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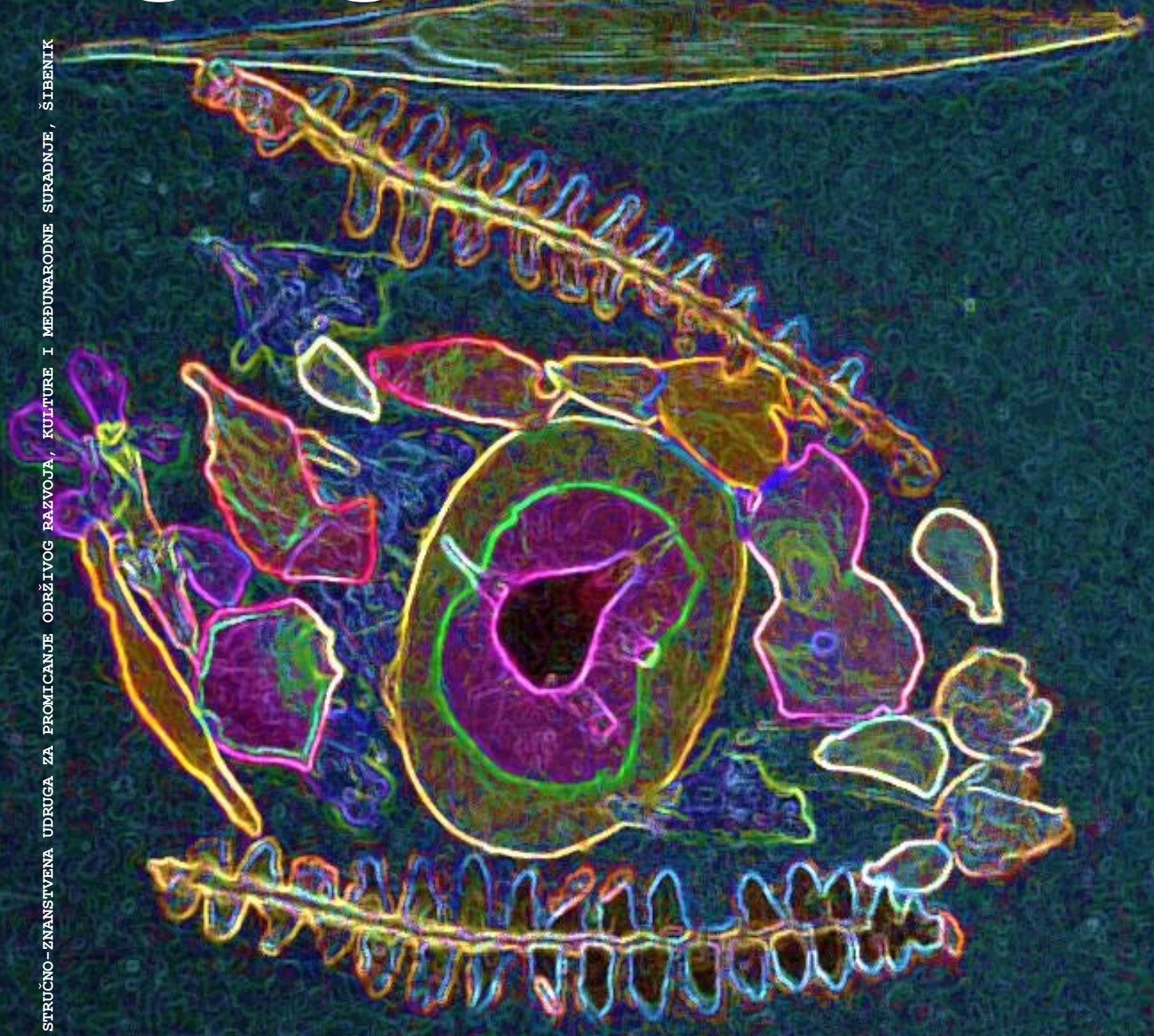

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Remarks on recent distribution of *Polygonum albanicum* Jáv. in Bosnia and Herzegovina

Semir Maslo[1]*, Šemso Šarić[2]

pregledni rad (scientific review)

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Abstract

This paper presents a survey of *Polygonum albanicum* in Bosnia and Herzegovina and includes an identification key, distribution data and map of localities in Bosnia and Herzegovina based on a revision of herbarium specimens from SARA, and private collections of the authors, literature data and on field observations. *P. albanicum* is an obligate serpentinophyte. Regarding its distribution, *P. albanicum* is a Balkan endemic species. The paper presents a short morphological description and photographs of the species based mainly on the collected specimens, as well as information on the distribution of the species.

Key words: Balkans, distribution, morphology, *Polygonum albanicum*, serpentine.

Introduction

The genus *Polygonum* L. (Polygonaceae) is mainly a north temperate genus, including about 50 species which are now almost cosmopolitan weeds (Snogerup and Snogerup, 1997). Approximately 20 species of genus *Polygonum* are mentioned in the flora of the Balkans (Uotila, 2017), of which only 4 taxa are recorded for the flora of Bosnia and Herzegovina: *Polygonum albanicum* Jáv., *Polygonum arenarium* subsp. *pulchellum* (Loisel.) Thell., *Polygonum aviculare* L. and *Polygonum bellardii* All. (Beck-Mannagetta, 1906, Ritter-Studnička, 1963). *P. albanicum* was collected for the first time in 1918 by Sándor Jávorka on a botanical journey on serpentine in northern Albania. It was collected as well by Alston and Sandwith in southern Albania in 1933. Outside Albania, the species has been collected on serpentine in Central Bosnia (Krause and Ludwig, 1957). Since that time the species has been recorded in Bosnia and Herzegovina only by Ritter-Studnička (1963, 1970a, 1970b). According to the available data, the species is recorded only at a few localities in Montenegro (Lakušić, 1985),

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Greece (Akeroyd, 1987; Snogerup and Snogerup, 1997), Albania (Shuka et al., 2008) and Kosovo (Tomović et al., 2014, Mustafa et al., 2015). In the territory of the Republic of Macedonia, this species was reported by Snogerup and Snogerup (1997), but the authors did not specify any concrete locality. According to the same authors, the distribution of this species is inadequately known. This report has of yet not been confirmed by any other author and, therefore, seems somewhat doubtful.

P. albanicum (Figure 1) is a glabrous, grey-green annual plant, branched from base. Stems are few, erect to erecto-patent, slender, angled, 10-50 cm long. Ochreae 3-6 mm, becoming brown at base, scarious and lacerate above, considerably shorter than the internodes. Leaves caduceus, 10-30 mm x 1-3 mm, linear-lanceolate, 1-veined and acute. Inflorescences occupying most of the stem, usually all internodes more than 1cm. Flowers many, on the distal part of the branches, 1-2(-3) in axils of narrow, lanceolate bracts; bracts small, upper ones with very small and not exceeding the flowers. Pedicels 1-2 mm. Perianth segments 1,5-2,0 mm. Perianth segments united for about 1/3 of their length, elliptical, connivent but not overlapping, green with white or pink margins (Figure 1 d.). Nut shortly stipitate, exceeding perianth and visible between the narrow segments (Figure 1 e.) 1,8-2,2 mm, trigonous, dark reddish-brown, dull to somewhat glossy (Akeroyd, 1987, 1993; Snogerup and Snogerup, 1997).

Materals and methods

The study was carried out in recent field studies, analysis of herbarium material deposited at SARA (herbarium acronyms according to Holmgren et al., 1990), as well as literature data. Digital photographs and GPS coordinates were taken in the field. The nomenclature follows the Euro-Med checklist (EURO+MED 2006). The distribution of the species in Bosnia and Herzegovina is shown on the map using standard UTM grid 10x10 km. Localities gathered from literature and herbariums are indicated in black on the map, while confirmed data are indicated in red. A list of all localities representing the distribution of *P. albanicum* in Bosnia and Herzegovina is given in the Appendix 1. For new records, the exact WGS1984 coordinates are given.

Results and discussion

Polygonum albanicum Jáv., in Növ. Közl. 19: 18. 1920. *P. albanicum* belongs to a taxonomically difficult group of annual species, within Section *Polygonum*, characterized by very small bracts that are shorter and narrower than the leaves, and which scarcely exceed the flowers (Akeroyd, 1987). To identify this species, we offer the adjusted key according to Akeroyd (1987, 1993).

1. Perianth pink or white.....*P. arenarium*
1. Perianth green, sometimes with pink or white margins.....2
2. Nuth 3-5 mm, shorter than the perianth.....*P.bellardii*

2. Nuth 1.5 – 3 mm, equalling or slightly exceeding the perianth.....3

3. Flowers subsessile, crowded towards the ends of the branches, nut 2 – 3 mm.....*P. patulum*

3. Flowers distinctly pedicellate, not crowded towards the ends of the branches, nut 1.8 – 2.2 mm.....*P. albanicum*

Serpentine areas in Bosnia and Herzegovina exist in small outcrops separated from other geological formations in North Central Bosnia. In eastern Bosnia, serpentines are represented north of the town of Višegrad, in small outcrops on both banks of the Drina River, and are connected to those in western Serbia (Ritter-Studnička, 1963). *P. albanicum* is quite common on the thermophilous rocky serpentine habitats of North Central Bosnia. It is one of 298 Balkan endemic taxa reported in the territory of Bosnia and Herzegovina (Lubarda et al., 2014). This Mediterranean-Submediterranean plant belongs to Balkan obligate serpentine endemic and trans-regional Balkan endemic plants with world distribution range only in Albania, Bosnia, Greece, Kosovo and Montenegro (Stevanović et al., 2003, Tomović et al., 2014).

The occurrence of *P. albanicum* in the flora of Bosnia and Herzegovina was firstly noted by Krause and Ludwig (1957) in the area of Gostović near the town of Zavidovići. Although known from several localities mentioned in older botanical literature (Ritter-Studnička, 1963, 1970a, 1970b), findings of *P. albanicum* in Bosnia and Herzegovina in the last 50 years have been very rare. In the Herbarium of the National Museum of Bosnia and Herzegovina (SARA), fourteen specimens of *P. albanicum* were stored. All specimens were collected by Ritter-Studnička on serpentine substrates in North Central Bosnia between 1957 and 1964 (Appendix 1). The species was recorded in 22 UTM squares 10x10 km, from Banja Luka in the west to Kalesija in the east (Fig. 2). During a floristic research in Central Bosnia in 2016 and 2017 the presence of *P. albanicum* could be confirmed in the 4 UTM squares. The species was found in 12 micro localities in the vicinity of the towns of Banovići, Lukavac, Olovo, Vareš and Zavidovići (Apendix 1). Its altitude range varies here between 330 and 785 m. Some populations were numerous, with high seed production.

According to Ritter-Studnička (1963), the centre of development of the species is in North Central Bosnia, while the sites from Albania, Greece, Kosovo and Montenegro are located on the SE border of the species areal. In addition to the relatively large distribution in Bosnia, its polymorphism in terms of the colour of the perianth and the surface area of the seeds is also supported. The colour of the perianth is white to greenish during bloom, while in some individuals it becomes red at the time of ripening of the fruit. *P. albanicum* was not recorded on the serpentine complex in E Bosnia near Višegrad. It has been replaced here with the related taxon *Polygonum arenarium* subsp. *pulchellum* which belongs to the Pontic chorological group (Ritter-Studnička, 1963).

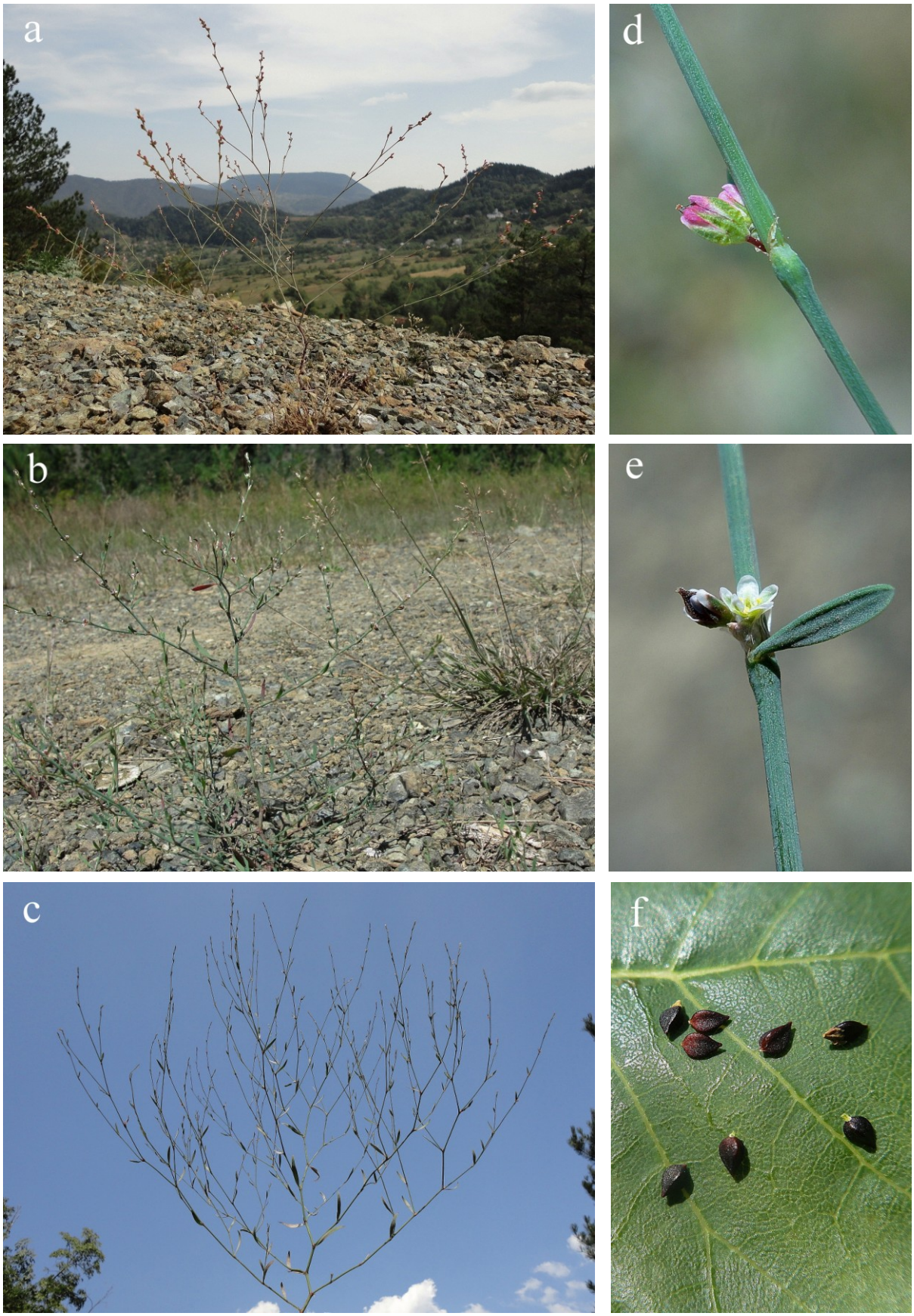

Figure 1. *Polygonum albanicum* in the vicinity of the village Jelaške near Olovo a., b. habitat c. whole plant d. flower e. flower and fruit f. fruit (Photo: Šemso Šarić).

