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Crataegus and *Rosa* genera in the Solec Basin and southern part of the Pińczów Hummock (Southern Poland)

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Abstract: The *Crataegus* and *Rosa* genera are critical taxa. Because of difficulties in species identification, nobody has dealt with the distribution of these genera in the Solec Basin (Niecka Solecka) and southern part of the Pińczów Hummock (Garb Pińczowski) thus far. The aim of this work was prepare a complete list of critical species of these genera in the study area. The floristic studies were carried out in the years 2004-2009. Nineteen species were recorded: 6 hawthorns and 13 roses. Seven species were new for the flora of the studied area (4 roses and 3 hawthorns).

Key words: *Rosa*, *Crataegus*, critical taxa, distribution, Solec Basin, Pińczów Hummock, S Poland

1. Introduction

Wild roses (*Rosa* L.) and hawthorns (*Crataegus* L.) are very common plants in Poland; however, in many regions of the country their distribution is not sufficiently known. This results from, among other things, taxonomic problems connected with these critical genera. Because of the recent hawthorn systematics proposed by Christensen (1992), the *Crataegus* genus occurring in Poland requires a new taxonomic revision. The distribution of many rose species is also insufficiently known and the relevant detailed information is not available. This particularly concerns anthropophytes which often escape from cultivations and naturalize in natural and semi-natural plant communities.

The regions where both the occurrence and distribution of roses and hawthorns are only superficially examined include some fragments of the Nida Basin, e.g. the Solec Basin. Investigations conducted by botanists in the Nida Valley since the second half of the 19th century have been focused mainly on the occurrence of rare and protected species, xerothermic flora and the plant cover of this region (Rostafiński 1872; Szafer 1918; Medwecka-Kornaś 1952, 1959; Filkowa 1987; Łuszczyńska 1998). The only monograph concerning the vascular flora of the Nida Valley provides very fragmentary data about the discussed genera (Szwagrzyk 1987).

The first information about roses occurring within the Solec Basin can be found in papers by Rostafiński and Dziubałtowski. The authors recorded 2 rose species, *Rosa gallica* L. (Rostafiński 1872) and *R. rubiginosa* L. (Dziubałtowski 1916). Next articles containing information on this issue appeared not earlier than in 1980s and 1990s (Popek 1984; Szwagrzyk 1987; Łuszczyńska 1998). The largest number of rose species was recorded in the work by Popek (1984) who investigated the species composition and distribution in the south-eastern parts of the Małopolska Upland. The author found, within the boundaries of the Solec Basin localities, the following species: *R. agrestis* Savi, *R. canina* L., *R. dumalis* Bechst., *R. inodora* Fries., *R. rubiginosa* L. and *R. sherardii* Davies. These species were later repeated in the *Distribution Atlas of Vascular Plants in Poland* (Zając, Zając 2001) alongside *R. tomentosa* Sm. which was added to this list. Altogether, eight species of roses and only three species of the *Crataegus* genus were reported based on the literature in the area of the Solec Basin and the southern part of the Pińczów Hummock. The first information concerning the above genus was provided by Cieśliński (1979, 1981) and Głazek (1984) who described *C. monogyna*

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Jacq. in their papers. Two other hawthorn species, *C. rhipidophylla* Gand. and *C.* ×*subsphaericea*, were mentioned in the work by Łuszczyńska (1998).

All rose and hawthorn species from the discussed area mentioned in the literature so far of were reported from a few stands as sporadic. Therefore, the aim of the present study was to compile a detailed list of taxa of the *Crataegus* L. and *Rosa* L. genera found in the Solec Basin and the southern part of the Pińczów Hummock and to determine the frequency of their actual occurrence.

2. Study area, material and methods

The investigated region includes Solecka Basin, situated on the east side of the Nida Valley, between the Wodzisław Hummock and the Pińczów Hummock, and covers an area of ca. 200 km^2. The study also involved the southern fragment of the Pińczów Hummock of approximately 80 km^2 area situated between the Solec Basin and the road Pińczów-Busko-Stopnica (Kondracki 1998).

The bedrock of the area consists of Cretaceous marls overlaid with Miocene sediments, mainly lithothamnium limestones and gypsum deposits. These rocks provide habitat for communities of steppe plants for protection of which several reserves were established (Kondracki 1998).

Floral materials were collected in years 2006-2009. They included fragments of short and long shoots of roses and hawthorns. Stands of common and easily identified in the field taxa such as *Rosa canina* L. and *Crataegus monogyna* Jacq. were only sporadically recorded. The correctness of hawthorn identification was verified by Prof. K. I. Christensen of the University of Copenhagen. Cultivated specimens of the *Rosa* genus

