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RESEARCH AREAS:

1. Biomass
2. Bioenergy
3. Grassland ecosystem

HONORS AND AWARDS:

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Research Interests

- Conservation of Biodiversity/Medicinal Plants
- Development of degraded land.
- Biomass Research for fuelwood and Nursery technology
- Screening of *Jatropha curcus* clones for high oil content (Biodiesel)
- Molecular ecology of *Cenchrus ciliaris*
- Ecophysiological evaluation of tropical tree seedlings for selection of superior quality
- Carbon sequestration potential of natural and man modified ecosystems
- Micro propagation of tropical trees

We are trying to understand the basic cause of ecosystem fragmentation and degradation of grassland, forest and biodiversity. We have developed an experiment based physiological area. Our work on physiological basis of tropical biodiversity and tropical succession show that degraded ecosystem show resiliency if they are managed properly. Our work on multidisciplinary research projects on Western Ghats and Eastern Ghats contributed enormously in terms of research data on various aspects of ecology and ecophysiology. While working in the forest ecosystem, especially on management part, as a function of disturbances we answered a basic question of forest management and development of wasteland for fuel and fodder needs. Most significant work from our group is to understand the role of light on biodiversity pattern of tropical rain forest as a function of light flecks revealed for the first time that one second light fleck is enough to induce photosynthesis. These studies hopefully allow one to understand the regeneration and successional pattern of understorey plant and maintain biodiversity.

Our work on the analysis of ecosystems and modelling of biomass and forestry resources are significant contributions useful to the people of western, Eastern Ghats. A model for fuel wood development and fodder production was also elaborated. The data generated forms the basis for designing conservation strategies for sustainable development and improvement of degraded lands. Recently we developed a technique

for the production of quality seedlings for afforestation programs and he has identified allelochemicals from *Gliricidia spium*, which can be used for weed control. Our most significant achievement is the creation of the biomass Research center at Madurai Kamaraj University, which is the first of its kind in India. This center focuses on research efforts towards sustainable development and welfare of society. This will also help to conserve degraded land and biodiversity.

PUBLICATIONS:

1. V.Rajeswari and **Kailash Paliwal**, *In vitro* propagation of red sanders (*Pterocarpus santalinus* L.) from cotyledonary nodes. 2008. *Ind. J. Biotechnol.* (Accepted).
2. V.Rajeswari and **Kailash Paliwal**, *In vitro* adventitious shoot organogenesis and plant regeneration from seedling explants of *Albizia odoratissima* (L.f) Benth. 2008. *In vitro Cellular and Development Biology –Plant* (Accepted).
3. S.G. Saraswathi and **Kailash Paliwal (2008)**. Diurnal and Seasonal trends in Photosynthetic performance of *Dalbergia sissoo* Roxb. and *Hardwickia binata* Roxb. from a semi arid ecosystem. *Photosynthetica* .46: 248-254.
4. S.Gnaana Saraswathi , C.Lalrammawia and **Kailash Paliwal (2008)**. Seasonal variability in soil surface CO₂ efflux in selected young tree plantations in semi-arid eco-climate of Madurai. *Current Science*, Vol. 95: 94-99
5. R.Sankaravadaimmal and **Kailash Paliwal (2008)** Joint Forest Management-Decentralization and Devolution: A Case Study from Kalakad Mundanthurai Tiger Reserve, Thirunelveli District, Tamil Nadu. *The Indian Forester* 134: 177.
6. V. Rajeswari and **Kailash Paliwal (2007)**. *Albizia odoratissima* L.f (Benth). In: *Protocols for Micropropagation of woody trees and fruits.* (S.M.Jain and H.Haggman (eds.)), Springer, pp 201-211.
7. V. Rajeswari and **Kailash Paliwal (2006)**. *In vitro* shoot multiplication and *ex-vitro* rooting of red sanders (*Pterocarpus santalinus*): an endangered and an endemic medicinal tree. *Journal of Swamy Botanical Club*. 23: 31-38
8. V. Rajeswari and **Kailash Paliwal (2006)**. *In vitro* propagation of *Albizia odoratissima* L.F. (Benth.) from cotyledonary node and leaf nodal explants. *In vitro Cellular and Development Biology – Plant*. Vol 42 (5). 399–404.
9. V. Meenakshi Sundaravalli, R. Ganesan, S. Suresh and **Kailash Paliwal (2006)**. Salinity stress on growth, biomass production and photosynthesis of *Albizia lebbeck* and *Dalbergia latifolia* seedlings. *Journal of Plant Biology*. 33: 227-230
10. V. Meenakshi Sundaravalli and **Kailash Paliwal (2005)**. Influence of fertilizer application on growth and physiology of *Cassia siamea* seedlings. *Journal of Current Biosciences*. 3: 312-315.
11. V. Meenakshi Sundaravalli, **Kailash Paliwal** and A. Ruckmani (2005). Effect of water stress on photosynthesis, protein content and nitrate reductase activity of *Albizia* seedlings. *Journal of Plant Biology*. 32: 13-17.
12. V. Rajeswari and **Kailash Paliwal (2004)**. Effects of light quantity and quality (Red/Far red quanta) on seedling growth of *Dalbergia sissoo* Roxb. and *Dalbergia latifolia* Roxb. *National Journal of Life Sciences*. 1:161-168.
13. G. Renuga and **Kailash Paliwal (2004)**. Characterization of a protective enzyme associated with chloroplast under sulphur dioxide stress. *Journal of Plant Biology*