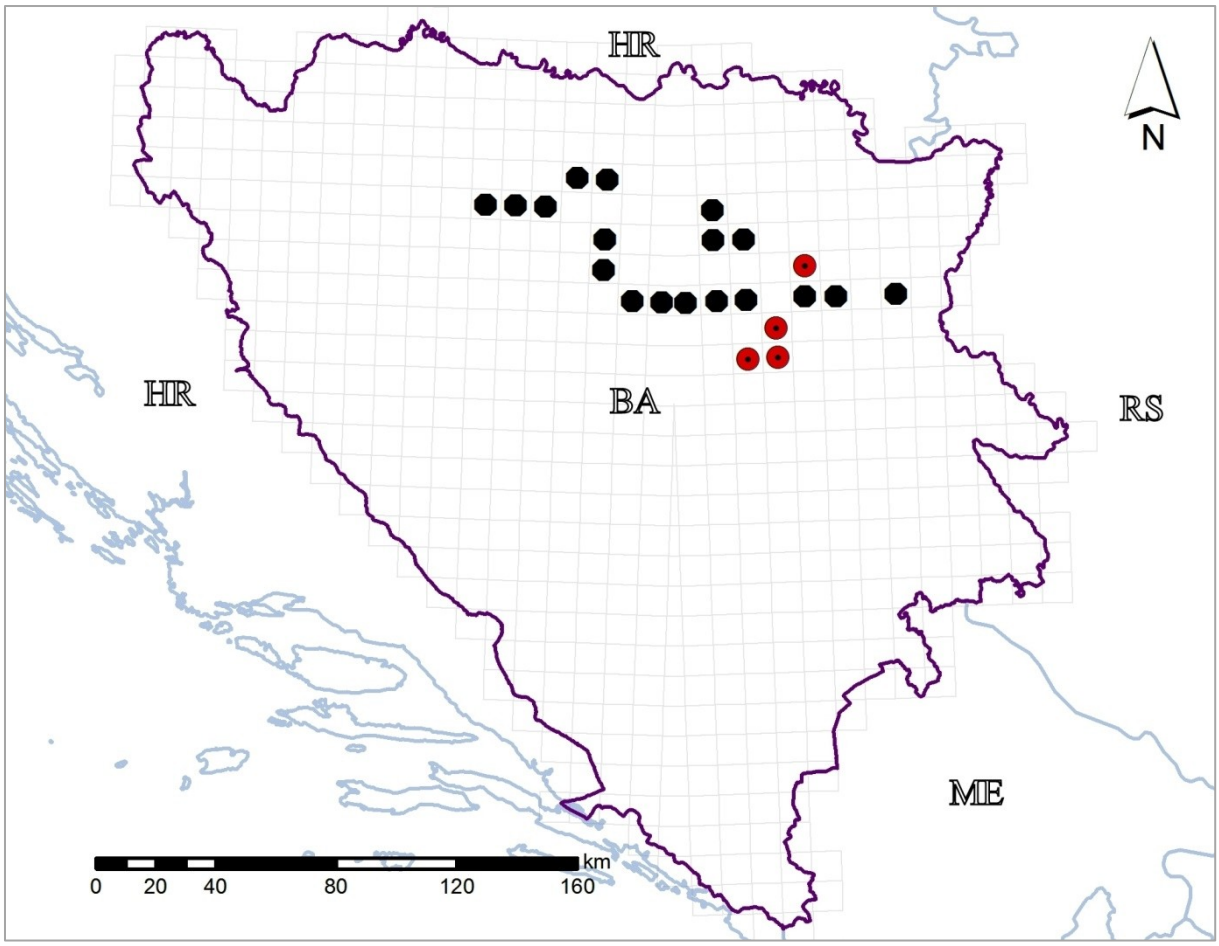

Figure 2. The distribution of *Polygonum albanicum* in Bosnia and Herzegovina where old records are black circles and new records are red circles (the distribution map was made by Aldin Boškailo)

Conclusion

The first record of *P. albanicum* in Bosnia and Herzegovina dates from 1957, when it was discovered in Central Bosnia near the town of Zavidovići. On the territory of Bosnia and Herzegovina, *P. albanicum* only appears on serpentine substrates. According to literature data and herbarium material stored in the Herbarium of the National Museum of Bosnia and Herzegovina (SARA), as our own field study, we could conclude that *P. albanicum* is a widely distributed species on serpentine in Bosnia and Herzegovina. Therefore, this leads to the conclusion that the centre of distribution of this species is actually located in North Central Bosnia and not in Albania as stated in some literature data..

Acknowledgements

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APPENDIX 1: List of localities of *Polygonum albanicum* Ják. in Bosnia and Herzegovina

Herbarium material:

Ljubić mountain near Prnjavor (SARA, 49281; coll. RITTER-STUDNIČKA 1964).

Ograjni brook valley near Žepče (SARA, 49282; coll. RITTER-STUDNIČKA 1957).

On track ballast along the railway in village Jošavka near Banja Luka (SARA, 49283; coll. RITTER-STUDNIČKA 1964).

Gostilj near Bosansko Petrovo Selo (SARA, 49284; coll. RITTER-STUDNIČKA 1957).

On serpentine near village Rječica, Maglaj (SARA, 49285; coll. RITTER-STUDNIČKA 1957).

Gostovića brook valley near Otežna (SARA, 49286; coll. RITTER-STUDNIČKA 1963).

On serpentine near Vrbanja, Banja Luka (SARA, 49287; coll. RITTER-STUDNIČKA 1964).

Orlovski Vis near Prnjavor (Kalesija) in Gornje Sprečko polje (SARA, 49288; coll. RITTER-STUDNIČKA 1962).

On serpentine near Maglaj (SARA, 49289; coll. RITTER-STUDNIČKA 1955).

Boljak mountain near Žepče (SARA, 49290; coll. RITTER-STUDNIČKA 1957).

On serpentine near village Sjenina, Doboj (SARA, 49291; coll. RITTER-STUDNIČKA 1962).

On serpentine near village Čečava, Teslić (SARA, 49292; coll. RITTER-STUDNIČKA 1963).

Lišci near Olovo (SARA, 49293; coll. RITTER-STUDNIČKA 1964).

Markovo brdo near Žepče (SARA, 49294; coll. RITTER-STUDNIČKA 1957).

Data from literature:

Borje mountain (RITTER-STUDNIČKA 1963)

Gostović (Zavidovići) (KRAUSE & LUDWIG 1957, RITTER-STUDNIČKA 1963, 1970)

Ljubić (Prnjavor) (RITTER-STUDNIČKA 1963, 1970)

Jošavka , Snjegotina, Čečava , uz prugu B.Luka-Doboj (Teslić) (RITTER-STUDNIČKA 1970)

Vrbanja (kod Čelinca-Banja Luka) (RITTER-STUDNIČKA 1963, 1970)

Pribinić (Teslić) (RITTER-STUDNIČKA 1970)

Grebić i Gostilj kod Suho polja (Doboj) (RITTER-STUDNIČKA 1970)

Kakmuž ((Sprečko polje) (RITTER-STUDNIČKA 1970)

Borova glava, Paklenica, Ravna kosa, Čerkez, Riječice, Rakovac (Maglaj) (RITTER-STUDNIČKA 1970)

Kalesija (RITTER-STUDNIČKA 1970)

Žepče (RITTER-STUDNIČKA 1963, 1970)

Slatina (Teslić) (RITTER-STUDNIČKA 1970)

Vitlaci, Ograjni potok, Boljak, Markovo brdo (Žepče) (RITTER-STUDNIČKA 1970)

Otežna kod Gostovića (Zavidovići) (RITTER-STUDNIČKA 1970)

Svatovac (Lukavac) (RITTER-STUDNIČKA 1970)

Donja Višća i Oskova (Živinice) (RITTER-STUDNIČKA 1970)

Oskova (Banovići) (RITTER-STUDNIČKA 1970)

Maoča (Zavidovići) (RITTER-STUDNIČKA 1970)

Župeljeva (Konjuh) (RITTER-STUDNIČKA 1970)

Duboščica, Careva ćuprija, Ječmište (Vareš) (RITTER-STUDNIČKA 1970)

Curent localities:

Mali Zelemboj, Banovići (44° 21′ 58.92" N; 18° 29′ 14.38" E; elvation 690 m; coll. ŠARIĆ 2017)

Mala Maoča, Olovo (44° 21′ 38.29" N; 18° 26′ 41.15" E; elvation 526 m; coll. ŠARIĆ 2017)

Župeljeva, Olovo (44° 17′ 15.29" N; 18° 27′ 01.35" E; elvation 429 m; coll. ŠARIĆ 2017)

Buk, Olovo (44° 17′ 37.3" N; 18° 25′ 38.93" E; elvation 399 m; coll. ŠARIĆ 2017)

Miljev Lug, Olovo (44° 16′ 39.76" N; 18° 26′ 04.89" E; elvation 398 m; coll. ŠARIĆ 2017)

Stipin Han, Zavidovići (44° 19′ 05.70" N; 18° 24′ 58.93" E; elvation 330 m; coll. ŠARIĆ 2017)

Jelaške, Olovo (44° 17′ 13.42" N; 18° 23′ 29.18" E; elvation 604 m; coll. ŠARIĆ 2017)

Vojnica, Olovo (44° 15′ 22.88" N; 18° 21′ 48.17" E; elvation 785 m; coll. ŠARIĆ 2017)

Manjin Vrh, Olovo (44° 02′ 32.88" N; 18° 24′ 08.76" E; elvation 606 m; coll. ŠARIĆ 2017)

Duboštica, Vareš (44° 14′ 27.19" N; 18° 20′ 03.64" E; elvation 651 m; coll. ŠARIĆ 2017)

Svatovac, Lukavac 44° 27′ 38.42" N; 18° 26′ 48.71" E; elvation 358 m; coll. ŠARIĆ 2017)

Svatovac, Lukavac 44° 28′ 15.36" N; 18° 26′ 51.47" E; elvation 380 m; coll. ŠARIĆ 2017)

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Ukrasna vrijednost invazivnih biljnih vrsta Hrvatske

Decorative value of invasive plant species in Croatia

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Sažetak

Istraživanje invazivnih biljnih vrsta provedeno je na području tri regije Republike Hrvatske (SZ Hrvatska, Slavonija i Dalmacija) gdje je zabilježeno ukupno 36 invazivnih biljnih svojti s ukrasnom vrijednosti. Od ukupno 36 svojti s ukrasnom vrijednosti, njih 29 su na područje Hrvatske namjerno unesene s ciljem uzgoja. Nakon određenog vremena, kultivirane biljke pobjegle su iz uzgoja i spontano počele rasti na različitim staništima te danas takve biljke označavamo terminom „*Planta hortifuga*“. Zabilježeno je ukupno 20 biljnih porodica, a najzastupljenija porodica s 10 svojti je porodica Asteraceae. Na području sve tri regije zabilježeno je 12 zajedničkih svojti. Isključivo na prostorima Dalmacije zabilježeno je devet svojti. U Slavoniji nije zabilježena niti jedna svojta koja se može ubrojiti u kategoriju invazivnih alohtonih vrsta, a da nije već prisutna u ostale dvije regije, ali su na području sjeverozapadne Hrvatske dokumentirane četiri biljne svojte koje nisu zabilježene niti u jednom drugom dijelu Hrvatske. Sjeverozapadnom Hrvatskom te Slavonijom proširile su se biljne vrste koje najčešće izvorno potječu s područja Sjeverne Amerike, dok u Dalmaciji nailazimo na ukrasne invazivne vrste koje najčešće potječu iz Južne Amerike i Meksika. Najviše biljnih vrsta cvate tijekom proljeća i ljeta, a najzastupljeniji životni oblik su terofiti sa 16 biljnih svojti, dok su najmanje zastupljeni hemifiti i nanofanerofiti s dvije biljne svojte. Zaključujemo da se zbog bogatstva i raznolikosti ekoloških uvjeta veliki broj alohtonih vrsta uspio „udomaćiti“ u Hrvatskoj. Alohtona flora nije uvijek štetna, ali invazivna flora predstavlja opasnost stoga je potrebno provoditi određene mjere kako bi se sačuvala staništa, vrste pa i sama bioraznolikost.

Ključne riječi: ukrasna vrijednost, invazivne biljne vrste, alohtone biljne vrste, Hrvatska.

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[2] Dujmović Purgar, D., Domljanović, M., Paurić, E., Stura, L. (2021). Ukrasna vrijednost invazivnih biljnih vrsta Hrvatske. *Glasilo Future*, *4*(5-6), 10–22. / Dujmović Purgar, D., Domljanović, M., Paurić, E., Stura, L. (2021). Decorative value of invasive plant species in Croatia. *Glasilo Future*, *4*(5-6), 10–22.

Abstract

The research of invasive plant species was conducted in three regions of the Republic of Croatia (NW Croatia, Slavonia and Dalmatia) where a total of 36 invasive plant taxa with ornamental value were recorded. Out of a total of 36 taxa with decorative value, 29 of them were deliberately introduced into the territory of Croatia with the aim of cultivation. After some time, the cultivated plants escaped from cultivation and spontaneously began to grow in different habitats, and today we refer to such plants as „*Planta hortifuga*". A total of 20 plant families were recorded, and the most common family with 10 taxa is the Asteraceae family. In the area of all three regions, 12 common taxa were recorded. Nine taxa have been recorded exclusively in Dalmatia. In Slavonia, not a single taxon that can be included in the category of invasive allochthonous species has been recorded without being present in the other two regions, but in the area of northwestern Croatia, four plant taxa have been recorded that have not been recorded in any other part of Croatia. Plant species that most often originate from North America have spread to northwestern Croatia and Slavonia, while in Dalmatia we find invasive ornamental species that most often originate from South America and Mexico. Most plant species bloom during spring and summer, and the most common life forms are therophytes with 16 plant taxa, while the least common are hemiphytes and nanophanerophytes with two plant taxa. We conclude that due to the richness and diversity of ecological conditions, a large number of non-native species managed to "domesticate" in Croatia. Non-native flora is not always harmful, but invasive flora is a danger, so it is necessary to implement certain measures to preserve habitats, species and even biodiversity itself.

Key words: ornamental value, invasive plant species, allochtonous plant species, Croatia.

Uvod

Flora Hrvatske izrazito je bogata i raznolika. Broji oko 4250 vrsta, tj. oko 5010 vrsta i podvrsta, što je čini jednim od centara biološke raznolikosti Europe (Nikolić et al., 2014). Biljne vrste s obzirom na porijeklo možemo svrstati u dvije glavne kategorije: autohtone (zavičajne) i alohtone (strane) vrste koje su unesene namjernom ili ne namjernom ljudskom aktivnošću.

Autohtone (zavičajne) biljne vrste možemo definirati kao biljne vrste koje su na ovom području prisutne bez posredovanja čovjeka, tj. područje Hrvatske predstavlja dio njihove prirodne rasprostranjenosti i uvjetovano je prirodnim čimbenicima. Za razliku od njih, alohtone (strane) biljne vrste, unesene su slučajno ili namjerno na područje Hrvatske gdje nikada prije nisu bile rasprostranjene (Nikolić et al., 2014.). Naime, određene vrste su potakle namjeran unos zbog svojih hranidbenih vrijednosti, ljekovitih i medonosnih svojstava pa tako i ukrasne vrijednosti. Takvim unosom čovjek je ukrasne vrste, namjerno unio u svoju neposrednu okolinu, a da nije uočio invazivan potencijal ovih vrsta. Nakon određenog vremena mnoge unesene biljne vrste, a među njima i one s

ukrasnom vrijednošću odbjegle su iz uzgoja i spontano počele rasti na različitim staništima. Danas takve biljne vrste označavamo terminom *"Planta hortifuga"* (Karlović et al., 2020).

Alohtone vrste su se zbog svoje prilagodljivosti, vrlo brzo "udomaćile", te neke čak i formiraju nove biljne zajednice sa zavičajnim vrstama (Horvat i Franjić., 2016, prema, Galić, 2017). Invazivna flora (kategorija alohtone flore) predstavlja svojevrsnu opasnost za bioraznolikost, sam okoliš te uzrokuje negativne posljedice za ljudsko zdravlje (npr. Trovanja), međutim ne mora uvijek biti štetna. Naprotiv, može biti jako korisna ako se primjenjuje u prehrani, u ljekovite svrhe, kao krma (Mitić et al 2008., prema, Galić, 2017).

Ukrasne biljne vrste, bile one zeljaste ili drvenaste sam prostor naglašavaju svojim oblikom, bojom, mirisom i to listovima, cvjetovima, plodovima, habitusom ili korom. Tako i velika većina invazivnih biljnih vrsta posjeduje upravo navedene estetske značajke zbog kojih je čovjek iste počeo primjenjivati u vlastitoj okolini.

Materijali i metode

Istraživanje je provedeno za područje sjeverozapadne Hrvatske, Slavonije i Dalmacije na temelju literature (Nikolić et al., 2014). Napravljen je popis invazivnih biljnih vrsta koje su zabilježene na području istraživanja. Biljne vrste, njihova znanstvena i narodna imena, rodovi te porodice navedene su u popisu flore abecednim redom unutar viših sistematskih kategorija. Za svaku biljnu vrstu navodi se životni oblik, porijeklo i način unosa, vrijeme cvatnje te područje rasprostranjenosti na kojima su zabilježene (Tablica 1). Životni oblici (H – Hemicrytophyta, T – Therophyta, G – Geophyta, P – Phanerophyta, N - Nanophanerophyta i Ch – Chamaephyta) prikupljenih biljnih vrsta određeni su prema Flora Croatica Database. Porijeklo biljnih vrsta označeno je kao: Sj. Am (Sjeverna Amerika), J. Am (Južna Amerika), Az (Azija), Af (Afrika). Način unosa može biti namjeran ili nenamjeran.

Slika 1. Prikaz područja istraživanja (Izvor: https://croatia.eu/index.php?view=article&lang=1&id=12)

Figure 1. *Overview of the research area*

(Source: https://croatia.eu/index.php?view=article&lang=1&id=12)

Područje istraživanja

Sjeverozapadna Hrvatska, naziv je za područje najsjevernijeg dijela Republike Hrvatske. Gospodarski gledano, ono je najrazvijenija hrvatska regija unutar koje se nalazi pet županija (Zagrebačka, Krapinsko-zagorska, Varaždinska, Koprivničko-križevačka i Međimurska županija) i Grad Zagreb (www.razvoj.gov.hr). Na području regije dominiraju smeđa tla na laporima, u unutrašnjosti regije te na samom sjeveru prisutna su aluvijalna i močvarna tla. Sjeverozapadni dio Hrvatske pak čini les dok na mali dio regije, Žumberačko gorje i Medvednicu, otpada smeđe tlo na vapnencima (Husnjak., 2014., prema, Tkalčec, 2016). Ova regija nalazi se unutar pojasa umjerenih širina, s izraženim godišnjim dobima, gdje se miješaju utjecaji euroazijskog kopna, Atlantika i Sredozemlja. Područje sjeverozapadne Hrvatske pripada umjereno toploj kišnoj klimi, u kojoj nema suhog razdoblja tijekom godine te su oborine jednoliko razdijeljene na cijelu godinu (Juras., 1985., prema, Franković, 2019). Prema DHMZ, najsuši dio godine jest mjesec veljača (44,2 mm), dok je oborinski maksimum ovog područja u lipnju (97,0 mm). Najhladnije razdoblje jest od siječnja do ožujka, dok razdoblje od lipnja do kolovoza predstavlja najtoplije mjesece ove regije (https://meteo.hr/klima.php?section =klima_podaci&param=k1&Grad=zagreb_maksimir).

