

The fungus *Curvularia clavata* Biological Control Agent against weed *Desmostachya bipinnata*.

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Abstract:

were Carried out several experiments for estimated the biological control *curvularia clavata* by fungus , pure fungal colonies and a spore suspension containing 10^6 conidia/ml on weed *Desmostachya bipinnata* after isolated naturally from the same weed *D. bipinnata* which is considered for the first time on the side of the resistance biogenic for weed *D. bipinnata* which is characterized by hardness and roughness did not report so far biological method effective against this type of weed where applied experiments after isolating and diagnosing and growthness fungus sprayed on weed plants *D. bipinnata* fungus spores by spraying where gave high results very close to the results of herbicide (Glyphosate) Which was used for comparison with spray spores fungus if the results showed there high significant Spread along the leaves and plant height and blades leaves as well as dry weight.

إمكانية استخدام الفطر *Curvularia clavata* كعامل مقاومة احيائية ضد دغل الجلدا *Desmostachua bipinnata*

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الخلاصة:

نفذت التجربة لتقييم مدى فاعلية الفطر *Curvularia clavata* كعامل مقاومة احيائية على دغل الجلدا *Desmostachya bipinnata* بعد عزله طبيعيا من نفس الدغل والتي تعتبر لأول مرة في جانب المقاومة الاحيائية لدغل الجلدا الذي يتميز بالصلابة والخشونة ولم تذكر لحد الان طريقة حيوية فعالة ضد هذا النوع من الدغل حيث طبقت التجارب بعد عزل وتشخيص واكثار الفطر برش نباتات الجلدا بسبورات الفطر بمرشة حيث اعطت نتائج عالية بحدود 90% وقريبة جدا من نتائج مبيد كلايفوسيت الذي استخدم للمقارنة مع تجربة الرش بسبورات الفطر اذ بينت النتائج وجود فروقات معنوية عالية في طول الاوراق وارتفاع النباتات وانصال الاوراق فضلا عن الوزن الجاف للنباتات فضلا عن اجراء تجربة عدوى برش نباتات الاقتصادية والخضر (الحنطة ، الشعير ، الذرة ، نباتات خضر ، ، خيار ، طماطة ، بادنجان ، قرع ، لوبيا باميا ، فجل) بعالق الفطر السبوري حيث لم تسجل أي إصابة بالفطر *C. clavata* .

Introduction:

Desmostachya bipinnata , commonly known in English by the names Halfa grass, Big cordgrass, and Salt reed-grass, is an old world perennial grass, long known and used in human history. In India it is known by many names, including: Daabh, Dharba, Kusha, etc distributed *D. bipinnata* is native to northeast and west tropical, and northern Africa (in Algeria, Chad, Egypt, Eritrea, Ethiopia, Libya, Mauritania, Somalia, Sudan, and Tunisia); and countries in the Middle East, and temperate and tropical Asia (in Afghanistan, China, India, Iran, Iraq, Israel, Myanmar, Nepal, Pakistan, Saudi Arabia, Thailand). (Mahdihassan,.1987). Considered one from more commonly weed of Iraq especially in middle region in Iraq, *D. bipinnata* is ranked as the seventh worst weed in the world and is the most serious perennial weed of southern and eastern Asia (Holm et al. 1977). It infests more than 500 million ha worldwide, including 200 million ha in Asia and Africa, and about 100,000 ha in the southeastern United States (Holm et al. 1977 , Falvey 1981) if cause competition economic field crops as well as soil solidify by rhizomes and prevent adequate light to reach it, The use of mechanical control methods to manage *Desmostachya bipinnata* is not justifiable on the basis of either cost or feasibility (Shilling et al. 1995 , Dozier et al. 1998). Chemical control methods, aside from being costly, may were use many of method resistance cause non-target plant injury and select for herbicide-resistant plants. Using herbicides is considered as one of the best methods for controlling weeds; however, improper and unduly use of these chemicals along with the resulting pollution in the environment have limited their use and the risk of resistance to pesticides should be added to the previous issues (Holt and Lebaron, 1998).using other controlling methods such as applying natural weed-controlling as biological controls or bioherbicides has become necessary (Rashed Mohasel et al., 2001). Biological control using plant pathogens and insects has been considered as a potential means to manage weeds infestations (Van Loan et al. 2002).Was used in Malaysia, several fungal plant pathogens have been evaluated as potential control agents for weeds including *Colletotrichum caudatum* (Sacc.) Peck, *Colletotrichum graminicola* (Ces.) G.W. Wils., *Aschochyta* sp., *Puccinia rufipes* (Diet.) , *Didymaria* sp., and *Dinesmasporium* sp. Chase et al. (1996),.Yandoc (2001) but do not report in references biological control method so far against weed *D. bipinnata* .in this study we need detect potential the fungus *curvularia clavata* for control the weed *Desmostachya bipinnata*.

