



**Fig. 2: The structure of the compound isolated from the methanol extract of *Capparis sepiaria* root.**

fect against thermal noxious stimuli may be elicited through opioid receptors<sup>12</sup> or through modulation several neurotransmitters involved in the relevant phenomena<sup>13</sup>, similarly the inhibition of carrageenan-induced rat paw oedema indicates anti-inflammatory activity. Serotonin, histamine, bradykinin, prostaglandins have been identified as mediators for carrageenan-induced hindpaw oedema<sup>14</sup>. The mechanism of anti-inflammatory action of *Capparis sepiaria* may be related to the inhibition of enzymes responsible for prostaglandin biosynthesis, increase vascular permeability or inhibition of degranulation of mast cells.

## ACKNOWLEDGEMENTS

We thank The Director and Prof. S. C. Chaturvedi, Head Department of Pharmacy, S.G.S.I.T.S. Indore.

## REFERENCES

1. Trease, G.E. and Evans, E.C., Eds., In; Pharmacognosy, 12th Edn., Bailliere Tindal, London, 1983, 185.
2. Kirtikar, K.R. and Basu, B.D., In; Indian Medicinal Plants, Vol. I, Lalit Mohan Basu, Allahabad, 1993, 195.
3. Juneja, T.R., Gaiind, K.N. and Dhavan. C.L., *Res. Bull.*, Panjab Univ. Sci., 1970, 21, 23.
4. Manzoor-I-Khuda, M. and Jeelani, N.A., *Pak. J. Sci.*, 1968, 11, 250.
5. Viquar-Uddine, A., Nargis, I., Shoib A. and Aziz Ur-Rahman, A., *J. Nat. Prod.*, 1992, 55, 1509.
6. Gaiind, K.N., Gandhi, K.S. and Juneja. T.R., *Phytochemistry*, 1975, 14, 1415.
7. Manzoor-I-Khuda and Kapadi, M., *Pak. J. Sci.*, 1968, 11, 108.
8. Kirtikar, K.R. and Basu, B.D., In; Indian Medicinal Plants, Vol. I, Lalit Mohan Basu, Allahabad, 1993, 199.
9. Silverstein, R.M., Bassler, G.C. and Morrill, T.C., In; Spectroscopic Identification of Organic Compound, 5th Edn. John Wiley and sons, Inc., 1991. 7.
10. Winter, C.A., Risley, E.A. and Nuss, G.W., *Proc. Soc. Expt. Biol.*, 1962, 111, 544.
11. Davies, L.L., Reventos, J. and Walpole, A.L., *Brit. J. Pharm.*, 1946, 1, 246.
12. Duggan, A.W., North, R.A., *Pharmacol. Rev.*, 1983, 35, 219.
13. Crosland, J., In; Lewis's Pharmacology, 5th Edn., Churchill Livingstone, 1980, 385.
14. Larsen, G.L., Henson, P.M., *Annu. Rev. Immunol.*, 1983, 1, 235.

## Spectrophotometric Determination of Fluoxetine Hydrochloride

K. SUJATHA\*, K. CHITRA, P. ASHOK KUMAR, K. KIRANBABU AND J. VASANTHA.

Sri Ramachandra College of Pharmacy, Sri Ramachandra Medical College and Research Institute (DU), Porur, Chennai-600116.

Accepted 31 May 2004

Revised 19 February 2004

Received 24 February 2003

A new, simple, sensitive spectrophotometric method in ultraviolet region has been developed for the determination of fluoxetine hydrochloride in bulk and in dosage form. Fluoxetine hydrochloride shows maximum absorbance at 225 nm with apparent molar absorptivity of  $1.2388 \times 10^4$  l/mol.cm Beer's law was obeyed in the concentration range of 2.5-25  $\mu$ g/ml. Results of the analysis were validated statistically and by recovery studies.

\*For correspondence

E-mail: ulagaimano@yahoo.com

TABLE 1: RESULTS OF ASSAY AND RECOVERY STUDIES

Pharmaceutical Formulation	Label Claim (mg)	Amount Found*		% Recovery*	Standard Deviation	Co-efficient of variation
		(mg)	%			
Prodep (Sun Pharma)	20	20.02	100.1	100.2	0.0087	0.0430
Fludac (Cadila)	20	20.01	100.5	99.85	0.0150	0.0750
Platin (Esskay)	20	19.94	99.70	98.84	0.0291	0.1460

\*Mean of five determinations.