Slavonija je regija na području istočne Hrvatske. Prostire se površinom veličine 12.556 km² između rijeka Drave (sjever), Save (jug), Dunava (istok) i planine Papuk (zapad). Unutar prirodnih granica Slavonije stvoren je prostor sa šumama, pašnjacima i brežuljcima. Područje obuhvaća pet županija: Virovitičko-podravska, Osječko-baranjska, Požeško-slavonska, Brodsko-posavska i Vukovarsko-srijemska. Na području Slavonije pronalazimo 6 tipova tala: aluvijalna močvarna, močvarna, crnicu, flišna, smeđa tla s laporima i lesna tla (http://www.pfos.hr, prema, Tkalčec, 2016). Umjereno topla vlažna klima s toplim ljetom (Cfb) prevlada u najvećem dijelu Hrvatske uključujući i na prostorima Slavonije. U Slavoniji je ljeto nešto toplije, a zima hladnija u odnosu na sjeverozapad, a to je posljedica slabljenja maritimnih utjecaja. Područja sjevernije od doline Save imaju od 700 do 1000 mm padalina godišnje, dok dijelovi Vukovarsko-Iločkog područja imaju manje od 700 mm godišnje. Padaline dostižu proljetni i jesenski maksimum. Početkom ljeta i u proljeće padaline su konvekcijske, a jesenski maksimum je vezan uz prolaz ciklona. Snijeg se zadržava različito dugo na tlu, najčešće do 40 dana godišnje. Slavonija uglavnom nema više od 2000 sunčanih sati godišnje (https://www.crometeo.hr/klima/).

Dalmacija je najjužnija hrvatska regija te se proteže od rijeke Zrmanje na sjeveru do granice sa Crnom Gorom na jugu. Prostire se na 12103 km^2 te čini 21 % ukupne površine Republike Hrvatske. Primorski karakter je glavna osobina dalmatinskog kraja (Friganović et al., 1974). Teritorij Dalmacije obuhvaća četiri hrvatske županije, a to su redom od sjevera ka jugu: Zadarska, Šibensko-kninska, Splitsko-dalmatinska i Dubrovačko-neretvanska. Područjem Dalmacije dominira vapnenačko tlo, dok crvenicu nalazimo u malim količinama nerijetko u samim pukotinama stijena (Friganović et al., 1974). Dalmatinska regija ima sredozemnu klimu. Osnovno obilježje klime su suha i sparna ljeta s visokim

temperaturama, dok su zime blage i kišovite. Sama regija ima prosječno od 2500 do 2700 sunčanih sati godišnje (https://www.crometeo.hr/klima/). Srednja siječanjska temperatura je 7,9 °C, a srednja srpanjska temperatura iznosi 26 °C (https://meteo.hr/klima.php?section=klima_podaci&param=k1&Grad=split_marjan). Na obali i na otocima u prosjeku pada najmanje kiše, npr. Hvar ima 767 mm godišnje, a Split 859 mm godišnje, dok Biokovsko područje i zaleđe Dubrovnika imaju godišnje znatno veće brojke (Sinj 1456 mm i Dubrovnik – Gruž 1272 mm) (Friganović et al., 1974)..

Rezultati i diskusija

Popis invazivnih biljnih vrsta na području tri regije Hrvatske prikazan je u tablici 1.

Na istraživanom području ukupno je zabilježeno 36 invazivnih biljnih vrsta unutar 20 porodica, od čega je najzastupljenija porodica glavočika (Asteraceae) s 10 svojti. Razlog tome je velika sjemenska produkcija vrsta koje pripadaju ovoj porodici. Sjeme ovih vrsta se najčešće rasprostire vjetrom (anemohorija) zahvaljujući različitim morfološkim prilagodbama plodova, što osigurava rasprostranjenost sjemena vrsta iz porodice glavočika na velike udaljenosti od matične biljke. Najzastupljeniji rod je rod *Impatiens* iz porodice Balsaminaceae koji ima veliku dekorativnu vrijednost, a predstavljen je s ukupno tri svojte.

Na području sve tri regije zabilježeno je 12 zajedničkih svojti: *Acer negundo*, *Ailanthus altissima*, *Ambrosia artemisiifolia, Datura innoxia*, *Datura stramonium*, *Euphorbia maculata*, *Galinsoga parviflora*, *Oenothera biennis*, *Parthenocissus quinquefolia*, *Phytolacca americana*, *Robinia pseudoacacia* i *Veronica persica*. U sjeverozapadnoj Hrvatskoj i Slavoniji pretežno nalazimo iste invazivne biljne vrste. Takvo stanje nije neočekivano s obzirom da oba dijela Republike Hrvatske pripadaju kontinentalnoj klimi te je na oba područja porodica glavočika najučestalija. Međutim, na području sjeverozapadne Hrvatske zabilježene su neke biljne vrste koje su prisutne samo na tom području, a to su: *Impatiens parviflora*, *Impatiens glandulifera*, *Galinsoga ciliata* i *Duchesnea indica*. Analizirajući invazivne biljne vrste Dalmatinskog podneblja uočavamo značajne razlike naspram prethodno navedenih regija. U Dalmaciji nailazimo na invazivne biljne vrste koje nismo pronašli u sjeverozapadnoj Hrvatskoj i Slavoniji, primjerice: *Broussonetia papyrifera*, *Carpobrotus edulis*, *Diplotaxis erucoides*, *Euphorbia prostrata*, *Nicotiana glauca*, *Opuntia ficus-indica*, *Oxalis pes-capre*, *Solanum elaeagnifolium* i *Tagetes minuta*. Od 10 svojti najzastupljenije porodice Asteraceae, tek polovica raste i u Dalmaciji. Razlog tome su drugačiji klimatski i ekološki uvjeti. Možemo uočiti da su se invazivne biljne vrste koje potječu iz sjevernog dijela Zemljine polutke razmnožile više u kontinentalnoj Hrvatskoj dok su one koje potječu s južnog dijela pretežno razmnožile Dalmacijom.

Tablica 1. Popis invazivnih biljnih vrsta na području tri regije Hrvatske.

Table 1. *List of invasive plant species in the three regions of Croatia.*

Porodica	Ime svojte	Narodni naziv	Podrijetlo	Način unosa	Životni oblik	Vrijeme cvjetanja	Područje rasprostranjenosti		
							Sjeverozapadna Hrvatska	Slavonija	Dalmacija
Aizoaceae	*Carpobrotus edulis* (L.) N. E. Br. in Phillips	Karpobrot	Af	Namjeran	Ch	3, 4			X
Asclepiadaceae	*Asclepias syriaca* L.	cigansko perje	Sj. Am	Namjeran	H	6, 7, 8	X	X	
Asteraceae	*Ambrosia artemisiifolia* L.	Ambrozija	Am	Nenamjeran	T	8, 9, 10	X	X	X
	Chamomilla suaveolens (Pursh)	žuta kamilica	Az, Sj. Am	Namjeran	T	6, 7, 8, 9	X	X	
	Erigeron annuus (L.) Desf.	jednogodišnja krasolika	Sj. Am	Namjeran	H	6, 7, 8, 9	X	X	
	Galinsoga ciliata (Raf.) S. F. Blake	trepavičava konica	J. Am	Namjeran	T	5, 6, 7, 8, 9, 10	X		
	Galinsoga parviflora Cav.	sitnocvjetna konica	J. Am	Namjeran	T	5, 6, 7, 8, 9, 10	X	X	X
	Helianthus tuberosus L.	gomoljasti suncokret	J. Am	Namjeran	G	10, 11	X		X
	Rudbeckia laciniata L.	dronjava pupavica	Sj. Am	Namjeran	H	7, 8	X	X	
	Solidago canadensis L.	gustocvjetna zlatnica	Sj. Am	Namjeran	H, G	8, 9, 10	X	X	
	Solidago gigantea Aiton	velika zlatnica	Sj. Am	Namjeran	H, G	8, 9	X	X	
	Tagetes minuta L.	sitna kadifica	J. Am	Nenamjeran	T	9, 10, 11			X
Balsaminaceae	*Impatiens balfourii Hooker* f.	balfourov nedirak	Az	Namjeran	T	7, 8	X		X

Porodica	Ime svojte	Narodni naziv	Podrijetlo	Način unosa	Životni oblik	Vrijeme cvjetanja	Područje rasprostranjenosti		
							Sjeverozapadna Hrvatska	Slavonija	Dalmacija
	Impatiens glandulifera Royle	žljezdasti nedirak	Az	Namjeran	T	7, 8	X		
	Impatiens parviflora DC.	mali nedirak	Az	Namjeran	T	6, 7, 8, 9	X		
Brassicaceae	*Diplotaxis erucoides* (L.) DC.	rigin dvoredac	Af, Az, Eu	Nenamjeran	T	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12			X
Cactaceae	*Opuntia ficus-indica* (L.) Mill.	Opuncija	J. Am	Namjeran	Ch	5, 6, 7			X
Cucurbitaceae	*Echinocystis lobata* (Michx.) Torr. et A. Gray	divlji krastavac	Sj. Am	Namjeran	T	6, 7, 8, 9, 10	X	X	
Euphorbiaceae	*Euphorbia maculata* L.	pjegava mlječika	Sj. Am	Nenamjeran	T	5, 6, 7, 8, 9, 10	X	X	X
	Euphorbia prostrata Aiton	polegnuta mlječika	Sj. Am, J. Am	Nenamjeran	T	6, 7, 8, 9, 10, 11			X
Fabaceae	*Robinia pseudacacia* L.	Bagrem	Sj. Am	Namjeran	P	4, 5, 6	X	X	X
	Amorpha fruticosa L.	Amorfa	Sj. Am	Namjeran	N	4, 5, 6	X	X	
Moraceae	*Broussonetia papyrifera* (L.) Vent.	Dudovac	Az	Namjeran	P	4, 5			X
Onagraceae	*Oenothera biennis* L.	Noćurak	Sj. Am	Namjeran	H	6, 7, 8	X	X	X
Oxalidaceae	*Oxalis pes-caprae* L.	priklonjeni cecelj	Af	Namjeran	G	4, 5			X
Phytolaccaceae	*Phytolacca americana* L.	Vinobojka	Sj. Am	Namjeran	G	7, 8	X	X	X
Polygonaceae	*Reynoutria japonica* Houtt.	japanski dvornik	Az	Namjeran	G	7, 8, 9	X	X	
Rosaceae	*Duchesnea indica* (Andrews) Focke	indijska jagoda	Az	Namjeran	H	7, 8, 9	X		
Sapindaceae	*Acer negundo* L.	američki javor	Sj. Am	Namjeran	P	3, 4	X	X	X

Porodica	Ime svojte	Narodni naziv	Podrijetlo	Način unosa	Životni oblik	Vrijeme cvjetanja	Područje rasprostranjenosti		
							Sjeverozapadna Hrvatska	Slavonija	Dalmacija
Scrophulariaceae	*Veronica persica* Poir.	Veronika	Az	Namjeran	T	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	X	X	X
Simaroubaceae	*Ailanthus altissima* (Mill.) Swingle	Pajasen	Az	Namjeran	P	7, 8	X	X	X
Solanaceae	*Datura innoxia* Mill.	Datura	Sj. Am, J. Am	Namjeran	T	6, 7, 8, 9	X	X	X
	Datura stramonium L.	bijeli kužnjak	Az, Sj. Am	Namjeran	T	6, 7, 8, 9, 10	X	X	X
	Nicotiana glauca Graham	drvenasti duhan	J. Am	Nenamjeran	N	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12			X
	Solanum elaeagnifolium Cav.	srebrnolisna pomoćnica	J. Am	Nenamjeran	T	7, 8			X
Vitaceae	*Parthenocissus quinquefolia* (L.) Planchon	peterolisna lozika	Sj. Am, J. Am	Namjeran	P	6, 7	X	X	X

Životni oblici (H – Hemicrytophyta, T – Therophyta, G – Geophyta, P – Phanerophyta, N - Nanophanerophyta i Ch – Chamaephyta)

Premda su invazivne biljne vrste same po sebi jako prilagodljive i izdržljive iz popisa vrsta možemo zaključiti da postoje limitirajući faktori za svaku od njih te da se mogu širiti do granica određenog podneblja. Najviše vrsta cvate tijekom proljeća i ljeta. Što se tiče životnih oblika najzastupljeniji su terofiti dok su najmanje zastupljeni hemifiti i nanofanerofiti. Također, većina biljnih vrsta porijeklom je iz Sjeverne Amerike (17), a najmanje (1) s područja Europe. Svakako treba naglasiti kako je većina biljnih vrsta namjerno unesena na neko područje, dok njih samo sedam je nenamjerno uneseno na određeno područje. Tako je primjerice *Tagetes minuta* unesena na područje Europe nenamjerno, ali danas se ciljano uzgaja zbog svojih eteričnih ulja koja se koriste u aromaterapiji i parfumerijskoj industriji.

Mnoge invazivne biljne vrste imaju izrazitu dekorativnu vrijednost zbog privlačnog izgleda (boje i teksture cvjetova, listova, plodova i kore, zanimljivog habitusa) pa su često prisutne u vrtovima i parkovima (Maršić, 2020). Tablica 2. daje uvid u ukrasne vrijednosti biljnih vrsta koje su zabilježene na obuhvaćenom području.

Tablica 2. Ukrasna vrijednost invazivnih biljnih vrsta.

Table 2. *Decorative value of invasive plant species*.

Ime svojte	**Ukrasna vrijednost**											**Zanimljivost**
	Deblo	**Kora**	**Habitus**	**Stabljika**	**List**	**Grane**	**Cvijet**	**Boja cvijeta**	**Cvat**	**Plod**	**Simetrija**	
Acer negundo	X		X		X	X						zaštita od erozije i vjetra
Ailanthus altissima	X	X	X		X	X	X			X		otporan na visoku razinu onečišćenja zraka
Ambrosia artemisiifolia											X	u Hrvatskoj prvi put zabilježena u vrijeme II. Svjetskog rata, zbog čega je dobila naziv partizanka; uzrokuje značajne zdravstvene probleme (alergije)
Amorpha fruticosa								X				primjenjuje se za liječenje srca i živčanih bolesti
Asclepias syriaca							X					u Europu unesena radi kaučuka, koristila se za punjenje jastuka, vjetrovki i pojaseva za spašavanje
Broussonetia papyrifera					X							namjeran unos u Europi kako bi se uzgajao u botaničkim vrtovima
Carpobrotus edulis							X					zaštita od erozije
Chamomilla suaveolens			X		X				X			namjerno unesena u botaničke vrtove

Ime svojte	**Ukrasna vrijednost**											**Zanimljivost**
	Deblo	**Kora**	**Habitus**	**Stabljika**	**List**	**Grane**	**Cvijet**	**Boja cvijeta**	**Cvat**	**Plod**	**Simetrija**	
Datura innoxia							X					u mnogim starim kulturama Amerike i Azije smatra se svetom i ljekovitom biljkom
Datura stramonium							X					biljka može nanijeti štete biljkama koje se nalaze u njezinoj neposrednoj blizini (izlučuje toksin u tlo)
Diplotaxis erucoides									X			biljka domaćin virusa brončavosti rajčice (TSWV)
Duchesnea indica							X			X		jako slična šumskoj jagodi
Echinocystis lobata					X				X			smatra se da je u Hrvatsku prodrla putem rijeke Save
Erigeron annuus									X			nalikuje tratinčici
Euphorbia maculata				X	X							privlači mrave
Euphorbia prostrata				X	X							primjena u tradicionalnoj medicini (posebno na području Afrike)
Galinsoga ciliata					X		X					biljka domaćin mnogim virusima, kukcima i oblićima koji napadaju usjeve
Galinsoga parviflora					X		X					biljka domaćin mnogim virusima, kukcima i oblićima koji napadaju usjeve
Helianthus tuberosus							X					primjenjuje se u proizvodnji alkohola, hrana za ljude i stoku
Impatiens balfourii							X					porijeklom s područja Himalaje
Impatiens glandulifera							X	X				porijeklom s područja Himalaje
Impatiens parviflora							X					lako prodire u prirodna staništa tvoreći guste prizemne sklopove
Nicotiana glauca									X			korovna i otrovna vrsta koja direktno ugrožava zdravlje ljudi i stoke
Oenothera biennis							X	X				jestiv korijen
Opuntia ficus-indica				X						X		bogata vitaminom C, koristi se u proizvodnji alkohola
Oxalis pes-caprae							X					raste na kultiviranim staništima kao što su maslinici i vinogradi

Ime svojte	Ukrasna vrijednost											Zanimljivost
	Deblo	Kora	Habitus	Stabljika	List	Grane	Cvijet	Boja cvijeta	Cvat	Plod	Simetrija	
Parthenocissus quinquefolia					X							prvi put zabilježena na Medvednici
Phytolacca americana									X	X		u prošlosti se koristila za bojanje vina
Reynoutria japonica			X									upija veliku količinu metala iz tla (može se koristiti za remedijaciju)
Robinia pseudoacacia									X			dobila ime po vrtlaru s francuskog dvora Jean Robinu
Rudbeckia laciniata									X			u Francuskoj namjerno unesena u 17. st.
Solanum elaeagnifolium					X		X					biljni ekstrakti inhibiraju rast tumorskih stanica
Solidago canadensis									X			danas vjerojatno prisutna na području cijele kontinentalne Hrvatske
Solidago gigantea									X			u 17. st. (SAD) prodavala se kao egzotična lijek protiv svih bolesti
Tagetes minuta				X					X			danas se ciljano uzgaja zbog svojih esencijalnih ulja
Veronica persica					X			X				sjemenke se rasprostranjuju mravima

Iz priložene tablice može se zaključiti kako se većina biljnih vrsta primjenjuje zbog svojih listova i cvjetova ili cvatova.

