CONTENTS

REVIEW ARTICLES
Cholesterol Ester Transfer Protein: A Potential Target for the Treatment of Coronary Artery Disease
HARSHA PATEL, JIGNA SHAH, SUNITA PATEL AND I. S. ANAND 735-740

Properties and Formulation of Oral Drug Delivery Systems of Protein and Peptides
A. SEMALTY, MONA SEMALTY, R. SINGH, S. K. SARAF AND SHUBHINI SARAF 741-747

RESEARCH PAPERS
Fabrication and Evaluation of Asymmetric Membrane Osmotic Pump
C. S. CHAUHAN, M. S. RANAWAT AND P. K. CHOUDHURY 748-752

Studies of Disintegrant Properties of Seed Mucilage of Ocimum gratissimum
RAVIKUMAR, A. A. SHIRWAIR, ANNIE SHIRWAIR, S. LAKHISHMANA PRABU, R. MAHALAXMI, K. RAJENDRAN AND C. DINESH KUMAR 753-758

Simultaneous Spectroscopic Estimation of Ezetimibe and Simvastatin in Tablet Dosage forms
S. J. RAJPUT AND H. A. RAJ 759-762

Formulation and Optimization of Carbamazepine Floating Tablets
D. M. PATEL, N. M. PATEL, N. N. PANDYA AND P. D. JOGANI 763-767

Effects of Medicago sativa on Nephropathy in Diabetic Rats
M. S. MEHRANJANI, M. A. SHARIATZADEH, A. R. DESFULIAN, M. NOORI, M. H. ABNOSI AND Z. H. MOGHADAM 768-772

Development of Hospital Formulary for a Tertiary Care Teaching Hospital in South India
R. J. D’ALMEIDA, LEELAVATHI D. ACHARYA, PADMA G. M. RAO, S. S. PRAKASH, R. P. VENKATESWARLU AND P. D. JOGANI 773-779

Simultaneous Spectrophotometric Estimation of Rosiglitazone Maleate and Glimepiride in Tablet Dosage Forms
ANJU GOYAL AND I. SINGHVI 780-783

Preparation, Characterization and Antimicrobial Activity of Acrylate Copolymer Bound Amoxyclillin
J. S. PATIL, H. R. PATIL, N. K. PATEL AND D. MADAMWAR 784-790

Haematonic Evaluation of Lauha Bhasma and Mandura Bhasma on HgCl2-Induced Anemia in Rats

RPHPLC Method for the Estimation of Glibenclamide in Human Serum
S. D. RAJENDRAN, B. K. PHILIP, R. GOPINATH AND B. SURESH 796-799

2D QSAR of Arylpiperazines as 5-HT1A Receptor Agonists
URMILA J. JOSHI, R. K. DUBE, F. H. SHAH AND S. R. NAIR 800-804

Antiproliferative and Cancer-chemopreventive Properties of Sulfated Glycosylated Extract Derived from Leucaena leucocephala
AMIRA M. GAMAL-ELDEEN, H. AMER, W. A. HELMY, H. M. RAGAB AND ROBA M. TALAAT 805-811

SHORT COMMUNICATIONS
Simultaneous Derivative and Multi-Component Spectrophotometric Determination of Drotaverine Hydrochloride and Mefenamic Acid in Tablets

Diuretic Activity of Lagernaria siceraria Fruit Extracts in Rats
B. V. GHULE, M. H. GHANTE, P. G. YEOLE AND A. N. SAOJI 817-819

Simultaneous Spectrophotometric Estimation of Furosamide Using Hydrotropic Solubilization Phenomenon
R. K. MAHESHWARI, S. DESWAL, D. TIWARI, N. ALLI, B. POHLEN AND S. JAIN 822-824

In Vivo Pharmacokinetic Studies of Prodrugs of Ibuprofen
ABHA Doshi AND S. G. DESHPANDE 824-827

