Cover Story

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Review Article

Jayanti Veda (*Tridax procumbens*) - Unnoticed Medicinal plant by Ayurveda

SRP Kethamakka [1], Meena S Deogade [2]

[1] Head, Panchakarma, technoayurveda@gmail.com, [2] Reader, Dravyaguna, MGACH&RC, Wardha, (MS),

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Abstract:

Indian Traditional / folklore Medicine is source of many herbs which are not included in Ayurveda material medica. As potential to develop new compounds and chemotherapeutic agents are found through in vitro and vivo studies, it is right time to include new herbs in to Ayurveda pharmacopeias. *Tridax* is one such multifaceted weed available throughout the continent which can be used as a substitute for many herbs. The prime focus of scientific Ayurveda is to strengthen the herbal treasure house through Ayurvedic concept based researches. The present endeavor embarks on analyzing the updated information of *Tridax* identification, phyto-anatomy, phyto-chemical study, toxicity and therapeutics, to fortify the knowledge of rich traditional folkore practices followed since years to the well being of mankind.

Key words: *Tridax, Jayantiveda, Kshudra-Shevantika,* Kotobukigiku, Coat Buttons Plant

Traditional Indian Medicine (TIM) is an important source of potentially useful new compounds for the development of chemotherapeutic agents. Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural resources [1]. It has been estimated that herbal medicines serve about 80% of the world's population health need for millions of people in the rural areas of developing countries and more than 65% of the global population use traditional medicine for basic health care [2]. WHO estimated that approximately one fourth of the 500 million prescriptions written in US each year contain a mention of leafy plant extracts or active ingredients obtained from or modeled on plant substances [3]. According to one estimate 20,000 to 35,000 species of plants are used as medicines, pharmaceuticals, cosmetics and neutraceuticals by different ethnic groups the entire world over [4].

It is necessary to convert ethno-medicine practices into organized system either following through scientific extractive evaluations and /or on Ayurveda systemic approaches. In recent, herbal medicines and extracts have gained renewed interest for several reasons; affordability, low pricing, no side effects, solutions for chronic diseases and disorders, time tested remedies (folklore), preventive approaches, etc. [5]. The present review is aimed to notice biological and medicinal activity of *Tridax* and introducing such unnoticed herbs for inclusion in Ayurveda Materia-medica which helps in serving the ailing mankind.

Distribution:

Tridax procumbens L. is a common medicinal herb called *Jayanti Veda* in Sanskrit [6] belonging to family *Asteraceae*. It is best known as a widespread weed coat buttons plant, wild daisy and pest plant and Kotobukigiku in Japanese [7]. The

plant is native of tropical America and naturalized in tropical Africa, Asia, Australia and India [22]. *Tridax* is present throughout India (Andhra Pradesh, Maharashtra, Madhya Pradesh and Chhattisgarh [13]) and is employed as indigenous folklore medicine for variety of ailments. It is widely distributed throughout Indo-Pak region [11, 12].

Description:

Tridax is a hardy, perennial [14], with week straggling, hispid, procumbent herb with woody base sometime rooting at the node, up to 60 cm high or about 12-24cm long with few leaves 6-8cm long and very long slender solitary peduncles a foot or more in length. The leaves are short, hairy and arrow shaped [17].

It's Leaf is simple, opposite, exstipulate, ovate-lanceolate 2 to7 cm and lamina pinnatisect, sometimes three lobed, acute with two types of flowers such as ray-florets, disk-florets and Basal placentation, and these flowers are small, long peduncled heads; achenes 1.5 - 2.5 mm long x 0.5 – 1 mm in diameter and densely ascending pubescent; persistent; bristles of disc achenes alternately longer and shorter, 3.5 – 6 mm in length with inflorescence capitulum. It has daisy-like yellow centered white or yellow flowers with three toothed ray floret; [18, 19] and it produces a hard achene cypsela [21] fruit that is covered with stiff hairs [20]. Its widespread distribution and importance as a weed are due to its spreading stems and abundant seed production [22].

