



First Ringing Station in Cyprus, Karpaz Bird Ringing Station: Results of Autumn Migration Season in 2024

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Abstract

Cyprus is one of the important islands in the Western Palearctic for bird migration routes, especially on the eastern Mediterranean route. In contrast to Western Europe, research on bird migrations in Eastern Europe and the Eastern Mediterranean remains limited. Due to its geographical location and surface area, Cyprus hosts millions of migratory birds in the Eastern Mediterranean region during the Eastern European bird migrations. The Karpaz Bird Ringing Station, established in Northern Cyprus, has the potential to fill many gaps. Regular ringing activities started in the autumn season of 2024 at the station, a total of 157 meters of mist nets were used, and 1,436 birds from 39 species were ringed. The most frequently ringed species were the Eurasian blackcap, common chiffchaff, European robin, Sardinian warbler, willow warbler, song thrush, stonechat, Spanish sparrow, black redstart, and common redstart. According to the results, the long-distance migrants, such as willow warblers, common redstarts, and blackcap individuals, have higher fat scores. These preliminary data reveal the importance of the role of



Cyprus in bird migrations. Although there is only one control bird (Hungarian control), increasing the recapture data (especially between Israel, Türkiye and Cyprus) will significantly contribute to the determination of migration dynamics (migration phenology, stopover ecology, migration routes, individual physiological changes and more) in the Eastern Mediterranean part of bird migrations under the western Palearctic migration route.

Keywords: Bird migration; Bird ringing; Ecological barrier; Eastern Mediterranean; North Cyprus; Stopover.

Kıbrıs'ın İlk Halkalama İstasyonu, Karpaz Kuş Halkalama İstasyonu: 2024 Sonbahar Göç Sezonu Sonuçları

Öz

Kıbrıs, özellikle Doğu Akdeniz rotası olmak üzere, Batı Paleartik kuş göç yolları için önemli adalardan biridir. Batı Avrupa'nın aksine, Doğu Avrupa ve Doğu Akdeniz'deki kuş göçleri üzerine yapılan araştırmalar sınırlı kalmaktadır. Kıbrıs, coğrafi konumu nedeniyle Doğu Avrupa kuş göçleri sırasında Doğu Akdeniz bölgesinde milyonlarca göçmen kuşa ev sahipliği yapmaktadır. Kuzey Kıbrıs'ta kurulan Karpaz Kuş Halkalama İstasyonu birçok boşluğu dolduracak potansiyele sahiptir. İstasyonda 2024 sonbahar sezonunda düzenli halkalama faaliyetlerine başlanmış, toplam 157 metre sis ağı kullanılmış ve 39 türe ait 1.436 kuş halkalanmıştır. En sık halkalanan türler karabaşlı ötleğen, çıvgın, kızılgerdan, maskeli ötleğen, söğüt bülbülü, öter ardıç, söğüt serçesi, kara kızılkuş ve kızılkuş olmuştur. Elde edilen sonuçlara göre, karabaşlı ötleğen, kızılkuş ve söğüt bülbülü gibi uzun mesafe göçmenler daha fazla yağ miktarına sahiptir. Bu ön veriler, Kıbrıs'ın kuş göçlerindeki rolünün önemini ortaya koymaktadır. Sadece bir kontrol kuşu (Macar geribildirimi) olmasına rağmen, yeniden yakalama verilerinin artması (özellikle İsrail, Türkiye ve Kıbrıs arasında) Batı Paleartik göç rotası altındaki kuş göçlerinin Doğu Akdeniz bölümünde göç dinamiklerinin (göç fenolojisi, durak ekolojisi, göç rotaları, bireysel fizyolojik değişiklikler ve daha fazlası) belirlenmesine büyük katkı sağlayacaktır.

Anahtar Kelimeler: Kuş göçleri; Kuş halkalama; Ekolojik engel; Doğu Akdeniz; Kuzey Kıbrıs; Konaklama.