Protective Effect of Tamardindus indica Linn Against Paracetamol-Induced Hepatotoxicity in Rats
B. P. PIMPLE, P. V. KADAM, N. S. BADGUJAR, A. R. BAFNA AND M. J. PATIL 827-831

Simultaneous Estimation of Atorvastatin Calcium and Amodipine Besylate from Tablets
P. MISHRA, ALKA GUPTA AND K. SHAH 831-833

Development and Validation of a Simultaneous HPTLC Method for the Estimation of Olmesartan medoxomil and Hydrochlorothiazide in Tablet Dosage Form
N. J. SHAH, B. N. SUHAGIA, R. R. SHAH AND N. M. PATEL 834-836

Orodispersible Tablets of Meloxicam using Disintegrant Blends for Improved Efficacy
P. V. SWAMY, S. H. AREEFULLA, S. B. SHIRSHAND, SMITHA GANDRA AND B. PRASHANTH 836-840

Spectrophotometric Method for Ondansetron Hydrochloride SRADHANJALI PATRA, A. A. CHOUDHURY, R. K. KAR AND B. B. BARIK 840-841

HPTLC Determination of Artesunate as Bulk Drug and in Pharmaceutical Formulations
S. P. AGARWAL, A. ALI AND SHIPRA AHUJA 841-844

Simultaneous Spectrophotometric Estimation of Metformin and Regaplinide in a synthetic mixture
R. R. SHAH AND B. N. S. PATIL 844-846

Synthesis and Antiinflammatory Activity of Substituted (2-oxochromen-3-yl) benzamides
V. MADDI, S. N. MAMEDESAI, D. SATYANARAYANANDA AND S. SWAMY 847-849

Evaluation of Hepatoprotective Activity of Ethanol Extract of Pitrospermum acerifolium Ster Leaves
S. KARHPATE, G. VADNERKAR, DEEPTI JAIN AND S. JAIN 850-852

New Antihistaminic Agents: Synthesis and Evaluation of H1-Antihistaminic actions of 3-((N,N-Dialkylamino)alkyl)-1,2,3,4-tetrahydro-1H-thioquinazolin-4(3H)-ones and Their oxo Analogues
M. B. RAJU, S. D. SINGH, A. R. RAGHU RAM RAO AND K. S. RAJAN 853-856
Diuretic Activity of Lagenaria siceraria Fruit Extracts in Rats

B. V. GHULE*, M. H. GHANTE, P. G. YEOLE AND A. N. SAOJI
Institute of Pharmaceutical Education and Research, Borgaon (Meghe), Wardha - 442 001, India

Ghule, et al.: Diuretic activity of Lagenaria siceraria

Vacuum dried juice extract and methanol extract of the fruits of Lagenaria siceraria Mol. have been evaluated for its diuretic activity in albino rats. Different parameters viz. total urine volume (corrected for water intake during the test period), urine concentration of electrolytes such as sodium, potassium and chloride have been evaluated. The rats treated with vacuum dried Lagenaria siceraria juice extract (LSJE) and Lagenaria siceraria methanol extract (LSME) (100-200 mg/kg; p.o.) showed higher urine volume when compared to the respective control. Both LSJE and LSME have exhibited dose-dependent increase in the excretion of electrolytes when compared to control group. The elevated diuretic potential of LSFE and LSM E was statistically significant (P<0.05) and comparable to that of the standard diuretic agent furosemide (20 mg/kg; i.p.).

Key words: Lagenaria siceraria, fruit juice and methanol extracts, Electrolytes concentration, diuretic activity

The plant, Lagenaria siceraria (Mol.) Standl. (Family: Cucurbitaceae), known as bottle gourd, is a common fruit vegetable used throughout the India. Since time immemorial the fruit is used as diuretic, cardio-tonic, cardio-protective and nutritive agent. The fruit is also reported to have good source of vitamin B complex and choline along with fair source of vitamin C and β-carotene. It is also reported to contain cucurbitacins, fibers and polyphenols1-4. Two sterols namely campesterol and sitosterol have been identified and isolated from the petroleum ether fraction of methanol extract of L. siceraria fruits, which is reported to possess antihepatotoxic activity5. LS fruit has been reported to possess antioxidant activity6, hypolipidemic and antihyperlipidemic effects in normocholesterolemic and triton-induced hyperlipidemic rats7. HPLC analysis of methanolic extract from plant shows the presence of flavone-C glycosides8. Lagenin, a novel protein has been isolated from lyophilized extract of seeds9.

