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Breeding and migratory distribution of collared pratincole (*Glareola pratincola*) at Boğazkent, Southern Turkey

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Abstract: On migration seasons, both in spring and autumn, wetlands in southern Turkey play a significant role as a stopover and/or breeding areas for several bird species, especially water birds. Although a huge amount of bird species migrate on Turkey every season, there is unfortunately poor information about their migration. Collared pratincole (*Glareola pratincola*) is one of the important species, which use these areas as stopover or breeding. We monitored Collared pratincole between 2009 and 2011 both in migration and breeding seasons. Collared pratincole started to arrive second half of the April. The most part of the observed birds were passage birds, the average numbers 73 in April and 380 in May, which used the area as stopover for a few days. We found totally 10 nests and colony nested mostly on seasonal wetland, and less pairs chose semi-arid area and very few pairs on pasture. These results are very important to define the protection and sustainable use of areas, but more studies may help to understand the importance of our environment for sustainable protection.

Keywords: Breeding, Collared pratincole, *Glareola pratincola*, Migration.

Introduction

Collared pratincole, *Glareola pratincola*, is a colonial, monogamous and mainly aerially feeding insectivorous shorebird (Cramp and Simons, 1983). This species have a large breeding distribution throughout the Palearctic (Cramp and Simons, 1983; Del Hoyo et al., 1996), along the northern shore of the Mediterranean Sea (Calvo and Alberto, 1990; Calvo, 1994), and in North Africa (Hanane et al., 2010; Bensaci et al., 2014). Even though this species breed eastern the Mediterranean Sea, there are only few investigations to understand breeding ecology and behaviour of this species (Goutner, 1997; Onmuş and Sıki, 2011). Because of the habitat loss by using agricultural land use, these studies have underlined that the intensive transformation of natural marshes and grasslands into agricultural areas constitutes a threat to the breeding populations (Calco and Alberto, 1990; Hanane et al., 2010).

Agricultural land use is very similar in Turkey and there is stil restricted information in most aspects of different species such as Collared pratincole. On the

migration route, in southern Turkey, especially wetlands and seasonal wetlands have great importance for a stopover and also for breeding. Nevertheless, only a few studies show the breeding population size of the species (Onmuş and Sıki, 2011). On the other hand, with the increasing of birdwatcher numbers in Turkey, the number of recorded birds from different sites are growing up recent years. But, this data set only helps the distribution value of species in different areas without the density of both migratory and breeding populations. Therefore, there is a big necessity to understand the population dynamics of this species in southern Turkey. Boğazkent, the studied area is located on the south coast of Turkey, and over 200 species distribute as passage-, summer- and winter migrants with some sedentary species. In this study, we aim to underly the importance of this area for collared pratincole both passage migrants and breeding pairs.

Materials and Methods

Study area: The study was carried out at Boğazkent in the Belek Special Protection Area, 45 km east of the city

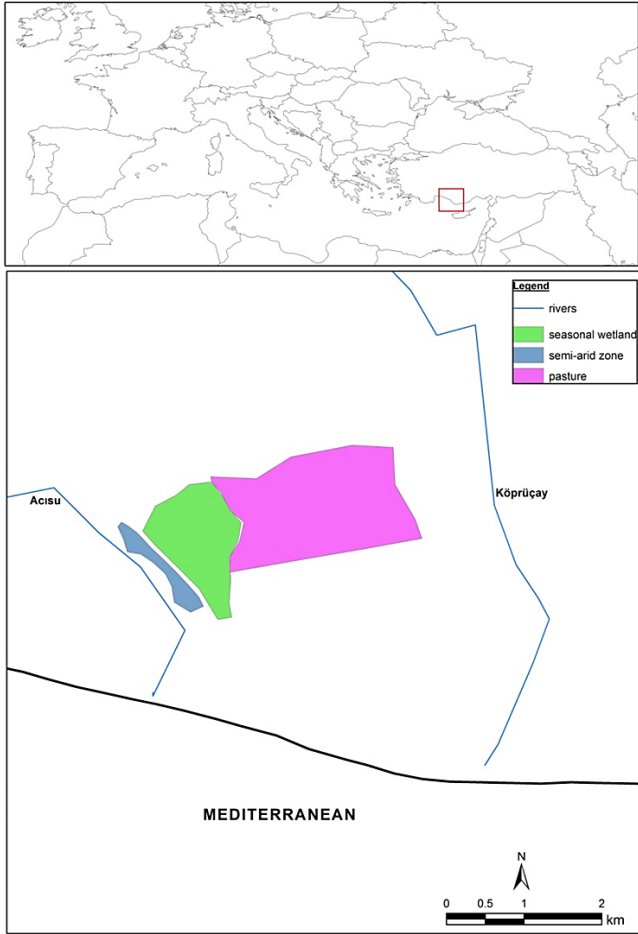


Figure 1. Location and features of the study area. The blue line shows rivers, green area seasonal wetland, dark blue semi-arid zone and pink pasture.

