

INVESTIGATIONS OVER THE PHYTOCOENOTIC ROLE OF *ASTER SEDIFOLIUS* L. IN THE EASTERN PART OF ROMANIA (MOLDAVIA)

C. SÎRBU¹, A. OPREA²

Aster sedifolius L. is a vascular plant, sporadically met in Romania, from forest-steppe to hills region, settled in meadows, bushes, in everglades of the forests, on slopes, on eumesobasic soils, moist (often wet in springs), poor in humus, moderately salinized. We analyzed here the role of this species in edification of some meso-halophilous communities, unknown till now in the eastern part of Romania (Moldavia). On the basis of the field relevées, arranged in an analytic table, we made coenotaxonomic, phytogeographic, as well as ecologic analyses of those plant communities, framed by us in the next coenotaxa: Cl. *Puccinellio-Salicornietea* Țopa 1939, Ord. *Puccinellietalia* Soó 1947 em. Vicherek 1973, Al. *Festucion pseudovinae* Soó 1933, Ass. *Achilleo-Festucetum pseudovinae* (Magyar 1928) Soó (1933) 1945, **subass. *asteretosum sedifolii* subass. nova.**

Key words: halophilous vegetation, salt meadows, *Puccinellio-Salicornietea*, *Aster sedifolius*, new subassociation.

INTRODUCTION

Aster sedifolius L. is a Continental-Eurasian plant, mesohalophylous to mesohygro-halophylous, being sporadically met in Romania, distributed on meadows, bushes, in everglades of the forests, in places more or less wet and salty, from the steppe zone to the nemoral belt [Țopa, 1939; Bucur *et al.*, 1960; Morariu et Nyárády, 1964; Popescu et Sanda, 1998; Ciocârlan, 2000; Oprea, 2005].

From the phytocoenotic point of view, this plant is characteristic for the Ord. *Puccinellietalia* Soó 1947 em. Vicherek 1973 [Popescu et Sanda, 1998; Chifu *et al.*, 2006]. It has been identified in the floristic structure of the next halophylous associations, in Romania [Țopa, 1939; Șerbănescu, 1965; Pop, 2000; Chifu *et al.*, 2006]; *Heleochoetum shoenooides* (Soó 1933) Țopa 1939 em. Pop 1968 (I⁺); *Astero pannonici-Puccinellietum distantis* Géhu, Roman et Boulet 1994 (r⁺); *Puccinellietum limosae* Rapaics ex Soó 1936 (I⁺); *Nitrario-Artemisietum maritimae*

¹ University of Agricultural Sciences and Veterinary Medicine "I.I. de la Brad", 3, M. Sadoveanu Str., Iași, Romania, E-mail: culita69@yahoo.com;

² "A. Fătu" Botanical Gardens, 7-9, Dumbrava Roșie Str., Iași, Romania, E-mail: aoprea@uaic.ro

Mititelu *et al.* 1979, 1980 (I^+); *Leuzeetum salinae* (Borza 1931 n. n.) Răvăruț 1958 (I^+); *Agrostio-Beckmanietum* (Rapaics 1916) Soó 1933 (I^+); *Limonio gmelini-Artemisietum monogynae* Țopa 1939 (I^{+1}); *Artemisio-Festucetum pseudovinae* (r^+); *Peucedano-Asteretum sedifolii* Soó 1947 corr. Borhidi 1996 (Syn.: *Peucedano-Festucetum pseudovinae* (Rapaics 1927) Pop 1968) (III^{+1} - V^{+1}).

Also, *Aster sedifolius*, is sometimes present only as a companion species (r^+ - I^+) in the structure of some vegetal communities, without a halophyllous feature, as they are: *Fraxino pallisae-Quercetum pedunculiflorae* (Popescu *et al.* 1979) Ad. Oprea 1997; *Fraxino pannonic-Ulmetum* Soó in Aszöd 1936 corr. Soó 1963 *evonymetosum nanae* Chifu *et al.* 2006; *Potentilletum anserinae* Felföldy 1942 etc. [Oprea, 1997; Chifu *et al.*, 2006].