Material and methods:**Isolation the fungus *curvularia clavata***

Isolate of the fungus *curvularia clavata* was isolated from infected stems of the weed *Desmostachya bipinnata* in Hamza AL-Garby region , Babylon Province in Iraq by cultured some sections of infected parts in Petri dish contain 20 ml potato dextrose agar media(PDA)posited in autoclave for 20 munities to sterilized , after its externally sterile by sodium hypochlorite ,the fungus was predicated and identification by protocol

depended on shape spores as well as series spores on conidophores although all samples that isolated in weed *D. bipinnata* is was *curvularia clavata* purees .

Pathogenicity of the fungus *curvularia clavata* on the weed *Desmostachya bipinnata*

Planted weed *D. bipinnata* in plastic pots 12 × 16 where was length rhizomes(10)cm from field then cultivate in pots after passing several week was spread by spores suspension for note pathogenicity *curvularia clavata* on weed halfa , give percentage 90 % from total plants experiments.

Pathogenicity of the fungus *curvularia clavata* on economic plants.

Planted of crop corn, wheat , barley, vegetables cucumber , tomato ,eggplant, cowpea , okra squash and radish in plastic pot 12 × 16 conducted each process of service at reach plants to two actual leaf after were sprayed by suspended spore same methods mentioned 4week were taken of results was purpose therefor it is for trials pathogeneses for the fungus *curvularia* on economic .

Effect the fungus *curvularia clavata* on the weed *Desmostachya bipinnata* in pots :

We used plastic pots diameter 12× 16 placed in soil mixed then was take plants cogongrass rhizomes cut into 10-cm segments and planted in plastic pots by one per pot by 5 replicated 3 take and 2 as alternate placed under date palm canopy considering cut leaves very long was irrigation and conducted all process of serves fertilizer was added after 4week from planting considering all sprayed by water at daytime for three days its after that was let plant cogongrass to grow after one month sprayed plant by suspension spores with distilled water at sundown time for appropriate conditions growth of fungi concentrations ranged from 10¹⁰ spore/ml. inoculated control plant sprayed by distilled water only, also used herbicide Glyphosate company WAR origin Italia by sprayed of plant and suspend spore after week from spread by suspended was sprayed by herbicide after appearance infected by shape spot on leaves then widen and grow and tend toward growth top as well as control, calculated results diseases severity on long leaves and its diameter and number per plant , weight dry as well as size of infected on rhizomes by ruler.

Effect the fungus *curvularia clavata* on the weed *Desmostachya bipinnata* in the field:

Conducted experiments in field found in which the weed *D. bipinnata* naturally parted to four sections according to treatment of experiment by three sub-section per treatment applying treatments above –mentioned calculated results after several weeks.

