Non-native Monk Parakeets (*Myiopsitta monachus*) in Rome's largest urban parks: nest density, host tree characteristics, and management recommendations

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Abstract

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Non-native Monk Parakeets (*Myiopsitta monachus*) are invasive birds widely distributed in European urban parks. Studying the nesting sites of urban populations is mandatory since these areas often serve as initiation of colonization processes in surrounding non-urban environments, posing a risk to agricultural crops and commercially valuable orchards. Therefore, understanding the density and distribution of nesting sites, as well as the structural characteristics of both the nests and their host trees, becomes crucial. In this study, we surveyed all Monk Parakeet nests in the five largest urban parks in Rome. Our data provides new insights for urban habitats supporting previous findings on nest-tree selection in Monk Parakeets. We recorded 66 nests on 30 trees belonging to four ornamental species: *Cedrus libani*, *Phoenix canariensis* (or *P. dactylifera*), *Pinus pinea*, and *Trachycarpus fortunei*. Cedars and palms were the most frequently used host trees, with nest density varying among parks (2 nests per 10 hectares, approximately). Nests were typically located at heights of around 13–14 meters, and parakeets showed a preference for taller trees with larger trunk diameters. These larger trees offer increased stability (e.g., during adverse weather) and, for highly social species like this, allow to build nests in higher (and then sure) positions, in terms of group dynamics and predator avoidance. Differences in tree architecture may account for the variation in relative nest height (nest height/tree height ratio, %) among species: in palms, nests are placed higher in the canopy (87.76% ± 7.03) compared to those in cedars (64.7% ± 16.4). Cedars hosted a significantly greater number of nests per tree (2.8 nests/tree ± 1.82; n = 20 nest trees) compared to palms. Our findings, combined with citizen-science data, could contribute to more effective management and control strategies—not only within urban parks but also at finer spatial scales, such as private gardens and residential areas.

Keywords

Cedrus libani, nest density, nest height, non native species, *Phoenix* sp., urban parks

Introduction

The Monk Parakeet (*Myiopsitta monachus*) is a bird species in the family Psittacidae, native to South America (Argentina, Paraguay, Uruguay, Bolivia, and Brazil), where it inhabits riparian forests, ecotones, savannahs, and synanthropic environments at elevations up to 3,000 meters (Menchetti and Mori, 2014). Similar to the Rose-ringed Parakeet (*Psittacula krameri*), it is among the most commonly introduced parrot species

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in Europe and is listed among the world's most invasive bird species (Keller et al., 2011). Its distribution mainly covers urban areas, such as historical parks (Menchetti and Mori, 2014), although recent evidence points to an expansion into suburban and rural environments (Mori et al. 2013). This spread from urban parks into adjacent farmland raises economic concerns, as it could have negative effects on commercially important croplands and orchards, potentially causing significant economic damage in non-native regions (e.g., MacGregor-Fors et al., 2011; Postigo et al., 2017), similar to what has been reported for the Rose-ringed Parakeet (Mentil et al., 2018).

The Monk Parakeet is a generalist and opportunistic feeder with a herbivorous/frugivorous diet and demonstrates high behavioral flexibility (Postigo et al., 2021; Battisti and Fanelli, 2022). As a result, when population densities become high, the species can have a negative impact on native biodiversity (Di Santo et al., 2017a) and cause substantial damage to agricultural crops (Moran and Keidar, 1993; Senar et al., 2016; Postigo et al., 2017).

In Europe, the impact of the Monk Parakeet remains limited primarily because most individuals are concentrated in urban areas, where they mainly forage in parks and gardens (Strubbe and Matthysen, 2009a; Di Santo et al., 2013), where there are no crops of commercial interest, and the plant species present serve primarily ornamental purposes (Senar et al., 2016). However, in recent years, the species has begun expanding into suburban and extra-urban agricultural areas, raising increasing concern (Castro et al., 2022; Hernández-Brito et al., 2020). For example, in Italy, Monk Parakeets have already been recorded in farmland bordering several major cities (Battisti, 2019; Battisti and Cerfolli, 2022; Lardelli et al., 2022).

