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*On the status of Lithobius carinipes* Daday, *L. californicus* Daday, and *L. filicium* Attems, three little-known Nearctic species of Lithobiidae (Chilopoda)

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## INTRODUCTION

The three North American species, *Lithobius carinipes* Daday, 1889, *L. californicus* Daday, 1889, and *L. filicium* Attems, 1901, have hitherto been known only from their original descriptions. Chamberlin (1922, 1925) discussed the probable generic classification of Daday's two species, but *L. filicium* has been overlooked and does not appear in any list of North American centipedes.

In the present paper the holotypes of each of these three species are described. It is concluded that *L. carinipes* is a valid species of *Lophobius* closely akin to if not identical with *Lophobius castellopes* (Chamberlin, 1903); *L. californicus* is a valid species of *Ethopolys* and the senior synonym of *E. sierravagus* (Chamberlin, 1903) (**new synonymy**); and *L. filicium* is a junior synonym of *Bothropolys multidentatus* (Newport, 1845) (**new synonymy**).

**Lithobius carinipes** Daday. Figs. 1, 2.

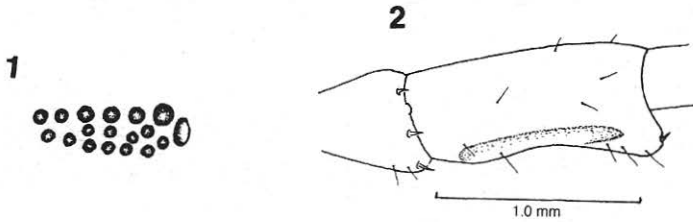
*Lithobius carinipes* Daday, 1889, Termes. Fuzetek. **12**: 153.

*Type locality*: Northern California.

*Holotype*: A male labelled "*Lithobius carinipes* Dad. Typ. E'sz. California. 866. 117. 1889." Hungarian Natural History Museum, Budapest.

*Description*: Colour, yellow. Size: 15.5 mm long, 2.05 mm broad at T.10. Head: as broad as T.1; lateral marginal interruptions distinct and slightly projecting. Antennae: 5.6 mm long; one entire with 21 articles, mostly about one and a half times as long as broad, the terminal only slightly longer than the penultimate; the other with 21 but at least the terminal article missing (Daday mentioned 22 articles). Ocelli: 1+17; not contiguous; posterior ocellus no larger than postero-

superior (Fig. 1). Prosternum and prehensors: missing, presumably removed to expose mouthparts (Daday recorded four prosternal teeth, presumably 2+2). Tergites: T.1 almost rectangular with lateral borders convex, almost as broad as T.3; posterior angles of T.9, 11, and 13 without projections. Coxal pores: 2, 3, 4, 3: small, circular. Anterior tarsal articulations: very faint on first to 11th legs, more



Figures 1 and 2. *Lophobius carinipes* (Daday), male holotype. 1. Left ocelli. 2. Right 15th femur, dorsal aspect. Scale = 1.0 mm.

distinct on 12th and 13th. 14th leg: slightly swollen but not otherwise modified; accessory apical claw present. 15th leg: markedly swollen, particularly the femur which is slightly bowed ventrally and presents a dorsomedial sulcus along most of its length and a prominent distal dorsomedial lobe projecting slightly beyond the level of the femoro-tibial articulation, bearing a small spine (DpF) directed caudad and towards the long-axis of the limb (Fig. 2); prefemur unmodified; tibia and tarsus strongly compressed laterally and thus appearing abruptly narrower than the femur when viewed dorsally; metatarsus missing on both sides but described by Daday as having a simple apical claw. Genitalia: second genital sternite without setae; gonopod of a single article.

Spinulation:	Ventral					Dorsal			
	C	+	P	F	T	C	P	F	T
1	-	-	mp	amp	am	-	mp	ap	ap
2-9	-	-	mp	amp	am	-	amp	ap	ap
11-12	-	-	amp	amp	am	-	amp	ap	ap
13	-	-	amp	amp	am	a	amp	p	p
14	a	m	amp	amp	am	a	amp	p	p
15	a	m	amp	am	-	a	amp	p	-

The 10th leg is missing on both sides.