Literature survey revealed that the plant extract has yet not been screened for its traditional diuretic activity in experimental animals. Therefore the present study was carried out to provide pharmacological evidence for the folklore medicinal consideration of fruit plant as diuretic.

L. siceraria fruits were collected from the local farms of Wardha District, Maharashtra in the month of October-November, the botanical authentication was done by the authority of Department of Botany, Nagpur University, Nagpur and voucher specimen is lodged in our research laboratory for the future reference.

The fresh and semi-riped fruits were cut into small pieces and fed to a juicer to collect the juice and the collected juice was filtered and vacuum dried to obtain L. siceraria fruit juice extract (LSJE, yield: 18 % w/w). Also the fruits were sliced using a home slicer and the slices obtained were shade-dried, pulverized and passed through a 20 mesh sieve. The dried, coarsely powdered plant material was extracted with 90% methanol using a Soxhlet apparatus. The solvent was evaporated under vacuum which extracted with 90% methanol using a Soxhlet apparatus. The solvent was evaporated under vacuum which gave semisolid mass (23% w/w) with respect to the dried powder. The preliminary phytochemical screening was carried out to detect the chemical constituents of both fresh fruit juice extract as well as methanol extracts (LSME) which revealed the presence of steroids, saponins and polyphenols, carbohydrates, proteins. Both the extracts were stored in tight containers in dessicator.

Adult Wistar rats of either sex weighing 170-200 g were used for experiment. The animals were housed in standard metal cages provided with food and water
while the 5th and 6th groups were treated with normal saline (control) and furosemide (20 mg/kg, i.p.), respectively. Immediately after administration, animals were deprived and fasted of water for 18 h prior to experimentation. On the day of experimentation, first two groups were administered with LSJE (100 mg/kg and 200 mg/kg, p.o.). The 3rd and 4th groups were treated with LSME (100 mg/kg and 200 mg/kg, p.o.), while 5th and 6th groups were treated with normal saline (control) and furosemide (20 mg/kg, i.p.), respectively. Immediately after administration, animals were placed in metabolic cages (2 per cage) specially designed to separate urine and fecal matter and kept at room temperature (25±0.5°C). During the period of study no food, water was made available to the animals. The total volume of urine was collected and measured from control, standard and extract treated groups up to 5 h of administration. The parameters monitored for each individual rat were total urine volume (corrected for water intake during the test period and measured after 24 h of treatment) and urine concentration of Na⁺, K⁺ and Cl⁻. Na⁺ and K⁺ concentration were measured by flame photometry and Cl⁻ concentration was estimated as NaCl by titration with silver nitrate solution (2.096 g/l) using one drop of 5% potassium chromate solution as indicator.

Diuretics relieve pulmonary congestion and peripheral edema. These agents are useful in reducing the syndrome of volume overload, including orthopnea and paroxysmal nocturnal dyspnoea. They decrease plasma volume and subsequently venous return to the heart (preload). This decreases cardiac workload, oxygen demand and plasma volume, thus decreasing blood pressure. Thus, diuretics play an important role in hypertensive patients.

The LSJE and LSME were found to be active in renal system of rats. Dose-response studies showed the maximal activity at 200 mg/kg, p.o. by LSJE and LSME. The excretion of sodium, potassium and chloride has also been significantly increased. The results were compared with those of furosemide (20 mg/kg; i.p.) treated group. All the data are expressed as mean±SEM and analyzed by ANOVA followed by Dunnett’s t-test (n=6).

