
Agropyron Artemisia aucheri

Stipa barbata elongatum

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(// : // :)

Agropyron)

(*Artemisia aucheri*) (*Stipa barbata*) (*elongatum*)

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Stipa barbata Agropyron elongatum Artemisia aucheri :

(2009) Azarnivand *et al.* .

(2007)Yong .

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.(Bordbar & Mortazavi, 2006)

Schuman & Mortenson,)

.(2002

.(Abdi *et al.*, 2008)

(Forouzeh, 2006)

(Bordbar & Mortazavi, 2006)

Azarnivand *et*)

(Tavakoli *et al.*, 2008)

(*al.*, 2009

).(Dianatitilki & Naghipur, 2009)

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Forouzeh *et al.*,)

CO₂

.(2008

.(Allen-Dias, 1996)

(*Artemisia*)

.(Arzani *et al.*, 2007)

(*Stipa*)

(*Agropyron*)

(Bauer *et al.*, 1987)

Burke *et al.*,)

.(1997

Aradottir)

(2004) Woomer *et al.* .(*et al.*, 2000

(*Artemisia aucheri*)

Stipa) (*Agropyron elongatum*)

(*barbata*)

...

Azarnivand *et al.*,)

(2009)

Agropyron) (*Artemisia aucheri*)
(*Stipa barbata*) (*elongatum*)

(2000 UNDP)

()

()

(Mir Senjeri, 2004)

Artemisia aucheri

Agropyron

Stipa barbata

elongatum

Bordbar & Mortazavi, Abdi *et al.*, 2008)

(Forouzeh *et al.*, 2008 2006

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(

1983)

(Chambers & Brown,

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(

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(

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(Mac Dicken, 1997) ()

(Mahdavi, 2008)

OC= / OM

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:OM

:OC

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Rosaceae Rhamnaceae Cupressaceae

Zarinkafsh,)

Agropyron

(Nosetto *et al.*, 2006 1993

Artemisia aucheri Stipa barbata elongatum

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Alyssum

$Cc = \frac{C}{C + BD} \times C (\%) \times BD \times E$ (

Bromus tectrum Stachys inflata linifolium

Festuca ovina

:Cc

:C

:BD

E

Bromus danthoniae

Alyssum linifolium Aegilops crassa

(Mahmoudi Taleghani *et al.*, 2007)

Astragalus

Phleum pratensis Orobanch alba missoureinsis

Festuca Zataria multiflora Teucrium polium

1

Festuca ovina

SPSS

Excel

MSTAT-C

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Poaceae

Asteraceae

Chenopodiaceae Lamiaceae

Rhamnus pallasii Juniperus sp Berberis vulgare
Berberidaceae Rosa canina

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/ *	/	/	
			%

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/	/	a	<i>Agropyron elongatum</i>
/	/	b	<i>Stipa barbata</i>
/	/	a	<i>Artemisia aucheri</i>

Artemisia

/ *aucheri*

.()

a	/	<i>Agropyron elongatum</i>
a	/	<i>Stipa barbata</i>
b	/	<i>Artemisia aucheri</i>

Woomer et al., 2004

Yong, 2007 Azarnivand *et al.*, 2009

Forouzeh)

(2008) Forouzeh *et al.* (*et al.*, 2008

(2002) Indufor

(Mesdaghi, 2003)

(%)

(2006) Bordbar & Mortazavi

(Mir Senjeri, 2004)

(2007) Gao *et al.*

(Forouzeh, 2006)

