

## ID FORUM

# Flight identification and plumage descriptions of six *Accipiter* species on southbound migration at Khao Dinsor, Chumphon province, Thailand

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## Introduction

Khao Dinsor, the premier raptor migration watch site in southern Thailand, provides exceptional views of many species which can be difficult to see at close quarters elsewhere in Asia (DeCandido *et al.* 2013), particularly the six accipiters—the highest number of such species recorded at any raptor watch site in the world—observed there during southbound migration. Five are migrants through southern Thailand and one, the Crested Goshawk *Accipiter trivirgatus*, is resident.

Accipiters were the greatest identification challenge when raptor counting began in southern Thailand in September 2003 (DeCandido *et al.* 2004). Since then, the ability to distinguish between juveniles of the different species has improved markedly and discoveries have been made about migration strategies, including those of Besra *A. virgatus* and Shikra *A. badius*, species not previously known to migrate through the area.

Details of the Khao Dinsor site and the raptor ringing activities there have been reported by Nualsri *et al.* (2013). Working with live birds in the hand during ringing has given insights into morphological and plumage characteristics not necessarily apparent from museum specimens or even from photographs (Nualsri *et al.* 2013). The colours of bare parts, including the eye and orbital ring and how these may subtly change as birds mature, are revealed. Illustrations in books showing perched accipiters are often too small to show bare part colours or nuances of barring or streaking on the underparts, and depictions of juveniles all too frequently resemble one another too closely to be of use in the field.

After several years of photographing accipiters in flight and in the hand, we here present descriptions and images together with comments regarding the best field characteristics to look for, and information on flight behaviour. These notes should be taken as a general guide only: juvenile accipiters, even those of the same species, are very variable, especially the thickness of the mesial stripe, presence or absence of a white supercilium, and the extent of markings on the underwing-coverts and body. Adults vary much less from the

images and descriptions presented here. Readers wishing to improve their identification skills are urged to photograph as many accipiters in flight as possible. It is amazing how much detail can be captured even with a short telephoto lens and then enlarged on a computer screen. The orbital ring colour, for example, is virtually impossible to see on a fast-flying bird, even with the best binoculars, and nuances of plumage, especially underwing pattern and streaking on the body, are much easier to evaluate on a screen. The number of visible primary tips—referred to as ‘fingers’—can also be counted much more easily in a photograph.

At Khao Dinsor, the majority of accipiters are identified by their distinctive flight style, which becomes familiar over time, and these are described here. When a bird of different appearance or flight style is seen, field marks are used to confirm (or refute) the initial identification. Features such as the shape of the tail (square, rounded, notched) and presence or absence of a supercilium are highly variable and less emphasis is put on these in most cases. For this reason it is suggested that no single characteristic should be used to identify a bird to species. Please place reliance on photographs: there can be a big difference between what was ‘seen’ on a moving raptor compared with what is later revealed in an enlarged image. Finally, there are a number of on-line resources which allow comparison of individuals of a species from different parts of its range or in different seasons. Perhaps the best is <http://orientalbirdimages.org>.

## Species identification

The six species of accipiter passing through Khao Dinsor are Chinese Sparrowhawk *Accipiter soloensis*, Japanese Sparrowhawk *A. gularis*, Shikra *A. badius*, Besra *A. virgatus*, Eurasian Sparrowhawk *A. nisus*, and Crested Goshawk *A. trivirgatus*. Flight views of these species, taken from below, are shown on pages 53 to 55 (Plates 1–18). The plates are arranged in the same sequence on each page. Plates 1–6 illustrate males, Plates 7–12 illustrate females and Plates 13–18 illustrate juveniles. Detailed comments on each of the six species follow the plates.

All images taken at Khao Dinsor except where indicated.



