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ARTÍCULO:

Additions to the knowledge of the geographical distribution of some colombian scorpions (Buthidae: *Ananteris*, *Rhopalurus*, *Tityus*)

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ARTÍCULO:

Additions to the knowledge of the geographical distribution of some Colombian Scorpions (Buthidae: *Ananteris*, *Rhopalurus*, *Tityus*)

Ricardo Botero-Trujillo & Giovanny Fagua

Abstract:
New locality records for some buthids (Scorpiones: Buthidae C. L. Koch, 1837) in Colombia are presented: *Ananteris columbiana* Lourenço, 1991 and *Tityus - (Archaeotityus) tayrona* Lourenço, 1991 are recorded for the first time for Atlántico Department, *Rhopalurus laticauda* Thorell, 1876 for Atlántico and Vichada Departments, *Tityus (Archaeotityus) betschi* Lourenço, 1992 for Antioquia Department, and *Tityus (Atreus) forcipula* (Gervais, 1843) for Cundinamarca and Tolima Departments.
Key words: Scorpions, Buthidae, Colombia, new localities.

Adiciones al conocimiento de la distribución geográfica de algunos escorpiones colombianos (Buthidae: *Ananteris*, *Rhopalurus*, *Tityus*)

Resumen:
Se presentan nuevos reportes de localidades para algunos bútidos (Scorpiones: Buthidae C. L. Koch, 1837) en Colombia: se reporta por primera vez la presencia de *Ananteris colombiana* Lourenço, 1991 y *Tityus (Archaeotityus) tayrona* Lourenço, 1991 en el Departamento de Atlántico, de *Rhopalurus laticauda* Thorell, 1876 en los Departamentos de Atlántico y Vichada, de *Tityus (Archaeotityus) betschi* Lourenço, 1992 en el Departamento de Antioquia, y de *Tityus (Atreus) forcipula* (Gervais, 1843) en los Departamentos de Cundinamarca y Tolima.
Palabras clave: Escorpiones, Buthidae, Colombia, nuevas localidades.

Introduction

The family Buthidae C. L. Koch, 1837 (Arachnida: Scorpiones) is represented in Colombia by four genera and 35 species, 29 of them belonging to *Tityus* C. L. Koch, 1836, four to *Ananteris* Thorell, 1891, one to *Centruroides* Marx, 1890 and one to *Rhopalurus* Thorell, 1876 (Flórez, 2001a; Lourenço, 2002; Kovařík, 2007).

In recent decades several works dealing with Colombian scorpions have been developed and many species were described (Lourenço & Flórez, 1989, 1990; Lourenço, 1991, 1992, 1994, 1997, 1998, 1999a, 1999b, 2000, 2002; Flórez, 1996; Lourenço & Otero-Patiño, 1998; Kovařík, 2007). Recent collections of scorpions in various localities and the revision of the arachnological material deposited in the Museo Javeriano de Historia Natural "Lorenzo Uribe S. J." (Bogotá), have indicated the existence of a still important gap in the knowledge of this group, since various Colombian genera and species exhibit wider geographical distributions than those addressed in literature. Moreover, various new species have been discovered and are in process of description, while other material is pending of additional studies. The aim of this paper is to present some of these new findings, specifically new records of five species from five Colombian departments.

Material and Methods

Specimens are preserved in ethanol 70% and were studied under a Stemi SV 6 (Zeiss) stereoscope. Photographs were taken using an Olympus D-590 ZOOM digital camera. Maps were elaborated with the program ArcView GIS version 3.1. [Environmental Systems Research Institute (ESRI), Redlands, California].

Acronyms of museums: **MPUJ**—Museo Javeriano de Historia Natural "Lorenzo Uribe S. J.", Pontificia Universidad Javeriana, Bogotá, Colombia.

Results

Ananteris Thorell, 1891

This genus includes 58 known species (Gonález-Sponga, 2006; Kovařík, 2006; Lourenço *et al*., 2006), four of which are present in Colombia (Flórez, 2001a) as apparently endemic elements of very restricted areas. Up to date, *Ananteris columbiana* Lourenço, 1991 is known from Bolívar and Magdalena Departments, *A. ehrlichi* Lourenço, 1994 from Caquetá, *A. gorgonae* Lourenço & Flórez, 1989 from Cauca and Valle del Cauca, and *A. leilae* Lourenço, 1999 from Chocó (Flórez, 2001a). In this way the genus has been only recorded from six Colombian departments and none of the species has been reported in literature for the remaining 26.

NEW RECORDS

Ananteris columbiana Lourenço, 1991

Figs. 1–3.