Fluoxetine hydrochloride, chemically, N-methyl-3-phenyl-1,3-( $\alpha,\alpha,\alpha$ -trifluoro-p-tolyloxy) propylamine hydrochloride, is an antidepressant drug<sup>1</sup>. It is readily absorbed through the GI tract and exhibits antidepressant activity by selectively inhibiting the uptake of serotonin. It is official in United States Pharmacopoeia<sup>2</sup>. Literature survey revealed that fluoxetine has been determined by HPLC<sup>3,4</sup>, GC<sup>5,6</sup>, fluorimetry<sup>7</sup> and colorimetric method<sup>8</sup> but no UV Spectrophotometric method so far has been reported for its analysis. The present investigation reports a simple UV spectrophotometric method for the analysis of fluoxetine hydrochloride in bulk as well as from capsule dosage forms.

A Systronics UV/Vis spectrophotometer-118 with 1 cm matched quartz cells was used. Pure fluoxetine hydrochloride was obtained as a gift sample from Micro Labs Ltd., Bangalore. The capsules were purchased from a local pharmacy. Fluoxetine hydrochloride (10 mg) was accurately weighed and dissolved in distilled water so as to give a stock solution of concentration of 1000  $\mu\text{g/ml}$ . Aliquots of 100  $\mu\text{g/ml}$  solution were transferred into six 10 ml volumetric flasks and volume was adjusted with distilled water to give final concentrations of 2.5, 5, 10, 15, 20 and 25  $\mu\text{g/ml}$ . The absorbance was measured at 225 nm against distilled water as a blank.

The proposed method was applied to the analysis of commercially available fluoxetine hydrochloride capsule. A quantity of mixed contents of twenty capsules equivalent to 10 mg of fluoxetine was transferred into a 100 ml volumetric flask. A small quantity of distilled water was added and shaken well to dissolve the drug. It was made up to volume and the solution is filtered. The filtrate was further diluted with distilled water to 10  $\mu\text{g/ml}$  concentration and the absorbance measured at 225 nm against distilled water as a blank.

Recovery studies were carried out by adding a known quantity of pure drug (1mg/ml) to the pre-analyzed formulations and the proposed method was followed. From the amount of drug found, percentage recovery was calculated. The proposed method of determination of fluoxetine hydrochloride showed molar absorptivity of  $1.2388 \times 10^4$  l/mol.cm and Sandell's sensitivity of  $0.0279 \mu\text{g/cm}^2/0.001$  absorbance unit. Linear regression of absorbance on concentration gave the equation  $y=0.0033+0.0354x$  with a correlation coefficient of 0.9992.

Relative standard deviation of 0.0009 was observed for analysis of five replicate samples, indicating precision and reproducibility. Fluoxetine hydrochloride exhibits its maximum absorption at 225 nm and obeyed Beer's law in the concentration range of 2.5-25  $\mu\text{g/ml}$ . The results of analysis and recovery studies are presented in Table 1. The percentage recovery value 99.4% indicates that there is no interference from the excipients present in the formulation. The developed method was found to be sensitive, accurate, precise and reproducible and can be used for the routine quality control analysis of fluoxetine hydrochloride in bulk drug and formulations.

#### ACKNOWLEDGEMENTS

The authors are grateful to M/S. Micro Labs Ltd., Bangalore for providing authentic sample of fluoxetine hydrochloride.

#### REFERENCES

- 1) Reynolds, J.E.F., Eds., In; Martindale, the Extra Pharmacopoeia, 30th Edn., the Pharmaceutical Press, London, 1993, 254.
- 2) United States Pharmacopoeia, USP convention, Inc., Rockville, MD., 2002, 758.
- 3) Risle, D.S., Peterson, J.A., Griffiths, K.L. and McCarthy, S. LC-

- GC, 1996, 14, 1040.
- 4) Parmar, Y., Das Gupta, V. and Behtea, C., *Drug Develop. Ind. Pharm.*, 1992, 18, 257.
- 5) Sane, R.T., Jani, A.B., Ghadge, J.K., Vaidya, A.J. and Kotwal, S.S., *Indian Drugs*, 1992, 29, 237.
- 6) Reghuveer, S., Avadhanulu, A.B. and Pantulu, A.R.R., *Indian Drugs*, 1993, 30, 83.
- 7) Gonzalez, M.M.I. and Gonzalez, P.C., *Anal. Lett.*, 1997, 30, 2493.
- 8) Naik, M.T. Rokade, M.D. and Dhadke, P.M., *Indian J. Pharm. Sci.*, 1999, 61, 156.

