



**PRELIMINARY PHYTOCHEMICAL ANALYSIS AND IN VITRO ANTIOXIDANT EFFCET OF MIMUSOPS ELENGI**

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**ABSTRACT**

**Key words:**

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*Mimusopselengis* popularly known as bakul, magilam poo belongs to Sapotaceae found in tropical forest in South Asia and Northern Australia. The tribes of Malayali and Muthuvan of Kerala, Kalrayan and Kani of Tamilnadu used the leaf and its preparation is used for tooth ache, uterus problem and mouth freshner, bleeding gum for body shine respectively. The phytochemical review of leaf, flower, fruit, seed and the whole plant revealed the presence alkaloid carbohydrate, sterols, terpenoids, flavonoids, volatile oil. Pharmacological review of leaf exhibited lipid peroxidation effect, wound healing & immune pharmacological activity. Literature survey revealed the preliminary phytochemical studies for the leaves was not so far. An Endeavour was taken to investigate the preliminary phytochemical studies for the leaves. An initiative study for in vitro anti oxidant was also investigated.

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lipid peroxidation effect, wound healing & immunopharmacological activity [13-15].

**INTRODUCTION**

*Mimusopselengis* popularly known as magilampoo, bakul belongs to Sapotaceae found in places throughout India & Pakistan, especially in Eastern Ghats, Western Ghats and Central Deccan plateau area where frequently cultivated in gardens [1-3]. The tribes of Malayali and Muthuvan of Kerala, Kalrayan and Kani of Tamilnadu used the leaf and its preparation are used for tooth ache, uterus problem and mouth freshner, bleeding gum, and for body shine respectively [4-9]. Phytochemical review of leaf, flower, fruit, seed and the whole plant revealed the presence of alkaloid carbohydrate, sterols, terpenoids, flavonoids, volatile oil [10-12]. Pharmacological review of leaf exhibited

Literature survey revealed the preliminary phytochemical studies for the leaves was not So far. An Endeavour was taken to investigate the preliminary phytochemical studies and in vitro anti oxidant for the leaves.

**MATERIALS AND METHODS**

**Collection of Plant Materials**

Leaves were collected from Meenakshi Mission Hospital campus in Madurai, Tamil Nadu in the month of January 2020. The species for the proposed study was identified and authenticated by DR. Stephen, Professor, Department of Botany, American college Madurai-

625002. The herbarium of this specimen was kept in the department for further reference.

### Preparation of plant material

The leaves were collected, dried in shade, coarsely powdered, passed through sieve no 40 and stored in a closed container for further use. All reagents were used of analytical grade.

### Preparation of Hydro-alcoholic extract of *Mimusopselengi* (HAEME)

The leaves were collected, shade dried and coarsely powdered, passed through sieve no 40, was extracted with 70% hydroalcohol by maceration technique, was concentrated to dryness and stored in a closed container for further use.

### Phytochemical studies

#### Qualitative chemical analysis

Hydro-alcoholic extract of *Mimusopselengi* Linn (Leaf) was subjected for its qualitative and quantitative chemical analysis. Phytochemical screening was performed as per Harborne et al. 1998. [16]

#### Quantitative Analysis.

Hydroalcoholic extract of *Mimusopselengi* Linn (Leaf) was estimated for the total tannic acid, gallic acid and quercetin equivalents.

### Determination Of Gallic Acid Content Singleton et al., 1999 [17]

**Procedure** - About 1 mL (1 mg/ml and 0.5 mg/mL) of hydroalcoholic extract of *Mimusopselengi* (HAEME), 0.5 mL of Folin-ciocalteu reagent (1N) were added and allowed to stand for 15 minutes. Then 1 mL of 10% sodium carbonate solution was added to the above solution. Finally the mixtures were made up to 10 mL with distilled water and allowed to stand for 30 minutes at room temperature and total phenolic content was determined spectrophotometrically at 760 nm wavelength. The calibration curve was generated by preparing Gallic acid at different concentration (10, 20, 30, 40 and 50 µg/mL). The reaction mixture without sample was used as blank. Total phenolic content of HAEME extract is expressed in terms of mg of Gallic acid equivalent per gm of extract (mg GAE/g).