Zaključak

Na područjima triju proučavanih regija Republike Hrvatske (SZ Hrvatska, Slavonija i Dalmacija) zabilježeno je ukupno 36 invazivnih biljnih svojti s ukrasnom vrijednošću. Kao što je već navedeno u uvodu te biljne svojte su u razdoblju između 17. i 20. stoljeća pretežno namjerno unesene u neposrednu okolinu čovjeka, najčešće zbog svojih ukrasnih vrijednosti (cvatovi, plodovi, listovi…). Nakon određenog vremena, iste, kultivirane biljne vrste pobjegle su iz uzgoja i spontano počele rasti na različitim staništima te danas takve biljke označavamo terminom „*Planta hortifuga*“. Od ukupno 36 svojti, njih 7 je dospjelo na područje Hrvatske nenamjerno.

Zabilježeno je ukupno 20 biljnih porodica, a najzastupljenija porodica s 10 svojti su glavočike odnosno Asteraceae.

Na području sve tri regije zabilježeno je 12 zajedničkih svojti, a to su slijedeće vrste: *Acer negundo*, *Ailanthus altissima*, *Ambrosia artemisiifolia*, *Datura innoxia*, *Datura stramonium*, *Euphorbia maculata*, *Galinsoga parviflora*, *Oenothera biennis*, *Parthenocissus quinquefolia*, *Phytolacca americana*, *Robinia pseudoacacia* i *Veronica persica*.

Isključivo na prostorima Dalmacije zabilježeno je devet svojti: *Broussonetia papyrifera*, *Carpobrotus edulis*, *Diplotaxis erucoides*, *Euphorbia prostrata*, *Nicotiana glauca*, *Opuntia ficus-indica*, *Oxalis pes-capre*, *Solanum elaeagnifolium* i *Tagetes minuta*.

U Slavoniji nije zabilježena niti jedna svojta koja se može ubrojiti u kategoriju invazivnih biljnih vrsta, a da nije već prisutna u ostale dvije regije. Na području sjeverozapadne Hrvatske zabilježene su četiri biljne svojte koje nisu zabilježene na ostalim područjima, kako slijedi: *Impatiens parviflora*, *Impatiens glandulifera*, *Galinsoga ciliata* i *Duchesnea indica*.

Najviše biljnih vrsta cvate tijekom proljeća i ljeta. Najzastupljeniji životni oblik su terofiti sa 16 biljnih svojti dok su najmanje zastupljeni hemifiti i nanofanerofiti s dvije biljne svojte.

Na temelju proučavanja ukrasnih invazivnih biljnih vrsta Hrvatske uočavamo da su se sjeverozapadnom Hrvatskom te Slavonijom proširile biljke koje najčešće izvorno potječu sa područja Sjeverne Amerike, dok u Dalmaciji nailazimo na ukrasne invazivne biljne vrste koje najčešće potječu iz Južne Amerike i Meksika. Razlog tome su slični klimatski i ekološki uvjeti

Zbog bogatstva i raznolikosti flore, ali i velike raznolikosti edafskih čimbenika na tako malom državnom teritoriju, veliki broj alohtonih vrsta se uspio „udomaćiti“ u Hrvatskoj. Alohtona flora nije uvijek štetna, ali invazivna flora predstavlja opasnost za svojevrsna staništa, vrste pa i samu bioraznolikost. Stoga je potrebno provoditi monitoring populacija invazivnih biljnih vrsta, gospodariti staništima, rano otkriti pojavu invazivnih biljnih vrsta, ali i u konačnici prevenirati njihovu pojavu, kako bi se njihov štetni učinak doveo do minimuma.

Napomena

Rad je izvod iz Stručnog projekta naziva Ukrasna vrijednost invazivnih biljnih vrsta Hrvatske koji su izradile studentica studija Hortikultura – Ukrasno bilje, a ujedno su i koautorice ovog rada.

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Ožiljavanje reznica indijske lagerstremije (*Lagestroemia indica* L.) tretiranjem vrbinom vodom, hormonom i vodom

Rooting cuttings of Indian lagerstroemia (*Lagerstroemia indica* L.) by treatment with the willow water, hormone and water

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Sažetak

Indijska lagestremija (*Lagerstroemia indica* L.) je ukrasni grm ili drvo visine do 8 m. Cvjetovi joj mogu biti: bijele, crvene, ljubičaste ili ružičaste boje. Prednost ove vrste leži i u njezinoj univerzalnoj primjeni u gradskim krajobrazima. Komercijalno se razmnožava reznicama, zrelim ili zelenim. U novije vrijeme sve se više upotrebljavaju različiti botanički pripravci u cilju ožiljavanja reznica. Tako npr. pripravak od vrbe (*Salix.* spp.) (vrbina voda) obiluje auksinima, indol-3-maslačnom kiselinom (IBA) i salicilnom kiselinom. Cilj rada je bio utvrđivanje postotka ožiljavanja drvenastih reznica vrste *Lagestroemia indica*. U svrhu ožiljavanja upotrebljeni su: Rhizopon II i vrbin hormon. Zrele reznice indijske langestremije, 120 komada uzete su s matične biljke početkom ožujka te su obavljena četiri različita tretiranja s biljnim hormonima. Tijekom uzgoja, na reznicama su mjerene sljedeće karakteristike: broj listova, broj izdanaka i ukorjenjivanje. Na osnovu dobivenih rezultata može se zaključiti da se za uspješno ožiljavanje *Lagestroemia indica* iz netrapljenih reznica preporučuje aplikacija hormona Rhizopona II ili vrbinog hormona u trajanju namakanja od 24 sata.

Ključne riječi: indijska langestremija, ožiljavanje, zrele reznice, hormoni, vrbina voda.

Abstract

Indian lagerstroemia (*Lagerstroemia indica* L.) is an ornamental shrub or tree that is up to 8 m tall. Its flowers can be of white, red, purple or pink colour. The advantage of this species is in its universal

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[4] Temim, E., Dorbić, B., Hadžiabulić, A., Mujčin S. (2021). Ožiljavanje reznica indijske lagerstremije (*Lagestroemia indica* L.) tretiranjem vrbinom vodom, hormonom i vodom. *Glasilo Future*, *4*(5-6), 23–30 / Temim, E., Dorbić, B., Hadžiabulić, A., Mujčin S. (2021). Rooting cuttings of Indian lagerstroemia (*Lagerstroemia indica* L.) by treatment with the willow water, hormone and water. *Glasilo Future*, *4*(5-6), 23–30.

application in urban landscape architecture. Commercially is propagated by cuttings, mature or the green ones. In recent times, various botanical preparations have been increasingly used to prune cuttings, for example the willow tree (*Salix.* spp.) which is abundant with auxins, indole-3-butyric acid (IBA) and salicylic acid. The aim of this study was to determine the percentage of rooting of woody cuttings of *Lagerstroemia indica*. For the purpose of scarring, the following were used: Rhizopon II and willow hormone. Mature cuttings of Indian lagerstroemia, in total 120 pieces of them were taken from the parent plant in early March, and afterwards on them there were performed four different treatments with the plant hormones. During cultivation, the following characteristics were measured on cuttings: the number of leaves and the number of shoots and rooting. Based on the obtained results we can conclude that for the successful rooting of *Lagerstroemia indica* from non-macerated cuttings, the use of hormone Rhizopone II or willow hormone for a period of soaking during 24 hours is recommended.

Key words: Lagerstroemia indica, scarring, mature cuttings, hormones, willow water.

Uvod

Indijska lagestremija (*Lagerstroemia indica* (L.) je grm ili drvo visine do 8 m. Listovi su nasuprotni, a gornji naizmjenični, jednostavni eliptični, gotovo glatki sjedeći, kožasti, od 2 do 7 cm dugi i od 0,7 do 4,2 cm široki. Listovi su jarko-zelene boje, a u jesen narančasto crveni (Šilić, 1990). Cvjetovi, po kojima je ova biljka prepoznatljiva, mogu biti: bijele, crvene, ljubičaste ili ružičaste boje. Cvjetovi se nalaze u cvatovima, dihijazama ili metilicama, te mogu biti aktinomorfni ili zigomorfni, dvospolni, 4, 6 ili 8-člani. Čašični listići su srasli u obliku cijevi ili tanjura, krunice ponekad nema. Prašnika je obično dva puta više nego kruničnih listića. Plodnica je nadrasla, visoka. Cvijeta tijekom ljeta i jeseni (lipanj-listopad). Nakon cvjetanja stvaraju se plodovi (Temim, 2008).

Pored izuzetno dekorativnih cvjetova, boja stabla također dolazi do izražaja. Kora je prilično glatka, krem boje, prošarana crvenkasto-smeđim linijama. Razmnožava se sjemenom ili reznicama. Indijska lagestremija preferira sunčane položaje te plodna, svježa i dobro drenirana tla. Uzgaja se na Mediteranu i submediteranu.

Prednost indijske lagestremije leži i u njezinoj univerzalnoj primjeni. Može se uzgajati kao grm ili stablo za javne drvorede, u gredici grmlja, kao neformalna živica, pojedinačno (soliter) ili u obliku bonsaia.

Vrste i kultivari su: "Bourbon Street" izrazito crvena; "Baton Rouge" svijetlo crvena; "Bayou Marie" ružičasta cvjetovi s tamno crvenim rubom; "Centennial" svijetlo ružičasta, prelazi u ljubičastu; L. speciosa drvo visine do 20 m, ružičastih cvjetova krajem ljeta – početkom jeseni (Temim, 2008).

Indijska lagestremija se komercijalno razmnožava reznicama, zrelim ili zelenim (Williams et al., 2000 i Knox, 2003). Klingaman (2005) navodi da se ova ukrasna vrsta može uspješno razmnožavati u

različita godišnja doba. Tako se zrele reznice ukorjenjuju zimi, zelene reznice sredinom proljeća i poluzrele u ljeto.

Aktivne tvari koje potiču razvoj korijenja prilikom razmnožavanja reznicama obično sadrže indol-3-maslačnu kiselinu (IBA), 1-naftalenoctenu kiselinu (NAA) ili kombinaciju ove dvije aktivne tvari. Na tržištu su dostupne u obliku tableta, tekućine, praška ili gela (Blythe et al., 2004).

Supstrati su također značajni prilikom ožiljavanja. Treset se sve više koristi u cvjećarstvu i rasadničarstvu jer posjeduje mnoge kvalitete značajne za proizvodnju (Karašek, 1999). On predstavlja odumrli biljni materijal, koji je manje ili više izmijenjen različitim mikrobiološkim procesima i transformiran u humus (Hanić, 2000). Dokazano je da u tresetu biljke rastu za 20-30% brže, te da je ožiljavanje kraće za 4-6 dana. U rasadničarstvu se koristi za ožiljavanje reznica (čist ili u smjesi s pijeskom) (Karašek, 1999).

Temperatura i vlaga zraka su također značajni faktori tijekom procesa zakorijenjivanja (Vertels, 2012).

U novije vrijeme sve se više i u području ukrasnog bilja upotrebljavaju različiti botanički pripravci za ožiljavanje reznica. Jedan od njih je i pripravak od vrbe (*Salix.* spp.) (vrbina voda) koja obiluje auksinima, indol-3-maslačnom kiselinom (IBA) i salicilnom kiselinom.

Auksin je biljni hormon koji je uključen u čitav spektar bioloških mehanizama i na njegovom istraživanju se aktivno radi. Nama su najznačajnije uloge produljenja stanica i diferencijalni rast (Sauer et al., 2013), a imaju i ključnu ulogu kod različitih aspekata rasta, razvoja i diferencijacije korijena (Aloni, 2006). Vrbe obiluje i salicilnom kiselinom koja ima funkciju prilikom rasta i razvoja biljaka, endogenoj signalizaciji, obrani od patogena itd. (Hayat i Ahmad, 2007).

Zanimljivo je navesti da je indijska lagestremija i ljekovita, tako se čaj od njenih listova konzumira na Filipinima zbog visokog udjela polifenola (Labib et al., 2013).

Cilj rada je bio utvrđivanje postotka ožiljavanja drvenastih reznica ukrasne drvenaste kulture, *Lagestroemia indica*, uz upotrebu dva hormona za ožiljavanje i vode. Kao hormoni za ožiljavanje upotrebljeni su: Rhizopon II i vrbin hormon. Dobiveni rezultati trebaju ocijeniti koji bolje utječe na ukorjenjivanje i rast izdanaka.

Materijali i metode

Istraživanje je provedeno u stakleniku Agomediteranskog fakulteta, Univerziteta „Džemal Bijedić“ u Mostaru, u periodu ožujak – lipanj 2013. godine. Pokus je obavljen u negrijanom stakleniku, s automatskim prozračivanjem, ljetnim zasjenjivanjem i automatiziranim zalijevanjem i orošavanjem. Korisna površina obuhvaća prostor od 220 m^2. Položaj je istok – zapad. Korištene su zrele reznice *Lagestroemia indica* L. Reznice su uzete s matične biljke 08.03.2013. godine na Agromediteranskom

fakultetu. Presađene su u kontejnere od tvrde plastike volumena 200 ml (60 mjesta, dimenzija 4,5 x 4,5 x 14 cm).

Napravljene su reznice dužine 10 cm/120 komada. Presađivanje reznica je izvršeno u četiri grupe kontejnera s tresetnom mješavinom, koje su tretirane na sljedeći način:

- 30 reznica tretirano je vrbinim hormonom-period namakanja je 24 sata (08.03. – 09.03),
- 30 reznica tretirano je vrbinim hormonom-period namakanja 72 sata (08.03. – 11.03),
- 30 reznica tretirano je komercijalnim hormonom – Rhizopon II (Aktivna tvar: indolilmaslačna kiselina IBA) (08.03. – 08.03). Suhe reznice (30 kom) su s donjim krajem (bazalni dio reznice 2-3 cm) utisnute u praškasti preparat Rhizopon, s time da se suvišni preparat istresao nazad u posudu. Postavljanje reznica u supstrat obavio se odmah nakon tretiranja (Hadžiabulić, 2000).
- 30 reznica tretirano je vodom-period namakanja 72 sata (08.03. – 11.03.).

U svakom kontejneru je bila zastupljena tresetna mješavina. Obzirom da su vršena četiri različita tretiranja, bilo je ukupno 120 lončića.

Četrdeset dana nakon što je obavljeno tretiranje reznica hormonima obavljeno je prvo mjerenje (19.04.2013. godine), dok su preostala tri mjerenja obavljana u razmaku od 21 dan. Tijekom uzgoja, u četiri navrata, na reznicama su mjerene sljedeće karakteristike: broj listova, broj izdanaka i ukorjenjivanje. Pokus je završen nakon četvrtog mjerenja (21.06.2013. godine).

Vrste iz roda *Salix* - vrba proizvode velike količine auksina. Prirodno sredstvo za ožiljavanje se dobije kada se iz mladih izbojaka vrbe ekstrahiraju fitohormoni zaslužni za ožiljavanje. U ovom pokusu vrbina voda je pripremljena na način da je 40 reznica vrbe dužine 20 cm i debljine olovke, s kojih je uklonjeno lišće isjeckano i potopljeno u dvije litre vode te ostavljeno da stoji sedam dana. Nakon toga je pripravak procijeđen i korišten za namakanje reznica. Nakon toga reznice se posade u vlažan supstrat ili pijesak i ostave da se ožile. Pored auksina, vrba sadrži i acetilsalicilnu kiselinu koja ima antibaktericidno i antifungicidno svojstvo, što je također veoma značajno u procesu ožiljavanja reznica te indol-3-maslačnu kiselinu (IBA).

Statistička obrada provedena je mjerilima centralne tendencije tj. na osnovu izračuna aritmetičke sredine u programu Microsoft Excel 2010.