References

- Abdi, N., Maadah Arefi H., Zahedi Amiri, GH., 2008. Estimation of Carbon Sequestration in Astragalus Rangelands of Markazi Province (Case Study: Malmir Rangeland in Shazand Region), Iranian Journal of Range and Desert Research 15(2), 269-282.
- Allen-Dias, B., 1996. Rangelands in a changing climate: impacts, adaptations and mitigation. In: Watson, R.T., et al. (Eds.), Climate change 1995. Impacts, Adaptations and Mitigation of Climate change: Scientific-Technical Analyses. Cambridge University Press, Cambridge, Published for the Intergovernment Panel on Climate Change, 131-158.
- Aradottir, A., Savarsottri, L., Kristin, H., Jonsson, P., Gudbergsson, G., 2000. Carbon accumulation in vegetation and soils by reclamation of degraded areas. Icelandic agricultural sciences 13, 99-113.
- Arzani, H., Azarnivand, H., Mehrabi, A. A., Nikkhah, A., Fazel Dehkordi. L., 2007. The minimum rangeland area required for pastoralism in Semnan province. Pajouhesh & Sazandegi, No 74, pp: 107-113.
- Azarnivand, H., Joneidi, H., Zare Chahuki, H. A., Jafari, M & Niku, Sh. 2009. Effects of livestock grazing on carbon sequestration and nitrogen store in rangelands by *Artemisia sieberi* in Semnan province. Journal of range 4(3), 590-610.
- Bauer, A, C.V., Black, A.L., 1987. Soil Property Comparisons in Virgin Grasslands between Grazed and None grazed Management Systems. Soil Science Society of America Journal 51, 176-182.
- Bordbar, S.K., 2004. Carbon sequestration potential of *Eucalyptus comaldulensis* Dehnh. And *Acacia salicina* Lindl. Plantation of Fars province. PhD Thesis on Forestry of Islamic Azad University of Tehran. Science and investigations unit. 158pp.
- Bordbar, S.K, Mortazavi jahromi, M., 2006. Carbon sequestration potential of *Eucalyptus comaldulensis* Dehnh. And *Acacia salicina* Lindl. Plantation in western areas of Fars province. Journal of Pajuhesh & Sazandegi, 70, 95-103.
- Burke, I.C., W.K. Laurenroth, D.G., Milchunas, 1997. Biogeochemistry of Managed Grasslands in Central North America. In: Paul, E. A., K. Paustian, E.T. Elliott & C.V. Cole (Eds.), Soil Organic Matter in Temperate Agro ecosystems: Long-term Experiments in North America. CRC Press, Boca Raton, FL, 85-102.
- Chambers, J.C., Brown, R.E. 1983. Methods for Vegetation Sampling and Analysis on Revegetated Mined Lands. Intermountain Forest and Range Experiment Station. General Technical Report. INT-151.
- Dianatitilki, G., Naghipur Borj, A., 2009. Exclusion effect on soil and biomass carbon sequestration in semi-ard rangelands of northern Khorasan. Journal of range. 4:668-679.
- Forouzeh, M.R. 2006. Effect of floodwater irrigation on carbon sequestration potential of *Helianthemum lippii* (L.) Pers., *Dendrostellera lessertii* Van Tiegh. And *Artemisia sieberi* Besser in the Gareh Bygone plain: A case study. Journal of Pajuhesh & Sazandegi 78, 11-19.
- Forouzeh, M.R. Heshmati, G & Messbah, S. H. 2008. Comparing on carbon sequestration potential of three shrub species: *Helianthemum lippii* (L.) Pers., *Dendrostellera lessertii* Van Tiegh. And *Artemisia sieberi* Besser. in semi-arid rangelands of Iran. Journal of Environmental Studie 46, 65-72.
- Frank, A. B., Karn. J. F. 2003. Vegetation indices, CO₂ Flux, and biomass for northern plains grasslands. Journal of Range Management. 55:16-22.
- Gao, Y. H., Lue, P., Wu, Chen, H., Wang, G.X., 2007. Grazing Intensity Impacts on Carbon Sequestration in an Alpine Meadow on the Eastern Tibetan Plateau. Journal of Agriculture and Biological Sciences, 3(6):642-647.
- Indufor. 2002. Assessing Forest Based carbon sinks in the Kyoto protocol Forest Management and Carbon sequestration. Discussion paper, 115 p.
- Kilbride, C. M., Byrne, K.A., Gardiner, J.J., 1999. Carbon sequestration and Irish Forests. DUBLIN COFORD, 37pp.

