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## Nativity, Phytochemistry, Ethnobotany and Pharmacology of *Dianthus caryophyllus*

Satish Chandra, D.S. Rawat, Dinesh Chandra and Jyotsna Rastogi

**Abstract:** *Dianthus caryophyllus* L. (carnation) is an important cut flower in trade. This plant traditionally used in China, Japan and Korea in the treatment of wounds and gastro-intestinal disorder and various other ailments. In recent pharmacological studies plant tested for anticancer, antiviral, antibacterial, antifungal and anti-insecticide activities. Kaempferide triglycoside a phenolic compound from plant exhibit anticancer properties against colon cancer cell lines and also show antifungal properties against *Fusarium* wilt causative pathogenic fungi. Plant extract possesses antibacterial properties against *Helicobacter pylori*, *Pseudomonas* spp. and *Bacillus* spp. The seeds extract of *D. caryophyllus* exhibit potent antiviral activity against HIV, herpes simplex virus-1 (HSV-1) and hepatitis A virus-27 (HAV-27). Essential oil extracted from flowers of carnation shows arthropods repellent and larvicidal activity.

### How to cite this article:

Satish Chandra, D.S. Rawat, Dinesh Chandra and Jyotsna Rastogi, 2016. Nativity, Phytochemistry, Ethnobotany and Pharmacology of *Dianthus caryophyllus*. Research Journal of Medicinal Plant 10 (1): 1-9, 2016. (DOI: 10.3923/rjmp.2016.1.9)

## Resistance, Pharmacology Properties and Nutritional Value of a Shrub from Arid Environments *Atriplex halimus*

Zohra Mohammedi

**Abstract:** Several of experimental studies and molecular investigations highlight the power of herbs to evidence-based medicine. In Algeria, a number of medicinal plants have been studied for the treatment of diabetes such as *Atriplex halimus* L., xerohalophyte species, growing in arid and sub-arid areas, known for its hypoglycemic activity and widely used by the local population as remedy to treat diabetes mellitus. The objective of this review is to give value to this important traditional medicinal plant as antidiabetic, to set other biological and nutritional properties and its importance as resistant shrubs and good forage in severe environmental conditions.

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## Ethnomedicinal Uses of Tree Species by Tharu Tribes in the Himalayan Terai Region of India

Omesh Bajpai, Jitendra Pandey and Lal Babu Chaudhary

**Abstract:** The present investigation aimed at documenting medicinally important species of trees used by Tharu tribe in the Himalayan Terai region of India. Out of 204 tree species belonging to 143 genera and 50 families reported in this study, uses of 148 species have been recorded from this region for the first time. Twenty nine leguminous species belonging to 16 genera are most commonly used by tribal people of the region. Eight species of *Ficus* are used in different diseases. About 75% of total tree species of medicinal uses have been found in wild habitat while the remaining species are cultivated. It has been noticed that bark is one of the frequently utilized plant parts by the tribe. In such diseases as diarrhoea, skin problems, dysentery, fever, ulcer, rheumatism, wounds, diabetes, respiratory and gastrointestinal problems, more than one plant species are used. Over all, more than 86 health-related issues are being cured utilizing ethnomedicinally important tree species. It has also been observed that the majority of youth in Tharu tribe are very less aware of their ethnic knowledge and are also not so much interested in such learning. Thus, a precise documentation of these information with traditional knowledge base from the ethnic people has great relevance for the human welfare. The study suggests the need for training local people for sustainable utilization of these plant resources and their proper conservation. The youth should be encouraged learning to sustain their ethnic wisdom which would also help creating employment among local inhabitants.

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Omesh Bajpai, Jitendra Pandey and Lal Babu Chaudhary, 2016. Ethnomedicinal Uses of Tree Species by Tharu Tribes in the Himalayan Terai Region of India. *Research Journal of Medicinal Plant* 10 (1): 19-41, 2016. (DOI: 10.3923/rjmp.2016.19.41)

**GC/MS Determination of Bioactive Constituents of Methanol Fraction of *Spilanthes uliginosa* (Sw) Leaves**

A.J. Uraku

**Abstract:** Plant as a source of herbal medicine is the oldest form of medicine known to mankind. It was the mainstay of many earlier civilization and still the most widely practiced form of medicine in the world currently. The GS-MS analysis of the leaf extract of *Spilanthes uliginosa* (Sw) was investigated. The analysis revealed the presence of six peaks from the chromatogram which showed six phytochemicals. The major phytochemicals identified in the leaf extract are hexadecanoic acid (8.68%), hepta-9, 10, 11-trienoic acid (19.36%), octadecenoic acid (8.14%), 5-hydroxymethyl heptadecane (14.02%), docosane aldehyde (41.72%) and 1-ethoxyoctadecane (8.08%). The presence of these assorted chemicals may be responsible for the beneficial potentials of *Spilanthes uliginosa* (Sw) in tradomedicine.