Unlike the Rose-ringed Parakeet, which nests in cavities and tree holes (a secondary hole-nester; Strubbe and Matthysen, 2009b; Grandi et al., 2018), the Monk Parakeet constructs large communal nest structures in mature and often ornamental trees (Hyman and Pruett-Jones, 1995; Postigo et al., 2021), primarily *Cedrus libani*, *Phoenix* spp., *Eucalyptus* spp., and *Washingtonia* spp. (Di Santo et al., 2017b; Battisti and Cerfolli, 2022). These nests, used year-round, consist of multiple compartments (nest chambers; Navarro et al., 1992), each with its own entrance and occupied by a different breeding pair (Eberhard, 1996, 1998; Burger and Gochfeld, 2005; Romero et al., 2015). Nest architecture has long been a subject of interest (Harrison, 1973) and has been more recently re-examined (Battisti and Fanelli, 2021).

In Rome, Monk parakeet is widely distributed across historical urban parks and their immediate surroundings (Brunelli et al., 2011; Taffon et al., 2008; Zocchi et al., 2009; Di Santo et al., 2013, 2017a, b). While their impact in urban parks is largely limited to altering the physiognomy of ornamental vegetation—especially through the cutting of branches from many shrub species for nest construction (Battisti and Fanelli, 2021)—the study of urban nesting sites remains of fundamental importance from the alien species management point of view. These areas could represent the origin of colonization processes affecting all the surrounding extra-urban environments (Postigo et al., 2017). Research on nesting behavior and distribution is therefore essential to guide control efforts of non-native populations of this species (Blanco-González et al., 2025).

In this regard, several management strategies have been proposed, including the removal of communal nests (Avery and Shiels, 2017; Burger and Gochfeld, 2009; review in Senar et al., 2021). Effective implementation of such measures requires detailed knowledge of nest density, spatial distribution, and the structural characteristics of both the nests and their hosting trees.

In this study, we aimed to identify all Monk Parakeet nests within the five largest urban parks in Rome, the largest metropolitan area in Italy. Although numerous studies have examined the nesting behavior and ecology of this species (e.g., Pranty, 2009; Volpe and Aramburú, 2011; Avery et al., 2012; Burgio et al., 2014; Reed et al., 2014; Romero et al., 2015; Di Santo et al., 2017a, b), to our knowledge, this is the first study to quantify both density and structural placement of nests and hosting trees across a representative sample of historical and more recently urban parks in a large metropolis.

Materials and methods

We conducted a field survey across the five largest urban parks in Rome—comprising four historic parks and one recently established green area (Cignini, 2015)—covering a total of 336 hectares (Fig. 1):

- Villa Ada (VA: 140 ha; 50 m asl): A historic park located in northern Rome (centroid:41°55'58.1"N, 12°30'07.7"E), near the confluence of the Tiber and Aniene rivers along the ancient Via Salaria. The park spans approximately 140 hectares; however, our study focused exclusively on a 29-hectare sector dominated by ornamental species. The remaining area, covered by semi-natural forest vegetation, was considered unsuitable for Monk Parakeets.
- Villa Borghese (VB: 80 ha; 60 m asl): Centrally located in the heart of Rome (41°54'50.1"N, 12°29'07.6"E), this historic park features a continuous parkland landscape composed of open woodlands with scattered trees and numerous clearings. The dominant tree species include ornamental oaks and other hardwoods, as well as conifers such as cedars, pines, and cypresses.
- Villa Doria Pamphili (VP: 184 ha; 50 m asl): The largest of Rome's historic and monumental parks, situated in the southwestern part of the city (41°53'07.3"N, 12°26'30.0"E). Originally established in the 17th century and now municipally owned, the park includes a mosaic of pine and holm oak woodlands, tree-lined avenues, and formal Italian-style gardens.
- Villa Sciarra (VS: 7 ha; 70 m asl): A small historic villa located near Rome's city center, in the Monteverde-Trastevere district (41°53'04.1"N, 12°27'49.2"E). The park functions as a botanical garden and contains a variety of exotic ornamental tree species.
- EUR Lake Park (EU: 36 ha; 41°49'41.3"N, 12°28'03.4"E):