Analysis statistical:

Experiments were analyzed using program genstat was use completely randomized design on level 5% using ANOVA table ,

Results and discussion:**the pathogenicity of the fungus *curvularia clavata* weed *Desmostachya bipinnata* and economic plants.**

The results showed that the fungus *curvularia clavata* don't infected the economic plants: Maize and wheat, barley and some vegetable crops as tomato, Eggplant, and squash as well as weed *D. bipinnata* in the same pot used for the experiment and spread with suspension germs after their reach to the real third leaf both separately , after passage a few weeks don't registered any infection of plants. The results showed that the fungus *curvularia clavata* effected on wide blade of weed plants leaves *D. bipinnata* after a few weeks of planting, also showed that a visible differences between the which gave treatment spray fungi *C clavata* highest impact on plant weed was 2 mm compared to treat the control was 7.33mm followed by treatment of the herbicide spraying that was 4.67 mm as shown in picture 1 and figure 1 believed to be due to fungus works on lack of chlorophyll leading to weakness, where there are changes in the permeability of the membrane and structure plastids which may contribute to the low level of chlorophyll also found to a,b-dehydrocurvularin has a limited effect on photosynthesis and concluded that its work was related to photosynthesis but affects photosynthesis indirectly or interfere with the structure part of photosynthesis . (Bicalho et. al., 2003 , Jiang, et. al.,2007). as well as it is not registered any infected in proportion in economic plants experiments .



Picture (1) Effect the fungus *curvularia clavata* (left, medium) and herbicide (right) *D. bipinnata*

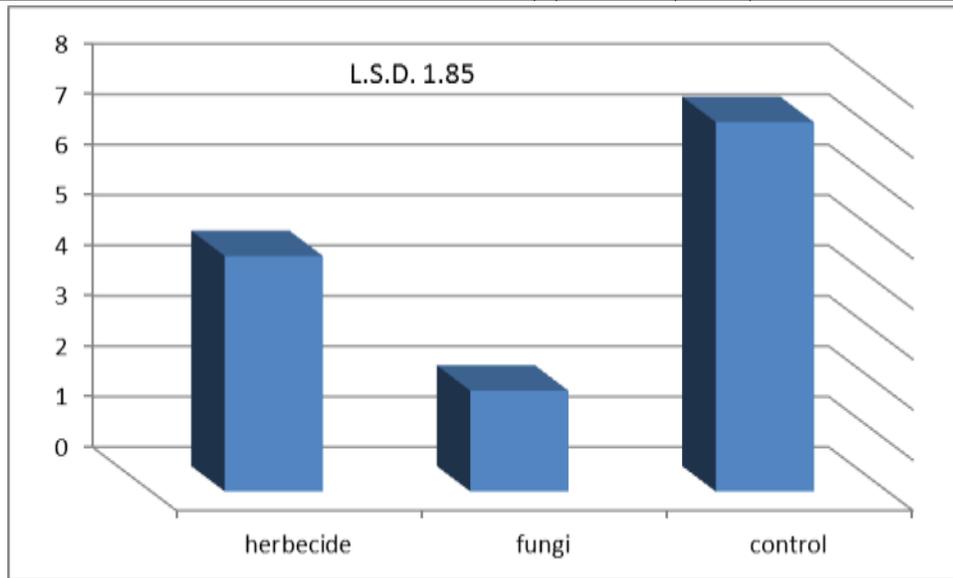


Figure (1) treatment infect *curvularia clavata* on wide of leaves blade for weed *D.bipinnata*.

The results showed that the fungus *curvularia clavata* effected where they found significant differences big as they up to (23.3) cm while she was in treatment control (34.7) cm and reason for this is to secretions by fungus, figure (2). Which lead to the crash tissue plant where leaves seem like decay as the fungus will secrete toxins to kill plant tissue, which in role analyzes which results in tissue wrap inward and shrinking.

