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INHIBITORY EFFECT OF CAMPHOR LEAF POWDER ON GERMINATION AND GROWTH OF THE WEED, *Bromus rigidus.*

Slik, O. M.; I. H. Abou El-darag and S. Fkerin
Rice Research & Training Center, Sakha, Kafr El-Sheikh - Egypt.

ABSTRACT

This study was conducted at Experimental station of Tajora- Agricultural Research Center for Western during 12/ 2014 and 1/ 2015. It aimed to find out the effect ground leaves of camphor trees, Eucalyptus camaldulensison on seed germination growth of the weed (*Bromus rigirdus*) .All treatments of ground leaves (1, 2, 3 g. /pot), caused a significant decrease in the length of shoot and radical of weed boshrenta, as well as fresh and dry weight of the weed compared to the control treatment.
Keywords: Fresh weight, Dry weight, Radical, Shoot, *Bromus rigidus*, Germination.

INTRODUCTION

Weeds pose a serious problem to agricultural crops, reducing the crop yield and affecting the grain quality. Weed problems are more complex and serious under dry condition than all other production systems because of simultaneous germination of crop and weed seeds.

Ripgut brome (*Bromus rigidus* Roth), a winter annual grass, is native to Europe and northern Africa but quite common along the Pacific Coast of North America from British Columbia to Mexico (Hawkes et al., 1985). Brome grass, the common name given to several species of grasses belonging to the genus *Bromus* can be found throughout the temperate world, with origins in the Mediterranean and European region (Kon and Blacklow 1995). Considering the competitiveness of *B. rigidus* to cereal crops and the increasing adoption of minimum tillage by growers in the region (D'Emden and Llewellyn 2004), these weed species pose a serious threat to productivity and sustainability of current farming systems. Although previous researches have has considerably improved our understanding of the ecology and management of brome grass (Gill and Blacklow 1984, Kon and Blacklow 1988), much of the research and literature tended to focus on weed populations in Western Australia. Furthermore, significant knowledge gaps still remain concerning seed biology (dormancy and germination) and seedbank dynamics of *B. rigidus*. Better understanding of the population dynamics and ecology of *B. rigidus* is likely to be critical for the development of effective management programs for this troublesome weed.

Allelopathy was first defined in 1937 by H. Molisch, who originated the term to refer to inhibitory and stimulatory interactions between all types of plants including microorganisms. To separate this interaction from resource competition, recent work defines allelopathy as the "direct or indirect harmful or beneficial effects of one plant on another through the production and release of chemical compounds" (Rice 1984). Using this definition, allelopathy refers to both autotoxic and heterotoxic effects (Miller 1996). Allelopathic interactions, therefore, represent chemical competition between plants (Harborne 1993). Allelopathy can be used in weed control in two ways: (1) selecting an appropriate crop cultivar or incorporating an allelopathic character into a desired crop cultivar and (2) applying residues and straw as mulches or growing an allelopathic cultivar in a rotational sequence that allows residues to remain in the field (Putnam and Duke 1974, Rice 1995). Putnam and Tang (1986) reported that chemicals with allelopathic potential exist in virtually all plant tissues, including leaves, flowers, fruits, stems, root, rhizomes, and seeds. Allelochemicals are released by such processes as volatilization, root exudation, leaching, and decomposition of plant residues (Rice 1984, Putnam 1986). Allelopathic chemicals are generally considered to be secondary plant products which are released directly from living plants into the environment via leaching, root exudation, volatilization, or the decomposition of plant residues (Miller 1996, Rice 1984). Most chemicals that have been identified in allelopathic interactions have been identified as either terpenes or phenolic compounds (Harborne 1993). Renata and Marija (2015) showed that carrot extracts reduced germination for up to 16.1% of fresh mayweed biomass. Extracts had no significant effect on fresh weight of carrot seedlings, while length of root and shoot were both stimulated and inhibited.

MATERIALS AND METHODS

This study was conducted at experimental station of Tajora- Agricultural Research Center for western region during 12/ 2014 and 1/ 2015.