The communities (co-) dominated by the species *Aster sedifolius* is quite prevalent in Hungary (on Tisa river Basin) [Soó, 1947; Soó, 1973; Borhidi, 1996; Borhidi, 2003; Makra, 2006], from where they described an association, namely: *Peucedano-Asteretum sedifolii* Soó 1947 corr. Borhidi 1996 (syn.: *Peucedano-Asteretum punctati* Soó 1947). That association has as a characteristic species - *Peucedanum officinale*, which is a constant species, and at the same time is also a co-dominant for that association (having as companions: *Aster sedifolius* and *Festuca pseudovina*). It is thought that these kinds of vegetal communities are the most characteristic ones for the halophyllous vegetation situated in the vicinity of the oak forest in Hungary [Demeter & Veen 2001; Makra & Zalatnai 2006].

In the vegetation of Romania, Șerbănescu (1963) cited from the Romanian Plain “an association with *Aster sedifolium*”, without any other explanations, but two years later (1965), the same author, in a synthesis paper on halophyllous vegetation from the Romanian Plain, not to mention anything about this “association” (!).

Pop (1968) described another association, namely: *Peucedano-Festucetum pseudovinae*, characteristic for the poorly halophyllous soils from Crișana, situated at the edge of the oak forests; there, *Aster sedifolius* is a constant species (being present in 66.6% of its relevés), but with a reduced coverage ($AD = + - 1$). *Peucedanum officinale* and *Festuca pseudovina* are characteristic and co-dominant species. Through the floristic structure, as well as their ecology, those plant communities described by Pop (1968) can be registered, as a matter of fact, under the name *Peucedano-Asteretum sedifolii* Soó 1947 corr. Borhidi 1996 (even Pop, in 1968, said that his newly described association “is also known under the name of *Peucedano-Asteretum punctati* Soó” !).

Later, those semi-halophyllous communities where *Aster sedifolius* plays an important role as a constant, dominant and co-dominant plant, together with *Peucedanum officinale* (as a characteristic one) and *Festuca pseudovina* (as a co-dominant one), have been cited under various names (e.g. *Peucedano-Festucetum*

pseudovinae (Rapaics 1927) Pop 1968; *Peucedano-Asteretum punctati* Soó 1947, *Peucedano-Festucetum pseudovinae* (Rapaics 1927) Pop 1968 *asteretosum punctati* (I. Şerbănescu 1963) Sanda, Popescu et Doltu 1980) from Transylvania, Banat or Muntenia [Grigore, 1971; Karácsonyi, 1981-1982; Pop, 2000; Sanda *et al.*, 1980; Sanda *et al.*, 1998; Sanda, 2002; Sanda et Popescu, 2000; Sanda *et al.*, 2001; Sanda et Popescu, 2005], but not from Moldavia [Chifu *et al.*, 2006].

We have identified in the latest years, in the Eastern part of Romania (Moldavia), certain semi-halophylous phytocoenoses edified by *Aster sedifolius*. In the structure of these communities, *Peucedanum officinale* is missing at all (moreover, this plant is very rare in this part of Romania, being cited only in few localities from the Southern part of this historic province, namely in Galaţi county [Mititelu *et al.*, 1993; Oprea, 2005; Chifu *et al.*, 2006]). On the other hand, in the structure of the plant communities identified by us, an important phytocoenotic role is played by other two species: *Silaum silaus* and *Artemisia pontica*. *Festuca pseudovina* is a subconstant species, together with *Achillea setacea* (another subconstant species) and *A. collina* (a constant species).

From the floristic structure and ecologic point of views, these kinds of communities could be framed like this: Cl. *Puccinellio-Salicornietea* Țopa 1939, Ord. *Puccinellietalia* Soó 1947 em. Vicherek 1973, Al *Festucion pseudovinae* Soó 1933, Ass. *Achilleo-Festucetum pseudovinae* (Magyar 1928) Soó (1933) 1945.

– **subass. *asteretosum sedifolii* subass. nova** (see Table 1).