1. Introduction

Bird migration has been one of the most important research topics throughout human history. With the acceptance of bird ringing methodology in the early 20th century [1,2], very

comprehensive, and long-term studies have been carried out in cooperation between countries [3]. Bird ringing stations have played a significant role in determining the mysteries of the journeys of species between breeding and wintering areas in Western Palearctic bird migrations [4]. In the last few decades, with the development of technology, detailed data on bird migrations, times, migration routes, and wintering areas have been obtained by using geographical positioning devices (satellite transmitter, GPS, geolocator, etc.) [5,6]. Numerous studies conducted in Europe have produced comprehensive results on Western Europe-Western Mediterranean migration routes [7,8]. In contrast, significant deficiencies are observed in Eastern Europe-Eastern Mediterranean bird migrations.

The key roles of Türkiye (wetlands and coastal stopovers against geographical-ecological barriers) and Cyprus (terrestrial area in the Eastern Mediterranean) in Eastern Europe-Eastern Mediterranean bird migrations are revealed. Control data obtained from ringing studies in southern Türkiye reveal that Central and Eastern European bird populations migrate between breeding and wintering areas via this route [9,10]. Due to its geographical location and surface area, Cyprus hosts millions of migratory birds in the Eastern Mediterranean region during Eastern European bird migrations. However, to date, although irregular studies or short-term research have been conducted to identify diseases carried by birds [11], there is no station in Cyprus where regular bird ringing studies are carried out. To fill this gap and investigate the migration ecology and behavior of birds, the Karpaz Bird Ringing Station (Northern Cyprus) was established in Dipkarpaz, northeast of the island, by the Taşkent Nature Park and the Cyprus Wildlife Research Institute. Studies for the 2024 autumn migration period have begun. This study aimed to determine the diversity and phenology of migratory species in the autumn period of 2024.

2. Materials and Methods

2.1. Study Area

The Karpaz Bird Ringing Station is located near Dipkarpaz Town in the İskele District, northeastern Cyprus. The station is situated close to Ronnas Beach at the Taşkent Nature Park Karpaz Research Station (35°36'01" N; 34°19'50" E) (Fig. 1). The following plant species are dominant in the area: *Juniperus phoenicea*, *Pistacia lentiscus*, *Thymus capitatus*, *Myrtus communis*, *Lithodora hispidula*, and *Rhamnus oleioides*. In addition, *Fumana thymifolia*, *Rubia lauræ*, *Asparagus acutifolius*, *Cistus* sp., *Helichrysum conglobatum*, *Genista fasselata*, *Olea europea*, *Allium* sp., *Hyperhenia hirta*, and *Ceratonia siliqua* species are also found in the region.



Figure 1: The location of the Karpaz Bird Ringing Station (modified from Google Earth).

2.2. Fieldworks

The study was conducted during the autumn migration period (October-November 2024) to examine the migration movements of bird species and determine their migration phenology. During the autumn season, a total of 157 meters of mist nets were used, including one 18-meter net, ten 12-meter nets, two 9-meter nets, and one 6-meter net. The nets were set parallel to the vegetation in the area, which primarily consisted of juniper and lentisk (Fig. 2). All birds were aged and sexed by plumage coloration [12], measured (maximum wing length to the nearest 0.5 mm) [12], and weighed to the nearest 0.1 g. The fat score was estimated on a nine-class scale [13], and the size of the breast muscle was assessed on a four-class scale [4]. The individuals were ringed using metal rings sourced from "cwri.net," each coded individually and suitable for the leg size of the bird.