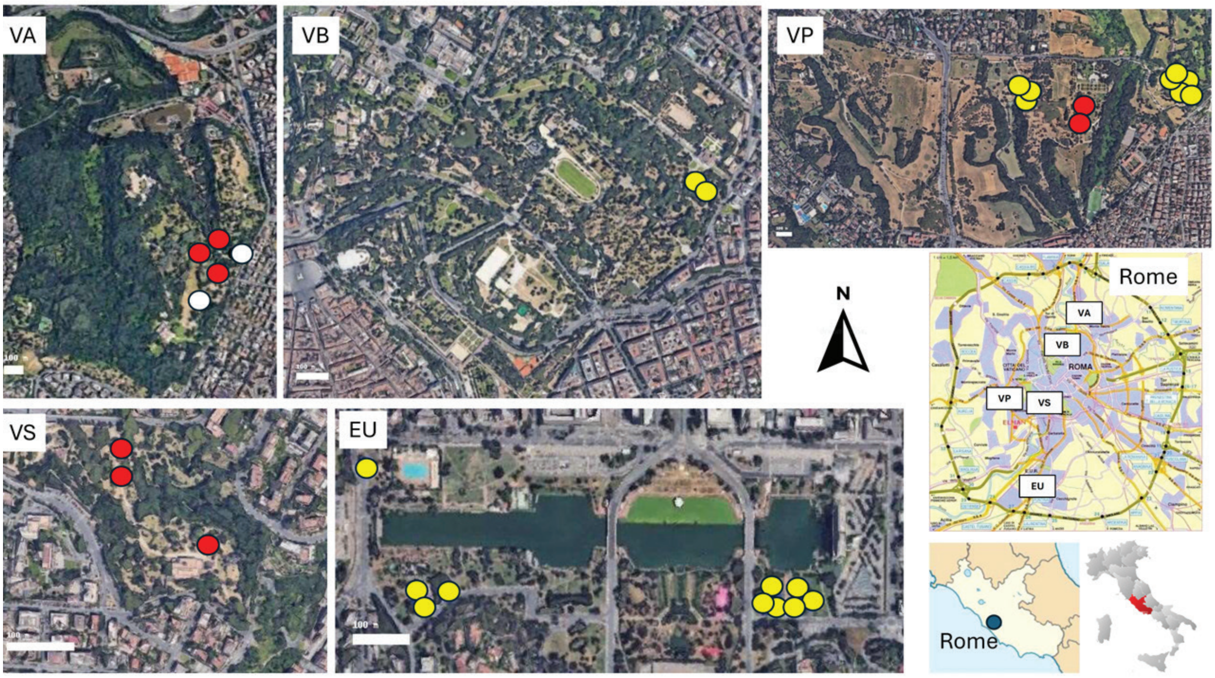

Fig. 1. Map of the study areas (five largest urban parks of Rome, Italy: VA: Villa Ada; VB: Villa Borghese; VP: Villa Pamphili; VS: Villa Sciarra; EU: EUR lake) and their location inside Rome. Everywhere, bars represent 100 m. (Source: Google Maps). Yellow points: Cedars (*Cedrus libani*), red: palms (*Phoenix dactylifera* vel. canariensis), white: other tree species.

A landscaped park built around an artificial lake in the 1960s, located in the EUR district. The park features a mix of ornamental trees and shrubs arranged in a circum-lacustrine setting.

The survey was monthly conducted between November 2024 and March 2025. In each park, transects were systematically established to comprehensively cover the designated survey areas, enabling the identification and recording of Monk Parakeet colonial nests. Nests were defined as complete structures—potentially comprising multiple chambers—actively constructed by parakeets using twigs and branches. Identification relied on visual observations and the detection of vocalizations emitted near nesting sites (Martella and Bucher, 1990), with observers positioned beneath each tree.

Once a nest was located, its geographical coordinates were recorded using an E-Garmin GPS device, and the species of the hosting tree (hereafter referred to as the "nest tree") was documented. Nest density in each park was calculated by dividing the number of nests detected by the area of suitable habitat (i.e., gardens and parkland with ornamental vegetation), expressed as nests per hectare.

For each nest and associated nest tree, the following measurements were recorded: (i) tree diameter at breast height (DBH; measured at 1.40 m from the ground, in centimeters); (ii) tree height (in meters); (iii) nest height (in meters); (iv) nest height/tree height ratio (expressed as a percentage); (v) horizontal distance from the nest to the tree trunk (in meters); (vi) nest structural type, categorized into two predefined classes: OH (Open Hand): nests positioned on multiple third- and fourth-order branches with a predominantly horizontal orientation, and CR (Crown): nests located near the main trunk at the apex of the tree canopy (see structural categorization methods in Zocchi et al., 2004). Additionally, the number of nests per nest tree was recorded.

For the nest trees, mean values and standard deviations (s.d.) were calculated for diameter, total height, horizontal distance from the trunk, nest height/tree height ratio, and the mean number of nests per tree. Additionally, each park was surveyed for trees of the same species used for nesting but without nests, serving as control trees. For these control trees, both diameter (in cm) and height (in m) were measured, and corresponding mean values with standard deviations were calculated. Measurements were taken using a professional dendrometric calliper and a clinometer.