**How to cite this article:**

A.J. Uraku, 2016. GC/MS Determination of Bioactive Constituents of Methanol Fraction of *Spilanthes uliginosa* (Sw) Leaves. *Research Journal of Medicinal Plant* 10 (1): 42-54, 2016. (DOI: 10.3923/rjmp.2016.42.54)

**Potential of Ginger (*Zingiber officinale*) Rhizome and Watermelon (*Citrullus lanatus*) Seeds in Mitigating Aspartame-Induced Oxidative Stress in Rat Model**

E.V. Ikpeme, O.U. Udensi, E.E. Ekerette and U.H. Okon

**Abstract:** Aspartame (ASP) consumption has been reported to implicate oxidative stress and antioxidant supplements from plant origin are one of the safest ways of averting their effect in the body. The current study was aimed at ascertaining the ability of aspartame (ASP) to induce oxidative stress in rats as well as assessing the potential of ginger (*Zingiber officinale*) rhizome and watermelon (*Citrullus lanatus*) seeds extracts in averting the aspartame induced oxidative stress. This was done using sperm parameters and biochemical assays such as superoxide dismutase (SOD), glutathione peroxidase (GP<sub>x</sub>), catalase, melonaldehyde (MDA), aspartate aminotransferase (AST), alanine aminotransferase and alkaline phosphate (ALP). Forty eight sexually matured male albino rats were divided into six groups (A-F) with eight rats in each group. Group A served as the positive control and received physiological saline. Group B served as the negative control and were administered with 1000 mg kg<sup>-1</sup> b.wt., of aspartame (ASP). Rats in group C were administered with 1000 mg kg<sup>-1</sup> b.wt., ASP+500 mg kg<sup>-1</sup> b.wt., of ginger extracts while rats in group D were administered with 1000 ASP+1000 mg kg<sup>-1</sup> b.wt., of ginger extracts. On the other hand, rats in group E received 1000 mg kg<sup>-1</sup> b.wt., ASP+500 mg kg<sup>-1</sup> b.wt., of watermelon seed extracts while rats in group F received 1000 mg kg<sup>-1</sup> b.wt., ASP+1000 mg kg<sup>-1</sup> b.wt., of watermelon seed extracts. The result revealed that administration of ASP reduced sperm viability, sperm count and increased sperm head abnormalities significantly (p<0.05) while sperm motility was not affected by ASP administration in the rats. Superoxide dismutase and GP<sub>x</sub> levels were increased significantly by ginger and watermelon seeds extracts. Although ginger extract reduced more of lipid peroxidation (MDA), watermelon seeds extract increased the activities of SOD, GP<sub>x</sub> and reduced AST, ALT and ALP in the liver of rats at 1000 mg kg<sup>-1</sup> b.wt., than the extract of ginger. Thus, the extracts of these two medicinal plants are possible antioxidant reservoir and may provide reliable solution in averting oxidative stress pathologies.

**How to cite this article:**

E.V. Ikpeme, O.U. Udensi, E.E. Ekerette and U.H. Okon, 2016. Potential of Ginger (*Zingiber officinale*) Rhizome and Watermelon (*Citrullus lanatus*) Seeds in Mitigating Aspartame-Induced Oxidative Stress in Rat Model. *Research Journal of Medicinal Plant* 10 (1): 55-66, 2016. (DOI: 10.3923/rjmp.2016.55.66)

