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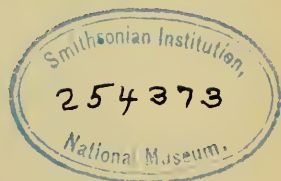
# ZOOLOGICAL SOCIETY

11

OF LONDON.

1920, pp. 1-194,

WITH 5 PLATES and 68 TEXT-FIGURES.



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PRINTED FOR THE SOCIETY,  
SOLD AT ITS HOUSE IN REGENT'S PARK.  
LONDON:  
MESSRS. LONGMANS, GREEN, AND CO.,  
PATERNOSTER ROW.

6. On some Lizards of the Genus *Chalcides*.

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[Received February 4, 1920: Read February 24, 1920.]

(Text-figures 1-4.)

At a recent meeting of the Society a paper was read by Major Stevenson-Hamilton in which the subject of the geographical distribution of the varieties of various African mammals was touched upon, and it was pointed out that one would be justified in treating some of the varieties as distinct species were it not for the existence of intermediate forms. This paper brought to my mind some notes I had made about ten years ago on the classification and distribution of the Skink *Chalcides ocellatus*, a species inhabiting Southern Europe, Northern and N.-Eastern Africa, and S.W. Asia, which presents an extraordinary amount of variation: in fact, the structural difference between the two extreme forms is so great that, were it not for the wonderfully complete manner in which they are connected, they could not possibly be denied specific rank. I have recently gone over again the material in the British Museum, and completed my notes on this subject, which I now have the honour to bring before the Society.

In papers written nearly 30 years ago my father, dealing with the matter, came to the conclusion that this species could be divided into five distinct varieties or subspecies, characterized mainly by the coloration and by the number of scales round the body, which was found to vary between 24 and 40—a range of variation far greater than is to be found in any other lizard\*. The five forms then described were the *forma typica*, and the varieties *ragazzii*, *tiligugu*, *vittatus*, and *polylepis*. To these must be added the var. *occidentalis* (*Ch. simonyi* Stdr.).

The position of the nostril has been used as a specific character in the lizards of the genus *Chalcides*, the species *viridanus*, of the Canary Islands, and *bottegi*, of Somaliland, being regarded as specifically different from *C. ocellatus*, mainly from the fact that the opening is pierced in advance of the suture between the rostral and the first labial instead of exactly above it, as is normally the case in the typical *C. ocellatus*. *C. bottegi* was described from a single specimen preserved in the Genoa Museum, and was stated to be closely related to *C. ocellatus*, but differed, apart from having the nostril pierced in advance of the rostral and first labial, in the body being much more slender and the scales of the vertebral rows being more than twice as broad as

\* Boulenger. Ann. & Mag. N. H. (6) v. 1890, p. 144.  
 ,, Tr. Zool. Soc. xiii. 1891, p. 138, pl. xvii.  
 ,, Ann. Mus. Genova (2) xii. 1891, p. 12.  
 ,, ,, ,, ,, xvi. 1896, p. 551.  
 Anderson. Zool. Egypt, Rept. p. 210 (1898).

long\*. On examination of a large material since received at the British Museum, I find that this form cannot be accepted as a distinct species, the nostril being almost as often pierced above the suture in question as in advance of it; while in a number of specimens of the typical *C. ocellatus* the nostril is pierced in advance of the rostral and the first labial. The body of the form *bottegi* is, I find, not always more slender than in the typical *C. ocellatus*, in which there is considerable variation in this respect. The number of scales, however, is less than in the typical *C. ocellatus*, being as a rule 24, as in the var. *ragazzii*, but dropping sometimes to 22. The degree of enlargement of the two median rows of dorsal scales varies considerably both in the form in question and in the typical *C. ocellatus*. If the position of the nostril cannot in this genus be regarded as of specific value, the question arises whether *C. viridanus*, which apart from this character agrees so closely with *C. ocellatus*, must also be only allowed the rank of a variety to be added to the numerous other forms which are embraced in the specific conception of *C. ocellatus*. I find, however, that the head has a different shape, the snout being less convex—a difference which finds expression in the proportions of the upper labials, all or most of which are not deeper than long.

