

MIENIS, H.K.:

Predation on landsnails by the Stone curlew: Burhinus oedicnemus, in Israel /Mollusca, Gastropoda - Aves, Charadriiformes/ - Az ugartyuk: Burhinus oedicnemus csigafogyasztása Izraelben /Mollusca, Gastropoda - Aves, Charadriiformes/

ABSTRACT: Analyses of faecal pellets showed that the Stone curlew: Burhinus oedicnemus s.l./Aves, Charadriiformes/ feeds on at least eight species of landsnails in Israel.

Of the nine species of Stone curlews, Thick knees, Dikkops or Stone plovers currently recognized as forming the family Burhinidae /Aves, Charadriiformes/, seven belong to the genus Burhinus and two to Esacus /MACLEAN, 1978; ROSELAAR, 1983/. Although the family has representatives on all continents, their distribution is mainly confined to tropical and warm-temperate areas.

Only one species Burhinus oedicnemus or the Stone curlew /fig.1./ occurs in Israel. It is represented there by two subspecies: Burhinus oedicnemus oedicnemus /LINNAEUS, 1758/ and Burhinus oedicnemus saharae /REICHENOW, 1894/. All resident, breeding birds belong to the latter subspecies. The nominate species occurs in Israel either as a migrant on their autumn and spring flights to Africa, or as a winter visitor, and then usually in both cases in large flocks.

Stone curlews may be encountered over the whole country, however, always in open, dry sandy or stony areas with sparse vegetation.

Although the birds are rather secretive during daytime, their wild, wailing shrills during early evening and night form usually the first indication that Stone curlews are presented.

Burhinus oedicnemus is known to feed on a large variety of terrestrial invertebrates and small vertebrates /ROSELAAR, 1983: with extensive references/. In Israel their food consists mainly of beetles, locusts, crickets and snails, however, also now-and-then small specimens of amphibians, reptiles and mammals may be taken /PAZ, 1986/. This is a deviation of the statement by INBAR /1975/, who claimed that they are mainly

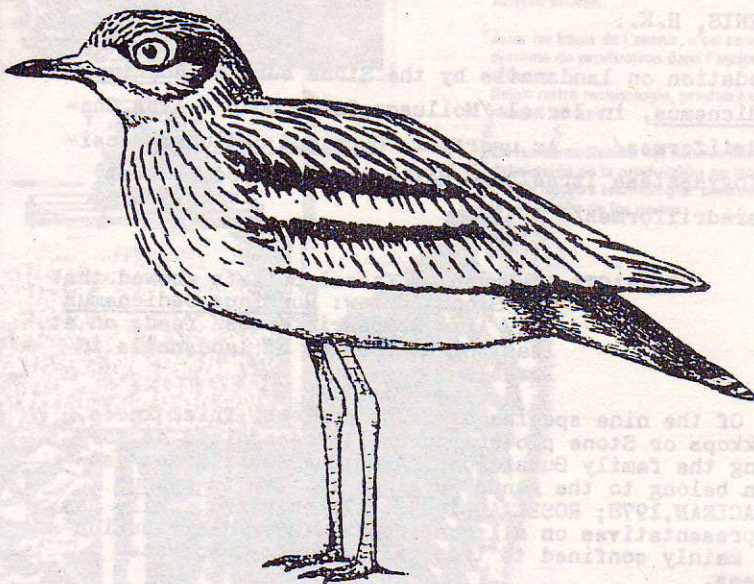


Fig.1. The Stone curlew: Burhinus oedicnemus

feeding on rodents like mice and voles, while they take in addition also some geckos, skinks, lizards, insects and land-snails. MIENIS /1978/ reported on droppings of the Stone curlew which were composed almost entirely of crushed shells of Theba pisana /MÜLLER, 1774/, a landsnail of considerable economic importance in Israel. YOM-TOV /1970/ showed also readily on Trochoidea seetzenii /PFEIFFER, 1847/ and even the thick shelled Sphincterochila zonata /BOURGUIGNAT, 1853/.