## Physico-Chemical Characterization of Avocado (*Persea americana* Mill.) Oil from Three Indonesian Avocado Cultivars

Luthfia Indriyani, Abdul Rohman and Sugeng Riyanto

**Abstract:** A study was carried out to determine the physico-chemical characteristics of avocado oil derived from three Indonesian avocado cultivars, namely Bantul (MAB), Purwokerto (MAP) and Garut (MAG). The extraction of avocado oil from avocado fruit was carried out using solvent extraction method. The avocado oil obtained from all samples had a green yellowish color. The iodine value of MAG is 88.7 g I<sub>2</sub>/100 g oil, slightly higher than MAB (87.0 g I<sub>2</sub>/100 g oil) and MAP (77.09 g I<sub>2</sub>/100 g oil) indicated that MAG contains more unsaturated fatty acid. The saponification values of avocado oil were 193.1 mg KOH/g oil for MAB, 198.4 mg KOH/g oil for MAP and 153.17 mg KOH/g oil for MAG, respectively. The peroxide values of MAB, MAP and MAP were 166.1, 124.7 and 14.9 meq kg<sup>-1</sup> oil, respectively. The Conjugated Dienes (CDs) and Conjugated Trienes (CTs) value of MAB, MAP and MAG were significantly different in the specific absorptivity range value from 2.6-3.7. The MAG had lowest CDs and CTs value. The anisidine value for avocado oil samples ranged from 10.59-11.36. There were no significant differences in the anisidine value among avocado oil samples. Avocado oil samples had high amounts of total unsaturated fatty acids, i.e., MAB (55.7%), MAP (62.8%) and MAG (68.9%), respectively. Thermal analysis by Differential Scanning Calorimetry (DSC) showed that avocado oil from three different cultivar had different melting and crystallization profile. Principal component analysis was used to classify each sample based on their DSC parameters. The results showed that by using the melting and crystallization profiles the discrimination of three avocado oils was very clear.

### How to cite this article:

Luthfia Indriyani, Abdul Rohman and Sugeng Riyanto, 2016. Physico-Chemical Characterization of Avocado (*Persea americana* Mill.) Oil from Three Indonesian Avocado Cultivars. Research Journal of Medicinal Plant 10 (1): 67-78, 2016. (DOI: 10.3923/rjmp.2016.67.78)

## Anti-Diabetic Effect of *Anthocleista vogelii* Ethanolic Root Extract in Alloxan-Induced Diabetic Rats

Rita M. Sunday, Olapade R. Ilesanmi and Efere M. Obuotor

**Abstract:** This study was carried out to evaluate the potential anti-diabetic effect of *Anthocleista vogelii* ethanolic root extract in alloxan-induced diabetic rats. Albino rats of both sexes were randomly divided into five groups with five rats each. Group 1 (control; 10 mL kg<sup>-1</sup> distilled water), group 2-4 (100, 200 and 400 mg kg<sup>-1</sup> *A. vogelii* ethanolic root extract) and group 5 (5 mg kg<sup>-1</sup> glibenclamide). Diabetes was induced physiologically using 10 g kg<sup>-1</sup> glucose p.o. and chemically using 150 mg kg<sup>-1</sup> alloxan i.p. Fasting blood glucose levels of the diabetic rats were determined at intervals of 30, 60, 120 and 240 min in glucose loaded rats and on days 4, 7, 10 and 14 in alloxan-induced diabetic rats. After two weeks, the levels of serum cholesterol, triglyceride, high density lipoprotein, low density lipoprotein, alanine aminotransferase, aspartate amino transferase and creatinine of all the groups were analyzed. The LD<sub>50</sub> of *A. vogelii* ethanolic root extract was ≥5000 mg kg<sup>-1</sup> (p.o.). The extract exerted a significant (p<0.05) reduction in Fasting blood glucose levels, serum cholesterol, triglyceride, low density lipoprotein, creatinine, alanine aminotransferase and aspartate aminotransferase levels and an increase in serum high density lipoprotein levels when compared to the control. The extract also elicited a significant decrease in body weight, food and water intake in diabetic treated rats. The results show that *A. vogelii* ethanolic root extract have anti-diabetic and anti-hyperlipideamic effect when administered for 14 days in alloxan-induced diabetic rats.

### How to cite this article:

Rita M. Sunday, Olapade R. Ilesanmi and Efere M. Obuotor, 2016. Anti-Diabetic Effect of *Anthocleista vogelii* Ethanolic Root Extract in Alloxan-Induced Diabetic Rats. Research Journal of Medicinal Plant 10 (1): 79-88, 2016. (DOI: 10.3923/rjmp.2016.79.88)

## Green Coffee Extract Protects H9C2 Cardiomyocytes from Doxorubicin Induced Apoptosis

Srividya Malkapuram, Krishnan Venkataraman, Rucha Tongaonkar, Swamini Taran, Lakshmisireesha Kolla and Lakshman Rajagopalan