There are two forms of *C. viridanus*—the typical, from Tenerife, Gomera, and Hierro, with the sides and belly black and 26–32 (usually 28) series of scales; and the var. *simonyi*, from Gran Canaria, with the belly yellow, greenish white or grey, the head somewhat larger and better defined than in the preceding, and 28–34 series of scales.

As pointed out by Steindachner, the *Chalcides* of Fuertaventura must be regarded as a variety (var. *occidentalis*) of *C. ocellatus* †.

Great individual variation in form is to be found in the structure of these lizards, especially in the proportions of the limbs and body. In the var. *bottegi* the latter may vary to a very great extent, namely from 18 to 28 per cent. In the distance between the axilla and groin the variation is also often great. The variations show that little importance can be attached to the proportions of the body and limbs, there being an overlap, for instance, in the length of the limbs between the two species *C. ocellatus* and *C. bebrigeæ*. The latter lizard was described as differing specifically from *C. ocellatus* in the proportions of the limbs, and in the nostril being pierced in advance of the suture between the rostral and first labial. It has been shown that neither of these characters can be regarded as absolute. I have ascertained, however, that in *C. bebrigeæ* the fourth labial normally takes the place of the subocular, and not the fifth, and

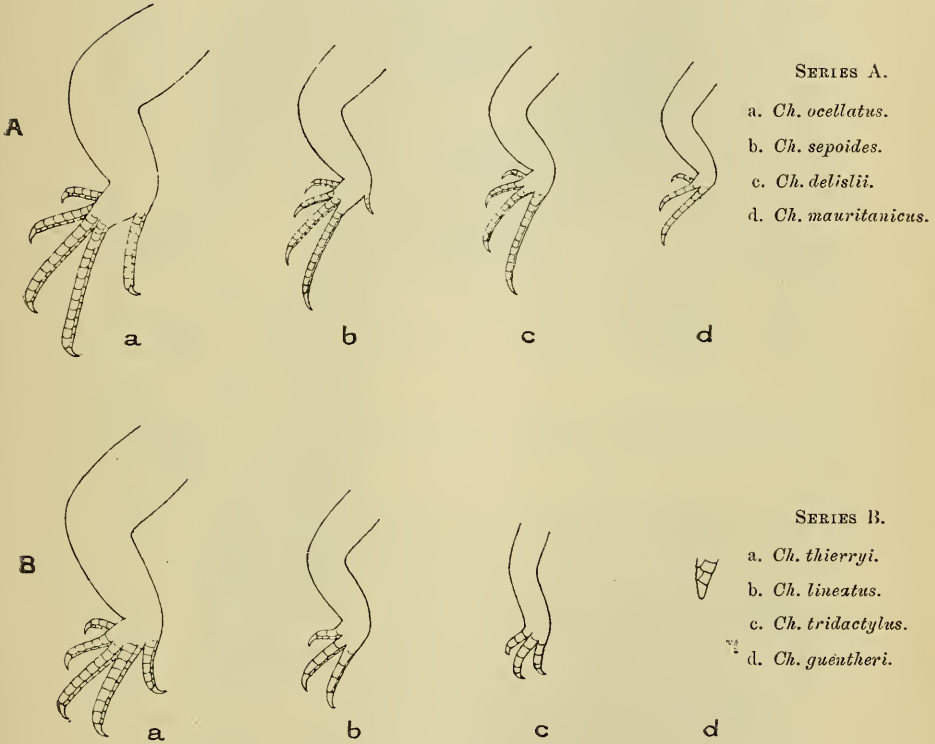
\* Boulenger. Ann. Mus. Genova (2) xviii. 1898, p. 719, pl. x. fig. 1, and (3) v. 1912, p. 330.

