Turk J Zool
29 (2005) 177-181
© TÜBİTAK

Observations on Some Behaviours of Krüper's Nuthatch (*Sitta krueperi*), a Little-Known West Palaearctic Bird

Tamer ALBAYRAK, Ali ERDOĞAN
Department of Biology, Faculty of Science - Art, Akdeniz University, 07058, Antalya - TURKEY

Received: 15.03.2002

Abstract: Some intraspecific and interspecific behaviours in Krüper's Nuthatch (*Sitta krueperi*) populations were observed in Antalya province, southern Turkey. An account of their endemic distribution in Anatolia on the one hand, and the lack of sufficient data on the other, gave rise to the need for such a study. The breeding behaviour in the populations is observed, particularly in the BÜK (Lütfi Büyük Yıldırım research forest) and ELMALI Cedar research forests. The results are given in 2 parts as observed behaviours throughout a year and breeding period, which are mating, nesting, brooding, parental care and rearing and territorial behaviours.

Key Words: Krüper's Nuthatch (*Sitta krueperi*), Behaviour, Antalya

Az Bilinen Batı Palearktik Kuşu Anadolu Sıvacısının (*Sitta krueperi*) Bazı Davranışlarına ilişkin Gözlemler

Özet: Türkiye'nin güneyinde Antalya'da yaşayan Anadolu sıvacısı populasyonunun tür içi ve türler arası davranışları incelenmiştir. Bir yandan Anadolu sıvacısının Anadolu'daki endemik yayılışı, diğer yandan eldeki verilerin azlığı, böyle bir çalışmaya gerek duyulmasına yol açmıştır. Populasyonun üreme davranışları özellikle BÜK (Lütfi Büyük Yıldırım araştırma ormanı) ve Elmalı Sedir araştırma ormanında kaydedildi. Elde edilen bulgular, yıl boyunca gözlenen davranışlar ve eşleşme, yuvalanma, kuluçka ve yavru bakımı, teritoryal davranışları içeren üreme dönemindeki davranışlar olmak üzere iki kısımda değerlendirilmiştir.

Anahtar Sözcükler: Anadolu sıvacısı, (*Sitta krueperi*), Davranış, Antalya

Introduction

Turkey has a rich fauna and lies on the main migration route (e.g., Barış, 2000; Erdem, 1995; Heath and Evans, 2000; Kasparek and Bilgin, 1996; Kirwan et al., 1998; Kiziroğlu, 1989; Porter, 1983; Roomen and Schekkerman, 1989; Roselaar, 1995; Yarar and Magnin, 1997). Most previous studies on birds in Turkey were avifaunistic and limited to their biology (e.g., Ayvaz, 1990; Başkaya, 1998; Erdoğan, 1990, 1995; Kaçar, 2001; Kiziroğlu, 1981; Sert, 2000; Sıkı, 1992; Sıkı et al., 1998; Turan, 1998). Krüper's Nuthatch is not a well-known bird (Cramp and Perrins, 1993; Harrap and Quinn, 1996) and a small fraction of its world population lives in the near neighbourhood of Turkey, e.g., the Greek Islands and the Caucasus (200–700 individuals), whereas the greatest number of them are seen in Anatolia (10,000–100,000 individuals) (Hagemeijer and Blair, 1997). In this context, an account of their endemic distribution in Anatolia (Frankis, 1991), on the one hand, and a lack of sufficient data on the other, prompted the need for such a study. Krüper's Nuthatch belongs to SPEC 4 (Species of European Conservation Concern) whose global population is concentrated in Europe; therefore it is secure (S) in the sense of its European Protection Status. However, this situation may change in the future due to changes in its density and distribution (Tucker and Heath, 1994).

Study Area and Methods

The behaviour of Krüper's Nuthatch was observed once a week in its breeding period from mid-March to late June and once a month in its non-breeding period between February 1999 and December 2000 in the natural forests around Antalya, particularly the *Pinus brutia* forest BÜK (Lütfi Büyük Yıldırım Research Forest) and the *Cedrus libani* forest of Elmalı Research Forests. During the observations, 10 x 50 Soligor binoculars and

for the recording of behaviour observations a camera and an audio recorder were used. The behaviours of both genders of adult birds and young individuals were recorded separately.

Results

Various kinds of intraspecific behaviour were encountered during the study. For Krüper's Nuthatch, which exhibits territorial behaviours, differences in gender were observed, especially during the breeding period.

Observed Behaviours Throughout a Year

Krüper's Nuthatch is very active all year round. Males and females usually search for food together, in the cones and trunk of the upper third of trees. Whilst looking and pecking at the trunk or cones of pine and cedar trees the body is held in an upright position. When one of a pair has found suitable food it typically calls to invite its partner, which answers with a hoarse cry before going to join it. The birds occasionally catch food in the air. When flying they suddenly rise quickly and steeply, catching an insect, and then glide downwards for a short time before continuing to fly normally.