---

## AntiHIV, Antibacterial and Antifungal Activities of Some 2,3-Disubstituted Quinazolin-4(3H)-ones

---

V. ALAGARSAMY<sup>1</sup>, R. REVATHI<sup>1</sup>, S. MEENA<sup>2</sup>, K. V. RAMASESHU<sup>2</sup>, S. RAJASEKARAN AND E. DE CLERCO<sup>3</sup>

Medicinal Chemistry Laboratory, J. S. S College of Pharmacy, Mysore-570015.

<sup>1</sup>Department of Pharmaceutical Chemistry, Periyar College of Pharmaceutical Sciences, Trichy-620021.

<sup>2</sup>Department of Pharmaceutical Chemistry, K. M. College of Pharmacy, Madurai-625107.

<sup>3</sup>Rege Institute for Medical Research, Minderbroederstrart-10, Belgium.

Accepted 2 June 2004

Revised 19 February 2004

Received 8 July 2003

**The title compounds 2-mercapto-3-(substitutedmethylamino) quinazolin-4(3H)-ones were synthesized by condensing the active hydrogen atom of 3-amino group of 3-amino-2-mercapto quinazolin-4(3H)-one with formaldehyde and the desired amines. Investigation of antimicrobial activity of the compounds was performed by agar dilution method against 6 pathogenic bacteria, 3 pathogenic fungi and antiHIV activity against replication of HIV-1 (IIIB) and HIV-2 (ROD) in MT-4 cells. The compounds exhibited significant antibacterial and antifungal activities.**

Quinazolines and condensed quinazolines are reported to show a variety of biological activities, such as antibacterial<sup>1</sup>, antifungal<sup>2</sup> and antiHIV<sup>3</sup>. Mannich bases are reported to possess potent antibacterial, antifungal and antiHIV activities<sup>4</sup>. In view of these facts and as a continuation of our earlier efforts carried out in our laboratory<sup>3,5</sup>, 2-mercapto-3-(substitutedmethylamino) quinazolin-4(3H)-ones were synthesized. The title compounds were synthesized by condensing the active hydrogen atom of 3-amino group of 3-amino-2-mercapto quinazolin-4(3H)-one with formaldehyde and the desired amines [Mannich reaction]. The starting material 3-amino-2-mercapto quinazolin-4(3H)-one was prepared from anthranilic acid using methods reported<sup>6</sup> from our laboratory. The title compounds (fig.1) were screened for antibacterial, antifungal activity by agar dilution method

and antiHIV activity against HIV-1(III B), HIV-2(ROD) in MT-4 cells.

Melting points were determined in open capillary tubes on a Thomas Hoover melting point apparatus and are uncorrected. IR spectra were recorded in KBr on a Perkin Elmer-841 grating spectrometer (cm<sup>-1</sup>), Mass spectra on a Varian Atlas CH-7 mass spectrometer at 70 ev and NMR Spectra on a Varian A-60 or EM-360 spectrometer, using TMS as internal standard. Elemental analysis was performed on a Carlo Erba 1108 CHN analyzer.

The starting material, 3-amino-2-mercapto quinazolin-4(3H)-one was synthesized by the following method. To a vigorously stirred solution of methyl anthranilate (3.02 g, 0.02 mol) in dimethyl sulfoxide (10 ml) at room temperature, carbon disulphide (1.6 ml, 0.026 mol) and sodium hydroxide (1.2 ml, 20 mol) were added during 30 min. After 30 min, dimethyl sulfate (2.5 g, 0.02 mol) was added drop wise at 5-

---

\*For correspondence

E-mail: Samy\_veera@yahoo.com