MATERIAL AND METHODS

The methodology applied in this study follows the Central European Phytocoenotic-Floristic School principles, and the working methodology is that one proposed by J. Braun-Blanquet et Pavillard, improved by R. Tüxen, H. Ellenberg, etc. [Braun-Blanquet, 1964; Borza et Boşcaiu, 1965; Cristea *et al.*, 2004]. We have made field investigations on stationary. The surface of the relevées varies between 40 and 100 square metres. The botanical nomenclature is according to Ciocârlan V. (2000).

RESULTS AND DISCUSSION

Chorology and local conditions. Phytocoenoses edified by *Aster sedifolius*, framed by us in ass. *Achilleo-Festucetum pseudovinae* (Magyar 1928) Soó (1933) 1945, subass. *asteretosum sedifolii* subass. nova, have been identified by us in the next localities: Cotnari, Iaşi county (on Paraclis hill), Miroslava, Iaşi county (in the point called “La Crăcană”, near the forest called “Ionaşcu”), Vulturi-Popricani, Iaşi county, and in the forest Balta, between the villages Munteni and Berheci, Galaţi county.

Table 1 (continued)

Euras.	T	6	5	5	<i>Matricaria recutita</i> var. <i>salina</i>	-	-	-	-	-	-	-	+	-	-	I
Euras.	T	5	x	x	<i>Odontites vernus</i>	-	-	+	-	-	-	-	-	-	+	I
Euras. cont.	H	3	7	8	<i>Aster linosyris</i>	-	-	-	-	-	-	-	-	-	+	I
Festuco-Brometea																
Euras. cont.	H	2	7	7	<i>Festuca valesiaca</i>	-	+	+	1	+	+	+	+	-	+	IV
Euras.	H	4	5	8	<i>Filipendula vulgaris</i>	-	-	+	+	+	+	+	+	-	+	IV
	H	3	7	5	<i>Salvia nemorosa</i>	-	-	+	+	+	+	-	+	-	+	III
Pont.-Medit.-Eur. centr..																
Euras. cont.	G	3	6	x	<i>Carex praecox</i>	-	-	-	-	+	+	-	1	-		II
Euras.	H	2	x	3	<i>Potentilla argentea</i>	+	+	-	+	-	-	-	-	-	+	II
Euras. cont.	H	2	7	5	<i>Veronica spicata</i>	+	-	-	-	-	-	-	-	+	+	II
	T	2	7	8	<i>Cerastium pumilum</i>	-	+	-	-	-	-	-	-	-	-	I
Eur. centr. and West																