**Plate 1.** Adult male Chinese Sparrowhawk *Accipiter soloensis*, 2 October 2012.



**Plate 2.** Adult male Japanese Sparrowhawk *Accipiter gularis*, 2 October 2012.



**Plate 3.** Adult male Shikra *Accipiter badius*, 26 October 2012.



**Plate 4.** Adult male Besra *Accipiter virgatus*, Thoolakharka, Nepal, 18 November 2012.

**Plate 5.** Adult male Eurasian Sparrowhawk *Accipiter nisus*, Thoolakharka, Nepal, 7 November 2012.

**Plate 6.** Adult male Crested Goshawk *Accipiter trivirgatus*, 24 September 2012.



ALL IMAGES: ROBERT DE CANDIDO EXCEPT WHERE INDICATED



**Plate 7.** Adult female Chinese Sparrowhawk, 10 October 2013.



**Plate 8.** Adult female Japanese Sparrowhawk, 23 September 2013.



**Plate 9.** Adult female Shikra, 11 October 2013.



**Plate 10.** Adult female Besra, 16 October 2013.

**Plate 11.** Adult female Eurasian Sparrowhawk, Finland, 12 October 2005.

**Plate 12.** Presumed adult female Crested Goshawk, 30 August 2012.





**Plate 13.** Juvenile Chinese Sparrowhawk, 7 October 2013.



**Plate 14.** Juvenile Japanese Sparrowhawk, 4 October 2012.



**Plate 15.** Juvenile Shikra, 24 September 2012.

**Plate 17.** Juvenile Eurasian Sparrowhawk, Finland, 2 September 2009.



**Plate 16.** Juvenile Besra, 14 October 2013.

**Plate 18.** Juvenile Crested Goshawk, 8 September 2012.



**Chinese Sparrowhawk *Accipiter soloensis***

(80,000–125,000 per year)

The most common accipiter on migration and, in some years, the most abundant raptor counted at Khao Dinsor. This species prefers to migrate in flocks, although in late August and early September a few lone adults pass, sometimes with Japanese Sparrowhawks. By early October, flocks range in size from a few hundred to about a thousand; the peak migration is between 25 September and 10 October. At a distance, from below adults show substantial black wing-tips. Adult males have a pink wash to the breast, adult females an orange wash. Adult males have dark red to dark vinous-brown eyes (Plate 19) whilst females and juveniles have yellow eyes (some juveniles lemon-yellow) (Plates 20 & 21). All (including juveniles) have a prominent orange-yellow cere, easily seen as an individual approaches head-on, and a dark grey orbital ring. The mesial stripe may be prominent (a few juveniles) or thin (most juveniles and females), but faint to absent on adult males. All adults are dark grey above and have virtually no markings on the underwing-coverts. Most juveniles are brownish-grey above, with very little to moderate marking on the underwing-coverts (the least of any juvenile accipiter seen here). The streaking and barring on the juvenile's body is larger and redder than in any of the other species, which are all browner. At all ages, from above the tail shows 4–6 thin, dark incomplete bars. When rising on thermals, all ages flap rapidly 8–15 times to help gain altitude, but generally prefer to glide or soar. In flight the species shows five fingers and, unique among accipiters here, p3 is the longest.

**Plate 19.** Adult male Chinese Sparrowhawk showing the dark eye, grey orbital ring, orange-yellow cere, no mesial stripe, pink wash on breast, 23 September 2011.



Additionally, the thigh is surprisingly large and the tarsus proportionately short and thick for an accipiter.

The size difference between the sexes is less than in other accipiters at this site: males (25–28 cm) and females (27–30 cm) are approximately the same length, and overlap in weight (males 106–138 g, females 125–150 g) and wingspan (males 52–56 cm, females 55–62 cm) (Ferguson-Lees & Christie 2001, Nualsri *et al.* 2013). The other species show a much greater degree of size dimorphism, particularly Japanese Sparrowhawk, Besra and Crested Goshawk.

**Plate 20.** Adult female Chinese Sparrowhawk showing the yellow eye, grey orbital ring, orange-yellow cere, orange wash on breast, 25 September 2011.



**Plate 21.** Juvenile Chinese Sparrowhawk showing the yellow eye, grey orbital ring, orange-yellow cere, thin mesial stripe and teardrop body markings, 20 September 2012.