Determination of Tannic Acid Content (Rabianaz And AsghariBano, 2013 [18])

### Procedure

About 0.2 mL of (1 mg/mL) hydroethanolic extract of *Mimusopselengi*, was made up to 1 mL with distilled water. Then add 0.5 mL of Folin Denis reagent and allowed to stand for 15 mins, then 1 mL of sodium carbonate solution was added to the mixture and it was made up to 10 mL with distilled water. The mixture was allowed to stand for 30 mins at room temperature and the tannin content was determined spectrophotometrically at 760 nm. The calibration curve was generated by preparing tannic acid at different concentration (10, 20, 30, 40 and 50 µg/mL). The reaction mixture without sample was used as blank. The total tannin content in the leaf extract was expressed as milligrams of tannic acid equivalent per gm of extract.

Determination Of Quercetin (Flavanoid) Content (Zhishen Et Al., 1999 [19])

**Procedure**- 1 mL of hydroethanolic extract of *Mimusopselengi*, 0.1 mL of aluminium chloride solution, 0.1 mL of potassium acetate solution and 2.8 mL of ethanol were added and the final volume was then made up to 5 mL with distilled water. After 20 min the absorbance was measured at 415 nm. A calibration curve was constructed by plotting absorbance reading of quercetin at different concentrations (10, 20, 30, 40 and 50 µg/mL). The sample without aluminium chloride was used as a blank. The total flavonoid content in the extract was expressed as milligrams of quercetin equivalent per gram of extract

In Vitro Antioxidant Activity

### Determination Of Total Anti

Oxidant Activity (Prieto et al., 1999) [20]

### Procedure

Hydroalcoholic extract of *Mimusopselengi*, in different concentration ranging from 100 µl to 500 µl were added to each test tube individually containing 3 ml of distilled water and 1 ml of Molybdate reagent solution. These tubes were kept incubated at 95 °C for 90 min. After incubation, these tubes were normalized to room temperature for 20-30 min and the

absorbance of the reaction mixture was measured at 695 nm. Mean values from three independent samples were calculated for each extract. Ascorbic acid was used as positive reference standard.

**Determination of Scavenging Activity against Hydrogen Peroxide (Mg.Rana Et Al., 1996. [21])**

**Procedure**

To 1 mL of test solutions of different concentrations, 3.8 mL of 0.1 M phosphate buffer solution (pH 7.4) and then 0.2 mL of hydrogen peroxide solution were added. The absorbance of the reaction mixture was measured at 230 nm after 10 min. The reaction mixture without sample was used as

blank. Sample blank was also prepared without reagents. Ascorbic acid was used as standard. The percentage inhibition of hydrogen peroxide was calculated using the formula, % inhibition = [(Control-Test) / Control] × 100 . The concentration of the sample required for 50 % reduction in absorbance (IC<sub>50</sub>) was calculated using linear regression analysis.

**RESULTS AND DISCUSSION**

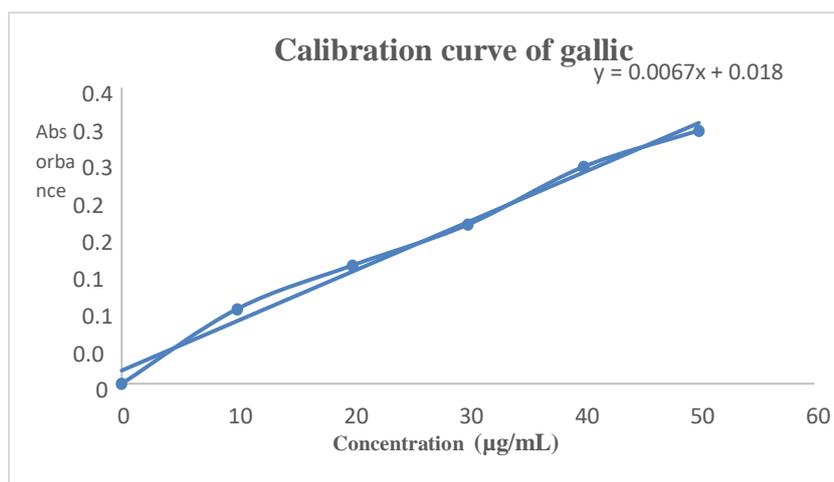
The phytochemical screening of the hydro-alcoholic extracts (70%) *Mimusopselengi*(leaf) powder revealed the presence of alkaloid, carbohydrate, proteins, flavonoids, sterols, triterpenoids, glycoside, tannin and saponins.