Rezultati i diskusija

Prema podacima (tablica 1) dobivenim kroz sva četiri mjerenja broja izdanaka *Lagestroemia indica*, može se zaključiti da su na prvom mjerenju najveći prosječan broj izdanaka imale reznice iz treće grupe, odnosno one koje su tretirane vrbinim hormonom u trajanju od 24 sata, dok je najmanji

prosječan broj izdanaka zabilježen kod biljaka iz četvrte grupe, odnosno kod reznica tretiranih vrbinim hormonom u trajanju od 72 sata.

Na drugom, trećem i četvrtom mjerenju broja izdanaka, ponovo se najbolje pokazala primjena vrbinog hormona u trajanju od 24 sata, dok se kao najslabija metoda pokazala primjena hormona Rhizopona II, te su reznice iz te grupe davale najmanji prosječan broj izdanaka.

Broj izdanaka *Lagestroemia indica*

Tablica 1. Prosječan broj izdanaka *Lagestroemia indica* (prema, Mujčin, 2013)

Table 1. *Average number of shoots of Lagestroemia indica (according to, Mujčin, 2013)*

Mjerenja	**1 grupa** Rhizopon II	**2 grupa** Voda namakanje 72 h	**3 grupa** Vrbin hormon namakanje 24 h	**4 grupa** Vrbin hormon namakanje 72 h
Prvo mjerenje	1,47	1,43	1,7	0,9
Drugo mjerenje	0,77	1,07	1,23	1,2
Treće mjerenje	0,73	0,9	1	0,77
Četvrto mjerenje	0,5	0,37	0,54	0,37

Broj listova *Lagestroemia indica*

Tablica 2. Prosječan broj listova *Lagestroemia indica* (prema: Mujčin, 2013)

Table 2. *Average number of leafs of Lagestroemia indica (according to, Mujčin, 2013)*

Mjerenja	**1 grupa** Rhizopon II	**2 grupa** Voda namakanje 72 h	**3 grupa** Vrbin hormon namakanje 24 h	**4 grupa** Vrbin hormon namakanje 72 h
Prvo mjerenje	1,5	1,63	1,57	1,27
Drugo mjerenje	2,93	1,2	1,43	2,2
Treće mjerenje	4,13	4,8	6,1	4,03
Četvrto mjerenje	4,73	1,53	3,17	2,93

Shodno tablici 2. prikazan je prosječan broj listova *Lagestroemia indica*. Kao što se može vidjeti, na prvom mjerenju je bio dosta ujednačen prosječan broj listova kod svih biljaka. Broj listova na tom mjerenju se kretao od 1,27 listova na biljkama iz grupe tretirane vrbinim hormonom u trajanju od 72 sata, do najvećeg prosječnog broja listova od 1,63 kod biljaka tretiranih vodom.

Na drugom mjerenju, prosječan broj listova se kretao od 1,2 kod biljaka iz druge grupe, odnosno biljaka tretiranih vodom do 2,93 listova kod biljaka iz prve grupe, tj. onih biljaka koje su tretirane s

hormonom Rhizoponom II. Biljke iz prve grupe razvile su znatno veći prosječan broj listova između prvog i drugog mjerenja, kao i biljke iz četvrte grupe, tretirane vrbinom vodom 72 sata.

Na trećem mjerenju, najmanji prosječan broj listova je zabilježen kod biljaka iz četvrte grupe 4,03, a najveći iz grupe tretirane s vrbinim hormonom u trajanju od 24 sata sa 6,1 listova.

Na posljednjem mjerenju najveći prosječan broj listova (4,73) imale su biljke iz prve grupe, odnosno biljke tretirane hormonom Rhizoponom II, a najmanji prosječan broj biljke tretirane vodom (1,53).

Ukorjenjivanje *Lagestroemia indica*

Tablica 3. Broj ukorijenjenih reznica *Lagestroemia indica* (prema, Mujčin, 2013)

Table 3. *Number of rooted cuttings of Lagestroemia indica (according to, Mujčin, 2013)*

Ukorjenjivanje	**1 grupa** Rhizopon II	**2 grupa** Voda namakanje 72 h	**3 grupa** Vrbin hormon namakanje 24 h	**4 grupa** Vrbin hormon namakanje 72 h
Broj ukorijenjenih reznica	9	0	3	0

Sedam mjeseci nakon uzimanja reznica (08.10.2013. godine) i njihovog tretiranja hormonima i vodom primijećeno je da je samo nekolicina biljaka ukorijenjena (tablica 3).

Tretiranje reznica hormonom Rhizoponom II pokazalo se kao najbolja metoda. Od 30 tretiranih reznica ožililo se 9 komada, što znači da je ožiljeno 27 % od ukupnog broja tretiranih reznica. Prema inozemnoj literaturi (Zhe i Chan, 2010) u supstratu izrađenom od perlita i treseta postignuto je ukorjenjivanje 80% zrelih reznica tretiranih s 250 mg/l IBA, dok drugi literaturni izvori (Wang et al., 2013) navode čak i bolje ukorjenjivanje od 90% također u sličnim supstratima.

Reznice tretirane vodom dale su veoma slabe rezultate. Od 30 tretiranih reznica niti jedna se nije ožilila (0%).

Reznice tretirane vrbinim hormonom u trajanju od 24 sata pokazale su slabije rezultate od biljaka tretiranih hormonom Rhizoponom II. Od 30 tretiranih reznica ožililo se 3 komada, što je 10% od ukupnog broja tretiranih reznica.

Biljke tretirane vrbinim hormonom u trajanju od 72 sata također su dale veoma slabe rezultate rezultate. Od 30 tretiranih reznica niti jedna se nije ožilila (0%).

Zaključak

Nakon istraživanja obavljenog na reznicama *Lagestroemia indica* korištenjem različitih hormona i vode, može se zaključiti:

- hormoni su imali izuzetno različit utjecaj na rast i razvoj biljaka *Lagestroemia indica*
- najveći utjecaj na rast izdanaka je imalo tretiranje reznica s vrbinim hormonom u trajanju od 24 sata, potom reznice tretirane vrbinim hormonom u trajanju od 72 sata. Nakon toga dolaze reznice tretirane vodom i na kraju dolaze biljke tretirane hormonom Rhizoponom II
- najveći utjecaj na prosječan broj listova biljaka se primijetio kod grupe biljaka koje su tretirane s hormonom Rhizoponom II, zatim kod biljaka koje su tretirane vrbinim hormonom u trajanju od 24 sata, nakon toga biljke tretirane vrbinim hormonom u trajanju od 72 sata i na kraju kod biljaka koje su tretirane vodom
- utjecaj na prosječan broj listova posebno je uočljiv između drugog i trećeg mjerenja
- najveći utjecaj na ožiljavanje se primijetio kod grupe biljaka koje su tretirane s hormonom Rhizoponom II, te nešto manji utjecaj kod biljaka tretiranih vrbinim hormonom u trajanju od 24 sata. Nikakav utjecaj na ožiljavanje nisu imale reznice iz grupe tretirane vodom, te grupe tretirane vrbinim hormonom u trajanju od 72 sata

Na osnovu rezultata dobivenih ovim istraživanjem može se zaključiti da se za uspješno ožiljavanje *Lagestroemia indica* iz netrapljenih reznica preporučuje se upotreba hormona Rhizopona II ili vrbinog hormona u trajanju od 24 sata, koja se pokazala najučinkovitijom.

Napomena

Rad je nastao u okviru izrade Završnog rada studentice Sanele Mujčin, vidi literaturu.

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Judging of ringneck doves (*Streptopelia roseogrisea* L.) and exhibition and judging of ringneck doves (*Streptopelia risoria* L.)

Slobodan Kulić[1]*

popularan rad (popular article)

For the upbringing of exhibition Ringneck doves, and their participation in competitions, there are three important things: the preparation for the exhibition, presentation at the exhibition, and judging and placement.

1. The Preparation of Ringneck Doves for an Exhibition

The preparation of any bird species for an exhibition in contemporary competitive aviculture is a very broad concept. The preparation does not only consist of the "final act" - the treatment of birds prior to the exhibition - but begins at least a year, and most often, several years earlier, by forming a quality breeding flock and choosing parental couples whose offsprings will be exhibition birds. Dedicated breeders-competitors work most seriously on the quality of their exhibition breeding flock permanently throughout the year, as this is the foundation of everything. When the basis is excellent, it does not take much effort to fulfill subsequent pre-exhibition tasks, in order to complete the preparations for the exhibitions.

However, a combination of knowledge, effort, and necessary tasks, is a winning combination with a high probability of resulting in top-notch winning placements.

Prerequisites for this are:

1. A healthy and quality breeding flock - health is an indicator of all the characteristics and qualities of each bird, especially if it is an exhibition bird as well;
2. The right choice of parents, and the formation of couples;
3. A satisfactory number of young birds;
4. The professional selection of quality young birds for exhibitions;
5. The plan and schedule of participation in exhibitions and, last but not least,
6. To correctly fill in the application forms for the exhibition according to the organizer's exhibition sections. A possible rejection may otherwise result due to an incorrect class determination.

In addition to these basics, there are also additional conditions:

1. A proper nutrition of the breeding flock throughout the year – the basic and most critical condition for normal growth and development, regeneration and maintenance of condition,

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and normal functioning of all organs and metabolic processes;

2. A proper accommodation of the home-breeding flock (enclosure, aviary and cage - with satisfactory dimensions, adequate layout of perches, and plants for optimal physical development) and other necessary conditions (temperature, ventilation, draughtless, air humidity, lighting, a quiet space, regular hygiene maintenance, etc.);
3. The preparation of breeding pairs with the necessary additional nutrition;
4. The proper nutrition of parents and younglings during a breeding cycle;
5. A timely separation of younglings and the preparation for complete independence;
6. A proper accommodation of younglings with sufficient space and conditions for flight, and comprehensive development of musculature and skeleton;
7. The training of future competitive birds for the full presentation of quality at exhibitions;
8. Final preparations before the transport to the exhibition (removal of impurities from the feathers – bathing and washing with hot water, bird shampoos, nail cutting, the treatment of the beak and feet with a care cream, etc.) These are very important and sometimes crucial for a good grade;
9. The transportation of birds to the exhibition venue and accommodation in exhibition cages (without stress, loss of feathers and injuries).

All of these conditions are also success factors, and are all individually important for the final result - success, and above all the presentation of the quality of the selected competition specimens. That is why it is indispensable for each individual specimen to be approached with great seriousness and expertise, and give them the necessary attention.

In addition to the above-mentioned, one needs to know the following as well:

Some features of a bird cannot be corrected before the exhibition, but for some it is feasible, desirable and useful. This mainly refers to what is not directly related to the genetic quality of a bird, but is visible, so it can sometimes be crucial in evaluating. The real damage is when a judge has to punish a quality bird because of ignorance, neglect, or the negligence of the breeder for something he could do.

What can be affected the most is feathers and deportment, in the sense of bird behaviour in a cage.

The feathers should be taken care of in timely manner. Very often, some of the feathers are frayed, twisted, irregular, etc. and should be plucked in time. It should be kept in mind that the time needed for the growth and formation of new feathers is 40 – 50 days.

In parallel to this, a bird should be transferred to an exhibition in a smaller cage in order for it to get used to a smaller space, and be put in a "busy" place in order to get used to the presence of people. It is

simultaneously the training for a good "pose" during judging, which involves normal jumping and flying in the cage without fear.

And this is not all. A well-prepared bird must be "aware" of its beauty, it must impose on the judge by its behavior - prancing, singing - simply "showing off" and being "convinced" that it can be a champion. Many times, I have judged birds prepared in such a manner, and rewarded them with a good placement. A grade higher can mean a lot at the end.

Therefore, without an adequate preparation for the exhibition, there is no satisfactory judging.

2. A presentation at the Bird Exhibition as the Ultimate Goal

Breeders-competitors have exhibit-related activities and the results they want to achieve throughout the entire season of the competition, which begins long before the show.

From the aspect of judging and announcement of the winners, there are competitive bird exhibitions, and bird shows.

According to the types of showpieces, there are comprehensive, combined and group exhibitions for all or several bird species, as well as the so-called "specials" show, for just one species of bird, which are most often organized by specialist clubs.

Also, there are many ranks of competitions – exhibitions, ranging from social (as the lowest) to national and world championships as the highest ones. For a large number of federations, the results from competitions ranked in such a way are usually bases for scoring criteria, and summing up the annual results and the announcement of the best breeders by sections, as well as overall winners at the end of the competition season.

In bird shows, birds exhibit and present themselves without the placement, rewarding and the announcement of winners, and they are organized mostly for the purpose of socialiser exhibitors, with each other and with other breeders and visitors. They can also be educational in character, with professional presentations and lectures. They are also often of a commercial nature, where birds, food, food supplements, basic and accompanying accessories for upbringing and literature are bought, sold and exchanged. That is why such exhibitions are usually outside of the competition season (at its beginning or end) and are visited by throngs.

The competition season usually begins in Autumn, with exhibitions of the lowest rank. Such competitions are usually organized by one or more societies together.

Exhibitions can be: city, intercity, regional, republic, state or federal, or more widely territorially connected when organized by societies or associations of several countries of the region and even the whole continent (The European Championship, South American Championships, Australian Championships, etc.), COM exhibitions and, of course, a top notch exhibition of birds as the crown of all competitions – the World Ornithology Championship. This is regularly organized every year according to precisely defined criteria and propositions under the patronage of COM **(**La Confédération Ornithologique Mondiale – The World Ornithological Confederation), and the World Cup of the Southern Hemisphere, as the territorially separated COM World Championship.

Many exhibitors have the desire to participate in numerous exhibitions of a different rank, and present the results of their breeding. On this occasion, they usually create a schedule of exhibitions where they will participate, and plan and prepare their representative samples based on this, balancing the quality of their exhibition specimens, and the expected competition to the level of the exhibition.

For a proper choice, the basic knowledge of judging is crucial – the knowledge of the standards and other exhibits, the quality and characteristics of their breeding flock and their offsprings, the correct and objective judging of the breeder himself and his colleagues – visitors to his farm, because the results depend on the correct selection of competitive birds.

Upon the completion of the primary selection, a further course of preparation for the exhibitions begins – from calming the birds and getting them used to the exhibition cage, to cosmetic interventions for the purpose of aesthetic corrections.

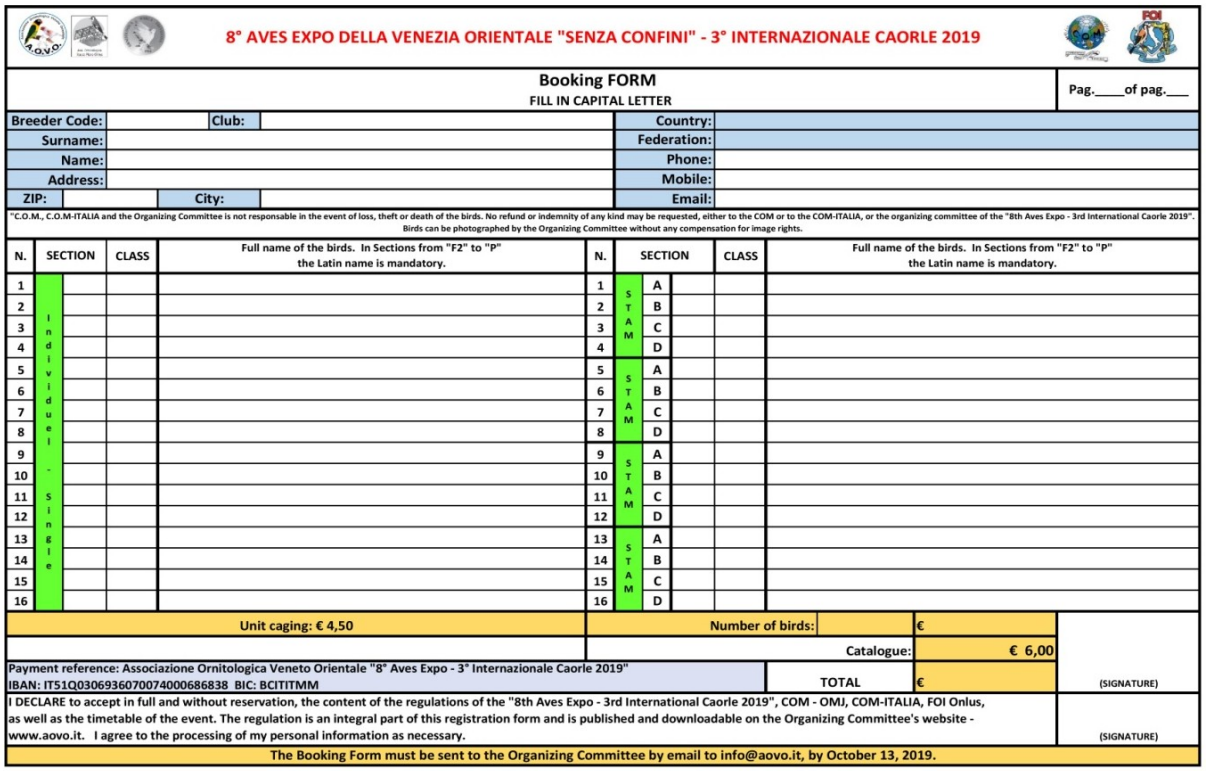
The final selection of the "representation" for participation in the exhibitions is done by a breeder when completing the exhibition application (see the photo). However, corrections of the "competition list" are possible right until the departure to the competition or exhibition.