Microscopic study

The leaf section shows single layered upper epidermis consisting of polygonal tabular cells about 40-70 µm by 15 to 30 µm with a single layer of cylindrical palisade cells about 18 to 30 µm wide and 60 to 70 µm long, spongy parenchyma 2-4 layered, cells polyhedral or isodiametric in shape. The root section shows composed of thin walled tangentially elongated cells. Cortex composed of oval to polygonal parenchymatous cell. Simple pitted vessels are present. The stele is surrounded by a single layer of pericycle and has xylem and phloem arranged in a circle, alternating in position so that each lies on a different radius. The stem section shows cortex consisting of 1-2 layers of collenchyma and 6-7 layers of parenchyma. Endodermis is indistinct. Powder microscopy of the plant showed fibers of 175 µm length, and collenchyma cells of 70-115 µm diameter, glandular trichomes of stem are present, latex cells are seen in the stem, root cortex cells of diameter 80-120 µm are present, spiral vessels are present in the leaf, unicellular covering trichomes of length 200 µm [55].

Extraction Procedure:

Various methods are followed to draw the extracts of *Tridax* using a soxhlet extractor from Juice of fresh leaves, dried leaves powder, air dried whole plant is pulverized and extracts are prepared for 72 hours and the yield found to be 6% W/V at room temperature [25-32]. Standard solutions were prepared in methanol for alkaloids and tannins, and methylene chloride for phytosterols. The linearity of the dependence of response on concentration was verified by regression analysis [33]. The extraction commonly carried out according to Tram method [34], and of oil with AOAC method 999.02 [35], and the analysis of sterols was carried out according to AOAC method 994.10 [36]. This involved extraction of the lipid fraction from homogenized sample material, followed by alkaline hydrolysis (saponification) extraction of the non-saponifiables, clean-up of the extract, derivatisation of the sterols, and separation and quantification of the sterol derivatives by gas chromatography (GC) using a capillary column [37].

Preparation of extract dose

The powder compound obtained from extract of *Tridax* leaves was administered orally at different doses by dissolving it in Normal saline [29, 30]. The other method is, 2% acacia suspension was prepared by suspending 2 gram of accurately weighed *Tridax* powder in 100 ml of 0.9% saline. 20 ml of vehicle was taken separately to which 2 gram of dried extract was added and sonicated, this

produce suspension of 100 mg/ml strength. Both *Tridax procumbens* ethanolic extract (TPEE) and *Tridax procumbens* ethyl acetate extract (TPEAE) suspension were prepared in such manner [38].

Phytochemistry:

The Phyoto-chemical investigation reports the isolation of lipid constituents, sterols, flavonoids, and polysaccharide; and bergenin derivatives from *Tridax* [39, 40]. Some of the reported chemical constituents present in the aerial parts of the plant are phytosterols; beta-sitosterol, stigmasterol, campesterol [41] and a characteristic triterpene; beta-amyrin [42]. The plant yielded interesting compounds like luteolin, β-amyrin, β-amyron, lupeol, tria contanol, fucosterol, campasterol, stigma sterol, besides arachidic acid, lauric acid, palmatic acid, flavones and glycosides [43, 44]. The flower yields steroidal saponin, characterized as b-sitosterol 3-O-b-D-xylopyranoside, which has been isolated from the flowers of *Tridax* [45]. The amount of total phenolics was expressed as gallic acid equivalent (GAE) in milligram per gram dry plant extract using the expression; C = c x V/m [46]

The proximate profile shows that the plant is rich in sodium, potassium and calcium [47]. Leaf of *Tridax* mainly contains crude proteins of 26%, 17% of crude fiber, soluble carbohydrates 39%, and calcium oxide 5%. Luteolin, glucoluteolin, quercetin and isoquercetin have been reported from its flowers. Whereas the fumaric acid, flsitosterol and tannin has also been reported in the plant [48]. Flower extract has even b-Sitosterol-3-O-b-Dxylopyranoside [49]. *Tridax* have a high phenolic content of 12 mg/g GAE (gallic acid equivalent) [50]. Oleanolic acid was obtained in good amounts and found to be a potential anti-diabetic agent when tested against aglucosidase [51]. The presence of flavonoid quercitin is confirmed in the plant since the HPLC and HPTLC studies of the ethanolic extract of the whole plant and that of standard quercitin match each other [52].

