

Vol 4 Issue 10 Nov 2014

ISSN No : 2230-7850

International Multidisciplinary
Research Journal

*Indian Streams
Research Journal*

Executive Editor
Ashok Yakkaldevi

Editor-in-Chief
H.N.Jagtap

Welcome to ISRJ

RNI MAHMUL/2011/38595

ISSN No.2230-7850

Indian Streams Research Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial board. Readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

International Advisory Board

Flávio de São Pedro Filho Federal University of Rondonia, Brazil	Mohammad Hailat Dept. of Mathematical Sciences, University of South Carolina Aiken	Hasan Baktir English Language and Literature Department, Kayseri
Kamani Perera Regional Center For Strategic Studies, Sri Lanka	Abdullah Sabbagh Engineering Studies, Sydney	Ghayoor Abbas Chotana Dept of Chemistry, Lahore University of Management Sciences[PK]
Janaki Sinnasamy Librarian, University of Malaya	Ecaterina Patrascu Spiru Haret University, Bucharest	Anna Maria Constantinovici AL. I. Cuza University, Romania
Romona Mihaila Spiru Haret University, Romania	Loredana Bosca Spiru Haret University, Romania	Ilie Pintea, Spiru Haret University, Romania
Delia Serbescu Spiru Haret University, Bucharest, Romania	Fabricio Moraes de Almeida Federal University of Rondonia, Brazil	Xiaohua Yang PhD, USA
Anurag Misra DBS College, Kanpur	George - Calin SERITAN Faculty of Philosophy and Socio-Political Sciences AL. I. Cuza University, IasiMore
Titus PopPhD, Partium Christian University, Oradea,Romania		

Editorial Board

Pratap Vyamktrao Naikwade ASP College Devrukh,Ratnagiri,MS India	Iresh Swami Ex - VC. Solapur University, Solapur	Rajendra Shendge Director, B.C.U.D. Solapur University, Solapur
R. R. Patil Head Geology Department Solapur University,Solapur	N.S. Dhaygude Ex. Prin. Dayanand College, Solapur	R. R. Yalikar Director Managment Institute, Solapur
Rama Bhosale Prin. and Jt. Director Higher Education, Panvel	Narendra Kadu Jt. Director Higher Education, Pune	Umesh Rajderkar Head Humanities & Social Science YCMOU,Nashik
Salve R. N. Department of Sociology, Shivaji University,Kolhapur	K. M. Bhandarkar Praful Patel College of Education, Gondia	S. R. Pandya Head Education Dept. Mumbai University, Mumbai
Govind P. Shinde Bharati Vidyapeeth School of Distance Education Center, Navi Mumbai	Sonal Singh Vikram University, Ujjain	Alka Darshan Shrivastava Shaskiya Snatkottar Mahavidyalaya, Dhar
Chakane Sanjay Dnyaneshwar Arts, Science & Commerce College, Indapur, Pune	G. P. Patankar S. D. M. Degree College, Honavar, Karnataka	Rahul Shriram Sudke Devi Ahilya Vishwavidyalaya, Indore
Awadhesh Kumar Shirotriya Secretary,Play India Play,Meerut(U.P.)	Maj. S. Bakhtiar Choudhary Director,Hyderabad AP India.	S.KANNAN Annamalai University,TN
	S.Parvathi Devi Ph.D.-University of Allahabad	Satish Kumar Kalhotra Maulana Azad National Urdu University
	Sonal Singh, Vikram University, Ujjain	

Address:-Ashok Yakkaldevi 258/34, Raviwar Peth, Solapur - 413 005 Maharashtra, India
Cell : 9595 359 435, Ph No: 02172372010 Email: ayisrj@yahoo.in Website: www.isrj.org



BIOCONVERSION OF *FICUS RELIGIOSA* INTO ECO – FRIENDLY MANURE BY USING EPIGEIC EARTHWORM *EISENIA FETIDA*

B. Jayanthi¹ and M. Jayanthi²

¹Ph.D Research Scholar, Department of Zoology, Seethalakshmi Ramaswamy College, Trichy .

²Associate Professor & Head, Department of Zoology, Seethalakshmi Ramaswamy College, Trichy .

Abstract:-Vermibeds were prepared in three different concentrations. *E.fetida* worms were inoculated into the *F.religiosa* vermibed in all the concentration except control. The conversion ratio of *F.religiosa* into vermicompost was found to be more or less similar in all the concentration. The reproductive potential and physico-chemical parameters were analyzed in the vermicompost. The results of the present study reveals that the equal proportion of *F.religiosa* leaf litter with cured cowdung can be used for highest value added vermicompost production by using *E.fetida*.

Keywords:*F.religiosa*, *E.fetida*, Nutrient status .