Focusing on the subset of data related to the most frequently used tree species for nesting—cedars and palms (see Results section)—both univariate and bivariate statistical analyses were performed. In the univariate analysis, median values of tree diameter and height were compared between nest trees and control trees using the Mann–Whitney U test. To assess the goodness of fit for diameter frequency distributions, a one-sample Kolmogorov–Smirnov test was applied. The null hypothesis assumed that the diameter distributions of both nest trees and control trees followed a normal distribution.

An Ordinary Least Squares (OLS) regression analysis was carried out to examine the relationships between the following variable pairs: tree diameter vs. tree height, tree height vs. nest height, and distance from the trunk vs. tree height. Bootstrapped 95% confidence intervals (N = 1,999) were applied to increase robustness.

All statistical analyses were performed using PAST

Table 1. Characteristics of Monk Parakeet (*Myiopsitta monachus*) nests and host trees in the five largest urban parks of Rome, Italy: VA (Villa Ada), VB (Villa Borghese), VP (Villa Pamphili), VS (Villa Sciarra), and EU (EUR lake). Top section: Number of nests (and percentage of the total) by tree species used, mean nest height (m ± standard deviation, s.d.), height range, and nest height/tree height ratio (percentage). Bottom section: Number of nests on host trees (and percentage of the total host trees), mean tree height (m ± s.d.), mean trunk diameter (m ± s.d.), and mean number of nests per host tree (± s.d.)

				Nests					
Trees	N nests (% on total)	VA	VB	VP	VS	EU	Mean nest height (±s.d.)	Nest height range (m)	Ratio nest/tree height (±s.d.)
Cedrus libani	56 (84.8)	0	6	15	0	35	13.64 (±3.83)	5–20.7	64.64 % (±16.4)
Phoenix sp.	7 (10.6)	2	0	2	3	0	14.43 (±5.68)	9–25	87.76 % (±7.03)
Pinus pinea	2 (3.03)	2	0	0	0	0	18 (±1.41)	17–19	80.22 % (±13.29)
Trachycarpus fortunei	1 (1.51)	1	0	0	0	0	3 (–)	–	39.47 % (–)
Tot	66 (100)	5	6	17	3	35			
				Host trees					
Trees	N nest trees (% on total)	VA	VB	VP	VS	EU	Mean tree height (±s.d.)	Mean diameter (±s.d.)	Mean N nests/trees (±s.d.)
Cedrus libani	20 (66.67)	0	2	8	0	10	21.35 (±2.74)	89.4 (±21.40)	2.8 (±1.82)
Phoenix sp.	7 (23.33)	2	0	2	3	0	9.06 (±5.25)	51.29 (±7.52)	1 (±0)
Pinus pinea	2 (6.67)	2	0	0	0	0	22.6 (±1.98)	121.43 (±14.18)	1 (±0)
Trachycarpus fortunei	1 (3.33)	1	0	0	0	0	7.6 (–)	15.6 (–)	1 (–)
Tot	30	5	2	10	3	10			

software (Hammer et al., 2001), with the significance level (α) set at 0.05.

Results

In five urban parks, we recorded 66 nests on 30 trees belonging to four species: *Cedrus libani* (hereafter "cedar"), *Phoenix canariensis* vel. *dactylifera* (hereafter, "palm"), *Pinus pinea*, and *Trachycarpus fortunei* (Fig. 1; Table 1; Supplementary material Table S1). Cedar was the most utilized tree species, hosting 56 nests on 20 trees (84.8% of total nests; 66.7% of nest trees). Palm was the second most used taxon: since the two species of the genus *Phoenix*—*P. canariensis* and *P. dactylifera*—readily hybridize (González-Pérez et al., 2004), we treated them here as a single taxon.

Overall, we observed a nest density of 0.196 nests ha^{-1} and 0.089 nest trees ha^{-1}, with the highest nest density recorded in EU and the highest number of nest trees in VS (Table 2).

Considering the two primary host tree species, a strong correlation emerges between tree diameter and height for all trees (both nest and control trees) with a highest data dispersion in cedars ($R^2 = 0.29$) when compared to palms ($R^2 = 0.45$; Ordinary Least Squares Regression; Fig. 2).