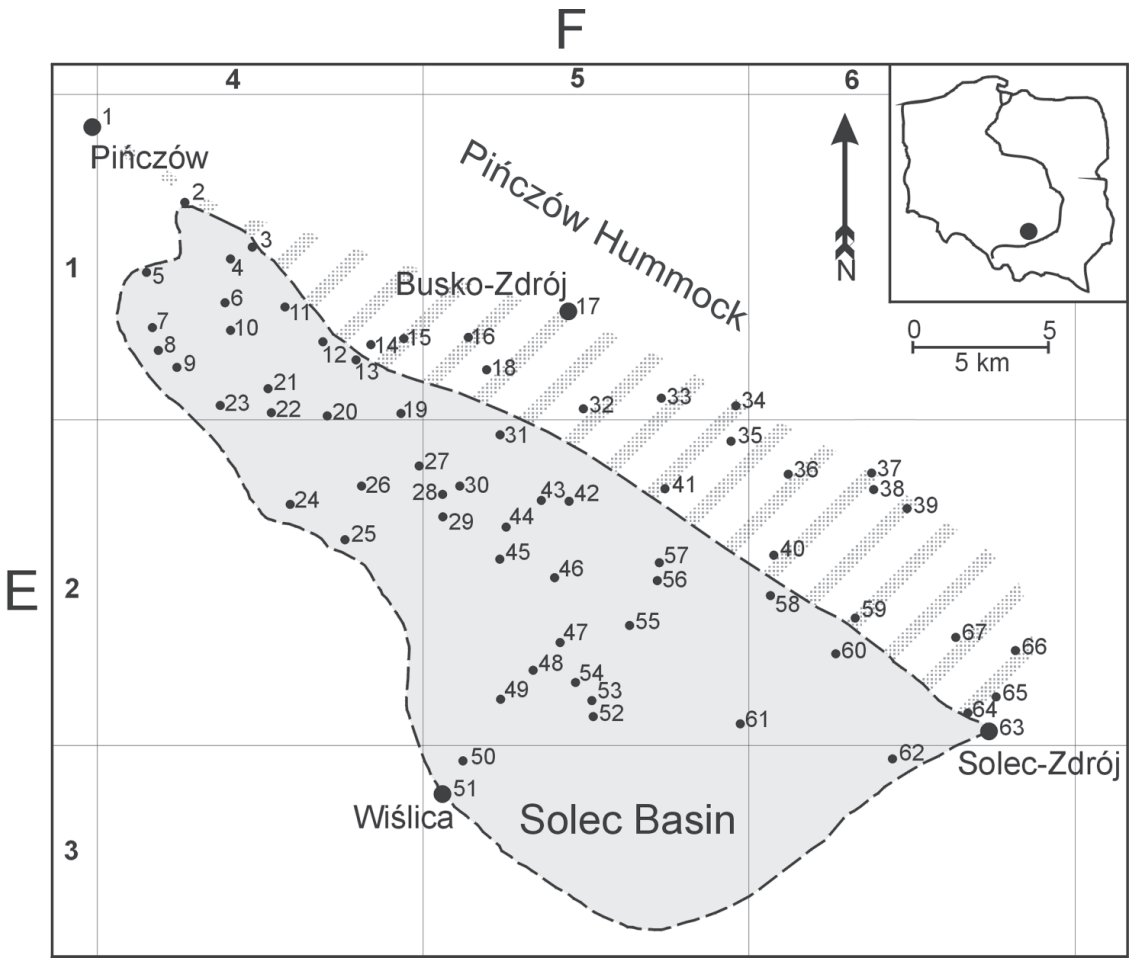

Fig. 1. Location of stands in the study area and on the ATPOL grid square system

List of stands: 1 – Pińczów, 2 – Pasturka, 3 – Bogucice I, 4 – Bogucice – Skałki, 5 – Kowala, 6 – "Grabowic" Reserve, 7 – Krzyżanowice Średnie, 8 – Krzyżanowice Dolne, 9 – "Krzyżanowice" Reserve, 10 – Gacki – quarry, 11 – Marzęcin, 12 – Kostki Małe, 13 – Kostki Duże, 14 – to W from Kostki Małe, 15 – Oleszki, 16 – Wełecz, 17 – Busko-Zdrój, 18 – Siesławice, 19 – Biniątki, 20 – Winiary, 21 – Wola Zagojska-Górna, 22 – Wola Zagojska-Dolna, 23 – to N from Leszcze, 24 – Zagość, 25 – Skotniki Dolne, 26 – Skotniki Górne, 27 – "Winiary Zagojskie" Reserve, 28 – to N from Skorocice, 29 – Skorocice, 30 – "Skorocice" Reserve, 31 – Chotelek Zielony, 32 – Zbludowice, 33 – near "Owczary" Reserve, 34 – Pęczewice, 35 – to N from Pęczewice, 36 – Skotniki Małe, 37 – to N from Sułkowice, 38 – Sułkowice, 39 – to SW from Sułkowice, 40 – Baranów, 41 – Radzanów, 42 – Hołudza, 43 – to E from Hołudza, 44 – Łatanice, 45 – to S from Łatanice, 46 – Gluzy, 47 – Gaj, 48 – Chotel Czerwony, 49 – to SW from Chotel Czerwony, 50 – Gorysławice, 52 – Zagórze, 53 – "Góry Wschodnie" Reserve, 54 – "Przęślin" Reserve, 55 – Bilczów, 56 – Dobrowoda, 57 – Olganów, 58 – Gadawa, 59 – Piasek Mały, 60 – to S from Piasek Mały, 61 – Piasek Wielki, 62 – Chinków, 63 – Solec-Zdrój, 64 – to NW from Solec-Zdrój, 65 – to N from Solec-Zdrój, 66 – Zborów, 67 – Żuków

and forms of hybrid origin were consulted with Prof. J. Zieliński of the University of Natural Sciences in Poznań. All herbarium materials are deposited in the Herbarium of the Ojców National Park (ONP).

The list of stands within the investigated area presented in the ATPOL grid square system 10 km x 10 km is shown in Figure 1. The list was made according to increasing numbers of the ATPOL grid squares in which the stands were arranged alphabetically. Place-names were based on the tourist and nature map from 1993 at a scale of 1: 100 000. Descriptions of stands in the list include the name of the author and the year in which field observations were made or specimens collected. One common date of observation was given in cases when, within the ATPOL square, specimens from several stands were collected or recorded during the same year. Stands that confirmed the earlier literature records which were identified during the discussed study are marked with an exclamation mark (!).

Altogether, the study comprised 67 stands. The frequency of occurrence was determined on the basis of species number and the adopted criteria were as follows: 1-5 stands – very rare species, 6-20 stands – rare species, 21-40 stands – quite frequent species, 41-60 stands – frequent species, > 60 stands – very frequent species.

The species nomenclature and taxonomy follows Christensen (1992, 1997) and Janjić (2002) for the *Crataegus* L. genus and Popek (1996, 2007) and Henker (2000) for the *Rosa* L. genus.

Explanations to symbols and abbreviations. Collectors: AK – Anna Klasa, KL – Krzysztof Lelek, SL – Anna Sołtys-Lelek; others: * – anthropophyte, leg. – legit, obs. – observation, Rez. – reserve.

3. Results

3.1. Systematic list of species of the genus *Crataegus*

The occurrence of 6 taxa of the *Crataegus* genus was recorded within boundaries of the studied area. These taxa included: 3 native species (1 of the subseries *Erianthae* and 2 of the subseries *Crataegus*) and 3 native species of hybrid origin.

Serie *Crataegus*
Subserie *Erianthae*

Crataegus laevigata (Poiret) DC. – A very rare species, not reported earlier from the study area. 1 stand (All localities are listed in the Appendix).

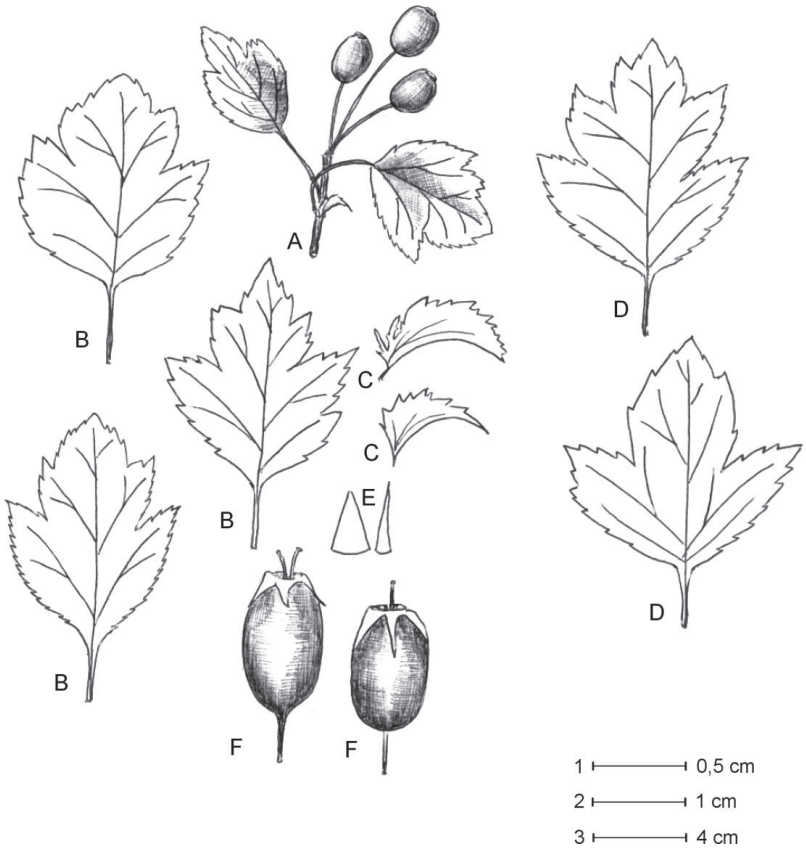

Fig. 2. *Crataegus* ×*macrocarpa* Hegetschw. nothovar. *macrocarpa*
Explanations: A – part of short shoot; B_1, B_2, B_3 – subterminal leaf of a flowering short shoot; C_1, C_2 – stipule of leaf of a flowering short shoot; D_1, D_2 – subterminal leaf of a short shoot; E – sepals; F_1, F_2 – fruits (fruit crowned by recurved sepals). Scale, 1: E; 2: B_1, B_2, B_3, C_1, C_2, D_1, D_2, F_1, F_2; 3: A (after Sołtys-Lelek 2011, modified)