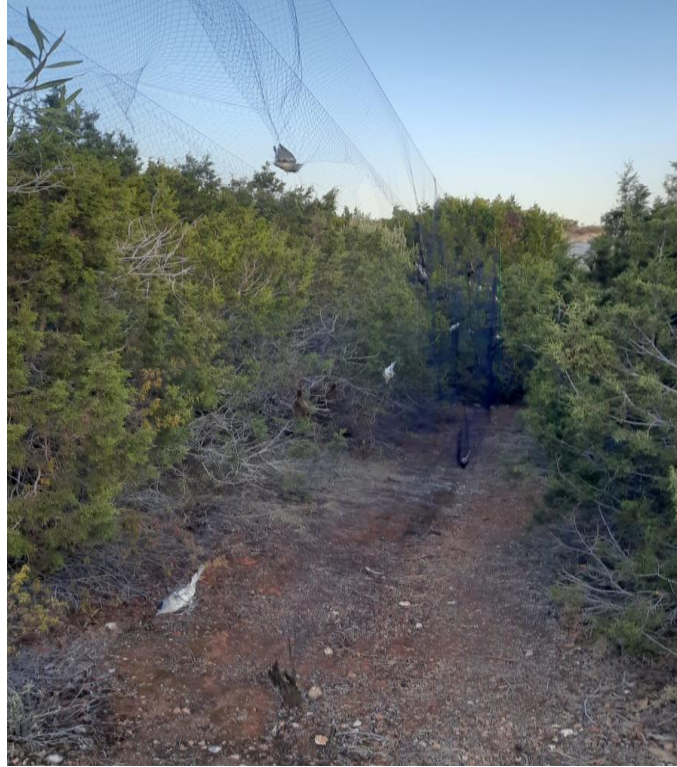


Figure 2: Mist nets used for capturing birds, set parallel to the vegetation.

3. Results and Discussion

During the autumn ringing season in 2024, 1.434 birds from 39 species were captured at the Karpaz Bird Ringing Station. Among these, 1.401 birds were ringed for the first time, one was a control bird, and 32 were recaptures. The ringed bird species and numbers during the autumn period of 2024 are presented in Table 1.

The most frequently ringed species during the autumn period were the Eurasian blackcap (*Sylvia atricapilla*), common chiffchaff (*Phylloscopus collybita*), European robin (*Erithacus rubecula*), Sardinian warbler (*Curruca melanocephala*), willow warbler (*Phylloscopus trochilus*), Song thrush (*Turdus philomelos*), stonechat (*Saxicola torquatus*), Spanish sparrow (*Passer hispaniolensis*), black redstart (*Phoenicurus ochruros*), and common redstart (*Phoenicurus phoenicurus*) (Fig. 3). According to the results, the long-distance migrants, such as willow warblers, common redstarts, and blackcap individuals, have higher fat scores. The mean values of the weight, fat scores, and muscle scores of these species are presented in Table 2.

During the autumn period, two scarce species for Cyprus, the red-breasted flycatcher (*Ficedula parva*) and little bunting (*Emberiza pusilla*), were captured and ringed (Figs. 4-5).

Table 1: Summary of bird ringing results at Karpaz Bird Ringing Station in 2024 (I: "First capture," R: "Recaptured during the period," and C: "Control").