Cosm.	G	3	7	x	<i>Cynodon dactylon</i>	-	+	-	-	-	-	-	+	-	-	I
Euras.	T	4	6	x	<i>Erophila verna</i>	-	-	+	-	-	-	-	-	-	-	I
Pont.-Balc.	H	3	7	x	<i>Euphorbia agraria</i>	-	-	-	-	-	+	-	-	-	-	I
Euras.	H	3	x	x	<i>Euphorbia cyparissias</i>	+	-	-	-	-	-	-	-	-	-	I
	H	5	2	6	<i>Hieracium bauhinii</i>	-	-	-	+	-	-	-	+	-	-	I
Eur. E., centr.																
Euras.	T	3	x	4	<i>Myosotis stricta</i>	-	-	-	-	+	-	-	-	-	+	I
Euras.	H	4	x	8	<i>Plantago media</i>	-	-	-	+	-	-	-	+	-	-	I
Euras.	H	3	5	x	<i>Poa angustifolia</i>	-	-	-	-	-	-	-	-	-	+	I
Euras.	H	2	8	4	<i>Poa bulbosa</i>	-	-	-	-	-	-	-	-	-	+	I
Eur.	H	3	6	8	<i>Potentilla arenaria</i>	-	+	-	-	-	-	-	+	-	-	I
Euras. cont.	H	2	6	7	<i>Potentilla recta</i>	+	-	+	-	-	-	-	-	-	-	I
Euras.	H	4	5	7	<i>Senecio jacobaea</i>	-	-	-	+	-	-	-	-	-	-	I
Euras. cont.	H	3	7	7	<i>Verbascum phoeniceum</i>	-	-	-	-	-	-	-	-	+	-	I
	H	2	8	7	<i>Veronica orchidea</i>	-	+	-	-	-	-	-	-	-	-	I
Pont.-Pan.-Balc.																
Monilio-Arrhenatheretea																
Circ.	H	5	x	x	<i>Poa pratensis</i>	1	2	+	+	1	+	+	+	+	+	V
Eur.	H	x	x	x	<i>Centaurea jacea</i>	+	+	+	+	+	-	+	+	-	+	IV
Circ.	H	6	x	x	<i>Agrostis stolonifera</i>	-	-	-	+	1	+	+	-	1	-	III
Euras.	H	5	x	x	<i>Dactylis glomerata</i>	+	-	-	+	-	+	+	+	-	-	III
Euras.	H	6	5	x	<i>Rumex crispus</i>	-	-	+	-	+	-	-	+	+	+	III
Euras.	H	x	x	x	<i>Trifolium pratense</i>	+	+	-	-	+	-	+	+	-	-	III
Euras. cont.	H	5	7	7	<i>Althaea officinalis</i>	+	+	+	-	-	-	-	-	+	-	II
Euras.	H	4	x	7	<i>Lotus corniculatus</i>	+	+	-	-	-	-	-	-	-	+	II
Euras.	H	6	6	7	<i>Potentilla reptans</i>	-	-	+	+	-	-	+	-	-	-	II
Euras.	H	5	x	x	<i>Taraxacum officinale</i>	+	+	-	-	-	-	+	+	-	-	II
Euras.	H	4	x	x	<i>Achillea millefolium</i>	+	-	-	-	-	-	-	-	+	-	I
Euras.	H	6	x	6	<i>Alopecurus pratensis</i>	-	-	-	-	+	-	-	-	-	-	I
Euras.	G	5	5	x	<i>Carex tomentosa</i>	-	-	-	-	+	1	-	-	-	-	I
Euras.	H	4	x	x	<i>Leontodon hispidus</i>	-	-	-	+	-	-	-	+	-	-	I