**Abstract:** Green Coffee Extract (GCE), an extract of *Coffea arabica* bean is a popular health supplement employed for anti-obesity and anti-diabetic effects. Here a hydroalcoholic extract of Green Coffee (GCE) was evaluated for its potential as a cardioprotective agent against Doxorubicin (Dox) induced cardiac insult in a H9C2 rat cardiomyocyte *in vitro* model system. The GCE was tested in an MTT viability assay using 1  $\mu\text{M}$  Dox with and without GCE pretreatment at 50, 100 and 250  $\mu\text{g mL}^{-1}$  concentrations. GCE was also tested for its free radical scavenging ability in a DPPH assay at 10 concentrations (500  $\mu\text{g mL}^{-1}$  maximum concentration). To understand the mechanism of action of cardioprotection, mitochondrial membrane potential ( $\Delta\psi\text{m}$ ) was compared between Dox treated cells with and without GCE pretreatment, using the JC-1 dye. Finally, the activation of caspase-3/7 was quantitated. Findings from the above experiments demonstrated that GCE rescued H9C2 cardiomyocytes from Dox induced loss of cell viability in a dose-dependent manner. While Dox treatment caused a clear decrease in the JC-1 ratio from 2 to 1.6 due to loss of  $\Delta\psi\text{m}$ , pre-treatment with GCE at 25, 50 and 100  $\mu\text{g mL}^{-1}$  restored the JC-1 ratio to 1.6, 1.9 and 2.0, respectively. Dox treatment potently induced caspase 3/7 activity by 5 fold and pre-treatment with GCE at 100 and 500  $\mu\text{g mL}^{-1}$  reduced this activation to 3.5 and 1.5 fold, respectively. This data clearly demonstrates that GCE is strongly cardioprotective against Dox induced cardiac insult and the mechanism of action is by blocking activation of intrinsic apoptotic pathway.

### How to cite this article:

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## Protective Role of Aqueous Guava Leaf Extract Against Caffeine Induced Spermatotoxicity in Albino Rats

U.B. Ekaluo, E.V. Ikpeme, U.U. Uno, S.O. Umeh and F.A. Erem

**Abstract:** This study investigated the protecting potential of Aqueous Guava (*Psidium guajava*) Leaf Extract (AGLE) against caffeine induced spermatotoxicity in albino rat models. Thirty healthy and sexually matured albino rats were divided into five groups of six rats each using a completely randomized design. They were treated with caffeine and AGLE combinations orally for 65 days. The result showed that caffeine significantly ( $p < 0.05$ ) reduced sperm viability, sperm count and sperm motility, while sperm head abnormality increased in caffeine treated rats when compared to the control. However, AGLE significantly ( $p < 0.05$ ) protected the treated albino rat models from caffeine induced spermatotoxicity in a dose-dependent manner. These results show that AGLE is effective in protecting albino rat models against caffeine induced spermatotoxicity in a dose dependent manner.

### How to cite this article:

U.B. Ekaluo, E.V. Ikpeme, U.U. Uno, S.O. Umeh and F.A. Erem, 2016. Protective Role of Aqueous Guava Leaf Extract Against Caffeine Induced Spermatotoxicity in Albino Rats. Research Journal of Medicinal Plant 10 (1): 98-105, 2016. (DOI: 10.3923/rjmp.2016.98.105)

## Antimicrobial Activity of Medicinal Plant: *Parthenium hysterophorus* L.

M. Kaur, N.K. Aggarwal and R. Dhiman

**Abstract:** Plants produce a diverse range of bioactive molecules, making them rich source of different types of medicines. In the present study, the *in vitro* antimicrobial activity of medicinal plant *Parthenium hysterophorus*, was evaluated by using chloroform, methanol, acetone, ethyl acetate, petroleum ether and distilled water. The extracts were tested against *Escherichia coli*, *Pseudomonas aeruginosa*, *Candida albicans*, *Bacillus subtilis*, *Saccharomyces cerevisiae* and *Staphylococcus aureus* by using agar well diffusion method. Ciprofloxacin and Amphotericin were used as standard antibiotics. Some of the solvent extracts of

the plant showed the highest activity against some pathogenic microorganisms than standard antibiotics used. The findings provide support for the use of this plant in producing new bioactivity compounds having antimicrobial activity.