14. **Kailash Paliwal** and Makesh Kumar and Renuka Devi (2004). Influence of shading on growth and physiological responses of *Dalbergia sissoo* seedlings. *Journal of Bio Sciences*, 2 (2) 162-167.
15. **Kailash Paliwal** and Makesh Kumar and D.W. Lee (2004). Effect of light quantity and quality on the seedling development of *Dalbergia latifolia*. *Journal of Bio Sciences*, 2 (2) 290-298.
16. V. Meenaskshi Sundaravalli and **Kailash Paliwal** (2003). Effect of fire on vegetation composition and primary production of grazinglands in the semi-arid region of Madurai. *International Journal of Ecology and Environmental Sciences*, Vol. 29(3-4) 239-243.
17. Kailash Paliwal and V. Meenakshi Sundaravalli (2002). Effect of fire on nutrient dynamics in a semi arid grazing land ecosystem of Madurai. *Current Science*, Vol. 83(3) 101-103.
18. Manfred Koppers, Hutienheim and Kailash Paliwal (2002). Monsum - Gebiete in Asien Und Nord - Australien. D1 Indien.
19. N.Malathi, Indira P. Sarethy and Kailash Paliwal (2002). The effect of aluminium on the growth and physiology of *Acacia nilotica* seedlings. *Journal of Plant Biology*, Vol.29(1) 29-32.
20. G.Renuga and Kailash Paliwal (2002). Changes in protein profile during sulphurdioxide fumigation of *Vingna unguiculata*. *Journal of Plant Biology*, Vol. 29(1) 77-81.
21. Meenakshi Sundaravalli and Kailash Paliwal (2002). Influence of silvipastoral system on nutrient dynamics and soil fertility in a semi-arid grazingland at Madurai. *Journal of Tropical Ecology*, 43 (2).
22. N.Malathi, Indira P. Sarethy and Kailash Paliwal (2001). The effect of Aluminium on hydroponically grown *Acacia nilotica* seedlings. *Journal of Plant Biology*, Vol.28(1) 105-109.
23. V.M.Sundaravalli, Kailash Paliwal and D.Ilakkiam (2001). Leaf Litter Decomposition and Soil Respiration in a semi-arid Ecosystem near Madurai, South India. *International Journal of Ecology and Environmental Sciences* 27:221-224.
24. Meenakshi Sundaravalli and Kailash Paliwal (2000). Primary production and soil carbon dioxide emission in the semi-arid grazing land of Madurai, India. *Tropical grassland* 34;14-20.
25. Reeta Jayshankar and Kailash Paliwal (2000). Seasonal variation in the essential micro-nutrients of *Gracillaria* sps of Tamil Nadu Coast. *Indian. J. Fish.* 47(4):359-363.
26. Kannan, D. and Paliwal, K. (1999). Effect of *Rhizobium* inoculation on growth, physiology of *Acacia auriculiformis* seedlings under nursery conditions. *Forest, Farm and Community Tree Net Work* Vol (4): 1999.
27. T.Balakumar, V. Selvakumar, K. Sathimeena and K.Paliwal (1999). UV-B radiation mediated alterations in the nitrate assimilation pathway of crop plants. I kinetic Characteristics of nitrate reductase. *Photosynthetica* : 37 (3):459-467.
28. T.Balakumar, V.Selvakumar, K.Sathimeena and K.Paliwal (1999). UV-B radiation mediated alterations in the nitrate assimilation pathway of crop plants. II kinetic Characteristics of nitrate reductase. *Photosynthetica* : 37 (3):469-475.