The upside-down posture, which is used by both sexes, has 2 different forms. The first occurs as soon as its search for food has finished, when its body faces downwards on the tree trunk. This indicates that it is soon to go to another place (Figure 1). The second is observed to occur only once when it is in an upside-down position and stretches downward in order to drink water from the bushes without treading the earth.

Looking left-right is frequently observed in birds that have finished searching for food in cones or tree trunks. This behaviour indicates that the bird is looking for a new feeding area.



Figure 1. Upside-down posture.

Krüper's Nuthatch is rarely seen on the ground, where it collects nest materials. Sitting and comfort postures are used by both sexes. It rests on the main branches of the tree with legs bent. The body feathers are fluffed and the wings spread out and feathers cleaned with the bill in the comfort posture (Figure 2).



Figure 2. A view of the comfort posture of a male.

During wing-spreading behaviour the primaries are in contact with the body and are spread out for a few seconds. These movements were generally observed in the female relaxing between leaving the nest and taking flight, whilst resting.

Observed Behaviour throughout the Breeding Period

Mating

No copulation was observed, but some courtship behaviour and offering of the nest site were observed. The male circles around the female, moving from branch to branch, or circles around the female in the air chirping constantly. When this happens, the female calls hoarsely with her wings slightly lowered, fluttering. The tail is held downwards whilst the body sways from left to right.

When the male brings food to the female, the latter eventually holds its wings downwards, fluttering them lightly, and at the same time making a hoarse cry, in a ritualistic way.

The male typically brings food to the female, as a kind of ceremony. In this behaviour, the bill is brought forwards, the wings are held downwards slightly and fluttered, the tail is held downwards and a hoarse cry is let out by females towards males during incubation (Figure 3).

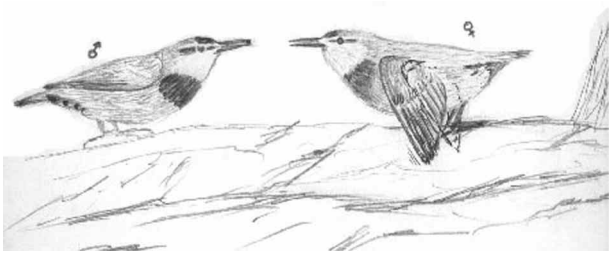


Figure 3. The male typically brings food to the female, as a kind of ceremony.

Nesting

They either use a nest-hole that has been opened by woodpeckers or make their own hole in a slightly decayed tree-trunk. When they make a hole, the male is usually seen to work harder than the female When the birds open the hole by pecking, using their wings to give them extra strength, they work upside-down, sideways and in upright positions. The birds peck approximately 25-30 times per minute.

The nest materials, composed of very thin bands of tree cortex (66.3%), pine seeds (21.3%), bristles (5.5%), feathers (2.8%), lichens (2.5%), and nylon and cotton threads (1.3%), are dull in colour, ranging from cream to brown, not multi-coloured (proportional weights of materials are average values over 9 nests). Surplus nest materials are gathered together near the nest by both males and females.

Brooding, parental care and rearing

During incubation, only females stay in the nest, and males are seen to provide food for them constantly. Males work harder than females to feed the young birds, but females are seen to be busier cleaning the nest by removing faeces. For example, it was observed that the female transported food about 22 times and faeces 5 times, while the male transported food 32 times and faeces 4 times in 30 min. Faeces are carried approximately 20 m away from the nest, and not only to one area. During the incubation period, females sometimes look out from their nest entrance to check their surroundings.

An inviting call is used by parents when taking young birds that are flying for the first time to a refuge area densely populated with trees. A hanging down posture is used, especially by fledglings. The birds hang like bats on the thin branches waiting for their parents (Figure 4).



Figure 4. A juvenile as viewed in a hanging down posture.

This kind of posture is also seen from time to time in mature birds after foraging.

Territorial behaviour

During the breeding season the male holds its head high when singing. An upright posture is used by males during chirping to mark their territory. It quivers its tail softly and raises its head slightly. When the males flutter their wings in a larger movement, they move their tails up and down rapidly and make a loud cry at the same time, this signal being used while guarding the territory in the breeding season.