The presence of fair numbers of breeding birds in the fields of Kibbutz Netzer Sereni, the author's residence, gave an opportunity to learn more about the snail eating behaviour of the Stone curlew in Israel:

Material and Methods

Faecal pellets of Burhinus oedicnemus s.l. were collected at nest- and resting sites mainly in the fields of Kibbutz Netzer Sereni. At home the pellets were soaked in tapwater for 24 hours. This period was long enough for even the driest pellet to disintegrate into tiny particles. The obtained

solution was rinsed in tapwater and flushed through a sieve with a mesh size of 1 mm. The remaining particles were dried and screened under a low-power binocular for the presence of shell fragments. The latter were identified with the help of a reference collection consisting of locally collected living snails. The number of snails present in the pellets was established by counting the maximum number of either apexes, shell lips or umbilical regions.

Results

a. The faecal pellets

Faecal pellets of the Stone curlew from sites in Israel are easily recognized both by size and composition. Their droppings differ from those of the Spur-winged plover: Hoplopterus spinosus, which occurs often in the same biotope /MIENIS, 1985/, by their much larger size. Near Kibbutz Netzer Sereni Burhinus-droppings were collected as large as 33 x 18 mm. Another bird which shares the same site is the Chukar: Alectoris chukar. Pellets of the latter are entirely composed of plant-material, a food item hardly present in Stone curlew pellets. There is no doubt what-so-ever that we analyzed therefore faecal pellets of Burhinus oedicnemus.

b. The qualitative and quantitative results

The presence of landsnails in droppings of the Stone curlew is represented in table 1. From these data is clear that Burhinus oedicnemus carries out predation under natural conditions on at least eight species of landsnails /table 2./, all belonging to the Helicidae except for Euchondrus aff. ovularis.

In table 3 we have enumerated the quantitative data of the number of landsnails recovered from all the pellets found at a certain site. From these data it appears that the number of shells per dropping varied from site to site with a minimum of 3.4 shells per dropping near Ramlah to 7.2 shells per dropping near Ahisamakh. The distance between both sites is only a few kilometers. The differences are probably caused by the fact that the fields south of Ramlah are much more intensively cultivated than those near Ahisamakh. The latter fields harbour therefore a much higher snail population almost entirely consisting of Monacha obstructa and Monacha haifaensis.

In the few cases we have analyzed individual faecal pellets, the number of shells per dropping ranged from at least one to over ten juvenile shells of Trochoidea seetzenii.

Discussion and conclusion

Although we have checked the faecal pellets of Burhinus oedicnemus only for the presence of landsnails, the results

presented here seem to confirm a previous observation /MIENIS, 1978/ that the food of the Stone curlew in Israel consists for a large part of landsnails.

These results stand in quite some contrast with those obtained by WESTWOOD /1983/ during a study of the diet of Stone curlews at Weeting Heath, Norfolk, Great Britain. Although his birds were feeding occasionally on snails, the major part of the food consisted of earthworms, beetles, spiders and woodlice. Also AMAT /1986/ found only the remains of two snails in 50-60 droppings of Burhinus oedicnemus collected in Donana, southern Spain.

In order to know more about the total diet of Stone curlews in the fields of Kibbutz Netzer Sereni, a number of highschool students is currently analyzing the remains of food items in faecal pellets for a period of one year.

In the mean-time we may conclude that the Stone curlew: Burhinus oedicnemus is a major predator of landsnails in Israel.

Összefoglalás

A szerző az ugartyúk /Burhinus oedicnemus/ csigafogyasztását vizsgálva megállapította, hogy a madár egyike Israel jelentős csigaevő madarainak.

