

ANALYSIS OF *CERASUS FRUTICOSA* SHRUBLAND FROM COMANA (GIURGIU COUNTY) – HABITAT PROTECTED WITH PRIORITY WITHIN THE EUROPEAN ECOLOGICAL NETWORK NATURA 2000

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The paper presents the structure of a *Cerasus fruticosa* shrubland in southern Găvanu Burdea plain, close to Comana locality and forest. The area covered by the shrubland is very small (300 m²). The species richness is significant (46 species), most of them being southern, Balkan, Pontic and Pannonic geoelements. The shrubland is included in an artificial “peri-Pannonic” European habitat, given that the area of the species stretches from Central Europe to Central Asia, and Romania, in the Romanian Plain, Dobruđa and Moldova, shelters many populations. The phytocoenosis is dominated by hemicryptophytes and phanerophytes. Only one rare species, *Knautia macedonica*, is present. Biometrically, the population of *Cerasus fruticosa* from Comana is 0.79 m ± 0.12 tall and 0.68 cm ± 0.21 (thickness); the largest specimen was 1.35 m (height) and the largest diameter was 1.30 cm. The density of the *Cerasus fruticosa* population was 21 specimens/m² with 40% coverage, while the entire phytocoenosis, including the herbs layer, covered practically the entire area. The phenology of the population, under the conditions of 2007, fit within the annual active cycle between March 15 and October 15. The population was in a state of balance, had both young and mature specimens producing fruits and seeds, but it did not have the capacity for spatial expansion when competing with other shrubland species. The population from Comana is included on a map of the current dispersion of *Cerasus fruticosa* in Romania.

Key words: *Cerasus fruticosa*, European habitat, shrubland, biodiversity.

INTRODUCTION

The *Cerasus fruticosa* shrublands are located in steppe and silvo-steppe areas, where most of the natural vegetation has been replaced by agricultural land. The anthropic factor and the excessively warm climate which limits the expansion of the woody species, as well as the competition between plants, caused the drastic shrinkage of this habitat in Romania and Europe. Consequently, the habitat **R3130 Ponto – Pannonic shrubland of European dwarf cherry (*Cerasus fruticosa*)** from Romania, part of the **Habitat 40A0* Subcontinental peri – Pannonic scrub**, are protected with priority through the network of protected areas “Natura 2000,” both in Romania and in Europe.

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The habitat includes the South-Siberian, Sarmatic, Pontic, Pannonic floristic regions, as well as insular in Central Europe, but in the conservative European classification it is artificially included in the “peri-Pannonic” habitat.

Cerasus fruticosa (Pall.) G. Woron. species is synonymous with *Prunus fruticosa* Pall., *Prunus pumila* L. Mant., *Prunus cerasus* ssp *pumila* L, *Prunus chamaecerasus* Jacq. Coll.

In Romania, these shrublands are very limited, located at the boundary and in the clearings of *Quercus pubescens* forests, in areas of steppe meadows or in shrubland formations located on barren land stretches between agricultural plots, on road sides and on slopes.

MATERIAL AND METHOD

The *Cerasus fruticosa* shrubland from Comana (Giurgiu County, at 30 km S of Bucharest, in Găvanu-Burdea plain) is located in Valea Gurbanului, tributary of Neajlov River, 50m altitude, situated above the Bucharest – Giurgiu railroad, on a steep slope, cleared a long time ago and probably shaped for the construction of a railroad. The slope is covered with old shrublands with different coenotic composition and affiliation; the shrublands are dominant, in principal those belonging to the Pruno – Crataegetum associations.

The area covered by *Cerasus fruticosa* is properly delimited, rather small in surface, of about 200-300 m², with abundant herbaceous vegetation.

The observations were conducted in April – June 2007, intensively, and continued subsequently on an episodic basis. We inventoried the specific composition and made biometric and phenologic measurements on this shrubland.

