

## HAWTHORN (*CRATAEGUS*, ROSACEAE) DATA FROM HUNGARY

Csaba MOLNÁR<sup>1</sup>, László DEMETER<sup>2,3</sup> and Ferenc HORVÁTH<sup>2</sup>

<sup>1</sup>Independent researcher, H-3728 Gömöraszó, Kassai u. 34, Hungary; birkaporkolt@yahoo.co.uk

<sup>2</sup>HUN-REN Centre for Ecological Research, Institute of Ecology and Botany,  
H-2163 Vácrátót, Alkotmány u. 2–4, Hungary

<sup>3</sup>School of Geography, University of Nottingham, NG7 2RD Nottingham, University Park, UK

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**Abstract:** This paper includes 2 hawthorn species (*C. lindmanii*, *C. rosaeformis* subsp. *curvisepala*) and 9 hawthorn hybrid taxa (*C. ×kyrtostyla*, *C. ×media*, *C. ×plagiasepala* nothosubsp. *dunensis*, *C. ×subsphaerica* nothosubsp. *fallacina*, nothosubsp. *jacquinii*, nothosubsp. *subsphaerica*, *C. ×walokochiana*, *C. monogyna* × *C. laevigata* × *C. rosaeformis* s. str.), including a mosaic hybrid individual (*C. monogyna* × *C. laevigata* × *C. rosaeformis* s. str.), from Hungary, giving the exact location data and site conditions of the new discoveries. A detailed survey of the core area of 3 forest reserves provided a good opportunity to observe the distribution patterns within the forest stand.

**Key words:** Bereg region, forest reserve, hybrid, microspecies, North Hungarian Mountains, Visegrád Mountains

### INTRODUCTION

In Hungary, with the exception of the two common red fruit hawthorn species (*C. laevigata* (Poir.) DC., *C. monogyna* Jacq.), we hardly know anything about the distribution of rarer, lesser known taxa. Attention has been drawn by recent research to the fact that microspecies and hybrids are not rare in forested and spontaneously reforested landscapes, but due to taxonomic and identification difficulties not much attention was paid to these. The need of dealing with such plants was indicated by the recently revived hawthorn research in Hungary (e.g. BARINA *et al.* 2015, KERÉNYI-NAGY *et al.* 2019, MOLNÁR 2016) and in the surrounding area (e.g. DÖNMEZ 2004, KUHN *et al.* 2020, NEGREAN and KARÁCSONYI 2017, OKLEJEWITZ *et al.* 2015, SARGSYAN 2022). As a continuation of a previous study (MOLNÁR 2021), the main purpose of this paper is to broaden the knowledge by clarifying the identity and adding location data for the distribution of these taxa.

## MATERIAL AND METHODS

Between 2021 and 2023, in connection with various field studies, we visited many forests and reforested areas where we recorded the rarer hawthorn taxa we found. Especially, we managed to collect a lot of data during two works. In 2022 and 2023, we surveyed ancient and spontaneously developed forests on former pastures, wood-pastures and hay meadows at 24 sites in Hungary representing three characteristic forest type (turkey oak-sessile oak woodlands, sessile oak-hornbeam woodlands, and riverine oak-elm-ash woodlands). We made 360 coenological relevés in these sites. Moreover, we prepared a baseline survey of the core area of the Prédikálószték Forest Reserve (Visegrád Mts) in 2022, and the Csókás-völgy Forest Reserve (Bükk Mts) as well as the Kelemér-Serényfalva Forest Reserve (Putnok Hills) in 2023. In the latter, we surveyed the forest stand (shrub layer and herb layer) in subsamples around the network of permanent sample points including hawthorns (HORVÁTH 2011, HORVÁTH *et al.* 2022, [http1](http://)).

A herbarium documentation of the identifiable specimens was prepared. Herbarium specimens were deposited in the Botanical Department, Hungarian Natural History Museum (BP).