Species	Autumn			Total	Species	Autumn			Total
	I	R	C			I	R	C	
<i>Acrocephalus melanopogon</i>	3	1	0	4	<i>Luscinia svecica</i>	12	1	0	13
<i>Acrocephalus schoenobaenus</i>	1	0	0	1	<i>Oenanthe oenanthe</i>	1	0	0	1
<i>Acrocephalus scirpaceus</i>	2	0	0	2	<i>Otus cyprius</i>	1	0	0	1
<i>Alcedo atthis</i>	1	0	0	1	<i>Passer domesticus</i>	14	0	0	14
<i>Athene noctua</i>	1	0	0	1	<i>Passer hispaniolensis</i>	37	0	0	37
<i>Cettia cetti</i>	4	1	0	5	<i>Phoenicurus ochruros</i>	18	2	0	20
<i>Curruca communis</i>	2	0	0	2	<i>Phoenicurus phoenicurus</i>	17	0	0	17
<i>Curruca curruca</i>	14	0	0	14	<i>Phylloscopus collybita</i>	149	4	0	153
<i>Curruca melanocephala</i>	99	2	0	101	<i>Phylloscopus trochilus</i>	94	0	0	94
<i>Emberiza pusilla</i>	1	0	0	1	<i>Prunella modularis</i>	1	0	0	1
<i>Erithacus rubecula</i>	111	14	0	125	<i>Saxicola maurus</i>	1	0	0	1
<i>Falco tinnunculus</i>	2	0	0	2	<i>Saxicola torquatus</i>	41	2	0	43
<i>Ficedula parva</i>	1	0	0	1	<i>Serinus serinus</i>	1	0	0	1
<i>Fringilla coelebs</i>	4	0	0	4	<i>Spilopelia senegalensis</i>	1	0	0	1
<i>Galerida cristata</i>	2	0	0	2	<i>Sylvia atricapilla</i>	690	5	1	696
<i>Hirundo rustica</i>	1	0	0	1	<i>Sylvia borin</i>	3	0	0	3
<i>Jynx torquilla</i>	1	0	0	1	<i>Troglodytes troglodytes</i>	3	0	0	3
<i>Lanius collurio</i>	1	0	0	1	<i>Turdus merula</i>	5	0	0	5
<i>Linaria cannabina</i>	1	0	0	1	<i>Turdus philomelos</i>	58	0	0	58

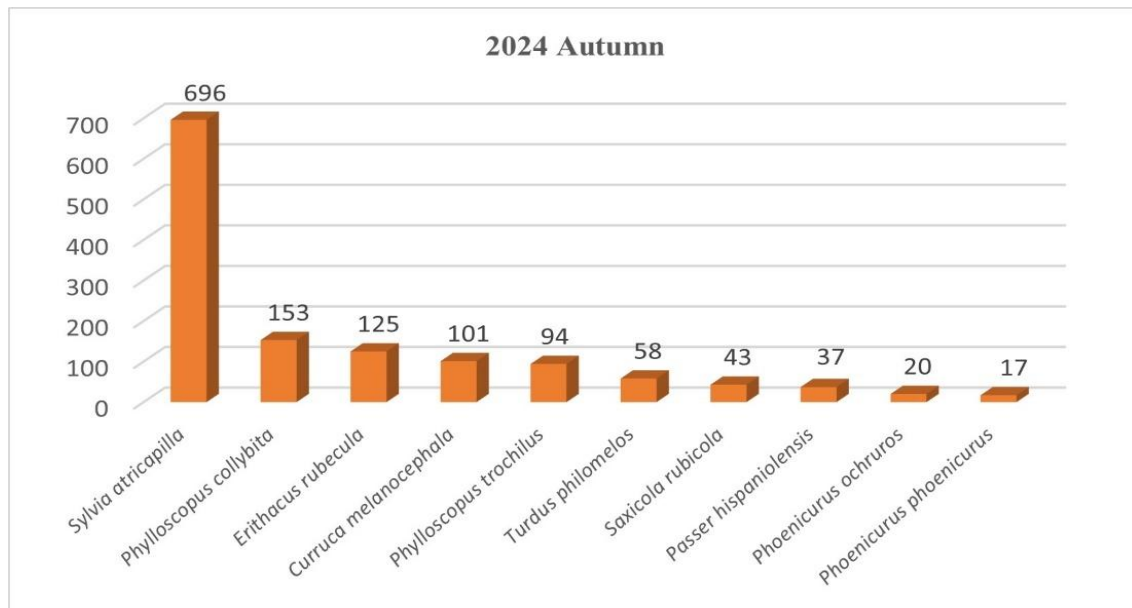
**Figure 3:** The most frequently captured migratory species.

Table 2: Body condition values of the most frequently captured migratory species during the autumn season (2024).