-
- MacDicken, K.G., 1997. A Guide to monitoring carbon storage in forestry and agro forestry projects. Winrock International Arlington, VA, USA, 87.
 - Mahdavi, Kh., 2008. Effects of crop intensity, plantation density and exploitation periods on carbon sequestration in *Atriplex lentiformis* pastures of Isfahan Ardestan. Ph.D thesis on Range management. Islamic Azad University of Tehran. Science and investigations unit. 128pp.
 - Mahmoudi Taleghani, E.A., Zahedi Amiri, GH, Adeli, E., and Sagheb Talebi, KH. 2007. Assessment of carbon sequestration in soil layer of managed forest. Iranian Journal of Forest and Poplar Research 15(29), 241-252.
 - Mesdaghi, M., 2003. Range management in Iran. Astan Ghods Razavi publications. 333.
 - Mir Senjeri, M., 2004. Environmental valuation in the rangelands. Range and forest. 64,56-62.
 - Mortenson, M., Schuman, G., 2002. Carbon sequestration in rangeland interseeded with yellow-flowering alfalfa (*Medicago Sativa Spp. Falcata*) USDA Symposium on Natural Resource Management to Offset Greenhouse Gas Emission in University of Wyoming.
 - Noretto, M.D., Jobbagy, E.G., Paruelo, J.M., 2006. Carbon Sequestration in Semi-Arid Rangelands Arid Environments 67, 142-156.
 - Singh, G., Bala, N., Chaudhuri, K.K., Meena, R.L., 2003. Carbon sequestration potential of common access resources in arid and semi-arid regions of northwestern India. Indian Forester 129(7), 859- 864.
 - Tavakoli, H.E, Filehkesh. H., Ahmadinejad. Aliabadi. M., 2008. How can contribute to carbon Sequestration and biodiversity in arid regions? The 3rd International conference on water resources and arid environments. 69-73.
 - UNDP. 2000. Carbon sequestration in the desertified rangelands of Hossein Abad, through community based Management, program coordination, 1-7.
 - Woomer, D .L, Toure. A., 2004. Carbon stocks in Senegal's Sahel transition zone. Journal of Arid Environments, 59: 499-510.
 - Yong Zhong Su., 2007. Soil Carbon and nitrogen sequestration following the conversion of cropland to alfalfa land in northwest china, Journal of Soil and Tillage Research 92, 181-189.
 - Zarinkafsh, M., 1993. Applied Soil Science, Soil Survey and Sanity Analysis of Soil- Water- Plant, Tehran University Publications, 342pp.

Investigation of Carbon Storage Potential of *Artemisia aucheri*, *Agropyron elongatum*, *Stipa barbata*, in Semi-arid Rangelands of Iran (Case study: Peshert Region, Kiasar)

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Abstract

Carbon sequestration potential of three species including *Agropyron elongatum*, *Stipa barbata* and *Artemisia aucheri* was evaluated in parts of a semi-arid rangeland in this study. After determination and selecting key areas as study sites, sampling from vegetation and soil, based on randomized systematic method, was done and 90 plant and 45 soil samples were taken, respectively. Shooting and rooting organs of the species were separated from each other after transfer to the laboratory and carbon sequestration coefficient of plant organs was determined with combustion method. Then carbon sequestration coefficient of different species, organs and soil under these species were analyzed. The results showed that carbon sequestration rate between studied three species, had significantly statistical difference ($p < 5\%$) while *Artemisia aucheri* had the highest carbon sequestration rate in the region. Also carbon sequestration between organs (roots, stems and leaves) of three species showed significantly statistical difference ($p < 5\%$). Investigation of soil carbon storage showed that *Artemisia aucher* stores 29.445 t/ha carbon in the soil which is higher than other studied species.

Keywords: Carbon sequestration, *Artemisia aucheri*, *Agropyron elongatum*, *Stipa barbata*, Peshert of Kiasar