Tridax isolations are observed with methyl 14 oxoacagaecunoate, methyl 14-oxononacosanoate, 3-methyl-non adecylben-zene, heptacosanyl cyclohexane carboxylate, 1-(2,2, dimethyl-3-hydroxypropyl) isobutyl phthalate, 12-hydroxytetracosa-15-one, 32-methyl-30-ozotetraatriacont-31-en-1-ol along with β-amyrin, β-amyrone, fucosterol and sitosterol, arachidic, behenic, lauric, linoeic, linolenic, myristic, palmitic and stearic acids]53].

Twenty-three known flavonoids were detected, consisting mainly of apigenin (29.00%), quercetin (21.67%), kaempferol (11.20%), (-)-epicatechin (6.38%), naringenin (4.82%), (+)-catechin (3.28%), biochanin (3.21%), robinetin (3.13%), diadzein (2.57%), and nobiletin (2.07%). Compared to test control, the treatment dose dependently significantly lowered (P<0.05) alkaline phosphatase (54.91-100.52%), aspartate transaminase (37.74-64.79%), and alanine transaminase (32.96-57.82%) activities [54].

Toxicity Studies

The "Staire case" method LD_{50} was determined in rats and mice by oral and intra-peritoneal route. The initial dosing of *Tridax* was 2000 mg/kg p.o. and 800 mg/kg i.p. in both the species [56]. In acute toxicity studies with a dose of 250 mg/kg of dried extract on mice were observed for motor reflexes for 48 h. and the study carried out for a period of 15 days. In chronic toxicity studies in two groups extract of *Tridax at* 250 mg/kg was administered daily for a period of 15 days. No mortality was observed and the behavioral pattern was unaffected [57].

Folk & Pharmacology Practices

The Ethno pharmacological and traditional use of plants often results in the discovery of new biologically active molecules [58]. Plants have a long history of use in the treatment of many diseases like cancer, etc [59]. Research is being spotlighted on plants and their phytochemicals [61] and 74% of the plant- derived medicines have a modern indication that correlates with their traditional, cultural and sometimes ancient uses [62]. Hence, traditional

medicine is an important source for the development of novel chemotherapeutic agents which are less toxic and more economic [63].

In village side it is a best medicine to stop hemorrhage from cuts and bruises as anticoagulant [8]. It is used as an ornamental or fodder plant, and its leaves are cooked as vegetables [23, 24]. In Nigeria [9], *Tridax* is traditionally used in the treatment of fever, typhoid fever, cough, asthma, epilepsy and diarrhea [10]. In the West Africa sub-region and tropical zone of the world, Traditional medical practitioners and the native peoples of these areas use the leaves of the *Tridax* as a remedy against conjunctivitis [60]. Traditionally, *Tridax* is used for the treatment of bronchial catarrh, malaria, stomach ache, diarrhoea, epilepsy, diabetes, high blood pressure, hemorrhage, liver problems, and as a hair tonic [64, 65, 66, 67, 68].

Tridax [69] possesses significant pharmacological practices like - Wound healing [70], anti-inflammatory [71-74], Analgesic [99], Immunomodulatory [75,76, 77], Anti-oxidant [78,79], Anti-hyperglycemic [80] Anti-diabetic activity [81,82,171] hypotensive effect [83, 84], Hepatoprotective [85-87], Anti hepatotoxic [88], etc. The researches on its efficacy over liver injury [89] and Lung metastasis [90] are noticeable. Its action is found as Anti-arthritic [91], Anti fungal [92], antibacterial action [93], Antimicrobial [94] also. The *Tridax* exhibits antimicrobial activity against both gram-positive and gram-negative bacteria [95] and also found as Antileishmanial [96]. It is parasite [97] killer and also works as insect repellent [98]. It is also used as bio-adsorbent for chromium (VI) is one of the highly toxic ions released into the environment through leather processing and chrome plating industries [99].

