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Analgesic Activity of *Lonicera quinquelocularis* Leaf Extract

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ABSTRACT

The aim of the study was to determine analgesic activity of ethanolic extract of the *Lonicera quinquelocularis leaf extract* in *Wistar* albino rats. The maximum tolerated doses study was performed with the dose of 2000mg/kg and 150 and 300mg/kg body weight of EELQ, was selected as test-I and test-II respectively and Diclofenac sodium was used as standard drug for analgesic activity performed by Eddy's hot plate method, *Wistar* albino in rats. The EELQ showed the significant ($P<0.001$) analgesic effect at the dose of 150 and 300mg/kg body weight against control treated group. It is concluded that the oral administration of ethanol extracts of *Lonicera quinquelocularis* leaf extract showed significant analgesic effect from 60min. This effect may be attributed due to the presence phytochemicals such as flavonoids, tannins, steroids, triterpenoids, might be through the increase in serotonin level in brain.

1. INTRODUCTION

Algesia (pain) or nociception is an ill-defined, unpleasant bodily sensation, usually evoked by an external or internal noxious stimulus[i]. There are number of analgesics are available, acceptable and reliable synthetic for this condition but become a limited usage and restricted mainly the narcotics (morphine) and non-narcotics like salicylates, corticosteroids and most of professionals are aware as these drugs have side-effects, low response, interactions with cells and expensive, still we helplessly bank on them, just hoping for a better alternative. Traditional medicine has already been declared by WHO as promotive, preventive, curative and rehabilitative and can serve as an alternative in this regard[ii]. Thus, a novel phytochemicals as a good therapeutic drug candidate with potential effect is the demand of the physicians. Therefore in this study, we aimed to evaluate the analgesic activities of ethanol extract of *Lonicera quinquelocularis* leaves.

Lonicera quinquelocularis is a member of this genus widely distributed in dry sunny places between 750-3000m in many countries of Asia. In Pakistan, it is found in Baluchistan, Kurram, Chitral, Swat, Astor, Hazara, Murree hills, Poonch and Kashmir, large hairy shrub or a small tree, growing up to 5m tall. Bark is grey and the young branches are purplish in color. Ovate to broadly lance like leaves, 36.5 cm long, are hairy beneath. Paired flowers are borne in stalkless clusters in leaf axils. Flowers are 1.3cm across, finely hairy outside, cream colored, turning yellow. Flowers are 2 lipped, with the stamens and the style protruding out. Fruit is ovoid, upto 6 mm, green or white translucent[iii].

2. MATERIALS AND METHODS

2.1 Drug and reagents

Diclofenac sodium was procured commercially. All the chemicals and reagents (analytical reagent grade) were provided by Dhanvanthri College of Pharmaceutical Sciences, Mahabubnagar, Telangana, India).

2.2. Collection of Plant material

The fresh leaves of *Lonicera quinquelocularis* were collected and authenticated by botanist Dr. Madhava chetty, Assistant Professor, Department of Botany in S.V. University, Tirupathi, and A voucher specimen number (1189).

2.3. Preparation of Extract

Fresh leaves of *Lonicera quinquelocularis* were cleaned and dried under shade in clean dust free environment, grinded and stored in an air-tight container. The total 200g of course powder was extracted with 1 L of 90% ethanol in a soxhlet apparatus at 60-75°C for 48 hrs. The extract was concentrated by evaporation. The yield was about 15.60% and stored at 4˚C for future use. The solid EELQ was dissolved by using 1% v/v Tween-80 as a vehicle for oral administration[iv, v & vi].

2.4 Phytochemical screening

Phytochemical screening of the EELQ was performed according to standard procedures [vii, viii & ix].

2.5. Experimental animals

Wistar albino rats (150-200g), maintained under standard conditions (27 ± 2°C; relative humidity 60 ± 5%, light dark cycle of 12hrs) and fed with standard pellet diet and water *ad libidum* were used for present study. All the experimental protocols were duly approved by Institutional Animal Ethics Committee (Reg. No: 1477/PO/a/11/CPCSEA), Dhanvanthri College of Pharmaceutical Sciences, Mahabubnagar, Telangana, India.

2.6. Determination of maximum tolerated dose

EELQ leaf extract was studied for acute oral toxicity as per revised OECD guidelines No. 425 the overnight fasted rats was received a single oral dose (2000mg/kg, b.wt.) of EELQ extract by oral route. Rats were observed individually at least once during the first 30min after dosing, periodically during the first 24h and daily thereafter for a period of 14 days [x].