Their body feathers are held erect in order to seem strong as a show of power when threatening other birds. During this time, if there is a fight or a threat very close to the nest, females also join in the fight by billing once or twice. Otherwise, females give support by letting out a loud cry, with their feathers held erect and tail held

upwards. These fights continue in the trees, on the ground and in the air until the birds have distanced themselves from the nest. Fighting on the ground involves loud cries and billing. In the trees feathers are fluffed out and the head and bill are rubbed against a branch, from left to right, with the head held downwards. Billing sometimes takes place in the trees. In the air billing continues in addition to hitting with the wings and kicking. The birds turn in the air together while fighting. Any other birds like the Great tit (*Parus major*) and redstart (*Phoenicurus phoenicurus*) that apparently intended to occupy the nest were attacked by the female in the nest, chirping loudly and pecking from the nest entrance.

A hunched posture is used to oppose threats of interspecific or intraspecific attack when its territory is infringed. This time the body is hunched, with all body feathers fluffed, tail upright and a strong uniform series of loud notes of simple structure. Males also use this posture to display their power during the breeding season.

The behaviour in which the head is held slightly downwards and the bill is rubbed on a branch is observed to be a manifestation of power, used as a threat to other birds in a fight situation. Also used by males as a demonstration of power during attacks, the head and the tail are raised upwards and the wings are held downwards. Kicking, billing and feather-pulling are observed when attacks occur in trees, on the ground and sometimes in the air.

It walks towards other birds in the area, such as the chaffinch (*Firingilla coelebs*) and greenfinch (*Carduelis chloris*), though not too aggressively to scare them away. In this movement, the bird walks quickly with its beak forward as if about to peck. Finally, the other birds move away from the area with small jumps.

Escape and submission are observed in birds that are about to lose fight. Individuals run and fly when attacking and threatening as one bird escapes from the chasing ones.

Discussion

Various kinds of behaviour of Krüper's Nuthatch, which is a very active bird, were observed. Generally its postures were shown for short times. It usually searches for food at the top of the tree, in cones, in tree-trunks and in stout branches. The ways in which it searches for food, upside-down, sideways, hanging-down and foraging as though gravity did not exist, are very interesting. In this way, it is a bird that is not uncomfortable with people (Kumerloeve, 1958). Being a bird that is always on the move, it could attain more food in a shorter time.

It has been noted that incubation is carried out only by females, whereas the male and female work together in the feeding of young birds (Polivanov and Polivanova, 198; Löhrl, 1988). The food of the Corsican Nuthatch (*Sitta whiteheadi*) for the young is collected by both sexes, perhaps more by the male (Cramp and Perrins, 1993). This kind of behaviour has also been observed in Krüper's Nuthatch. In the early stages of the nesting period, apparently the male did most of feeding but removed less faeces to clean the nest, whereas the female did most of the cleaning and less feeding.

The hunched posture is an aggressive kind of behaviour. In this posture the feathers are also fluffed (Löhrl, 1988). The tail is raised slightly in this posture observed in this study. For the threat posture of the Corsican Nuthatch (*Sitta whiteheadi*), all body feathers are ruffled, so that the bird resembles a ball; head held low, black crown of male conspicuous; tail often held up a little (Cramp and Perrins, 1993). Consequently Krüper's Nuthatch and the Corsican Nuthatch exhibit similar behaviour.

Löhrl (1988) reported that the blue tit (*Parus caeruleus*) tried to occupy the nest of Krüper's Nuthatch. However, the present study reveals that the redstart (*Phoenicurus phoenicurus*) and great tit (*Parus major*) tried to occupy the nest too, but were not successful. On the other hand, it was later recorded that the redstart did occupy the nest, after the young birds had left.

Acknowledgements

I would like to thank Barbara Kılıç and especially Daniel M. Brooks from the Association of Field Ornithologists program of editorial assistance for the improvements made to the English usage. This study was supported by the Akdeniz University Research Fund (Nr.: 990212108).

References

Ayvaz, Y. 1990. Malatya Pınarbaşı Gölü Kuşları. Tr. J. Zool. 14: 139-143.

Barış, S. 2000. Türkiye Kuş Coğrafyası. Türkiye Kuş Konferansı, 19-20 Ekim 2000, Burdur, 3–4.

Başkaya, Ş. 1998. Dağ Horozu (*Tetrao mlokosıewiczi*)'nun Doğu Karadeniz dağlarındaki teritoryal ve kur yapma davranışları. XIV. Ulusal Biyoloji Kongresi, 7-10 Eylül 1998, Samsun, Cilt III, 369-377.

Cramp, S. and Perrins, C.M. (eds.) 1993.The Birds of Western Palearctic. Vol. 7, Oxford University Press.

Erdem, O. 1995. Türkiye'nin Kuş Cennetleri. T.C. Çevre Bakanlığı, Yeşil Seri: 5, Ankara, 113 pp.