Species	Weight				Fat Score			Muscle Score		
	n	mean	min-max	SD	mean	min-max	SD	mean	min-max	SD
<i>Curruca melanocephala</i>	100	11,10	9,6-13,5	0,704	0,81	0-4	1,080	1,51	0-3	0,674
<i>Erithacus rubecula</i>	111	15,06	12,6-18,6	1,097	0,73	0-3	0,863	1,50	0-3	0,686
<i>Luscinia svecica</i>	12	14,97	12,8-17,4	1,667	1,58	0-3	1,084	1,08	1-2	0,289
<i>Passer hispaniolensis</i>	37	25,99	22,9-30,3	1,669	1,43	0-3	0,728	1,43	1-2	0,502
<i>Phoenicurus ochruros</i>	18	15,08	13,8-17	0,949	0,67	0-2	0,594	1,33	0-3	0,767
<i>Phoenicurus phoenicurus</i>	17	15,23	12,6-19,4	1,729	1,76	0-4	1,091	1,06	0-2	0,556
<i>Phylloscopus collybita</i>	148	7,22	4,8-11,4	1,370	1,61	0-5	1,450	1,14	0-3	0,791
<i>Phylloscopus trochilus</i>	94	10,10	7-12,7	1,246	2,60	0-4	1,221	0,87	0-2	0,660
<i>Saxicola rubicola</i>	41	13,68	10,9-15,3	0,854	1,12	0-3	1,077	1,59	0-3	0,670
<i>Sylvia atricapilla</i>	688	18,20	14,2-28,5	2,026	2,27	0-6	1,343	1,58	0-3	0,682
<i>Turdus philomelos</i>	58	62,83	47,8-75,7	4,985	0,67	0-2	0,803	0,91	0-2	0,601

**Figure 4:** One of the rare species for Cyprus, the red-breasted flycatcher (*Ficedula parva*).



Figure 5: Extremely rare species for Cyprus, little bunting (*Emberiza pusilla*).

During the 2024 bird ringing season at the Karpaz Bird Ringing Station, recovery data for one control bird were obtained. The Eurasian blackcap (*Sylvia atricapilla*) was originally ringed at the Sumony Bird Ringing Station (Baranya, Hungary) on September 23, 2024. After 51 days and covering an aerial distance of 1,795 kilometers, it was recaptured at the Karpaz Bird Ringing Station on November 13, 2024.

4. Conclusion

Cyprus has a strategic location on the bird migration routes of Eastern Europe, particularly in the Eastern Mediterranean. Birds spend most of their time in stopover areas during their long-distance migration journeys [6], and the Mediterranean is one of the ecological barriers during the migration [14], with the importance of almost all of Cyprus and the south coastline of Türkiye as stopover areas.

Bird ringing stations contribute to determining the bird diversity of a region [15,16]. Moreover, it can clearly reveal the spread of rare species in the area [17]. Although there is no regular ringing station in Cyprus to date, species diversity has been primarily revealed through bird observation records. However, the little flycatcher and little bunting captured in the first

season of the study (autumn 2024) were important indicators of the level of contribution level of the bird ringing station where regular work had started. On the other hand, long-term ringing studies are effective in determining the migration phenology [18] and the behavior of species [19] over time and in response to changing environmental conditions, particularly climate change. In addition, islands in ecological barriers serve as stopover areas for species during their long and dangerous migration journeys, and data can be obtained to reveal the migration strategies of species (fat depot, muscle score, weight, etc.). Birds increase their fat stores to successfully complete long-distance migrations and cross ecological barriers such as the Mediterranean [6]. Among the species captured in the first season of the study, the weights, fat and muscle scores of long-distance migrants (such as willow warblers, blackcaps, common redstarts, chiffchaffs) were higher compared to other species (Table 2, Figs. 6-8). These preliminary data reveal the importance of the role of Cyprus in bird migrations. Although there is only one control bird for now (Hungarian control), increasing the recapture data (especially between Israel, Türkiye and Cyprus) will significantly contribute to the determination of migration dynamics (migration phenology, stopover ecology, migration routes, individual physiological changes and more) in the Eastern Mediterranean part of bird migrations under the western Palearctic.