Table 1: Effects of LSJE and LSME on Excretory Parameters

<table>
<thead>
<tr>
<th>Treatment (mg/kg, p.o.)</th>
<th>Measured parameters of experimental groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total urine volume (ml/24 h)</td>
</tr>
<tr>
<td>Control (Saline)</td>
<td>18.70±0.34</td>
</tr>
<tr>
<td>Furosemide-20</td>
<td>42.40±0.21*</td>
</tr>
<tr>
<td>LSJE-100</td>
<td>20.20±0.36*</td>
</tr>
<tr>
<td>LSME-200</td>
<td>25.30±0.92*</td>
</tr>
<tr>
<td>LSJE-200</td>
<td>22.50±0.78*</td>
</tr>
<tr>
<td>LSME-200</td>
<td>27.10±0.58*</td>
</tr>
</tbody>
</table>

Each value is mean±SEM (n=6); *Denotes significant difference when compared to control values at P<0.05 (ANOVA followed by Dunnett’s t-test); LSJE: Lagenaria siceraria fruit juice extract; LSME: Lagenaria siceraria methanol extract.

REFERENCES

Determination of Racecadotril by HPLC in Capsules

S. L. PRABU1, T. SINGH1, A. JOSEPH2, C. DINESH KUMAR3 AND A. SHIRWAIKAR4*

1Department of Pharmaceutical Quality Assurance, 2Department of Pharmaceutical Chemistry, 3Department of Pharmacognosy and 4Department of Pharmaceutics, Manipal College of Pharmaceutical Sciences, Manipal - 576 104, India

Prabu, et al.: HPLC Determination of Racecadotril

A simple, precise and rapid RP-HPLC method was developed for the determination of racecadotril in a pharmaceutical formulation using gemfibrozil as internal standard. Ratio of the peak area of analyte to internal standard was used for quantification. The chromatographic separation was carried out by using a Reverse Phase C18 column (BD S-Hypersil). The mobile phase consisting of a mixture of 20 mM phosphate buffer (pH 3.5) and acetonitrile in the ratio of (40:60) with detection at 230 nm at a flow rate of 1 ml/min was employed. The method was statistically validated for linearity, accuracy and precision. The elution time was 6.9 min for racecadotril and 9.8 min for gemfibrozil. The simplicity and accuracy of the proposed method ensures its use in routine quality control analysis of pharmaceutical formulations.

Key words: Racecadotril, RP-H PLC estimation

Racecadotril (RAC), is chemically known as [2-{2(acetylsulfanylmethyl)-3-phenyl-propanoyl} amino acetic acid benzyl ester], which is a prodrug of the enkephalinase inhibitor thiorphan (fig. 1). It gets rapidly converted into thiorphan which interacts specifically with the active site of enkephalinase. The drug is used for the treatment of acute diarrhea of bacterial and viral aetiology. Since this drug is being marketed in domestic and international market, there is a need to develop a simple assay procedure for the determination of this drug, particularly in its pharmaceutical formulations for quality control purpose. The availability of an HPLC method with high sensitivity and selectivity would be very useful.

RAC (assigned purity 99.8%) was procured as a gift sample from Dr. Reddy’s Laboratories Ltd., Hyderabad, India, and gemfibrozil (GEM) was a gift sample from Sun Pharmaceutical Industry Ltd., Vadodara, India. HPLC grade acetonitrile and water procured from Ranbaxy Fine Chemicals Limited, SAS Nagar, India and Qualigens Chemicals, India, respectively were used in this study. Potassium dihydrogen phosphate was obtained from S. D. Fine Chemicals, Mumbai. Commercially available RAC capsules claimed to contain 100 mg of the drug were procured from the local pharmacy (Zedott, Torrent Pharmaceuticals, Ahmedabad, India).

Fig. 1. Typical HPLC chromatogram of racecadotril