

# First breeding record of Besra Sparrowhawk *Accipiter virgatus besra* from southern India

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Somasundaram, S. & Vijayan, L. 2007. First breeding record of Besra Sparrowhawk *Accipiter virgatus besra* from southern India. *Indian Birds* 4 (1): 6-8.

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*Mss received on: 13th October 2006.*

The Besra Sparrowhawk *Accipiter virgatus besra* Jerdon, 1839 is a forest-dwelling, rare, resident raptor found in the southern Indian hills (Davison 1883). Besra was recorded in most of the parts during a general raptor survey conducted by Vijayan *et al.* (1992) in the southern Indian hills, but there was no evidence of its breeding. A recent ecological study of montane wet temperate forests and grasslands, conducted in the Nilgiris, southern India, showed that these birds were observed throughout the study period in the high altitudes but no nests were found (Zarri *et al.* 2005). Ali & Ripley (1987) gave the distribution and brief ecological information such as clutch size and nest characteristics of this species. The northern Indian race of Besra Sparrowhawk *Accipiter v. affinis* breeds in the high altitude evergreen forests in both Nepal and northern India, (Ali & Ripley 1987; Inskipp & Inskipp 1991). Nests of this species were observed near Kathmandu (Godavari Botanical Garden at an elevation of 1,525 m) and in Namche Bazaar (28°00'N 86°45'E, at an elevation of 3,440 m) by Hackett (1998). This is the only published information about the breeding of the Besra Sparrowhawk in its distribution range. Up till now, no other breeding information was available for the southern race. Here we record the breeding and nest-site information for *A. v. besra*. Its nesting was recorded for the first time in southern India in the montane wet temperate forests of the Upper Palni Hills, during March 2003-June 2004.

## Study area

The study was conducted at Kukkal in the Palni Hills (10°1' 26'N 77°14' 52'E), a range of the Western Ghats, southern India. The Palni Hills consist of two well-marked topographic divisions, namely Upper Palnis and Lower Palnis. The Upper Palnis (1,500-2,450 m a.s.l.) has a moderate climate with mean temperatures ranging from 12°C-23°C in summer, and from 8.3°C-17.3°C in winter. The annual average rainfall is 165 cm. The Palni Hills is in the catchments of the rivers, namely Kodaganaru, Palar, Kuthiraiyar, Porandalar, Varadhamanathi, Manjalar and Aruthanathi, which drain into two major rivers; Vaigai and Cauveri. The vegetation is predominantly of the montane wet temperate forest type (Champion & Seth 1968). The flora includes species of *Syzygium*, *Ternstroemia*, *Sideroxylon*,

*Meliosma*, *Elaeocarpus*, *Symplocos*, *Eurya*, *Litsea* and *Rhododendron*. The forest lies adjacent to exotic plantations such as *Acacia*, *Eucalyptus*, *Pinus* and agricultural fields (Matthew 1996).

## Methods

We searched for nests at dawn and dusk, during the drier months, of January-June, wherever the bird's movement was frequently observed—generally in tall trees alongside streams. Once an active nest was located, the nearest trees were marked with paint and the following details were recorded: nest characters, nest-site, and, nesting habitat, following methods established by Titus & Mosher (1981), Bechard *et al.* (1990) and, Hullsieg & Becker (1990). In 2004 nesting activities monitored at an interval of four days up to the end of June.

Nest characters such as, nest height, cup width and thickness, nest tree height and, diameter at breast height (DBH) were recorded. In nest-site characters, numbers of trees above 30 cm DBH, numbers of shrubs, percentage of ground cover, distance to stream, distance to rocky cliff and, distance to trek path were recorded. Percentage of nest height was calculated from the nest height and the nest tree height [percent nest height = (nest height / nest tree height) x 100].

Nest concealment was estimated by viewing the nest from distances of 2, 5, 7 and 10 m, in each of the four cardinal directions (Martin & Roper 1988). Concealment was evaluated based on the number of points from where the nest was not seen, thus: low (1-4 points), medium (5-8 points), high (9-12 points) and very high (13-16 points).

A 0.07 ha circular plot (15 m radius), centred on the nest location, was marked for both nests and details of nest and nest-site characters, based on Titus & Mosher (1981), were recorded. Nest-patch variables such as canopy cover and ground cover (visually estimated in relative percentage terms), number of trees, number of shrubs, distance to nearest tree, distance to trek path or road and distance to water; were measured to identify the microhabitat required for nesting. Distance to road or trek path was included to ascertain whether the site selection was affected by human activity. The frequency of usage by humans or cattle was measured. Ground cover was visually estimated in

percentage. Canopy cover immediately over the nest was measured visually in percentage.

### Results

Two breeding pairs were recorded in the 20 ha area between April 2002 and June 2004.