As a result, the start of the studies at the Karpaz Bird Ringing Station will contribute to bird migration research in the Western Palearctic. Future studies at this station will support the planning of conservation measures, the acquisition of information required for the protection of bird migration, and biodiversity monitoring due to both climatic and environmental changes. Additionally, it will facilitate the establishment of new stations and the development of international cooperation projects on this island, where millions of migratory birds stop over each year.

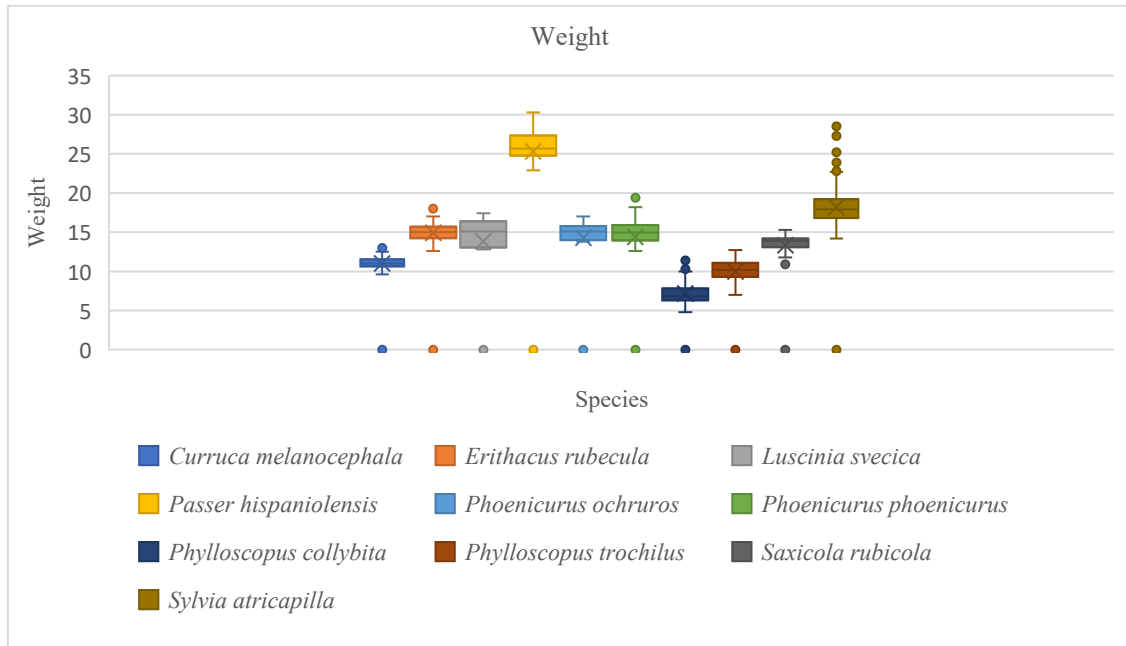


Figure 6: Distribution values of weight from the most frequently captured migratory species during the autumn season (2024).