**Japanese Sparrowhawk *Accipiter gularis***

(9,000–13,000 per year)

This species has the longest migration period of any raptor at Khao Dinsor, the first appearing in mid-August and the last arrivals in November. Between 10 September and 5 October, most birds are adults, after which juveniles predominate until 20 October. The species may occasionally be seen in groups of 10–30 loosely associated individuals, rising on thermals, but normally migrates alone. In September, especially in the early afternoon when strong headwinds prevail, males fly low over or through the treetops, while the larger females

**Plate 22.** Adult male Japanese Sparrowhawk showing the red eye, yellow orbital ring, lemon-yellow cere and faint mesial stripe, 20 September 2012.



**Plate 23.** Adult female Japanese Sparrowhawk showing the yellow eye, yellow orbital ring and lemon-yellow cere tinged with green, and faint mesial stripe, 21 September 2012.



**Plate 24.** Juvenile Japanese Sparrowhawk showing the yellow eye, yellow orbital ring, lemon-yellow cere and thin mesial stripe, 20 September 2012.



tend to fly higher. Adult females have a ‘hooded’ appearance due to the contrast between their grey-brown heads and whitish undersides. Adult males are dark greyish-blue above with a reddish wash and barring below, and appear to have a dark blue cap. The male’s eye colour changes from orange-red to scarlet-red as it matures, with a deep yellow to orange-yellow orbital ring when adult (Plate 22). Females and juveniles have yellow eyes with a yellow orbital ring (Plates 23 & 24). All have a lemon-yellow cere, tinged with green. The mesial stripe is usually thin (occasionally thick) on females and juveniles, but is faint to very thin on adult males. From below, the adult female’s body shows tannish-brown barring, whilst juveniles are heavily marked with brown teardrops and more heavily marked with darker dots on the underwing-coverts than juvenile Shikra or Besra. The tail is short for an accipiter, sometimes appearing square or notched in flight, and has 4–5 medium-width dark bars (Plate 25). When perched, the species shows a relatively long primary projection; the wing-tips extend almost half-way down the tail, noticeably further than in Besra (Leader & Carey 1995). All age groups flap quickly 5–10 times and then glide for a distance. In moderate winds, males are not steady gliders; instead they flap once or twice to maintain balance. The species has broader, more rounded wings than Chinese Sparrowhawk, with p4 the longest primary, and shows five fingers in flight. When soaring, especially at a distance, the wings appear remarkably long and it can easily be confused with Chinese Sparrowhawk, although there is no black on the primary tips at any age—very different from Chinese (extensive) and Shikra (some).

There is little overlap in biometric data for the sexes of Japanese Sparrowhawk. Males are 23–26 cm in length, weigh 89–118 g and have a wingspan of 46–52 cm. Females are 26–30 cm, 115–168 g and 52–58 cm respectively (Ferguson-Lees & Christie 2001, Nualsri *et al.* 2013).



**Plate 25.** Tail of female Japanese Sparrowhawk showing the notched tip, 20 September 2012.

**Shikra *Accipiter badius***

(2,500–6,000 per year)

In the Khao Dinsor area this species breeds near habitations with oil palm plantations. Juveniles appear at the site in mid-September and comprise the majority of the early flight, with adult numbers peaking between 10–30 October. Adult males are pale to medium grey above, with red barring on the underside and blood-red eyes (Plate 26), whilst females are slightly darker grey above (younger ones appearing greyish-brown) with similar (but coarser) red barring to males that extends further onto the abdomen, and deep yellow eyes (Plate 27). The orbital ring is grey, sometimes with a yellowish tinge, although lighter grey than Chinese Sparrowhawk. The cere is always yellow with a

**Plate 26.** Adult male Shikra showing the blood-red eye, grey orbital ring and yellow cere tinged with green, black primary tips, and long, floppy tail with incomplete bars, 25 September 2011.



