Vieraea **16**: 17-22.
Junio 1986

ISSN 0210-945X

Data on courting behaviour patterns in some canarian lizards.

M. MOLINA BORJA

Departamento de Fisiología Animal. Facultad de Biología. Universidad de La Laguna. Islas Canarias.

(Aceptado el 17 de Mayo de 1985)

MOLINA BORJA, M., 1986. Data on courting behaviour patterns in some canarian lizards. *Vieraea* 16: 17-22.

ABSTRACT: Several behaviour patterns that appear during courting of females by male lizards are described for two different Canarian subspecies: Gallotia galloti eisentrauti and G. galloti palmae. A report of copulation in G. galloti caesaris is also included. The importance of the courting behaviour as a character for studying behaviour evolution and taxonomic relationships is discussed in relation to another behavioural character previously cited by other authors.
Key words: Courting behaviour patterns, lizards, Canary Islands.

RESUMEN: Se describen pautas de comportamiento que aparecen durante el cortejo de las hembras por parte de los machos en dos subespecies de lagartos canarios: Gallotia galloti eisentrauti y G. galloti palmae. Se incluye también un caso de copulación en G. galloti caesaris. Se discute la importancia del comportamiento de cortejo, como carácter para estudiar la evolución de la conducta y las relaciones taxonómicas, en relación con otro carácter conductual usado por otros autores.

INTRODUCTION

The sexual behaviour of lizards has been a matter of interest for many years (PLANCY, 1877; ROLLINAT, 1900; NOBLE & BRADLEY, 1933; KRAMER, 1937) and its study evolved from general observations of the behaviour patterns involved in the mating of several species until hypothesis on sexual selection theories (NOBLE & BRADLEY, 1933) or the use of some of its behaviour pattern components as factors contributing to the evolution of behaviour and even to the segregation of species.

Therefore, many descriptions do in fact exist on the courting and mating behaviours of different lizard species. However, the literature is more abundant with relation to the several kinds of displays in iguanids (JENSSEN, 1971; STAMPS & BARLOW, 1973; CREW 1975; JENSSEN, 1975, 1979; JENSSEN & HOVER, 1976), including assertion, challenge and courtship displays.

Some reports on courting and mating behaviours have been published for lacertid lizards (NOBLE & BRADLEY, 1933; KRAMER, 1937; KITZLER, 1941; SMITH,1954; WEBER, 1957; VERBEEK, 1972), usually including descriptions of the behaviour patterns involved in the whole sequence.

For Canarian lizards belonging to the genus Gallotia (BOULENGER, 1920; ARNOLD, 1973), some general data on mating behaviour have also been published (BISCHOFF, 1971,1974) as well as the consideration of the biting pattern during copulation as a systematic character shared with other primitive lizard species (BÖHME & BISCHOFF, 1976).

Although, for many other species, the description of courting and mating behaviours correspond to observations in their natural habitats, the published data for the Canarian lizards mainly proceed from terrarium observations (BISCHOFF, 1971,1974; BÖHME & BISCHOFF, 1976) excepting author's previous data (MOLINA-BORJA, 1981).

Some more detailed descriptions of the courting behaviour in two different Canarian lizards: Gallotia galloti eisentrauti (BISCHOFF, 1982) from the North of Tenerife and G. galloti palmae from the island of La Palma, are therefore included.

BEHAVIOUR PATTERN DESCRIPTIONS

The first observation of courting behaviour was in G. galloti galloti, already reported in a previous paper (MOLINA-BORJA, 1981), corresponding to the locality of Llano del Moro, a small town near La Laguna. In this case only the general sequence could be noted.

A second observation was made while the author was recording lizard spatial and temporal behaviour (MOLINA-BORJA, 1985); in this case the species was G. galloti in a natural population at El Rayo (Buenavista, Tenerife) where specimens referable both to G. galloti galloti and G. galloti eisentrauti (BISCHOFF, 1982) were present. The second subspecies, altough cited as characteristic of the North of Tenerife by BISCHOFF (1982), appears to mix with the first one at Buenavista.

On this occasion, the observation was made in June of 1982 and the entire sequence was as follows: a male, with the external morphological characteristics of G. galloti eisentrauti, was seen walking in circles around a female which was in rest; while moving, the male had its throat inflated (dewlap) and performed vertical head movements (= head bobs, following the terminology of many investigators -CARPENTER & FERGUSON, 1977-) in a typical sequence: at least five successive head bobs, a short interval, and again the head bobs. Afterwards, both animals retired and no other details could be gathered.

A third observation was made in July of 1983 on G. galloti palmae, in a place near Puntallana town (Northeast of La Palma island). Here, a male could be seen with dewlap and walking around and near a female (Fig. 1). While moving and maintaining the dewlap, the male performed vertical head movements (head bobs) which consisted of three to five up and down movements. This sequence of head bobs was repeated during the displacement of the male around the female. Unfortunately, the lizards disappeared very soon and no other behaviour could be observed.