Different researchers have different opinions about the taxonomy of hawthorns due to the high degree of hybridisation, apomixis and polyploidy (DICKINSON and CAMPBELL 1991). As our aim was to learn more about the *Crataegus* taxa, we preferred a detailed taxonomic classification. At the same time, we were aware of that individual plants are often representing different degrees of introgression and that individuals of “clear” species are rare (compare BYATT 1975, OKLEJEWITZ *et al.* 2013). Therefore, the identifications were based on the monograph of V. KERÉNYI-NAGY (2015), taking into account the works of BARANEC (1986, 1992) and SCHMIDT (2017).

Our identification was based on morphological characters. Those specimens that did not bear fruit (this was the majority) were omitted, because according to our observation, the leaf stigmas were not sufficient for a reliable separation of taxa.

The observed specimens are listed in the Enumeration. The nomenclature follows the work of KERÉNYI-NAGY (2015), but in each case we also provide the most important synonyms, mainly based on CHRISTENSEN (1992), which is needed primarily for the interpretation of taxa. This is followed by the exact occurrence data with topographic names and coordinates in WGS 84 system, the relevant CEU code (KIRÁLY and HORVÁTH 2000), the time of observation, the characteristic habitat, and then the significance of the occurrence is explained in Hungarian. If herbarium specimen has been prepared, the ID number of the hosting herbarium (HNHM-TRA, Budapest (BP)) is indicated.

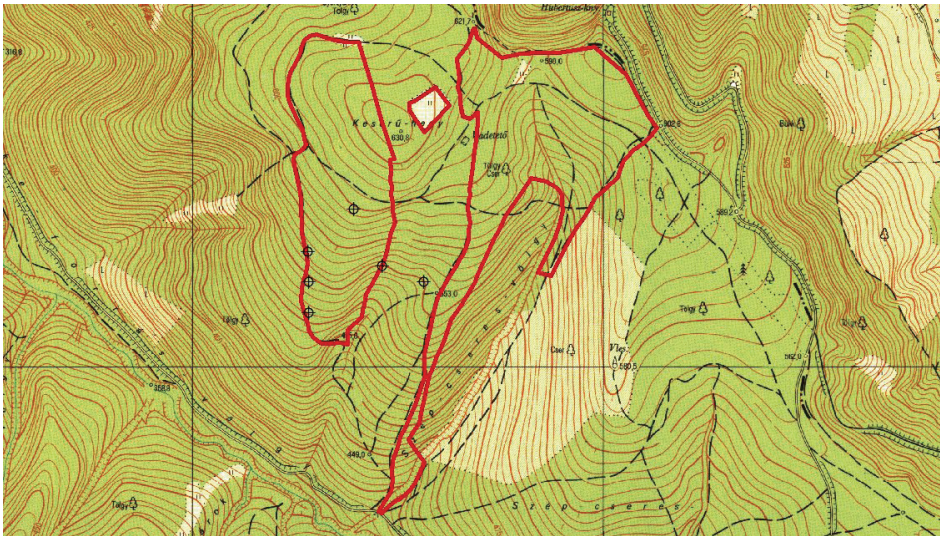
## RESULT AND DISCUSSION

Identifiable specimens were rare, approximately 10% of individuals had fruits and showed the necessary identification marks (MOLNÁR 2021).