RESULTS AND DISCUSSIONS

In Romania, the current distribution of *Cerasus fruticosa* shrublands was established using mainly literature references and databases. Its configuration is (Fig. 1): **AB** (Rebeşul Mic*, Sebeş*, Alba Iulia**, Valea Popii**, Aiud**); **AR** (Dl. Capra**); **BC** (Oneşti pe dl. Perchiu*, Vereşti*); **BH**; **BN** (Rodna**); **BT** (Leorda*, Ciritei*, Călăraşi*, Darabani*, N.Bălcescu***, Stânca***, Darabani***); **BV**; **BZ** (Rm.Sărat***); **CJ** (Cheile Turzii reg.*, Fâneţele Clujului, Floreşti, Cluj, Bontida – Sic (între), Dej, Hoia**); **CL** (Călăraşi, Lehliu, Ulmeni, Fundulea***); **CS**; **DJ** (Greceşti, Pleniţa***); **GL** (pd. Bălţatu – Slobozia Conachi*, pd. Gârboavele*, pd. Balta Munteni*, Tuluceşti***); **GR** (Comana – v. Gurbanului*, Băneasa***, Goştinari***); **HD**; **HR**; **IF** (incl. Ciorogârla*,

Căciulați**, Păd. Cernica**); **IL** (Cocora, Urziceni, Albești***); **IS** (rez. Valea lui David*, REDIU TĂTAR*, Breazu**, MİRZEȘTI**, FOCURILE***, COADA STÂNCII***, POPRICANI***, CEPLenița***, ROȘCANI***); **MH** (Coarnele Caprii***); **MS** (Sovata**); **NT** (rez. Dealul Vulpiei – Botoaia*, Dragomirești*, Ciritei***); **OT** (Bârza, Vlădila***); **SB** (Gușterița**, Măcelaru***, Copșa Mică***, Mediaș***, Netuș***, Nou***, Ocna Sibiului***, Păuca***, Pod. Secașelor***, Roșia***, Șura Mare***); **Sj** (Munții Meseșului - Treznea**); **SV** (rez. Ponoare – Bosanci*, Bosanci**); **TL** (Tulcea*, Niculițel*, Cocoș*, Altân Tepe***, Ceamurila***, Camena***, Caugagia***, Greci***, Islaz***); **TM** (Murani, în pod. Dorvaș*, Brestovat**); **TR** (Băduleasa***, Brătășani***); **VS** (rez. Fânațu Glodeni – Negrești*, Branca***, Brăhășoiaia***, Ghermănești***). (* According to Adrian Oprea (2001), ** IBB database and ***Other literature data.

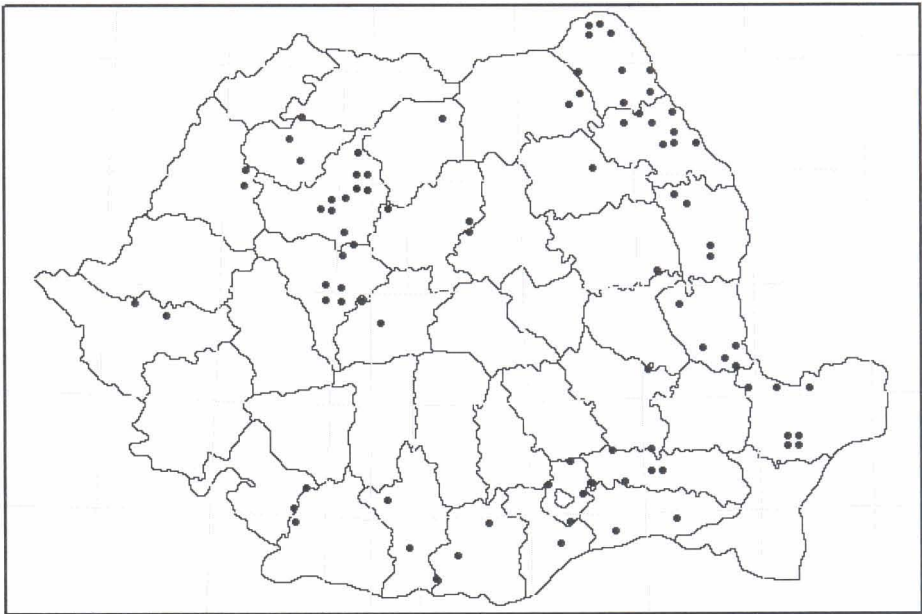


Fig. 1. Spread of *Cerasus fruticosa* in Romania.

