iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 **Issue:** XII **Month of publication:** December 2021

DOI: https://doi.org/10.22214/ijraset.2021.39666

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 9 Issue XII Dec 2021- Available at www.ijraset.com

Antibacterial and Antifungal Activities of *Rumex Confertus* Willd

G. D. Shermatova[1], Zhang Ying-Jun[2], Khakhramon Davranov[3]
[1]*Junior researcher of the laboratory of the chemistry of terpenoids and phenolic compounds acad. S. Yu. Yunusov Institute of the Chemistry of Plant Substances, Uzbekistan, Tashkent*
2Dr., Professor, Head of the State Key Laboratory of Phytochemistry and Plant Resources in West China, Kunming Institute of Botany, Chinese Academy of Sciences, China, Kunming
3Dr. Professor, Director of the Institute of Microbiology, the AS of Uzbekistan, Tashkent, Uzbekistan

Abstract: ***The leaves and roots of Rumex confertus Willd were tested in vitro for antibacterial and fungal activity in the fractions of gasoline, chloroform, ethyl acetate and butanol. As a result, it was found that the leaves of the Rumex confertus Willd plant, chloroform and ethyl acetate fractions of the root part have antibacterial activity against fungi and gram-positive bacteria.***
Keywords: Rumex confertus Willd, fractions, extracts, antibacterial, antifungal

I. INTRODUCTION

The interest of natural drugs as adjunctive therapy for acute and chronic diseases has grown significantly in the recent years. Herbal remedies play an important role in modern medicine and it appears feasible that the compounds from herbs can be helpful in prevention or treatment of different diseases.

The name *Rumex* derived from the Latin word for dart, alluding to the shape of the leaves. It is the largest genus of family *Polygonaceae* [1]. This genus includes more than 250 species distributed worldwide. 16 species grow in Uzbekistan [2,3]. Since ancient times *Rumex L*. (dock) species have been well known for their use in traditional medicine, due to therapeutic efficacy and various biological activities [4]. The herb *Rumex confertus* Willd belongs to the family of *Polygonaceae*, which is widespread in North America, Europe, Russia and East Asia. Since ancient times, concoctions and tea from leaves and roots of this herb have been used to treat various intestinal inflammations [5,6]. Clinical trials of the use of *Rumex confertus* Willd rootstock against children's salmonellosis have been successful [7]. Similar therapeutic studies have been shown to be effective in treating acute intestinal infections (dysentery) and high blood pressure [8] and also used in veterinary for the treatment of diarrhea in animals [9]. In Europe, it is mainly used in medicine. *Rumex confertus* Willd (the seeds) [10]. Roots of *Rumex confertus* Willd is used for liver diseases, dysentery, pulmonary and uterine bleeding, as a laxative, for hemorrhoids and cracks in the anus, externally for burns, wounds, stomatitis, gingivitis, skin diseases [11]. In previous studies, Polish scientists studied the antibacterial and antifungal activity of an extract from the fruit of *Rumex confertus* Willd [12].

II. MATERIALS AND METHODS

A. Plant Material

The roots and leaves of *Rumex confertus* Willd were collected from Botanic Garden, Tashkent, Uzbekistan, on August 2020.

B. Extraction

The roots and leaves of the herb *Rumex confertus* Willd were collected in August and dried at room temperature, in shade. The pounded herb roots and

leaves were first subjected to extraction in chloroform, then three times in 70% acetone hydrous solution. The acetone extract was distilled under vacuum, the remaining water solution was subjected to extraction with ethyl acetate. Ethyl acetate extracts were collected and were dehydrated by adding anhydrous salt Na2SO4. The dehydrated extract was filtered, its concentartion increased under vacuum, the total polyphenols were precipitated by adding pure hexane to the condensed extract. The created precipitate was washed, and filtered and the extracted total phenols of chloroform and ethyl acetate fractions constituted 3.4% of the herb dry weight.

©IJRASET: All Rights are Reserved

III. RESULTS

A. *Antibacterial and Antifungal Activity*

The leaves and roots of *Rumex confertus* Willd were tested in vitro for antibacterial and antifungal activity in the fractions of gasoline, chloroform, ethyl acetate and butanol.