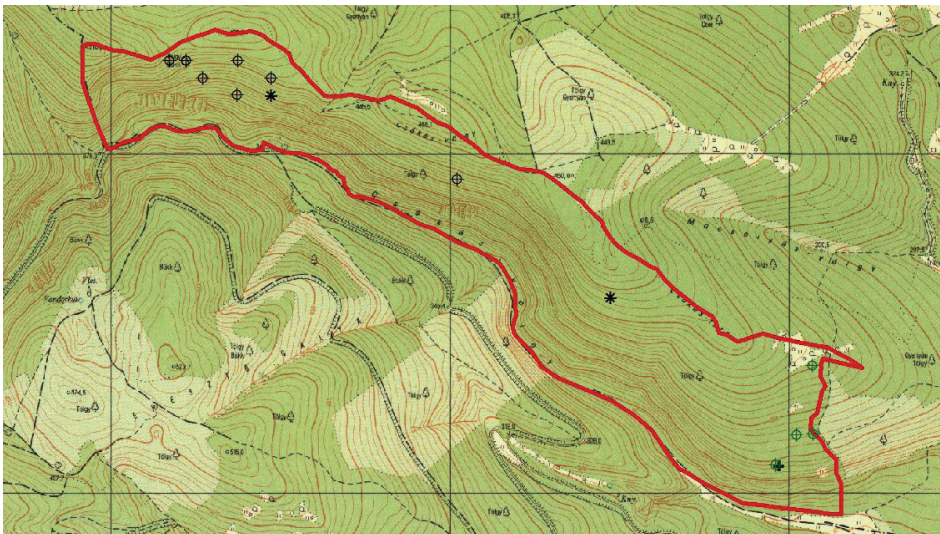
A total of 2 hawthorn species (*C. lindmanii*, *C. rosaeformis* subsp. *curvisepala*) and 9 hawthorn hybrid taxa (*C. ×kyrtostyla*, *C. ×media*, *C. ×plagiosepala* nothosubsp. *dunensis*, *C. ×subsphaerica* nothosubsp. *fallacina*, nothosubsp. *jacquini*, nothosubsp. *subsphaerica*, *C. ×walokochiana*, *C. monogyna* × *C. laevigata* × *C. rosaeformis* s. str.), including a mosaic hybrid individual (*C. monogyna* × *C. laevigata* × *C. rosaeformis* s. str.) were identified, with these occurrence data, we expand our knowledge of the distribution of hawthorns in Hungary.

We emphasize that, based on our experience, *C. lindmanii* and its hybrids occur in closed, cooler forests, while *C. rosaeformis* subsp. *rosaeformis* and its hybrids are typical of the more open, drier forests. In both cases, we found more introgressive individuals/populations than pure ones. The examined individuals primarily show a transition towards *C. monogyna*, which, given the association of *C. monogyna* with open and anthropogenic habitats, suggests that the hybrid populations may be the result of by previous human activities that opened up forests (cutting trees, deforestation, grazing, etc.) by the fact that at least temporarily overlapping areas were created and that taxa that were not at a great genetic distance could meet (FINESCHI *et al.* 2005, SCHMIDT 2015, 2024). The hybrids may locally or regionally be more frequent than the parents (CINOVSJKIS 1971, SCHMIDT 2017).

A detailed survey of the core area of 3 forest reserves provided an opportunity to learn about the distribution pattern of the rarer and lesser-known hawthorn taxa living here. Within the core area of the Prédikálószék Forest Reserve (Visegrád Mts) *C. rosaeformis* subsp. *curvisepala* population lived only in one specific part, toward south of the top of the mountain, at the head of the small valley, parallel to the Szép-cseres Valley from the north. Around these main distribution areas, there are also some shrub specimens exhibiting a transition towards *C. monogyna* (Fig. 1). Csókás-völgy Forest Reserve (Bükk Mts) is much more complex in terms of habitats due to the limestone bedrock and varied geomorphology, so several hawthorn taxa live in the core area. Thanks to the more open forest structure, they reach flowering and fruit ripening in a higher proportion. *C. laevigata* is widespread, common. *C. monogyna* is rare, only a few plants occur here. *Crataegus ×subsphaerica* nothosubsp. *subsphaerica* (syn.: *C. ×silicensis*) was spotted in the slightly more open, shallow soil part of the southeast part of the reserve. However, this plants is probably more widespread in the more open parts of the forest and it is possible that *C. rosaeformis* is also present in a pure, non-hybrid form (certainly known from the Bükk Mts, KERÉNYI-NAGY and SZTUPÁK 2012, MOLNÁR 2021). *Crataegus ×kyrtostyla* (syn.: *C. ×domicensis*) was characteristic of the cooler, closed part of this forest, and it cannot be ex-



**Fig. 1.** The core area of the Prédikálószték Forest Reserve. We also surveyed the forest sections connecting certain parts of the core area. Red line: core area; black target cross: *Crataegus curvisepala*.



