

ARTÍCULO:

The First Record of the Genus *Mundochthonius* Chamberlin (Pseudoscorpiones: Chthoniidae) from Spain: *Mundochthonius gallaecicus* sp. nov.

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The First Record of the Genus *Mundochthonius* Chamberlin (Pseudoscorpiones: Chthoniidae) from Spain: *Mundochthonius gallaecicus* sp. nov.

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Abstract:

Mundochthonius gallaecicus new species from Galicia, mainland Spain, is described. This is the first record of the genus *Mundochthonius* Chamberlin from Western Europe and suggests that the genus may be widespread across the entire continent.

Key Words: taxonomy, morphology, biogeography, Galicia.

Taxonomy: *Mundochthonius gallaecicus* sp. n.

The First Record of the Genus *Mundochthonius* Chamberlin (Pseudoscorpiones: Chthoniidae) from Spain: *Mundochthonius gallaecicus* sp. nov.

Resumen

Se describe *Mundochthonius gallaecicus*, una nueva especie de Galicia, España continental. Se trata de la primera cita del género *Mundochthonius* Chamberlin para Europa occidental y sugiere que el género está ampliamente extendido por todo el continente europeo.

Palabras Clave: taxonomía, morfología, biogeografía, Galicia.

Taxonomía: *Mundochthonius gallaecicus* sp. n.

Introduction

The specimens studied in this paper belong to a large pseudoscorpion collection from the Museu Valencià d'Història Natural and kindly sent on loan by the colleagues and friends Dr Alberto Sendra and Sergio Montagud. *Mundochthonius* Chamberlin specimens were found in the same vial together with *Roncocreagris galeonuda galeonuda* (Beier, 1955) and *Ephippiochthonius* sp. Discovery of genus *Mundochthonius* in mainland Spain is greatly interesting because it reveals that the genus is widespread in Europe and emphasizes the importance of intensive research in different habitats using extractive methods for best knowledge of the Spanish pseudoscorpion fauna.

Material and methods

Microscopical examination and measurements were performed with a ZEISS AXIOLAB microscope. Temporary slide mounts were made in glycerol. All measurements are in mm. Ratio is the length/width or length/length index of an article. Nomenclature and familial affiliation is after CHAMBERLIN (1931) and HARVEY (1992).

Systematics

FAMILY Chthoniidae

GENUS *Mundochthonius* Chamberlin

Mundochthonius gallaecicus sp. nov.

MATERIAL. 1 ♀ holotype and 1 ♀ paratype from Baamonde, province of Lugo, Comunidad Autónoma de Galicia, mainland Spain, geographic coordinates: 43°11'N, 7°46'W. Collected on 12 September 2003 with Berlese funnel extraction of leaf mould samples, leg. Sergio Montagud. Holotype deposited in Museu Valencià d'Història Natural, paratype in coll. Departamento de Ecología – Universidad de Alicante.

DIAGNOSIS. A very small species without eyes or ocular spots. Carapace with 18-19 setae, 2 near the posterior margin. Tergites I-II each with 4 setae. Cheliceral palm with 6 setae. Coxal spine fan-shaped. Chela about 4.00 times longer than broad, length about 0.46 mm. Pedipalpal femur length about 0.30 mm. Ratio length chelal finger/hand about 1.50.

DESCRIPTION. Data within parentheses correspond to the paratype when the data does not coincide with holotype.

Carapace, chelae and chelicerae lightly pigmented, opisthosoma and legs pale yellowish. Carapace (Fig. 1) subquadrate. Without eyes or ocular spots. Epistome (Fig. 2) well-developed and strongly dentate. Some minute denticles on anterior lateral margin. Chaetotaxy 6-5-4-2-2: 19 (6-4-4-2-2: 18). Some lyrifissures are present: 5 (4) on the anterior margin and 4 on the posterior (4), as shown in Fig. 1.