**Table 1 Preliminary phytochemical screening of hydro-alcoholic extract of *Mimusopselengi .L* (leaf).**

S.No	Analysis	HAEME
1	Test for carbohydrate	Positive
2	Test for alkaloids	Positive
3	Test for glycoside	Negative
4	Test for protein and free amino acid	Positive
5	Test for coumarin glycoside	Positive
6	Test for flavonoid	Positive
7	Test for triterpenoids	Positive
8	Test for saponins	Positive
9	Test for sterols	Positive
10	Test for tannins	Positive
11	Test for mucilage & gum	Negative
12	Test for resins	Negative
13	Test for anthocyanins	Negative

**Table 2.Determination of gallicacid equivalent in Hydroalcoholic extract of *Mimusopselengi* (HAEME)**

S.No	Concentration	Absorbance	
	Gallic acid & HAEME (µg/mL)	Gallic acid	HAEME
		*MEAN ± SEM	*MEAN ± SEM
1.	10	0.101±0.00202	0.056±0.000882
2	20	0.160±0.0023	0.059±0.001449
3	30	0.215±0.00124	0.062±0.0012
4	40	0.293±0.00147	0.064±0.00202
5	50	0.342±0.00154	0.069±0.00266
GAE- Gallic acid equivalent		31.02mg/gm	

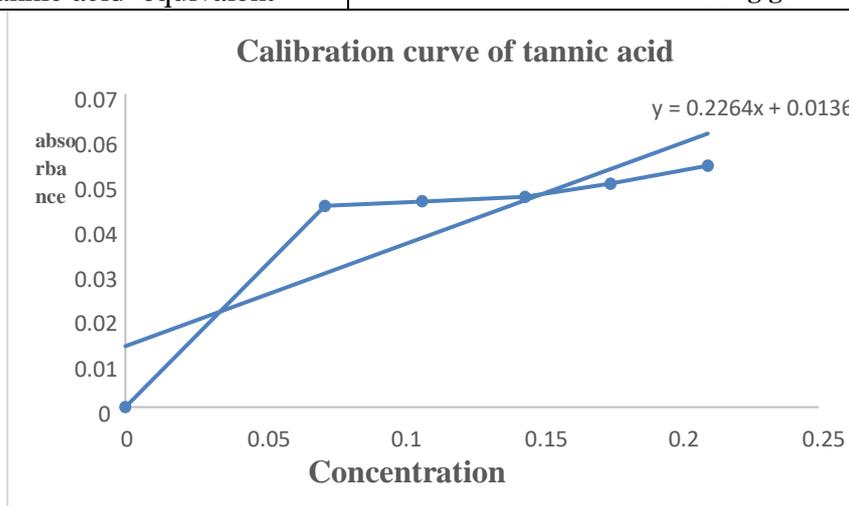


**Figure: 1- Calibration curve of gallic acid**

Hydroalcohol extract of *Mimusopselengi* was found to contain 31.02mgGAE/gm.

**Table 3 Determination of tannic acid equivalent in Hydroalcoholic extract of *Mimusopselengi* (HAEME)**

S. No	Concentration Tannic acid & HAEME(µg/mL)	Absorbance	
		TANNIC ACID	HAEME
		*MEAN ± SEM	*MEAN ± SEM
1.	10	0.072±0.00202	0.045±.00088
2.	20	0.107±0.00233	0.046±0.00143
3.	30	0.144±0.002559	0.047±0.00152
4.	40	0.175±0.002851	0.050±0.001856
5.	50	0.210±0.00317	0.054±0.001884
<b>TAE tannic acid equivalent</b>		<b>0.36mg/g</b>	