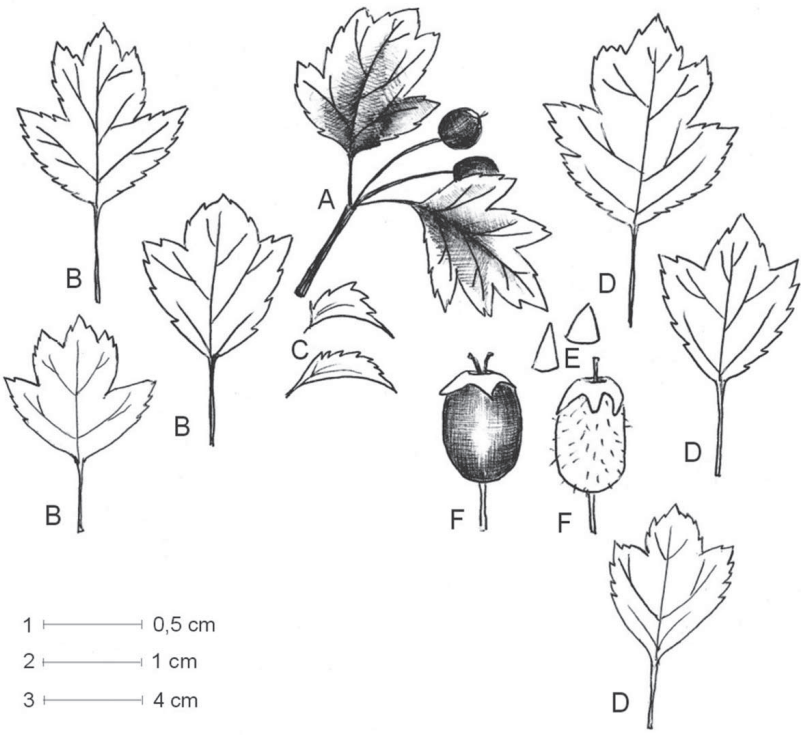

Fig. 3. *Crataegus* ×*media* Bechst. nothovar. *media*
Explanations: A – part of a short shoot; B_1, B_2, B_3 – subterminal leaf of a flowering short shoot; C – stipule of a leaf of a flowering short shoot; D_1, D_2, D_3 – subterminal leaf of a short shoot; E – sepals; F_1, F_2 – fruits. Scale, 1: E; 2: B_1, B_2, B_3, C, D_1, D_2, D_3, F_1, F_2; 3: A (after Sołtys-Lelek 2011, modified)

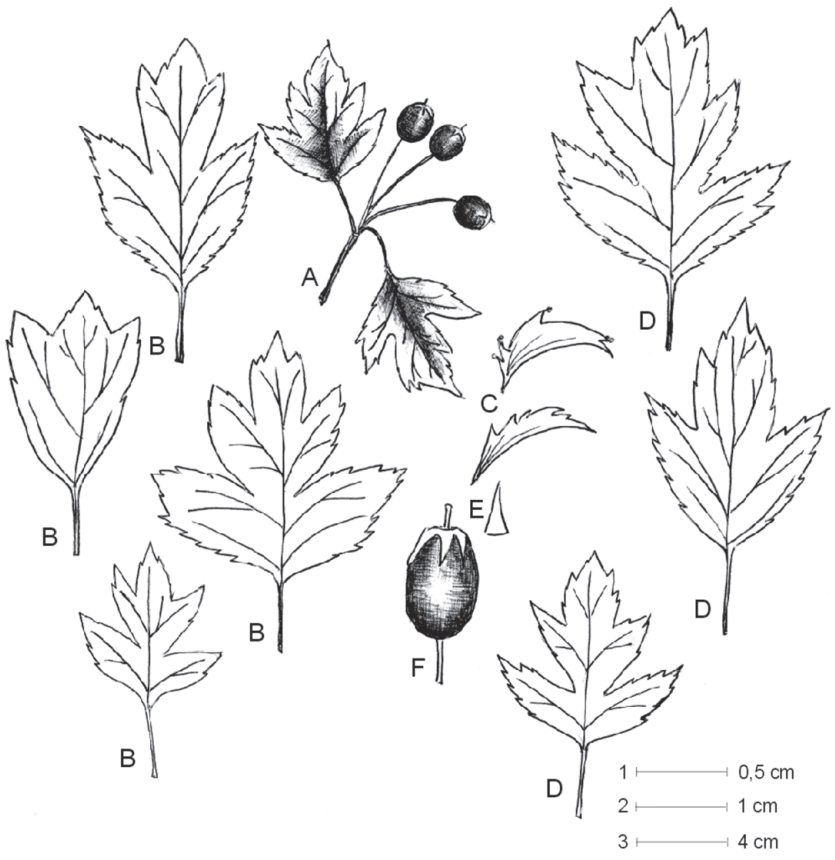

Fig. 4. *Crataegus* ×*subsphaericea* Gand. nothovar. *subsphaericea*
Explanations: A – part of a short shoot; B_1, B_2, B_3, B_4 – subterminal leaf of a flowering short shoot; C – stipule of a leaf of a flowering short shoot; D_1, D_2, D_3 – subterminal leaf of a short shoot; E – sepals; F_1 – fruits. Scale, 1: E; 2: B_1, B_2, B_3, B_4, C, D_1, D_2, D_3, F_1; 3: A (after Sołtys-Lelek 2011, modified)

Subserie *Crataegus*

C. rhipidophylla Gandoger – A rare species, found in 15 stands, reported earlier from only 1 stand in the "Grabowiec" Reserve (Łuszczyńska 1998). In the studied area the species occurs in two varieties:

a) *C. r.* var. *rhipidophylla*. (Syn.: *Crataegus curvisepala* Lindm.) – A rare variety. 15 stands.
b) *C. r.* var. *ronnigeri* (K. Malý) Janjić. (Syn.: *Crataegus lindmanii* Hrabetová, *C. rhipidophylla* var. *lindmanii* (Hrabetová-Uhrová) – A very rare variety. 3 stands.

C. monogyna Jacquin var. *monogyna* – A quite frequent species. Previous records of the species from the study area described it as rare and occurring in 8 stands (Łuszczyńska 1998). Currently, it is known from 30 stands. A cultivated variety with pink flowers – *Crataegus monogyna* var. *monogyna* 'Rosea' was also found in the investigated area. 1 stand.

C. ×*macrocarpa* Hegetschweiler nothovar. *macrocarpa* (*C. laevigata* (Poiret) DC. × *C. rhipidophylla* Gand. var. *rhipidophylla*) (Fig. 2). (Syn.: *C.* ×*pseudoxyacantha* Cinovskis 1971) – A very rare species, not reported earlier from the study area. 4 stands.

C. ×*media* Bechstein nothovar. *media* (*Crataegus laevigata* (Poiret) DC. × *Crataegus monogyna* Jacq.var. *monogyna*) (Fig. 3) – A very rare species, not reported earlier from the study area. 4 stands.

C. ×*subsphaericea* Gandoger nothovar. *subsphaericea* (*C. monogyna* Jacq. × *C. rhipidophylla* Gand. var. *rhipidophylla*) (Fig. 4). (Syn.: *C.* ×*kyrtostyla* Fingerhuth nothovar. *kyrtostyla*) – A rare species, reported earlier from 1 stand (Łuszczyńska 1998). Currently, it is known from 12 stands.