Erdoğan, A. 1990. Ankara Beytepe serçe populasyonlarının (*Passer montanus* L. ve *Passer domesticus* L. Passeridae: Aves) davranış ve yuva yapımı üzerine çalışmalar. Tr J. Zool. 14: 274-280.

Erdoğan, A. 1995. Türkiye'de yaşayan akbabaların (*Neophron percnopterus, Gypaetus barbatus, Aegypius monachus, Gyps fulvus*) biyolojisi ve populasyon büyüklükleri üzerine araştırmalar. Doktora Tezi. Hacettepe Üni. Fen Bilimleri Enst. Ankara, 201 pp.

Frankis, M.P. 1991. Krüper's Nuthatch *Sitta krueperi* and Turkish pine *Pinus brutia*: an evolving association. Sandgrouse 13: 92-97.

Hagemeijer, W.J.M. and Blair, M.J. (eds.) 1997. The EBCC Atlas of European Breeding Birds: Their Distribution and Abundance. London.

Harrap, S. and Quinn, D. 1996. Tits, Nuthatches and Treecreepers. Helm Identification Guides, London.

Heath, M.F. and Evans, M.I. 2000. Important Bird Areas in Europe: Priority sites for conservation. 2 vols. Cambridge, UK. (BirdLife Conservation Series No. 8), 791 pp.

Kaçar, M.S. 2001. Antalya araştırma ormanlarındaki Bahçe Kızılkuyruğu (*Phoenicurus phoenicurus* L.) populasyonları üzerine biyolojik araştırmalar. Yüksek Lisans Tezi. Akdeniz Üniversitesi Fen Bilimleri Enstitüsü, Antalya, 100 pp.

Kasparek, M. and Bilgin, C.C.1996. Türkiye Kuşları Tür Listesi. In: Kence, A. and Bilgin, C.C. (eds.) Türkiye Omurgalılar Tür Listesi. DPT/TÜBİTAK.

Kirwan, G.M., Martins, R.P., Eken, G. and Davidson, P. 1998. Checklist of the Birds of Turkey. Sandgrouse, Suppl. 1:1-32.

Kiziroğlu, İ. 1981. Ankara Beynam Ormanı'ndaki Baştankara, *Parus* L., cinsi (Aves) türlerinin biyolojisi, ekolojisi ve davranışları ile ilgili araştırmalar TBAG-371 projesi, Ankara.

Kiziroğlu, İ. 1989. Türkiye Kuşları. Orman Genel Müdürlüğü, Ankara, 314 pp.

Kumerloeve, H. 1958. Sur la presence en Asie Mineure de la Sittelle nainem de Krüper (*Sitta canadensis krüperi* Pelzeln). Alauda 26: 81-85.

Löhrl, H. 1988. Türkenkleiber, *Sitta krueperi*. Bonner Zoologische Monographien 26: 116-125.

Polivanov, V.M. and Polivanova, N.N. 1986. *Sitta krueperi* Pelz. Trudy Teberdinsk. Gos. Zapoved. 10: 115-121.

Porter, R. F. 1983. The autumn migration of passerines and non-passerines at the Bosphorus, Turkey. Sandgrouse, 5:45-74.

Roomen, M. Van and Schekkerman, H. 1989. The migration of waders and other waterbirds through inland wetlands in Central Turkey, Spring 1988. The Ornithological Society of the Middle East Bulletin 23:1-4.

Roselaar, C. S. 1995. Songbirds of Turkey: An atlas of biodiversity of Turkish passerine birds. Pica Press, Mountfield, UK, 240 pp.

Sert, H. 2000. Termessos Milli Parkının (Antalya) avifaunası ve ekosistemdeki ilişkileri. Yüksek Lisans Tezi. Akdeniz Üniversitesi Fen Bilimleri Enstitüsü, Antalya, 188 pp.

Sıkı, M. 1992. Ev serçesi (*Passer domesticus*)'nin üreme biyolojisi üzerine araştırmalar. Tr. J. Zool. 16: 243-247.

Sıkı, M., Tok, C.V., Mermer, A. and Tosunoğlu, M. 1998. İzmir Kuş Cenneti'nin avifaunası ve herpetofaunası. XIV. Ulusal Biyoloji Kongresi 7-10 Eylül 1998, Samsun, Cilt III, 181-193.

Tucker, G.M. and Heath, M.F. (eds.) 1994. Birds in Europe: Their conservation status. BirdLife Conservation Series No: 3, Cambridge.

Turan. L.S. 1998. Observations of magpie in Turkey. J. Field Ornithology 69(2): 421-426.

Yarar, M. and Magnin, G. 1997. Türkiye'nin Önemli Kuş Alanları. Doğal Hayatı Koruma Derneği, İstanbul, 313 pp.