THE GENUS *PRUNUS* L. GENERATIVE REPRODUCTIVE POTENTIAL (GRP) IN THE SOUTH-WEST SLOVAKIA REGIONS

Ivana ŽGANČÍKOVÁ, T. VEREŠ, T. BARANEC

Slovak University of Agriculture in Nitra
Tr. A. Hlinku 2, 949 76 Nitra, Slovakia
E-mail: ivanazgancikova@yahoo.com

Abstract*: In the populations of non-forest woody vegetation in the form of belts–biocorridors on the borders of agriculture landscape - in dominant representation, there occur species and spontaneous hybrids of the genus Prunus L. Generative reproductive potential (GRP) of some of taxa Prunus L. from 2010 to 2011 years had been analyzed on the territory in the south-west Slovakia at 3 localities (Jelenec, Vráble and Veľké Úľany). Experimental observations were done during the important blackthorn phenophases from April to May and from September to October. In this work we detected the ability of the flowers formation (the number of flowers we investigated the phenological stages of full flowering (April-May) on indicated specimens, respectively. To select twig end individuals, we randomly selected inflorescence, we counted the number of flowers in clusters and calculated the average) and the fruits formation (we investigated the number of fruit in the months of September to October, methodical process as the first point) to determine the generative reproductive potential (GRP). Generative reproductive potential of individual taxa in the studied period 2010 to 2011 was relatively balanced. Experimental locality Vráble GRP was zero across all individuals in both years. Important thing for the amount of GRP on the location are surveyed habitats and related environmental conditions. On the actual population had the worst effect the occurrence of diseases and pests. The main disease at the locality Vráble was Clasterosporium carpophilium with the symptoms on leaves - the leaves were made round to oval, a few millimeter, dark purple with a brown edge stain and on fruits - the fruits we have seen tiny blotches, which was accompanied by gummosis. It is important to note also that the generative reproduction of individuals examined longer-term research is needed. Our results show that 2011 was the production of flowers richer and less prone to diseases incidence than in 2010. The originality of this research is in the detection of GRP of genus Prunus spp., which mainly form non forest woody vegetation and biocorridors in the agricultural land of Slovak Republic.*

Key words**:** *reproductive biology, genus Prunus L., Prunus spinosa* L.

INTRODUCTION

Generative reproduction is a fundamental and important way reproduction of seed plants. The biological significance of this process lies in the fact that thanks to the double inheritance created organisms that are viable and better adapted to changing environmental conditions (PODDUBNAJA-ARNOLDI, 1976). The paper focuses on the reproductive biology of selected taxa of the genus Prunus L. The dominant species *Prunus spinosa* and hybrids *Prunus x fruticans* Weihe and *Prunus* × *fetchneri* subject of our research are abundant in the shrub communities (series *Prunetalia spinosae*), which are part of the corridors. Lessons learned from the study of reproductive biology studied taxa are important not only for basic research, since so far we have with similar research in selected taxa met only in (RYBNIKÁROVÁ, et al. 2009). The results of the work can be useful in breeding and, horticulture and gardening, as well as in landscaping works. Populations of the genus *Prunus* L. from an important group of biotopes – blackthorn shrublets which we include to the Association Ligustro – Prunetum, from the clasis Rhamno-Prunetea. The main part of these shrublets are *Prunus spinosa*, *Rosa canina, Crataegus monogyna, Ligustrum vulgare* (RUŽIČKOVÁ, et al. 1996). From the taxonomic point

of view, we include the genus *Prunus* L. to the family *Rosaceae* Juss., which plays an important role in the phylogenetic system. *Prunus* L. is extensive and economically important genus with considerable morphological variations (BORTIRI, et al. 2006).

MATERIAL AND METHODS

The number of flowers and fruit, we examined over two growing seasons in the months of April to May (flowers) and September to October (fruit) in 2010 and 2011. Major research sites were located in Veľké Úľany on the hilly area of Trnava and Jelenec and Vráble site located in the hilly area of Nitra (Table 1). At all observed stations were recorded occurrence of taxa of the genus *Prunus* L. When studying the reproductive biology of the genus *Prunus* L. We used the methodologies applied in BARANEC (1990) and BARANEC (1996) and we detected:

- Formation of flowers - the number of flowers we investigated the phenological stages of full flowering (April-May) on indicated specimens, respectively. To select twig end individuals, we randomly selected inflorescence; we counted the number of flowers in clusters and calculated the average,
- Production of fruit - we investigated the number of fruit in the months of September to October, methodical process as the first point,
- Generative reproductive potential (GRP) - was set in each year of research (2010 to 2011) as the ratio of the number of fruit bearing tree for the number of flowers marked the subjects respectively.