Table 1 (continued)

Cosm.	H	5	5	x	<i>Lolium perenne</i>	+	+	-	-	-	-	-	-	-	-	-	-	-	I		
Euras.	Ch	6	6	x	<i>Lysimachia nummularia</i>	-	-	-	-	-	-	-	-	-	-	-	-	+	-	I	
Euras.	H	5	x	x	<i>Phleum pratense</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	+	I	
Cosm.	H	6	5	x	<i>Potentilla anserina</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	I
Cosm.	H	x	x	4	<i>Prunella vulgaris</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	I
Euras. cont.	H	6	7	7	<i>Rumex confertus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	I
Eur.	H	5	x	5	<i>Rumex obtusifolius</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I
Euras.	H	x	x	x	<i>Trifolium repens</i>	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	I
Euras.	H	5	x	x	<i>Vicia cracca</i>	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	I
Trifolio-Geranietea																					
Eur. centr.	H	3	6	7	<i>Peucedanum alsaticum</i>	+	+	+	1	+	+	+	+	+	-	-	-	-	-	IV	
Euras.	H	4	5	7	<i>Galium verum</i>	+	-	+	+	+	+	+	+	+	-	+	-	-	-	IV	
Euras.	H	3	5	8	<i>Fragaria viridis</i>	+	-	-	+	+	+	-	+	-	+	-	-	-	-	III	
Euras.	H	4	x	x	<i>Veronica chamaedrys</i>	+	-	+	+	-	+	-	+	+	-	-	-	-	-	III	
Eur.	H	4	?	x	<i>Ranunculus polyanthemos subsp. polyanthemoides</i>	-	-	-	+	+	-	+	+	-	-	-	-	-	-	II	
Eur. centr.-submedit.	H	4	5	9	<i>Coronilla varia</i>	-	-	-	+	+	-	-	-	+	-	-	-	-	-	II	
Euras.	H	4	6	8	<i>Agrimonia eupatoria</i>	-	-	-	+	+	-	-	-	+	+	-	-	-	-	II	
Euras.	H	5	x	x	<i>Galium molugo</i>	-	-	+	+	+	-	-	-	-	-	-	-	-	-	II	
Euras.	H	4	6	x	<i>Stachys officinalis</i>	-	-	+	+	-	-	-	-	-	+	+	-	-	-	II	
Eur. centr.-submedit.	Ch	2	6	8	<i>Teucrium chamaedrys</i>	+	-	-	+	-	-	-	-	-	-	-	-	-	-	I	
Eur. centr.-SE	Ch	3	6	9	<i>Dorycnium pentaphyllum</i>	-	-	-	1	+	-	-	-	-	-	-	-	-	-	I	
Euras.	H	3	6	8	<i>Senecio erucifolius</i>	-	-	-	-	-	-	-	-	-	-	-	-	+	-	I	
Euras.	H	x	6	8	<i>Serratula tinctoria</i>	-	-	-	-	-	-	-	-	-	-	-	-	+	-	I	
Eur.	H	4	5	x	<i>Knautia arvensis</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	I	
Euras. (submedit.)	G	2	8	5	<i>Asparagus officinalis</i>	-	-	-	-	-	-	-	-	-	-	+	-	-	-	I	
Circ.	H	4	5	7	<i>Clinopodium vulgare</i>	-	-	-	+	-	-	-	-	-	-	-	-	+	-	I	
Euras. cont.	H	4	5	x	<i>Lavatera thuringiaca</i>	-	-	-	-	-	-	-	-	-	-	+	-	-	-	I	
Euras.	H	3	5	8	<i>Viola hirta</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	I	
Eur. centr.	H	3	7	8	<i>Clematis recta</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	I	
Rhamno-Prunetea																					
Euras.	Ph	4	5	8	<i>Crataegus monogyna</i>	+	-	+	+	+	-	+	+	+	+	-	-	-	-	IV	
Eur.	Ph	4	5	x	<i>Rosa canina</i>	-	+	-	+	+	+	+	+	+	-	+	-	-	-	IV	
Eur.	Ph	x	5	x	<i>Prunus spinosa</i>	+	-	+	+	+	-	+	+	-	+	-	-	-	-	IV	
Eur. centr.	Ph	x	5	8	<i>Cornus sanguinea</i>	-	-	-	+	+	-	-	-	-	-	-	-	-	-	I	
Artemisietea																					
Euras.	Ht	4	6	x	<i>Daucus carota</i>	+	+	+	+	+	+	+	+	+	-	+	-	-	-	V	
Circ.	G	5	x	x	<i>Elymus repens</i>	+	+	+	+	1	+	+	+	+	+	+	+	+	+	V	
Euras.	H	5	x	x	<i>Tanacetum vulgare</i>	-	+	+	-	+	+	+	+	+	-	+	-	-	-	IV	
Euras.	Ch	4	6	x	<i>Artemisia absinthium</i>	+	+	+	-	+	-	-	-	+	-	-	-	-	+	III	

Table 1 (continued)