References

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Table 1: Records of landsnails recovered from faecal pellets of the
Stone Curlew Burhinus oedicnemus in Israel

No.	Prey species	Locality	Date
1.	<u>Theba pisana</u>	Netzer Sereni	July 1977
2.	<u>Xeropicta vestalis joppensis</u> <u>Theba pisana</u>	Netzer Sereni	21 April 1981
3.	<u>Helix engaddensis</u>	Netzer Sereni	25 April 1981
4.	<u>Xeropicta vestalis joppensis</u> <u>Monacha haifaensis</u> <u>Theba pisana</u>	Netzer Sereni	30 April 1981
5.	<u>Xeropicta vestalis joppensis</u> <u>Monacha haifaensis</u> <u>Theba pisana</u>	Netzer Sereni	10 May 1981
6.	<u>Xeropicta vestalis joppensis</u> <u>Monacha haifaensis</u> <u>Theba pisana</u>	Netzer Sereni	16 May 1981
7.	<u>Xeropicta vestalis joppensis</u> <u>Theba pisana</u>	Netzer Sereni	21 May 1981
8.	<u>Xeropicta vestalis joppensis</u> <u>Monacha haifaensis</u> <u>Theba pisana</u>	Netzer Sereni	23 May 1981
9.	<u>Xeropicta vestalis joppensis</u> <u>Theba pisana</u>	Ramlah	14 June 1981
10.	<u>Monacha obstructa</u>	Ramlah-Ahisamakh	14 June 1981
11.	<u>Monacha obstructa</u>	Ramlah-Ahisamakh	2 May 1982
12.	<u>Euchondrus aff. ovularis</u> <u>Xeropicta vestalis joppensis</u> <u>Monacha haifaensis</u> <u>Theba pisana</u> <u>Helix engaddensis</u> juv.	Netzer Sereni	2 March 1985
13.	<u>Trochoidea seetzenii</u>	Yeruham	12 March 1986
14.	<u>Euchondrus aff. ovularis</u> <u>Xeropicta vestalis joppensis</u> <u>Monacha haifaensis</u> <u>Theba pisana</u>	Palmahin	25 Sept. 1987
15.	<u>Trochoidea seetzenii</u> <u>Trochoidea tuberculosa</u>	Hazerim-De'er Sheva	22 Febr. 1988

Table 1 (Cont.)

16. <u>Monacha haifaensis</u>	Ramlah-Ahisamakh	29 March 1988
<u>Monacha obstructa</u>		
17. <u>Monacha obstructa</u>	Ahisamakh	6 April 1988
18. <u>Monacha haifaensis</u>	Ramlah	9 April 1988

Table 2: Systematic list of landsnails predated upon by the Stone Curlew
Burhinus oedicnemus in Israel

1. Euchondrus aff. ovularis⁺
2. Trochoidea (Xerocrassa) seetzenii (Pfeiffer, 1847)
3. Trochoidea (Xerocrassa) tuberculosa (Conrad, 1852)
4. Xerovicta vestalis jordanensis (Schmidt, 1855)
5. Monacha haifaensis (Pallary, 1939)
6. Monacha obstructa (Pfeiffer, 1842)
7. Theba pisana (Müller, 1774)
8. Helix (Pelagga) engaddensis Bourguignat, 1852)

⁺ This species has so far been recorded from Israel as Euchondrus ovularis (Olivier, 1801), a species from Turkey. Although the species from Israel is closely related, it belongs most probably

Table 3: Quantitative data concerning the presence of landsnails in faecal pellets of the Stone curlew: Burhinus oedicnemus, from seven sites in Israel.

Site	No. pellets	Max. no. snails	Remarks ⁺
Netzer Sereni	217	853	Eo-2; Xvj-313; Mh-51; Tp-484; He-5.
Ramlah	12	41	Xvj-20; Mh-4; Tp-17.
Ramlah-Ahisamakh	25	103	Mh-17; Mo-86.
Ahisamakh	12	87	Mo-87.
Palmahim	52	220	Eo-1; Xvj-122; Mh-17; Tp-81.
Hazerim-Be'er Sheva	22	88	Ts-87; Tt-1.
Yeruhim	3	17	Ts-17.

+ The following abbreviations have been used:

Eu-Euchondrus aff. ovularis; Ts-Trochoidea seetzenii; Tt-Trochoidea
tuberculata; Xvj-Xeropicta vestalis japensis; Mh-Monacha haifaensis;
Mo-Monacha obstructa; Tp-Theba pisana; He-Helix engaddensis.

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