3.2. Systematic list of species of the genus *Rosa*

The list of roses occurring in the studied area comprises 13 taxa belonging to the sections: *Cinnamomeae* DC. (2 species), *Caninae* DC. emend. H. Christ. (8 taxa), *Rosa* and *Synstylae* (1 each), and also one hybrid form. These taxa include 9 native species, 1 native taxon of hybrid origin, and 3 anthropophytes (including 1 hybrid).

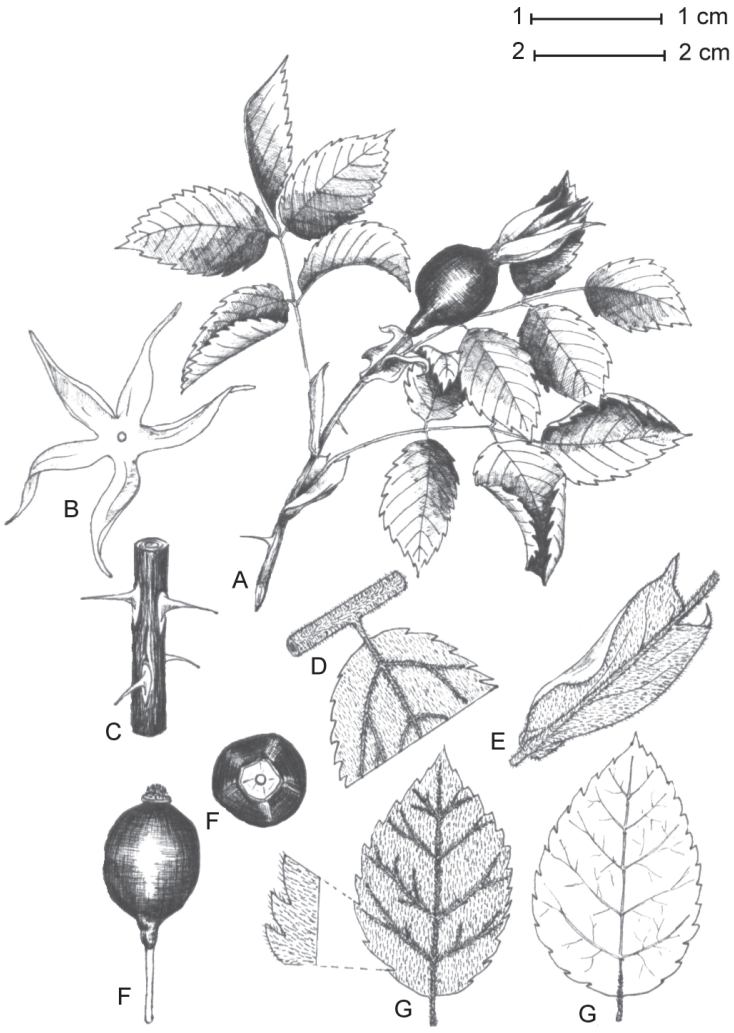

Fig. 5. *Rosa majalis* Herrm.
Explanations: A – part of a fruiting short shoot; B – sepals; C – part of a long shoot; D – part of a leaf axis; E – stipule; F_1, F_2 – fruit; G_1 – part of a leaf (underside); G_2 – part of a leaf (upper side). Scale, 1: A, B, C, D, F_1, F_2, G_1, G_2; 2: E (after Sołtys-Lelek 2011)

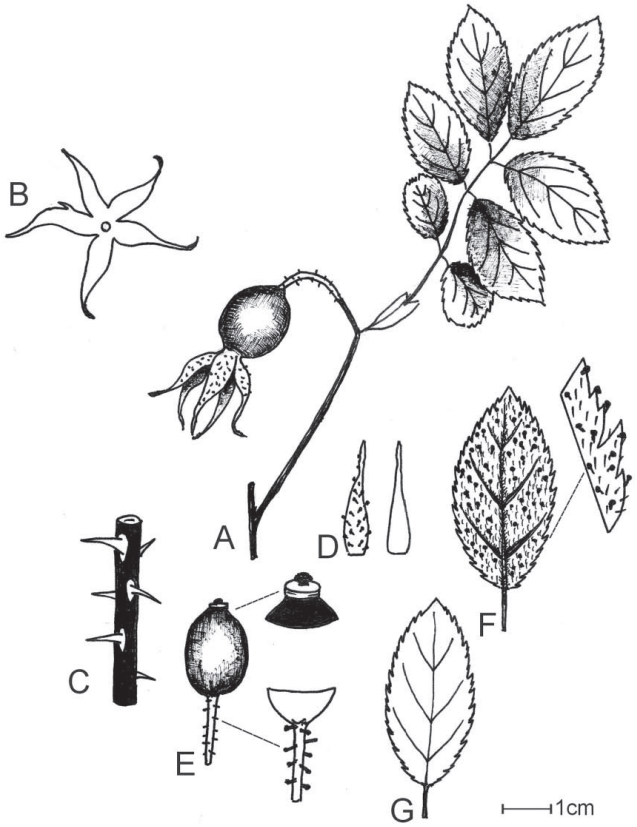

Fig. 6. *Rosa gorenkensis* Besser
Explanations: A – part of a fruiting short shoot; B, D – sepals; C – part of a long shoot; E – fruit; G – part of a leaf (underside); H – part of a leaf (upper side)

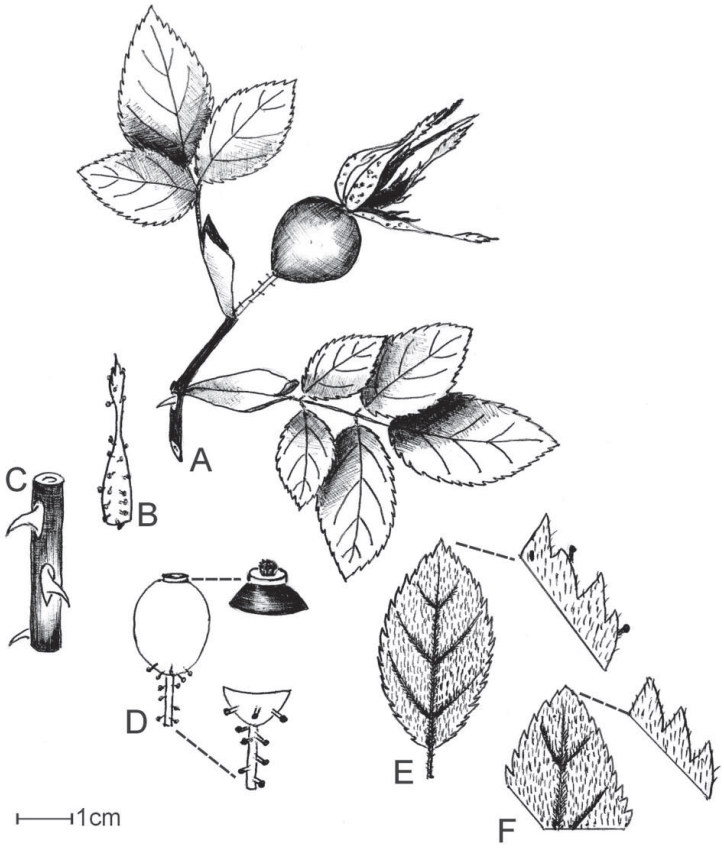

Fig. 7. *Rosa dumalis* Bechst. var. *caesia* (Sm.) Boulenger
Explanations: A – part of a fruiting short shoot; B – sepals; C – part of a long shoot; D – fruit; E, F – part of a leaf (underside)

Section *Cinnamomeae* DC.