Euras.	Ht	4	6	8	<i>Cichorium intybus</i>	+	+	-	+	-	-	-	-	+	+	III
Euras.	H	4	5	8	<i>Medicago lupulina</i>	+	+	-	+	+	-	+	+	-		III
Euras.	Ht	3	5	8	<i>Melilotus officinalis</i>	-	+	-	+	+	-	+	+	-	+	III
Euras. cont.	Ht	6	6	7	<i>Dipsacus laciniatus</i>	-	-	-	-	+	+	+	+	+	-	III
Euras.	H	3	5	7	<i>Linaria vulgaris</i>	-	-	-	+	-	-	-	-	+	+	II
	Ht	4	x	8	<i>Picris hieracioides</i>	-	-	-	+	-	-	-	+	-	+	II
Eur. centr.-Medit.																
Euras.	Ht	3	6	x	<i>Berteroa incana</i>	-	-	-	-	-	-	-	-	-	+	I
Euras. cont.	H	4	x	8	<i>Bromus inermis</i>	+	-	-	+	-	-	-	-	-	-	I
Eur.	Ht	3	5	x	<i>Carduus acanthoides</i>	-	-	-	-	-	-	-	+	-	+	I
Euras.	Ht	5	5	x	<i>Cirsium vulgare</i>	-	-	-	-	-	+	-	-	-	-	I
	Ht	3	6	7	<i>Verbascum blattaria</i>	-	-	-	-	-	-	-	-	-	+	I
Euras submedit.																
Medit.	G	4	7	8	<i>Aristolochia clematidis</i>	-	-	-	-	-	+		+	-	-	I
					<i>Cephalaria</i>	-	-	-	-	-	-	-	+		1	I
Pont.-Medit.	Ht	3	6	7	<i>transylvanica</i>											
					<i>Aliae</i>											
Euras	H	x	x	x	<i>Plantago lanceolata</i>	+	+	+	+	+	+	+	+	-	+	V
Euras.	G	4	6	8	<i>Lathyrus tuberosus</i>	-	-	-	+	+	+	+	+	-	-	III
Medit.	H	x	5	x	<i>Vicia sativa</i>	-	-	-	+	+	-	-	+	-	-	II
Cosm.	G	10	5	7	<i>Phragmites australis</i>	-	1	-	+	-	-	+	-	-	-	II
Eur.	T	3	5	5	<i>Dianthus armeria</i>	-	-	-	+	-	-	-	+	-	+	II
Euras. cont.	T	4	7	?	<i>Atriplex oblongifolia</i>	-	-	+	-	-	-	-	+	-	-	I
Euras.	G	x	x	x	<i>Cirsium arvense</i>	-	-	-	-	-	-	-	-	+	+	I
Euras.	T	x	x	6	<i>Matricaria perforata</i>	+	-	+	-	-	-	-	-	-		I
Medit.	T	?	?	?	<i>Trigonella caerulea</i>	-	-	-	-	-	-	-	-	-	+	I
	H	8	x	7	<i>Valeriana officinalis</i>	-	-	-	+	-	-	+	-	-	-	I
Euras. (submedit.)																
Cosm.	G	4	6	7	<i>Convolvulus arvensis</i>	-	-	-	-	-	-	-	-	+	+	I
Euras.	G	9	7	7	<i>Carex riparia</i>	-	-	-	-	-	-	-	-	-	+	I

Date and place of relevés: 1-3 Paraclis Hill at Cotnari, Iași county (31st of July, 2000); 4-8 Miroslava, Iași county (17th of June, 2002; 6th of October, 2002); 9 a clearing in the forest Balta, Galați county (10th of September, 2006); 10 Vulturi-Popricani, Iași county (11th of September, 2008)

*- nomenclatural relevé type

In the above mentioned localities, the phytocoenoses with *Aster sedifolius* develop small islands, measuring in some cases even hundreds of square meters, with a coverage of the soil between 75% and 95%, on slopes with some landslides processes, on North-East, North-West or South-East exposures and declivities between 5° and 20° (at Cotnari, Miroslava and Vulturi-Popricani), with saltiferous soils of slopes (having saltiferous marls in substrate). In some places, these phytocoenoses are located on flat areas, like on the inferior course of the Bârlad

river (in the forest “Balta”, between the villages Munteni and Berheci, Galați county), where the soils are alluvial and salinized (Fig. 1).



Fig. 1. A phytocoenosis with *Aster sedifolius* in the forest “Balta” between Munteni and Berheci (Galați county).

The phytocoenoses with *Aster sedifolius* are developing in the vicinity of the bushes (belonging to the ass. *Arctio-Balлотetum nigrae* (Felföldy 1942) Morariu 1943 subass. *prunetosum spinosae* Soó 1961 (at Cotnari and Vulturi-Popricani) and to the ass. *Pruno spinosae-Crataegetum* Hueck 1931 (at Miroslava), or in the clearings of the forest within the ass. *Fraxino pallisae-Quercetum pedunculiflorae* (Popescu *et al.* 1979) Oprea 1997 (the forest “Balta”, Galați county).