The current presence of the species, and particularly its development on a larger and more complex scale as a shrubland (and thus as a habitat or ecosystem), must be double-checked and validated, given that some literature data are rather old, while others do not quantify its distribution, not allowing thus to clearly differentiate the spread of the species or habitat.

Currently, the Romanian shrublands included under the name “**Ponto – Pannonic shrubland of European dwarf cherry (*Cerasus fruticosa*)**” (Doniță *et al.*,

2005) are not accepted as a distinct category of habitat in the ecological network Natura 2000, but as a type belonging to the peri-Pannonic shrublands habitat (“**40A0* Subcontinental peri – Pannonic scrub**”). However, in Romania, the “peri-Pannonic” area covers Dobruđga and goes up to northern Moldavia.

The population of *Cerasus fruticosa* from Comana is limited, growing on a quite narrow area (200–300m²); these shrublands rarely cover wider areas, at least in Romania. The biometric measurements on this population (Table 1) show a state of balance, with young specimens next to mature ones. We did not identify old specimens, and this suggests that the population is in full evolution. Most mature specimens bear flowers, even of small dimensions, and these reach the fructifying stage, although the fructification is not rich. The dimensions of the inventoried specimens are usually small, under one meter; the largest specimens barely reached 1.35 m.

Table 1

Biometric data of the population *Cerasus fruticosa* from Comana

• Abundance:	41 specimens, with habitus of small tree
• Density:	21 specimens (100 m ²) 16 clusters (100 m ²)
• Specimen grouping:	no multiple aboveground stems from the same root; however, the plant grows in clusters which may have underground connections
• Height:	average 0.79 m ±0.12 (S ² 0.18; S% 2.68) maximum 1.35m minimum 0.23m
• Diameter:	average 0.68 cm ±0.21 maximum 1.30 cm minimum 0.20 cm
• Coverage:	Shrub layer 40% Herbs layer 95%

The phenology of the *Cerasus fruticosa* shrubland in the Comana climatic conditions is largely similar for the entire *Cerasus* genus, but delayed by about two weeks (Table 2). The most dynamic period is between April 1st and end of June. The fruits are usually eaten by birds and insects; they do not remain on the branches, even those partially consumed disappeared during the subsequent period.

Although it is considered a shrub, maybe because of its small dimensions, the general image in the surveyed area was that of a growing shrub, with properly built canopy. Its diameter does not exceed 1.3 cm. The distance between plants is variable, but it does not suggest they belong to the same genetic specimen not even in the case of the closest specimens. The underground connection between the specimens could not be documented, as the soil was dry, tough, and digging would

have endangered the already-scarce population. However, in “The flora of Romania”, Al. Buia (1956) posits that “species can differentiate stolons”. In the whole habitat surveyed 41 specimens were identified.

Table 2

Annual dynamics of *Cerasus fruticosa* population development in 2007

March	1	vegetative stage-wintering
	15	vegetative stage, leaf buds
April	1	budding stage
	15	flowering stage
May	1	incipient fructifying stage
	15	fruit formation stage
June	1	fruit ripening stage
	15	fruit and seeds dissemination stage
July	1	vegetative stage, all fruits are eaten or fallen
	15	vegetative stage
August	1	vegetative stage
	15	vegetative stage
September	1	vegetative stage
	15	vegetative stage
October	1	vegetative stage, leaves are drying
	15	leaves are drying and falling

The structure of *Cerasus fruticosa* shrubland is largely influenced by soil characteristics; as indicated, the Comana site soil is dry almost all the time, because the flowing on the 35°–40° slope is very fast and the S-SW exposition increases the interval of sun exposure.