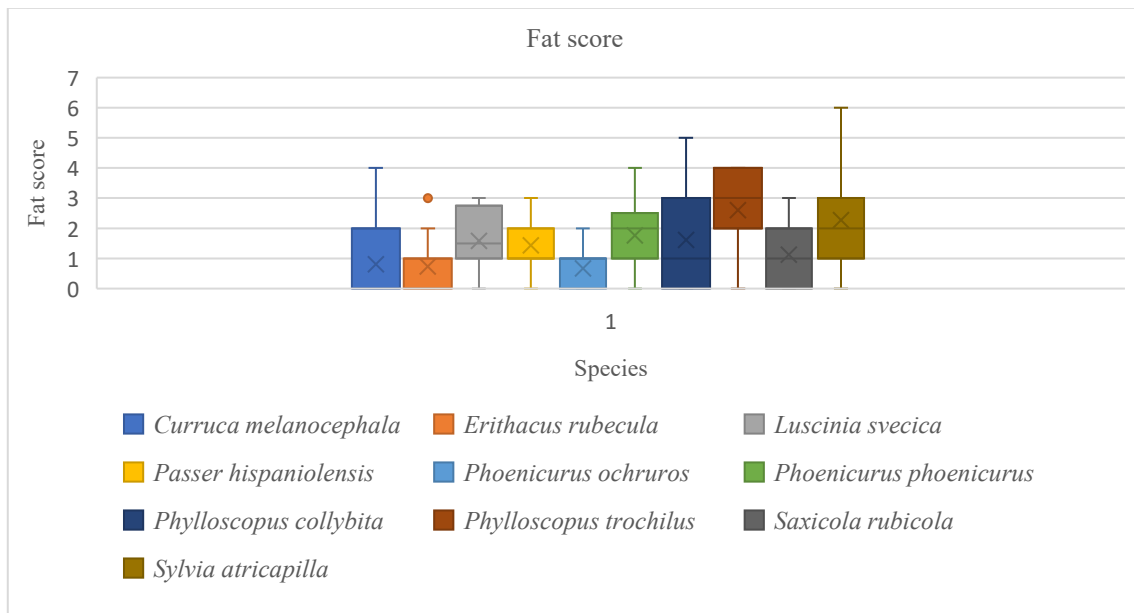


Figure 7: Distribution values of fat scores from the most frequently captured migratory species during the autumn season (2024).

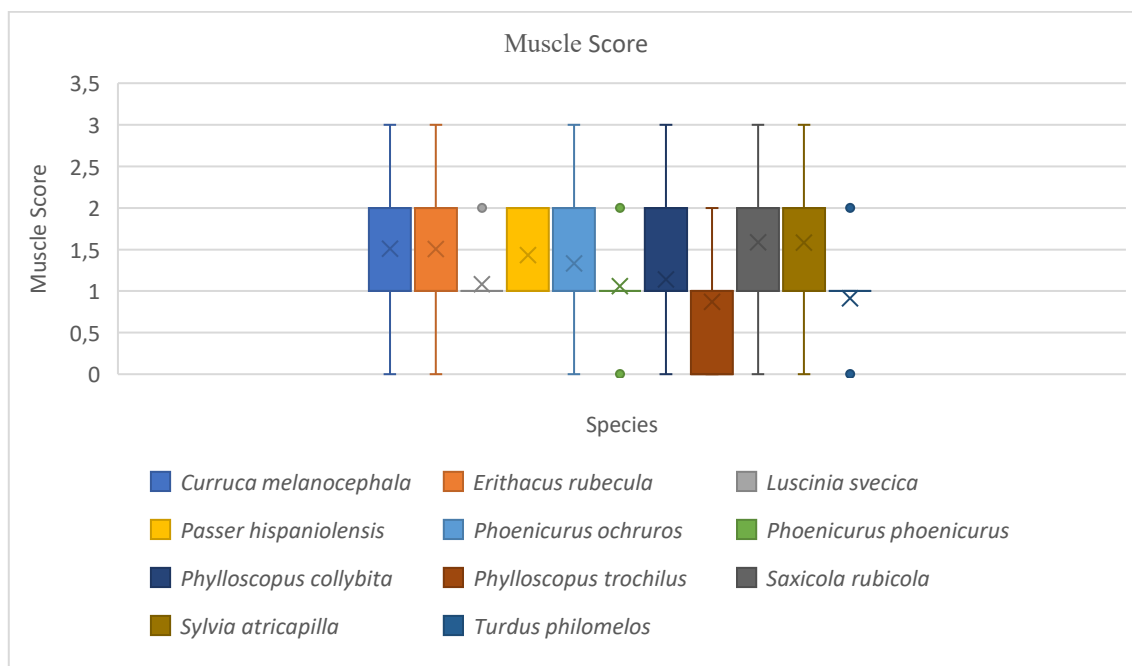


Figure 8: Distribution values of muscle scores from the most frequently captured migratory species during the autumn season (2024).

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