ABSTRACT

Comparative effect of water extracts from stem, leaf, root and mixed part of 4 soybean cultivars; KU35, NW1, CM4 and GC10981 on the germination and seedling growth of Chinese radish (Raphanus sativus var. longipinnatus L.) were tested. Extract concentrations from each plant part at 12.50, 25.00, 50.00 and 100.00 mg/ml were used and the distilled water was the control for comparison. It was found that leaf water extract had the greatest inhibitory effect compared to stem and root. The inhibitory effect was increased when the higher concentrations were applied.

Allelopathic effect of leaf water extracts from 30 soybean cultivars; KU35 JKP1, KMT, SKT1, SKT2, SKT3, CM1, CM2, CM3, CM4, CM60, SJ1, SJ2, SJ4, SJ5 GC2679, GC2796, GC3318, GC4120, GC4637, GC7231, GC9822, GC10848, GC10981 GC10992, GC11101, KUSL20004, PK462 and #8407 on the germination and seedling growth of 2 tested plants; Chinese radish and green pak choy (Brassica campestris var. chinensis L.) were evaluated by using the extract concentrations at 0 (distilled water) 25.00, 50.00 and 100.00 mg/ml. The results indicated that the extracts from cultivars CM60, SKT1, CM3 and SJ4 were the greatest inhibitory effect group whereas those from cultivars KUSL20004, GC10992, #8407 and CM1 were the lowest inhibitory effect group.

The relationships between the flavonoid content and allelopathic activity of the soybean leaf water extracts from the 4 highest inhibitory effect cultivars and the 4 lowest effect cultivars were comparative studied by measuring the absorbance at the specific wavelength for each flavonoid compound. The results showed that the 4 highest
inhibitory cultivars had significantly higher contents of chalcone, aurone, anthocyanin and tannin than those of the 4 lowest inhibitory cultivars. Nevertheless the contents of some flavone, flavanone, isoflavonoid and flavonol compounds from these 2 soybean groups were not significantly different.

The expression of genes from the flavonoid biosynthetic pathway encoding chalcone synthase (CHS) and dihydroflavonol 4-reductase (DFR) were analyzed using RT-PCR technique. The result showed the correlation between allelopathic activity and the transcription levels of CHS and DFR genes from the young leaves of these 2 soybean groups. The highest expression of CHS and DFR were found in CM60 cultivar whereas the cultivars #8407 and KUSL20004 gave the lowest expression of these genes, respectively.