**Fig. 2.** The surveyed part of the core area of the Csókás-völgy Forest Reserve. Red line: core area, also the border of the investigated area; black target cross: *Crataegus lindmanii* × *C. monogyna*; green target cross: *C. monogyna* × *C. rosaeformis*; star: *C. lindmanii* × *C. monogyna* × *C. rosaeformis*; black cross: *C. × media*.

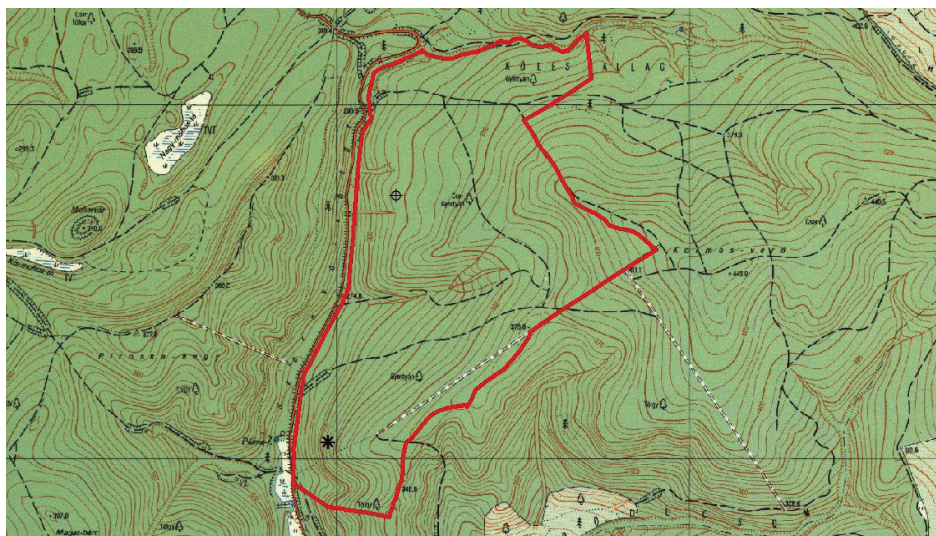


Fig. 3. The core area of the Kelemér-Serényfalva Forest Reserve. Red line: core area, also the border of the investigated area; star: *Crataegus lindmanii*; target cross: *C. lindmanii* × *C. monogyna*.

cluded that the relatively rare parent species (*C. lindmanii*) is also present in the area, but the plants supposedly belonging to it were not in a state suitable for identification (also know from the Bükk Mts, KERÉNYI-NAGY and SZTUPÁK 2012, MOLNÁR 2021). We also found some shrub specimens that showed the signs of transition between the above mentioned two hybrid taxa (*Crataegus* × *plagiosepala* nothosubsp. *dunensis*). In addition, the otherwise not rare *C* × *media* was also located (Fig. 2). Within the core area of the Kelemér-Serényfalva Forest Reserve (Putnok Hills), 80% of hawthorns are *C. laevigata*. *C. monogyna* is very, very rare here (0.1%). We think that the remaining approx. 20% belong to *C. lindmanii* and its hybrids, but only 2 individuals could be clearly identified. Both of them were located on the coolest edge of the area, towards Szörnyű Valley, and one of them proved to be *C. lindmanii*, the other one was a hybrid of *C. lindmanii* with *C. monogyna* (Fig. 3).

#### ENUMERATION

*Crataegus* × *kyrtostyla* Fingerh. s. str.

(*C. lindmanii* Hrab.-Uhr. × *C. monogyna* Jacq.)

Syn.: *C. domicensis* Hrab.-Uhr.; *C. ×kyrtostyla* Fingerh. nothovar. *domicensis* (Hrab.-Uhr.) Christensen

Bükk Mts: Miskolc: Csókás-völgy Forest Reserve. Several specimens, N48.04940°, E20.68419°, N48.05183°, E20.67566° (HNHM-TRA-00704921),

N48.05220°, E20.67690°, N48.05224°, E20.67421°, N48.05267°, E20.67557°, N48.05270°, E20.67356°, N48.05271°, E20.67289°, 7990.1, (CEU) 7990.3, 07–09. 2023. – In the cooler, closed parts of the forest, in *Quercus-Carpinetum*.

