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VARIABILITY STUDY REGARDING SOME MORPHOLOGICAL CHARACTERS OF BIOTYPES OF SEA BUCKTHORN PSEUDOFRUITS

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INTRODUCTION

Sea buckthorn is a shrub or fruit tree, spiny bushy and strong, with leaves covered with covered with silvery hairs, large (usually 1.5 to 4 meters). The species grows in clumps or large brush on sand and gravel, along rivers, on pastures, rocky coasts, rocks, saline formations (BOTEZ et al., 1984).

In extensive studies conducted on the genus *Hippophaë*, RONGSEN (2007) show that the pseudofruits size vary with species: the largest pseudofruits presents the species *Hippophaë tibetana* (41.5 to 52.4 per 100 pseudofruits), followed by *Hippophaë rhamnoides* ssp. *rhamnoides* (35.1 to 38.8 per 100 pseudofruits) and the lowest are found in *Hippophaë neurocarpa* (2.5 to 3.5 per 100 pseudofruits). The chemical composition of seabuckthorn pseudofruits is complex and it varies with the origin, environmental conditions, harvest period, (ZEB,2004; TIITINEN et al., 2005). In our country also, sea buckthorn has been subject of studies that have followed its spread, its morphological characterization of some biotypes present in the spontaneous flora, pseudofruit chemical composition etc. (ȚOPA, 1960; BOTEZ et al., 1984; BRAD et al., 2002; PÂRVU, 2002; RAȚI et al., 2003; TIȚĂ 2003). From these information, we intend to contribute to understanding the behavior of some morpho-physiological characters of *Hippophaë rhamnoides* L. pseudofruit of biotypes in the spontaneous flora, but also grown, to identify forms of perspective to improve the species.

MATERIAL AND METHODS

Biological material used in the biometric study were represented by six biotypes of seabuckthorn (*Hippophaë rhamnoides*) from three natural populations of Bacau (Coteni, Viforeni, Letea) and three populations in culture at S.C. FRUCTEXS.A.Bacău.

From the six biotypes were harvested fruit samples at physiological maturity (second half of October) for analysis of morpho-physiological indices. From each biotype were collected 100 pseudofruits randomized for biometric measurements: length, diameter and individual pseudofruit weight. The data were statistically processed and interpreted. The results of investigations are presented in tables 1-3 and fig. 1.

RESULTS AND DISCUSSIONS

In our investigations we have chosen for observations and measurements different biotypes in terms of size, shape and pseudofruits color, as shown in fig. 1. The average length of the pseudofruit from the six biotypes studied ranged from 6.90 mm (biotype Schitu- Frumoasa) and 11.67 mm (biotype Delta 60M). High values of this parameter were recorded in biotypes Viforeni, Letea 6 and Delta 60M (11.47 to 11.67 mm). The variability of the character "fruit length" in these biotypes is reduced, s% having values between 5.33% and 10.59 (table 1), which shows that this character has a high genetic stability and that can be successfully operated the selection by this parameter. Observed values of sx% indicates that the data presented in the table are safe.

Table 1. Variation in pseudofruit length character (mm) in populations of *Hippophaë rhamnoides* L.

	Biotype name	Values of statistical parameters				
		x	s	s%	sx	sx%
Wild populations	Viforeni	11,59	0,62	5,33	0,06	0,53
	Letea 6	11,47	0,69	5,99	0,07	0,60
	Schitu-Frumoasa	6,90	0,52	7,62	0,05	0,76
Cultivated populations	Vibratina	8,85	0,84	9,52	0,08	0,95
	Delta 60M	11,67	0,79	6,80	0,08	0,68
	Coteni	7,60	0,80	10,59	0,08	1,06

Regarding the pseudofruit diameter, from Table 2 results that the parameter had average values varied between 6.06 mm (biotype Schitu-Frumoasa) and 8.75 mm (biotype Delta 60M). High values of sea buckthorn fruit diameter were recorded at biotypes Letea 6 (8.29 mm) and Delta 60M (8.75 mm). And this character has a low variability, the values of s% are between 4.24 and 10.34, indicating that its use as a selection criterion to improve white seabuckthorn, from this point, can be successfully practiced. The values of sx% certified the veracity of the results.