Floristic structure: we register a number of 126 vascular plant species in our communities (see Table 1).

The characteristic plants of this association (namely, *Achillea setacea*, *A. collina* and *Festuca pseudovina*) though they have a relatively higher constancy they have small values of coverage (III-IV⁺¹) in our phytocoenoses. The dominant species in our phytocoenoses, *Aster sedifolius* (a mesophylous, meso-halophylous species, having an Eurasian-Continental distribution area), besides *Silaum silaus* (a mesophylous – meso-hygrophylous, tolerant halophylous – meso-halophylous species, having an European distribution area) and *Artemisia pontica* (a xeromesophylous – mesophylous, optional halophylous species, having an Eurasian-Continental distribution area), have a constant presence in the phytocoenoses structure. These species are designated as differential species of the newly described subassociation (subass. *asteretosum sedifolii* subass. nova). Thus, against the type association *Achilleo-Festucetum pseudovinae* (Magyar 1928) Soó (1933)

1945, these newly described communities of *Aster sedifolius* are differentiating through (xero-) mesophyllous and oligo-mesohalophyllous features, reflected by all these three species, designated by us as being differential ones (*Aster sedifolius*, *Silaum silaus*, and *Artemisia pontica*).

Besides the above mentioned species, from among the characteristic higher coenotaxa (for alliance, order, class) in our phytocoenoses appear, constantly or subconstantly, the next ones: *Inula britannica*, *Juncus gerardi*, and *Limonium gmelinii*.

Besides the so-called characteristic species for the class *Puccinellio-Salicornietea*, in the floristic structure of our phytocoenoses are to be met, also, certain tolerant-halophyllous species, which belong from the phytocoenotic point of view to other vegetation classes, as they are: *Cynodon dactylon*, *Agrostis stolonifera*, *Althaea officinalis*, *Potentilla reptans*, *Lolium perenne*, *Lotus corniculatus*, *Lysimachia nummularia*, *Trifolium repens*, *Melilotus officinalis*, *Cichorium intybus*, *Matricaria perforata*, *Trigonella caerulea*, *Plantago lanceolata*, *Phragmites australis* and so on. On the whole, the ratio of the plants with different halophytic degrees (i. e. tolerants, preferants, obligates) in our phytocoenoses is about 36% (45 species).

Because the communities dominated by *Aster sedifolius* are installed on relatively dry soils during the summer time, but moist in the spring time, thanks to the presence of the ground water near the surface of the soil (fact proved by the actively landslides), in the floristic structure of these phytocoenoses are frequent both some xerophyllous – xeromesophyllous species from the class *Festuco-Brometea* (e. g. *Festuca valesiaca*, *Filipendula vulgaris*, *Salvia nemorosa* and so on) and some mesophyllous (even meso-hygrophyllous) species from the class *Molinio-Arrhenatheretea* (e. g. *Poa pratensis*, *Centaurea jacea*, *Dactylis glomerata*, *Agrostis stolonifera* and so on).

The vicinity of the bushes and forests to our phytocoenoses cause the getting in the numerous plants, characteristic for other vegetation classes, such as: *Trifolio-Geranietea* (*Peucedanum alsaticum*, *Galium verum*, *Fragaria viridis*, *Veronica chamaedrys* and so on) or *Rhamno-Prunetea* (*Crataegus monogyna*, *Rosa canina*, *Prunus spinosa*) and so on.

The anthropogenic influence is felt in the phytocoenotic structure by the participation of numerous characteristic species for the class *Artemisietea vulgaris*; amongst the most frequent species are the next ones: *Daucus carota*, *Elymus repens*, *Tanacetum vulgare*, etc.

All these floristic interferences impress to the structure of this newly described subassociation a pretty heterogeneous phytocoenotic feature, like in the case of the association *Peucedano-Asteretum sedifolii* Soó 1947 corr. Borhidi 1996

(Syn.: *Peucedano-Festucetum pseudovinae* (Rapaics 1927) Pop 1968). Against this one, the communities dominated by *Aster sedifolius* identified by us in Moldavia are differentiated, generally speaking, by the lack of the species *Peucedanum officinale*, as well as by the presence with higher constancy indexes of the next species: *Silaum silaus*, *Artemisia pontica*, *Peucedanum alsaticum*, and *Galium verum*.