In vitro screening results for antibacterial and antifungal activity

Name of extracts	Inhibition zone diameter (mm)				
	Gram-positive microorganisms		Gram-negative strains		Conditionally pathogenic fungus
	Bacillus subtilis	*Staphylococcus aureus*	*E.coli*	*Pseudomonas aeruginosa*	*Candida albicans*
Rumex confertus Willd leaf extract	10	na	na	15	15
$CHCl_3$ extract of *Rumex confertus* Willd root	na	na	na	17	15
EtOAc extract of *Rumex confertus* Willd root	17	na	13	14	17
Ampicillin (10 µg/disc)	27	26	nt	nt	nt
Ceftriaxone (30 µg/disc)	nt	nt	26	25	nt
Flucanazole (25 µg/disc)	nt	nt	nt	nt	28

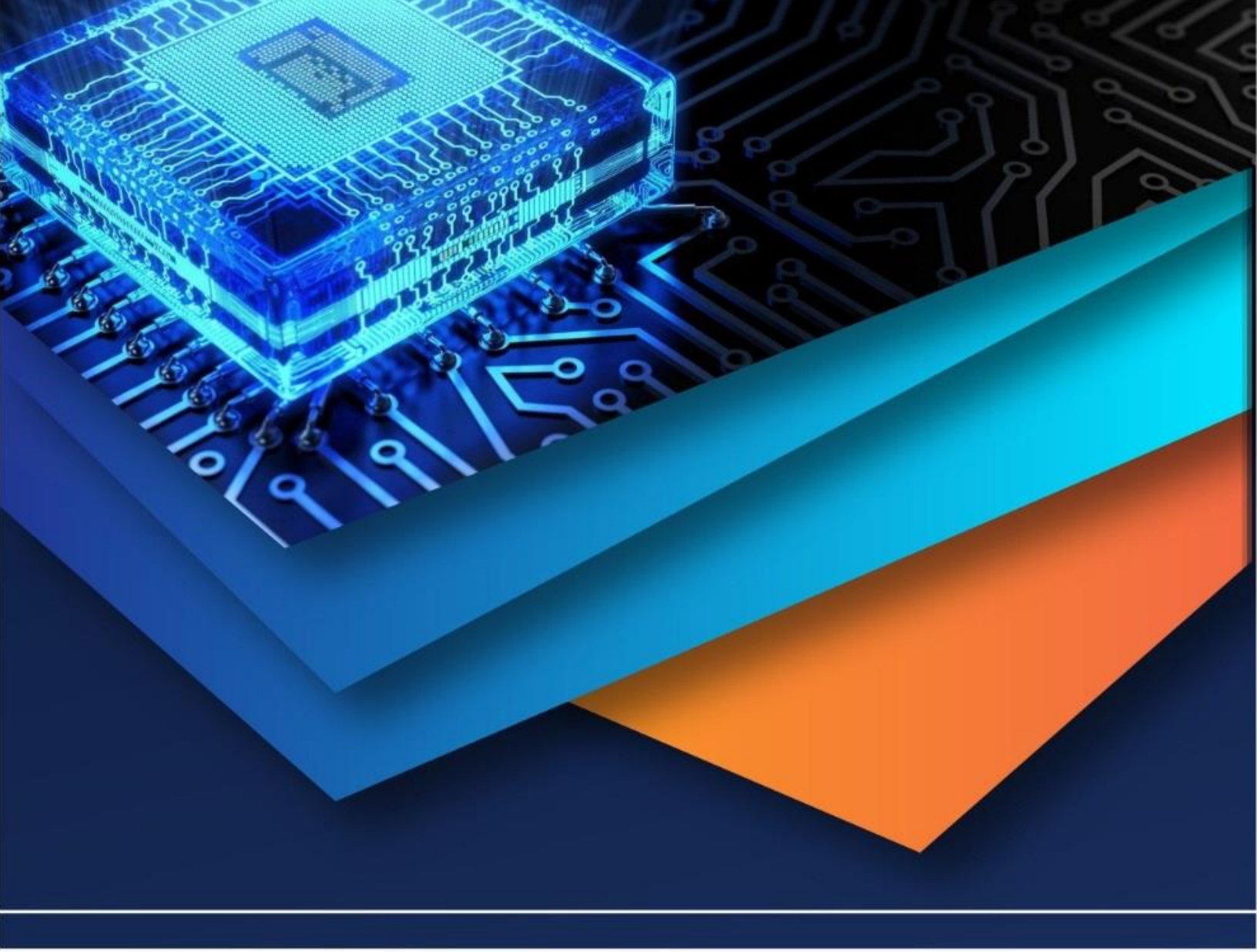
na- not active; nt – not tested
PS.Weak: Inhibition zones ≤ **6-8 mm;**
Appreciable: **8-14 мм**;
Pronounced: **14-20 мм**;
Strong: ≤ **20 мм**