Rosa majalis Herrm. (Fig. 5). (Syn.: *Rosa cinnamomea* L.) – A very rare species, not reported earlier from the study area. 1 stand. The study also confirmed the occurrence in the investigation area of the fully bloomed, cultivated variety of this species, *Rosa majalis* 'Foecundissima'. A very rare variety. 2 stands.

**R. gorenkensis* Besser (Fig. 6) – A very rare species, not reported earlier from the study area. 1 stand.

Section *Caninae* DC. emend. H. Christ.

R. dumalis Bechst. em. Boulenger (Syn.: *R. glauca* Vill, *R. caesia* Sm., *R. coriifolia* Fr.) – A quite frequent species, found in 30 stands in four varieties. It was previously described as rare based on 9 records (Popek 1984; Łuszczyńska 1998).

a) *R. d.* var. *afzeliana* (Fr.) Boulenger – A rare variety, 19 stands.
b) *R. d.* var. *dumalis* – A very rare variety, 12 stands.
c) *R. d.* var. *coriifolia* (Fr.) Boulenger – A very rare variety, 7 stands.
d) *R. d.* var. *caesia* (Sm.) Boulenger (Fig. 7) – A very rare variety, 1 stand.

R. sherardii Davies var. *sherardii* – A very rare species, reported earlier from 5 stands (Popek 1984). Currently, it is known from 7 stands.

R. tomentosa Sm. var. *tomentosa* – A very rare species, reported earlier from 2 stands (Szwagrzyk 1987). Currently, it is known from 3 stands.

R. rubiginosa L. (Syn.: *R. eglanteria* L.) – A rare species found in 12 stands in three varieties. The species was also earlier reported from the study area as rare based on 6 records (Dziubałtowski 1916; Popek 1984; Łuszczyńska 1998).

a) *R. r.* var. *rubiginosa* (Fig. 8) – A very rare variety. 2 stands.
b) *R. r.* var. *umbellata* (Leers) Dumort. – A very rare variety. 10 stands.
c) *R. r.* var. *jenensis* (M. Schulze) H. Christ – A very rare variety. 1 stand.

R. inodora Fr. var. *inodora*. (Syn.: *R. elliptica* Tausch.) – A rare species, reported earlier from 8 stands (Popek 1984; Szwagrzyk 1987). Currently, it is known from 12 stands.

R. agrestis Savi var. *gizellae* (Borbás) R. Keller. (Syn.: *Rosa sepium* Thuill) – A rare species, reported earlier from 3 stands (Popek 1984). Currently, it is known from 4 stands.

R. canina L. (Syn.: *R. corymbifera* Borkh., *R. dumetorum* Thuill.) – A very frequent species. It occurs in four varieties in 62 stands. The species was reported earlier from the study area based on 19 records (Cieśliński 1979, 1981; Popek, 1984; Łuszczyńska 1998).

a) *R. c.* var. *canina* – A very rare variety. 6 stands.
b) *R. c.* var. *corymbifera* (Borkh.) Boulenger – A quite frequent variety, reported earlier from 1 stands (Łuszczyńska 1998). Currently, it is known from 32 stands.

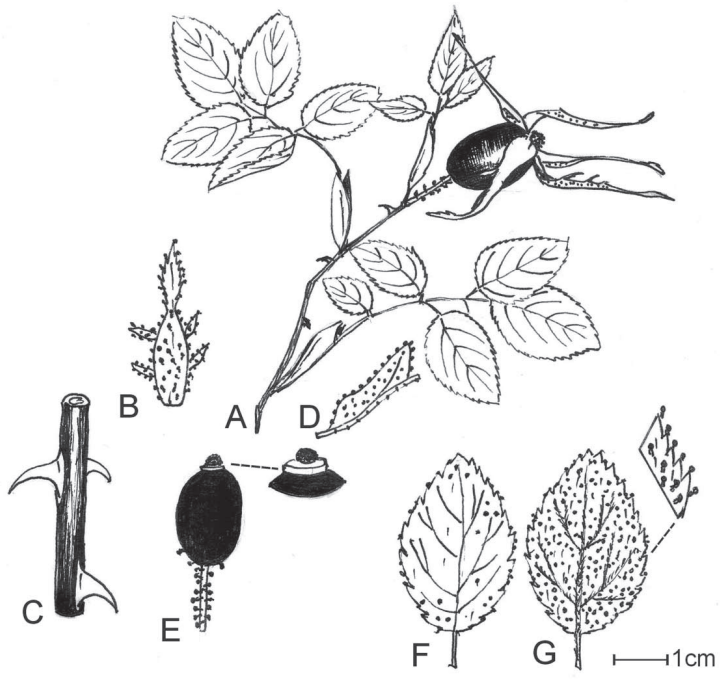

Fig. 8. *Rosa rubiginosa* L. var. *rubiginosa*
Explanations: A – part of a fruiting short shoot; B – sepals; C – part of a long shoot; D – stipule; E – fruit; F – part of a leaf (upper side); G – part of a leaf (underside)

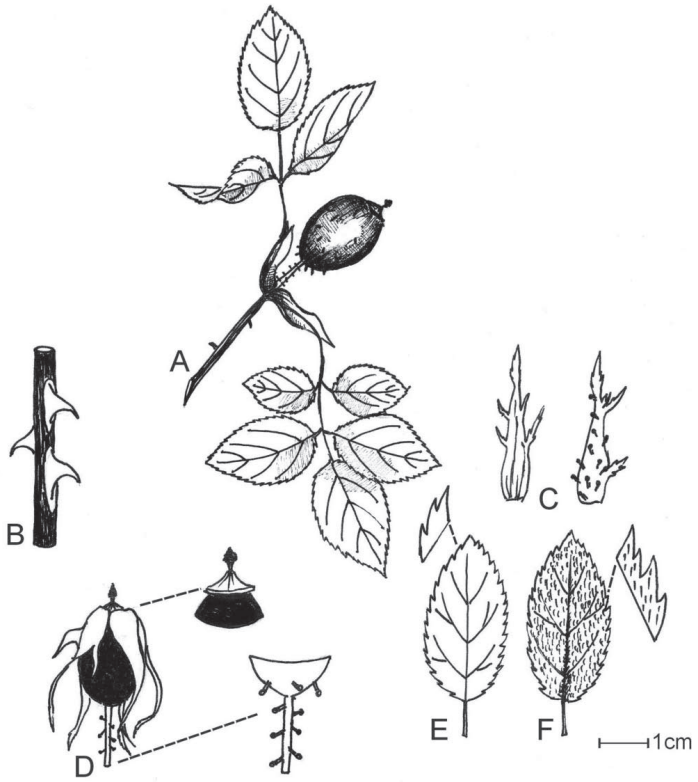

Fig. 9. *Rosa canina* var. *deseglisei* (Boreau) Crépin
Explanations: A – part of a fruiting short shoot; B – part of a long shoot; C – sepals; D – fruit; E – part of a leaf (upper side); F – part of a leaf (underside)