† Lanzarote and Fuertaventura, waterless and treeless and nearer the African coast, differ greatly from the other Canary Islands in their fauna, which is nearly identical with that of the neighbouring Sahara.—Tristram, Brit. Assoc. 1893.

that therefore it may, provisionally at least, retain its specific rank.

In the small island of Linosa, between Tunisia and Malta, lizards similar to, but easily distinguishable from, the typical *C. ocellatus* are found, and have been regarded as the young of the var. *tiligugu*, which occurs in Tunisia and Malta. They differ from the typical form in the small size (the largest specimen measuring only 80 mm. without the tail), in having the gular

Text-figure 1.



Reduction in the hind limb.

region spotted, and in the under surface being slate-colour. They are dorsally brown, spotted all over with small black and white ocelli. An indistinct paler dorso-lateral band is sometimes present. The number of scales round the body is 30 in all specimens, the two median rows being enlarged. These lizards are undoubtedly distinct from all the other forms of the species *ocellatus*, and for them I propose the varietal name of *linosae*.

*C. thierryi* was originally described as a var. of *C. bottegi*: it is,

however, a very distinct species, quite different from the numerous forms of *C. ocellatus* \*. In its shorter not so unequal toes, in its large ear-opening, and in its long, thick tail, it approaches the groups including *C. lineatus*, *tridactylus*, *guentheri*; and my father has given it as his opinion, that, although derived from the same stock as *C. ocellatus*, it represents one of the pentadactyle forms from which the more degenerate types referred to above have been evolved; whilst a continuous degeneration can be traced from *C. ocellatus* through *C. sepoides* to *C. delislii* and *C. mauritanicus*.

In all, therefore, we now have, apart from the typical form, seven varieties of the lizard *C. ocellatus*, and it is interesting from the evolutionary point of view that they are geographically connected, it being possible to trace every link in the chain from the short and stout variety with as many as 40 scales from Morocco, which must be regarded as the most generalized form, to the long and slender type with only 22 scales round the body from Abyssinia and Somaliland.

The general reduction in the number of scales takes place as follows:—

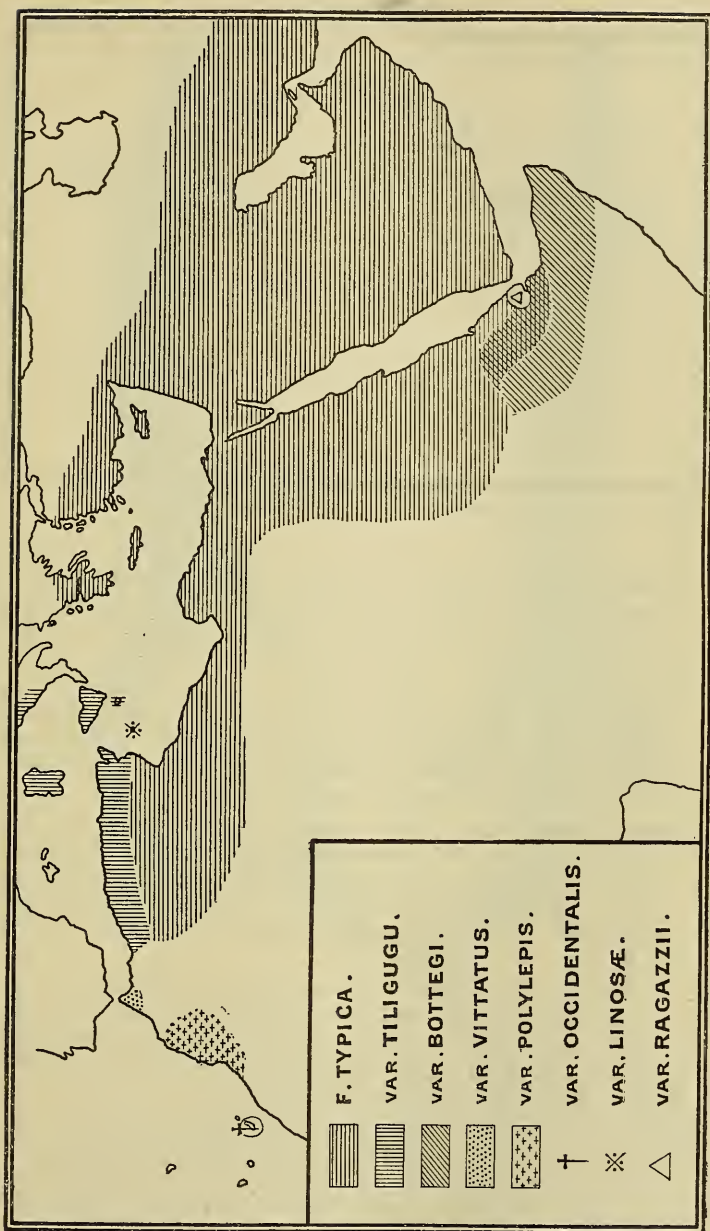
1. var. *polylepis* (34-40 scales). Morocco.
2. ,, *occidentalis* (30-32 ,, ). I. of Fuertaventura.
3. ,, *vittatus* (30-34 ,, ). Tangier.
4. ,, *tiligugu* (28-34 ,, ). Sardinia, Sicily, Malta, S. Italy, Algeria and Tunisia, N. of the Sahara.
5. forma *typica* (26-32 ,, ). Arabia, Persia, Egypt to Algerian Sahara, Syria, Cyprus, Greece, Eritrea.
6. var. *linosa* (30 ,, ). I. of Linosa.
7. ,, *ragazzii* (24 ,, ). Assab.
8. ,, *bottegi* (22-24 ,, ). Abyssinia, Somaliland.