Mátra Mts: Kiszána: Erdő-dűlő. Several specimens, N47.86694°, E20.13703°, (CEU) 8186.2, 11.08.2023. (HNHM-TRA-00704920). – Pasture, abandoned more than 50 years ago, developed from treeless state and has by now reforested. This population shows a morphologically *monogyna* predominance.

Putnok Hills: Serényfalva: Kelemér-Serényfalva Forest Reserve. Several specimens, N48.33872°, E20.43881°, (CEU) 7688.4, 18.08.2023. (HNHM-TRA-00704908). – In the cooler part of the *Quercus-Carpinetum* forest. This population shows a morphologically *lindmanii* predominance.

*Crataegus ×kyrtostyla* is broadly interpreted by many authors (e.g. CHRISTENSEN 1992, IBRAHIMOV *et al.* 2020, SOŁTYS-LELEK 2012) as a hybrid of *C. monogyna* and all the long-sepaled hawthorns (*curvisepala*, *rosaeformis/rhipidophylla*, *lindmanii*), which is why the exact distribution of this narrowly interpreted taxon is hardly known. Its seemingly reliable data from the current territory of Hungary is only known from Budapest, Fertőrákos and Pálháza (KERÉNYI-NAGY 2015), as well as from Slovakia from the Pannonicum area from Gömörhorka and 3 locations in the Carpathians (BARANEC 1992), with additions from Nagyberég (currently Ukraine), also from the Pannonicum (KERÉNYI-NAGY *et al.* 2014). It is also present in Northern Italy, Poland and Sweden (CHRISTENSEN 1992); probably found everywhere within the range of *C. lindmanii*.

#### *Crataegus lindmanii* Hrab.-Uhr.

Syn.: *C. curvisepala* Lindm. subsp. *lindmanii* (Hrab.-Uhr.) Byatt; *C. rhipidophylla* Gand. var. *lindmanii* (Hrab.-Uhr.) Christensen; *C. rhipidophylla* Gand. var. *ronnigeri* (K. Malý) Janjić  
(Fig. 4)

Putnok Hills: Serényfalva: Kelemér-Serényfalva Forest Reserve. One specimen, N48.33247°, E20.43594°, (CEU) 7688.4, 06.09.2023. (HNHM-TRA-00704909). – In the cooler part of the *Quercus-Carpinetum* forest.

It seems to be a widespread, closed-forest species in the North and the Transdanubian Mountains (KERÉNYI-NAGY 2015). In the Börzsöny Mts, J. Nagy (HASZONITS *et al.* 2021, NAGY 2019, NAGY and GAÁL 2022) mapped it and found it in many places. It is widespread in central and northern Europe (e.g. BARANEC 1992, CHRISTENSEN 1992, SOŁTYS-LELEK 2012).



Fig. 4. *Crataegus lindmanii* near Serényfalva (HNHM-TRA-00704909) (Photo: Bauer, N.).

*Crataegus* ×*media* Bechst.

(*Crataegus laevigata* (Poir.) DC. × *C. monogyna* Jacq.)

Bükk Mts: Cserépfalu: Cinegés. Several specimens, N47.96947°, E20.55550°, N47.96925°, E20.55544°, (CEU) 8089.1, 30.07.2022. – In wood-pasture.

Miskolc: Csókás-völgy Forest Reserve. One specimen, N48.04158°, E20.69669°, (CEU) 7990.3, 18.04.2023. – In *Ceraso mahaleb-Quercetum* forest.

Tard: Legelő. Several specimens, N47.913861°, E20.598194°, (CEU) 8089.4, 30.07.2022. – In abandoned and overgrown pasture.