Antalya, Turkey (36°50'N, 31°11'E, near sea level). This is an area of over 200 ha of shrub steppe, arable fields, marshlands, grasslands and farmlands (Fig. 1). The site has a typical Mediterranean climate consisting of hot and dry summers and mild but windy winters.

Breeding and migrating bird surveys: Data were collected from March to October between 2009 and 2011. Previous observations showed that three important areas (seasonal wetland, semi-arid and pasture areas, Fig. 1) were used as stopover site and breeding areas by the species. We chose 3 points for observation and counted birds in one hour period each points every 10 days to estimate the migratory bird size of the species from the second half of March through the end of May. Counting breeding birds from outside of the colony can give a fair estimate. Thus, in June, July and August, one observer walked carefully through the colony and counted birds in ten day periods.

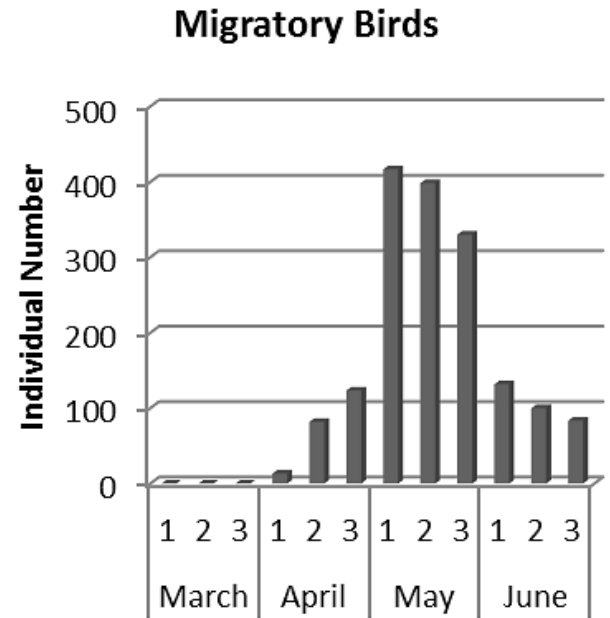
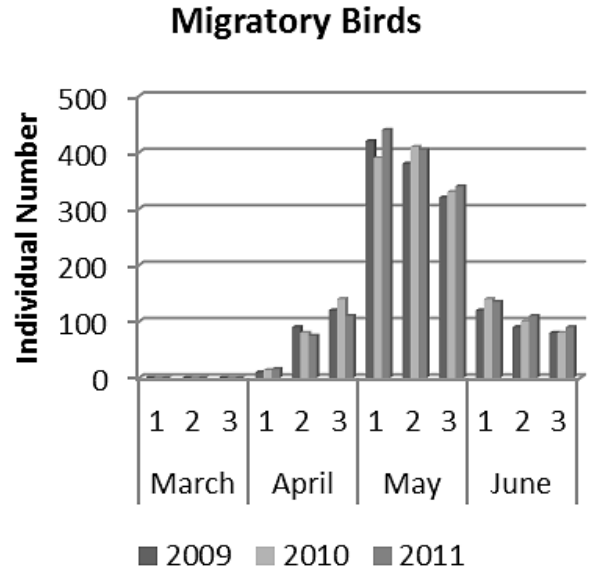


Figure 2. Migration phenology of Collared pratincole in spring at Boğazkent. Dispersion of individual numbers in different years (above) and in average of all years (beneath).

Results

Migratory birds: Collared pratincole started to arrive second half of the April. In the beginning, the numbers of arrived birds between 8 and 10 individuals in different years, after a short time (in the beginning of the May) the numbers increased around 300 individual-groups (Fig. 2-3). The most part of the observed birds were passage birds, which used the area as stopover for a few days. Most migratory birds used the seasonal wetland all studied