Tergal chaetotaxy I-XII: 4 : 4 : 6 : 6 : 6 : 6 : 6 : 6 : 6 (2 tactile setae: TS) : 4 : 2 : 0. Coxae (Fig. 5): Manducatory process with 2 setae, palpal coxa with 2-3 (3), coxa I with 3 setae and 3 microsetae, anterior process prominent and rounded (Fig. 6), coxa II with 6 setae and with a single, short, broad and deeply incised, fan-shaped spine (Fig. 7), coxa III with 7 setae, and coxa IV with 7 setae. A bisetose intercoxal tubercle present between coxae III and IV. Genital opening with 10 (8) setae on sternite II and 8 on sternite III. Chaetotaxy of sternites IV-XII: 6 : 10 : 10 : 10 : 10 : 8 : 7 (2 TS) : 4 (2 TS) : 2, 3 + 3 microsetae on stigmata of sternites III and IV.

Chelicera (Figs 3-4) with 6 setae on palm and one seta on movable finger, 0.64 (0.59) from base. Palm with scale-like granulations. Fixed finger with 12 (11) teeth, distal 3 teeth are larger than the others. Movable finger with 10 (11) teeth, an isolated subapical tooth is present and distal tooth is clearly larger than the rest. Spinneret is a low, rounded tubercle. Flagellum with 11 pinnate setae, posterior one half length than the others. Serrula exterior with 14 blades, serrula interior with 12 (14) blades.

Pedipalps (Figs 8, 10): moderately slender, ratios

and measurements presented in Table I. Dorsal hand of the chela and the base of the fixed finger granulate. Fixed finger with 44 contiguous teeth, distal 8 acute and the remainder range from quadrate-shaped to flattened and rounded proximally. Movable finger with 40 (41) teeth with the same shape as the fixed finger; one small tubercle, probably associated with a sensillum, is situated on the external surface of the dental line at half distance between trichobothria *st* and *t*. Distance between trichobothria *b-sb* is 1.10 (1.16) times longer than between *sb-t*.

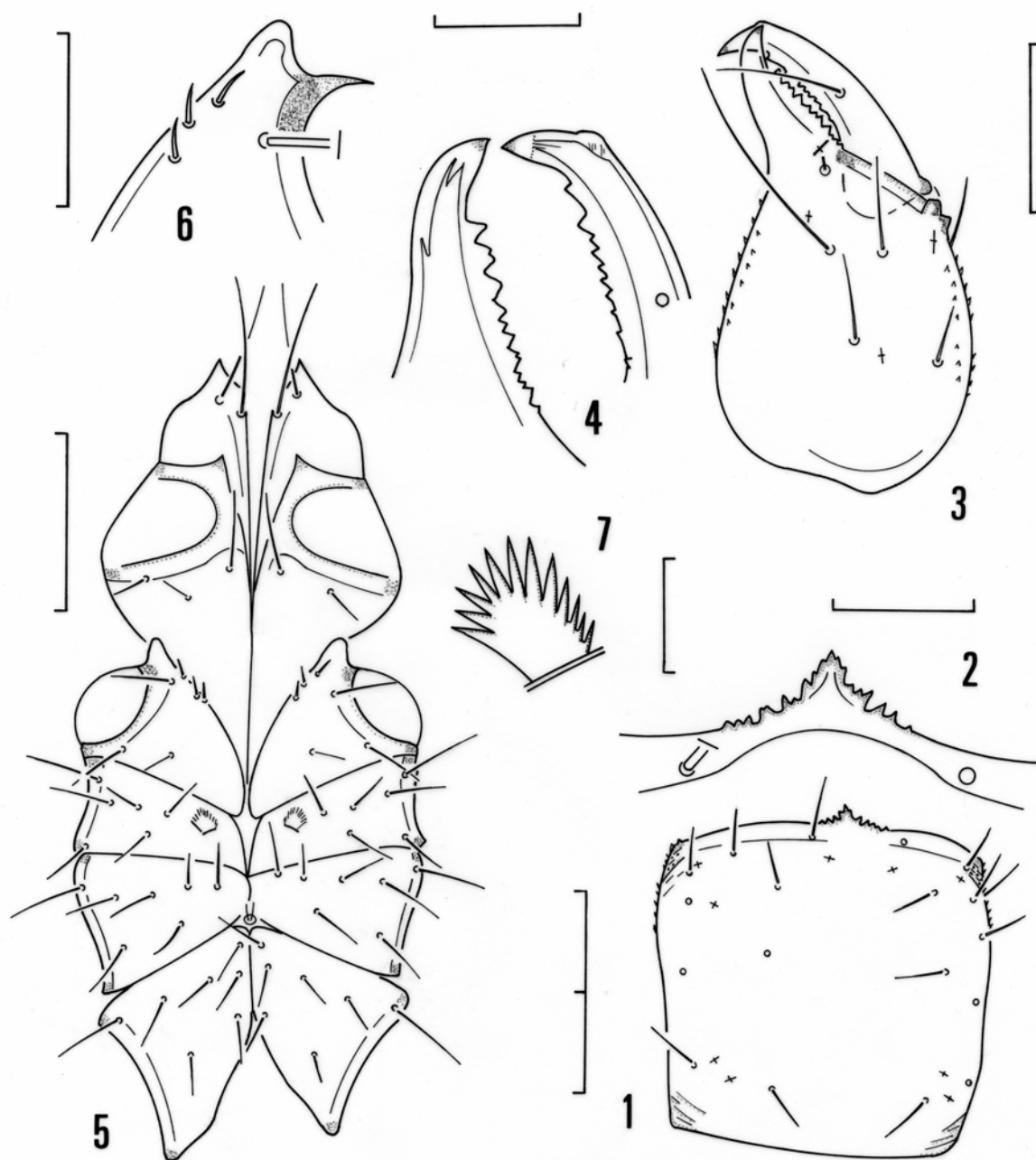
Legs I and IV: measurements and ratios presented in Table I. Leg IV (Fig. 9): tibia with a tactile seta proximal of middle, TS ratio: 0.39, basitarsus TS: 0.31 (0.30), telotarsus TS: 0.26 (0.29).