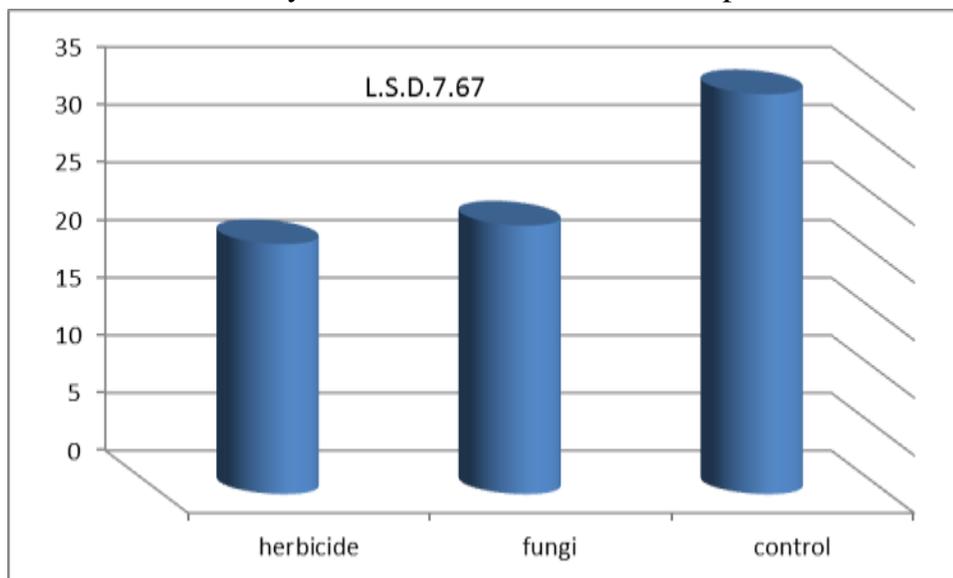
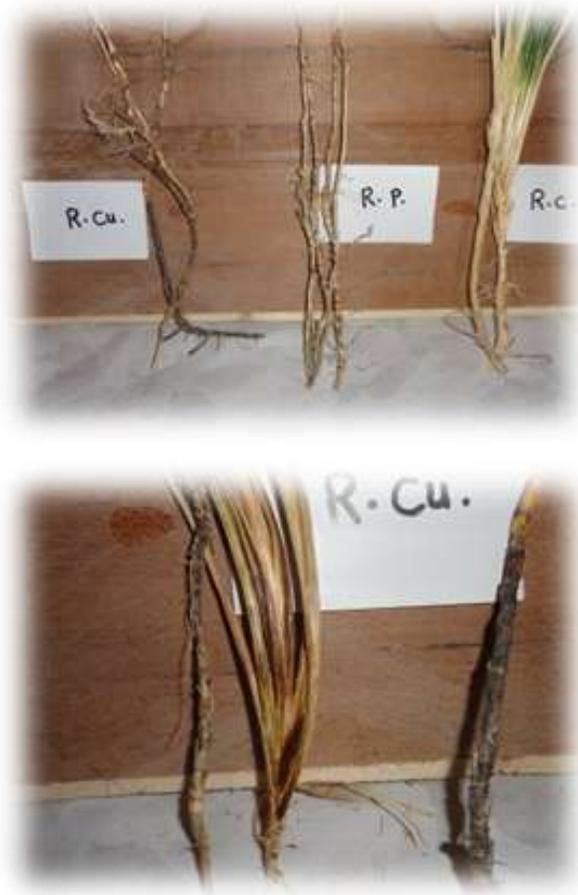


Figure (2) treatments infect *curvularia clavata* on plant lengths weed *D. bipinnata*

Were measured thickness rhizomes in plants treated and health using the ruler has been observed there significant differences among plants treated fungi and healthy or plants control where the thickness rhizomes treatment fungi up to (4)mm while controls

that were (6.58)mm, picture (2), figure (3), reason belong the fungus *curvularia clavata* the thin the chlorophyll resulting in him weak in the process of photosynthesis, which negatively affects the nature of the growth of plants, as well as wounding rhizomes fungi itself through its extension of leaves through rhizomes and access to the roots. (Jadulco et al., 2002).