The following are definitions of the 8 forms into which *C. ocellatus* may be divided:—

1. Var. *polylepis* Blgr. 34-40 scales round the body, the two median dorsal rows not enlarged; light brown above, without ocelli, but with a round yellowish spot on each scale, forming regular longitudinal series sometimes separated by dark lines: young with vertical black-and-white bars on the sides of the neck. Maximum length from snout to vent 155 mm.
2. Var. *occidentalis* Stdr. 30-32 scales round the body, the two median dorsal rows not enlarged; coloration as in the preceding, but the yellow spots less numerous. Maximum length from snout to vent 100 mm.

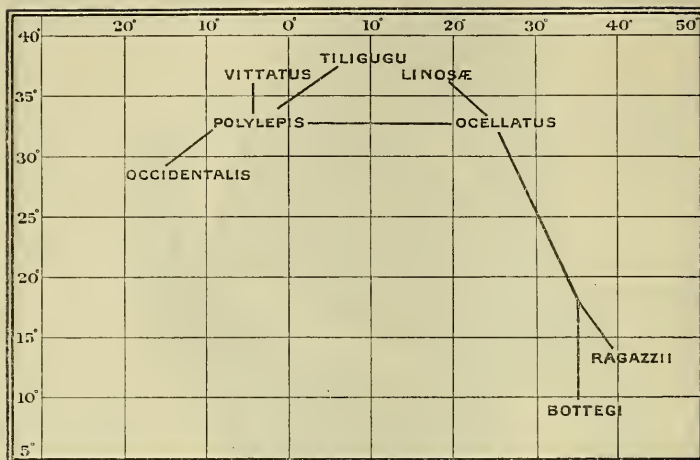
\* *Ch. bottegi* var. *thierryi* Tornier, Arch. f. Nat. 1901, p. 87.  
*Ch. thierryi* O. Neumann, Zool. Jahrb., Syst. xxii. 1905, p. 401.  
*Ch. pulchellus* Mocquard, Bull. Mus. 1906, p. 466.

Text-figure 2.



Geographical distribution of *Chalcides ocellatus*.