The study aimed to find out the effect of camphortroes, Eucalyptus camaldensison on seed germination and seedling length of *Bromus rigidus* weed, using randomized complete design with three replicates.

Treatments of flour srol trees leaves were applied as 1, 2 and 3 grams/ pot.

- **Practical steps:**

Leaves of srol trees were dried at 70-85^{c}c for 24 hours, and then ground using home blender. From the ground powder, 1, 2 and 3 g were added to pots of 10-cm diameter, each containing 100 g of soil. In each pot, three seeds of *Bromus rigidus* weed were sown. The same procedure was followed with pots without the ground powder of srol trees, to act as a check, the pots were irrigated when needed.

Data Recorded:

1-Emergence (%):

The percentage of emerged seedling (Figure (1) *Bromus rigidus* seeds) was calculated after 25 days from planting.

Figure (1) *Bromus rigidus* seeds

2-Plant height (cm):

Average plant height of three *Bromus rigidus* weed was measured from the soil surface to the longest leaf tip 25 days after sowing.

3-Radical length (cm):

Average radical length of three *Bromus rigidus* weed was measured from the soil surface to the longest radical tip 25 days after sowing.

4- Fresh weight (g):

At 25 days after sowing, the pots were drained for two days and survived seedling from each pot were harvested at the soil surface and the fresh weight was recorded as gram per pot (plot).

5- Dry weight (g):

Average weight of plants of three *Bromus rigidus* weeds per pot was recorded 25 days after sowing.

All statistical analyses were performed using analysis of variance technique by means of Gen Stat Computer Software Package.

RESULTS AND DISCUSSION

According to data recorded in (Figures 2, 3) percentage of emergence of *Bromus rigidus* was greatly affected by srol treatments.

The percentage of emergence was significantly reduced sharply with increasing concentrations of flour at 5 days after sowing (Figure, 2).