**Plate 27.** Adult female Shikra showing the deep yellow eye and yellow cere tinged with green, black primary tips and darker grey upperparts than male, 2 October 2012.



green tinge. Juveniles (Plate 28) have pale yellow eyes and a thick mesial stripe—two key features distinguishing them from juvenile Japanese Sparrowhawks, which have darker yellow eyes and thin mesial streaks. The mesial stripe is less prominent (sometimes faint) on adult female Shikras and faint to absent on adult males. All ages have some black on the primary tips visible at a distance from both above and below; adult females usually show more black than males, whilst the black may be absent or minimal when juveniles are seen from below. In flight, Shikras show five fingers. Juveniles, especially males, have a light greyish head that contrasts with the brown body and back, and a chestnut ‘ear’ patch. The long floppy rounded tail with 4–5 medium-width incomplete dark bars helps separate the species at all ages from Japanese Sparrowhawk, which often shows a notched tail (Plate 25). Juvenile Shikras show reddish streaks on the leading edge of the underwing compared with the brown dots of the more heavily marked juvenile Japanese Sparrowhawk. Shikras, especially juveniles, gather and soar in groups of up to 20 birds where thermals and currents are good, but mostly they are lone migrants. They are strong, low-level gliders in moderate winds, hardly ever flapping. When Shikras do flap (on windless days), they have the quickest wing-beats (4–8 flaps) of all the accipiters at this site. They rarely dive into the forest at Khao Dinsor after prey and hardly ever migrate through the scrub forest here, unlike Japanese Sparrowhawks.

There is little overlap in biometric data for the sexes of Shikra. Males are 25–32 cm in length and have a wingspan of 48–56 cm whilst females are 32–36 cm and 56–68 cm respectively (Ferguson-Lees & Christie 2001).

**Plate 28.** Juvenile Shikra showing the pale yellow eye, light greyish head contrasting with brown back, and rounded wings, 15 October 2011.





OSCAR DOMINGUEZ

SOMPONG NUAMSAWAT

**Besra *Accipiter virgatus***  
(50–100 per year)

An uncommon late migrant mainly between 20 October and 5 November, the Besra appears after 10 October when winds begin to veer to the north-east and it is difficult to detect when there are many Shikras and Japanese Sparrowhawks present. Juveniles, with yellow eyes and dark brown heads, are often mistaken for adult female Japanese Sparrowhawks. The underside of the adult Besra is, however, much more strongly marked than the similar adult Japanese Sparrowhawk. All ages have a prominent dark mesial stripe compared to Japanese Sparrowhawk (faint to very thin). From below, the wings of adults appear striped black and white from the tip of the primaries to the body (juveniles tan and white). Adults have 6–10 vertical rows of blackish streaks on the upper breast, similar to Crested Goshawk. Adult male Besra has a strong reddish-brown wash with some barring on the belly, more intense than the similar male Japanese Sparrowhawk. It is also darker above, even blackish, especially on the nape, although usually dark bluish-grey with a dark blue cheek-patch (Plate 29); females are medium greyish-brown on the back and wings, with a brownish cheek-patch (Plate 30). Females have thick, reddish-tan barring on the belly extending almost to the vent, and are more thickly barred and marked than female Japanese Sparrowhawks (Leader & Carey 1995). When perched, the species shows a short primary projection, the wing-tips extending only about a quarter of the way down the tail (Plate 30). The tail has 4–6 thick dark grey bars (dark greyish-brown in juveniles), alternating with light grey bars (tan in juveniles) of about the same width. Adult

**Plate 29** (left). Adult male Besra showing the red eye, orange-yellow orbital ring, yellow cere with a green tinge, dark blue-grey crown and cheek, prominent mesial stripe, strongly marked underparts and long, thin legs, 11 November 2011.

**Plate 30** (right). Adult female Besra showing the yellow eye, orbital ring and cere with green tinge, brownish cheek-patch and equal width bars on tail, 5 November 2013.

males have orange-red eyes; adult females and juveniles have yellow eyes. All have yellow orbital rings and yellow cere with a green tinge. Juvenile Besra is the most difficult accipiter to identify at this site; the best field marks are the prominent mesial stripe, the equal-width dark and light tail bars, thick barring and teardrop spots on the body, and heavily marked underwing-coverts (Plate 31). Upperparts are tan-brown and lighter in colour than in juvenile Eurasian Sparrowhawk. In flight the very agile Besra shows a mixture of the characters of a large Japanese Sparrowhawk (rounded wings) and a Shikra (long tail). From below, an adult Besra could be confused with adult Crested Goshawk, but the latter has extensive white 'puffy' vent feathers, larger feet, thicker legs and shows six fingers (Chow 2011). Adult Besra is also more heavily marked on the underwing-coverts and shows five fingers. At Khao Dinsor, the Besra does not fly high and is a steady glider, even in strong winds.