DISCUSSION

As can easily be deduced, the courting sequence looks very similar in both subspecies although a more detailed analysis is needed in order to discover possible differences.

However, some new characteristics, hitherto unknown in any Canarian lizard,

were obtained: 1) the circling movement of the male around the female in both subspecies and 2) the three to five head bobs which are repeated in sequence. These particularities were not cited in terrarium observations (BISCHOFF, 1971, 1974; BÖHME & BISCHOFF, 1976) of G. galloti galloti or for other lacertid species (VERBEEK, 1972).

Perhaps the absence of copulating patterns after that of courtship, in our observations, could be due to the late date of the reproductive seasonal time in which both of them were made (June and July, respectively). However, the copulation pattern has already been described (BISCHOFF, 1971,1974; BÖHME & BISCHOFF, 1976; MOLINA-BORJA, 1981) for some Canarian lizard species. A case of copulation in G. galloti caesaris is represented in Figs. 2 & 3 as obtained from two photographs kindly provided by C. SILVA.

The importance of the courting patterns, and in general of the several kinds of lizard displays, in order to understand their behavioural evolution, diversity within a species or to aid in the taxonomic positioning of related species, has mainly been expressed by CARPENTER (1962, 1964, 1966, 1967), CARPENTER et al. (1970), CARPENTER & FERGUSON (1977) and JENSSEN (1971,1975) for iguanid lizards.

BÖHME & BISCHOFF (1976) considered the importance of the biting pattern during copulation as a systematic character for Canarian and other lizards. However, in order to establish taxonomic relationships as well as behavioural evolution in these Canarian animals and, in general, in lacertid species, perhaps a more suitable characteristic would be the afore-mentioned courtship pattern in terms of its greater importance for a successful communication of the sexes during mating. Biting during copulation is common behaviour in different and separated lizard species or families and, thus, perhaps would not be so useful to obtain evolutive trends and closer taxonomic relationships.

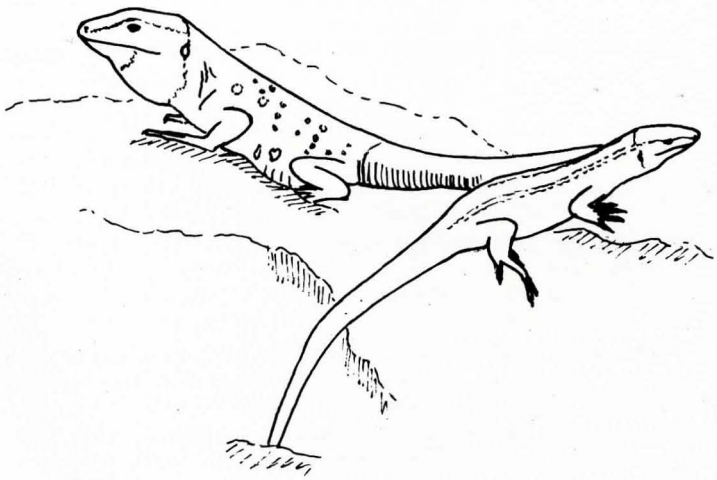
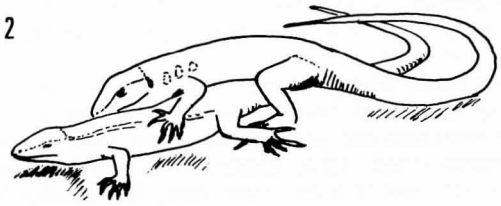
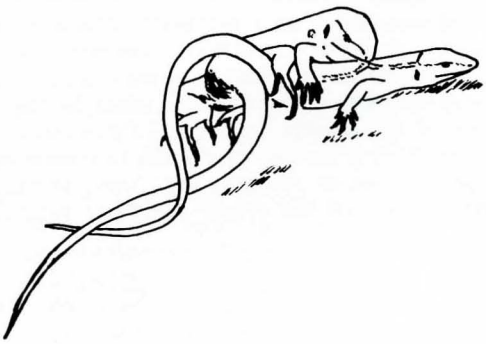


Fig. 1.- Male of Gallotia galloti palmae displaying one of the typical behaviour patterns of courtship to a female.

In this sense, something similar to the work carried out mainly by CARPENTER (1962,1964, 1966, 1967), CARPENTER et al. (1970), JENSSEN (1971, 1975, 1979), JENSSEN & HOVER (1976), JENSSEN & ROTHBLUM (1977), JENSSEN & GLADSON (1984) and HOVER & JENSSEN (1976) on the displays in iguanid lizards should be undertaken in the future for lacertid species.





Figs. 2 & 3.- First and second components of the mating sequence in Gallotia galloti caesaris.

ACKNOWLEDGMENT

To Pauline Agnew for revising the English.

BIBLIOGRAPHY

ARNOLD, D.E.N., 1973. Relationships of the Palearctic lizards assigned to the genera Lacerta, Algyroides and Psammodromus (Reptilia: Lacertidae). Bull. Brit. Mus. Natur. Hist. 25 (8): 291-366.