29. K.S.T.K. Karunaichamy, K. Paliwal and P.A. Arp (1999). Biomass and nutrient dynamics of mistletoe (*Dendrophthoe falcata*) and Neem (*Azardichta indica*) seedlings. *Current Science*: 76(6): 840-842.
30. Kailash Paliwal and D. Kannan (1999). Growth and nutritional characteristics of four woody species under nursery conditions and growth after transplantation in semi-arid field conditions at Madurai, India. *Journal of Arid Environments* 43;133-141.
31. Kannan, D. and Paliwal, K. (1998) Effect of spacing between the containers on seedling growth, photosynthesis and stomatal conductance of *Cassia siamea* under nursery conditions. *Proceedings, IUFRO RG 2.09.00 Symposium on 'Innovations in Forest Tree Seed Science & Nursery Technology'*, Pt. Ravishankar Shukla University, Raipur, India. pp 273-278.
32. K. Paliwal, K.S.T.K. Karunaichamy and Ananthavalli (1998) Effect of sewage water irrigation on growth performance, biomass and nutrient accumulation in *Hardwickia binata* under nursery conditions. *Journal of Bioresource Technology* 66(2): 106-111.
33. Paliwal, K. and Meenakshi Sundaravalli, V. (1998) Silvipastoral system: A strategy of grassland management towards sustainable environment in Western Ghats region. *Vasundara* 3: 66-72.
34. V. Meenakshi Sundaravalli and Kailash Paliwal (1998) Effect of abiotic variables and root biomass on CO₂ evolution and carbon balance after burning in semi-arid grassland ecosystem. *Journal of Tropical Forest Science* 10(4): 494-504.
35. Kannan, D. and Paliwal, K. (1998). Height and diameter: An index to predict the biomass production in *Cassia siamea* Lam. *Journal of Trees Science* (Communicated).
36. Meenakshi Sundaravalli and K. Paliwal (1997). Dry matter production and nitrogen dynamics in the semi-arid grazingland of Madurai, India. *Journal of Tropical Ecology* 38(1): 81-86.
37. D. Kannan and Kailash Paliwal (1997). Fertilization Response on Growth, Photosynthesis, Starch Accumulation and Leaf Nitrogen Status of *Cassia siamea* Lam. Seedling under Nursery conditions. *Journal of Sustainable Forestry* 4(1/2), 141 - 158.
38. K. Paliwal, M. Ananthavalli and K.S.T.K. Karunaichamy (1997). Response of leaf optical properties in *Hardwickia binata* seedlings to sewage water irrigation under nursery conditions. *The International Tree Crops Journal*.
39. Kannan, D. and Paliwal, K. (1996). Effects of nursery fertilization on growth, starch concentration and nitrogen status and field performance of *Cassia siamea*. *Proceedings, IUFRO S4.01 conference on 'Effect of environmental factors on Tree and Stand growth'*, September 23-27, 1996, Technische University Dresden, Germany, pp. 107-109.
40. M. Ilangovan and Kailash Paliwal (1996). Changes in mass and nutrients during decomposition of *Leucaena leucocephala* and *Cymbopogon citratus* and the effect of substrate quality, weather variable and soil variables on mass loss during decomposition in a semi-arid ecosystem, Madurai, India. *Journal of Tropical Forest Science* 8(3): 317-332.
41. K. Natarajan and Kailash Paliwal (1996). Gas exchange in *Hardwickia binata* after water stress and rewatering. *Journal of Biologia Plantarum* 38(1): 141-143.