2.6. Biological study to evaluate Analgesic activity

2.6.1. Hot-plate test

The test was performed as described by hot plate methods of Eddy et al., 1950[x]. The basal reaction time of all animals for thermal heat was recorded. The animals which showed fore paw licking or jumping response within 2-8sec were selected for the study. Thirty minutes after the administration of test and reference compounds, the animals in all the five groups were individually exposed to the hot plate (Sisco) maintained at 55 ± 1°C. A cut off period of 60sec

was observed to avoid damage to the rat paw[xii]. The reaction time of animal to start paw licking or jump response or lifting one of its hind paw from the hot plate was taken as the hot plate latency[xiv]. The reaction time of each animal was observed at 30min interval upto 90min. The results were presented in Table 1 and Figure 1.

2.6. Statistical analysis

All the results were expressed as mean ± SEM. Data were analyzed by two-way analysis of variance (ANOVA) followed by Bonfori multiple comparison test as post hoc test using the software prism, version 5.03. The level of statistical significance considered was P< 0.05, when compared with the control group.

3. RESULTS

3.1. Phytochemical group test

Phytochemical analysis of ethanolic extract of EELQ indicated the presence of flavonoids, glycosides, steroids, tannins, phenolics and carbohydrates.

3.2 Maximum Tolerated Dose

The result of toxicity study showed that EELQ was not shown any signs of morbidity and mortality at a dose of 2000mg/kg body weight for 14 days of observation. Hence the biological evaluation was carried out at doses of 150 and 300mg/kg doses of extract.

3.3 Analgesic activity by Eddy's Hot plate test

This study establishes the analgesic activity of *Lonicera quinquelocularis* leaf extract. In this method, there was no significant difference in basal reaction time observed between all the treatment groups indicated that all the *Wistar* albino rats have equal sensitivity level to heat. The standard drug Diclofenac sodium (25mg/kg, i.p) shows significant (P<0.01 and <0.001) increase in reaction time after 60 and 90min respectively. The EELQ at a dose level 150 and 300mg/kg, body weight p.o. showed significant (P<0.05, P<0.01 and P<0.001) increase in reaction time after 60min when compared to distilled water treatment rats. The analgesic activity of the ethanol extract was comparable with the standard drug Diclofenac sodium, the data shown in Table 1 and Figure 1.

Table 1. Analgesic activity of Ethanolic extract of *Lonicera quinquelocularis* on Eddy's hot plate method *Wistar* albino in rats

Group	Treatment	Dose (Kg/p.o.)	Reaction time in Seconds			
			Basal	30Min	60Min	90Min
Control	Distilled Water	10ml	3.50±0.428	3.33±0.421	4.00±0.58	4.00±0.37
Standard	Diclofenac sodium	25mg	4.00±0.577	4.67±0.42	6.50±0.43**	10.50±0.76***
Test-I	EELQ	150mg	4.00±0.577	4.83±0.477	6.00±0.365*	8.17±0.31***
Test-II	EELQ	300mg	3.67±0.42	4.17±0.40	6.33±0.49**	9.00±0.68***

Values are expressed as mean±SEM (n=6); Statistical analysis of data was carried out by two way ANOVA followed by Bonfori multiples comparison test, *P<0.05, **P<0.01, ***P<0.001 compared to distilled water treated group; EELQ=Ethanolic extract of *Lonicera quinquelocularis.*

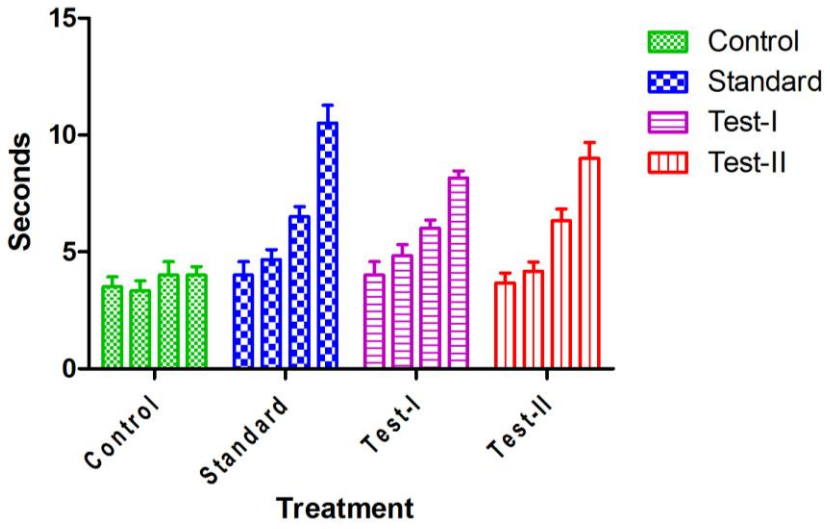

Figure 1. Graphical representation of analgesic activity of ethanolic extract of *Lonicera quinquelocularis* on Eddy's hot plate method in rats

