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Study of vegetative reproduction ability of *Cynanchum acutum* under different thermal conditions

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ABSTRACT

Swallow-wort, is a perennial invasive twining of Milkweed family that has become problematic in many parts of Iran, especially in orchards. Present study was conducted in order to study the effect of temperature on asexual reproduction ability of this weed. The following experiments were conducted in Iranain Research Institute of Plant Protection during 2003-2004: 1- Effect of temperature on root asexual proliferation with 3 factors and 4 replications that the first factor (A) was duration (0 (control), 24, 48, 96 and 192 hrs) of root keeping in oven; the second factor (B) was root length (3, 6, 9 and 12 cm), and the third factor (C) was oven temperature (10, 20 and 30˚C). 2- Effect of freezing on root asexual proliferation with 3 factors and 4 replications that the first factor (A) was duration (0 (control), 24, 48, 96 and 192 hrs) of root keeping in freezing, the second factor (B) was root length (3, 6, 9 and 12 cm) and the third factor (C) was freezing temperature (-1, -3 and -5˚C). Under 20 and 30˚C temperatures, the roots were completely destroyed, but 10˚C for 24, 48 and 96 hours could not kill all the roots. Freezing temperatures of -5˚C or -3˚C for 96 hours killed all the roots. Freezing temperatures of -3˚C for up to 48 hours, or -1˚C, could not completely kill the roots. Therefore, it seems that desiccation and freezing of roots are suitable approaches for management of swallow-wort.

Key words: *Cynanchum acutum*, vegetative reproduction, temperature, freezing

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References

BHOWMIK, P. C. 1997. Weed biology importance to weed management. Weed Sci., 45, 349-356.

BOOSE, A. B. and J. S. HOLT, 1999. Environmental effects on asexual reproduction in *Arundo donax*. Weed Res., 39, 117-127.

BOOTH, B. D., S. D. MURPHY, C. J. SWANTON, 2003. Weed Ecology in Natural and Agricultural Systems. CABI Publishing. Wallingford, UK.

COBLE, H. D. and F. W. SLIFE, 1970. Development and control of Honeyvine milkweed. Weed Sci., 18 (3), 352-356.

CHITTENDON, F. 1956. RHS Dictionary of plants plus supplement. Oxford University press.

DAY, B. E. and R. C. RUSSELL, 1955. The effect of drying on survival of nutgrass tubers. California agricultural experiment station Bull. 1751.

DEXTER, S. T. 1937. The winter hardiness of weeds. J. Am. Soc. Agron., 29, 507-528.

DUNHAM, R. S., K. P. BUCKHOLTZ, L. A. DERSCHEID, B. H. GRIGSBY, E. A. HELGESON and D. W. STANIFORTH, 1956. Quackgrass control. North cent. Reg. Publ. 71.

FAGHIH, A. and H. SALIMI, 1998. Study of some biological, Phenological and dispersal aspects of *Cynanchum acutum*. Final Report of Research Project, Plant Pests and Diseases Research Institue, Tehran, Iran (in Persian with English summary).

GUGLIELMINI, A. C. and E. H. SATORRE, 2004. The effect of non-inversion tillage and light availability on dispersal and spatial growth of *Cynodon dactylon*. Weed Res., 44, 366-374.

HAKANSSON, S. 2003. Weeds and weed management on arable land and ecological approach. CABI Publishing. Wallingford, UK.

HETTWER, U. and B. GEROWITT, 2004. An investigation of genetic variation in *Cirsium arvense* field patches. Weed Res., 44, 289-297.

HOLT, J. S. and D. R. ORCUTT, 1996. Temperature thresholds for bud sprouting in perennial weeds and seed germination in cotton. Weed Sci., 44, 523-533.

LAWLOR, F. M. and D. J. RAYNAL, 2002. Response of swallow-wort to herbicides. Weed Sci., 50, 179-185.

LYONS, J. M. 1973. Chilling injury in plants. Ann. Rev. Plant Physiol., 24, 445-466.

MC WHORTER, C. G. 1972. Factor affecting Johnson grass rhizome production and

germination. Weed Sci., 20, 41-45.

ORYKOT, O. E. and J. C. SWANTON, 1997. Effect of tillage and corn on pigweed (*Amaranthus* spp.) seedling emergence and density. Weed Sci., 45, 120-126.

RAO, J. S. and M. NAGARAJAN, 1962. Relationship between moisture levels and viability of nutgrass tubers. Madras Agic. J., 49,120-123.

SCHIMMING, W. K. and C. G. MESSERSMITH, 1988. Freezing resistance of overwintering buds of four perennial weeds. Weed Sci., 36, 568-573.

SHIMI, P. 2003. *Cynanchum acutum* control in apple orchards. Final Report of Research Project, Plant Pests and Diseases Research Institue, Tehran, Iran (in Persian with English summary).

SINGH, M. and N. R. ACHHIREDDY, 1984. Germination ecology of milkweedvine (*Morrenia odorata*). Weed Sci., 32, 781-785.

SMITH, E. V. and G. L. FICK, 1937. Nutgrass eradication studies I. Relation of the life history of nutgrass. *Cyperus rotundus* L., to possible methods of control. J. Am. Soc. Agron., 29, 1007-1013.

SOTERES, J. K. and D. S. MURRAY, 1982. Root distribution and reproductive bilogy of honeyvine milkweed (*Cynanchum leave*). Weed Sci., 30,158-163.

STOLLER, E. W. 1973. Effect of minimum soil temperature on differential distribution of *Cyperus rotundus* and *C. esculentus* in the United States. Weed Res., 13, 209-217.

STOLLER, E. W. 1977. Differential cold tolerance of quackgrass and Jhonson grass rhizomes. Weed Sci., 25, 348-351.

THOMAS, P. E. L. 1969. Effects of desiccation and temperature on survival of *Cyperus esculentus* tubers and *Cynodon dactylon* rhizomes. Weed Res., 9, 1-8.

WILCUT, J. W., R. R. DUTE, B. Truelove and D. E. Davis, 1988. Factors limiting the distribution of cogongrass (*Imperata cylindrica*) and torpedograss (*Panicum repens*) Weed Sci., 36, 577-582.

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