Tridax successfully inhibited the growth of *Escherichia coli, Klebsiella pneumonia Proteus vulgaris , Bacillus subtilis* and *Staphylococcus aureus* [100]. Its leaves are also used for bronchial catarrh, dysentery, diarrhoea and also used as preventive measure for hair falling / promoting hair growth [102, 124, 125] noticed in 1991 [101].

The cardiovascular effects of aqueous leaf extract (on *Sprague-Dawley* rat) decreases the mean arterial blood pressure and the higher dose leads to significant reduction in heart rate where as lower dose did not cause any changes in the same [120].

Tridax have antiplasmodial activity against chloroquine-resistant *P. falciparum* parasites with aqueous and ethanolic extracts. The RBC protection started at a concentration of 100µg/ml [121]. In another study with essential oils of steam distillation from leaves found for its topical repellency effects against malarial parasite *Anopheles stephensi* in mosquito cages [122, 123].

The n-hexane extract of the flowers showed activity against Escherichia coli. A whole aerial part was active against Mycobacterium smegmatis, Escherichia coli, Salmonella group C and Salmonella paratyphi. None of the tested extracts was active against the yeasts, Candida albicans, Candida tropicalis and Rhodotorula rubra; or the fungi: Aspergillus flavus, Aspergillus niger, Mucor sp. and Trichophyton rubrum [130].

This plant was also used as a good bioadsorbent for the removal of highly toxic ions of Cr (VI) from industrial wastewater. Hence *Tridax* recommended for bio-remediation [126]. This plant was also used for bronchial catarrh, dysentery, diarrhoea and in the West Africa and for a remedy against conjunctivitis [127, 128, 129].

The studies of Ikewuchi on the elemental composition [107], Salahdeen on high blood pressure and heart rate on rats [108], Ravikumar on liver antioxidant defense system during lipo-polysaccharide-induced hepatitis [109], weight reducing activity [110], and analgesic activity [111], and the protective effects of aqueous extract of the leaves against cholesterol and salt loading (in Wistar albino rats) [112, 113] is remarkable. It possesses antiseptic, insecticidal, parasiticidal properties and has marked depressant action on respiration [114,

115, 116, 117] along with nutrient/ nutraceutical potential of the leaves [118, 119].

- **Anti-Cancer**

Some specific studies have shown that the β-pinene, along with α-pinene and other terpenes are cytotoxic on cancer cells [103]. The α- and β-pinenes were strongly reported for its cytotoxic activity on several cell lines like breast cancer and leukemic cell lines and anti Prostate Cancer activities [104]. As the essential oil of *Tridax* has revealed to have α-pinene, β-pinene l-phellandrene and Sabinene as their major bioactive compounds as identified and studies reveled that its preventive/ chemotherapeutic effect on experimentally induced lung cancer development. The essential oil of *Tridax* was found to have 14 compounds and out of which four compounds namely α-pinene (C10H16) β-pinene (C10H16) phellandrene (C10H16) and Sabinene (C10H16) were found to be the major compounds used for cancer treatment [105].

The essential oil of *Tridax* showed a high cytotoxicity of cancer cell death within 24 hrs for 50 µg which shows the potency of essential oil on killing B16F-10 cells in vitro. From the in vivo drug toxicity study it is clear that the *Tridax* even in its highest dosage did not show any lethal effect/ abnormality on C57BL/6 mice, and have taken 50 µg as the minimal dose for the anti-cancer studies. It can be concluded that the synergistic effects of essential oil of *Tridax* on chemoprevention of lung cancer development in B16F- 10 injected mice makes them potentially valuable drug for cancer treatment [106].