Cserhát Hills: Ecseg: Cseh-völgy. Several specimens, N47.90614°, E19.58372°, (CEU) 8083.4, 10.08.2022. – In abandoned and overgrown pasture.

Hollókő: Szár-hegy. Several specimens, N47.99558°, E19.58617°, N47.99464°, E19.58517°, (CEU) 8083.2, 10.08.2022. – In forested wood-pasture.

Zsuny: Kis-Zsunyi-hegy. Several specimens, N47.98567°, E19.62106°, (CEU) 8083.2, 10.08.2022. – In *Quercetum petraeae-cerris* forest.

Mátra Mts: Parád: Tariska-rét. One specimen, N47.89858°, E19.99500°, (CEU) 8185.2, 08.08.2022. – In forested wood-pasture.

Where its parent species occur, *C. ×media* usually appears.

*Crataegus* × *plagiosepala* Pojark. nothosubsp. *dunensis* (Cin.) Kerényi-Nagy  
(*C. lindmanii* Hrab.-Uhr. × *C. monogyna* Jacq. × *C. rosaeformis* Janka subsp. *rosaeformis*)

Syn.: *C.* × *dunensis* Cin.

(Fig. 5)

Bükk Mts: Miskolc: Csókás-völgy Forest Reserve. Two specimens, N48.05191°, E20.67680° (HNHM-TRA-00704925), N48.04617°, E20.69012°, (CEU) 7990.1, 7990.3, 11.07.2023. – In the more closed part of the *Ceraso mahaleb-Quercetum* forest.

This taxon is widespread in the northern half of the Carpathian Basin (BARANEC 1992, KERÉNYI-NAGY 2015). In addition, reliable data are also known from the Baltic (CINOVSKIS 1971). It probably appears in the proximity of the three parent species. Although some authors consider this form to be a hybrid of only two taxa (*C. lindmanii* × *C. rosaeformis*) (SCHMIDT 2017).



Fig. 5. *Crataegus* × *dunensis* in Csókás-völgy Forest Reserve (HNHM-TRA-00704925) (Photo: Bauer, N.).



*Crataegus rosaeformis* Janka subsp. *curvisepala* (Lindm.) Kerényi-Nagy  
Syn.: *C. curvisepala* Lindm.

Visegrád Mts: Dömös: Prédikálószerék Forest Reserve, Keserű-hegy. Several specimens, N47.73094°, E18.92046° (HNHM-TRA-00704923), N47.73020°, E18.91828°, N47.73066°, E18.91784°, N47.73050°, E18.91894°, N47.73222°, E18.91941°, N47.73060°, E18.92174°, (CEU) 8279.4, 28–30.06.2022. – In more open *Quercus-Carpinetum* forest.

It is widespread in Europe (KERÉNYI-NAGY 2015), but since it is often combined with the taxon *C. rosaeformis/rhipidophylla*, its exact distribution is uncertain (CHRISTENSEN 1992, SCHMIDT 2017). Its closest data is known from Pilisborosjenő (KERÉNYI-NAGY 2012).

*Crataegus* × *subsphaerica* Raunk. nothosubsp. *fallacina* (Klok.) Kerényi-Nagy  
(*C. monogyna* Jacq. > *C. rosaeformis* Janka subsp. *rosaeformis*)  
Syn.: *C. fallacina* Klok.

Putnok Hills: Gömörszőlős: Pozsok. One old small tree, N48.39307°, E20.43273°, (CEU) 7688.2, 25.07.2022. (HNHM-TRA-00704914). – In a wooded orchard.

Gömörszőlős: Szeles-kert. One old small tree, N48.38191°, E20.40737°, (CEU) 7688.2, 27.09.2021. (HNHM-TRA-00704924). – On the edge of a gully, in a former, now forested pasture.

Among the transitional forms between *C. monogyna* and *C. rosaeformis/rhipidophylla*, nothosubsp. *fallacina* is rare in the North Hungarian Mountains (KERÉNYI-NAGY 2015, KERÉNYI-NAGY and SZTUPÁK 2012), but it is widespread in the hills and mountains near Gömörszőlős, now part of Slovakia (BARANEC 1986, 1992), and was also found in Bereg (KERÉNYI-NAGY *et al.* 2014).