ETYMOLOGY. The name of the species is derived from *Gallaecia* = Galicia, the Spanish region where it has been found.

REMARKS. The new species is distinguished from the four other European species of the genus by its smaller size and ratios of the palpal chela. Additionally, *M. gallaecicus* differs from *Mundochthonius alpinus* Beier, 1947 (Austria: BEIER, 1947, 1963; MAHNERT, 2004) and *Mundochthonius carpaticus* Rafalski, 1948 (Poland: RAFALSKI, 1948; BEIER, 1963; and Ukraine: SCHAWALLER, 1989) because both species possess eyes with a distinct lens, the ratio length finger/hand of the chela is about 1.70 and the number of teeth in both fingers of the chela is over 50; and *M. carpaticus* also has more setae on tergite II (6 setae). The new species corresponds with *Mundochthonius styriacus* Beier, 1971 (Austria: BEIER, 1971; MAHNERT, 2004; Czech Republic: DUCHÁČ, 1999; Germany: JOST, 1982, not seen by the authors but compiled by PLATEN *et al.*, 1995; and Switzerland: MAHNERT, 1979) and *Mundochthonius decouii* Dumitresco & Orghidan, 1970 (Romania: DUMITRESCO & ORGHIDAN, 1970) in the absence of eyes or have been reduced to eyespots, but is different from *M. styriacus* by the larger ratio chelal finger/hand (2.20) in the latter species and from *M. decouii* that has the chelal finger longer than the pedipalpal femur, on the contrary to *M. gallaecicus*.

Outside Europe, *M. gallaecicus* is similar to the North American species *Mundochthonius sandersoni* Hoff, 1949 (HOFF, 1949) in the pedipalpal measurements and ratios, even in the fan-shaped structure of the coxal spine, but differs because the latter has tergites I-III with 4 setae, longer galeal seta, 4 setae on the posterior carapaceal margin and a pedipalpal femur length shorter than the chelal finger.

