

6233
SHORT NOTESexual dichromatism in the
Namaqua chamaeleon,
Chamaeleo namaquensis

by

Michael D. Robinson

Desert Ecological Research Unit,
Gobabeb, South West Africa

Although Burrage (1973: 110) concluded that "There are no sexual, or age pattern differences in *Chamaeleo namaquensis*, ...", I have noted a consistent sexual dichromatism between adults, and a more subtle ontogenetic pattern change in this species. The neurological and hormonal activities that control the remarkable colour lability of chamaeleons are complex, and meaningful comparisons of coloration are therefore difficult. As an attempt to "standardize" these variables, the colour patterns described below and illustrated in Plate 1 are based on observations of "unmolested" animals of both sexes at similar body temperatures ($\pm 4.0^{\circ}\text{C}$).

Adult males with a snout-to-vent length (SV) greater than 100 mm have a light sulphur-green background colour, while females of similar size are pink, maroon, or dark brown (Table 1). There is a range of intra-sexual tonal changes, but adults of one sex do not change to the basic background colours of the other, and these colours remain virtually exclusive between the two sexes. For example, the body colours of a sleeping adult male and female at 31°C were respectively, light yellow-green and a pinkish-white. Therefore, Burrage's correlation (1973: 43) of degree of body compression to body colour, which does not recognize this sexual dichromatism, is spurious. Apparently several of his indices were based on animals of both sexes.

Other sexual colour differences I have found between adults, which involves the interstitial skin of the lateral body surface and the dewlap (gular region), and the skin colour of the angle of the jaw, are also reliable predictors of gender (Table 1). No seasonal colour shift in the dewlap of mature males was observed in the *Namaqua chamaeleon*, as Brain (1961) reported for males of *C. dilepis*.

There is also a non-sexual geographic colour variation on the inside of the mouth of this species. Adult chamaeleons in the southern Namib dunes and in the Pro-Namib semi-desert north of the Kuiseb River and east of the dune field have a bright yellow mouth, but those from the Lüderitz District have cream-coloured mouths. Hatchlings (SV 50 mm) from north of the Kuiseb River have black mouths, and a single juvenile (SV 60 mm) from near Lüderitz (Koichab Pan) had a cream-coloured mouth.

Ontogenetic colour and pattern changes (Table 1) are based on notes from three hatchlings (SV 48–60 mm) and four subadults (SV 60–95 mm). The three hatchlings from the Ganab area of the Namib Desert Park differ from Burrage's statement (1973: 138) that the young hatch with the adult colouration. The background colour of these hatchlings (one male and two females) was light brown to tan, much like dried grass, and body spots, which were outlined in dark brown, had either pinkish (vertebral spots) or light brown (lateral spots) centres. Linear marks on the head and body were dark brown. When excited, the body colour faded to a light tanish-yellow, similar to a colour



PLATE 1: Typical colour dimorphism between male (left) and female (right) Namaqua chameleons, *C. namaquensis*, from the Central Namib Desert, Namibia.

TABLE 1: Sexual dichromatism and ontogenetic pattern changes in *Chamaeleo namaquensis*. Colour notes are based on live males (31) and females (27) from the Central Namib Desert and the Lüderitz District of South West Africa. Sex was verified by hemipenial eversion or internal examination.

	lateral	Interstitial skin dewlap	Mouth coloration	Angle of the jaw	Basic background colours
Central Namib					
Adult males (s-v 100+ mm)	yellow	yellow	yellow	light yellow	light yellow to yellow-green
Adult females (s-v 90+ mm)	orange-red	orange-red to maroon	yellow	orange-maroon	pink, maroon or dark red-brown
Subadults, both sexes (s-v 60–90 mm)	orange-red	orange-red to maroon	yellow	orange-red	pink, maroon greenish-brown or dark brown
Hatchlings, both sexes (s-v 48–60 mm)	yellow to pink	orange	black	light yellow	tan to light brown
Lüderitz District					
Adult males (s-v 100+ mm)	yellow	yellow	cream	light yellow	light yellow to yellow-green
Adult females (s-v 100+ mm)	orange-red	orange-red to maroon	cream	orange to maroon	pink, maroon, to dark red-brown

of some adult males. The hatchlings' interstitial skin of the lateral body surfaces was light yellow (like males) with pinkish infusions (like females) in some areas. The dewlap was an orange-red and the angle of the jaw light yellow, which incorporates the adult colours of both sexes.

A subadult (SV 60 mm) male from Koichab Pan had the typical adult female colouration on the throat and jaw juncture, and the background colour was a dark tan to reddish-brown. As this male grew from 60 to 84 mm (in eight months) the background colour became darker brown with maroon hues, resembling that of a female. This suggests that as juveniles (45 — 60 mm SV), both males and females undergo an ontogenetic pattern change, but this transformation is greatest in males and continues until the adult colour pattern is reached as they attain sexual maturity at approximately 90 — 100 mm SV length.

Financial support was granted by the Transvaal Museum and the CSIR. The S.W.A. Division of Nature Conservation and Tourism provided facilities and permission to work in the Namib Desert Park.

REFERENCES

- BRAIN, C. K.
1961: *Chamaeleo dilepis* — A study on its biology and behaviour. *Jour. Herp. Soc. Rhodesia*, 15: 15–20.
- BURRAGE, B. R.
1973: Comparative ecology and behaviour of *Chamaeleo pumilus pumilus* (Gmelin) and *C. namaquensis* A. Smith (Sauria: Chamaeleonidae). *Ann. S. Afr. Mus.*, 61: 1–158.