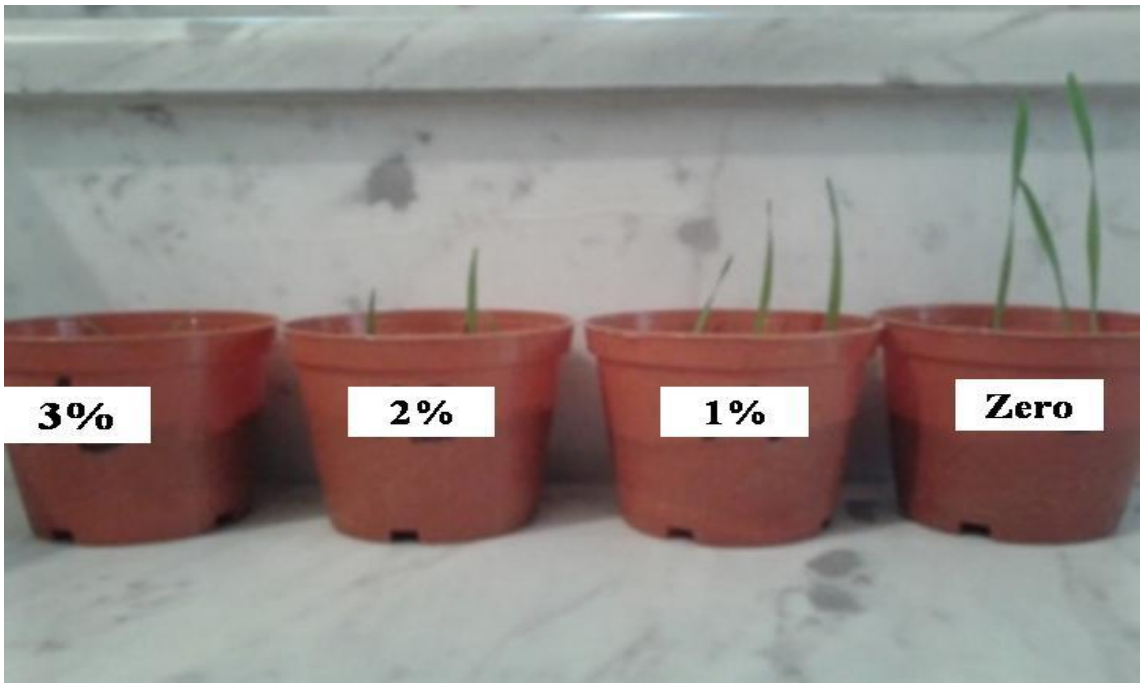

Figure (2) Effect of srol trees leaf flour on germination of *Bromus rigidus*

Figure (3) showed the significant variance in emergence percentage of the three concentrations of flour compared with control treatment. The germination reduction ranged from 26 to 100 % compared to the control.

The concentration of 3% of srol trees completely inhibited the germination of *B. rigidus*, while and 2% reduced the weed germination by 20 % and 74 %, respectfully. Similar results were obtained by Konar and Kushari. 1995 and Jackson and Willemsen. 1976.

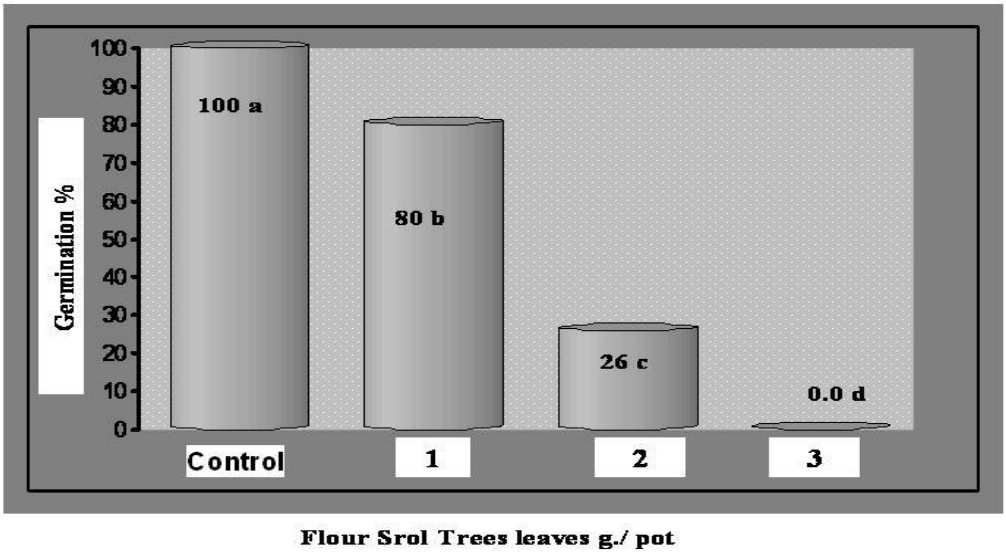

Figure (3) Effect of srol trees leaf flour on germination of *Bromus rigidus*

We can conclude that the *Bromus rigidus* weed was significantly affected by flour srol trees leaves. Similar results were obtained by Jackson and Willemsen 1976, Jayakumar, M. and M. Eyini 1990 and Manners and Galitz 1985.

Figure (4) show that there were significant differences in the length of *Bromus rigidus* seedling after the application of flour of srol leaves. At 3%, the length of the seedling was zero cm, but at 1 and 2%, the length was 9.8 and 6-3 cm, compared to 20 cm in the check. However, treatments of 1 and 2% were significantly the same.

This study agrees with previous research and findings in this regard, 2.5 higher inhibitory effect of flour of srol leaves has been observed by other researchers Tanveer et al., 2010; Raoof and Siddiqui, 2012.