Material examined: COLOMBIA: ATLÁNTICO DEPARTMENT: (1 juvenile ♀), Puerto Colombia, El Nisperal, 100m, 10/15.VI.2006, G. Fagua (MPUJ-SCO-334).

Remarks: This species is characterized, among other features, by the presence of 15–18 pectinal teeth, ten complete carinae in metasomal segments I–II and eight in segments III–IV. The anterior margin of the carapace is almost straight and the chelicerae exhibit a much reticulated pattern (Lourenço, 1991). This species was described from Magdalena Department. Even though it was subsequently recorded more to the South and West in Bolívar (Flórez, 2001a, 2001b), it had never been registered in Atlántico Department. In this way, this becomes the first record of *A. columbiana*, and of the genus, for this department.

Rhopalurus Thorell, 1876

This genus is represented in Colombia by one species, *Rhopalurus laticauda* Thorell, 1876. According to Lourenço (1982) this species includes two subspecies, since he stated that *R. pintoi* Mello-Leitão, 1932 should be included within *R. laticauda*. As a consequence of Lourenço's proposal, Fet & Lowe (2000) mentioned that this species is distributed in Colombia, Brazil, Guyana and Venezuela. However, recent considerations by Teruel (2006) indicate that *R. pintoi* should be considered a valid species distributed in Brazil and Guyana. This way, *R. laticauda* is only present in Venezuela and Colombia.

NEW RECORDS

Rhopalurus laticauda Thorell, 1876

Figs. 4–8, Table I.

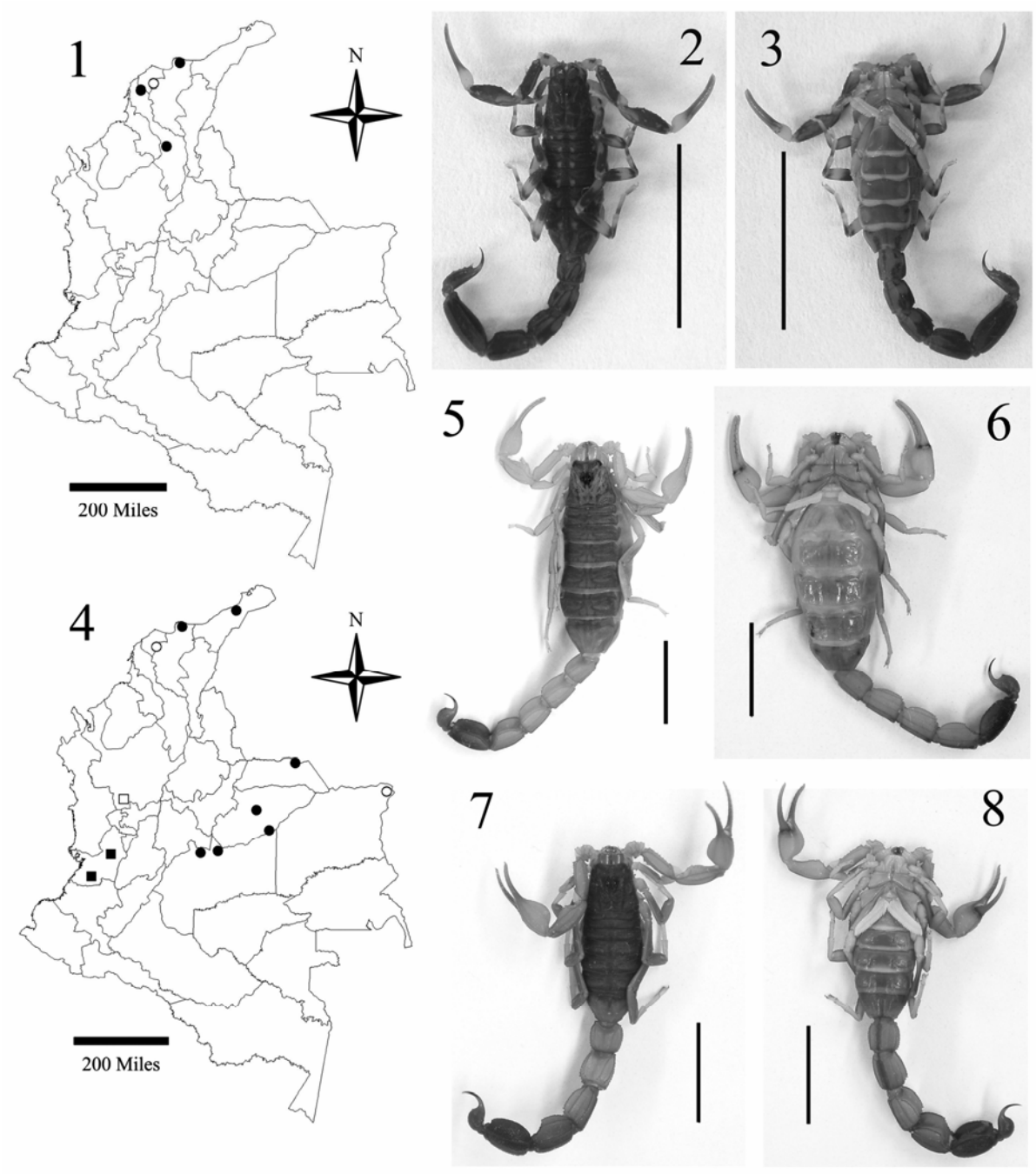
Material examined: COLOMBIA: ATLÁNTICO DEPARTMENT: (1 adult ♀), Puerto Colombia, El Nisperal, 100m, Tropical Dry Forest, ad hoc, 19.VII.2006, G. Fagua (MPUJ-SCO-318). VICHADA DEPARTMENT: (14 adult ♂, 13 adult ♀, 2 juvenile ♂[?], 1 juvenile), Puerto Carreño, Biological Reserve Bojonawi, 50m, II.2006 (MPUJ-SCO-214 to MPUJ-SCO-224; MPUJ-SCO-276 to MPUJ-SCO-294).

