

# Potensi *Helianthus annuus* dan *ipomoea batatas* dalam menghambat pertumbuhan *pennisetum polystachyon*

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## Abstrak

Pengaruh eksudat akar dan ekstrak daun *Helianthus annuus* serta *Ipomoea batatas* terhadap pertumbuhan rumput gajah *Pennisetum polystachyon* telah dilakukan; diamati pula pertumbuhannya bila ditanam di dalam 1 pot bersama *H. annuus* atau *I. batatas*.

Pada penelitian ini, eksudat akar *H. annuus* mampu menurunkan persentase perkecambahan biji dan panjang kecambah rumput gajah sampai 23,87 dan 47 % terhadap kontrol dalam 90 jam; sementara eksudat akar *I. batatas* menunjukkan penurunan 22,37 % dan 23,83 %.

Eksudat akar dari tanaman bunga matahari yang disiramkan selama 5 minggu pada rumput gajah umur 10 hari menekan tinggi gulma itu 13,62%; berat segar dan berat kering 39,56 dan 51,24 %. Eksudat akar tanaman ubi jalar hanya berpengaruh menekan berat segar dan berat kering gulma itu sampai 18,58 dan 18,40 %.

Ekstrak daun *H. annuus* serta *I. batatas* 4 % b.k. mampu menghambat persentase perkecambahan dan tinggi kecambah rumput gajah dalam 90 jam berturut-turut sebesar 38,45 dan 15,28 % serta 30,79 dan 19,45 %.

Ekstrak daun *H. annuus* serta *I. batatas* 2 % b.k. yang disiramkan sekali seminggu tidak berpengaruh terhadap tinggi dan berat segar rumput gajah. Ekstrak daun *H. annuus* mereduksi berat kering rumput gajah 19,15 %; sementara ekstrak daun *I. batatas* menekan berat segar dan berat kering rumput gajah 9,6 dan 31,01 %.

Rumput gajah yang ditanam dalam 1 pot bersama *H. annuus* atau *I. batatas* tidak menunjukkan perbedaan nyata dalam tinggi dan berat segar rumput gajah; namun berat kering menunjukkan penurunan 33,44 dan 39,63 % terhadap kontrol.

.....*Pennisetum polystachyon* is native of Tropical Africa. It has a high reproductive capacity and rapid seed germination; it becomes a troublesome weed when it takes over waste- and cultivated lands. It is now also found along the road sides and highways in Indonesia. The seeds are wind dispersed and have a resilient ability to survive drought and certain cultural and chemical control methods.

The concept that some crop plants may be allelopathic to certain weeds is receiving increased attention in the search for alternative weed control strategies. *Helianthus annuus* and *Ipomoea aquatica* are amongst the crop plants that may have the allelopathic effect to some weeds.

This research aims to study the inhibiting potential of *H. annuus* and *I. batatas* on the growth of *P. polystachyon*. This study observed the effects of root exudates and leaf extracts of *H. annuus* and *I. batatas* on the germination and growth of *P. polystachyon*; and also on the growth of this weed grown together with *H. annuus* or *I. batatas*.

Root exudates taken from the sand planted with *H. annuus* or *I. batatas* for 4 weeks diluted 1-- 4 times (5 replications each) inhibited the percentage of germination and the length of germination seeds in 90 hours. Root exudates of *H. annuus* reduced the percentage of germination up to 23.87 % and the length of the germination seeds up to 19.46 % of control; while root exudates of *I. batatas* reduced both parameters 22.37

% and 23.83 % respectively.

Root exudates, liquid comes out from watering *H. annuus* or *I. batatas* (0, 1, 2, 3 and 4 plants/pot), poured over a 10-days seedling of *P. polystachyan* twice a day during 5 weeks (5 replications each) reduced the height, fresh and dry weight of the weed. The height reduced up to 13.62 %; fresh and dry weight up to 39.56 % and 51.24 % by the root exudate of *H. annuus*; while those of *I. batatas* had no effect to the height of *P. polystachyan* but did reduce the fresh and dry weight up to 18.58 and 18.40 %.

Leaf extracts of *H. annuus* or *I. batatas* (0--4 % dry weight), with 5 replications each, reduced also the percentage of germination and length of the germination of seed of *P. polystachyan*. During 90 hours, leaf extracts of *H. annuus* reduced the percentage of germination of the weed species up to 38.45 % and length of the germination of seeds up to 15.28 %; while those of *I. batatas* up to 30.79 % and 19.45 % respectively. The 10 days-old seedling of *P. polystachyan* with 50 ml leaf extracts of *H. annuus* or *I. batatas* (0; 0.5; 1.0; 1.5; and 2 % dry weight) once a week, showed a little difference effect on those weed growth a week after the third treatment. Leaf extract of *H. annuus* almost had no effect on the weed growth both in height, fresh and dry weight except the leaf extract of 2 % dry weight gave a very significant difference with those of control, it reduced up to 19.15 % of the control. Leaf extract of *I. batatas* did reduce the fresh and dry weight of the weed species. Tukey's test showed that it reduced significantly the fresh weight to 9.6 % and reduced very significantly the dry weight up to 31.01 %.

*H. annuus* -- *P. polystachyan* and *I. batatas* - *P. polystachyan* grown together in a pot (0-5; 1-4; 2-3; 3-2; 4-1; and 5-0) for 5 weeks; 4 replications each, gave another result; both had no effect on height and fresh weight of *P. polystachyan*. *H. annuus* - *P. polystachyan* and *I. batatas* - *P. polystachyan* 4-1 reduced the dry weight significantly up to 33.44 and 39.63 %.