INTRODUCTION

Vermicompost is an easy and effective way of recycling agriculture waste, city garbage waste and kitchen waste along with bioconversion of garden waste materials into nutrient rich vermicompost by using earthworm. In majority of the previous studies, *E.fetida* was used as a candidate species for vermicomposting operation, because it can tolerate wide range of pH, temperature, moisture and highest reproductive potential worms. *F. religiosa* is a large dry season deciduous or semi-evergreen tree. The tree grows up to 30 meters tall and with a trunk diameter up to 3 meters. The leaves are cordate in shape with a distinctive extended drip tip they are 10-17 cm long and 8-12cm broad, with a 6-10cm petiole. This plant is used for treating many diseases but it is not used in vermicomposting process. The main objective of the study, the composting performance and interference activity of *F.religiosa* by using an epigeic earthworm and analyze the nutrient status of vermicompost.

MATERIALS AND METHODS

Dry leaves of *F.religiosa* were collected from the college campus Seethalakshmi Ramaswami College, Tiruchirappalli. Pre-digestion is the essential for the process of composting. *F.religiosa* leaf litter was cut into tiny bits, sundried for 15 days because to remove the odour and shade dried for 15 days because to reduce the heat. Simultaneously cowdung also predigested. *F.religiosa* mixed with cured cowdung in three different concentration viz., 50:50, 60:40 and 70:30. Sprinkled water twice in a day in order to maintain the moisture. Adult healthy 30 *E.fetida* worms were inoculated into the vermibed. Worm un-worked experiment was also maintained. After harvest the vermicompost was collected, sieved, air dried and weighed separately. Physico chemical parameters were estimated by the following standard procedure (Murugesu boopathi *et al.*, 1999).

TABLE-1 Composition of predigested *F.religiosa* leaf litter and its conversion into vermicompost by *E.fetida*

PARTICULARS	50:50 [#]	60:40 [#]	70:30 [#]
Weight of <i>F.r</i> (g)	500	600	700
Weight of CD (g)	500	400	300
Weight of Predigested mixture (g)	1000	1000	1000
No. of worms introduced	30	30	30
Mean no. of days taken for bioconversion	40	43	47
Harvesting vermicompost(g)	829	748	652
Cocoons	114	98	73
Youngworms	56	42	39

#Experiments were conducted in triplicate in each concentration.

TABLE-II Quantity of Nutrient status of Control and Vermicompost produced by *E.fetida* in 50:50, 60:40 and 70:30 concentrations

PARTICULARS	50:50 VC	CONTROL	60:40 VC	CONTROL	70:30 VC	CONTROL
pH	7.0	6.98	7.2	6.99	7.1	6.99
TN	1.94	0.99	1.76	0.77	1.28	0.69
TP	3.45	1.52	2.63	1.28	1.87	1.09
TK	0.96	0.53	0.87	0.44	0.79	0.38

TN-Total Nitrogen, TP-Total Phosphorous, TK-Total Potassium

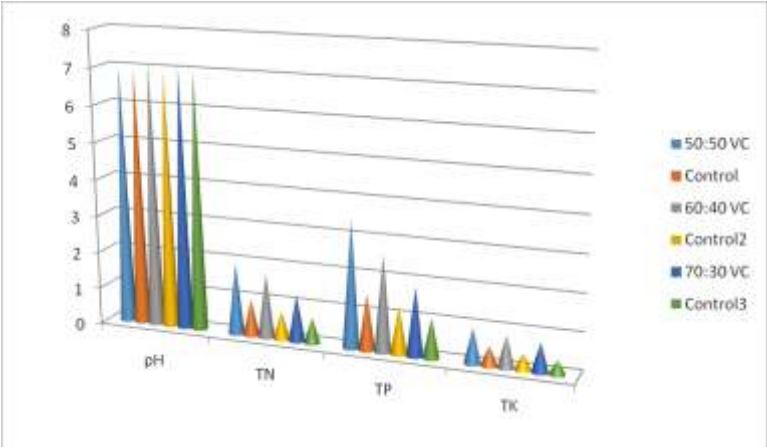


Figure 1. Graphical representation of Quantity of Nutrient status of Control and Vermicompost produced by *E.fetida* in 50:50, 60:40 and 70:30 concentrations

RESULTS AND DISCUSSION

Table 1 shows the composition of predigested *F. religiosa* leaf litter and its conversion into vermicompost by using *E. fetida*. *E. fetida* releases fine, powdery, dark brown material. The mean total weights of the vermicompost obtained from *F. religiosa* were 829g (50:50), 748g (60:40), and 652g (70:30). The maximum vermicompost recovered from 50:50 concentration compared than others. Earthworms feed more waste and released highest vermicompost. The mean number of cocoons and youngones produced by *E. fetida* was found to be 114 and 56 (50:50); 98 and 42 (60:40); 73 and 39 (70:30) respectively during the composting period. The cocoons and youngones production was found to be higher in 50:50 proportion than the other two proportions.