Remarks: In this species the metasomal segments IV–V are thickened and darker in comparison to the preceding segments (especially in males), segment V presents a deep dorsal depression and pectines exhibit 19–26 teeth [males 23–26, females 20–24 in our sample (Table I)]. Coloration is predominantly yellow and adults vary from 46 to 60mm length (Flórez, 2001b). In Colombia, this species has been registered in the following departments: Arauca, Casanare (Lourenço, 1997; Flórez, 2001a, 2001b), La Guajira (Hummelinck, 1940; Flórez, 1990, 2001a), Magdalena (Lourenço, 1991; Flórez, 2001a) and Meta (Prado & Rios-Patiño, 1939; Flórez, 1990, 2001a, 2001b). Therefore, *R. laticauda* was known only from five of the 32 Colombian departments, exhibiting a fragmentary distribution pattern with populations in the Caribbean and Orinoquian regions of Colombia (Fig. 4). The specimens referred here are the first to be collected from Atlántico and Vichada Departments, and become respectively the westernmost and easternmost records in the country.

Tityus C. L. Koch, 1836

This genus is represented in Colombia by 29 known species (Flórez, 2001a; Lourenço, 2002; Kovařík, 2007) distributed in the following three subgenera according to Lourenço's (2006) recent proposal: *Archaeotityus* Lourenço, 2006, *Atreus* Gervais, 1843 and *Tityus* C. L. Koch, 1836.

The subgenus *Archaeotityus* gathers the species commonly assigned to the *T. clathratus* C. L. Koch, 1845 group (Lourenço, 2006), and is represented in Colombia by seven known species (Flórez, 2001a; Kovařík, 2007): *T. columbianus* (Thorell, 1876), *T. parvulus* Kraepelin, 1914, *T. bastosi* Lourenço, 1984, *T. tayrona* Lourenço, 1991, *T. betschi* Lourenço, 1992, *T.*