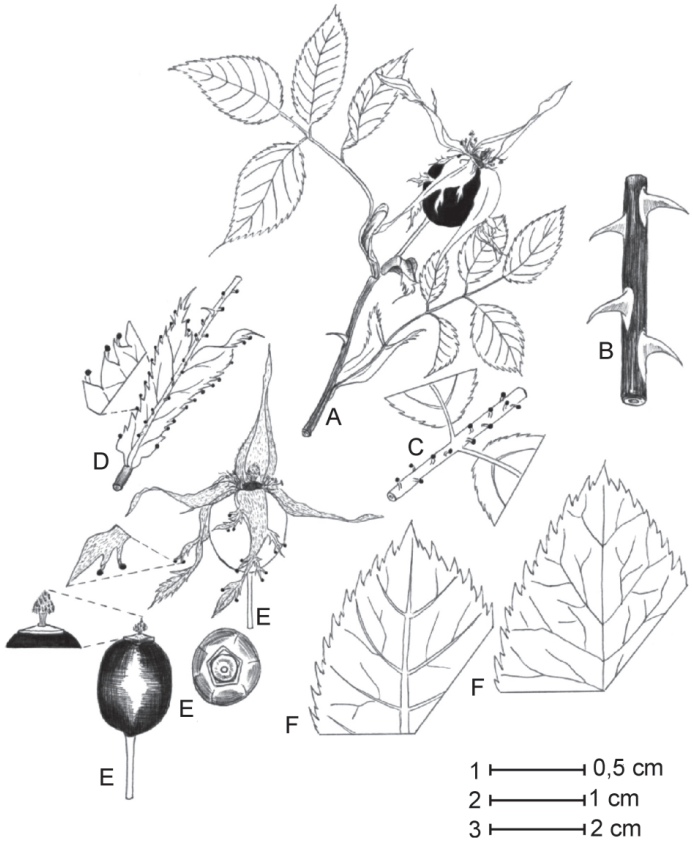

Fig. 10. *Rosa* ×*subcanina* (H. Christ) R. Keller
Explanations: A – part of a fruiting short shoot; B – part of a long shoot; C – part of a leaf axis; D – stipule; E_1, E_2, E_3 – fruit; F_1 – part of a leaf (underside); F_2, F_3 – part of a leaf (upper side). Scale, 1: D, F_1, F_2; 2: C; 3: A, B, E_1, E_2, E_3 (after Sołtys-Lelek 2011)

c) *R. c.* var. *deseglisei* (Boreau) Crépin (Fig. 9) – A quite frequent variety, reported earlier from 7 stands (Popek 1984). It is currently known from 22 stands.
d) *R. c.* var. *dumalis* Baker – A frequent variety. 56 stands.

R. ×*subcanina* (H. Christ) R. Keller (*Rosa canina* L. × *Rosa dumalis* Bechst.) (Fig. 10) – A quite frequent species, not reported earlier from the study area. 24 stands.

Section *Rosa*

R. gallica L. (Syn.: *R. austriaca* Crantz) – A very rare species. The present study failed to confirm its occurrence in the discussed area. The species has been reported from 4 stands.

Section *Synstylae* DC.

**R. multiflora* Thunb. (Syn.: *R. thunbergii* Trattinnick, *R. microcarpa* Hort.) – A very rare species, not reported earlier from the study area. 1 stand.

Hybrid form:

**R. majalis* Herrm. × *R. rugosa* Thunb. It was found in 1 roadside stand as an escapee from cultivation.

4. Discussion

The list of species of the *Crataegus* and *Rosa* genera present in the discussed area comprised 19 taxa, including 6 hawthorn species and 13 rose species. Seven species identified during the present study were new for the flora of the Solecka Basin and the southern part of the Pińczów Hummock. These included: *Crataegus laevigata*, *C.* ×*macrocarpa*, *C.* ×*media*, *Rosa majalis* and *R.* ×*subcanina*, and 2 anthropophytes which were escapees from the *R. gorenkensis* and *R. multiflora* cultivation.

The present investigations provided additional data concerning the number of stands of the species reported earlier from the discussed area. This allowed a more accurate determination of the occurrence frequency of these species and their distribution within the studied area. For instance, *C. rhipidophylla* and *C.* ×*subsphaericea* reported by Łuszczyńska (1998) from only 1 stand were found to occur in ten and twenty stands (*C. rhipidophylla* – 15 stands, *C.* ×*subsphaericea* – 12 stands). The study showed a significant increase in the number of species regarded as common in Poland, e.g.: *C. monogyna* (from 8 to 30 stands), *R. canina* (from 19 to 62 stands), and *R. dumalis* (from 9 to 30 stands), corroborating the fact that the knowledge of the occurrence of the discussed species in the investigation area was previously incomplete.

The results of the investigations concerning the frequency of occurrence of roses and hawthorns in the study area indicate that 8 species can be classified as very rare. These species included, among others: *C.* ×*macrocarpa*, *C.* ×*media* and *R. agrestis* (4 stands each), *R. majalis, R. tomentosa* (3 stands each), *C. laevigata,* and cultivated anthropophytes: *R. multiflora* and *R. gorenkensis* (1 stand each). The species classified as quite frequent were: *R. dumalis* (30 stands) and *R.* ×*subcanina* (24 stands). The most common species in the examined area was *R. canina* which, simultaneously, was the most common species of wild-growing roses in Poland.

In the course of field studies, a hybrid form with characteristics intermediate between *R. canina* and *R. dumalis* was found. Some authors, e.g. Henker (2000), claim that it should be classified in a rank of a separate species – *R.* ×*subcanina* (H. Christ) R. Keller. According to others, e.g. Zieliński (1985, 1987), it belongs to extreme, in terms of morphology, forms of *R. dumalis* that hybridise with numerous individuals typical for this species of intermediate character. The present study adopted Henker's (2000) systematics.

More interesting varieties found in the discussed area definitely included two varieties of *R. rubiginosa,* namely *R. r.* var. *rubiginosa* uncommon in our country with all spines uniform and ± hooked (Fig. 8), and *R. r.* var. *jenensis* – with eglandular pedicels, fruits and calyx sepals, also very rare and, in Poland, found only in the surroundings of Szczecin (Popek 1996). Two other species equally rare in our country found during the present study were varieties of *R. canina*, i.e. *R. c.* var. *canina* with singly serrate leaves, and *R. c.* var. *deseglisei* with hairy leaves devoid of glands and glandular pedicels. Another group of interesting species rare in Poland identified in the course of the discussed investigations also included the variety of *R. dumalis* var. *caesia* with leaves hairy on both sides and glandular pedicels.

The study failed to identify one species from among those reported earlier in the literature concerning the discussed area, namely *R. gallica*. It is a very rare species, known from isolated stands dating back to the end of the 19th and the early 20th century. Difficulties in finding this species can probably be attributed to changes that took place in the environment during the recent decades. The most important of these changes comprised secondary succession occurring in non-forest ecosystems and thermophilous brushwood that were natural habitats for this species.

Generally, within the boundaries of the discussed area, the study confirmed the existence of all native hawthorn species occurring in Poland and of about 60% of native rose species reported from the country, which suggests a high species richness of the region of a relatively small area. This, however, does not exclude the occurrence of isolated stands of rare species within

its boundaries of . Thus, further investigations should be performed in order to identify species threatened with extinction in the discussed area such as, e.g., *R. gallica* on a scale of the country.