The first nest was located in the first week of May 2003 with a chick. The nest was located in the top-most branch of a 20 m tall *Turpinia nepalensis*, standing 15 m away from the stream (Table 1). The branches of the tree were dry and the tree seemed on the verge of completely drying. An old nest of the Indian giant squirrel *Ratufa indica* was used as a base. Its sides had been renovated with twigs and leaves. The nest size was recorded with the help of a measuring scale and it was about 30-40 cm wide and 4-5 cm thick. From above the nest was completely concealed by the tree's canopy. We watched from a distance of 25 m, as the female fed the chick with an Anaimalai spiny lizard *Salea anamallayana*. The next observation was in the middle of June when the chick was fully grown up and looked larger than the male at the end of the nesting period (Fig. 1). This indicates that the nestling may be a female—however we could not ascertain its sex. The nestling was seen in the study area only up to 10.vii.2003 but the adult birds were seen throughout the study period.

In 2004, birds were seen frequently in the same nesting area, from January onwards. Nest construction commenced on 6.iii.2004 in the top canopy of a *Phoebe paniculata* tree. Nest-

material consisted of small twigs and leaves. This time a new nest was built, 10 m away from the previous one, though nest-site characters were similar in both years (Table 1). The tree was fully concealed by foliage. Nest building continued for a week with both birds taking part in nest construction. A single pale-bluish egg was laid on 17th March 2004 and incubation commenced immediately after the egg was laid. The egg hatched on 10th April 2004. The nestling left the nest in the last week of May 2004. Adult and the young one were seen in the nesting area up to the end of June. The incubation period and nestling period was 23 to 39 days respectively.

### Discussion

The breeding of the southern race of Besra Sparrowhawk was recorded for the first time in the montane wet temperate forests of Upper Palni Hills, southern India during March-June, in 2003 and 2004. The nest-site characters of both the years were similar in the southern race. Incubation was observed in the month of April, whereas in the northern race it was recorded in June (Hackett 1998). This may be due to the local climatic variations between the regions. Nest characters like nest size, width, nest height, cup width and thickness, nest tree height and, DBH were similar in both the races but it differs from nest-site characters such as numbers of trees above 30 cm DBH, numbers of shrubs, percentage of ground cover, distance to stream, distance to rocky cliff and, distance to trek path (Ali & Ripley 1987;



Fig. 1. Chick of southern Besra Sparrowhawk.

**Table 1. Nest-site characters of Besra Sparrowhawk in the Palni Hills.**

Nest and nest-site characters	Year	
	2003	2004
<b>Nest</b>		
Nest height (m)	20	15
Cup width (cm)	36	32
Cup thickness (cm)	6	4
Nest tree height (m)	22	17
Nest tree DBH (cm)	85	60
Nest tree canopy cover (%)	85	90
% of nest height	84.2	88.2
<b>Nest-site</b>		
Number of shrubs	34	27
Number of trees	17	14
Ground cover (%)	70	65
Distance to stream (m)	20	15
Distance to rocky cliff (m)	8	12
Distance to trek path (m)	150	160

Hackett 1998). The southern race nested in montane wet temperate forest whereas the northern race in spruce forest (Hackett 1998). The reuse of other species' nests is common in many *Accipiter* spp. (Ali & Ripley 1987). Our study indicates that Besra Sparrowhawks prefer nesting near streams, like other *Accipiter* spp. (Reynolds *et al.* 1982; Ali & Ripley 1987; Boal & Mannan 1998; Nenneman *et al.* 2003). Percentage of nest height had a direct relation to the nest position in the canopy and most of the *Accipiter* spp., nest-character studies shows that nest was in the middle of the canopy and the percentage of nest height was about 60-70 but in this study it was above 80 (Reynolds *et al.* 1982; Boal & Mannan 1998). Site fidelity is a common phenomenon in many resident raptors world-wide (Reynolds *et al.* 1982). We too observed Besra Sparrowhawk using the same area for nesting in two consecutive years.

Besra Sparrowhawk are reported to feed on different species of small birds, lizards and beetles (Davison 1883). We observed it feeding the chick with lizards six times and small snakes twice.

Davison (1883) reported that the Besra Sparrowhawk is a silent bird and rarely calls, but we noticed that during the breeding season it soared above the canopy, uttering loud double whistles frequently in the late morning and noon. Similar behavior was observed in the Nilgiris by Zarri *et al.* (2005).

The juvenile was last seen soaring with its parents in the study area on 10th July 2004 and after that day only the adults were seen in the area. Ali & Ripley (1987) reported that the normal clutch size was four or five. During our study period only one egg was laid in both years.

Ranganathan (1938) asserted that, both montane wet temperate forests and grasslands represent climax communities. But, there has been a loss of 50% of these habitats since 1850 (Sukumar *et al.* 1995). These forests have high endemism and harbour many habitat specialists, thus of high priority for bird conservation (Pramod *et al.* 1997; Vijayan & Gokula 1999; Vijayan & Gokula (in press); Somasundaram & Vijayan 2004). Further studies of breeding parameters of the Besra Sparrowhawk are required to better understand the requirements for its successful conservation.

