

INTERACTIONS OF PLANTING TIME
AND DISTANCE OF PLANTING ON GROWTH
OF SEEDLING WEEDS AND CROPS SPECIES

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ALLELOPATHIC EFFECTS OF *PENNISETUM POLYSTACHYON* (L.) SCHULT
ON GROWTH OF SEVERAL WEEDS AND CROPS SPECIES

By
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LIST OF ABBREVIATIONS

mg/L	milligram base liter
ml	milliliter
°C	degree Celsius
nm	nanometer
g/L	gram base liter
g/kg	gram base kilogram
g	gram
OD	optical density
cm	centimeter
rpm	round per minute
Na ₂ CO ₃	Sodium carbonate
±	more or less

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ABSTRACT

The allelopathic effects of *P. polystachyon* stem plus leaves extracts and debris on growth of several weeds and crops species were examined under greenhouse conditions. Weedy plants of *Eleusine indica* and *Heydotis verticillata* and edible crops of *Amaranthus caudatus* and *Zea mays* were bioassay species studied. *Pennisetum polystachyon* extracts stimulated the height of *A. caudatus* at lower concentration (50 and 100g/L) but no significant effect was observed for *A. caudatus* at the highest concentration (150g/L). All three concentration of *P. polystachyon* extracts induced *E. indica* to grow. Besides, there was no allelopathic effect observed for *Z. mays* and *H. verticillata* at the low concentration (50g/L). *Zea mays* was tolerant to 100g/L but was inhibited at the highest concentration (150g/L). *Heydotis verticillata* were inhibited at 100 and 150g/L. It is found that the allelopathic effect of extracts on some bioassay species is concentration dependent. This is because the content of phenolic compound in the *P. polystachyon* extract increased as the concentration of the extract increased. On the other hands, the allelopathic effect of *P. polystachyon* debris was observed because all bioassay species were inhibited as applied. This study suggests that *Pennisetum polystachyon* extract is suitable for controlling *H. verticillata* whereas its debris can be used for control of *E. indica*, implying potential of *P. polystachyon* as a natural herbicide.

**Kesan alelopati daripada *Pennisetum polystachyon* (L.) Schult ke atas
pertumbuhan beberapa spesies rumpai dan tanaman**

ABSTRAK

Kesan alelopati daripada ekstrak pucuk dan daun *P. polystachyon* ke atas pertumbuhan beberapa spesies rumput dan tanaman dikajikan dalam keadaan rumah hijau. *Eleusine indica* dan *Heydotis verticillata* ialah spesies rumpai yang digunakan dalam kajian ini manakala *Amaranthus caudatus* dan *Zea mays* merupakan spesies tanaman yang digunakan. Ekstrak *P. polystachyon* merangsang pertumbuhan *A. caudatus* pada kepekatan rendah iaitu 50 dan 100g/L tetapi tidak ada kesan alelopati ke atas *A. caudatus* pada kepekatan tertinggi (150g/L). Ketiga-tiga kepekatan ekstrak *P. polystachyon* merangsang pertumbuhan *E. indica*. Selain daripada itu, tidak ada kesan alelopati ke atas *Z.mays* dan *H. verticillata* pada kepekatan rendah (50g/L). *Zea mays* adalah toleran terhadap ekstrak *P. polystachyon* pada kepekatan 100g/L tetapi direncatkan pada kepekatan yang tinggi, iaitu 150g/L. Pertumbuhan *H. verticillata* direncatkan pada 100 dan 150g/L. Adalah didapati bahawa kesan alelopati ekstrak *P. polystachyon* bergantung kepada kepekatannya kerana kandungan sebatian fenolik meningkat apabila kepekatan ekstrak meningkat. Debris *P. polystachyon* menunjukkan kesan alelopati kerana ia merencatkan pertumbuhan semua spesies bioasai. Hasil kajian ini mencadangkan ekstrak *P. polystachyon* adalah sesuai untuk mengawal *H. verticillata* manakala debris *P. polystachyon* dapat digunakan dalam kawalan *E. indica*. Maka, *P. polystachyon* berpotensi digunakan sebagai racun herba semulajadi.