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Appendix. Genera *Crataegus* L. and *Rosa* L. in the Solec Basin and southern part of the Pińczów Hummock (Southern Poland)

Crataegus laevigata (Poiret) DC. EF14: Kostki Duże, 2009, leg. SL.; *Crataegus rhipidophylla* Gandoger var. *rhipidophylla*. EF14: Gacki-quarry, 2006, leg. SL, "Grabowiec" Reserve (Łuszczyńska 1998), Kostki Duże, 2009, leg. SL, Marzęcin, 2006, leg. SL, to N from Leszcze, 2009, leg. SL, Oleszki, 2009, leg. SL, Winiary, 2009, leg. SL, "Winiary Zagojskie" Reserve, 2008, leg. SL; EF15: Busko-Zdrój, 2007, 2009, leg. SL, Zbludowice, 2009, leg. SL; EF24: Zagość, 2007, leg. SL; EF25: Chotel Czerwony, 2009, leg. SL, "Przęślin" Reserve, 2006, leg. SL; EF26: Skotniki Małe, 2009, leg. S-L, to N from Sułkowice; *Crataegus rhipidophylla* Gandoger var. *ronnigeri* (K. Malý) Janjić. EF14: Kostki Duże, 2009, leg. SL; EF26: Skotniki Małe, 2009, leg. SL, to SW from Sułkowice; *Crataegus monogyna* Jacquin var. *monogyna*. EF13: Pińczów (Głazek 1984); EF14: Gacki-quarry, 2006, leg. SL, "Grabowiec" Reserve (Łuszczyńska 1998), Kostki Duże, 2009, obs. SL, Kowala, 2007, obs. SL, "Krzyżanowice" Reserve (!), (Cieśliński 1979), 2004, leg. SL, Marzęcin, 2006, obs. SL, to N from Leszcze, Oleszki, 2009, leg. SL, Pasturka, 2007, obs. SL, Winiary, 2007, 2009, leg. SL; EF15: Busko-Zdrój, Siesławice, Zbludowice, 2009, leg. SL; EF24: Skotniki Górne, 2009, leg. SL, Zagość, 2007, leg. SL; EF25: Chotel Czerwony, 2006, 2009, leg. SL, Gluzy (Łuszczyńska 1998), "Góry Wschodnie" Reserve (!), (Cieśliński 1981), 2009, leg. SL, "Przęślin" Reserve (!), (Łuszczyńska 1998), 2006, leg. SL, to N from Skorocice, to S from Łatanice, Skorocice, 2004, leg. SL; EF26: Gadawa, Skotniki Małe, Solec-Zdrój, Sułkowice (!), (Łuszczyńska 1998), 2009, leg. SL, to N from Solec-Zdrój, to NW from Solec-Zdrój; EF36: Chinków, 2009, leg. SL; *Crataegus monogyna* var. *monogyna* 'Rosea'. EF 25: "Przęślin" Reserve, 2006, leg. SL; *Crataegus* ×*macrocarpa* Hegetschweiler nothovar. *macrocarpa*. EF13: Pińczów, 2007, leg. SL; EF14: Winiary, 2009, leg. SL; EF25: "Przęślin" Reserve, 2006, leg. SL; EF26: Skotniki Małe, 2009, leg. SL; *Crataegus* ×*media* Bechstein nothovar. *media* EF13: Pińczów, 2007, leg. SL; EF14: Gacki, Marzęcin, 2006, leg. SL; EF25: "Przęślin" Reserve, 2006, leg. SL; *Crataegus* ×*subsphaericea* Gandoger nothovar. *subsphaericea*. EF13: Pińczów, 2007, leg. SL; EF14: Gacki, 2006, leg. SL, "Grabowiec" Reserve (Łuszczyńska 1998), Oleszki, 2009, leg. SL; EF15: near "Owczary" Reserve, 2009, leg. SL; EF25: "Przęślin" Reserve, 2006, leg. SL; EF26: Skotniki Małe, Solec-Zdrój, to N from Solec-Zdrój, to SW from Solec-Zdrój, Zborów, 2009, leg. SL; EF36: Chinków, 2009, leg. SL; *Rosa majalis* Herrm. EF25: Chotelek Zielony, 2009, leg. SL; *Rosa majalis* 'Foecundissima'. EF14: "Krzyżanowice" Reserve, 2006, 2009, leg. SL; Winiary, 2008, 2009, leg. AK; *Rosa gorenkensis* Besser. EF25: Skorocice, 2007, leg. SL.

Rosa dumalis Bechst. em. Boulenger var. *afzeliana* (Fr.) Boulenger. EF13: Pińczów (Popek 1984); EF14: Bogucice (Popek 1984), Kowala, 2007, leg. SL, "Krzyżanowice" Reserve, 2004, leg. KL, Krzyżanowice Średnie, 2004, leg. KL, Oleszki, 2009, leg. SL, Pasturka (Popek 1984), Wola Zagojska-Górna (Popek 1984); EF15: Zbludowice, 2009, leg. SL; EF24: Skotniki Dolne, 2009, leg. SL, Zagość, 2007, 2009, leg. SL; EF25: Chotel Czerwony, Chotelek Zielony, "Góry Wschodnie" Reserve, Skorocice, 2009, leg. SL, to N from Skorocie, to S from Łatanice; EF25: Solec-Zdrój, to NW from Solec-Zdrój, 2009, leg. SL. *Rosa dumalis* Bechst. em. Boulenger var. *dumalis*. EF14: Kostki Małe, 2009, leg. SL, Winiary, Wola Zagojska-Górna, 2007, leg. SL; EF15: Zbludowice, 2009, leg. SL; EF24: Zagość, 2007, leg. SL; EF25: Chotel Czerwony, Gaik, to S from Chotla Czerwonego, 2009, leg. SL; EF26: to NW from Solec-Zdrój, Olganów, Solec-Zdrój, 2009, leg. SL; EF35: Gorysławice, 2009, leg. SL. *Rosa dumalis* Bechst. em. Boulenger var. *coriifolia* (Fr.) Boulenger. EF14: Gacki, 2006, leg. SL, Wola Zagojska-Górna, 2007, leg. SL; EF15: Siesławice, 2009, leg. SL; EF25: Skorocice, 2004, leg. KL; EF26: to S from Piasek Mały, Zborów, Żuków, 2009, leg. SL. *Rosa dumalis* Bechst. em. Boulenger var. *caesia* (Sm.) Boulenger. EF26: Zborów, 2009, leg. SL. *Rosa sherardii* Davies var. *sherardii*. EF13: Pińczów (Popek 1984); EF14: Winiary (Popek 1984); EF15: Siesławice (Popek 1984); EF24: Skotniki Górne, 2009, leg. SL; EF25: Chotelek Zielony (Popek 1984), to S from Łatanice, 2009, leg. SL; EF35: Wiślica (Popek 1984). *Rosa tomentosa* Sm. var. *tomentosa*. EF15: Busko-Zdrój (Szwagrzyk 1987); EF25: Skorocice, 2009, leg. SL; EF26: Zborów (Szwagrzyk 1987). *Rosa rubiginosa* L. var. *rubiginosa*. EF14: Bogucice I, 2009, leg. SL; EF26: Zborów, 2009, leg. SL. *Rosa rubiginosa* L. var. var. *umbellata* (Leers) Dumort. EF13: Pińczów (!), (Popek 1984), 2007, leg. SL; EF14: Gacki, 2006, leg. SL, "Grabowiec" Reserve, 2007, leg. SL, "Krzyżanowice" Reserve (Popek 1984), Winiary (Popek 1984), Wola Zagojska-Górna, 2007, 2009, leg. SL; EF15: Wełecz (Popek 1984); EF25: Dobrowoda, 2009, leg. SL; EF26: Skotniki Małe, 2009, leg. SL, Solec- Zdrój (Dziubałtowski 1916). *Rosa rubiginosa* L. var. *jenensis* (M. Schulze) H. Christ. EF26: Skotniki Małe, 2009, leg. SL. *Rosa inodora* Fr. var. *inodora*. EF13: Pińczów (!), (Popek 1984), 2007, leg. SL; EF14: Bogucice I (Popek 1984), Gacki, 2006, leg. SL, "Krzyżanowice" Reserve (Popek 1984), Oleszki, 2009, leg. SL, Pasturka (Popek 1984), Winiary (!), (Popek 1984), 2007, leg. SL; EF15: Busko-Zdrój, 2009, leg. SL; EF25: Chotel Czerwony (Popek 1984), Skorocice (Popek 1984); EF26: Zborów (Szwagrzyk 1987); EF35: Wiślica (Popek 1984). *Rosa agrestis* Savi var. *gizellae* (Borbás) R. Keller. EF13: Pińczów (Popek 1984); EF14: Pasturka (Popek 1984); EF24: Zagość (Popek 1984); EF25: Skorocice, 2009, leg. SL. *Rosa canina* L. var. *canina*. EF14: Pasturka, Winiary, 2007, leg. SL; EF24: Skotniki Dolne, 2007, leg. SL; EF24: Baranów, Solec-Zdrój, Zborów, 2009, leg. SL. *Rosa canina* L. var. *corymbifera* (Borkh.) Boulenger. EF13: Pińczów, 2007, leg. SL; EF14: Bogucice I, Gacki-quarry, 2006, leg. SL, Kowala, 2007, leg. SL, Oleszki, 2009, leg. SL, Pasturka, 2007, leg. SL, to N from Leszcze, to W from Kostki Małe, Winiary, 2006, 2007, leg. SL, Wola Zagojska-Górna (!), (Łuszczyńska 1998), 2009, leg. SL; EF15: Busko-Zdrój, near "Owczary" Reserve, Siesławice, Wełecz, Zbludowice, 2009, leg. SL; EF24: Skotniki Dolne, Skotniki Górne, 2009, leg. SL; EF25: Chotel Czerwony, "Góry Wschodnie" Reserve (Łuszczyńska 1998), Olganów, 2009, leg. SL, Skorocice, 2007, leg. SL to N from Pęczewice; EF26: Baranów, Gadawa, Piasek Mały, Solec-Zdrój, to N from Solec-Zdrój, to N from Sułkowice, to NW from Solec-Zdrój, to S from Piasek Mały, Zborów, Żuków, 2009, leg. SL; EF35: Gorysławice, 2009, leg. SL. *Rosa canina* L. var. *deseglisei* (Boreau) Crépin. EF13:

Pińczów (Popek 1984); EF14: Bogucice I (!), (Popek 1984), 2009, leg. SL, Gacki, 2006, leg. SL, Kostki Duże, Kostki Małe, 2009, leg. SL, Kowala, 2007, leg. SL , Krzyżanowice Średnie, 2004, leg. KL, Pasturka (!), (Popek 1984), 2007, leg. SL, to N from Leszcze, to W from Kostki Małe, 2009, leg. SL, Winiary, 2006, 2007, 2009, leg. SL, Wola Zagojska-Górna, 2009, leg. SL; EF15: Siesławice (Popek 1984), Zbludowice, 2009, leg. SL; EF24: Skotniki Dolne, Zagość (!) (Popek 1984), 2009, leg. SL; EF25: Chotel Czerwony (Popek 1984), Łatanice, 2007, leg. SL, Skorocice, 2007, leg. SL, to N from Skorocice, to S from Łatanice, 2009, leg. SL; EF26: Zborów, 2009, leg. SL. *Rosa canina* L. var. *dumalis* Baker. EF13: Pińczów (Popek 1984); EF14: Bogucice I, Bogucice-Skałki, 2006, osb. SL, Gacki-quarry, 2006, leg. SL, Kostki Duże, Kostki Małe, 2009, leg. SL, Kowala, 2007, leg. Krzyżanowice Dolne (!), (Popek 1984), "Krzyżanowice" Reserve, 2006, leg. SL, Krzyżanowice Średnie, 2004, leg. KL, Marzęcin, 2006, obs. SL, Oleszki, 2009, leg. SL, Pasturka (!), (Popek 1984), 2007, leg. SL, Winiary (!), (Popek 1984), 2007, leg. SL, Wola Zagojska-Górna (!), (Popek 1984), 2009, leg. SL; EF15: Busko-Zdrój, near "Owczary" Reserve, Pęczewice, Siesławice (!) (Popek 1984), Wełecz, Zbludowice, 2009, obs. SL; EF24: Skotniki Dolne, Skotniki Górne, 2009, leg. SL, "Winiary Zagojskie" Reserve, 2008, obs. SL, Zagość (!), (Popek 1984), 2007, leg. SL; EF25: Chotel Czerwony (!), (Popek 1984), Chotelek Zielony (!), (Popek 1984), Dobrowoda, Gaj, Gluzy, Hołudza, 2009, obs. SL, Łatanice, 2007, obs. SL, Olganów, Piasek Wielki, 2009, obs. SL, Radzanów, 2009, leg. SL, Skorocice (!), (Popek 1984), 2007, obs. SL, "Skorocice" Reserve, 2007, leg. SL, to E from Hołudza, to N from Skorocice, to S from Łatanice, 2009, leg. SL, to SW from Chotel Czerwony, 2009, leg. SL; Zagórze, 2007, leg. SL; EF26: Baranów, Gadawa, Piasek Mały, Skotniki Małe, Solec-Zdrój, Sułkowice, to N from Sułkowice, to NW from Solec-Zdrój, Zborów, Żuków, 2009, obs. SL; EF35: Gorysławice, Wiślica, 2009, obs. SL; EF36: Chinków, 2009, leg. SL. *Rosa* ×*subcanina* (H. Christ) R. Keller. EF14: Biniątki, 2009, leg. SL, Bogucice I, 2006, leg. SL, Kostki Duże, 2009, leg. SL, Kowala, 2007, leg. SL, Krzyżanowice Średnie, 2004, leg. KL, Pastura, 2007, leg. SL, Winiary, 2006, 2007, leg. SL; EF15: Busko-Zdrój, near "Owczary" Reserve, Siesławice, Zbludowice, 2009, leg. SL; EF24: Skotniki Dolne, 2007, 2008, 2009, leg. SL, Skotniki Górne, 2009, leg. SL, Zagość, 2007, 2009, leg. SL; EF25: Chotel Czerwony, "Góry Wschodnie" Reserve, 2009, leg. SL, Olganów, Skorocice, 2004, leg. KL, 2007, 2009, leg. SL, to E from Hołudza, to N from Skorocice, to S from Łatanice; EF25: to NW from Solec-Zdrój, to SW from Sułkowice, Żuków, 2009, leg. SL. *Rosa gallica* L. EF13: Pińczów (Rostafiński 1872); EF14: Bogucice (Dziubałtowski 1916); EF15: Busko-Zdrój (Rostafiński 1872), Wełecz (Dziubałtowski 1916). *Rosa multiflora* Thunb. EF26: to N from Solec-Zdrój, 2009, leg. SL. *Rosa majalis* Herrm. × *Rosa rugosa* Thunb. EF25: Chotelek Zielony, 2009, leg. SL.