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M. Kaur, N.K. Aggarwal and R. Dhiman, 2016. Antimicrobial Activity of Medicinal Plant: *Parthenium hysterophorus* L. Research Journal of Medicinal Plant 10 (1): 106-112, 2016. (DOI: 10.3923/rjmp.2016.106.112)

**Comparative Study of Potential Anti-Cancerous and Cardio Protective Activities of Methanolic Leaf Extract of *Cyclea barbata* and *Entadapursaetha***

Mohammad Nazmul Alam, Md. Faruk, Ahmad Ibtehaz Chowdhury, Shekh Sabbir Ahmed, Md. Foyez Ahmad, Mitali Debnath and Mohammed Akter Sayeed

**Abstract:** The comparative study was aimed to evaluate the potential anticancerous and cardioprotective activities of methanolic leaf extract of *Cyclea barbata* and *Entadapursaetha*. The screening of anticancerous activity was performed using brine shrimp lethality bioassay while the cardioprotective activity was evaluated using the *in vitro* clot lysis model. Significant anticancerous activity was found for methanolic leaf extract of *C. barbata* whereas moderate effect was found for methanolic leaf extract of *E. pursaetha* and it was compared with the standard drug vincristine sulfate in the brine shrimp lethality bioassay. In the present study, the LC<sub>50</sub> values of methanolic crude extract of *C. barbata*, *E. pursaetha* and vincristine sulfate were 104.04, 330.31 and 12.59 µg mL<sup>-1</sup>, respectively. In cardioprotective study, it was found that *C. barbata* and *E. pursaetha* showed 45.69±1.96 and 38.19±1.83% of clot lysis, respectively. Between the plants studied *C. barbata*, showed very significant (p<0.05) percentage of clot lysis than *E. pursaetha* compared to reference drug streptokinase which is 63.54±2.61%. The results of this study demonstrated that the leaf of these plants possess promising anticancerous activity on brine shrimp as well as significant cardioprotective activity *in vitro* when tested on human blood.

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Mohammad Nazmul Alam, Md. Faruk, Ahmad Ibtehaz Chowdhury, Shekh Sabbir Ahmed, Md. Foyez Ahmad, Mitali Debnath and Mohammed Akter Sayeed, 2016. Comparative Study of Potential Anti-Cancerous and Cardio Protective Activities of Methanolic Leaf Extract of *Cyclea barbata* and *Entadapursaetha*. Research Journal of Medicinal Plant 10 (1): 113-119, 2016. (DOI: 10.3923/rjmp.2016.113.119)

**Cytotoxicity and Genotoxicity of *Tridax procumbens* L. in *Allium cepa***

Gustavo Franciscatti Mecina, Michelly Cristina Montenoti, Vanessa Marques de Oliveira Moraes, Luciana Pereira Silva and Regildo Marcio Gonçalves da Silva

**Abstract:** With increased consumption of medicinal plants in alternative treatments and the search for new compounds with biological activity, the need arose to investigate the toxic, carcinogenic and teratogenic potential of these compounds. Among many species, *Tridax procumbens* stands out for being a plant commonly used in folk medicine, finding varying reports of its use. This study was conducted to investigate cytotoxic and genotoxic effects of ethanolic, aqueous and hydroethanolic extracts of this species and a phytochemical screening of different classes present in extract by HPLC-PAD. *Allium cepa* seedlings were exposed to extracts for 48 h. After this period, the seedlings were replaced in distilled water. Then the roots were hydrolyzed in hydrochloric acid (HCl) 1 N and stained with Schiff reactive. The roots were placed on slides, then was added a drop of 2% acetic carmine and covered with coverslips and were observed 5000 cells per treatment. It was found that different extracts led to a reduction in mitotic index when compared with negative control and still presented changes in death rate. In this context, results suggest that extracts of *T. procumbens* have inhibitory effect on mitosis and mutagens on cell division in root meristematic cells of *A. cepa*.

**How to cite this article:**

Gustavo Franciscatti Mecina, Michelly Cristina Montenoti, Vanessa Marques de Oliveira Moraes, Luciana Pereira Silva and Regildo Marcio Gonçalves da Silva, 2016. Cytotoxicity and Genotoxicity of *Tridax procumbens* L. in *Allium cepa*. Research Journal of Medicinal Plant 10 (1): 120-126, 2016. (DOI: 10.3923/rjmp.2016.120.126)