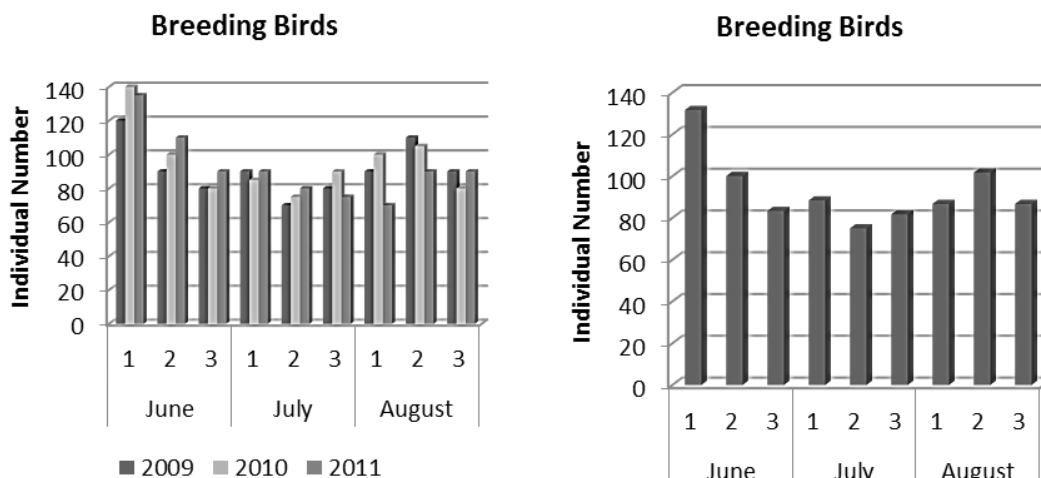


Figure 3. Breeding numbers of Collared pratincole at Boğazkent. Dispersion of individual numbers in different years (left) and in average of all years (right).

Table 1. Mean values of individual numbers per months and years on different sites both in migration and breeding process at Boğazkent, South Turkey.

Areas		2009		2010		2011	
		April	May	April	May	April	May
Migration	Semi-arid Zone	7	55	8	54	6	65
	Seasonal wetland	60	242	62	248	59	247
	Pasture	6	76	8	74	2	83
	Total	73	373	78	376	67	395

		2009		2010		2011	
		June	July	June	July	June	July
Breeding	Semi-arid Zone	22	18	24	16	26	18
	Seasonal wetland	66	58	72	60	70	60
	Pasture	8	4	10	4	19	3
	Total	96	80	106	80	111	81

Table 2. The mean, min-max and Std. Error values and comparison of each year.

Years	Min.	Max.	Mean	Std.Error	ANOVA test (Between years)	P Value
2009	10	420	208.57	60.88	0.995	<0.05
2010	14	410	214.86	60.11		
2011	16	440	217.29	65.27		

years, fewer individuals also used semi-arid zone and pasture area for stopover (Table 1). There is no significant difference for individual numbers of migratory birds between years ($P < 0.05$) (Table 2).

Breeding pairs: We continue to observe and count individuals from March through end of August each points every 10 days. We counted 96, 106 and 111 individuals as a mean value in June 2009, 2010 and 2011, respectively (Fig. 3). This numbers little decrease in July (80, 80 and 81 individuals in different years, respectively). We did not disturb the breeding colony, but on our observations, we found 2 nests in 2009, 4 nests both in

2010 and 2011 (Fig. 4). Colony nested mostly on seasonal wetland, but on nesting time, June-July and August, this area dried (Fig. 4 a, c, d) and less pairs chose a semi-arid zone and very few pairs on pasture (Table 1).

Discussion

One of the important aims of this investigation was to provide the migratory and breeding distribution of Collared pratincole in South Turkey. Our results show that these birds arrive at the study area as stopover and breed very late (mid-April) than other Mediterranean populations, such as beginning of March in Morocco