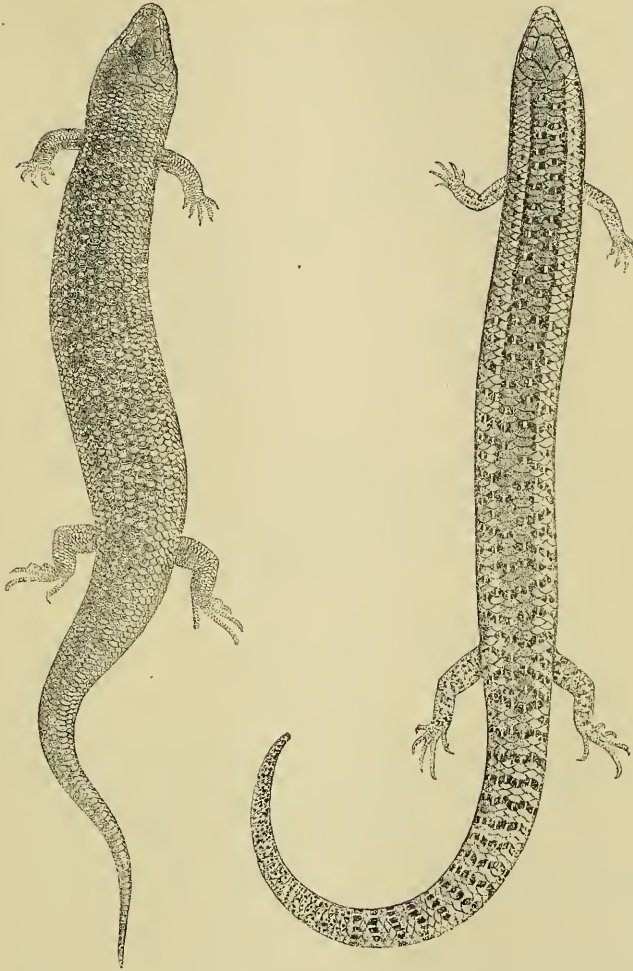
Text-figure 3.



Relationships and distribution.

3. Var. *vittatus* Blgr. 30–34 scales round the body, the two median dorsal rows not enlarged; brown above, without spots or ocelli, with a light dorso-lateral and a dark brown or black lateral band, both sharply defined. Maximum length from snout to vent 115 mm.
4. Var. *tiligugu* Gmel. 28–34 scales round the body, the two median dorsal rows not or but feebly enlarged; olive or brown above, with black and white ocelli and a well-defined yellowish dorso-lateral band edged with black below. Maximum length from snout to vent 150 mm.
5. Forma *typica* Blgr. 26–32 scales round the body, the two median rows not or but feebly enlarged; yellowish or brown above, with black and white ocelli, sometimes confluent into irregular transverse bands; a light dorso-lateral band sometimes present. Maximum length from snout to vent 140 mm.
6. Var. *linosæ*, n. 30 scales round the body, the two median dorsal rows not enlarged; dark brown above, ocellated all over, with or without a more or less distinct pale dorso-lateral band; belly grey; gular region spotted with black. Maximum length from snout to vent 80 mm.
7. Var. *ragazzii* Blgr. 24 scales round the body, the two median dorsal rows feebly enlarged; pale greyish brown above, with an ill-defined paler dorso-lateral band; no ocellar spots except on the posterior part of the body, the hind limbs, and the tail; crowded black spots form a lateral band from nostril to above axil, passing through the eye and above the ear-opening. Maximum length from snout to vent 75 mm.

Text-figure 4.

*Ch. ocellatus*, var. *polylepis*.*Ch. ocellatus*, var. *bottegi*.

8. Var. *bottegi* Blgr. 22-24 scales round the body, the two median dorsal rows more or less strongly enlarged; yellowish or greyish brown with black and white ocelli, with a dark, often black-edged dorsal band along the median rows of scales and a dark brown or black lateral band, the two separated by a sharply-defined pale area. Maximum length from snout to vent 130 mm.

The two extreme forms are represented on text-figure 4.