The taxon can also be interpreted as *C.* × *subsphaerica* nothosubsp. *sub-sphaerica* nothovarietas *fallacina*.

*Crataegus* × *subsphaerica* Gand. nothosubsp. *jacquinii* (Kerner ex Péntzes)  
Kerényi-Nagy

(*C. monogyna* Jacq. > *C. rosaeformis* Janka subsp. *curvisepala* (Lindm.) Kerényi-Nagy)

Szerencs Hills: formerly Monok, now Megyaszó: Györgyhalom. One specimen, N48.18972°, E21.10093°, (CEU) 7892.2, 29.08.2022. (HNHM-TRA-00704919). – Slope steppe with black locust trees on a kurgan.

Sporadic throughout Hungary. As the taxon *rosaeformis/rhipidophylla* is often combined with *curvisepala*, its European distribution is unknown, but is probably widespread.

*Crataegus* × *subsphaerica* Raunk. nothosubsp. *subsphaerica*  
(*C. monogyna* Jacq. × *C. rosaeformis* Janka subsp. *rosaeformis*)

Syn.: *C. ×silicensis* (Hrab.-Uhr.) T. Baranec

(Fig. 6)

Bereg: Beregdaróc: Kisasszony-erdő. Several specimens, N48.18958°, E22.50767°, (CEU) 7801.1, 26.07.2023. (HNHM-TRA-00704907). – In riverine oak-elm-ash forest. The forest was either planted or grew spontaneously in the meadow. This population shows a morphologically *rosaeformis* predominance.

Beregdaróc: Rivaly. Many specimens, N48.19131°, E22.51233°, N48.19422°, E22.51447°, (CEU) 7800.2, 7801.1, 26.07.2023. – On an abandoned, now shrubby, forested former hay meadow.

Lónya: Eperjeskei-legelő. Several specimens, N48.34003°, E22.30092°, (CEU) 7699.4, 27.07.2023. – In dense shrub patches under old trees of a wood-pasture.

Bükk Mts: Cserépfalu: Aranyomb. Several specimens, N47.95840°, E20.52764°, (CEU) 8089.1, 31.07.2022. – In abandoned vineyards.

Cserépfalu: Cinegés. Several specimens, N47.96947°, E20.55550°, N47.96925°, E20.55544°, (CEU) 8089.1, 30.07.2022. – In wood-pasture.

Cserépfalu: Perpác-oldal. Several specimens, N47.95736°, E20.53758°, (CEU) 8089.1, 29.07.2022. – In abandoned vineyards and orchards.

Cserépfalu: Úr szőlője. Several specimens, N47.95939°, E20.51647°, (CEU) 8089.1, 31.07.2022. (HNHM-TRA-00704916) – In abandoned vineyards. This population shows a morphologically *monogyna* predominance.



Fig. 6. *Crataegus* × *subsphaerica* nothosubsp. *subsphaerica* near Beregdaróc (Photo: Bauer, N.).

Miskolc: Csókás-völgy Forest Reserve. Several specimens, N48.04107°, E20.69653° (HNHM-TRA-00704926), 48.04246°, 20.69806°, 48.04247°, 20.69738°, 48.04426°, 20.69811°, (CEU) 7990.3, 21.06.2023. – In *Ceraso mahaleb-Quercetum* and *Quercetum petraeae-cerris* forests.

This taxon is already known from the neighbourhood of Bereg, in Máramaros (now Ukraine) (KERÉNYI-NAGY *et al.* 2014) and seems to be especially common in the southern part of the Bükk Mts (MOLNÁR 2021). KERÉNYI-NAGY (2015) and, of course, BARANEC (1992) indicates additional locations from the territory of Slovakia, but we can probably still expect its occurrence within the range of *C. rosaeformis* in Hungary. Again, its distribution outside the Carpathian Basin is only imprecisely known due to the merging of *C. rosaeformis/rhipidophylla* and *C. curvisepala*, but it is probably widespread.