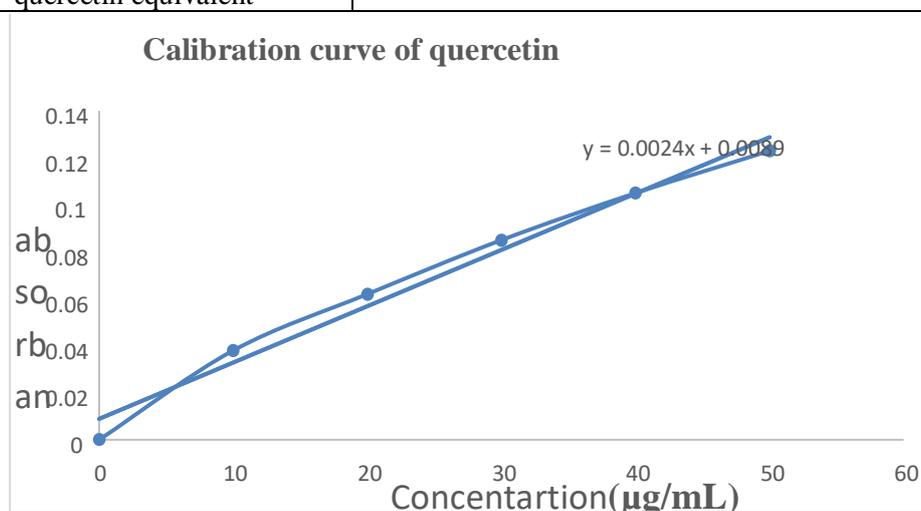


**Figure: 2- Calibration curve of tannic acid**

Hydroalcoholic extract of *Mimusopselengi* showed 0.36mgTAE/ gm

**Table :4 Determination of quercetin equivalent in Hydroalcoholic extract of *Mimusopselengi* (HAEME)**

S. No	Concentration	Absorbance	
	Quercetin & HAEME ((µg/mL))	Quercetin (Flavonoid)	HAEME
		*MEAN ± SEM	*MEAN ± SEM
1.	10	0.038±0.00123	.0.026±0.001
2	20	0.062±0.001453	0.035±0.00202
3	30	0.085±0.001578	0.048±0.00233
4	40	0.105±0.001856	0.059±0.002646
5	50	0.123±0.002081	0.061±0.00295
QE quercetin equivalent		0.39mg/gm	



**Figure 3Calibartion curve of quercetin**

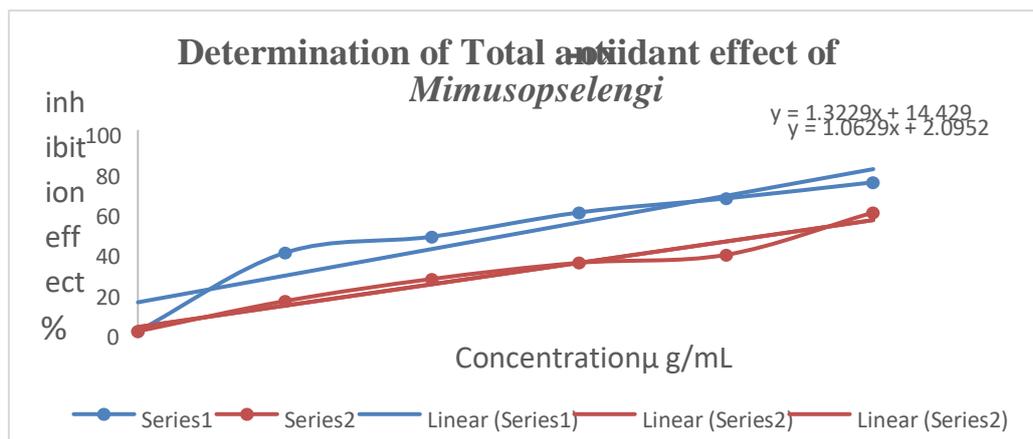
Hydroalcoholic extract of *Mimusopselengi* was found to contain **0.39mgQE/gm**

**In vitro Anti Oxidant Studies**

HAEME was screened for in vitro anti oxidant activity and total antioxidant capacity and Hydrogen peroxide was carried out and were displayed in table 5 & 6 and figure 4& 5 respectively.