## Studies on Nutraceutical Properties of *Caesalpinia bonducella* L.: An Indian Traditional Medicinal Plant

S. Manikandaselvi, V. Vadivel and P. Brindha

**Abstract:** *Caesalpinia bonducella* L. belongs to the family Caesalpiniaceae is distributed throughout India and commonly known as Kazhichikkai in Tamil. In the present study, attempts were made to assess the physicochemical, phytochemical, nutritional and pharmacological properties of *C. bonducella* seeds. Powder microscopy revealed characteristics features of *C. bonducella* seeds. Physicochemical properties such as foreign matter (0.97%), loss on drying (8.83%), total ash (3.37%), solubility in water (28.8%) and extractive value in water (6.7%) were revealed by the sample. Phytochemical analysis revealed the presence of alkaloid (0.12 mg g<sup>-1</sup>), phenol (0.60 mg g<sup>-1</sup>), flavonoid (0.33 mg g<sup>-1</sup>), tannin (4.90 mg g<sup>-1</sup>) and lignin (74.7 mg g<sup>-1</sup>). The nutritional profile of *C. bonducella* revealed the presence of carbohydrate (18.4 mg g<sup>-1</sup>), proteins (17.6 mg g<sup>-1</sup>), fat (3.6 mg g<sup>-1</sup>), fibre (3.3 mg g<sup>-1</sup>) and energy value (73.6 kcal). Presence of different phytochemicals was confirmed in the hexane and chloroform extracts of *C. bonducella* using HPTLC and GC-MS techniques. The aqueous extract (1000 µg mL<sup>-1</sup>) recorded anti-inflammatory activity in terms of inhibition of protein denaturation (94.15%), inhibition of protease activity (32.40%) and HRBC membrane stabilization (81.66%). Strong antioxidant activity was noticed in aqueous extract based on the results of DPPH radical scavenging (90%) and lipid peroxidation (99.69%) assays, which are higher than that of BHT standard. Thus the present investigation provides scientific evidence for the folk-lore claims for medicinal value of *C. bonducella* seeds.

### How to cite this article:

S. Manikandaselvi, V. Vadivel and P. Brindha, 2016. Studies on Nutraceutical Properties of *Caesalpinia bonducella* L.: An Indian Traditional Medicinal Plant. Res. J. Med. Plant, 10 (2): 127-139. (DOI: 10.3923/rjmp.2016.127.139)

## Effect of Methanol Extract of *Ricinus communis* (RC) Seeds on Blood Glucose Levels, Antioxidant Enzymes and Hematological Parameters of Alloxan Induced Male Wistar Albino Rats

E. Joshua Parker, Nweje-Anyalowu Paul Chukwuemeka, O.F.C. Nwodo and Uroko Robert Ikechukwu

**Abstract:** The study investigated the effect of methanol extract of *R. communis* seeds on blood glucose levels, antioxidant enzymes and hematological parameters of alloxan induced male Wistar albino rats. The methanol extract had LD<sub>50</sub> value above 5000 mg kg<sup>-1</sup> b.wt. After alloxan induction of diabetes, a significant (p<0.05) decrease in blood glucose levels were observed in all the test groups treated with the extract, when compared with positive control (group 2). The extract treated groups showed significant (p<0.05) increase in PCV, Hb, RBC and significant decrease (p<0.05) in WBC counts, when compared with positive control, however, no significant (p<0.05) difference was observed in total serum protein. With exception of group 4, malondialdehyde concentration decreased significantly (p<0.05) in test groups relative to positive control. A concentration dependent increase in glutathione activity in extract treated groups close to metformin treated group was observed when compared with normal and positive controls respectively. At higher concentrations of the extract, superoxide dismutase activity increased significantly (p<0.05) when compared with positive control. At lower concentrations of the extract, catalase activity increased significantly (p<0.05) close to metformin treated group but decreased significantly (p<0.05) with increasing concentrations of the extract close to positive control. The results of the study showed that the methanol extract of RC possess antihyperglycaemic properties and ability to modulate activities of antioxidant enzymes. It also suggests that the extract has positive effect on the hematological parameters.

### How to cite this article:

E. Joshua Parker, Nweje-Anyalowu Paul Chukwuemeka, O.F.C. Nwodo and Uroko Robert Ikechukwu, 2016. Effect of Methanol Extract of *Ricinus communis* (RC) Seeds on Blood Glucose Levels, Antioxidant Enzymes and Hematological Parameters of Alloxan Induced Male Wistar Albino Rats. Res. J. Med. Plant, 10 (2): 140-149. (DOI: 10.3923/rjmp.2016.140.149)

## Phytochemical Screening, Anti-Inflammatory and Analgesic Activities of Formulation Cream of *Silene vulgaris*

Smahane Boukhira, Latifa El Mansouri, Mouna Bouarfa, Ahmed Ouhammou, Sanae Achour, Maroua Khadhr and Dalila Bousta