The soil displays a natural structure, of an eroded dark grey chernozem type, barely eroded (syn. Alfic udic Argiustolls, in USDA-ST/1999). Litter is almost absent. Layer A, about 10 cm deep, is glomerular, sandy-clay, with mull-moder humus, and moderately humiferous. Layer A/B (depth between 10 cm and 18 cm) is grey-brown, slightly reddish, sandy-clay, moderately humiferous, and finely glomerular. Layer B₁, 18–40 cm deep, is yellowish-brown, slightly reddish, and granular-glomerular. B₂ is below 40 cm.

From a climate perspective, the south-north orientation of the Gurbanului Valley favours the flow of warmer currents from the Danube, accounting thus for the southern, more thermophilic character of this plain’s climate; the average temperature is 11.2 °C and the peak temperatures are constantly recorded in early summer. The low humidity caused by annual rainfall of just 560 mm is amplified by the rainfall misbalance occurring, usually, between May and August, which is the most important period for the development of *Cerasus fruticosa* population, but also a period of acute draught.

The analysis of the phytocoenosis established by *Cerasus fruticosa* covered the entire surface, given its small area, uniformity and clear differentiation from neighbouring phytocoenoses. Consequently, we could not observe the phytosociological rules of the repeated floristic sample taking; furthermore, given that the inventory covered the whole surface, we did not feel the need for it. The plants identified are shown in Table 3.

As shown, there are 45 species next to *Cerasus fruticosa*, most of them herbaceous (42 species), and four woody, scrub species too. Quantitatively, only *Melica ciliata*, *Brachypodium pinnatum*, *Chamaecytisus austriacus*, *Achillea pannonica*, *Euphorbia glareosa* (*Euphorbia nicaeensis*) are significantly represented. The species presented are not endangered from a conservation perspective. Only *Knautia macedonica* is a rare species; its typical area is in the Balkans.

Taking into consideration the typical species, the phytocoenosis can be included in the association ***Crataego – Cerasetum fruticosae* Soó**. Although the herbaceous layer is very rich, we cannot consider the affiliation as facies neither of the association *Stipetum stenophyllae austro-transsilvanicae* (Borza, 1959), nor of *Prunetum fruticosae* (Dziubaltovski, 1926), although *Prunetum fruticosae* has been observed in areas close to Comana, in Daia village, Giurgiu County (Sanda V. *et al.*, 2001). Compared to the grassland association, precisely the species characteristic to association are missing, those from *Stipa*, while the *Prunetum fruticosae* association, although part of the same order as *Crataego-Cerasetum*, distinguishes itself through physiognomy and through the most abundant species, indicated previously.

Geoelements

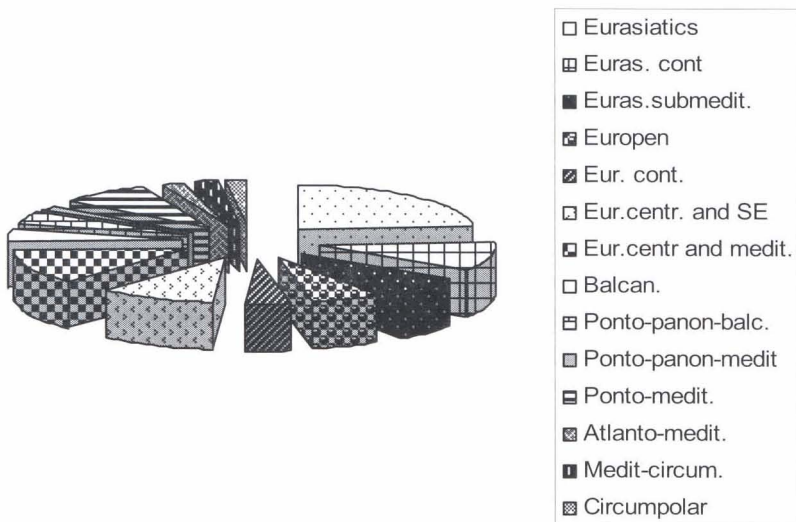


Fig. 2. Proportions of geoelements present in phytocoenosis.