42. Manfred Kupperts; Han Tim; Frank Orth; Jens Stegmann; Robert Stober; Han Schneider; Kailash Paliwal and K.S.T.K. Karunaichamy (1996). Effects of light environment and successional status on light fleck use by understory trees of temperate and tropical forests. *Tree Physiology* 16: 69-80.
43. G. Renuga and Kailash Paliwal (1995). Detoxification of SO₂ derivatives in chloroplasts of *Hardwickia binata*. *J. Bioscience* 20(1), 59-68.
44. K. Paliwal and K.S.T.K. Karunaichamy (1995). *In-situ* estimation of leaf chlorophyll by light transmittance in vegetable crops. *Indian Journal of Agricultural Sciences* 65(5), 361-362.
45. D. Kannan and Kailash Paliwal (1995). Effect of nursery fertilization on *Cassia siamea* seedlings growth and its impact on early field performance. *Journal of Tropical Forest Science* 8(2): 203-212.
46. K.S.T.K. Karunaichamy and Kailash Paliwal (1995) Nutrient dynamics of tropical grazing land ecosystem in Southern India. *Journal of Tropical Ecology* 36(2): 227-235.
47. K.S.T.K. Karunaichamy and Kailash Paliwal (1995). Monthly variation and compartmentation of nutrients in a tropical grazing land ecosystem in southern India. *Proceedings of the Fifth International Rangeland Congress, Salt Lake City, Utah, U.S.A. Vol.(1): 280-281.*
48. Kailash Paliwal and K. Manoharan (1995). Grazing and nutrient dynamics of grazinglands in Eastern Ghats of South India. *Proceedings of the Fifth International Rangeland Congress, Salt Lake City, Utah, U.S.A. Vol.(1): 426-427.*
49. K. Manoharan and Kailash Paliwal (1995). Effect of fire on the grazingland in Eastern Ghats of Tamil Nadu, India. *Proceedings of the Fifth International Rangeland Congress, Salt Lake City, Utah, U.S.A. Vol.(1): 344-345.*
50. K. Natarajan and Kailash Paliwal (1995) Photosynthesis of *Leucaena leucocephala* during water stress in a semi arid region of Madurai. *Nitrogen Fixing Tree Research Report* 13: 79-83.
51. Kailash Paliwal and Mayandi Sivaguru (1994) Indirect effects of Aluminum on the reflectance properties of rice cultivars differing in aluminum tolerance. *Journal of Plant Nutrition* 17: 883-897.
52. M. Sivaguru and Kailash Paliwal (1994). The possible Biochemical Mechanism of Aluminum Tolerance. A protocol for Rapid Screening of Rice (*Oryza sativa* L.) Germplasms. *Rice Biotechnology Quarterly* 6-7, April 1994, USA.
53. Karunyal Samuel, Renuga G. and Kailash Paliwal (1994) Effects of tannery effluent on seed germination, leaf area, biomass and mineral content of some plants. *Journal of Bioresource Technology* 47: 215-218.
54. Kailash Paliwal, M. Sivaguru and A. Thiruselvi (1994). Identification of an aluminum tolerant tropical cowpea cultivar by growth and biomass accumulation parameters. *Journal of Plant Nutrition* 17: 367-376.
55. Kailash Paliwal, Manfred Kupperts and Hans Schneider (1994). Leaf gas exchange in light flecks of plants of different successional range in the understory of a central European Beech forest. *Current Science* 67(1): 29-34.