Compared with other North American species, *M. gallaecicus* differs from the following species by the chaetotaxy of tergites I-IV: *M. erosidens* Chamberlin, 1929 (4-6-6-6), *M. magnus* Chamberlin, 1929 (4-6-8-8), *M. pacificus* (Banks), 1893 (4-4-4-6) and *M. mexicanus* Muchmore, 1973 (4-6-6-6). By the ratio length finger/hand of the chela, the new species is different

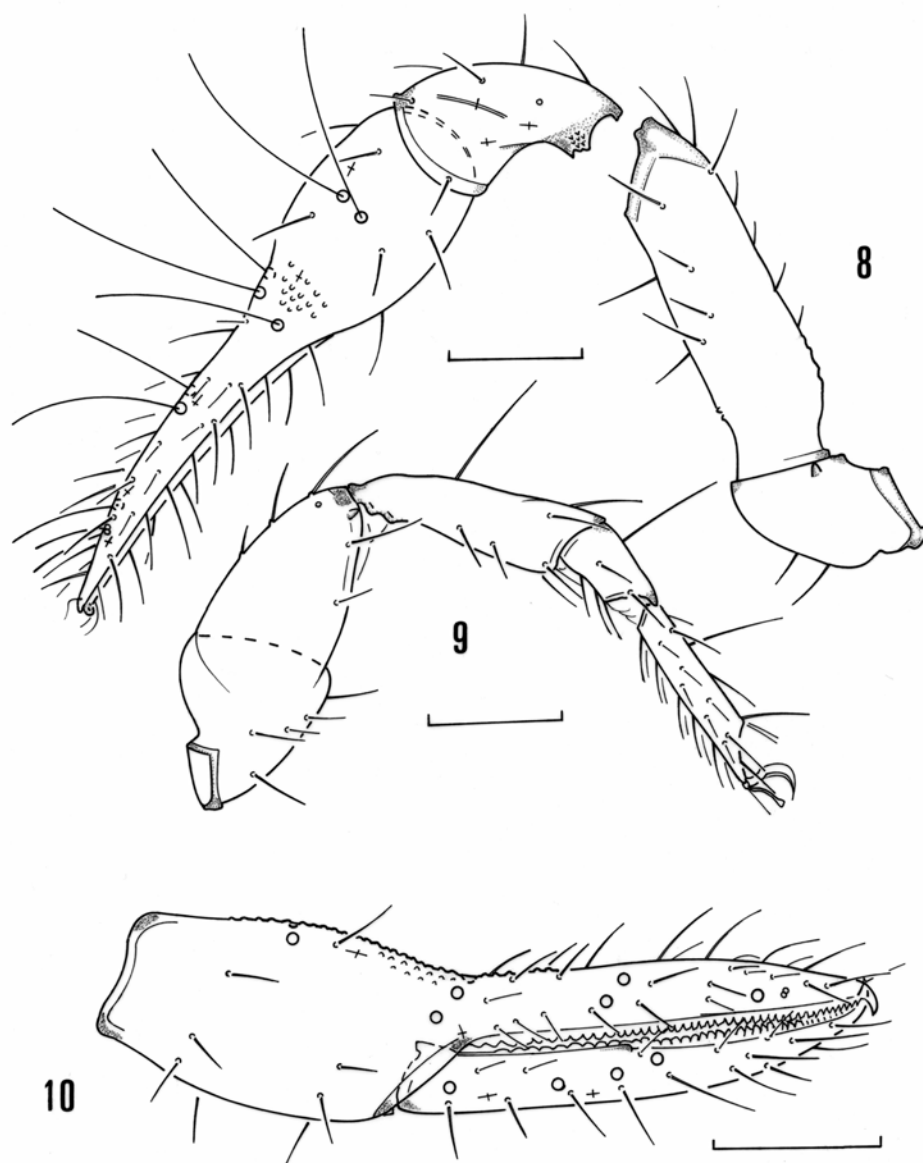


Figs 1-7: *Mundochthonius gallaecicus* sp. n., female holotype. 1 Carapace; 2 Carapaceal epistome; 3 Right chelicera; 4 Partial view of fingers of right chelicera; 5 Coxal area; 6 Anterior process of coxa I; 7 Coxal spine. Divisions of scale lines: 0.1 mm (Figs 1, 3, 5), 0.05 mm (Figs 2, 4, 6), 0.01 mm (Fig. 7).

from: *M. holsingeri* Benedict & Malcolm, 1974 (1.70x), *M. cavernicola* Muchmore, 1968 (1.73x), *M. montanus* Chamberlin, 1929 (1.70-1.85x) and *M. dominicanus* Muchmore, 1996 (1.85x). *Mundochthonius rossi* Hoff, 1949 has the spines of coxa II irregularly fused at the base, a situation different to *M. gallaecicus*. *Mundochthonius singularis* Muchmore, 2001 is a troglobitic species easily distinguishable from other species by its

large size (palpal femur 0.75 mm, chela 1.07 mm, etc).