Table 3

List of inventoried plants and their abundance in the *Cerasus fruticosa* shrubland

	Species	Coenotic value (characteristic sp.)	Indices AD	Sozological category	Geo- element	Bio- forma	Plant formation
1.	<i>Achillea pannonica</i> Scheele	Quercetea pubescenti-petraeae	+1	LC	Eur. Cont.	H.	Dry grassland
2.	<i>Turritis glabra</i> L. (<i>Arabis glabra</i> (L.) Bernh.	Origanetalia	+	LC	Circ.	Ht.	Oak forest, ecotone shrubland
3.	<i>Brachypodium pinnatum</i> (L) Beauv.	Quercetea pubescenti-petraeae	+1	LC	Euras (submedit)	H.	Oak forest, grassland, ecotone forest
4.	<i>Brachypodium sylvaticum</i> (Hudson) Beauv.	Querco-Fagetaea	+	LC	Euras (submedit.)	H.	Forest, shrubland, shady places
5.	<i>Lithospermum arvense</i> L.	Festucetalia valesiaca	+	LC	Euras.	T.	Cultivated and ruderal areas
6.	<i>Campanula persicifolia</i> L.	Quercetea pubescentis	+	LC	Euras	H.	Grassland, ecotone forest
7.	<i>Carex tomentosa</i> L.	Quercetalia pubescentis	+	LC	Euras	G.	Oak forest
8.	<i>Cerasus fruticosa</i> (Pallas) Woronow	Car ass.	2-3	LC	Euras. cont	Ph.	Shrubland, ecotone forest
9.	<i>Chamaecytisus austriacus</i> (L.) Link	Quercetalia petraeae- pubescentis, Festucetalia valesiaca	1-2	LC	Pont.-pan.-bale	Ph.	Grassland, shrubland ecotone forest
10.	<i>Coronilla varia</i> L.	Quercetea	+	LC	Centr.-eur.- submedit.	H.	Grassland, shrubland
11.	<i>Crataegus monogyna</i> Jacq	Prunetalia	+	LC	Euras	Ph.	Ecotone forest and clearings, shrublands
12.	<i>Dactylis glomerata</i> s.l. L.	Symphyto-Fagion	+	LC	Euras	H.	Oak forest, grassland ecotone forest
13.	<i>Elymus repens</i> s.l. (L.)Gould.	Artemisietea	+	LC	Med. Circ.	G.	Grassland, cultivated and ruderal areas
14.	<i>Eryngium campestre</i> L.	Festucetalia valesiaca	+	LC	Pont.-medit	H.	Grassland, ruderal areas
15.	<i>Euphorbia virgata</i> (<i>E.tommasiniana</i>) Waldst. et Kit.	Festucion valesiaca	+	LC	Euras. Cont.	H.	Cultivated areas, grassland, shrubland
16.	<i>Euphorbia glareosa</i> Pallas (<i>Euphorbia nicaeensis</i>)	Festucion valesiaca	1	LC	Eur. Centr. si E.	H	Grassland, shrubland and ruderal areas
17.	<i>Evonymus europaeus</i> L.	Prunetalia	+	LC	Eur.	Ph.	Oak forests, shrubland
18.	<i>Falcaria vulgaris</i> Bernh	Festucion valesiaca	+	LC	Euras	Ht.	Cultivated, ruderal areas, shrubland
19.	<i>Festuca heterophylla</i> Lam.	Quercetea pubescenti-petraeae	+	LC	Centr.eur.- submedit.	H.	Oak forest, ecotone forest
20.	<i>Filipendula vulgaris</i> Moench (<i>F.hexapetala</i> Gilib.)	Festuco-Brometea and -Quercetea	+	LC	Euras	H.	Grassland, shrubland
21.	<i>Fragaria viridis</i> Weston.	Festucetalia valesiaca	+	LC	Euras	H.	Grassland, sunny places

Table 3 (continued)