The physico-chemical quality of the worm-processed material was analyzed during this study. Table II shows the nutrient status of control and vermicompost was analyzed in all the parameters. The pH was measured using a digital pH meter. The observation of the pH value is 7.0 (50:50), 7.2 (60:40), and 7.4 (70:30). Vermicompost improves the pH of soil and make available the nutrient for the crop yield reported by Kale et al., (1992). The total nitrogen was estimated by kjeldahl method described by Jackson. The nitrogen range in vermicompost was 1.94g (50:50), 1.76g (60:40) and 1.28g (70:30). Availability of nitrogen increases growth and leaf area index of plant which in turn increases absorption of light leading to more dry matter and yield (Nanda et al., 1995, Ravi et al., 2008, Taleshi et al., 2011). The total phosphorous was measured by using gravimetric Quinoline molybdate method described by Anderson and Ingram. The total phosphorous value was 3.45g (50:50), 2.63g (60:40) and 1.87g (70:30). Researchers have reported that available phosphorus in earthworm casting is usually greater than in surrounding soil (Lunt and Jacobson, 1944; Tiwari et al., 1989). The levels of phosphorous in vermicompost are routinely 5-10 times greater than surface soils (Lee, 1985). Increased availability of phosphorous in vermicompost compared with surrounding soil is proposed to be attributable to enhanced phosphatase activity in the vermicompost (Satchell and Martin, 1984). The total potassium was estimated by using flame photometric method. The total potassium value was 0.96g (50:50), 0.87g (60:40) and 0.79g (70:30). Lee (1985) showed that exchangeable potassium (K) was over 95% higher in vermicompost. The NPK level is high in 50:50 concentration compared than other two concentrations and control. The total NPK level is good for plant growth and improvement of soil fertility. *F. religiosa* is not only medicinal uses always used as a vermicompost production.

CONCLUSION

The process of vermiculture helps in improving soil fertility and minimizes the use of chemical fertilizers. This eco-friendly vermiculture-agriculture-ecoengineering makes organic recycling much more active and enhances plant growth. This technology also provides opportunities for self employment by utilizing the available agricultural resources to the rural people.

REFERENCES

1. Anderson JM, Ingram JS (1993). Tropical soil biology and fertility. A handbook of methods. Commonwealth agriculture Bureau, Oxan
2. Dominguez J, Edwards C.A (2010). Relationships between composting and vermicomposting: relative values of the products. In: Edwards CA (ed) Vermiculture technology, I st edn. CRC Press, USA, pp 11-25
3. Jackson ML (1975). Soil chemical analysis. Prentice Hall of India, New Delhi
4. Lee K.E. (1985). Earthworms: Their ecology and relationships with soil and land use (Academic press, Sydney).
5. Lunt E.E., Jacobson G.M. (1944). The chemical composition of earthworm casts. Soil Sci. 58:367
6. Nanda S.S, Swain K.C, Panda S.C, Mohanty A.K, and Alim M.A (1995). Effect of nitrogen and biofertilizers in fodder rainfed upland conditions of orisa. Current agricultural Res 8:45-47
7. Ravi.S, Channel H.T, Hebsur N.S, Patil B.N, Dharmatti P.R (2008). Effect of sulphur, zinc and iorn nutrition on growth, yield, nutrient uptake and quality of safflower (*carthamus tinctorius* L.). Karnataka J Agric sci 21:382-385
8. Satchell J.E., Martin K. (1984). Phosphatase activity in earthworm faeces. Soil Biol. Biochem.

16:191-194

9.Kale R.D and Bano K.,(1992). Laboratory studies on the age specific fecundity and mortality of earthworm *Eudrilus eugeniae*. Mitteilungen aus dem hambergischen museum and Institut. Ferganzurgsband.(89), 139-144

10.Taleshi K, Shokah-far A, Rafiee M, Noormahamadi G, Sakinejhad T (2011). Effect of vermicompost and nitrogen levels on yield and yield component of safflower (*Carthamus tinctorius* L.)

11.Tiwari S.C., Tiwari B.K., Mishra R.R. (1989). Microbial populations, enzymes activities and nitrogen-phosphorous-potassium enrichment in earthworm casts and in surrounding soil of a pineapple plantation. Biol. Fertil. Soils 8:178-182.

Publish Research Article International Level Multidisciplinary Research Journal For All Subjects

Dear Sir/Mam,

We invite unpublished Research Paper, Summary of Research Project, Theses, Books and Book Review for publication, you will be pleased to know that our journals are

Associated and Indexed, India

- ★ International Scientific Journal Consortium
- ★ OPEN J-GATE

Associated and Indexed, USA

- Google Scholar
- EBSCO
- DOAJ
- Index Copernicus
- Publication Index
- Academic Journal Database
- Contemporary Research Index
- Academic Paper Database
- Digital Journals Database
- Current Index to Scholarly Journals
- Elite Scientific Journal Archive
- Directory Of Academic Resources
- Scholar Journal Index
- Recent Science Index
- Scientific Resources Database
- Directory Of Research Journal Indexing

Indian Streams Research Journal
258/34 Raviwar Peth Solapur-413005, Maharashtra
Contact-9595359435
E-Mail-ayisrj@yahoo.in/ayisrj2011@gmail.com
Website : www.isrj.org