In comparison with the Asian species of the genus, *M. gallaecicus* has different chaetotaxy of tergites I-IV: *M. ussuricus* Beier, 1979 (4-6-6-6), *M. minusculus* Kim & Hong, 1994 (4-6-6-6), *M. kiyoshii* Sakayori, 2002 (4-6-6-6) and *M. asiaticus* Dashdamirov, 2004 (4-6-9-11). *Mundochthonius basarukini* Schawaller, 1989 and *M. bifurcatus* Kim & Hong, 1994 also have diffe-



Figs 8-10.
Mundochthonius
gallaecicus sp. n.,
female holotype.

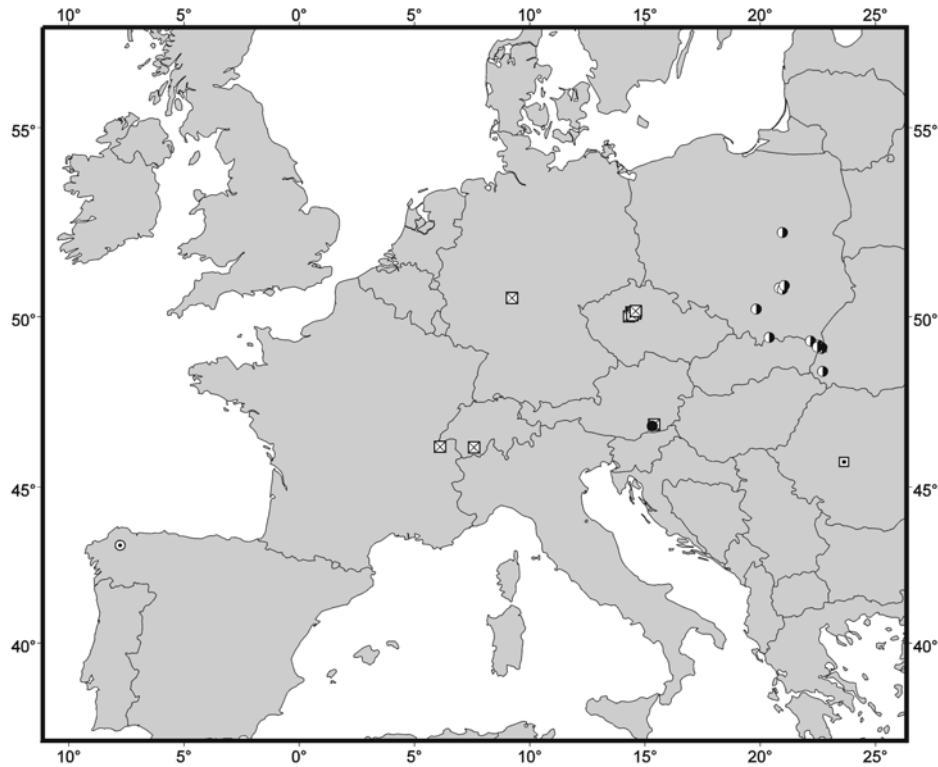
8 Dorsal view of
right palp; **9** Leg
IV; **10** Lateral view
of right chela. Divi-
sions of scale lines:
0.1 mm.

rent ratio length finger/hand of the chela than the new species (1.25x and 1.63-1.87x, respectively). The *M. japonicus* Chamberlin, 1929, "complex" comprises one species and three subspecies from Japan also differs from *M. gallaecicus* by the tergal chaetotaxy and the palp ratios.