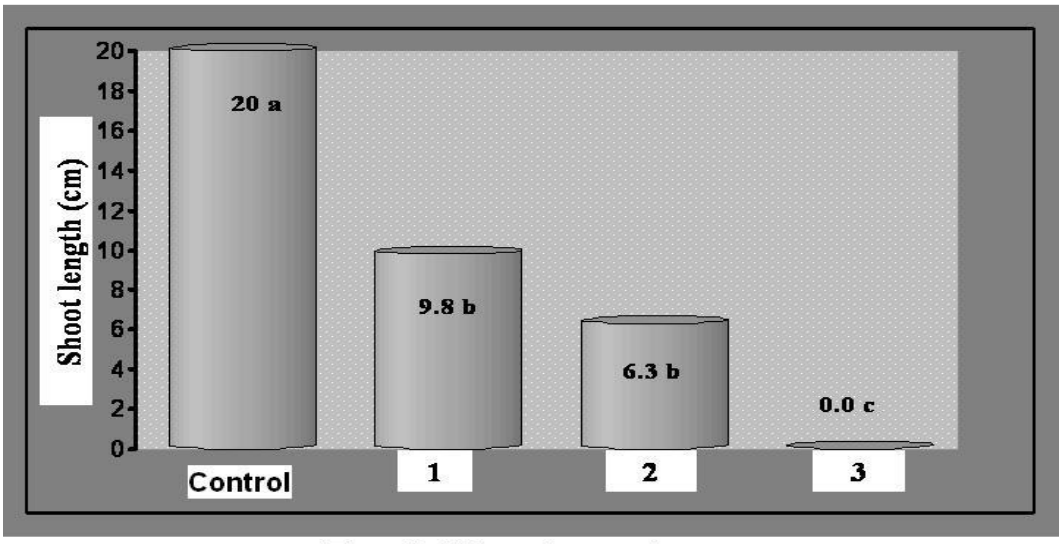

Figure (4) Effect of srol trees leaf flour on shoot length of *Bromus rigidus.*

Radical length was reduced significantly with the highest concentration, while the lowest concentration had a slight inhibitory effect.

The results in figure (5) revealed significant differences in radical length of the *bromus rigidus* weed. The treatment of 1 gram from flour leaves of trees srol significantly reduced this trait as compared to the control treatment. The length of radical dropped to more than 50 %, which reached a length of 9.5 cm. as a result of the inhibitory effect of flour srol leaves for 2 grams / Pot. This decline differs significantly than control treatment. The treatment of 1gram of flour srol leaves decreased radical length of 3.5 cm. The treatment of 3 grams from flour of srol leaves / pot gave zero length as compared with other treatments. These results are similar to those of Konar and Kushari. 1995 and Manners and Galitz 1985

