned, followed by ‘et al’. In the event that an author cited has had two or more works published during the same year, the reference, both in the text and in the reference list, should be identified by a lower case letter like ‘a’ and ‘b’ after the date to distinguish the works.

Examples:

Cole (2000), Steddy et al. (2003), (Kelebeni, 1983), (Bane and Jake, 1992), (Chege, 1998; Cohen, 1987a,b; Tristan, 1993,1995), (Kumasi et al., 2001)

References should be listed at the end of the paper in alphabetical order. Articles in preparation or articles submitted for publication, unpublished observations, personal communications, etc. should not be included in the reference list but should only be mentioned in the article text (e.g., A. Kingori, University of Nairobi, Kenya, personal communication). Journal names are abbreviated according to Chemical Abstracts. Authors are fully responsible for the accuracy of the references.

Examples:


Short Communications

Short Communications are limited to a maximum of two figures and one table. They should present a complete study that is more limited in scope than is found in full-length papers. The items of manuscript preparation listed above apply to Short Communications with the following differences:

(1) Abstracts are limited to 100 words; (2) instead of a separate Materials and Methods section, experimental procedures may be incorporated into Figure Legends and Table footnotes; (3) Results and Discussion should be combined into a single section.

Proofs and Reprints: Electronic proofs will be sent (e-mail attachment) to the corresponding author as a PDF file. Page proofs are considered to be the final version of the manuscript. With the exception of typographical or minor clerical errors, no changes will be made in the manuscript at the proof stage.
**Fees and Charges:** Authors are required to pay a $550 handling fee. Publication of an article in the Journal of Pharmacognosy and Phytotherapy (JPP) is not contingent upon the author's ability to pay the charges. Neither is acceptance to pay the handling fee a guarantee that the paper will be accepted for publication. Authors may still request (in advance) that the editorial office waive some of the handling fee under special circumstances.

**Copyright:** © 2013, Academic Journals.
All rights Reserved. In accessing this journal, you agree that you will access the contents for your own personal use but not for any commercial use. Any use and or copies of this Journal in whole or in part must include the customary bibliographic citation, including author attribution, date and article title.

Submission of a manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, or thesis) that it is not under consideration for publication elsewhere; that if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the publisher.

**Disclaimer of Warranties**

In no event shall Academic Journals be liable for any special, incidental, indirect, or consequential damages of any kind arising out of or in connection with the use of the articles or other material derived from the JPP, whether or not advised of the possibility of damage, and on any theory of liability.

This publication is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement. Descriptions of, or references to, products or publications does not imply endorsement of that product or publication. While every effort is made by Academic Journals to see that no inaccurate or misleading data, opinion or statements appear in this publication, they wish to make it clear that the data and opinions appearing in the articles and advertisements herein are the responsibility of the contributor or advertiser concerned. Academic Journals makes no warranty of any kind, either express or implied, regarding the quality, accuracy, availability, or validity of the data or information in this publication or of any other publication to which it may be linked.
ARTICLE

Research Article

Pharmacological studies of methanolic extracts of *Sonchus arvensis* from Kathmandu

Bhupendra Kumar Poudel, Jagnnath Prasad Sah, Shyam Raj Subedi, Mohan Prasad Amatya, Sadhana Amatya and Tirtha Maiya Shrestha
Pharmacological studies of methanolic extracts of *Sonchus arvensis* from Kathmandu

Bhupendra Kumar Poudel*, Jagannath Prasad Sah, Shyam Raj Subedi, Mohan Prasad Amatya, Sadhana Amatya and Tirtha Maiya Shrestha

Institute of Medicine, Tribhuvan University, Nepal.

Received 5 August, 2015; Accepted 17 November, 2015

*Sonchus arvensis*, a perennial sowthistle, is a common but underutilized species of Kathmandu, Nepal. Several uses like sedative, antioxidant and kidney stone eradicating properties have been identified till date, but study on other pharmacological activities is not yet explored. Therefore, this plant was collected from Kathmandu; aerial parts of the plant were dried, crushed, and extracted using a Soxhlet apparatus. The methanolic extract was then concentrated for screening pharmacological effects. While comparing with the standards, the plant was found to possess strong anti-inflammatory activity and inhibitory effect in Gastro Intestinal (GI) motility and locomotor activity in a dose-dependent fashion. The plant, however, did not show skeletal muscle relaxant activity as observed in the traction test and inclined plane test. Thus, it is concluded that the plant possess strong phyto-chemicals having anti-inflammatory activity and inhibitory effect in locomotion and GI motility.