56. K.S.T.K. Karunaichamy and Kailash Paliwal (1994) Optical properties of leaves of four vegetable crops. *Indian Journal of Agricultural Sciences* 64(7): 474-475.
57. K.S.T.K. Karunaichamy and Kailash Paliwal (1994) Dry matter production and transfer dynamics in a humid grasslands of Western Ghats in Southern India. *Tropical Grassland* 28, 17-23.
58. M. Sivaguru and Kailash Paliwal (1994) A simple test to identify aluminum tolerant rice genotypes at the level of signal perception. *Journal of Current Science* 67(5), 398 - 399.
59. K.S.T.K. Karunaichamy and K. Paliwal (1994) Biomass dynamics and net primary production in a tropical grassland of Western Ghats in Southern India. *Arch. Zotech* 43(164), 317-325.
60. Murugesan Ramamoorthy and Kailash Paliwal (1993) Allelopathic compounds in leaves of *Gliricidia sepium* (JACQ.) Kunth Ex Walp. and its effect on *Sorghum vulgare* L. *Journal of Chemical Ecology* 19(8): 1691-1701.
61. M. Sivaguru and Kailash Paliwal (1993) Differential aluminum tolerance in some tropical rice cultivars. I. Growth performance. *Journal of Plant Nutrition* 16(9): 1705-1716.
62. M. Sivaguru and Kailash Paliwal (1993) Differential aluminum tolerance in some tropical rice cultivars. II. Mechanism of aluminum tolerance. *Journal of Plant Nutrition* 16(9): 1717-1732.
63. T. Balakumar, V. Hari Babu Vincent and Kailash Paliwal (1993) On the interaction of UV-B radiation (280-315 nm) with water stress in crop plants. *Physiologia plantarum* 87: 217-222.
64. Kailash Paliwal, Rosary Mary and A.X. Christiana (1993). Biochemical changes induced by sodium carbonate and bicarbonate in the halophytes *Suaeda maritima* and *Suaeda nudiflora* of Tuticorin Coast. H. Lieth and A. Al masoom (eds): towards the national use of high salinity tolerant plants, Vol. 1: 251-254.
65. K.S.T.K. Karunaichamy, Kailash Paliwal and K. Natarajan (1993). Diurnal course of leaf gas exchange of mistletoe (*Dendrophthoe falcata*) and its host (*Azadirachta indica*) in a semi-arid region of Southern India. *Proceedings of Indian national Science Academy* B59(5): 505-510.
66. Hans Schneider, Kailash Paliwal and Manfred Kupperts (1993). Blattgasaustausch in Lichtflecken von pflanzen unterschiedlicher sukzessionaler Stellung aus dem Unterwuchs eines mitteleuropäischen Buchenwaldes - eine analytische Grundlage für die Ellenbergschen Light-Zeigerwerte? *Proceedings of the (German) Society of Ecologist, Oecologia* Vol. 22 pp. 439-442.
67. T. Balakumar, M. Thangavel and Kailash Paliwal (1993). Characteristics of *in vivo* nitrate reduction in the CAM plant *Notonia grandiflora* DC. *Journal of Photosynthetic* 28: (2) 297-306.
68. K.S.T.K. Karunaichamy and Kailash Paliwal (1993). Seasonal variation in live shoot biomass and chlorophyll content in a grassland ecosystem at Kottavasal. *Proceedings of Indian National Science Academy* B59 (6): 613-616.