Table 2. Variation in pseudofruit diameter character (mm) in populations of *Hippophaë rhamnoides* L.

	Biotype name	Values of statistical parameters				
		x	s	s%	sx	sx%
Wild populations	Viforeni	7,58	0,43	5,67	0,04	0,57
	Letea 6	8,30	0,35	4,24	0,03	0,42
	Schitu-Frumoasa	6,07	0,45	7,51	0,04	0,75
Cultivated populations	Vibratina	7,27	0,60	8,32	0,06	0,83
	Delta 60M	8,75	0,61	7,01	0,06	0,70
	Coteni	6,38	0,66	10,34	1,06	1,03

A very important production character in this species is the individual biomass of the pseudofruits (Table 3). Under this the mean values ranged from 0.18 g/ pseudofruit (biotype Schitu-Frumoasa) and 0.55 g/pseudofruit (biotype Delta 60M). The variability of the character is medium to low, the coefficient of variation s% having values between 9.70% and 15.39 at the biotypes studied. And from this perspective, the six biotypes are in a good situation, meaning relatively high genetic stability of pseudofruit biomass. Sx% s values shows that calculated arithmetic averages are safe.

Table 3. Variation in pseudofruit biomass character (g) in populations of *Hippophaë rhamnoides* L.

	Biotype name	Values of statistical parameters				
		x	s	s%	sx	s%
Wild populations	Viforeni	0,36	0,04	10,28	0,004	1,03
	Letea 6	0,42	0,04	10,21	0,004	1,02
	Schitu-Frumoasa	0,18	0,03	14,91	0,003	1,49
Cultivated populations	Vibratina	0,28	0,04	15,39	0,004	1,54
	Delta 60M	0,55	0,08	14,13	0,008	1,41
	Coteni	0,21	0,02	9,70	0,002	0,97

The results we obtained show the existence of differences between genotypes studied in the sea buckthorn pseudofruit size and biomass, irrespective of their origin. It appears therefore that the differences between biotypes under this part, maintained and through their culture.

Taking into account all the parameters analyzed, the most valuable in terms of size and biomass biotypes pseudofruit are Letea 6 and Delta 60M (the average pseudofruit length 11.47 to 11.67 mm; pseudofruit diameter from 8.30 to 8.75 mm; 0.42 to 0.55 g pseudofruit biomass), and the less valuable are the biotypes Schitu - Frumoasa and Coteni (6.90 to 7.60 mm pseudofruit length; pseudofruit diameter from 6.07 to 6.38 mm; pseudofruit biomass from 0.18 to 0.21 g).

CONCLUSIONS

1. Biometric studies conducted on the pseudofruit of six biotypes of *Hippophae rhamnoidees* L. (three planted and three from the spontaneous flora) showed that the average length of the pseudofruit varied between 6.90 and 11.67 mm, average pseudofruit diameter between 6.06 - 8.75 mm, and the biomass between 0.18 and 0.55 grams.
2. The length and diameter of these biotypes of sea buckthorn pseudofruits are characters with low variability, while biomass is pseudofruit character with medium variability.
3. Our investigations showed that biotypes Letea 6 (of spontaneous vegetation) and Delta 60M (grown) record high values of the parameters analyzed, consisting perspective forms to ameliorate white seabuckthorn.

ABSTRACT

Biometric study was done on six biotypes of sea buckthorn from Romania (three of three of spontaneous vegetation and culture). We have analyzed the morphological features of pseudofruits following: length, diameter and their individual biomass. Observed values were statistically processed. Biotypes Letea 6 (of spontaneous vegetation) and Delta 60M (over the culture) proved superior in pseudofruit size and biomass. Pseudofruit length and diameter are parameters with low variability, and mass presents medium to small variability.

Biotypes from wild populations

Viforeni Biotype
Pseudofruits large, oval, yellow-orange

Letea 6 Biotype
Pseudofruits large, elliptical, orange-reddish color

Schitu-Frumoasa Biotype
Pseudofruit small, round, orange

Biotypes from cultivated populations

Vibratina Biotype
Pseudofruit medium size, oval, orange

Delta 60 M Biotype
Pseudofruits large, elliptical, orange

Coteni Biotype
Pseudofruit medium size, oval, orange

Fig. 1. Appearance of sea buckthorn pseudofruit biotypes investigated

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