**Table : 5 Determination of Total AntioxidantCapacity of HAEME**

S.no	Concentration of ascorbic acid & <i>Mimsopselengi</i> (µg/mL)	%inhibition of ascorbicacid*	% inhibition of <i>Mimusopselengi</i>
1	10	39±0.0881	15±0.17321
2	20	47±0.36935	26±0.122206
3	30	59±0.120189	34±0.052389
4	40	66±0.152757	44±0.118653
5	50	79±0.104086	59±0.063598
	IC <sub>50</sub>	75µg/mL	62µg/mL

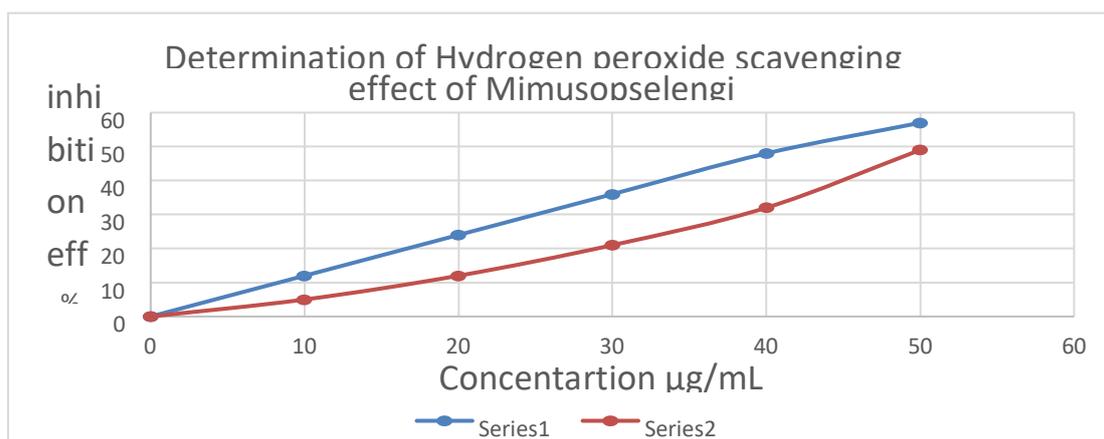


**Fig 4 Determination of total anti-oxidant effect of *Mimusopselengi***  
 Total Antioxidant Capacity of *Mimusopselengi* HAEME was found to be 62μg/mL in comparison with ascorbic acid 75μg/mL

**Table: 6- Determination of hydrogen peroxide of HAEME**

S.no	Concentration of asorbic acid & <i>Mimsopselengi</i> (μg/mL)	%inhibition of asorbic acid*	% inhibition of <i>Mimusopselengi</i>
1	10	12±0.0881	5±0.17321
2	20	24±0.36935	12±0.122206
3	30	36±0.120189	21±0.052389
4	40	48±0.152757	32±0.118653
5	50	57±0.104086	49±0.063598
	IC <sub>50</sub>	65μg/mL	58μg/mL

**Fig 5 Determination of Hydrogen scavenging effect against *Mimusopselengi***



Hydrogen peroxide scavenging effect of *Mimusopselengi* (HAEME) was found to be 58μg/mL in comparison with asorbic acid(65μ g/mL.)

## CONCLUSION

Phytochemical analysis revealed the presence of carbohydrates, proteins, amino acids, flavonoids, terpenoids, sterols, tannins, and absence of volatile oil, mucilage, anthocyanin and resin. The present research studies the phytochemical analysis of *Mimusops elengi* which acts as an additional scientific information to the existing research. It is estimated that hydroalcoholic extract possess better anti-oxidant effect than ascorbic acid. It is concluded that this plant preparation may be formulated further such preparation may be added as adjuvant therapy in the management of diseases