**Abstract:** The present study evaluates the anti-inflammatory and analgesic activities of cream formulation of *Silene vulgaris* leaves in rats. The anti-inflammatory effect of cream of *Silene vulgaris* at doses of 10 and 20% applied topically and was evaluated in rats during 6 h using the acute anti-inflammatory model of carrageenan-induced paw edema and during 7 days by chronic anti-inflammatory activity of cotton pellet induced granuloma. The analgesic activity using two *in vivo* models: acetic acid-induced writhing test and plantar test (Hargreaves method) was also studied. Furthermore, the acute toxicity of topical cream was evaluated in rats. Finally, a phytochemical analysis of *Silene vulgaris* was performed. The resulted demonstrated a significant reduction of inflammation after carrageenan-induced rat paw edema in treated group with cream of *S. vulgaris* at 20% compared to Diclofenac (85.71 and 58.33%, respectively). Furthermore, a significant reduction of granuloma weight of cotton pellet was noted in treated group with *S. vulgaris* cream compared to control ( $1.96\pm 0.04$ ,  $2.59\pm 0.2$ , respectively) with an ED50 of 17.2. In analgesic test, the number of writhings induced by acetic acid solution was decreased by  $35.5\pm 1.77$  in treated group with cream of *Silene vulgaris* at 20%. A potential peripheral analgesia on acetic acid-induced writhing and also in the plantar test was observed. In addition, topical application of cream did not produce any mortality and any visible signs of toxicity and biochemical parameters. The phytochemical profile of *Silene vulgaris* showed some secondary metabolites, mostly flavonoids, tannins and saponins. These data support the traditional uses of *Silene vulgaris* for acute, chronic inflammation and pain. However, more research is needed for its use in clinical studies.

### How to cite this article:

Smahane Boukhira, Latifa El Mansouri, Mouna Bouarfa, Ahmed Ouhammou, Sanae Achour, Maroua Khadhr and Dalila Bousta, 2016. Phytochemical Screening, Anti-Inflammatory and Analgesic Activities of Formulation Cream of *Silene vulgaris*. Res. J. Med. Plant, 10 (2): 150-158. (DOI: 10.3923/rjmp.2016.150.158)

## Characterization of Silver Nanoparticles Synthesized Using the Extract of the Leaves of *Tridax procumbens*

R. Sangeetha, Pavithra Niranjana and N. Dhanalakshmi

**Abstract:** The synthesis, characterization and application of biologically synthesized nanomaterials have become the prime area of study in nanotechnology. Green synthesis of nanoparticles using plant extracts is being explored globally owing to the absence of disadvantages associated with conventional methods. This study reports the synthesis of silver nanoparticles using the extract of *Tridax procumbens* Linn. leaves, characterization of the synthesized nanoparticles and the evaluation of blood clotting activity of the nanoparticles. Ultraviolet-Visible (UV-Vis) spectroscopy confirmed the synthesis of nanoparticles. X-Ray Diffraction (XRD), Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscopy (SEM) studies revealed the characteristics of the nanoparticles synthesized. The nanoparticles have been found to reduce the time taken for blood clotting significantly ( $p = 0.01$ ) and thus proved to be efficient hemostatic agents. *Tridax procumbens* leaves exhibit hemostatic activity by promoting blood clotting. The nanoparticles synthesized using extract of the leaves of *T. procumbens* were found to promote blood coagulation better than the plant extract. The hemostatic potential of the nanoparticles can be further validated *in vivo*.

### How to cite this article:

R. Sangeetha, Pavithra Niranjana and N. Dhanalakshmi, 2016. Characterization of Silver Nanoparticles Synthesized Using the Extract of the Leaves of *Tridax procumbens*. Res. J. Med. Plant, 10 (2): 159-166. (DOI: 10.3923/rjmp.2016.159.166)



## Contents of Important Phenolic Compounds in Indigowoad (*Isatis indigotica* Fort.) and Plains Wild Indigo (*Baptisia bracteata*) Roots

Audrey Chingzu Chang, Gerald L. Riskowski, Yung Chung Chang and Wai Kun Chan

**Abstract:** The levels of some phenolic compounds were determined for Indigowoad Root (IR) and the Plains Wild Indigo Root (PWIR) to provide insights on their health benefits. The IR is a well-known medicinal plant as well as an edible plant root similar to daikon, sweet potatoes, yam, ginseng and carrots. The PWIR roots, leaves and seeds have traditionally been used by Native Americans for medicinal purposes and its extracts are consumed to enhance health. Total phenolic, total flavonoid, p-coumaric acid, gallic acid, syringic acid and vanillic acid contents were determined. Overall, the phenolic compounds of PWIR and IR either exceeded or compared favorably with other commonly consumed root vegetables. The phenolic compounds of the PWIR generally exceed those of IR. Based on the findings of this study, further research on IR and PWIR may be warranted to determine their possible use as additional sources of phenolic compounds and other desirable constituents to benefit human health.