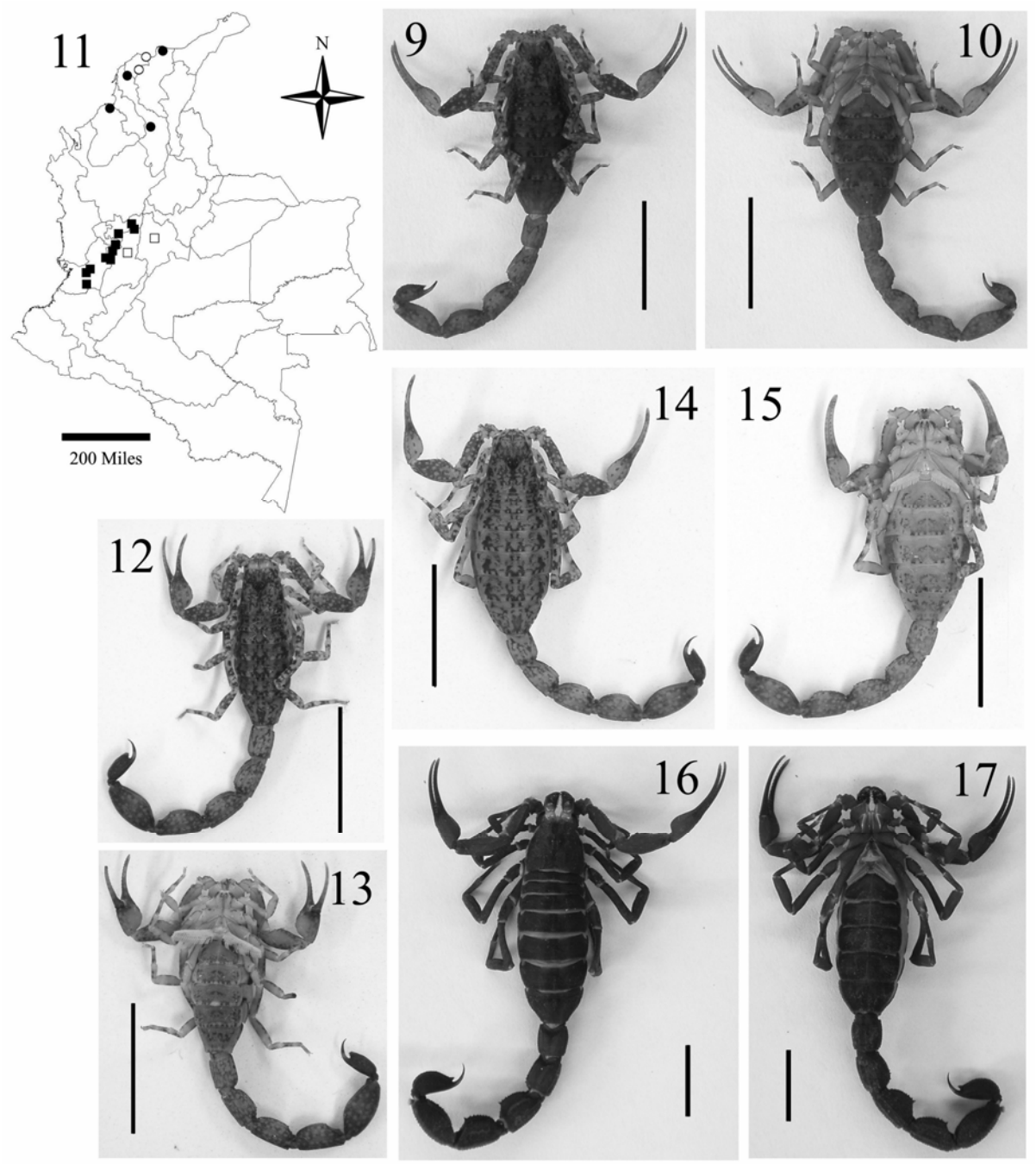
Figures 1–8. Fig. 1. Known distribution of *Ananteris columbiana*. Black circles: previous records. White circle: new record. **Figs. 2–3.** Juvenile female *A. columbiana* from Atlántico Department, dorsal and ventral views. **Fig. 4.** Known distribution of *Rhopalurus laticauda* (circles) and *Tityus betschi* (squares). Black symbols: previous records. White symbols: new records. **Figs. 5–6.** Adult female *R. laticauda* from Atlántico Department, dorsal and ventral views. **Figs. 7–8.** Adult male *R. laticauda* from Vichada Department, dorsal and ventral views. Scale bars equal 10mm.

erikae Lourenço, 1999 and *T. mraceki* Kovařík, 2007. Of these, almost all have exhibited a relatively wide geographical distribution, thus being present in at least two departments, except for *T. betschi* and *T. mraceki* which are known up to date only from Valle del Cauca Department (Flórez, 2001a; Kovařík, 2007).

NEW RECORDS

***Tityus (Archaeotityus) betschi* Lourenço, 1992**
Figs. 4, 9–10.

Material examined: COLOMBIA: ANTIOQUIA DEPARTMENT: (2 adult ♀), Tarso, Path El Cedrón, Las Camelias, Secondary Forest, 1600m, 3.IV.2007, J. M. Palacios (MPUJ-SCO-369, 370).



Figures 9–17. Figs. 9–10. Adult female *Tityus betschi* from Antioquia Department, dorsal and ventral views. **Fig. 11.** Known distribution of *Tityus tayrona* (circles) and *Tityus forcipula* (squares). Black symbols: previous records. White symbols: new records. **Figs. 12–15.** *T. tayrona* from Atlántico Department. **Figs. 12–13.** Adult male, dorsal and ventral views. **Figs. 14–15.** Adult female, dorsal and ventral views. **Figs. 16–17.** Adult female *T. forcipula* from Tolima Department, dorsal and ventral views. Scale bars equal 10mm.