Besra has the greatest male to female size ratio of the six *Accipiter* species seen here. Males are 24–30 cm in length with a wingspan of 42–58 cm whilst females are 31–36 cm and 56–70 cm respectively (Ferguson-Lees & Christie 2001).

**Plate 31.** Juvenile Besra showing the yellow eye, orbital ring and cere with green tinge, prominent mesial stripe and thick barring and teardrop spots on the body (though this is a lightly marked bird), 5 October 2012.





**Eurasian Sparrowhawk *Accipiter nisus***

(&lt; 15 per year)

The least encountered accipiter at Khao Dinsor. In some years the first migrants arrive around 10 October but they are mostly seen between 20 October and 5 November. Adult males have orange-red to scarlet-red eyes, yellow orbital rings and a reddish cheek patch (Plate 32). The orange-red wash on the upper breast and sides becomes orange-red barring on the belly. Upperparts are medium grey—lighter than either adult male Japanese Sparrowhawk or Besra. Adult females have slate-grey to silvery upperparts (younger ones are brownish-grey to brown) and are darker grey than males; they are heavily barred grey (sometimes brown) below, from the lower throat almost to the vent, and the barring continues onto the underwing-coverts (Plate 33). Juveniles have coarser brown barring on the breast and belly in irregular broken wavy lines (Plate 34). Females have yellow to orange eyes, and juveniles light yellow. All have a yellow orbital ring and a yellow cere with a green tinge. Females (adults and juveniles) have a moderate to prominent white supercilium (Plate 33). All have a long, slender tail, squared towards the tip and occasionally notched (recalling Japanese Sparrowhawk), with 4–6 medium to thick dark bars, thinner than the alternating light bars. The short, broad wings are rounded at the hand with six fingers (Besra and Japanese Sparrowhawk have five), p4 and p5 being the longest. There is no black on the wing-tip. Females appear longer-winged than males. Juveniles have a very thin to faint mesial stripe, usually absent in adults. The Eurasian Sparrowhawk resembles the Besra, but is lighter-coloured, with longer wings and tail and no prominent mesial stripe. The adult female can also be confused with

**Plate 32.** Adult male Eurasian Sparrowhawk showing the red eye, yellow orbital ring and a reddish cheek patch, Eilat, Israel, 9 April 2003.



adult female Japanese Sparrowhawk but has a white supercilium, a paler face below the eye, longer tail, fine grey and white barring (brown and white in Japanese Sparrowhawk) that extends from the body to the underwing, and overall a longer, more slender appearance. Like the Besra, the Eurasian Sparrowhawk is a steady glider in moderate to strong winds.

There is little overlap in biometric data for the sexes of Eurasian Sparrowhawk. Males are 28–34 cm in length and have a wingspan of 56–65 cm whilst females are 35–40 cm and 65–78 cm respectively (Ferguson-Lees & Christie 2001).

**Plate 33.** Adult female Eurasian Sparrowhawk showing the yellow eye and cere, white supercilium, brown cheek patch and reddish underside barring, Finland, 25 September 2010.



DICK FORSMAN

**Plate 34.** Juvenile Eurasian Sparrowhawk showing the yellow eye, orbital ring and cere, white supercilium, and coarse brown barring on the breast and belly, Finland, 31 October 2008.



PEKKA KOMI

KASET SUTASHA



**Plate 35.** Adult male Crested Goshawk showing the yellow eye, orbital ring and cere, grey head and nape, red-brown wash on barred underparts, and large feet, 11 January 2006.