3. Registration of birds for exhibitions

Within a specific period – the deadline set by the organizer of the exhibition, interested breeders to participate in the exhibition need to fill out and send a consolidated application for all birds they intend to exhibit and, together with a proof of payment, depending on competition proposals and competition rank, sent it directly to the organizer or his Society – the club that forwards all applications, or to the organizer when it comes to exhibitions of lower rank all the way to the levels of the federal championship or send the aplication to the Federation when it comes to the World championship or some international exhibition under the auspices of COM (Figure 1).

Before filling in the Application, it is necessary to know the exhibition classes and your birds for exhibitions (mutations, combinations of mutations…) in order to fill in the application correctly and thus avoid possible declassification due to incorrect application. What is very important and common

is that the organizer, along with the announcement of the organization of the exhibition, encloses the Application for the exhibition, Proposals for the competition and the List of exhibition sections and classes according to which the exhibits are classified. When it comes to World Ornithological Championships, the list of Sections and classes is made public long before the championship in order for potential exhibitors to be informed in time about possible changes in relation to the previous list.



8° AVES EXPO DELLA VENEZIA ORIENTALE "SENZA CONFINI" - 3° INTERNAZIONALE CAORLE 2019

Booking FORM
FILL IN CAPITAL LETTER

Pag.____of pag.___

Breeder Code:	Club:	Country:	
Surname:		Federation:	
Name:		Phone:	
Address:		Mobile:	
ZIP:	City:	Email:	

"C.O.M., C.O.M-ITALIA and the Organizing Committee is not responsable in the event of loss, theft or death of the birds. No refund or indemnity of any kind may be requested, either to the COM or to the COM-ITALIA, or the organizing committee of the "8th Aves Expo - 3rd International Caorle 2019". Birds can be photographed by the Organizing Committee without any compensation for image rights.

N.	SECTION	CLASS	Full name of the birds. In Sections from "F2" to "P" the Latin name is mandatory.	N.	SECTION		CLASS	Full name of the birds. In Sections from "F2" to "P" the Latin name is mandatory.
1	Individuel - Single			1	STAM	A		
2				2		B		
3				3		C		
4				4		D		
5				5	STAM	A		
6				6		B		
7				7		C		
8				8		D		
9				9	STAM	A		
10				10		B		
11				11		C		
12				12		D		
13				13	STAM	A		
14				14		B		
15				15		C		
16				16		D		

Unit caging: € 4,50	Number of birds:	€	
	Catalogue:	€ 6,00	
Payment reference: Associazione Ornitologica Veneto Orientale "8° Aves Expo - 3° Internazionale Caorle 2019" IBAN: IT51Q0306936070074000686838 BIC: BCITITMM	TOTAL	€	(SIGNATURE)

I DECLARE to accept in full and without reservation, the content of the regulations of the "8th Aves Expo - 3rd International Caorle 2019", COM - OMJ, COM-ITALIA, FOI Onlus, as well as the timetable of the event. The regulation is an integral part of this registration form and is published and downloadable on the Organizing Committee's website - www.aovo.it. I agree to the processing of my personal information as necessary. (SIGNATURE)

The Booking Form must be sent to the Organizing Committee by email to info@aovo.it, by October 13, 2019.

Figure 1. Booking form for the COM international exhibition Caorle, Venezia, Italy 2019. (Source: COM)

4. Bird Judging and Placement

There is no competitive exhibition without judging, determination of placement, and the announcement of the winner. This is the third, indispensable and the most important element of all competitive exhibitions.

Bird judging, in the order of activity at the exhibitions, comes after the reception and accommodation of birds in exhibition cages.

Depending on the ranking of the exhibition, birds can be evaluated by national and international judges, i.e. OMJ judges for the bird section for which they have passed the professional exam.

The judges can judge individually or in pairs, while the act of determining the best-placed birds is usually done in consultation with a colleague or colleagues. It is quite normal and not incorrect for the judge-assessor to do it himself.

The judging is done without the presence of an "audience" – breeders or competitors. The only ones that can be next to the judge are certain stewards, chosen by the organizer, who help the judge perform the judging work better, in a more organized and more efficient way.

The judging is done by completing the scorecard for a particular section. These can be classic ones - paper scores or electronic scorecards on tablets, introduced a few years ago.

For any dilemma that a judge may have during work, he or she may contact the rating supervisor at the exhibition, or the organizer of the competition.

Upon completion of the judging, depending on the "working technique" of either physical submission or over the Internet, or local electronic connection, the judge sends the scorecards (*Fiche de jugement*) to the organizer, who records the placements and further transfers the data for the exhibition catalog.

After the final placement, the on-call team of the organizers places a sumptuous rosette for the first, second and third place, on the cages of the award-winning birds (Figure 2).

Figure 2. Bird for exhibition (Photo: Klaudia Kacagó Gerléi, 2019)

Some organizers practice placing smaller-format scorecard lists on each cage, for educational purposes and for the sake of transparency. This is definitely a good practice.

When all this is done, the exhibition is ceremoniously opened for visitors.

During the exhibition, we must not forget that a huge role in the exhibition is played by the conveyors, who, in addition to transporting the exhibits, take care of the food, water and health of the birds at the exhibition.

The end of the exhibition is reserved for announcing the winners and results of the exhibition for all sections and classes, awarding trophies and medals to competitors whose birds are the best placed and a diploma for all participants in the exhibition.

At the end, the exhibition closes and exhibits are issued to the participants of the exhibition.

All exhibitions are mostly accompanied by a good organization, well-planned schedule of activities and obligations and full commitment of the team members on duty to the realization of tasks and obligations, and of course striving for the exhibition to be successful and everything to go well.

THE HISTORY OF RINGNECK DOVES JUDGING

Historically speaking, there has always been a need to verify the quality of the birds that are breeding. Initially, this was done at breeders' meetings, where the judging or quality estimation was declaratively and consensually established. However, this did not fully satisfy the "taste, aspirations, and desires" of breeders, because the grades were a matter of individual impression, they differed vastly and were not official. That is why the creation of certain norms related to birds was initiated on the one hand, and the ones related to judging were initiated on the other. For birds, the so-called standards that primarily encompassed the "appearance" and the visual impression were produced, and then the behavior, deportment, condition and general impression the bird leaves on the judge. On the other hand, items were determined – the judging areas and judging criteria.

In order to do everything properly, it was necessary for someone to make, or apply, the standard, and to assess the quality. Initially, the most prominent and renowned breeders were selected, most of whom were grouped into commissions that did this, first at informal meetings, then at exhibitions of small animals where birds were exhibited, and later in solo exhibitions of birds.

In order to have a written history, a scorecard (Fiche de jugement) was created and the criteria for judging were defined. Initially, these scorecards had only a few items, usually three or four, such as the color and plumage, size and shape, feathers and impressions, and later more precise criteria were included.

With the establishment of first scorecard, the judging areas were also defined.

The shape of birds should be such that there is a harmony between the head, neck, body and tail. The back is straight, the breast slightly bowed, and the head is properly rounded. The bird must not have a humped or hunched back, a protruding or funnel breast.

The size must be reflected in the standard. The bird must not be brittle (too small), but not too large, as these are deviations from the ideal length of the bird.

The deportment is the bird's position in relation to the perch as well as the behavior of the bird during the judging.

The color and drawing should fully correspond to the description of mutations, since any irregularity or deviation is negatively evaluated.

The wings and tail must have fully arranged feathers of adequate length and color. The wings must be staying close to the body and the tail must be a normal extension of the back.

The beak, legs and toes must be regular, without deformation and properly colored.

The valid *Fiche de jugement* – scorecards common to all exhibition classes of Section "O" – Diamond doves, Ringneck doves, Turtledoves, fruiteaters doves and other exotic pigeons have not changed for more than twenty years and dates back to the last, XX century.

Since everything is prone to changes and improvements, it would be necessary to make some corrections both in the scorecard itself and in the judging items and their redistribution according to the importance and number of points. But we will not make suggestions about that here, but we will leave it to the OMJ expert team for Section "O" to do it at one of the next expert meetings, because there are already some suggestions.

In the current Scorecard – (*Fiche de jugement*), the first judging items are Color and drawing and carry as many as 40 points.

The second judging items with 10 points is **holding.** It should be the typical and natural behavior of a Ringneck dove.

The size and shape in its entirety represent the third judging point that carries 10 points.

The size (and including the length as its element) must correspond to the Ringneck dove standard.

The shape must be characteristic of Ringneck doves, based on the type and enhanced by a similarly imagined image of an ideal bird. The shape refers to the whole body and unites all its parts – head, beak, neck, wings, tail and legs, into one regular and harmonious whole.

The fourth judging point is **feathers** and with 20 points it has a significant part in the overall score.

The condition - Fitness is the fifth judging point with 10 points.

The last, sixth point is **the General Impression**, which also carries 10 points.

Looking at the Fiche de jugement - Scorecard, regardless of the order of judging items, we see that the most important and with 40 points is the most valuable item Color and drawing – Color and drawing, and the second most important item is Feather – Feather with 20 points, although it is in the fourth place in the scorecard. The other four items have the same number of points, i.e. 10 points each.

THE RINGNECK DOVES JUDGING TECHNIQUE

The complete bird judging technique includes several segments, primarily a technical and professional part. It is technically related to the conditions and equipment of the premises where the judging will be carried out, or more professionally speaking the execution of the judging procedure.

1. General conditions for bird judging

There are several essential and very important conditions that enable and ensure bird judging at exhibitions in the best possible way. These are: the lighting, temperature, peaceful environment, color of exhibition cages, technical preparation for judging and support of the organizer.

One of the most important conditions during the judging is the lighting (Figure 3).

Figure 3. Artificial lighting during judging (Photo: S. Kulić)

There are several essential and very important conditions that enable and ensure bird judging at exhibitions in the best possible way. These are: the lighting, temperature, peaceful environment, color of exhibition cages, technical preparation for judging and support of the organizer.

One of the most important conditions during the judging is the lighting.

It is commonly known that it is best to evaluate birds when it is an ideal sunny day, because then it is the most accurate lighting. Then all the qualities, but also the flaws of the exhibition bird, are the most observable. The most important thing is to clearly see their true color or shade of color, which is very important and sometimes decisive when it comes to color mutations. However, this is hardly feasible for many reasons - changing the angle of the light, the time of the day, the brightness, the color quality of sunlight that can change during the day due to barely visible cloudiness, and other conditions which affect sunlighting. On the other hand, the practice is such that the judging is done in a closed room and most often under artificial light, which should be most similar to the sunlight. Therefore, proper lighting in the judging site should be given special attention and care. The layout of the light sources in relation to the rating table can be of crucial importance. It is not recommended that the illumination source is positioned opposite the judges, due to blinding (contrary light), but it is also not desirable that the illumination source is behind the judge's back due to "hard" shadows. It would be for the best if the light source is a bit on the side and behind, which will allow for better highlighting of the intensity of colors and the expressiveness of the plumage.

In the last few years, at large exhibitions, it is not unusual to use artificial lighting above the rating tables. The most common are light boxes with two parallel neon tubes, with a power of about 40 watts placed at about 80-100 cm above the assessment table. The neon tubes used are with a balanced imitation of sunlight, both in terms of spectrum and intensity, as well as in the so-called color temperature. Neon tubes can be from different manufacturers with the following characteristics: 80 cm, 40 W, 4500-5500 K.

The temperature is also an important condition at the exhibition, in order to make the birds feel comfortable and relaxed, and not stiff, ruffled and cluttered, which is what these birds are especially prone to when the temperature does not suit them. The optimal temperature allows birds, with arranged feathers and relaxed behavior, to fully show their qualities.

A quiet environment means space without too much unnatural noise, sudden sharp and strong sounds, vibrations and other disturbing situations for birds.

Regarding the correct judging, there is another recommendation, which has been discussed a little bit more in recent years, as a useful proposal regarding the color of exhibition cages and possible aids. In practice, the color of cages is usually white, which is somewhat correct but not the best solution, especially in the judging of white and bright pastel birds. This could be improved by simply placing, at

an appropriate distance, an opaque screen, of light green color and without a reflection. It can also be a plain cardboard placed on a stand, so that the birds will not be disturbed by waving. Make an experiment and you will see the effects of this setup. So, this "intervention" is very simple, inexpensive and does not require changes in exhibition cages. Unfortunately, there is still no sufficient use in practice.

There are also other conditions that enable the unhindered and continuous work of the judge: an excellent cooperation with the organizer and the bird bringers, a sufficient number of scorecards, lists of birds for judging by class (of course without the name of the breeder), and in the recent times a working tablet with balanced programs and functional internet, or a local connection for the tablet with a central computer and the like.

The organizer who wants a successful and impeccable exhibition would have to take all of this into account with the care of bird lovers, a good breeder, host and organizer.

An integral part of technical "support" is the scorecard.

For the judging of Ringneck doves, the scorecards for Section "O" – doves: Diamond doves, Ringneck doves, Turtledoves, fruiteaters doves and others exotic pigeons.

Until recently, these were just classic ones – paper scorecards, and several years ago electronic scorecards on tablets became increasingly used. It is needless to say which system is better and more modern, as this is self-explanatory (Figure 4).

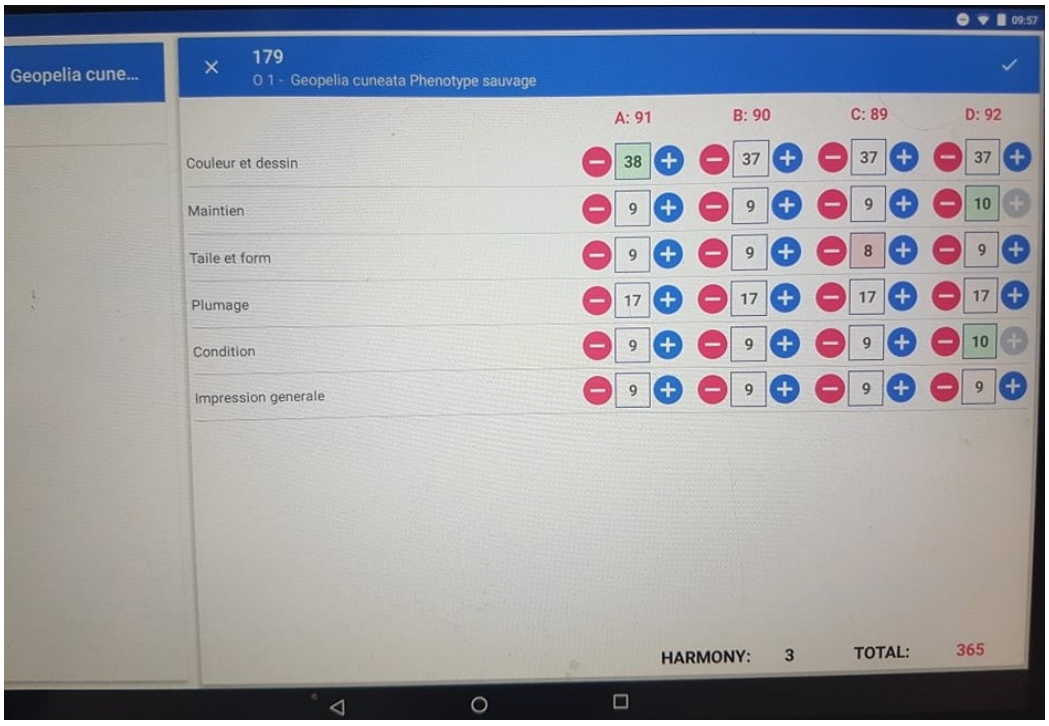


Figure 4. Tablet – Scorecard for Section "O" (Photo: Vicko Antičević)

Electronic scorecards are on tablets and are supported by a certain accompanying program, hence the benefits. The benefits are such that they give usually or most commonly the so-called basis for each judging area, so the judge adequately gives a bird his or her rating in accordance with the quality of the assessed bird by pressing the "+" or "-" or simply by changing the initial grade. Automatically, in the end, a sum appears, which facilitates the work of the judge and prevents an error in the final grade, or in the addition of points, which in practice is not a rare case. In addition, the judging via tablet does not require the entry of the bird class, the name of the mutation, the number of the exhibition cage, the name of the judge and the date of the judging. On the other hand, simply by pressing the command, you can disqualify the bird (DQ – disqualification), disentitle (DE – declasse, a disentitlement from a class), or notify that the bird is not assessed (NJ – no judgement). Also, the judge is always in the position to see the list of all the birds of the class they assess and the placement of the birds so far estimated, by the activation of a particular command. Upon the completion of work, by respecting the criteria, he or she receives the final placement which is sent to the organizing committee of the exhibition. Naturally, it is possible to adjust the judging until the end of the work, without any consequences, which is another advantage of this kind of work.