22.	<i>Galium album ssp. pycnotrichum</i> (H. Braun) Krendl		+1	LC	Centr. SE. eur.	H.	Grassland and weeds
23.	<i>Galium rubioides</i> L.	Quercetea	+	LC	Centr. Eur.	H.	Oak forest, grassland, wet forest, shrubland
24.	<i>Galium verum</i> L.	Festuco – Brometea	+1	LC	Euras	H.	Grassland, shrubland
25.	<i>Glechoma hirsuta</i> Waldst. et Kit.	Quercu-Fagetea	+	LC	Pont. -medi. - centr.eur	H. (Ch.)	Forest, shrubland
26.	<i>Hesperis tristis</i> L.	Festucion valesiacaе	+	LC	Pont.-pan.-medit.	Ht.-H.	Dry grassland, shrubland, ruderal places
27.	<i>Imula hirta</i> L.	Festucetalia valesiacaе	+	LC	Cent. Euras.	H.	Grassland, shrubland, ecotone forest
28.	<i>Iris graminea</i> L. (<i>I.pseudocyperus</i> Schur)	Quercetea pubescenti – petraeae	+	LC	Centr.eur.- submedit.	G.	Shrubland, ecotone forest, grassland
29.	<i>Knautia macedonica</i> Griseb.	Festuco – Brometea	+	R	Balc.	H.	Oak forest, grassland, shrubland
30.	<i>Linaria genistifolia</i> (L.) Miller	Festucetalia valesiacaе	+	LC	Cont.euras.	H.	Grassland, shrubland, rocky areas
31.	<i>Melica ciliata</i> L.	Festucetalia valesiacaе	1	LC	Centr.eur.-medit.	H.	Grassland, rocks, sunny spots
32.	<i>Origanum vulgare</i> L.	Quercetea	+	LC	Euras.	H.	Shrubland, ecotone forest, grassland
33.	<i>Peucedanum alsaticum</i> L.	Quercetea and Festucetalia valesiacaе	+	LC	Eur.cent.	H.	Grassland, shrubland
34.	<i>Prunus cerasifera</i> Ehrh.		+	LC	Pont.-balc.	Ph.	Shrubland
35.	<i>Prunus spinosa</i> L.	Prunion spinosae	+	LC	Eur.	Ph.	Shrubland, ecotone forest
36.	<i>Rosa gallica</i> L.	Quercetalia pubescentis	+	LC	Pont.-medit.	Ph.	Shrubland, grassland, ecotone forest
37.	<i>Salvia nemorosa</i> L.	Festuco – Brometea	+	LC	Centr.eur.	H.	Grassland, shrubland
38.	<i>Salvia pratensis</i> L.	Festuco – Brometea Quercetea pubescenti petraeae	+	LC	Eur. (submedit.)	H.	Shrubland, grassland, ecotone forest
39.	<i>Silene viridiflora</i> L.	Quercetea pubescenti-petraeae Quercion farnetto	+	LC	Eur.cent.	H.	Shrubland, grassland, forest borders
40.	<i>Tanacetum corymbosum</i> (L.) Schultz	Festucetalia valesiacaе Quercetea pubescentis	+	LC	Euras.	H.	Ecotone forest, shrubland, grassland
41.	<i>Teucrium chamaedrys</i> L.	Quercetea pubescenti-petraeae Festuco – Brometea	+	LC	Eur.cent. (submedit.)	Ch.	Grassland, sunny shrubland, arid zone
42.	<i>Verbascum phoeniceum</i> L.	Festucetalia valesiacaе and Quercetea	+	LC	Euras.cont.	H.	Grassland, shrubland, ruderal areas
43.	<i>Veronica chamaedrys</i> L.	Prunetalia	+	LC	Euras	H-Ch.	Grassland, shrubland, ecotone forest
44.	<i>Vicia villosa</i> Roth.	Stellarietea mediae	+	LC	Eur.	T.-Ht.	Shrubland, grassland, cereal crops
45.	<i>Viola kitaibeliana</i> Schultes	Festucetalia valesiacaе,	+	LC	Pont.-medit.	T.	Arid places, grassland, shrubland
46.	<i>Viola odorata</i> L.	Prunetalia	+	LC	Atl.,-medit.	H.	Forest and ecotone forest, shrubland, wet forest