Picture (2) treatments infect fungi *curvularia clavata* on rhizomes *D. bipinnata*.

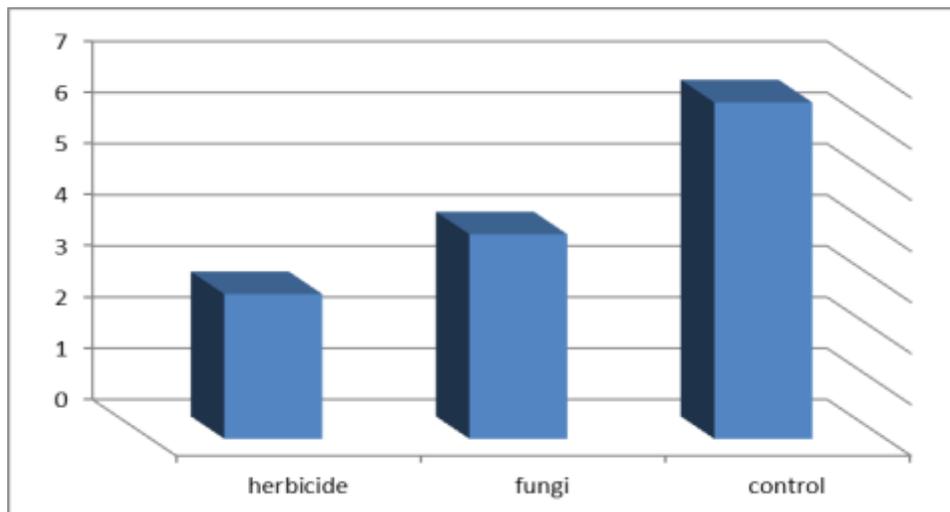


Figure (3) treatments infect *Curvularia clavata* on rhizomes *D. bipinnata* .

Were measured infect size in root treatment was (30.67) while the (0) in the treatment of control, picture (3) figure (4), the reason for this is due to the ability Enzymatic enjoyed by fungus *curvularia clavata*. affect heavily on many plants. (Bicalho et al., 2003).



Picture (3) effect the fungus *curvularia clavata* on rhizomes up and infect fungi in field for down.

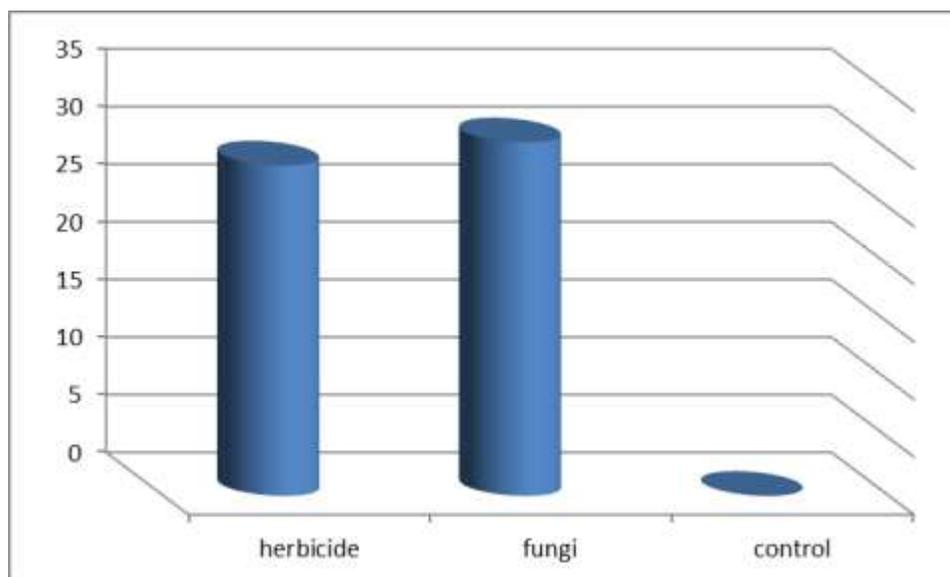


Figure (4) treatment effect *curvularia clavata* on infect size in root *D. bipinnata* .