IV. CONCLUSION

The leaves and roots of *Rumex confertus* Willd were tested in vitro for antibacterial and antifungal activity in the fractions of gasoline, chloroform, ethyl acetate and butanol. As a result, it was found that the leaves of the *Rumex confertus* Willd plant, chloroform and ethyl acetate fractions of the root part have antibacterial activity against fungi and gram-positive bacteria.

REFERENCES

[1] N. A. Saleh, El-Hadidi, M. N., & R. F. Arafa. “Flavonoids and anthraquinones of some Egyptian Rumex species (Polygonaceae)”. Biochemical Systematics and Ecology. 1993, 21(2), p. 301-303, DOI:10.1016/0305-1978(93)90049-W.
[2] G.D. Shermatova, B.A. Shamuratov. “Flavonoids of Rumex pamiricus”. Bulletin of National University of Uzbekistan. 2013, № 4/2, p. 232-233.
[3] Rao, K. N. V., Ch, S., & Banji, D. “A study on the nutraceuticals from the genus Rumex”. Hygeia. J.D.Med. 2011, vol.3 (1), p.76- 88.
[4] P.Babulka, The Rumex, from ethobotany to modern phytotherapy (Rumex spp.), [Les rumex, de l’ethnobotanique á la phytothérapie moderne (Rumex spp.)], Phytothérapie. 2004, 5, p.153-156 (in French).
[5] K.H. Rechinger. "Vorarbeiten zu einer Monographie der Gattung Rumex”. VII. Rumices asiatici. Candollea. 1949, 12, p. 9-152.
[6] K.H. Rechinger, T.G.Tutin, V.H. Heywood, N.A. Burges, D.M. Moore, D.H. Valentine, S.M. Walters & D.A. Webb (eds.). “Rumex L”. Flora Europaea 1, 1964, p. 82-89.P
[7] L. V. Benzel, O. I. Romanyuk, L. Ya. Rogovskaya, Y. I. Grinash. Poltava, 1996, p. 259-260.
[8] L. A. Shvedenko. Journal of Medical Cases. 1962, 10, p. 53–56.
[9] R. A. Muzychkina. Physiological and Biochemical Aspects of the Study of Medicinal Plants: Mater. Int., 1998, 46-48.
[10] В.В. Подгурская, Е.А. Лукша, Е.С. Гущина, И.А. Савченко, И.Н. Корнеева, Г.И. Калинкина. “БИОЛОГИЧЕСКАЯ АКТИВНОСТЬ РАСТЕНИЙ РОДА RUMEX (POLYGONACEAE)”. ХИМИЯ РАСТИТЕЛЬНОГО СЫРЬЯ. 2021. №2. С. 59–78. DOI: 10.14258/jcprm.2021027498.
[11] В.А. Куркин. “Фармакогнозия”. Учебник для студентов фармацевтических вузов. Самара, 2007. с.1239.
[12] Magdalena Wegiera, Urszula Kosikowska, Anna Malm, Helena D. Smolarz. “Antimicrobial activity of the extracts from fruits of Rumex L. species”. Central European Journal of Biology. 6(6), 2011, p. 1036-1043. DOI: 10.2478/s11535-011-0066-0.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)