4. DISCUSSION AND CONCLUSION

The pain/nociception is a disabling accomplishment of many medical conditions and the pain control is one of the most important therapeutic priorities. The hot plate test is one of the most

common tests of nociception that are based on phasic stimulus of high intensity[xiv]. The nociception or pain is mediated through central mechanism by the involvement of endogenous opioid peptides, and biogenic amines like BK, 5-HT, PGs, NA, NGF, neuropeptides like SP, CGRP and local interferons like enkephalins, GABA, etc.[xiv, i, and xv]. The ability of the extract to prolong the reaction latency to nociception induced thermally in rats suggests central analgesic activity[xvii]. The result from hot plate gave evidence for the analgesic activity of the EELQ extract with 150 and 300mg/kg body weight. The activity may be shown due to presence of flavonoids, steroids tannins and others. It was reported that inhibition of pain could arise not only from the presence of opioids, opioid mimetics or other centrally acting drugs but could also attribute due to the presence of phenolic constituents[xviii]. The phytochemical screening reveals that EELQ contains several phenolic compounds like flavonoids, tannins, steroids, triterpenoids, carbohydrates etc. which may exhibit the analgesic activity. Therefore the analgesic activities produced by EELQ may be related to increase brain serotonin level. From the above investigation of biological analgesic activity, it is concluded that ethanol extracts of *Lonicera quinquelocularis* leaf extract showed significant analgesic effect or significant increase in the reaction time against thermal stimuli at 60min and 90min of oral administration respectively and this effect may be attributed through increase in brain serotonin.

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REFERENCES

[i]KD Tripathi. Essentials of medical pharmacology, Jaypee Publication, 7th edition, 2003, page no: 469.

[ii]Gupta M, Banerjee D, Mukerjee A. Studies of, anti-infl ammatory, antipyretic and analgesic effects of aqueous extracts of traditional herbal drugs on rodents, Int Res J Pharm. 2013;4:113-20.

[iii]Dilfaraz Khan1, Masood Afzal et al., Two New Antioxidant Triterpenoids from Lonicera quinquelocularis, Rec. Nat. Prod. 2014; 8 (2):121-127

[iv]Tariq Ahmad Wani, Dhirendra Kumar et al., Analgesic activity of the ethanolic extract of Shorea robusta resin in experimental animals, Indian Journal of Pharmacology 2012;44 (4); 493

[v]Chandana Choudhury Barua, Jayanti Datta Roy et al., Analgesic and anti-nociceptive activity of hydroethanolic extract of Drymaria cordata Willd, Indian Journal of Pharmacology 2011;43 (1); 6-12

[vi]Nripendra Nath Biswas, Subarna Saha, Mohammed Khadem Ali, Antioxidant, antimicrobial, cytotoxic and analgesic activities of ethanolic extract of Mentha arvensis L, Asian Pacific Journal of Tropical Biomedicine 2014; 4(10): 792-797

[vii]Khandewal KR. Practical Pharmacognosy Technique and experiments, Nirali Publications, 9th edition, Pune. 2000; 149-156

[viii]Kokate CK, Purohit AP. Text Book of Pharmacognosy. Pune, Maharashtra, Nirali Prakashan 2004

[ix]Trease G, Evans M. Pharmacopoeial and related drugs of biological origin, A Textbook of Pharmacognosy, London 2001:171-440

[x]Oral acute toxicity study, OECD guidelines 425; October 3: 2008

[xi]Eddy NB, Touchberry CF, Lieberman IE. Synthetic analgesics: A methadone isomer and derivatives. J Pharmacol Exp Ther 1950; 98 (2): 121-137

[xii]Iyadi KC, Antai AB, Nia R, Okokon JE. Anti Inflammatory and antinociceptive activity of methanol extract from Ixora laxifora flower. African J Biomed Res 2005; 8: 47-50.

[xiii]Kulkarni SK. Hand book of experimental pharmacology. 3rd Edn., Vallabh Prakashan,
Delhi, 1999; page no:117.

[xiiv]Mandegary A, Sayyah M, Heidari MR. Antinociceptive and Anti-Inflammatory activity of the seed and root extracts of Ferula gummosa Boiss in mice and rats. DARU 2004; 12 (2):58-62.

[xv]Rang and dale's. Pharmacology, Elsevier, 6th edition 2007; page no:588-589

[xvi]Mazumder UK, Gupta M, Rath N. CNS activities of Cassia fistula in mice. Phytother
Res 1998;12: 520-524

[xvii]Turner RA. Screening methods in pharmacology. Academic press, New York and London, 1965; page no: 99-101

[xviii]De Campos RPO, Santos ARS, Vaz ZR, PInherio TR, Pizzolatti MG, Filho VC, Monache FD, Yunes RA, Calixto JB. Antinociceptive properties of the hydroalcholic extract and preliminary study of a xanthone isolated from Polgaya cyparissias. Life Sci1997; 61: 1619-30