Dry the plants after washing roots under running water to be cleaned of dust suspended and then placed in Oven to dry As for treatment spraying herbicide and suspense fungal not is placed in Oven because it is originally dried it in pots and notes from the results and there is significant differences large, amount the treatment of spraying herbicide and spraying suspended treatment (1.15 ,2.13)g. respectively compared to with control fungus that were (5.65)g. Picture (4), figure (5) due to the

ability of fungus to inhibition radicals and prevent cell division in the developing roots top (Jiang, et al., 2007).



Picture (4) effect *curvularia clavata*. on size root and stem (left) control (mid) herbicide (right) on weed *D. bipinnata* .

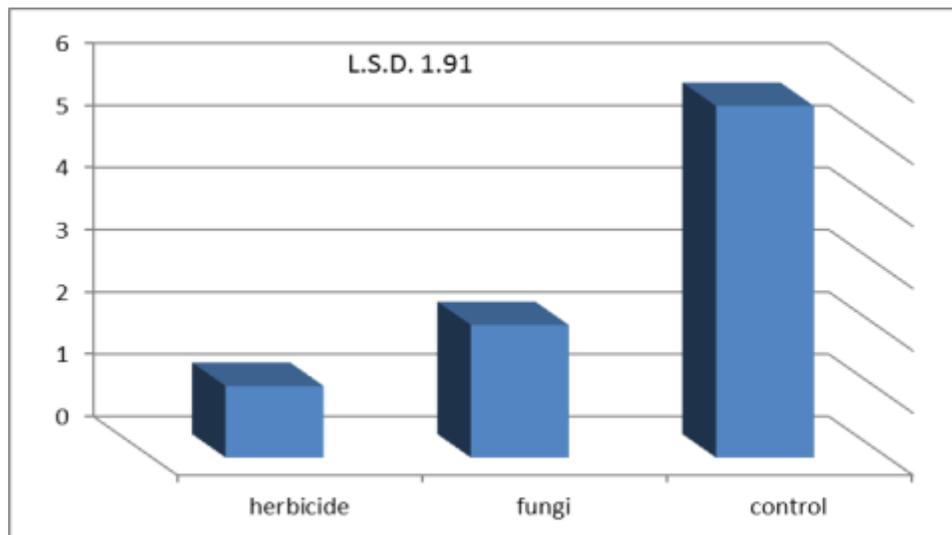


Figure (5) effect *curvularia clavata* on dry weight for weed *D. bipinnata* .

Discussion:

Weed halfa (*Desmostachya bipinnata*) considering from wide- world weeds in Iraq and some Arabic country where consider of perennial weeds that distinguished control difficult because to possess from rhizomes strong and wooden as well as to its extent great in soil and more branch as well as it is have rough leaf and oil layer covered, cause weed many of agriculture problem where resulted to weak of soil in terms of prepared element nutrition as well it is cause soil solid and cultivation it difficulty, thus make it not prepared for agriculture, control by chemical compound the method unique and known in world in control this weed where don't reported method biological control activation against *D.bipinnata* weed, in of Iraq was isolated fungi *curvularia clavata* in weed *D. bipinnata* where characterized *curvularia clavata* by ability many in influence on *Desmostachya bipinnata* it is infect of leaf and then tend an infection to stem access to rhizomes after it down to depth 90cm in rhizomes therefore give result very soon for result compound control although chemical compound was used in experiment comprise of two material active another characterized this fungi convert weed *D. bipinnata* as if decompose it is through result we obtain possibly used commercial scope in Iraq through of study as well as *curvularia clavata* survival overwinter on rhizomes weed *Desmostachya bipinnata* grow automatically after conditions, (Van Loan et al. 2002)

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