Discussion

The genus *Mundochthonius* Chamberlin has 22 named species (with three further subspecies named from Japan) and is widespread throughout Central and Eastern Europe (Map 1), Far East Russia, Japan, Mexico, U.S.A. (HARVEY, 1991; SAKAYORI, 2002), Canada (BUDDLE, 2005), Dominican Republic (MUCHMORE, 1996), Korea (KIM & HONG, 1994) and Pakistan (DASHDAMIROV, 2004). BEIER (1970) noted that the genus *Mundochthonius* has a highly relictual distribution within Europe.

The discovery of a species of *Mundochthonius* in north-western Spain suggests that the genus is probably also widespread in western Europe; this genus has not been found yet in other western European countries. Absence of the genus is possibly due to insufficient collections from habitats that these small chthoniids inhabit. *Mundochthonius* species are soil-dwelling and very small in size (about 1 mm body length), and hand capture is extremely difficult; extraction methods such as Berlese funnels are required to detect them from forest debris (HOFF, 1949). The specimens examined in this study were from funnel extractions, but the low number of specimens suggests that these animals may also be endogenous, which requires different methods. Some Asian and North American species have been found only in caves (BENEDICT & MALCOLM, 1974; MORIKAWA, 1956; MUCHMORE, 1968, 2001) but it is not sure that have strictly restricted cave-



Map 1. Known distribution of the European species of the genus *Mundochthonius*. Symbols: ● (*M. austriaca*), ☒ (*M. styriacus*), ▲ (*M. carpaticus*), ◼ (*M. decoui*), ⊙ (*M. gallaecicus*).

life; differences with epigean forms are slightly larger size and ratios but reduction or absence of eyes also occur in some epigean species; the only species that is considered an authentic troglobitic is *M. singularis* (Colorado: U.S.A) which exhibits specialised troglobitic adaptations such as large size and attenuated pedipalps and legs (MUCHMORE, 2001).

The presence of a small tubercle on the external surface of the movable chelal finger close to the chelal teeth and situated between trichobothria *sb* and *st* has been reported for *M. holsingeri* (BENEDICT & MALCOLM, 1974, fig. 3). The same authors mention that in *M. cavernicola*, this tubercle is situated almost opposite *st*. In *M. gallaecicus* the tubercle is present on the dental line between trichobothria *st* and *t*. This

characteristic is probably present in all the *Mundochthonius* species although it has not been mentioned in most descriptive papers. The significance of the presence, position and variation along the finger is unknown but deserves to be taken in account when comparing similar species.

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<i>Mundochthonius gallaecicus</i> sp. n.	♀ holotype		♀ paratype	
	Ratio	Measurement	Ratio	Measurement
Body		0.800		0.920
Carapace	1.04	0.350/0.335	0.99	0.348/0.353
Chelicera				
Hand		0.275		0.285
Finger		0.140		0.145
Pedipalp				
Trochanter	1.82	0.140/0.077	1.81	0.145/0.080
Femur	3.39	0.285/0.084	3.61	0.298/0.083
Patella	1.75	0.170/0.097	1.75	0.175/0.100
Hand	1.61	0.185/0.115	1.58	0.188/0.119
Finger		0.273		0.275
Chela	3.96	0.455/0.115	3.86	0.458/0.119
Chela/carapace *	1.30		1.32	
Carapace/femur *	1.23		1.17	
Femur/finger *	1.04		1.08	
Femur/patella *	1.68		1.70	
Hand/patella *	1.09		1.07	
Finger/hand *	1.48		1.46	
Leg I				
Basifemur	3.23	0.150/0.047	3.26	0.155/0.048
Telofemur	1.94	0.085/0.044	1.92	0.087/0.045
Patella	2.68	0.095/0.036	2.62	0.098/0.038
Tarsus	5.13	0.154/0.030	5.25	0.158/0.030
Basifemur/telofemur *	1.76		1.79	
Tarsus/patella *	1.62		1.60	
Leg IV				
Femur+patella	2.42	0.258/0.107	2.50	0.270/0.108
Tibia	3.40	0.187/0.055	3.30	0.190/0.058
Basitarsus	1.78	0.080/0.045	1.92	0.084/0.044
Telotarsus	4.73	0.154/0.033	4.78	0.160/0.034
Telotarsus/basitarsus *	1.92		1.90	