Generative reproductive potential determined as a percentage: GRP = number of fruits/number of flowers x 100 (%) (HARPER, 1977).

Table 1

Characteristics of analysed localities

Characteristics	**Locality**		
	Veľké Úľany	**Vráble**	**Jelenec**
GPS	Trnava region, district Galanta	Nitra region, district Nitra	Nitra region, district Nitra
Altitude	118 m n. m.	152 m n. m.	221 m n. m.
Size of evaluated corridors	144 m long, 20 m wide	1 190 m long, 45 m wide	286,76 m long, 11,62 m wide
Soil	Fluvial soil	Brown soil	Brown soil

RESULTS AND DISCUSSIONS

The formation of flower buds occurs in the spring (April to May) before sheets appeared. The disruption of generative reproductive potential (GRP) occurs due to many biotic and abiotic stress factors. The biotic factors cause external damage to generative and vegetative organs by wild animals. *Taphrina pruni*, diseases (moniliasis, scald leaves), and negative direct and indirect anthropic impact on plant communities was also detected. Species of the genus *Prunus* L. are host plants of many diseases and pests such as: viruses - Sarka plums, plums dwarf virus, necrotic ring virus plums. From the abiotic stress factors GRP was the most affected by the late spring frosts, rain, wind, especially during flowering. Very low fruit production occurs due to all the negative factors. For research, we analyzed the type of GRP Prunus spinosa L. and hybrids of *Prunus x fruticans* Weihe, *Prunus* × *dominii*, *Prunus* × *fetchneri*. The increased number of flowers was recorded in 2010. Despite intensive flowering, we recorded a lower incidence of fruit produced this year. Richer flowering might be a mild winter, an earlier onset of phenological stages. To reduce the number of fetuses was due to

worsening weather during the growing season. In 2010 the Deer area were recorded at the highest GRP *Prunus x fruticans* hybrids Weihe (73.19%) and the large area Úľany generative fertility rate reached 24.70% in *Prunus x fruticans* Weihe. *Prunus x dominii* in 2010 reached 33.48% compared to 2011. The lowest values were found in 2010 on location at Veľké Úľany hybrids of *Prunus × fetchneri* (12.86%). Zero GRP was found to Vráble site in all subjects (Table 2). In 2011, the highest value of the GRP were found on the site at Veľké Úľany hybrids *Prunus x fruticans*Weihe (68.16%) and the area Jelenec (65.84%) (Table 3).

Table 2

Comparason of GRP between area in 2010

	Veľké Úľany	Jelenec	Vráble
Prunus × fruticans Weihe	24,70	73,19	0
Prunus × dominii	-	33,48	0
Prunus × fetchneri	12,86	-	-

Table 3

Comparason of GRP between area in 20101

	Veľké Úľany	Jelenec	Vráble
Prunus × fruticans Weihe	68,13	65,84	0
Prunus × dominii	-	19,87	0
Prunus × fetchneri	9,87	-	-

Negative impact on the actual production of fruits in 2010 to 2011 in area Vráble had also an increased occurrence of microscopic fungi *Clasterosporium carpophilium*. Based on our assessment of the health status at the studied species, we conclude that the disease symptoms are manifested as follows:

-the leaves were made round to oval, a few millimeter, dark purple with a brown edge stain, after which time the knife dropped from 30 pieces collected leaves the disease fungus *Clasterosporium carpophilium* confirmed on 24 pieces of sheet

- the fruits we have seen tiny blotches, which was accompanied by gummosis, fruits were also challenged by fungi *Clasterosporium carpophiilum*, the number of infested fruit from the sample taken was 50%.

Rybnikarova, et al. (2009) states GRP of *Prunus spinosa* L. zero for the site Šindolka (Nitra Region), this was caused by damage to the developing fruits by *Taphrina pruni*, which in our studied sites will not occur.

CONCLUSIONS

Generative reproductive potential of individual taxa in the studied period of 2010 to 2011 was relatively balanced. Location Vráble GRP was zero across all individuals in both years. Important thing for the amount of GRP on the location are surveyed habitats and related environmental conditions. On the actual population had the worst effect the occurrence of diseases and pests. It is important to note also that the generative reproduction of individuals examined longer-term research is needed. Our results show that 2011 was the production of flowers richer and less prone to diseases incidence than in 2010.

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