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## Use of Partial Least Square-Discriminant Analysis Combined with Mid Infrared Spectroscopy for Avocado Oil Authentication

Abdul Rohman, Fajar A. Lumakso and Sugeng Riyanto

**Abstract:** The falsification of high price edible oils such as avocado oil become a serious problem in the oil trade. Simple and rapid methods for identifying and discriminating authentic Avocado Oil (AO) from its adulterants are increasing demand. This current work proposes the use of combination of mid infrared spectroscopy technique with Partial Least Square-Discriminant Analysis (PLS-DA) as direct and rapid tool to discriminate authentic AO from the adulterants of Soybean Oil (SO) and Grape Seed Oil (GSO) in binary and ternary mixture. Discrimination was carried out using the chemometrics approach, namely PLS-DA based on the infrared spectral data. The selected frequency used for authentication of AO was 1500-750  $\text{cm}^{-1}$ . Special spectral treatment of smoothing and offset correction was implemented to reduce the noise and background spectral. Furthermore, the high accuracy and clear discrimination were obtained with 100% correctness for binary mixture analysis and 93.3% for ternary mixture.

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## *Solanum nigrum* Leaf: Natural Food Against Diabetes and its Bioactive Compounds

Nandita Dasgupta, S.P. Muthukumar and Pushpa S. Murthy

**Abstract:** In the present study, antidiabetic activity of the leaf extract of *Solanum nigrum* (SN), a traditional edible plant was investigated in streptozotocin-induced diabetic rats. Novel microwave extraction method was used to get more activity and bioactive compound. The SN leaf extract indicated significant inhibition for glucose diffusion and also for other pancreatic enzymes such as  $\alpha$ -amylase ( $\text{IC}_{50}$ - $39 \pm 0.06 \mu\text{g mL}^{-1}$ ) and  $\alpha$ -glucosidase ( $\text{IC}_{50}$ - $78.8 \pm 0.7 \mu\text{g mL}^{-1}$ ). The antidiabetic activity of the SN leaf extract (125, 250 and 375  $\text{mg kg}^{-1}$ ) was investigated in streptozotocin-induced diabetic rats. The oral administration of leaf extract (375  $\text{mg kg}^{-1}$ ) significantly decreased hyperglycemia, urine sugar level, total cholesterol and triglycerides. It also

reduced and increased water and food intake respectively. Furthermore, it had an effect on increased kidney function, which reflected in decreased urine output and urine sugar compared to diabetic. *Solanum nigrum* contained polyphenols ( $14.72 \pm 0.37\%$  GAE) and major bioactive molecules such as p-coumaric acid, quercetin, catechol, caffeic acid, gallic acid and protocatechuic acid was analyzed by High Performance Liquid Chromatography (HPLC) and its beneficial effects on diabetic status were evaluated. The results demonstrate the beneficial effect of the SN leaf extract as functional food or as adjuvant in streamlining diabetes by consuming as daily or frequent intake in the form of natural food.

**How to cite this article:**

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**Influence of Different Cytokinins on the Growth, [6]-Gingerol Production and Antioxidant Activity of *in vitro* Multiple Shoot Culture of Ginger (*Zingiber officinale* Roscoe)**

Erika A. Macalalad, Christopher Jay T. Robidillo and Eufrocinio C. Marfori

**Abstract:** The growth, [6]-gingerol production and antioxidant activity of ginger multiple shoots cultured in MS medium containing  $1 \text{ mg L}^{-1}$   $\alpha$ -naphthalene acetic acid (NAA) in combination with varying levels of different cytokinins, namely, benzylaminopurine (BAP), kinetin (KIN) and thidiazuron (TDZ) were determined. The [6]-gingerol content ranged from 125-344  $\mu\text{g}$  per culture bottle, with the highest production found in ginger shoot cultures planted in MS medium containing  $2 \text{ mg L}^{-1}$  BAP. Growth was inversely correlated to [6]-gingerol production attributed to the negative effects of oxidized phenols on plant development. The antioxidant activity, as determined by FRAP assay, was highly correlated with total phenolics and [6]-gingerol content.

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