## REFERENCES

1. Nadkarni KM. *Indian Materia Medica*, Vol 1 (popular prakasna Pvt limited), Bombay, 1995, 327.
2. J.S Gamble flora of Madras- Volume II First publication 1921, vol III; 38-39.
3. P.S Varier *Indian Medicinal Plants*- Vol- V ;89-90; Orient Longman Ltd First Publication :1995
4. Manikandan\*, GM. Alagu Lakshmana n. Ethnobotanical Survey of Medicinal Plants in Kalrayan hills, Eastern Ghats, Tamil Nadu, *Int Journal of botany science* .2005 ;7(4):504-09.
5. Ganesan S, Eluvakal T and Kesavan L, Medicinal plant used by Paliyans of Sirumalai hills, Sathuragri hills and Kumily hills of Tamil Nadu, India, In state level seminar on conservation of biodiversity present and future scenario Ayyanadar Janaki Ammal college, Sivakasi, Tamil Nadu, 2001 March, 23-24
6. Ganesan S, Rajkumar P and Kesavan L, Medicinal plant used by Valaiyans, In national conference on Siddha Medicine, Friends of Siddha Medicine Tirunelveli, Tamil Nadu 2001, February 24-25.
7. Ganesan S and Kesavan L, Ethnomedicinal plant used by ethnic group Valaiyans of Vellimalai hills (reserved forest), Tamil Nadu India, *J Econ Taxon Bot*, 2003, 27(3) 754-760
8. Ganesan S, Suresh N and Kesavan L and Banumathy N, Ethnobotany of Ethnic group Thottainai of Tiruchirappalli district, Tamil Nadu, In *Advances in medicinal plant Vol. I*, by ND Prajapati, T Prajapati and Jaipura (Eds), Asian medicinal plant and healthcare trust Jodhpur, 2005, pp.59-75
9. Muniappan Ayyanara\*, Savarimuthu Ignacimuthu Ethnobotanical survey of medicinal plants commonly used by Kanitribals in Tirunelveli hills of Western Ghats, India *Journal of Ethnobiology and Ethnomedicine* 2011, 2:43 .
10. Adapu Satheesh, P. Dwarakanadha Reddy, Suggala V. Satyanarayana, Phytochemical screening and *in vitro* antioxidant study of *Magnolia vine*, *Muntingia calabura*, and *Alangium salviifolium* fruits, *International Journal of Green Pharmacy*, Jan-Mar 2020, 14 (1) 87-91
11. Venkatesan Krishnamoorthy . Diversity and traditional knowledge of wild fruits used by Muthuvan tribes of Wayanad district Kerala, India *International Journal of Botany Studies* 2018: volume 3 issue 6:19-24. ISSN: 2455-541X
12. Mishra G, Mitra CR. Constituents of bark of *mimusops elengi* Linn. *Phytochem. International Journal Of Chemical Studies* 2008; 6(2): 540-544
13. Prasad V. Kadam \*, Ramesh S. Deoda, Rakesh S. Shivatare, Kavita N. Yadav and Manohar J.

- PatilPharmacognostic,  
phytochemical and physiochemical  
studies of *MimusopsElengi* Linn  
stem bark (Sapotaceae) . Scholars  
Research Library Der Pharmacia  
Lettre, 2012, 4 (2):607-613
14. JaffarShaik, S.M.Khasim, P.Brahma  
Naidu-Protective activity of ethnolic  
extract of *Mimusopselengilinn* on  
lipidperoxidation and antioxidant  
enzymes in experimental diabetic  
rats - Ancient science of life 2011  
vol:XXV(3&4) Pages 9-24.
  15. Singleton VL, Orthofer R, Lamuela-  
Raventos RM (1999) et al., Analysis  
of total phenols and other oxidation  
substrates and antioxidants by means  
of FolinCiocalteu reagent. Methods  
Enzymol. 1999; 299,152-178.
  16. Harborne JB (1998) et al.,  
Phytochemical methods, A guide to  
modern techniques of plant analysis,  
1998; 3<sup>rd</sup> edition, pp 43-46. Springer  
(India) private limited, NewDelhi
  17. . Singleton VL, Orthofer R,  
Lamuela-Raventos RM (1999) et al.,  
Analysis of total phenols and other  
oxidation substrates and antioxidants  
by means of FolinCiocalteu reagent.  
Methods Enzymol. 1999; 299,152-  
178.
  18. RabiaNaz and AsghariBano,  
Phytochemical screening ,  
antioxidant and antimicrobial  
potential of *Lanatacamarain*  
different solvents. *Asian Pac J Trop  
Dis*, 2013;3(6):480- 486.
  19. Zhishen J, Mengcheng T and  
Jianming W (1999)., et al., The  
determination of flavonoid contents  
in mulberry and their scavenging  
effects on superoxide radicals. *Food  
Chemistry* 1999; 64: 555–559.
  20. Priteo ,Invivo free scavenging  
,studies of methanolic extract of the  
leaves of *Mimusopselengi*  
L.1996;6(2) ;60-73
  21. Rana MG ,Invitro anti-oxidant and  
free radicals scavenging studies of  
alcoholic extract of *Medicago sativa*  
L.1996;55(1);15-22