Table 2. Density ($n\ h^{-1}$) of nests (d_n) and nest trees (d_t) of Monk parakeet in the five largest urban parks of Rome, Italy: VA (Villa Ada), VB (Villa Borghese), VP (Villa Pamphili), VS (Villa Sciarra), and EU (EUR lake). The table also reports the number of nests, number of nest trees, and park area (ha).

Parks	ha	N nests	d_n	N nest trees	d_t
VA	29	5	0.172	5	0.172
VB	80	6	0.207	2	0.025
VP	184	17	0.586	10	0.054
VS	7	3	0.103	3	0.429
EU	36	35	1.207	10	0.278
tot	336	66	0.196	30	0.089

The diameters of nest trees were significantly larger than those of control trees (cedars: $U = 238.5$, $p < 0.001$; palms: $U = 21.5$, $p = 0.017$; Mann-Whitney U test; Fig. 3). The frequency distribution shows a skewness of nest trees toward larger size classes (Kolmogorov-Smirnov test; Fig. 4).

Although the mean tree height is similar between the two most selected host species (cedars: 13.64 m ± 3.83; palms: 14.43 m ± 5.68), nests in palms are positioned higher in the canopy (87.76% ± 7.03) compared to cedars (64.7% ± 16.4). However, the taller the nest tree, the higher the nest is placed with a highest data dispersion in cedars (R2 = 0.16) when compared to palms ($R^2 = 0.97$; Ordinary Least Squares Regression; Fig. 5). However, although the sample of palm trees was reduced in number, we obtained a significant relationship ($p < 0.001$).

Cedar trees host a significantly higher number of nests per tree (2.8 nests $tree^{-1}$ ± 1.82; n = 20 nest trees) compared to palms, which consistently host only one nest per tree (n = 7; $U = 21$, $p = 0.004$; Mann-Whitney U test). In palms, nests are always placed in the crown, beneath the attachments of leaf branches. In cedars, nests are consistently located openly on 3rd or 4th order branches, with a mean distance from the trunk of 4.01 m (± 1.94; range: 0.5–8 m). The distance of the nest from the trunk is inversely related to nest height (reflecting the tree's tapering towards the top; $r = –0.51$, $t = –4.35$, $p < 0.001$; Ordinary Least Squares Regression).

In cedars, the number of nests per tree does not correlate with tree size, considering both trunk diameter ($r = –0.08$, $t = –0.32$, $p = 0.75$) and tree height ($r = –0.17$, $t = –0.72$, $p = 0.48$).

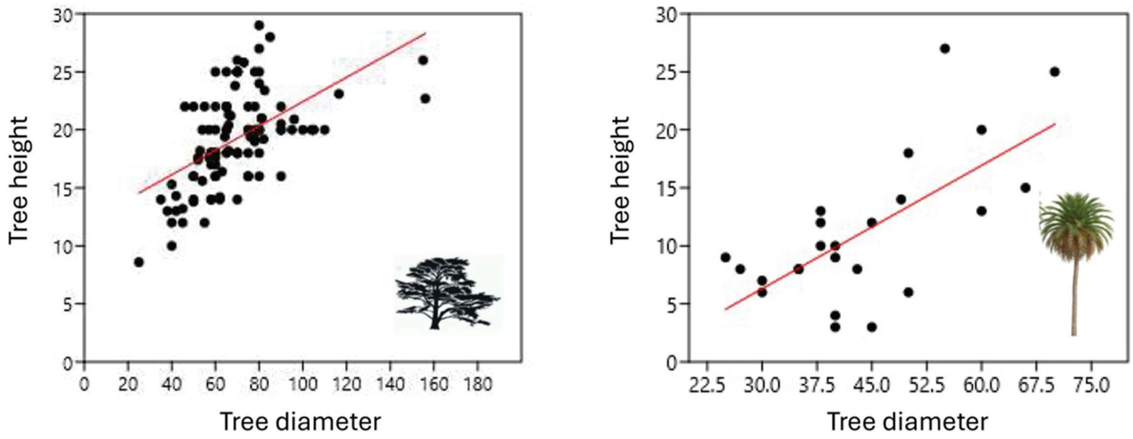

Fig. 2. Linear correlation between tree diameters (tree diam) vs. tree height for the two host tree species mainly utilized (cedars, *Cedrus libani*: left; palms, *Phoenix* sp.: right), considering both nest trees and control trees (Cedars: height = 0.11 × diameter + 11.94; $R^2 = 0.29$; r = 0.53, $p < 0.001$; palms: height = 4.32 × diameter + 0.35; $R^2 = 0.45$; r = 0.67, $p < 0.001$; Significance of regression line: cedars: t = 6.54; palms: t = 4.27; both $p < 0.001$; Ordinary Least Squares Regression (95% bootstrapped confidence intervals, N = 1,999).

