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ASSESSMENT OF ALLELOPATHIC POTENTIAL OF *Pennisetum polystachyon* (L.) Schult. ON SEVERAL WEED AND CROP SPECIES

By

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Research Report submitted in partial fulfillment of
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TABLE OF CONTENTS

CHAPTER 3 METHODOLOGY

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

alt	altitude
ANOVA	Analysis of Variance
atm	atmosphere
FER	Ferulic acid
HEPES	4-2-hydroxyethyl-1-piperazineethanesulfonic acid
MES	Morpholino ethansulfonic acid
mOsmol/kg	milliosmol per kilogram
MPa	Mega pascal
Nd	Not determined
p- Cou	*p*- Coumaric acid
p- HBA	*p*- Hydroxy benzoic acid
PEG	Polyethylene glycol
rpm	rotations per minute
SD	Standard Deviation
SYR	Syringic acid
VAN	Vanillic acid

LIST OF APPENDICES

ABSTRACT

The allelopathic potential of *Pennisetum polystachyon* was investigated using several bioassay weed and edible crop species in laboratory. Bioassay species used in this study were *Amaranthus caudatus, Zea mays, Eleusine indica* and *Hedyotis verticillata.* Stem plus leaf and root extracts of *P. polystachyon* were assayed to determine their allelopathic effects on seed germination and leaf disc discoloration of bioassay species. pH and osmotic potential tests were also conducted for the possible pH and osmotic effects of the extracts. The percentage of germination of weed species was lower than that of edible crop species. There were no significant differences in seed germination when pH was increased from 5 to 7 for all bioassay species. PEG solutions decreased germination of *H. verticillata* when PEG concentration was increased from 0 to -0.20 MPa. Leaf discs tests showed that *Z. mays* and *E. indica* were more sensitive to the stem plus leaf and root extracts. This result suggests that these extracts might contain allelochemicals which should be investigated further in the laboratory and the field for practical application of the extracts as weed inhibiting agent.

KAJIAN KEUPAYAAN ALLELOPATI EKSTRAK *Pennisetum polystachyon* (L.) Schult. **TERHADAP BEBERAPA SPESIES RUMPAI DAN TANAMAN**

ABSTRAK

Keupayaan alelopati dalam *Pennisetum polystachyon* telah dikaji di makmal menggunakan beberapa jenis rumpai dan tanaman bioasai. Spesies-spesies bioasai yang digunakan dalam kajian ini ialah *Amaranthus caudatus, Zea mays, Eleusine indica* dan *Hedyotis verticillata.* Ekstrak batang dan daun serta akar *P. polystachyon* telah diasaikan untuk menentukan kesan alelopati terhadap percambahan biji benih dan perubahan warna cakera daun spesies-spesies bioasai. Ujian pH dan keupayaan osmotik juga telah dilakukan untuk mengkaji kesan yang disebabkan oleh pH dan keupayaan osmotik ekstrak tersebut. Peratus percambahan biji benih rumpai adalah lebih rendah daripada peratus percambahan biji benih tanaman. Tiada perbezaan ketara dalam ujian pH terhadap percambahan biji benih semua spesies bioasai apabila pH ditingkatkan daripada pH 5 hingga pH 7. Larutan PEG mengurangkan peratus percambahan biji benih *H. verticillata* apabila kepekatan PEG ditingkatkan daripada 0 hingga -0.20 MPa. Ujian cakera daun menunjukkan bahawa *Z. mays* dan *E. indica* adalah lebih sensitif terhadap ekstrak batang dan daun serta akar jika dibandingkan dengan kesemua spesies bioasai yang dikaji. Hasil kajian ini mencadangkan bahawa ekstrak tersebut mungkin mengandungi alelokimia yang boleh dikaji secara lebih lanjut dalam makmal atau di lapangan sebagai agen perencat rumpai.