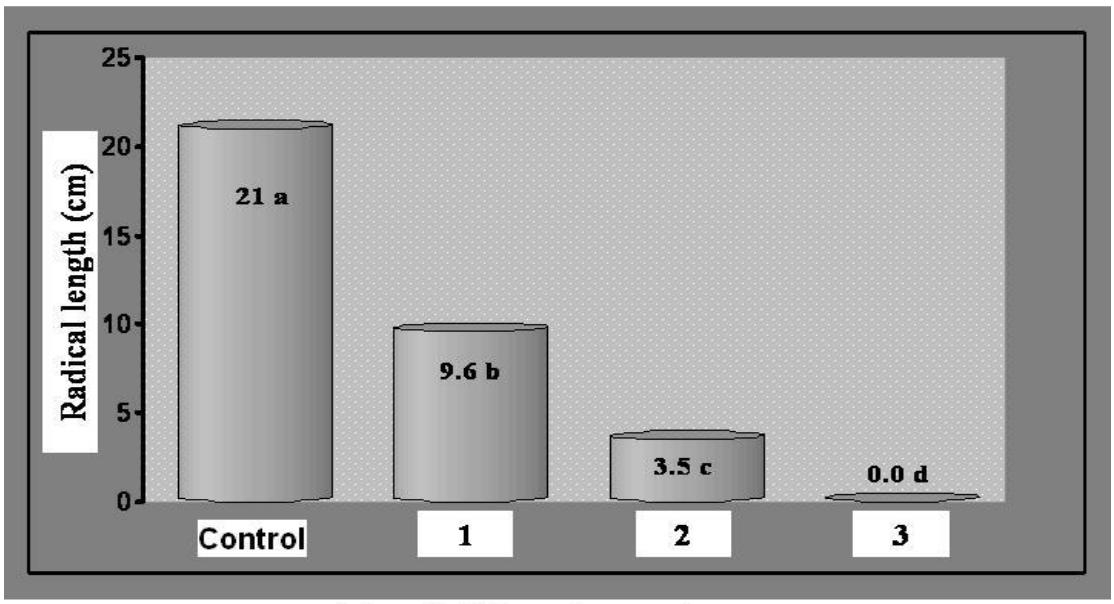

Figure (5) Effect of srol trees leaf flour on radical length of *Bromus rigidus.*

Figure (6) shows the effect of srol trees leaf flour on the fresh weight of *Bromus rigidus*. The concentration of 3% completely inhibited the growth of the weed, while concentration of 1 and 2 induced 0.06 and 0.05g of fresh weight, respectively. The effect of concentration 3% was significantly highest than all other concentrations, while 1 and 2% effect were significantly the same. Similar results were obtained by Konar and Kushari. 1995 and manners and Galitz 1985.

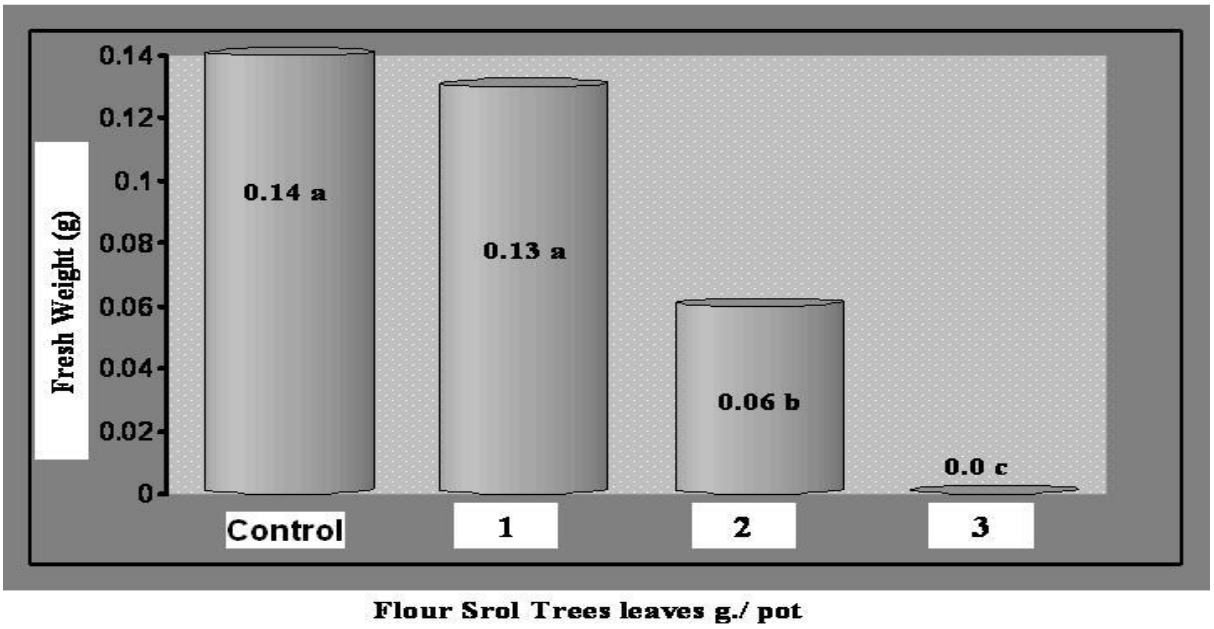

Figure (6) Effect of srol trees leaf flour on fresh weight of *Bromus rigidus.*

Figure (7) shows the effect of flour srol trees leaves on the dry weight of *Bromus rigidus*. The concentratim of 1 gram flour srol trees leaves gave weights significantly lower weight compared to the control treatment, so reducing about 20%; The 2 gram treatment decreased the dry weight to 0.05 g. Treatment of 3 gram flour srol trees leaves completely prevented growth of *Bromus rigidus*. These results support these of Manners and Galitz 1985 and Achhireddy and Sigh 1984.