The initial score, depending on the program and the exhibition, can be reduced to 88 points, which at this exhibition is usually competitive - a rating minimum, or to 90 points, which is the score of a quality bird, which is desirable at the exhibitions of a higher ranking of the competition.

Some programs have short instructions for disqualification and disentitlement (Discqualification – "disq") of the birds available (Déclassé "decl") to the judge.

In addition, there is other helpful information on the tablet: the exact time (hour), the percentage of judging birds, and the like.

THE PROCESS OF BIRD JUDGING

The judging technique is a serious and comprehensive process of professional quality grading, by determining individual grades for each judging area, and overall aggregate judging at the end, determining placements and announcing the winner (of a class, section or exhibition).

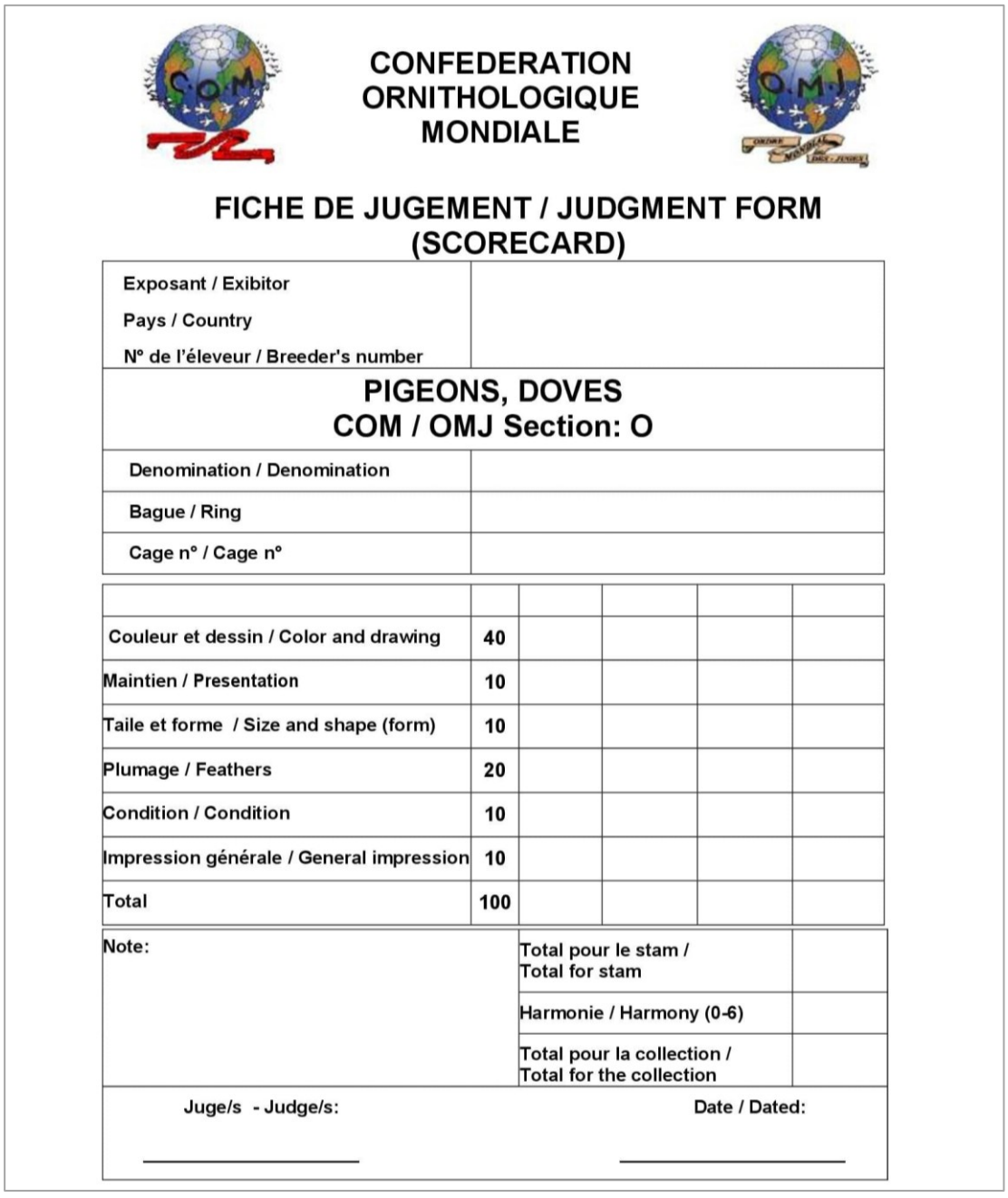
Theoretically, the maximum number of points is 100, but this is unattainable, so the so-called basis or starting points have been introduced. The basis may be lower depending on the ranking of the competition – 88 (for birds of medium quality) or higher – 90 (for birds of high exhibition quality).

Generally, a Ringneck dove that is typical of its kind and has, by standard, all the typical characteristics, excellent melanin pigments and plumage, good shape and size, is healthy and well-

groomed and has an appropriate presentation will be graded with a score of at least 90 points, which is the number of starting points at major exhibitions.

THE SCORECARD AND JUDGING AREAS WITH COMMENTS

A valid scorecard contains 6 judging items: color and drawing, presentation, size and shape (form), plumage, condition and general impression at the end (Figure 5).



CONFEDERATION ORNITHOLOGIQUE MONDIALE

FICHE DE JUGEMENT / JUDGMENT FORM (SCORECARD)

Exposant / Exibitor Pays / Country N° de l'éleveur / Breeder's number	

PIGEONS, DOVES
COM / OMJ Section: O

Denomination / Denomination	
Bague / Ring	
Cage n° / Cage n°	

Couleur et dessin / Color and drawing	40				
Maintien / Presentation	10				
Taile et forme / Size and shape (form)	10				
Plumage / Feathers	20				
Condition / Condition	10				
Impression générale / General impression	10				
Total	100				

Note:	Total pour le stam / Total for stam	
	Harmonie / Harmony (0-6)	
	Total pour la collection / Total for the collection	

Juge/s - Judge/s: _____ Date / Dated: _____

Figure 5. Bilingual scorecard for Section "O" (Source: COM)

1. COLOR AND DRAWING – 40 points

The first judging items in the scorecard is "Color and drawing". It carries the highest number of points – 40 and the starting base is 36 points. In order to fully analyze this judging point, it is necessary to break it down into individual parts.

1.1. Color

When it comes to **color**, it should be pointed out that in aviculture, during the domestication, the biggest differences occurred in the color of the feathers in relation to birds of nature. Even gray birds, originally called "naturally colored birds", are no longer completely identical with birds of nature, which is especially noticeable in the abdominal color of the female. She is pure white in nature, while she is beige with gray exhibition zebra finches.

Also, eye color has undergone a change. The original red iris is now, as a rule, dark brown, so the eye at first glance seems to be monochrome dark. In some breeding lines, though, the red iris is close to the natural color of the eyes, which is by no means a fault, although some judges do not think so.

The color in the scorecard is the subject of individual descriptions of the standards for different mutations, and there is not much doubt about it, because the standard is very clear and easy to apply.

1.2 Drawing

The term "**drawing**" includes all characteristics of the feathers that "animate" the basic color.

The color of the drawing varies, according to the mutation of the bird, from gentle beige through lead and dark brown to black, and can also be completely missing.

The plumage includes dark lines that border the upright white field of the front of the face and are called the beak and tear markings.

FAULTS: The most common fault is the uneven intensity of the basic color of the feathers and incorrect, incomplete and intermittent drawing.

NOTE: Breeders should know that the color of the feathers can be changed by poor diet or starvation, hormones or their disrupted function, disease, physical skin injuries, and aging, but also under the influence of sunlight.

JUDGING: The maximum number of points in this item is 40, and the basis is 36 points.

If the colored zones are clear, the basis is awarded, while 1– 2 points are taken away for uneven intensity. For a good visual appearance of the basic color and its uniformity, the judges will add 1 point to the basis.

The number of negative points in this item is not limited. For an uneven intensity of color or a mistake in the drawing, 1–5 points are deducted, depending on the number, type and "severity" of the mistakes that the bird manifests.

Sometimes the errors in color and drawing are so pronounced that the bird gets a grade below any minimum and does not deserve a comment, because such a bird is not in the standard. Often the drawing is so bad (inadequate, incomplete or non-intensive) that, objectively speaking, the bird should be excluded from the competition. Certainly such a bird is not a competitive bird because it is not in the standard and is not for further breeding. Such birds are the result of breeders' mistakes, unprofessional work and inadequate mating, and such mistakes are usually rooted in the genetic structure of that bird and sometimes the entire breeding flock. This should be written to the breeder in a note on the judging list.

However, there are also quality copies with excellent color and good drawing features that the judge should reward with a point more.

NOTE: Although two special points (color and drawing) are concerned, the judge also takes into account the inclusion of drawing in the color of the bird, which often leaves a special impression, which can be decisive for placement!

2. PRESENTATION – 10 points

Presentation is second judging item in scorecard.

Presentation, ie behavior should be natural and without fear, correct and typical for Ringneck doves, and the **attitude**, which is in some way an integral part of this judging item, means, above all, its position in relation to the stick.

Therefore, on the one hand, presentation means the behavior of birds in the exhibition cage, and on the other hand, keeping, i.e. the position of body parts: wings, tail, leg and the position of the body itself.

The presentation or position of the dove should be natural and at the same time act obliquely rather than steeply upright; with the axis at an angle of 45 ° to the horizontal. Only in the state of rest is the body allowed to rest on the stick.

The fact is that many breeders do not pay enough attention to preparing and training birds for the exhibition, so they need to be constantly educated in order to change such a situation. It has already been said that it is necessary to put the birds in an exhibition or smaller cage a few weeks before the exhibition. They are trained by placing themselves on a table at least once a day, moving from one end of the room to the other and simulating the judge's work in front of them. In that way, the birds will get used to that procedure and will not react wildly in the cage, but will take the correct position.

FAULTS: that most often occur when holding are: crossed wings, a relaxed or raised tail, a fan-shaped tail, an angle greater than or less than 45 °, maladaptation to the cage, etc.

NOTE: All faults in shape and presentation are transmitted dominantly by the parent to the offspring, which can be manifested in the first generation. That should be taken into account.

At the exhibitions, you can still see specimens that do not meet what is required by the item "presentation" or attitude, and especially the behavior during judging (restless flying in a cage).

JUDGING: The presentation item is closely related to the preparation of the bird and its adaptation to the exhibition cage and judging. When judging the bird must be accustomed to the exhibition cage, and not be afraid. Standing on a stick, it must show a characteristic holding angle. The wings must have a characteristic shape and position. The tail feathers must be arranged one over the other, so that when viewed from above, they give the impression of compactness, firmness and equal width. The grade in this item is a logical sequence of previous grades, it includes her health, vitality and purity. In this paragraph, the judge may, at his own discretion and according to his expert opinion, make a correction of the overall grade. The maximum number of points in this item is 10, and the starting base is 9 points. The number of negative points in this item is deducted depending on the number and type of errors on the bird. A bird that has an exemplary presentation, that poses in front of a judge during the judging and is "aware" of its beauty, should be rewarded and evaluated with the maximum number of points for this judging point.

Note: Without the proper behavior of the bird in the cage, the judge will not be able to objectively see all its pros and cons.

3. SIZE and SHAPE (FORM)

The third juding item in the scorecard is Size and Shape (Form)

3.1.The size of the Ringneck dove

Size (and within that is **length** as one of its elements) refers to the body, but also all its parts that are measurable and must correspond to the standard of a dove.

The exact size measure and its accuracy largely depend on the applied measurement method. If we measure good show birds scientifically correctly, ie on the back, from the top of the beak to the edge of the tail, we will get a value of **25** – **27 cm**, and if it is measured by the geometric method, it will be a few centimeters smaller.

Size is a characteristic that, as experience has shown, is subject to change. With hard work and skilful breeding selection, the size can be significantly increased, so the constant aspiration of the breeder was

to raise Ringneck doves of adequate size. In practice, this means that both birds that are too big and too small will be punished.

FAULTS: Faults in this item usually occur in birds that have formed by mating in a relationship. The most common mistakes are: a large or small length of the bird in relation to the ideal, but this also applies to the shape and size of the head or beak, etc.

3.2. The shape (form) of the Ringneck dove

What every judge, breeder or observer, rather perceives with a bird, except for feathers, is certainly its shape (form), ie constitution, as well as its calm presentation or restless jumping in a cage.

The shape of Ringneck dove represents the geometric design - shape of bird as a set that unites all the body characteristics, body composition and body structure of the bird.

The shape reflects all the characteristics of the Ringneck dove, based on the natural type, which have been improved in accordance with the imagined image of the ideal Ringneck dove, which is sought by breeders of exhibition birds. It refers to the whole body and unites all parts - head, beak, neck, wings, tail and legs, into one regular and harmonious whole.

The head, neck, shoulders, chest and back should form a complete whole, with recognizable characteristics of a dove, and the shape and position of the tail and wings should fully meet the standard characteristics.

The OMJ standard, which unfortunately does not yet exist as an official document - a rulebook for judging, should fully define the shape - form, starting with the shape of the head, body position, overall appearance: beak size, eye shape, size and volume neck and its connections with the head and body, presentation of the wings and tail, body shape, line of the back and lower part (chest and abdomen)

FAULTS: The Ringneck dove can have the following disadvantages: large or small length of the bird in relation to the ideal, inadequate line of the back or lower part - chest and abdomen, sagging on the back, sagging on the back of the head, relaxed stomach, oversized beak, oversized or small head, overweight and lean birds, etc. Errors in this item usually occur in birds that been formed by mating in kinship.

What is good about the shape of the Ringneck dove is the aspiration of experienced and good breeders that the shape of their birds be identical, typical, that is, that the birds look like each other in shape.

4. FEATHERS – 20 points

Although it is in the fourth place on the scorecard and is evaluated to the maximum with 20 points of feathers, it is a very important judging item on the scorecard.

It is possible that some breeders did not think about the importance of feathers and, above all, the impact that it has on other items on the scorecard, so we should draw attention to that.

What is meant by "feathers" on the scorecard?

Overall feathers are a set of different types of feathers that shape a bird and give it color and drawing. Through the feathers we distinguish and identify the species of bird or its mutation.

In the scorecard, "feathers" refers to the adequate arrangement of feathers, their compactness, length, smoothness, shine, purity of color and drawings of the bird participating in the competition.

The feathers should adhere well to the body, be complete, smooth and shiny, without signs of moulting and all feathers should be full length (not insufficiently grown, broken, worn, torn or insufficiently grown).

Feathers are a very important element on the scorecard. Almost all other elements are indirectly influenced by it. In addition to feathers that are nurtured, complete and clean, judges can correctly evaluate other elements of judging.

What happens when the exhibit has unkempt, dirty, incomplete, messy or torn and ruined feathers? How then can a color or drawing be properly assessed? How are symmetries, constraints and contours of drawings established? How can a judge assess, determine value, and form the correct decision, if the markings and melanin distribution have changed due to improper arrangement or missing feathers? Due to messy or torn feathers, the values of markings, melanin, hips, back and wing color cannot be assessed. Imagine a dove with dirty, missing or messy feathers. How can the purity of the base color or drawing be assessed? Very difficult or almost impossible.

The shape and figure are also changed when the bird has feathers that are disheveled, messy, do not fit well or do not adhere to the body. It is obvious that the pronounced non-adherence of the feathers changes and worsens the shape of the exhibition specimen.

Presentation and position are also very closely related to feathers. A restless exhibit that is constantly jumping or flying inside the cage, which, in addition, usually has broken, shabby and worn feathers, will certainly not get a good grade.

The condition is related to all points from the scorecard, and based on what has already been said, it is obvious that "feathers" also affect these points, i.e. elements.

Therefore, "feathers" is not just one item from the scorecard that has a standard description and is evaluated independently, but it really has an impact on all the others, so it also affects the final judging of the competition dove. For realistic and precise judging, "feathers" have a decisive role. That is why a lot of attention must be paid to the feathers of show birds.

Feathers are generally important for Ringneck doves, so constant and pronounced care is necessary. The ideal is a healthy, clean, stout, cheerful and perfectly groomed bird, which is mostly reflected in the feathers. Such a bird will be an excellent candidate for a good placement in any competition - exibition.

FAULTS: The most common and biggest mistakes of feathers are: broken and disheveled, as well as lack of feathers and visible unfeathered parts of the body.

JUDGING: What the judge must take into account when judging is that the bird must be completely feathered and washed. The feathers of the wings and tail must be complete. There must be 18 long flight feathers in the wings (primary, secondary and tertiary 6 feathers each), and 12 long feathers in the tail. The feathers must be close to the body, exude freshness and shine and give a complete whole in the appearance of a bird.

The maximum number of points in this item is 20, and the starting base is 18 points for birds with good feathers. The number of negative points in this item depends on the number and type of defects on the bird, and the lack of feathers, incompletely grown feathers without shine, feathers in moulting, non-adhesion to the body, feathers without smoothness and shine, worn, short or too long feathers is punished. Of course, the feathers must not be curly and messy.

When moulting disturbs the general appearance of the evaluated specimen, we will not evaluate the bird, and we will do the same if the bird lacks five flight feathers or half a tail, with an explanation on the scorecard.