Aqueous extract of the leaves of *Tridax* is an effective agent in the treatment and prevention of carbon tetrachloride-induced hepatic cytotoxicity. The data suggest that the daily oral consumption of the extract was prophylactic to carbon tetrachloride poisoning. This confirms the use of *Tridax* in traditional health care for the treatment of liver problems [131] also.

- **Anti-fungal**

Human mycoses, especially in immuno-compromised patients are not always successfully treated due to the ineffectiveness or toxicity of the available antifungal drugs. Minimum inhibitory concentrations (MIC), minimum fungicidal concentrations (MFC) and total activity were evaluated for determination of antifungal potential of each active extract. Excellent antifungal potential was recorded for free flavonoid of stem (IZ 12 mm, AI 1.2, with same MIC and MFC 0.156 mg/ml), bound flavonoid of stem (IZ 10 mm, AI 1, MIC 0.312 and MFC 0.625 mg/ml) and flower (IZ 10.2 mm, AI 1.02, with same MIC and MFC 0.312 mg/ml) against *A. niger*. Study indicated that *Tridax* can be used as a source of formulations of antifungal drug for treatment of diseases caused by *A. niger* [132].

- **Anti-bacterial**

Plants with antimicrobial potential has become the need of today's research [133] and hundreds of plant species have been tested for antimicrobial properties, the vast majority have not been adequately evaluated [134]. The traditional medicinal plants are emerging as potential sources of new antimicrobial agents [135] and several workers have reported antibacterial activities of local plants [136, 137, 138]. The development and spread of multi drug resistant super bugs especially in the hospital environment, continues to be a burning global issue due to the indiscriminate and irrational use of antibiotics [139]. The antimicrobial potential of this herb is tested with methanolic extract was found to be more effective than water extract against all bacteria. Author suggests that β-amyrin found in the leaves of this plant could be responsible for its antimicrobial activity [140].

Various studies on the anti-bacterial activity of *Tridax* revealed that the plant extract was effective on *Pseudomonas, Klebsiella pneumoniae, Proteus vulgaris, E. coli, Staphylococcus aureus,* as well as for fungus *Aspergillus niger* and *Candida albicans* [141-147]

- **Antioxidant**

Antioxidants prevent the damage done to

cells by free radicals-molecules that are released during the normal metabolic process of oxidation. Some of these free radicals include reactive oxygen free radicals species (ROS), reactive hydroxyl radicals (OH.), the superoxide anion radical (O_2.), hydrogen peroxides (H_2O_2) and peroxyl (ROO.) which generates metabolic products that attack lipids in cell membranes or DNA and associated with several types of biological damage [148]. Numerous reports indicate variations in the levels of antioxidants in the diabetic patients [149, 150]. Studies around the world have identified many new plant constituents with antioxidant activity, among these are the polyphenols [151]. The results of the DPPH radical scavenging activity of *Tridax* against test sample and standard (gallic and ascorbic acids (Fluka)) shows that *Tridax* possesses very high percentage antioxidant activity, 96.70% at a concentration of 250µg/ml. It shows a reductive potential of 0.89 nm. *Tridax* extracts may have hydrogen donors thus scavenging the free radical DPPH, with high AA% of 96.70% at 250µg/ml which was observed to be higher than even those of the standards (ascorbic and gallic acids) at a concentration of 250 µg/ml used [152].

Tridax plants are rich sources of natural antioxidant. *T. procumbens* has a percentage antioxidant activity (AA %) of 96.70 which was observed to be higher than those of gallic (92.92%) and ascorbic acids (94.81%) used as standards [172].