69. Karunyal Samuel and Kailash Paliwal (1993). Effect of water stress on water relations, photosynthesis, and element content of tomato. *Journal of Plant Physiology and Biochemistry*.
70. K. Varadarajan, Kailash Paliwal and C. Rajamanickam (1993). Metal accumulation in blood and milk of dairy cows grazed or fed by fodder grown on a sewage water disposal site. *Environmental Toxicology and Risk Assessment: 2nd volume, ASTM STP 1216*, 510-520.
71. T. Balakumar, M. Sivaguru, M.R. James, P.R. Anbudurai and Kailash Paliwal (1992). Impact of aluminium toxicity on growth and efficiency of nutrient metabolism in some tropical rice cultivars. *Tropical Agriculture* 69(3): 211-216.
72. D. Kannan and Kailash Paliwal (1992). Dry matter production, chlorophyll, protein contents and foliar nutrients concentration in *Pelotophorum ferrugineum* and *Albizia lebbbeck* under nursery conditions. *Forest Ecology and Management* 50: 265-273.
73. K. Varadarajan, D. Kannan, Kailash Paliwal, A. Mani and V.S. Balasubramanian (1991). Effect of sewage pollution on the health status of sewage farm workers. *Bulletin of Environmental Contamination and Toxicology* 47: 646-652.
74. K. Varadarajan, Kailash Paliwal, C. Rajamanickam, K. Manickavel, G. Jeyapaul and S. Logasundari (1991). Impact of sewage disposal on the hemotological and biochemical parameters of dairy cows. *Bulletin of Environmental Contamination and Toxicology* 47: 653-659.
75. Kailash Paliwal and K.S.T.K. Karunaichamy (1991). Productivity and nitrogen dynamics in the semi-arid grazing lands of Madurai, India. *Proceedings of the Fourth International Rangeland Congress, Montpellier, France*, pp. 216-220.
76. Thomas H. Green, Robert J. Mitchell, Kailash Paliwal, Uday V. Pathre, Bruce R. Zutter, and Dean H. Gjerstad (1991). Effects of herbaceous weeds on fourth year water relations and gas exchange of loblolly pine. *Weed Technology* 5: 753-758.
77. Kailash Paliwal, K. Natarajan and A. Gnanam (1990). Photosynthesis and productivity relationships. *Biology Education* 7(1): 21-25.
78. K.S.T.K. Karunaichamy, Kailash Paliwal and P.S. Swamy (1990) Effect of sewage water irrigation on dry matter yield and heavy metal concentration in three forage grasses. *Int. J. Ecol. Environ. Sci.* 16: 151-159.
79. Kailash Paliwal and M. Ilangovan (1990) Factors influencing *in vivo* determinations of nitrate reductase (EC 1.6.6.1) activity in mulberry (*Morus alba* L.). *Sericologia* 30(3): 369-379.
80. M. Ilangovan, K. Muthuchelian and Kailash Paliwal (1990). Nitrate reduction in weeds as a function of leaf age, extra nitrate application and photosynthetic photon flux density. *Geobios* 17:22-26.
81. K. Natarajan, Kailash Paliwal and A. Gnanam (1990). Diurnal changes in photosynthetic characteristics of *Leucaena leucocephala* cultivar K8 in semi-arid region of Madurai. *Photosynthetica* 24(3): 459-467.
82. K. Muthuchelian, Kailash Paliwal, A. Gnanam and R.K. Mitchell (1990) The effect of three long-chain aliphatic alcohols on photo-synthesis and growth of *Pennisetum polystachyeon* Schult. *Photosynthetica* 24(2): 257-260.