When we have a Ringneck dove prayer where every feather is in its place and which looks like it is made of porcelain, it deserves 19 points, and in exceptional cases even all 20 points.

5. CONDITION - 10 POINTS

Condition is the general physical and health condition of the show bird. All of the above judging items are also affected by the appropriate condition (general physical condition). Therefore, it goes without saying that fitness is the basic premise for a realistic judging.

FAULTS: Deficiencies of good condition are noticeable in diseases, injuries and poor condition in general, based on bristly feathers as well as distorted presentation, blurred eyes, pale colored beak and the presence of traces of diarrhea. The absence of good condition is manifested by the existence of the

so-called. "Holes" in the feathers due to moulting and damage to the feathers, as well as damaged varnish on the beak.

JUDGING: If the bird is healthy, calm, has harmonious movements and is curious about the surrounding events it will get 9 points. A dirty bird should not get more than 8 points. If the bird seems sleepy, tired and tries to sleep, it will get 7 points. Here one should be careful and determine the limit of drowsiness due to fatigue or drowsiness due to illness. In both cases, the condition is not good and deserves 7 points. When it comes to a sick bird, we must inform the organizer so that he can send a veterinarian on duty, and in that case we will not evaluate it with a note that the bird is sick.

The maximum number of points in this item is 10, and the starting base is 9 points. The number of negative points in this item is deducted depending on the number and type of errors on the bird. As a rule, a bird in poor condition should be excluded from the competition**.**

6. GENERAL IMPRESSION – 10 points

If the bird leaves a great impression with its appearance, behavior, health and condition it will also influence the judge who will reward it with a good grade.

JUDGING: This item is a logical continuation of all previous judging items. For a bird that was rated with a starting grade or higher than the starting grade in the previous items, we will give 9 points. If the evaluated copy in the item of colors and drawing received less than 36 points and feathers less than 18 points, the evaluation will be 7-8 points.

In the judging of the general impression, we must be careful not to reduce the judging to two items due to the same error, it should not happen that this judging is performed by calculation. In this paragraph, the judge should evaluate the general impression that the bird left with its appearance and behavior in the exhibition cage.

This grade sometimes gives the judge the opportunity, if justified, to correct the overall grade through this grade.

CONCLUSION

Thus, the Scorecard for Ringneck doves (Section “O”) contains six judging items of which four can be directly influenced by the breeder and improve quality and evaluation. If it is, theoretically, one "plus" point for each of the stated evaluation points, that is a total of four points. This is not a small number of "bonus" points and can be crucial in the final competition for placement and medal.

After the judging and completion of all judging items in the Scorecard, a complete picture of the evaluated bird – Ringneck dove is determined, which corresponds to the quality of its color, drawing,

presentation, compliance with the standard, its condition and readiness for the exhibition, but also its negative characteristics or shortcomings.

The scorecard as a mirror of quality is a kind of "instruction" to the breeder-competitor in which direction to direct the breeding of their competition birds, what to favor and what to eliminate, but also to exhibition visitors as a collective guide about all birds in a particular competition class and each individual bird, their mutual, competitive relationship and finally about quality ranking and placement. That is exactly the goal of evaluation and competition!

SPECIAL PROCEDURES FOR THE JUDGING OF RINGNECK DOVE

During the judging of birds, some non-characteristic and extraordinary situations may occur. They are foreseen and regulated by the Rulebook of the Judging on an Exhibition or the OMJ Rulebook - OMJ Regulation for the Judging at the World Ornithological Championship and exhibitions under the auspices of COM.

1. UNASSESSED BIRD (or no judgement bird) "NJ"

According to the propositions, birds will be **unassessed** (no judgement bird) if:

- sick
- hurt
- one-eyed or blind
- without a finger or nails
- with a stiff or twisted toe and
- without typical characteristics of the species or mutation.

In this case, the judge will write "**NJ** – **NO JUDGEMENT**" – unassessed on the judging list. In any case, the judge will write the reason for this decision.

2. DISENTITLEMENT (or Declassed) "DE."

The bird will be **disentitled** (**or Declassed)** if it is registered in the wrong class.

In this case, the bird will be normally assessed in accordance with the standard; points will be assigned and recorded in the scorecard, but the bird will not be eligible for the medal. The judge will sign the scorecard, write "**DE or Decl. – Disentitlement** – **Declassed (Déclassé**)" and state the reason for disentitlement. The scorecard must be signed by the supervisor or a member of the Supervisory Board.

3. DISQUALIFICATION "Disq."

Any bird having traces of manipulation and deception will be **"disqualified"**:

- an inconsistent ring (unofficial, too large, open, distorted, unreadable, etc.);
- has more than one ring;
- with artificial "beautifying" of the bird;
- with markings on a cage that can identify the breeder.

In these cases, the bird will not be assessed but the judge will cross out the judging points and sign the scorecard and notify the supervisor and the control board thereof.

Then, disqualification is confirmed by three members, who will also sign the scorecard on which **"DQ or Disq.** – **DISQUALIFICATION"** and the reason for disqualification will be written down.

The exhibitor who has been found guilty is subject to sanctions for fraud and all exposed birds will be disqualified at the World Championship.

Disciplinary proceedings will be instituted against such an exhibitor, in accordance with the O.M.J Rulebook.

4. ABSENT "Abs" – **bird not showcased**

The bird that has been registered at the exhibition and is not among the exhibits or for some reason was not brought to the judge for judging shall be deemed as not "present". Then the judge will put the note "**ABS. - Absent**" - "absent" in the scorecard.

FROM THE OMJ REGULATIONS (Reglement OMJ)

O.M.J. judges must, throughout the duration of the judging of the birds, judge conscientiously, and strictly respect the latest standards or descriptions in effect. It is also required to be in a perfect agreement with the other fellow O.M.J. judge.

During judging, it goes without saying that the complete secret must be kept as to the number of points and placement of the assessed bird. Any conversation with other colleagues about the judge's judgings is prohibited.

INFORMATION AND INSTRUCTIONS TO O.M.J. JUDGES

The O.M.J. Judge must, throughout the duration of the judgments of the birds, judge conscientiously, and in the strict respect of the latest standards or descriptions in force. It is also required to have a perfect agreement with other colleagues Judge O.M.J. (middle School).

During judgments, it goes without saying that complete secrecy must be kept as to the pointing and placing of the judged bird. Any conversation about judgments with judges from other colleges is also prohibited.

Responsibilities

For the duration of the judgments, the O.M.J. Judge depends solely on the Control Commission. He must scrupulously respect the instructions and regulations

If it is found that an O.M.J. judge violates the O.M.J. regulations or disregards the instructions received from the Control Commission, he may be immediately relieved of his duties by the O.M.J. Executive Committee. In this case, the latter is entitled to use the travel and subsistence expenses, which are owed to the offending O.M.J. judge, to cover the costs incurred following the appeal made, to another O.M.J. judge, with a view to replacing him. In such a case, the decision taken by the O.M.J. Executive Committee is final.

Judgments

Judgments must be made only in accordance with the C.O.M. and the requirements of the standards or descriptions in force. On the judgment cards of the first 5 birds or collections of a class, it is necessary to indicate, in the order chosen, the numbers 1 to 5. In addition, there must be a difference of at least 1 point between each bird of the first 3 places. It is also necessary to provide a difference of 1 point between birds ranked 3 and 4.

For collections, the harmony points must be correctly applied. For individual birds of classes D to P, the maximum permitted for scores are as follows:

- gold: 95 points
- silver: 94 points
- bronze: 93 points

The minimum score required to obtain one of these medals is set at 90 points.

The minimum score required to obtain one of these collection medals is 360 points (harmony included)

Judgment cards cannot show erasure(s).

For canaries of color, there is the key C.O.M. in force (see annex) which will, if necessary, provide a better understanding between judges of different languages.

Only points awarded, not points withdrawn, must appear on the judging card.

Conduct of judgments

During judgments, the O.M.J. Judge is under the responsibility of the member of the Control Commission designated for its section. Any inquiries relating to judgments made by an O.M.J. Judge shall only be made to the member of the Board of Control.

It is therefore forbidden for an O.M.J. Judge to address, in this regard, to the bearers of cages or any other persons. The panel of judges receives, from the member responsible for the Control Commission, the judging sheets, and an envelope containing a list containing the numbers of bird cages to be judged.

When the judgments of a class are completed, the panel of judges must submit, to the member of the Supervisory Commission, in the envelope that he has received, all the judging cards and points awarded and the list on which the judges have been mentioned.. If a class has not been fully judged, the judges must also hand over, at the end of the day, to the member of the Control Commission, all the pieces in their possession.

It is strictly forbidden for judges to leave the place of judgments by taking rooms in the hotel. On the last day of the judgments, the judges will be able to leave the place of the judgments only when the Control Commission will have finished the control of all the rings.

Scoring

For the award of gold, silver and bronze medals, the minimums required for scores, in each section, including harmony points, are included in the "Technical Communications" chapter.

Below are some examples for the allocation of harmony points (sections D – P):

90 90 90 90 0 points of difference harmony 6 points

89 89 88 87 2 points of difference harmony 4 points

90 87 88 84 6 points of difference harmony 0 points

Basic rule: the difference in point between the highest and the lowest score is always subtracted from the number 6.

Ljetni kamp za mlade "Misli o prirodi!"

Summer camp for young people "Misli o prirodi!"

Emir Delić[1]*

društvene vijesti i obavijesti (social news and announcements)

U okviru projekta "Misli o prirodi!", Centar za promociju civilnog društva (CPCD), uz financijsku podršku vlade Kraljevine Švedske, organizirao je ljetni kamp za mlade osobe koje su zainteresirane za stjecanje novih znanja u području ekologije i zaštite okoliša. Ljetni kamp se održao od 23. do 25.07.2021. godine u Sarajevu, na planini Igman, gdje je 55 učesnika imalo priliku dobiti nova teorijska i praktična znanja iz područja ekologije, zaštite okoliša, zagovaranja, civilnog društva, kružne ekonomije i dr. Istima su podijeljeni i certifikati za doprinos zaštiti okoliša Bosne i Hercegovine. Nakon ovoga iskustva i stečenih znanja, učesnici su dobili priliku da se uključe u rad lokalne organizacije koja se bavi zaštitom okoliša i promocijom prirode ili u rad jednog od devet Eko HUB-ova, kako bi aktivno djelovali kada je u pitanju zaštita okoliša/životne sredine. Potom da organiziraju mlade u svojoj lokalnoj zajednici i potaknu ih na zajedničko djelovanje kroz organizaciju najmanje jedne lokalne eko akcije. Nadalje da ukazuju na probleme ali i primjere dobre prakse kada je u pitanju zaštita okoliša/čovjekovog okoliša, te da ujedno i promoviraju aktivnosti projekta "Misli o prirodi!" u lokalnoj zajednici i šire.

Na ljetnom kampu su kroz tri dana obrađene sljedeće teme:

- *radionica zagovaranja,*

- *civilno društvo i eko aktivizam,*

- *novinarstvo i eko aktivizam,*

- *umjetnost, moda i aktivizam,*

- *biznis i cirkularna ekonomija,*

- *orijentacija u prostoru,*

- *ekologija šuma (dendrologija, klimatske promjene i biodiverzitet šuma BiH.*

Neke od ovih tema biti će detaljnije predstavljene u nastavku teksta.

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Terenske aktivnosti iz područja ekologije šuma su održane u šumama Igmana, a vodio ju je Emir Delić. Stručna ekspedicija je bila vezana za važnost drveća na Planeti Zemlji, problematici klimatskih promjena te o bioraznolikosti šuma Bosne i Hercegovine (flora i fauna) (slika 1).

Slika 1. Učesnici tijekom ekspedicije slušaju kratko predavanje o osnovama dendrologije (Izvor: CPCD)

Figure 1. *During the expedition, participants listen to a short lecture on the basics of dendrology (Source: CPCD)*

Brojni studenti koji pohađaju Šumarski fakultet UNSA, zatim Prirodno-matematički fakultet UNSA, te mnogi drugi studenti iz ostalih dijelova BiH, kao i zaposlenici raznih institucija i NVO-a, te ekološki aktivisti iz svih krajeva BiH, učestvovali su u šumskoj ekspediciji i stekli nova iskustva i znanja, koja će imati priliku primijeniti u daljnjem usavršavanju kroz karijeru (slika 2).

Za završnu aktivnost učesnicima je profesor Armin Daguda održao orijentacijsku radionicu u prirodi, gdje su isti imali priliku naučiti osnove orijentacije u prostoru, kao što su: orijentacija pomoću kompasa, orijentacija pomoću sunca i sata, orijentacija noću, topografska orijentacija i dr. Ova korisna znanja sigurno će svima dobro doći prilikom boravka i snalaženja u prirodi (slika 3).

Slika 2: Učesnici kreću na ekspediciju u šume Igmana (Izvor: CPCD)

Figure 2. *Participants embark on an expedition to the Igman forests (Source: CPCD)*

Slika 3. Orijentacijska radionica u prirodi (Izvor: CPCD)

Figure 3. *Orienteering workshop in nature (Source: CPCD)*

Jedna od zanimljivih radionica je bila radionica o zagovaranju, koje predstavlja komplet ciljanih akcija usmjernih ka donosiocima odluka radi ostvarivanja promjene u društvu (slika 4).

Slika 4. Radionica zagovaranja (Izvor: CPCD)

Figure 4. *Advocacy workshop (Source: CPCD)*

Upute autorima

Stručno znanstveni časopis Futura objavljuje znanstvene i stručne radove iz biotehničkih znanosti (poljoprivrede, šumarstva, drvne tehnologije, prehrambene tehnologije, nutricionizma, biotehnologije i interdisciplinarne biotehničke znanosti) kao i društvene vijesti, bibliografije, zatim prikaze knjiga i radova, popularne znanstvene radove, polemike i dr. Objavljuju se samo radovi koji nisu drugdje predani za objavljivanje, niti objavljeni. Znanstveni radovi se kategoriziraju: – izvorni znanstveni rad (original scientific paper) – pregledni znanstveni rad (scientific review) – prethodno priopćenje (preliminary communication) – konferencijsko priopćenje (conference paper) – rad prethodno prezentiran na konferenciji. Radove recenziraju dva ili više znanstvenika iz odgovarajućeg područja. Rad ne smije imati više od 17 tipkanih stranica, veličina slova 11, font Times New Roman, prored 1,5, margine 2,5. Izuzetno, uz odobrenje uredništva, neki interdisciplinarni ili uredništvu interesantni radovi mogu sadržavati do 25 ili više tipkanih stranica. Rukopisi se predaju u elektroničkom obliku na hrvatskom ili engleskom jeziku (e-mail: urednistvo@gazette-future.eu).

Izvorni znanstveni rad treba sadržavati: puna imena i prezimena autora s nazivima institucija, adresom i e-poštom u bilješkama – font 10, naslov, sažetak, abstract, uvod, materijale i metode, rezultate istraživanja, diskusiju, zaključak i literaturu – font 12 podebljano za naslove. Radovi napisani na engleskom jeziku se predaju bez naslova na hrvatskom jeziku i hrvatskog sažetka.

Naslov rada treba biti što kraći, na hrvatskom i engleskom jeziku. Kategoriju rada predlažu autori, a potvrđuju recenzenti i glavni urednik.

Sažetak treba sadržati opći prikaz, metodologiju, rezultate istraživanja i zaključak. Rad je potrebno pisati u trećem licu s min. 3 do 5 ključnih riječi. Obim sažetka ne bi smio biti veći od 250 riječi. Abstract je prijevod sažetka s ključnim riječima.

Uvod treba sadržavati što je do sada istraživano i što se željelo postići danim istraživanjem. Materijale i metode istraživanja treba ukratko izložiti. U rezultatima i diskusiji (raspravi) potrebno je voditi računa da se ne ponavlja iznijeto. U zaključcima je potrebno izložiti samo ono što pruža kratku i jasnu predstavu istraživanja. Literaturu treba poredati prema abecednom redu autora i to: prezime i početno slovo imena autora ili Anonymous (nepoznat autor), godina izdanja u zagradama, naslov knjige ili članka, naziv časopisa te broj ili godište, kao i mjesto izdavanja i oznaku stranica od–do. Više od tri autora se u literaturi navodi kao npr. (Prezime et al., 2018). Fusnote u radu treba izbjegavati ili eventualno koristiti za neka pojašnjenja. Autori se u tekstu citiraju sukladno APA standardu npr. (Prezime, 2018); (Prezime1 i Prezime2, 2016); (Prezime et al., 2018) (više od dva autora). Citate prate navodnici ("n") i stranica preuzimanja citiranog teksta (Prezime, 2018, str. 44).

Tablice se numeriraju i navode iznad na hrvatskom i u kurzivu na engleskom jeziku.

Slike se numeriraju i navode ispod na hrvatskom i u kurzivu na engleskom jeziku.

Rezolucija slika (grafikon, fotografija, crtež, ilustracija, karta) treba iznositi najmanje 300 dpi.

Fotografija: Božićno drvce, Vodice, 2021.

Autor: Boris Dorbić.