The vertical structure. In the phytocoenoses structure, one can distinguish three layers, namely:

– a superior one (90–150 cm in height, rough-east, with a coverage to 15%, edified by *Peucedanum alsaticum*, *Tanacetum vulgare*, *Silaum silaus* and some bushes from the neighborhoods, like: *Crataegus monogyna*, *Prunus spinosa*, and *Rosa canina*;

– a middle layer, of 50–70 (–80) cm in height, the best developed one, having a coverage of 70–90%, edified, mostly, by *Aster sedifolius*; besides this species are others, like the next ones: *Daucus carota*, *Elymus repens*, *Artemisia pontica*, *Poa pratensis*, *Centaurea jacea*, *Galium verum*, *Achillea collina*, *Inula britannica*, *Agrostis stolonifera* and so on;

– an inferior layer, of 15–30 cm in height, having a coverage of 10–15%, better coagulated in those spaces where the individuals of *Aster sedifolius* are more scarcely distributed, and where is to be met, in most cases, the next species: *Plantago lanceolata*, *Festuca valesiaca*, *Achillea setacea*, *Festuca pseudovina*, *Carex praecox*, *Veronica chamaedrys*, *Medicago lupulina*, *Fragaria viridis* and so on.

In the **live's form spectrum** one can distinguish an obvious dominance of hemicryptophyte species (60.6%), which suggests a well pronounced stability of these phytocoenoses in the surveyed territory. The next categories are represented by therophytes (12.6%), geophytes (11.8%), hemitherophytes (8.7%), phanerophytes (3.1%) and chamaephytes (3.1%).

The **phytogeographic spectrum** is dominated by the Eurasian elements (65.1%); besides this category, one can put into evidence the so-called European elements (16.7%), while other floristic elements are poorly represented: Pontic in general (5.6%), Mediterranean (3.2%), Circumpolar (4.7%), and Cosmopolite (4.7%).

The **ecologic spectrum**. All the phytocoenoses of this newly described subassociation have general mesophilous, meso-thermophilous and neutrophilous-poorly basiphilous features. The values of the ecologic indexes are the next ones: Um=4.3; Tm=5.0; Rm=7.1. A pretty higher proportion of the plant species has a large tolerance against the temperature (35 species, i.e. 28.5%) and the soil acidity (pH) (49 species, i.e. 38.8%); other 15 species (12%) are largely tolerant against

the soil supply with water. Moreover, as we already mention above in the text, ca. 36% apart of the species in our phytocoenoses proves, in various degrees, the halophylous features.

Physiognomy. The spring appearance of our phytocoenoses is dominated by the dry stems of the dominant species (*Aster sedifolius*) remained from the last year. During the summer time, the vegetation cover becomes more tight, with the growth of the stems in the current year, alongside with numerous other species, which round up the floristic structure. The most characteristic appearance is toward the end of the summer, while the dominant species is blossoming; thus, the vegetation cover becomes blue in color, due to the color of the very numerous anthodia; a little later, at the fruition of *Aster sedifolius*, the vegetation cover is changing the color, becoming whitish, due to the papus of the fruits (achenas).

We consider the relevé no. 8 as a *relevé type* for this subassociation (see Table 1).

CONCLUSIONS

– It is analyzed the role of the species *Aster sedifolius* in the edification of some meso-halophylous vegetal communities, unknown in the Eastern part of Romania (Moldavia) until now;

– On the basis of our surveys, presented in an analytical table (Table 1), it is made a complex analysis of those plant communities, framed out like this: Cl. *Puccinellio-Salicornietea* Țopa 1939, Ord. *Puccinellietalia* Soó 1947 em. Vicherek 1973, Al. *Festucion pseudovinae* Soó 1933, Ass. *Achilleo-Festucetum pseudovinae* (Magyar 1928) Soó (1933) 1945, subass. *asteretosum sedifolii* subass. nova.

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