Phytocoenological hierarchy of the association :

Quercetaea pubescenti – petraeae (Oberdorfer 1948) Jakucs 1960

Prunetalia Tx 1952

Prunion fruticosae R.Tx.1952

Crataego – Cerasetum (Prunetum) fruticosae Soó 21,51

Prunetum fruticosae Dziubaltovscki 1926

From a taxonomic perspective, the elements of the phytocoenosis belong mainly to the grassland structure (Fig. 4) and, in smaller, but identical proportion, forest and shrubland species are found; ruderal species are also present, although in a smaller proportion. The dominant biogeographical elements are those southern, Pontic-Balkan, sub-Mediterranean and Mediterranean, Central European and Pannonic, circumscribed largely to the entire area of the characteristic species, *Cerasus fruticosa* (Fig. 2). As number of species, those belonging to bifurms dominate: hemicyptophytes and phanerophytes (Fig. 3).

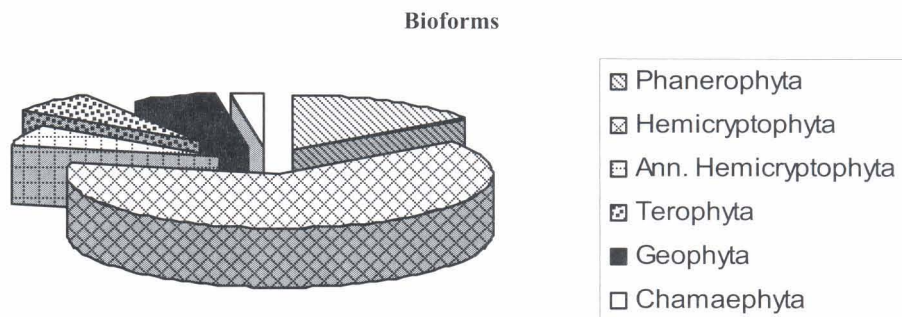


Fig. 3. Proportion of different bioform categories in phytocoenosis.

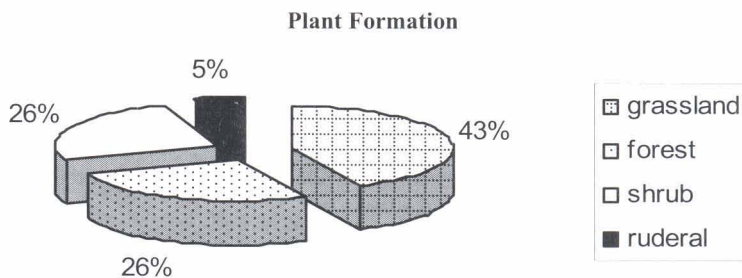


Fig. 4. Proportions of species present in the phytocoenosis, as a function of membership to different vegetal formations.

CONCLUSIONS

The *Cerasus fruticosa* population from Comana is in equilibrium with the existing environmental conditions, having the capacity of self-regeneration, to remain in the area. It belongs to the association *Crataego – Cerasetum (Prunetum) fruticosae* Soó 21,51. It does not have a strong competition capacity and it did not succeed to expand to the neighbouring areas occupied by *Pruno-Crataegetum*. The distribution of *Cerasus fruticosa* specimens in the phytocoenosis from Comana is quite homogeneous, with a density of 21 specimens/sq.m and it has intermediary/ (reaching toward the superior limit) biometric characteristics, compared to the known variability of the Romanian flora.

Given the wide area covered, from Central Europe to Central Asia, the extra-Carpathian area of the species in Romania, and the presence of a large number of Balkan and Pontic species, we do not consider appropriate to include *Cerasus fruticosa* in a “peri-Pannonic”, but rather in a Pontic-Sarmatic habitat. At any rate, it is an endangered European habitat because of the shrinking areas where species establishes certain phytocoenoses.

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