**Key words:** *Sonchus*, anti-inflammatory, motility, locomotion, extraction.

**INTRODUCTION**

In Nepal, the concept of ethno-medicine has developed since the late 19th century (1885-1901 A.D). The first book "Chandra-Nighantu regarding medical plants was published by the Royal Nepal Academy in 1969. Majority of the population is still dependent on botanical medicines which indicates the importance of herbal medicines in the primary health care (Rajbhandari et al., 2001; Amatya et al., 2009). *Sonchus arvensis*, a vigorous herbaceous perennial plant with milky sap and creeping roots is abundantly available in 1000 to 4100 m in range and grows in sandy, loamy or clayey soils (Holm et al. 1997). In many areas, this sowthistle is considered a noxious weed, as it grows quickly in a wide range of conditions and its wind-borne seeds allow them to spread rapidly (APNI, 2012). Since, this plant is least explored and there are only few pharmacological studies, this study is done to lay a strong foundation for the future development of herbal medicines from this plant's methanolic extract.

**MATERIALS AND METHODS**

Sample preparation

Samples of the plant were collected from Nagarjun Hill, Kathmandu, Nepal; the aerial parts were dried, crushed, and extracted using a
**RESULTS AND DISCUSSION**

The extractive value for methanol extract was higher than for other extracts; and hence was used for pharmacological screening. Similar higher percentage yield was found for methanolic extract of *S. arvensis* than with other fractions (Ali 2012).

In this study, the extract decreased propulsion of the charcoal meal through the gastrointestinal tract of mice dose dependently when compared with the control group. The 500 mg/kg; intraperitoneal (i.p) methanol and 5 mg/kg; ip atropine had comparable inhibitory activity in intestinal motility (Figure 1). This reduction in gastrointestinal motility by methanol extract of *S. arvensis* may be due to antisecretory effects. The numerous phytochemicals like tannins, polyphenolic compounds, flavonoids, quercetin and other chemical compounds may be speculated for antimotility effect (Ezekwesili et al., 2010). Hence, this activity of the plant may be useful in treatment of diarrhoea as an antimotility agent.

Similarly, methanol extract significantly inhibited locomotor activity on mice in dose dependent fashion indicating antidepressant property (Figure 2). Therefore, a standardized *S. arvensis* extract or its purified constituents could be of potential interest for the GI motility disorders.

The traction test and inclined plane test revealed that the methanol extract didn’t possess skeletal muscle relaxant activity (Table 1 and 2).
Further, methanol extract inhibited carrageenan induced acute paw oedema in dose dependent manner indicating anti-inflammatory activity. 400 mg/kg; ip methanol extract had higher anti-inflammatory activity than 10 mg/kg; ip diclofenac (Figure 3). Carrageenan releases prostaglandins (Winter et al., 1962) and inflammation occurs because of a proteolytic process with formation of kinin-like mediator(s) (Rosa and Sorrentino 1968).

*S. arvensis* contains various compounds palmitic acid, β-sitosterol, daucosterol, quercetin, apigenin-7-O-β-glucopyranoside, luteolin-7-O-β-D-glucopyranoside, quercetin-3-O-β-D-glucopyranoside and rutin (Jiang et al. 2009) which might have produced above pharmacological effects. However, further studies are required to isolate the major bioactive constituents and to verify the findings.

**Conclusions**

This study revealed significant anti-inflammatory, inhibitory effect on both gastrointestinal and locomotor activity. The study, however, revealed no skeletal muscle activity. It may, therefore, be concluded from this study that the plant possessed constituents that revealed the
Table 1. Effect of methanol extract of on skeletal muscle of mice by traction test.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dose (mg/kg; ip)</th>
<th>No. of mice failed to grasp the wire</th>
<th>Failure (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Methanol extract</td>
<td>125</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Methanol extract</td>
<td>250</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Methanol extract</td>
<td>500</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Diazepam</td>
<td>5</td>
<td>4</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2. Effect of methanol extract on skeletal muscle of mice by inclined plane test.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dose (mg/kg; ip)</th>
<th>Animal falling after treatment</th>
<th>Failure (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Methanol extract</td>
<td>125</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Methanol extract</td>
<td>250</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Methanol extract</td>
<td>500</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Standard (Diazepam)</td>
<td>5</td>
<td>4</td>
<td>100%</td>
</tr>
</tbody>
</table>

Figure 3. Effect of methanol extract on anti-inflammatory activity.

above pharmacological properties which may generate lead molecules for development of newer drugs. However, to reach any conclusive decision, a detailed phytochemical study for isolation, purification, identification, and characterization of the compound and biological studies with exact mechanism of action responsible for the particular activity, is necessary. Hence, further scientific investigation and specific studies are highly recommended for better evaluation of the potential effectiveness of the plant.

ACKNOWLEDGEMENT

The authors are thankful to Department of Pharmacy, Institute of Medicine, Tribhuvan University for providing laboratory and laboratory materials to conduct experiments.

Conflict of Interests

The authors have not declared any conflict of interest.

REFERENCES


Related Journals Published by Academic Journals

- African Journal of Pharmacy and Pharmacology
- Research in Pharmaceutical Biotechnology
- Medical Practice and Reviews
- Journal of Clinical Pathology and Forensic Medicine
- Journal of Medicinal Plant Research
- Journal of Drug Discovery and Development
- Journal of Clinical Virology Research