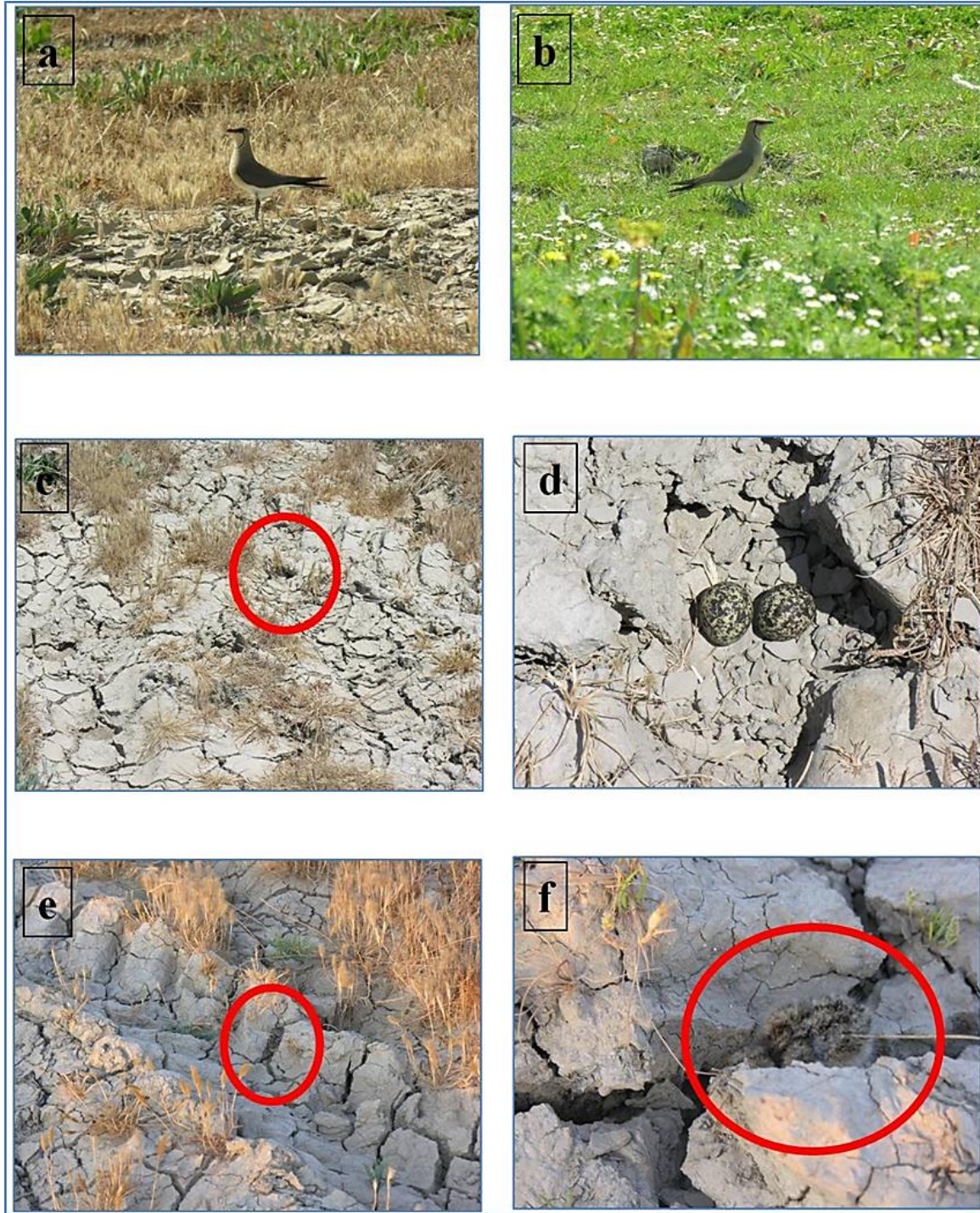


Figure 4. Breeding Collared pratincole (*G. pratincola*) at Boğazkent. (a) First individuals on seasonal wetland, (b) on pasture, (c) and (d) Collared pratincole nest on semi-arid zone, (e) and (f) hatched chicks, in first week and close to the nest (photo by H. Karaardıç, 2009).

(Hanane et al., 2010), mid-March in Algeria (Bensaci et al., 2014), end of March in Spain (Bertolero and Martinez-Vilalta, 1999) and first half of April in France (Vincent-Martin, 2007).

Collared pratincole breeds also in Greece (Goutner, 1997), in western Turkey (Onmuş and Sıkı, 2011) and in

European Russia (Lebedeva, 1998). These studies did not point out the arrival timing of the populations, but according to our results, migratory individuals may arrive to their northern breeding sites end of May or beginning of June. Hanane et al. (2010) reported that the hatching date is 45 days, our results show that the birds arrived

earlier than others may settle and after a short time lay eggs, because we observed the hatched chicks in early June.

There is quite restricted information about the density of migratory species likewise breeding birds on distributed areas. Many studies of Collared pratincoles around the Mediterranean mentioned the main causes of nest loss were human disturbance such as agriculture and domestic animals (Cramp and Simons, 1983; Hanane et al., 2010). We can estimate that Collared pratincole also could be affected by human agricultural studies and predation according to the breeding ecology of Great short-toed lark (*Calandrella brachydactyla*) (Karaardıç and Özkan, 2013) and Spur-winged lapwing (*Vanellus spinosus*) (Özkan et al., 2013) at Boğazkent.

In conclusion, even though these results are very important to define the protection and sustainable use of areas, it is not enough to determine the threaten factors for nature protection. Such studies may help to make different hypothesis like the breeding ecology of species in different areas, especially comparison between protecting and non-protecting areas, will be more useful to understand the importance of our environment.

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