83. K. Muthuchelian, Kailash Paliwal and A. Gnanam (1989) Influence of shading on net photosynthetic and transpiration rates, stomatal diffusive resistance, nitrate reductase and biomass productivity of a woody legume tree species (*Erythrina variegata* Lam.). Proc. Ind. Acad. Sci. (Plant Sciences) 99(6): 539-546.
84. K. Muthuchelian and Kailash Paliwal (1989). Biology of litter decomposition in terrestrial environments. Biology Education 6(2): 117-120.
85. G.A. Carter, Kailash Paliwal, U. Pathre, T.H. Green, R.J. Mitchell and D.H. Gjersted (1989). Effect of competition and leaf age on visible and infrared reflectance in pine foliage. Plant, Cell and Environment 12: 309-315.
86. K.S.T.K. Karunaichamy and Kailash Paliwal (1989). Primary productivity and transfer dynamics of grazing lands at Madurai, Southern India. Tropical Ecology 30(1): 111-117.
87. G.A. Carter, Kailash Paliwal, U. Pathre, R.J. Mitchell and D.H. Gjerstad (1988). Effect of competition on visible and infra-red reflectance in pine foliage. Bul. Ecol. Soci. of America 69(2): 93.
88. G.A. Carter, Kailash Paliwal, U. Pathre, R.J. Mitchell and D.H. Gjerstad (1988). Influence of competition induced stress on spectral reflectance in loblolly pine. Remote sensing for resource, inventory planning and monitoring. In: Proc. II Forest Serv. Remot. Sens. Appl. Conf., April 11-15, 1988, Mississippi, USA, pp. 318-327.
89. D.W. Lee, and Kailash Paliwal (1988). The light climate of a South Indian tropical evergreen forest. Geobios 15(1): 3-6.
90. K. Natarajan, Kailash Paliwal and A. Gnanam (1988). Biomass and leaf area relationships in *Leucaena leucocephala* (Lam.) de Wit. Photosynthetica 22(1): 105-107.
91. Kailash Paliwal and K. Muthuchelian (1988). Ecophysiological studies of *Cenchrus ciliaris* L. growth, productivity, photosynthesis and nitrate assimilation. Int. J. Ecol. Environ. Sci. 14: 167-174.
92. K. Muthuchelian, S. Maria Victorial Rani and Kailash Paliwal (1988). Differential action of Cu and Cd on chlorophyll biosynthesis and nitrate reductase activity in *Vigna sinensis* L. (Savi). Ind. J. Plant Physiol. 31(2): 169-173.
93. S. Maria Victorial Rani and Kailash Paliwal (1988). Germination as a screening index of heavy metal tolerance in a forage crop. Indian J. Range Mgmt. 9: 113-118.
94. S.M.V. Rani, K. Muthuchelian and Kailash Paliwal (1988). Effect of short term exposure of heavy metals on *in vivo* nitrate reductase (E.C. 1.6.6.1) activity of *Echinochloa colona* Link. Indian J. Range Mgmt. 9: 119-123.
95. K. Muthuchelian, S.M.V. Rani, G. Kandasamy and Kailash Paliwal (1988). Influence of sewage water and sewage soil on photosynthesis, nitrate reductase activity and biomass accumulation of *Phaseolus mungo*. Ind. J. Environ. Health 30(4): 367-371.
96. R.K. Jain, Kailash Paliwal, R.K. Dixon and D.H. Gjerstad (1988). Improving productivity of multipurpose trees growing on substandard soils in India. J. Forestry 87(4): 38-42.