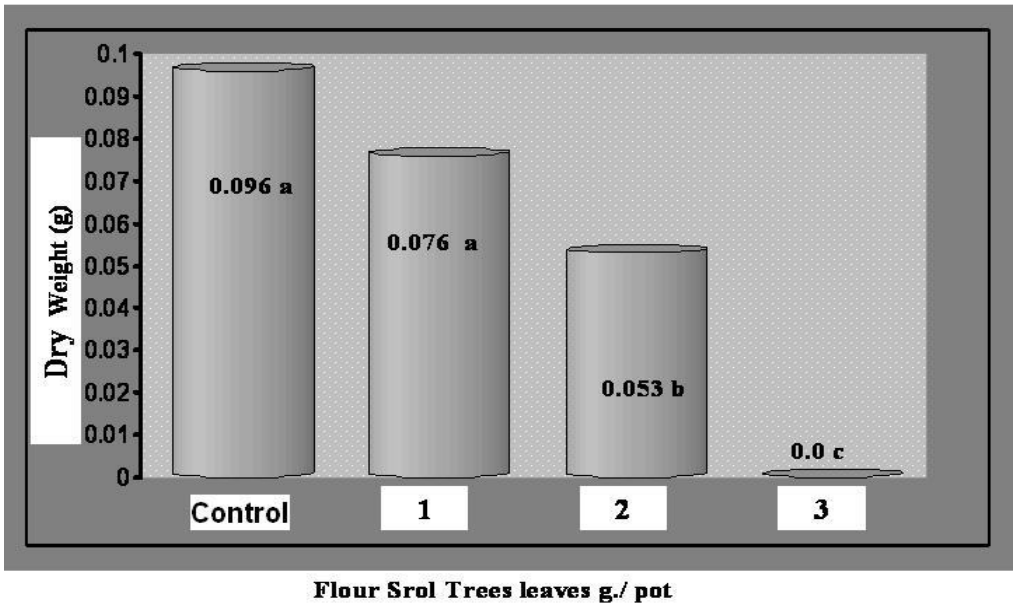

Figure (7) Effect of srol trees leaf flour on dry weight of *Bromus rigidus.*

CONCLUSION

Further field experiments could be recommend, with increasing concentration rates and consider the possibility of phenolic compounds manufacturing and composition of preparations of these active substances Practical studies are required for inclusion powder of *bromus rigidus* as herbicides as alternative to other chemical compounds.

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لتـأثير التثبيطـي لطحـين أوراق أشـجار السـرول (*Eucalyptus camaldulensis*) علـى إنبـات بـذور وطـول بادرات حشيشة بوشرنتة (*Bromus rigidus*)

أسامة ميلود سليك , ابراهيم حمدى أبو الدرج وصبري عبد المجيد فكيرين

مركز البحوث والتدريب فى الأرز- سخا- كفر الشيخ- مصر

الملخص

أجريت هذه الدراسة بمحطة بحوث تاجوراء بمركز البحوث الزراعية بالمنطقة الغربية بليبيا خلال ١٢/ ٢٠١٤ و ١/ ٢٠١٥. وقد تضمنت التجربة معرفة مدى تأثير طحين أوراق أشجار السرول (*Eucalyptus camaldulensiss*) على إنبات بذور وطول بادرات حشيشة أبو شرنتة وكذلك الوزن الرطب والجاف لحشيشة (*Bromus rigidus*). جميع معاملات طحين أوراق أشجار السرول (١-٢-٣ جرام/ أصيص) سببت نقصاً معنوياً على إنبات البذور وطول الرويشة والجذير لحشيشة بوشرنتة، و كذلك وزنها الرطب والجاف مقارنة بالمعاملة القياسية.

كلمات دالة: الوزن الرطب ، الجذير، الرويشة، البرومس ، % الانبات.