- **Anti-inflammatory (exudates)**

The clinically useful drugs against pain and inflammation exhibit many adverse effects; this leads to considerable interest in search of safer drug for these conditions [153]. The study of plants that have been traditionally used as pain killers should still be seen as a fruitful and logical research strategy, in the search for new analgesic drugs [154, 155]. *Tridax* has shown significant anti-inflammatory action influencing exudates, leucocyte migration, rat paw edema and granuloma. The anti-inflammatory action of *Tridax* may possibly be due to corticotrophic influence as evident from increase in weight. This adrenal corticotrophic effect might be indirectly inhibiting the inflammation by secretion of endogenous cortical hormones. The model of leucocyte migration has been used as this is an essential step in the development of inflammation [156]. The leucocyte migration and exudate studies done at the end of six hours [157, 158] inhibit the accumulation of exudate and leucocyte migration between 3 to 6 hrs after carrageenin [159], but there is disagreement about the steroidal activity [160]. The higher doses have been used as lower doses do not affect leucocyte migration. The results of *Tridax* are comparable to NSAIAS in all respects. A study reveals that none of the drugs tested potentiated either exudates volume or leucocyte migration. It is suggested that leucocyte migration will detect weaker anti-inflammatory activity and recommend as a good model for rapid screening [161]. It has been reported that prostaglandins are involved in causing gastric ulcers. A study is expressive that *Tridax* does not cause ulcer indicating less involvement of prostaglandins in anti-inflammatory effect [162]. Formalin induced persistent pain (Biphasic pain), Acetic acid induced writhing test (Peripheral pain) and CFA induced hyper analgesia in rat (Inflammatory pain) were tested with *Tridax procumbens* against standard (Diclofenac Sodium). The measurement of mechanical hyperalgesia was done at 30, 60 and 120 min. *Tridax*-400mpk in Normal Saline vehicle, Kg/10mL on Rats as dose volume for Biphasic pain exhibits 95±09 % of reversal. The same quantification of *Tridax* extract relives peripheral pain 78±07 % Reversal and inflammatory pain with 27±8 % Reversal. The % reversal =100 – (AVG response of test drug/ AVG response of vehicle*100). Oral administration of extract of *Tridax procumbens* significantly reduced mechanical hyper analgesia in CFA injected rats. As this anti nociceptive property of the extract may be attributed to the presence of flavonoids and phytosterol which are present in the plant However,

the isolated flavanoid such as procumbentin and quercetin and sterols such as β sitosterol may show more pronounced analgesic activity compared to the extract, particularly in the formalin – induced pain model, acetic acid induced writhing and in the inflammatory pain model [163].

- **Wound healing**

The effects of an indigenous drug, *Tridax* on developing granulation tissue in rats were studied at 4 day intervals up to 32 days of wounding. Lysyl oxidase activity, protein content, specific activity, and breaking strength were all increased in drug-treated animals as compared to controls. A fall in the lysyl oxidase activity was observed in drug-treated animals after day 8. The drug may be having a dual role: one a stimulatory (direct) effect in the initial phase of wound healing and the other a depressant (indirect) effect in the later stage [164]. *Tridax* antagonized anti-epithelization and tensile strength depressing effect of dexamethasone (a known healing suppressant agent) without affecting anti-contraction and anti-granulation action of dexamethasone [165]. The effect of various extracts (whole plant extract, aqueous extract, butanol extract and ether fraction) of this plant has been studied in dead space wound model [166]. The authors have reported that whole plant extract has the greatest pro-healing activity with increase in tensile strength and lysyl oxidase activity among the various extracts in both normal and immuno-compromised (steroid treated) rats in dead space wound model. The plant increased not only lysyl oxidase but also, protein and nucleic acid content in the granulation tissue, probably as a result of increase in glycosamino glycan content [167]. Kshudra-shevantika (*Tridax*) in human show not much significant ulcer healing against standard drug Jatyadi taila [179].

- **Anti-arthritic**

Tridax at 250 and 500 mg/kg has displayed significant anti-arthritic activity comparable with that of indomethacin. The ethanolic whole plant extract of *Tridax* exerts an anti-arthritic activity by significantly altering the pathogenesis during FCA -induced arthritis in female SD rats without exerting any side effects [170].