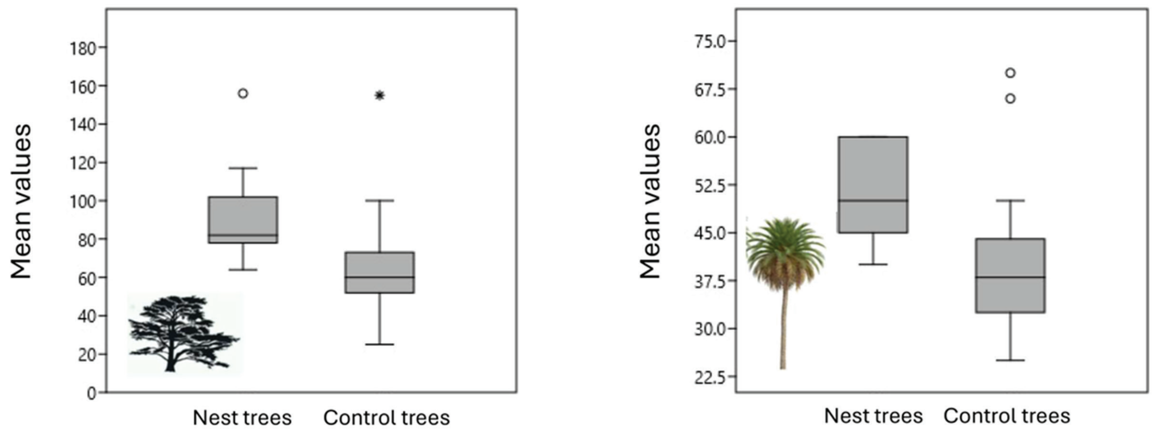

Fig. 3. Box plots comparing the tree diameter (in cm) in nest trees vs. control trees. Left: cedars, *Cedrus libani*: right; palms, *Phoenix* sp.). The minimum and maximum values are shown with vertical bars (‘whiskers’), and the 25–75 percentile range is indicated by the box. The horizontal line in the box represents the median value. Outliers (white dots) are also reported.

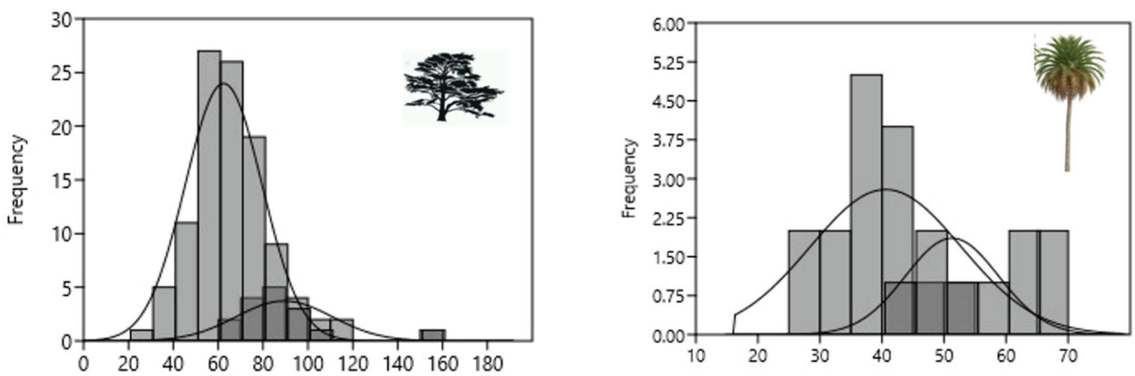

Fig. 4. Frequency distribution of diameter categories (x-axis) of Monk Parakeet’s nests. Left: ligth grey: cedars, *Cedrus libani* without nests (control trees); dark grey: with nests (host trees). Right: ligth grey: palms, *Phoenix* sp. without nests (control trees); dark grey: with nests (host trees). The frequency distribution shows a skewness of nest trees toward larger size classes (cedars: D = 0.63, $p < 0.001$; palms: D = 0.62, p = 0.015; Kolmogorov-Smirnov test).