97. S. Maria Victorial Rani, K. Muthuchelian and Kailash Paliwal (1987). Differential toxicity of Cu²⁺ and Cd²⁺ on chlorophyll biosynthesis and nitrate reductase activity in *Phaseolus mungo* L. *Annals of Plant Physiol.* 1(2): 126-135.
98. Kailash Paliwal, K. Muthuchelian and A. Gnanam (1986). Ecophysiological studies of some woody biomass species and fodder grass. *Proc. Seminar on Ecodevelopment of Western Ghats, KFRI II Sec. II:148- 152.*
99. K. Natarajan, and Kailash Paliwal (1986). Photosynthesis characteristics of *Leucaena leucocephala* Lam. de wit. *Proc. Seminar on Ecodevelopment of Western Ghats. KFRI Sec. V 5: 204-207.*
100. Kailash Paliwal, Sherine John and A. Gnanam (1986). Ecosociological studies of the human settlements and its impact on environment in the Western Ghats region of Tamilnadu. *Proc. Seminar on Ecodevelopment of Western Ghats, KFRI, Sec. V 5: 204-207.*
101. K. Muthuchelian, Kailash Paliwal and A. Gnanam (1986). Physiological studies of two fast growing tree species in semi-arid ecoclimate at Madurai. *J. Indian Forester* 112(9): 814-818.
102. D.W. Lee, Kailash Paliwal, K.A. Patel and D.A. Sen (1986). Optical properties of leaves of some Indian plants. *Curr. Sci.* 55(18): 923-925.
103. Kailash Paliwal, T.K. Sivaraj, K. Natarajan and M. Peter Marian (1986). Chlorophyll content in different plant species of Nagamalai Hills and its significance on biomass production. *Proc. Indian Acad. Sci. (Plant Sci.)* 96(6) 471-474.
104. S. Ponnammal, Kailash Paliwal and A. Gnanam (1985). Some phenological observations in a two year old *Leucaena* plantation. *Leucaena Research Report* 6: 53.
105. Kailash Paliwal, K. Natarajan and A. Gnanam (1985). Woody biomass productivities and photosynthesis rates under semi-arid conditions in India. *Proc. Symposium on Energy from Biomass and Wastes IX, Florida*, pp. 227-241.
106. K. Natarajan, Kailash Paliwal and A. Gnanam (1985). Diurnal course of CO₂ exchange in *Leucaena leucocephala* var. KB (Lam) de Wit. in semi-arid climate. *Leucaena Research Report* 6: 42-45.
107. S. Mathavan, Kailash Paliwal, A. Gnanam and Velpandi (1984). 1st Report on the occurrence of *Dasychira Mendosa* (Hubner) (Lepidoptera Lymantriidae) on rubber plant *Guayule* (*Parthenium argentatum*) in Tamilnadu. *Entomon.* 9(3): 221-222.
108. Kailash Paliwal, T.K. Sivaraj, T. Sri Ganesan and A. Gnanam (1984). Floristic studies of Nagamalai Hills. *J. SBCI Newsletter* 2(4): 100-103.
109. Kailash Paliwal and K. Muthuchelian (1983). Physiological changes in the root parasite *Santalum album* L. in association with host. *J. SBCI Newsletter* 2(4): 100-103.
110. Kailash Paliwal and S.C. Pandeya (1981). Energy content of herbage produce of *Cenchrus ciliaris* Ecotype RM: 4,5,16 and 17 dominated grazing lands in Western India. *Nat. symp.on Dynamics of energy flow in Biological Systems, Rajkot, Gujarat, India. Abstract No.3.16.*

111. Kailash Paliwal, S.C. Pandeya, S.C. Sharma, H.K. Jain, S.J. Pathak and V.M. Bhanot (1979). Dynamic stability of the environment and distributional pattern of the population of *Cenchrus ciliaris* in Western India. 3rd Int. Symp. Trop. Ecol. Panama.
112. Kailash Paliwal (1977). The environment and *Cenchrus* grazing lands in Western India. Final Report US PL 480 project, Saurashtra University publication.
113. Kailash Paliwal, S.C. Pandeya, S.C. Sharma, H.K. Jain, S.J. Pathak and V.M. Bhanot (1977). The environment and population differences in Anjan grass (*Cenchrus ciliaris*), Saurashtra University Publication.
114. Kailash Paliwal, S.C. Pandeya, S.C. Sharma, H.K. Jain, S.J. Pathak and V.M. Bhanot (1976). Autecology and genecology of Anjan grass (*Cenchrus ciliaris*) complex, 3rd Report, Saurashtra University publication.
115. Kailash Paliwal, S.C. Pandeya, S.C. Sharma, H.K. Jain, S.J. Pathak and V.M. Bhanot (1974). Autecology and genecology of Anjan grass (*Cenchrus ciliaris*) complex 2nd Report, Saurashtra University Publication.
116. Kailash Paliwal and S.C. Pandeya (1974). Dynamics of primary production of grazing land and forest ecosystems in Western India. 1st Int. Cong. Ecol.
117. Kailash Paliwal, S.C. Pandeya, S.C. Sharma, H.K. Jain, S.J. Pathak and Bhanot, V.M. (1973). Autecology and genecology of Anjan grass (*Cenchrus ciliaris*) complex. 2nd report, Saurashtra University publication.
118. Kailash Paliwal and S.C. Pandeya (1973). Net primary production of *Cenchrus ciliaris* (Ecotype: RM4) dominated grasslands during the growing season at Pilvai, Masana District, 43rd Session Nat. Acad. Sci. Biol. Soc.