Remarks: This species is characterized by a predominantly yellow coloration and a weakly rhomboidal subaculeus (Flórez, 2001b). Since its description by Lourenço (1992) it has been known, and still remains, only from females, and has been recorded only for Valle del Cauca Department (Lourenço, 1992; Flórez, 2001a, 2001b). The specimens referred here represent the first mention of *T. betschi* for Antioquia Department, and become the northernmost record in the country. According to the known distribution of this species in Colombia (Fig. 4), it is possible to think that it may be also distributed in the area between the locality for which it is herein reported for the first time and those previously known.

***Tityus (Archaeotityus) tayrona* Lourenço, 1991**
Figs. 11–15.

Material examined: COLOMBIA: ATLÁNTICO DEPARTMENT: (3 adult ♀, 2 adult ♂), Barranquilla, Pajonal, 40m, 15/20.VII.2006, G. Fagua (MPUJ-SCO-335 to MPUJ-SCO-338; MPUJ-SCO-347). (2 adult ♀, 1 adult ♂, 1 juvenile), Puerto Colombia, El Nisperal, 100m, 10/15.VI.2006, G. Fagua (MPUJ-SCO-339 to MPUJ-SCO-342); (3 adult ♀, 1 adult ♂), Puerto Colombia, Loma China, 100m, 15/20.VII.2006, G. Fagua (MPUJ-SCO-343 to MPUJ-SCO-346).

Remarks: Among the subgenus *Archaeotityus*, this species is characterized by the presence of 14–17 pectinal teeth, 15 rows of granules in the movable finger of pedipalp chela, marked sexual dimorphism with pedipalp chelae bulkier in males than in females, metasomal segments without spinoid granules, and sternite III lacking a smooth and shiny region, among other features (Lourenço, 1991; Flórez, 2001b). *Tityus tayrona* has been widely recorded in Magdalena, Bolívar and Córdoba Departments (Lourenço, 1991, 1992, 1997, 1998, 2000; Fet & Lowe, 2000; Flórez, 2001a, 2001b), being this the first record for Atlántico Department.

***Tityus (Atreus) forcipula* (Gervais, 1843)**
Figs. 11, 16–17.

Material examined: COLOMBIA: CUNDINAMARCA DEPARTMENT: (1 adult ♀), La Vega, La Reserva, under rock, *ad hoc*, 1300m, 5.VI.2006, R. Botero-Trujillo (MPUJ-SCO-373). (1 adult ♀), La Vega, 1230m, 28.II.1999, I. Otero (MPUJ-SCO-146). TOLIMA DEPARTMENT: (2 adult ♀), Ibagué, Path Cay, at night, *ad hoc*, 1400m, 18.VIII.2006, A. Giupponi (MPUJ-SCO-371, 372).

Remarks: Some features of this species are a reddish-brown coloration, the presence of various spinoid granules on dorsal carinae of metasomal segments I–IV, and that the hand of pedipalps is more bulky in males than in females (Flórez, 2001b). *T. forcipula* is known from Ecuador and Colombia (Fet & Lowe, 2000). In the last one, it has been recorded from Caldas, Quindío, Risaralda and Valle del Cauca Departments (Flórez, 2001a, 2001b), being a common species in the central Andean Region of Colombia. The examined specimens mentioned above are the first to be known from Tolima and Cundinamarca Departments.

Final comments

The new locality records presented in this study give evidence that there is a still important gap in the knowledge of the geographical distribution of various species within the family Buthidae in Colombia. Concerning *Rhopalurus* it is necessary to develop a further morphological analysis between the populations from the Caribbean and the Orinoquian regions. This is taking into account that in our sample we detected some features that differ between the specimens from both places: the scorpion from Puerto Colombia (Atlántico) presents lightly coloration over the entire body (Figs. 5–8) and less number of pectinal teeth (22/21) in comparison with most from Puerto Carreño (Vichada) (Table I). However, it is interesting to note that Manzanilla & Sousa (2003) found similar results for the populations of this species in Venezuela, since they advised that populations from wet habitats with dense vegetation tend to exhibit a darker coloration pattern than those from dryer habitats.

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Table I.

Variation in the number of pectinal teeth in *Rhopalurus laticauda* from Puerto Carreño, Vichada Department. Only adults were studied. Abbreviations: **N** = number of examined pectines; **SD** = standard deviation.

Sex	N	Pectinal teeth count							Mean	SD
		20	21	22	23	24	25	26		
Male	28	—	—	—	3	12	10	3	24.46	0.84
Female	26	1	6	16	2	1	—	—	21.85	0.78