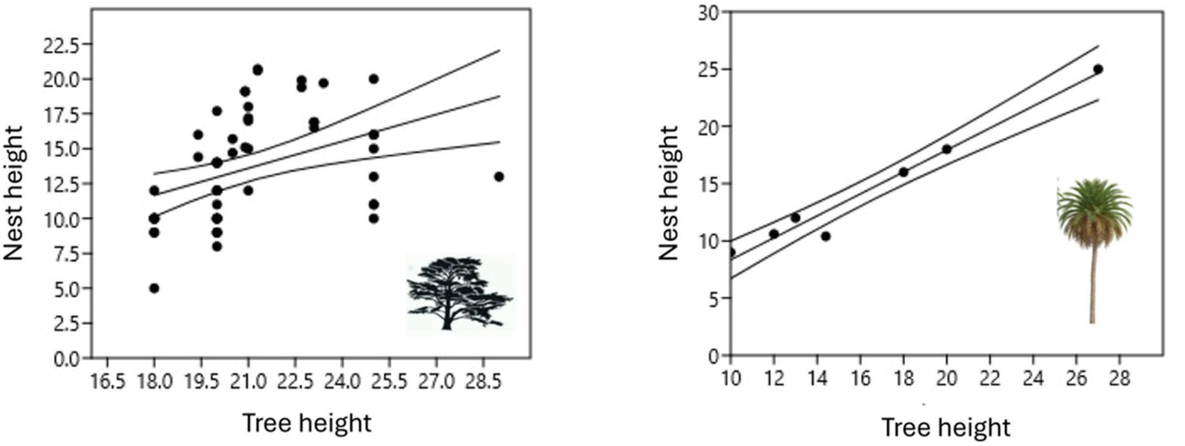

Fig. 5. Nest tree height vs. nest height correlation (left: cedars, *Cedrus libani*: right: palms, *Phoenix* sp.). Cedars: tree height = 0.64 × nest height + 0.10; $R^2 = 0.16$; $r = 0.41$, $t = 3.26$, $p < 0.01$; palms: tree height = 0.98 × nest height – 1.24; $R^2 = 0.97$; $r = 0.98$, $t = 12.53$, $p < 0.001$; Significance of regression line: cedars: $t = 3.26$; palms: $t = 12.53$; both $p < 0.001$; Ordinary Least Squares Regression (95% bootstrapped confidence intervals, N = 1999).

Discussion and conclusions

Our observations corroborate previous evidence on nest-tree use and selection in Monk Parakeets from both their native range and recently introduced areas (Hyman and Pruett-Jones, 1995; Burger and Gochfeld, 2000; Pranty, 2009; Volpe and Aramburú, 2011; Avery et al., 2012; Burgio et al., 2014; Reed et al., 2014; Romero et al., 2015; Di Santo et al., 2017a, b), providing, for the first time, additional information from the largest urban parks of Rome, useful to define appropriate management strategies of this invasive species.

Overall, we recorded approximately two nests per 10 hectares across the entire set of urban parks, although site-specific differences likely reflect the varying availability of tree species suitable for nest constructions. Our study confirms the use of ornamental species (Di Santo et al., 2017b; Briceño et al., 2022) for nest building, with cedars and palms being the two most used species, as previously reported (Sol et al., 1997; Pranty, 2009; Romero et al., 2015; Di Santo et al., 2017b). The former is a conifer introduced into cultivation in parks and gardens during colonial times (Din, 1990; Pijut, 2000), while palms have attracted significant horticultural interest worldwide (Sosa et al., 2021).

In both tree species, relative to their availability, parakeets select individuals with larger trunk diameters, which are also taller due to the strong positive correlation between diameter and height. This selection is reflected in a significant skewness in diameter frequency distributions, with nest trees shifted toward larger size classes. Similar findings have been reported for other parakeet colonies near Rome (Calzada Preston et al., 2021; Battisti and Cerfolli, 2022). Larger trees offer greater stability (e.g., during adverse weather events) and enable nests to be placed in the canopy higher portion, which is important for the social dynamics of this gregarious species and for defence against predators (Senar et al., 2019).

Clear differences emerge in nest placement between the two ornamental species, reflecting their distinct structural characteristics. Cedars are majestic trees, reaching 15 to 40 m tall at maturity, with massive trunks and wide-spreading branches. Young cedars have a pyramidal shape but develop flat-topped crowns with horizontally tiered branches when mature (Dirr et al., 1993; Farjon, 1990; Chaney, 1993). Branches extend horizontally up to the 4th and 5th order, providing broad support surfaces where nests are consistently placed in an 'open hand' position, mostly on 3rd and 4th order branches (Briceño et al., 2022).