Tridax ethanolic extract showed better results than ethyl acetate extract at 300mg/kg comparatively; as *Tridax* ethanolic extract showed significant ($P<0.001– 0.05$) whereas *Tridax* ethyl acetate extract was less significant ($P<0.05$) comparing with various groups by One way ANOVA followed by Tukey's multiple comparison test. The Rheumatoid factor was found negative in animals of all groups of Rat adjuvant polyarthritis. The migration of leucocytes into the inflamed area is significantly suppressed by *Tridax* ethanolic extract when compared to standard drug (Diclofenac sodium, Cyclophosphamide), as seen from the significant reduction in the total WBC count [168]. Earlier findings suggest that absorption of 14C-glucose and 14C-leucine in rat's intestine was reduced in the case of inflamed rats [169].

- **Anti-diabetic**

Diabetes mellitus occurs throughout the world; Diabetes is 5th in top 10, of the most significant diseases in the developed world and is still gaining significance [171]. The practical usage of juices of various plants achieved the lowering of blood glucose by 10-20% [173]. Alloxan [174, 175] induced Experimental studies revels that the aqueous and alcoholic extracts from *Tridax* leaves (200 mg/kg) orally administered for 7 days produced a significant decrease in the blood glucose level. Petroleum extract exhibits very weak anti-diabetic activity [176]. *Tridax* can impart not only by hypoglycemic effects but also by improving lipid metabolism, antioxidant status, and capillary function [177] in diabetics. The profile of malondialdehyde and antioxidant vitamins in the test rats clearly indicate cardio-protective potential and protects against oxidative stress in ocular tissues and support its use in traditional health care practices for the management of diabetes mellitus [178].

Discussion:

Tridax procumbens leaves have been traditionally and now experimentally used worldwide for its versatile therapeutic properties.

At the backdrop of increasing importance of herbal alkaloid usage in medical practice it is necessary to identify the active alkaloids of folk use plants for its therapeutic values. The *Tridax*, a weed spread all over, being time tested and passed through various in vivo and vitro studies, it could not make its place in either Ayurveda or Alkaloid therapeutics. It is far for the understanding of the common Ayurveda practitioners' wisdom to include the local weeds in to daily practice and the planners are under the crutches of hypocrisy. It is found that *Tridax* is dispensed as "*Bhringraj*", (adulteration) which is well known Ayurvedic medicine for liver disorders [15, 16]. It is because of the scarcity of *Bhringaraj* or not imparted importance to *Tridax*.

Conclusion:

For many, Ayurveda principles are hard nut to crack and a simple chemical evaluation is the better way to adopt. Thus, following the extracting methods of alkaloid and testing on animals, which are against to the holistic approach is being practiced at present. *Tridax*, which is wildly used in folklore medicine, has established its therapeutic uses with innumerable studies of in vitro and vivo which recommends itself to be placed in Ayurveda Dravyaguna and Pharmacy. However, future researches based on Ayurveda concept are to be initiated to potentiate the *Jayanti Veda*. Ayurveda herbal treasure house is to be expanded with new herbal species identified from folk practice as there is restrictions or extinction of known herbs.

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Compounds	Retention Time (min)	Composition (mg/kg)
(+)-Catechin	13.738	497.51
(+)-Gallocatechin	15.039	138.30
Genistein	15.617	147.49
Diadzein	16.034	391.05
Apigenin	16.244	4405.200
Butein	16.667	287.26
Naringenin	16.780	732.73
Biochanin	17.089	487.78
Luteolin	17.357	107.57
Kaempferol	18.491	1701.83
(-)-Epicatechin	19.514	969.34
(-)-Epigallocatechin	20.467	215.13
Quercetin	21.434	3292.48
(-)-Epicatechin-3-gallate	22.512	5.61
(-)-Epigallocatechin-3-gallate	23.226	39.65
Isorhamnetin	24.090	45.57
Robinetin	24.231	475.42
Ellagic acid	24.610	263.30
Myricetin	24.786	245.29
Baicalein	25.690	267.79
Nobiletin	26.281	314.77
Baicalin	27.058	144.34
Silymarin	27.799	17.22
Total	**-**	**15192.61**

Table-1: Falconoid compositions of *Tridax procumbens* aqueous extract [181]

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