### Acknowledgements

We thank V. S. Vijayan, Former Director, Sálím Ali Centre for Ornithology and Natural History for encouragement and providing facilities. This study was conducted as a part of the project on the endemic birds in the Western Ghats funded by the Ministry of Environment and Forest, Government of India (23-1/2001- RE).

### References

- Ali, S. & S. D. Ripley. 1987. *Compact handbook of the birds of India and Pakistan together with those of Bangladesh, Nepal, Bhutan and Sri Lanka*. 2nd ed. Pp. i-xlii, 1 l., 1-737, pll. 1-104. Delhi: Oxford University Press.
- Bechard, M. J., R. L. Knight, D. G. Smith & R. E. Fitzner. 1990. Nest sites and habitat of sympatric Hawks (*Buteo* spp.) in Washington. *J. Field Ornithology*. 61: 159-170.
- Boal, C. W. & R. W. Mannan. 1998. Nest-site selection by Cooper's Hawks in an urban environment. *J. Wildl. Manage.* 62: 864-871.
- Champion, H. G. & S. K. Seth. 1968. A revised survey of the forest types of India. Government of India, New Delhi.
- Davison, W. 1883. Notes on some birds collected on the Nilghiris and in parts of Wynad and southern Mysore. *Stray Feathers* X (5): 329-419.
- Hackett, J. 1998. A high-altitude breeding record of Besra *Accipiter virgatus*. *Forktail* 14: 73-74.
- Hullsieg, C. And D.M.Becker. 1990. Nest site habitat selected by merlins in south-eastern Montana. *Condor* 92: 688-694.
- Inskipp, C. & T. P. Inskipp. 1991. *A Guide to the Birds of Nepal*. London & Washington: A. & C. Black / Christopher Helm & Smithsonian Institution Press.
- Martin, T. E. & J. J. Roper. 1988. Nest predation and nest-site selection of the western population of the Hermit Thrush. *Condor* 90: 51-57.
- Matthew, K. M. 1996. *Illustrations on the flora of the Palni Hills*. Tiruchirapalli, India: The Rapinat Herbarium, St. Joseph's College.
- Nenneman, M. P., T. A. Grant, M. L. Sondreal & R. K. Murphy 2003. Nesting habitat of Coopers Hawks in northern Great Plains woodlands. *J. Raptor Res.* 37: 246-252.
- Pramod P., N. V. Joshi, U. Ghate & M. Gadgil. 1997. On the hospitality of Western Ghats habitats for bird communities. *Current Science* 73 (2): 122-127.
- Ranganathan, C. R. 1938. Studies in the ecology of the Shola Grassland vegetation of Nilgiri Plateau. *Indian Forester* 54: 523-541.
- Reynolds, R. T., E. C. Meslow & H. M. Wight. 1982. Nesting habitat of coexisting *Accipiter* in Oregon. *J. Wildl. Manage.* 46: 124-138.
- Somasundaram, S. & L. Vijayan. 2004. Avifauna of Palni Hills: A conservation perspective. pp 318-322 In Muthuchelian (Ed). *Proc. of National Workshop on 'Biodiversity Resources Management and Sustainable Use' Centre for Biodiversity and forest studies, School of energy environment and natural resources*. Madurai, India: Madurai Kamraj University.
- Sukumar R., S. Suresh & R. Ramesh. 1995. Climate change and its impact on tropical montane ecosystems in southern India. *J. Biogeograph.* 22: 533-536.
- Titus, K. & J. A. Mosher. 1981. Nest site habitat selected by wood-land hawks in the Central Appalachians. *Auk* 98: 270-281.
- Vijayan, L. & V. Gokula. 1999. Impact of human interference on some rare endemic birds in the Upper Nilgiris, Tamil Nadu. pp. 127-134 In: Kumaravelu, G. & K. K. Chaudhuri (Eds.): *Endemic and endangered plant and animal species of Eastern and Western Ghats*. Proc. National seminar, 22-23 March 1999, Chennai. Chennai, India: Forest Department, Govt. of Tamil Nadu.
- Vijayan, L. & V. Gokula *In press*. Human Impact on the Bird Communities in the Western Ghats. In Proc. of the Chinese Acad. Sciences. (Proc. of the 23<sup>rd</sup> International Ornithological Congress, Beijing 2002. Symposium paper).
- Vijayan, L., T. Sundaramoorthy, C. Sivasubramanian & J. C. Daniel. 1992. Status and ecology of the raptors-survey in South India. Bombay Natural History Society. Mimeographed report.
- Zarri, A. A., A. R. Rahmani & B. Senthilmurugan. 2005. Ecology of Shola and Alpine Grasslands. Final report (Part - A). Mumbai, India: Bombay Natural History Society.