By contrast, palms have thick, columnar trunks or stipes of relatively uniform thickness and mature heights of 12–15 m, although centenarian palms can exceed 30 m (Chao and Krueger, 2007; Sosa et al., 2021). Widely distributed in Mediterranean parks and common in Rome as ornamental and naturalized species (Lucchese, 2017), palms possess a simpler structure than cedars, with an apical tuft from which leaves emerge (Sosa et al., 2021). This structural simplicity explains why nests are located exclusively at the distal part of the trunk—under the leaves in a crown-like arrangement. In palms, available nesting space is restricted to the upper part below leaf branch attachments (Sosa et al., 2021). This resembles nests built on poles, a phenomenon mostly documented outside Europe (Burger and Gochfeld, 2000, 2009; Burgio et al., 2014; Reed et al., 2014), where nests are also placed near the top of artificial structures.

In both tree species, nests are placed at heights around 13–14 meters, consistent with other studies (Briceño et al., 2022). Moreover, nest height positively correlates with tree height, as previously demonstrated (e.g., Di Santo et al., 2017b). The tree architecture may explain the differences in relative nest height (the nest height/tree height ratio, %) between host trees: in palms, nests are near the top (~ 90%), beneath leaf branch attachments, whereas in cedars nests are located lower (~ 65%). This architectural difference also accounts for variation in the number of nests per tree: nearly three on average in cedars, but never more than one in palms. The greater number of nests in cedars has been previously reported (e.g., Romero et al., 2015; Briceño et al., 2022) and relates to the more complex branching structure of cedars (Chaney, 1993).

Nest site choice seems to reflect a trade-off among structural features, weather conditions, and predation risks. Relative height likely balances lateral placement to distance nests from terrestrial predators (e.g., *Rattus rattus*: Senar et al., 2019; *Corvus cornix*: Di Santo et al., 2017a) with positioning nests in more protected, inner parts of the canopy to shield them from harsh weather (e.g., heavy rains, strong winds), which can cause nest collapse (Burger and Gochfeld, 2005).

In cedars, nest proximity to the trunk increases with tree height because the species' pyramidal shape restricts the availability of suitable sites in more exposed positions. At lower heights, nests tend to be placed farther from the trunk on outer branches, possibly reflecting parakeets' behavioral preference for small terminal branches when perching (Granatosky et al., 2022).

Our study focused on the five largest urban parks in Italy's biggest metropolitan area. However, the species is also locally present in numerous smaller parks and private gardens (Di Santo et al., 2013; Battisti, 2019), suggesting a fine-scale distribution that may indicate a higher overall abundance and density. Rome contains a large number of urban parks, private gardens, tree-lined avenues, and mature individual trees (including cedars and palms) scattered throughout small green spaces embedded within high-density urban areas (Catalano, 1995). In total, the city comprises 82,000 ha of agricultural and non-urbanized land (Vignoli et al., 2009). Excluding agricultural areas, urban parks, gardens, and other green spaces cover 43,000 ha and include approximately 315,000 trees—120,000 street trees, 180,000 trees in parks and historic villas, and 15,000 trees on school grounds (Clemente et al., 2025).

Moreover, private gardens having a fine-grained distribution may host mature cedars and palms suitable for parakeet nesting. Such a fine-grained network of potentially suitable green areas suggests a very high number of active Monk Parakeet nests (estimated range: 100 to over 1,000), which is difficult to quantify in a single research project. Therefore, citizen science initiatives aimed at locating nests across the metropolitan area are recommended (Hernández-Brito et al., 2022) to better assess the density and distribution of Monk Parakeet nests.

Our data—combined with citizen-based surveys and GIS analyses focusing on the presence of cedars and palms in urban parks and private gardens (as suitable trees for nesting; see Isaac et al., 2008, for analogous habitat suitability surveys on other bird species), could help design more effective management and control strategies, particularly in the 'context analysis' phase of such projects (Battisti, 2018), where knowledge of distribution, density, and characteristics of nests and host trees is crucial (see Postigo et al., 2021). In this regard, yet vegetation maps at detailed scales and grains are available for Rome (Cecili et al., 2023). Given the recent spread of the species into bordering extra-urban areas (Biondi et al., 2005; Brunelli et al., 2011; Battisti and Cerfolli, 2022) the overlap among this information is mandatory to pursue functional management activities for the Monk parakeets.

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