BISCHOFF, W., 1971. Lacerta galloti galloti, Duméril et Bibron, 1839, die Eidechse von Teneriffa. Aquarien und Terrarien 18: 308-311.

— 1974. Beobachtungen bei der Pflege von Lacerta simonyi stehlini (Sauria, Lacertidae). Salamandra 10 (3/4): 93-103.

— 1982. Die innerartliche Gliederung von Gallotia galloti (Duméril et Bibron 1839) (Reptilia: Sauria: Lacertidae) auf Teneriffa, Kanarische Inseln. Bonn. zool. Beitr. 33(2-4): 363-382.

BÖHME, W. & W. BISCHOFF , 1976. Das Paarungsverhalten der kanarischen Eidechsen (Sauria, Lacertidae) als systematisches Merkmal. Salamandra 12 (3):109-119.
BOULENGER, G.A., 1920. Monograph of the Lacertidae. Vol. 1. Trust. Brit. Museum. London.
CARPENTER, C.C., 1962. A comparison of the patterns of display of Urosaurus, Uta and Streptosaurus. Herpetologica 18: 145-152.
— 1964. Comparative behavior of the lava lizards (Tropidurus) of the Galapagos Islands. Am. Zool. 4: 274.
— 1966. Behavioural studies on reptiles; bobs, nods and pushups. Amer. Biol. Teacher 28: 527-529.
— 1967. Display patterns of the Mexican iguanid lizards of the genus Uma. Herpetologica 23: 285-293.
— , J.A. BADHAM & B. KIMBLE, 1970. Behavior patterns of three species of Amphibolurus (Agamidae). Copeia 1970: 497-505.
— & G.W. FERGUSON, 1977. Variation and evolution of stereotyped behavior in Reptiles. In: Biology of the Reptilia, vol. 7: Ecology and Behaviour (Ed. by C. Gans & D.W. Tinkle). pp. 335-554. Academic Press. London.
CREWS, D., 1975. Inter and intraindividual variation in display patterns in the lizard Anolis carolinensis. Herpetologica 31, nº1: 37-47.
HOVER, E. L. & T.A. JENSSEN, 1976. Descriptive analysis of agonistic displays of Anolis limifrons (Sauria: Iguanidae). Behaviour 58: 173-191.
JENSSEN, T.A., 1971. Display analysis of Anolis nebulosus (Sauria, Iguanidae). Copeia 1971: 197-209.
— 1975. Display repertoire of a male Phenacosaurus heterodermus (Sauria: Iguanidae). Herpetologica 31: 48-55.
— 1979. Display modifiers of Anolis opalinus (Lacertilia: Iguanidae). Herpetologica 35 (1): 21-30.
— & E.L. HOVER, 1976. Display analysis of the signature display of Anolis limifrons (Sauria, Iguanidae). Behaviour 57: 227-240.
— & L. ROTHBLUM, 1977. Display repertoire analysis of Anolis townsendi (Sauria: Iguanidae) from Cocos Island. Copeia 1977: 103-109.
— & N.L. GLADSON, 1984. A comparative display analysis of the Anolis brevirostris complex in Haiti. J. Herpetol. 18, nº3: 217-230.
KITZLER, G., 1941. Die Paarungsbiologie einiger Eidechsen. Z. Tierpsychol. 4: 353-402.
KRAMER, G., 1937. Beobachtungen über Paarungsbiologie und soziales Verhalten von Mauereidechsen. Z. Morph. Ökol. Tiere 32: 752-783.
MOLINA-BORJA, M., 1981. Etograma del lagarto de Tenerife, Gallotia galloti galloti (Sauria-Lacertidae). Doñana Act. Vert. 8: 43-78.
— 1985. Spatial and temporal behaviour of Gallotia galloti in a natural population of Tenerife. Bonn. zool. Beitr. 36 (3/4): 541-552.
NOBLE, G.K. & H.T. BRADLEY, 1933. The mating behavior of lizards: its bearing on the theory of sexual selection. Ann. N.Y. Acad. Sci. 35: 25-100.
PLANCY, V.C. de, 1877. L'accouplement et la ponte chez les lézards de France. Bull. Soc. Zool. France II: 325-358.
ROLLINAT, R., 1900. Observations sur quelques reptiles du département de l'Indre. Moeurs et reproduction du lézard vert. Mem. Soc. Zool. XIII: 5-30.
SMITH, M.A., 1954. The British amphibians and reptiles. Collins. London.
STAMPS, J.A. & G.W. BARLOW, 1973. Variation and stereotypy in the displays of Anolis aeneus (Sauria: Iguanidae). Behaviour 42: 67-94.
VERBEEK, B., 1972. Ethologische Untersuchungen an einigen europäischen Eidechsen. Bonn. zool. Beitr. 23: 122-151.

WEBER, H., 1957. Vergleichende Untersuchung des Verhaltens von Smaragdeichsen (Lacerta viridis), Mauereidechsen (L. muralis) und Perleidechsen (L. lepida) Z. Tierpsychol. 14: 448–472.