*Crataegus* × *walokochiana* (Hrab.-Uhr.) P. A. Schmidt  
[[*C. laevigata* (Poir.) DC. × *C. lindmanii* Hrab.-Uhr. =  
*C. × palmstruchii* Lindm.) × *C. laevigata*]  
(Fig. 7)

Bükk Mts: Cserépfalu: Karácson tiszta. Several specimens, N47.96894°, E20.55303°, (CEU) 8089.1, 01.08.2022. (HNHM-TRA-00704918). – In *Quercetum petraeae-cerris* forest.

Mátra Mts: Parád: Tariska-rét. Several specimens, N47.89547°, E20.01019° (HNHM-TRA-00704922), N47.89581°, E20.00536°, (CEU) 8186.1, 08.08.2022. – In recently forested former wood-pasture.



Fig. 7. *Crataegus* × *walokochiana* near Parád (HNHM-TRA-00704918) (Photo: Bauer, N.).

So far recorded from the Balaton Uplands, the Buda and Visegrád Mts, in the North Hungarian Mts (Börzsöny, Mátra, Bükk) and near Jósvalfő (KERÉNYI-NAGY 2012, 2015, KERÉNYI-NAGY and VIRÓK 2017, MOLNÁR 2021). We can probably expect its occurrence around the distribution area of *C. lindmanii*. Since many researchers classify it under *C. laevigata* (despite the scissor sepals and 1–2 pyrenes) (CHRISTENSEN 1992), its European range of distribution is unknown.

*Crataegus monogyna* Jacq. × *C. laevigata* (Poir.) DC. × *C. rosaeformis* Janka  
subsp. *rosaeformis*

Mátra Mts: Paráds: Tariska-rét. One specimen, N47.89778°, E20.00000°, (CEU) 8186.1, 09.08.2023. (HNHM-TRA-00704917). – In now forested former wood-pasture.

A rare triple hybrid. Recorded only from a few locations one from Podolia (SOŁTYS-LELEK and OLIAR 2016), with additional occurrences in Poland, the Czech Republic and Slovakia (OKLEJEWICZ and VONČINA 2012; OKLEJEWICZ *et al.* 2015).

*Crataegus monogyna* Jacq. × *C. laevigata* (Poir.) DC. × *C. rosaeformis* Janka  
subsp. *rosaeformis* mosaic hybrid

Bereg: Lónya: Eperjeskei-legelő. One stem, about 10 cm from its base branches dichotomously into 2 shoots, one bearing *C. monogyna* × *C. rosaeformis* and the other *C. laevigata* × *C. rosaeformis* morphological marks. N48.34003°, E22.30092°, (CEU) 7699.4, 27.07.2022. (HNHM-TRA-00704915). – In dense shrub patches under old trees of a wood-pasture. Mosaic hybrids are not typical within the genus.

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**Összefoglaló:** Galagonya (*Crataegus*, Rosaceae) adatok Magyarországról. A tanulmány 2 galagonyafaj (*C. lindmanii*, *C. rosaeformis* subsp. *curvisepala*) és 9 galagonya hibrid taxon (*C. ×kyrtostyla*, *C. ×media*, *C. ×plagiosepala* nothosubsp. *dunensis*, *C. ×subsphaerica* nothosubsp. *fallacina*, nothosubsp. *jacquinii*, nothosubsp. *subsphaerica*, *C. ×walokochiana*, *C. monogyna* × *C. laevigata* × *C. rosaeformis* s.str.), köztük egy mozaikos hibrid egyed (*C. monogyna* × *C. laevigata* × *C. rosaeformis* s. str.) új előfordulási adatait mutatja be Magyarország területéről, megadva az új előkerülés pontos helyadatait és termőhelyi körülményeit. Három erdőrezervátum magterület részletes felmérése jó lehetőséget biztosított, hogy erdőn belüli elterjedési mintázatokat is megfigyelhessünk.

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