Confirmation of reproduction by parthenogenesis in *Hottentotta hottentotta* (Fabricius) (Scorpiones, Buthidae)

Confirmação de reprodução por partenogênese em *Hottentotta hottentotta* (Fabricius) (Scorpiones, Buthidae)

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Parthenogenesis is rather uncommon in scorpions. This form of reproduction was first suggested in the buthid *Hottentotta hottentotta*, from a population from Nigeria (Lourenço & Cuellar, 1994). Sex ratio analysis by Lourenço (see Lourenço, Cloudsley-Thompson & Cuellar, 2000), based on several living individuals of *Hottentotta hottentotta* from the delta of the River Niger (Nigeria), revealed the absence of males, suggesting that this particular population could be parthenogenetic. More specimens collected in the same area, provided additional support for this hypothesis (Lourenço, Cloudsley-Thompson & Cuellar, 2000), although *H. hottentotta* seems to be bisexual throughout most of its distribution. This suggested case of parthenogenesis was accepted in subsequent publications (Lourenço, Cloudsley-Thompson & Cuellar, 2000; Toscano-Gadea, 2005; Lourenço, 2002; Yamasaki & Makioka, 2005). However, it has been rejected by other scorpion experts during recent arachnological meetings (see Lourenço, 2007). In this respect it is worth noting that parthenogenesis was recently demonstrated in another species of the genus *Hottentotta*, *H. caboverdensis* (Lourenço, Ythier & Cloudsley-Thompson, 2007).

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In the present note, several new cases of parthenogenesis are reported for females of *H. hottentotta* from several populations in West Africa: Burkina Faso, Ghana and Togo. All these cases concern thelytokous parthenogenesis.

MATERIAL AND METHODS

Scorpions were reared using standard methods in plastic terraria of different sizes. These contained a layer of soil, 2-3 cm deep, as well as pieces of bark, flattened stones and a Petri dish containing water. Food, consisting of crickets (*Acheta domestica*, *Grillus assimilis* or *Grillus bimaculatus*) and/or cockroaches (*Shelfordella tartara*), was provided once every 7 to 10 days. Temperatures ranged from 27 to 30° C and the terrarium was dampened once per week. The available voucher material from the laboratory-reared specimens has been used as part of a taxonomic study and is now deposited in the Muséum national d'Histoire naturelle, Paris.

LABORATORY OBSERVATIONS

Several sub-adult females were collected in the field, from localities in Burkina Faso (Banfora), Ghana (Tamale) and Togo (Mango), between November 2001 and February 2006 [see female from Togo and the same female with offspring, respectively in Figs 1 and 2]. These were brought to the junior author and kept in laboratory conditions. The following cases of parthenogenesis were subsequently observed:

TOGO

A first sub-adult female moulted on 12 February 2002, becoming adult. It gave birth, on 21 June 2002, to an F-1 brood defined as n°1 and composed of 19 neonates. This female was designated female A. A second sub-adult female moulted on 20 March 2002, becoming adult. It gave birth, on 1 July 2002, to an F-1 brood defined as n° 2 and composed of 23 neonates. This female was designated female B. Subsequently, on 20 January 2003, female B gave birth to one more F-1 brood, defined as n°3 consisting of 52 neonates. Most neonates died during post-embryonic development, but two females of brood n°3 become adult after the 6th molt on 2 March 2004 and 15 March 2004 respectively. These females were designated B_1 and B_2 and they gave birth on 25 July 2004 and 2

Fig. 1. *Hottentotta hottentotta*, adult female from Togo

Fig. 2. *Hottentotta hottentotta*, female from Togo with offspring.

August 2004 to F-2 broods defined as n° 4 and n° 5 respectively, consisting of 24 and 18 neonates.

GHANA

A sub-adult female moulted on 12 September 2003, becoming adult. It gave birth, on 1 February 2004, to an F-1 brood defined as n°1 and composed of 21 neonates.

BURKINA FASO

A first sub-adult female moulted on 8 February 2005, becoming adult. It gave birth, on 10 June 2005, to an F-1 brood defined as n°1 and composed of 20 neonates. This female was designated female A. A second sub-adult female moulted on 3 January 2005, becoming adult. It gave birth, on 9 May 2005, to an F-1 brood defined as n°2 and composed of 12 neonates. This female was designated female B. Subsequently, on 15 August 2005, female B gave birth to one more F-1 brood, defined as n°3, consisting of 18 neonates. As in the previous cases, most neonates died during post-embryonic development, but one female of brood n°2 become adult after the 6^{th} molt, on 21 May 2006. This female was designated B_1 and gave birth, on 12 September 2006, to an F-2 brood defined as n° 4, consisting of 15 neonates.

Hottentotta hottentotta gave birth to 12-52 offspring, with an average of 22.2 neonates. The duration of embryonic development ranged from 98 to 203 days, with an average value of 132.2 days, representing a period similar to that observed in other species of Buthidae (LOURENÇO, 2002). The young scorpions moulted for the first time after an average of 4-5 days on their mother's back. The subsequent moults (up to six) took place at different ages in the specimens that survived.

RÉSUMÉ

Plusieurs nouveaux cas de parthénogenèse thélytoque ont été observes pour le scorpion *Hottentotta hottentotta* (Fabricius, 1787). Ils viennent ainsi confirmer cette forme de reproduction asexuée chez cette espèce. Les exemplaires utilisés pour les nouvelles observations ont été collectés au Burkina Faso, Ghana et Togo en Afrique Occidentale.

MOTS CLÉS: scorpion; parthénogenèse; thélytoque; *Hottentotta; hottentotta;* Afrique

SUMMARY

Several new cases of thelytokous parthenogenesis have been observed for the scorpion *Hottentotta hottentotta* (Fabricius, 1787), thus this form of asexual reproduction in the species. The scorpion specimens used in

these observations were collected in Burkina Faso, Ghana and Togo, in West Africa.

KEY WORDS: scorpion; parthenogenesis; thelytoky; *Hottentotta; hottentotta*; Africa

RESUMO

Diversas novas ocorrências de partenogênese completa (telitoquia) foram observadas para o escorpião *Hottentotta hottentotta* (Fabricius, 1787). As novas observações confirmam assim esta forma de reprodução assexuada na dita espécie. Os exemplares utilizados durante as novas observações foram coletados no Burkina Faso, Gana e Togo, na Africa ocidental.

PALAVRAS CHAVE: escorpião; partenogênese; telitoquia; *Hottentotta; hottentotta;* África

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