**Crested Goshawk *Accipiter trivirgatus***  
(sedentary)

Resident in the area, it bred at Khao Dinsor in 2010 and 2012. Adult males have a ‘winnowing’ display flight just above the tree tops with bowed wing-tips and rapid, shallow flaps, during which the pure white undertail-coverts are widely spread. This display has not been seen, however, when many raptors have been passing through. It is not unusual to see the male gain altitude and then dive, wings and body forming an equilateral triangle, towards the forest and sometimes land in a tall tree. They also dive at migrating Japanese Sparrowhawks as well as conspecifics, but are generally not aggressive towards other raptor species. The plumage of adult males and females is almost identical, but females are 10–20% larger—they cannot reliably be told apart except when seen together. Adults have medium grey heads (darker than adult male Shikra but similar to adult female Shikra), greyish wings, nape and back, although some adult females may have a brown nape and crown (Plates 35 & 36). The eye colour of both sexes varies from yellow/dark yellow to orange-yellow; the eye colour of juveniles tends to be lighter yellow (Plate 37). The orbital ring is yellow at all times. All lack any extensive black markings on the primary tips. The short crest is generally difficult to see—even when perched. In flight, all show six fingers, a pronounced (thin to thick) black mesial stripe, and a yellow to lemon yellow cere (Chow 2011). Adult Crested Goshawks have 4–5 prominent dark bars on the tail, equal in width to the lighter bars, but are much less heavily marked below than Besra. At all ages, the large, gnarled

feet are generally easy to see. Juveniles are easily distinguished from other juvenile accipiters at the site by barring on the thighs to the feet, and barred or spotted undertail-coverts. Their underparts may be sparsely or heavily marked with streaks on the upper breast and teardrop-shaped marks on the belly, but markings are very variable. At this site, fledglings are on the wing by late July, whilst adults begin display flights by mid to late October. Some dispersal or migration of juveniles probably occurs in the first half of October when different juveniles begin to appear. Between August and November, the local adults and juveniles are usually active on windy days and can be seen cruising around, rarely flapping, but rising on thermals and using currents to navigate at or near eye-level.

There is little overlap in biometric data for the sexes of Crested Goshawk. Males are 30–38 cm in length and have a wingspan of 68–76 cm whilst females are 39–46 cm and 78–90 cm respectively (Ferguson-Lees & Christie 2001).

**Plate 36.** Adult female Crested Goshawk showing the yellow eye, orbital ring and cere, prominent mesial stripe, and brown on shoulder (unlike male), 25 November 2003.



ANDREW PIERCE

**Plate 37.** Juvenile female Crested Goshawk showing the light yellow eye, barring on the thighs to the feet, barred undertail-coverts and large feet, 8 September 2012.



### Concluding remarks

As well as identification, there are other perplexing issues relating to migration of these accipiters yet to be understood. Why, for example, do adult Japanese Sparrowhawks migrate before the juveniles, adult and juvenile Shikras mostly precede adults, and adult and juvenile Chinese Sparrowhawks migrate together in large flocks? However, accurate identification is a vital first step to understanding the biology and behaviour of a species.

#### The distinguishing field marks of the six species may be summed up as follows:

- **Chinese Sparrowhawk:** primarily a flocking species; prominent black primary tips; five fingers.
- **Japanese Sparrowhawk:** five fingers; no black on primary tips; short tail, sometimes notched.
- **Shikra:** pale overall colour of adults; long floppy tail; five fingers; some black on primary tips.
- **Besra:** prominent mesial stripe; 6–10 bold streaks on upper breast; five fingers.
- **Eurasian Sparrowhawk:** six fingers; no black on primary tips; long tail; female/juvenile has white supercilium.
- **Crested Goshawk:** Adults almost identical, female 10–20% larger; six fingers; large feet.

### Acknowledgements

We thank the following for their comments, suggestions and support: Antero Lindholm, Chuenchom Hansasuta, David Wells, Deborah Allen, Dick Forsman, Edmund Pease, Henk Smit, Keith Bildstein, Khemthong Tonsakulrungruang, Mutana Mutanapata, Nattapol Kirdchuchuen, Sompong Nuamsawat, Tulsi Subedi, Wat Krab, Bird Conservation Society of Thailand, Flyway Foundation of Thailand and Hawk Mountain Sanctuary of North America.

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