*Remarks.* The above description agrees in many respects with Chamberlin's detailed description (1922) of *Pokabius (Lophobius) castelopes* (Chamberlin 1903). However, the only known specimen of that taxon, the male holotype from Shasta Springs, California, is described as being 8.8 mm long with short antennal

articles, 12 ocelli on each side, and 2, 3, 3, 2 coxal pores. Although the 15th femur as figured by Chamberlin (1922: pl. 12, fig. 1) for *castellopes* is similar to that of *carinipes* (Fig. 2) it is rather shorter, and there are some minor differences in spinulation, notably the presence of only one ventral spine on the 14th tibia compared with two (VamT) in *carinipes*. Chamberlin later (1928, 1940) attached great importance to this last character and used it in his keys for determination of the species of *Lophobius*: but, as Crabill (1962) has shown, although the posterior limits of spine series in Lithobiidae are more reliable in specific discrimination than are the anterior limits, they are often subject to intraspecific variation (see also Tobias, 1969). And most of the other characters separating the two forms are such as are related to a difference in size, itself a very variable character. But synonymy of *castellopes* with *carinipes* cannot be proposed with confidence on the basis of two specimens of such unequal size and they must provisionally be regarded as separate species.

Chamberlin (1922) removed *castellopes* from *Lithobius* to *Pokabius*, regarding *Lophobius* as a subgenus of the latter, but he later (1928) gave *Lophobius* generic status. On the basis of Daday's description of the 15th femur, which is inaccurate, he placed *carinipes*, with some doubt, in the nominate subgenus of *Pokabius*, but the distal position of the femoral lobe shows that *carinipes*, like *castellopes*, belongs to *Lophobius*.

***Lithobius californicus* Daday. Fig. 3.**

*Lithobius californicus* Daday, 1889: Termes. Fuzetek. **12**: 153.

*Type locality*: Northern California.

*Holotype*: A female labelled "*Lithobius californicus* Daday Typ. E'sz. California. 866.118. 1889.": Hungarian Natural History Museum, Budapest.

*Description*: Colour: yellow. Size: 20 mm long and 2.6 mm broad at T.10. Head: almost as broad as T.8; lateral marginal interruptions distinct and markedly projecting. Antennae: broken on both sides; the few intact articles elongate. Ocelli: 1+5, 5, 4; contiguous in regular rows; posterior ocellus larger than postero-superior; anterior ocellus of inferior row very small. Prosternum: eight teeth on the right, the lateral two separated from the others by a distinct diastema and a porodont, broad at the base and setiform at the apex; on the left side nine teeth with neither diastema nor porodont (Fig. 3). Tergites: T.1 distinctly trapeziform, as broad as T.5; posterior angles of T.9 and T.11 without projections, those of T.13 with very feeble projections. Coxal pores: multiseriate. Anterior tarsal articula-

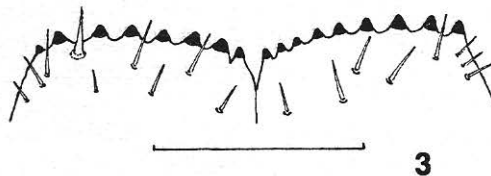


Figure 3. *Ethopolys californicus* (Daday), female holotype, dental margin of prosternum, ventral aspect. Scale = 0.5 mm.

tions: distinct. 14th and 15th legs: not swollen; accessory apical claw present on the 14th, absent from 15th. Gonopod: with three spurs and a tridentate claw as figured by Chamberlin (1925, pl. 5, figs. 1 and 2) for *Ethopolys sierravagus*, the lateral spur on the right gonopod being broken and represented by a socket only.

	Spinulation:					Dorsal				
	C	†	P	F	T	C	P	F	T	
12	-	m	amp	amp	am	-	amp	ap	ap	
13	-	m	amp	amp	am	a	amp	ap	p	
14	am	m	amp	amp	am	a	amp	p	p	
15	am	m	amp	am	a	a	amp	p	-	

So many of the anterior legs are missing that the spinulation formula for the first eleven pairs is omitted.

Remarks. Daday recorded eight prosternal teeth in *L. californicus* so that Chamberlin (1925) although placing the species correctly in *Ethopolys*, assumed that it had 4+4 teeth. Daday seems to have been counting the teeth on one side only despite the fact that in his description of Hungarian species of *Lithobius* (Daday, 1889b) he gave the total number — four in the smaller species (as in the case of *carinipes*) and, for example, ten to fourteen in *L. forficatus* (L.). Had it not been for this inconsistency over the number of teeth recorded, Chamberlin would probably have recognized the identity of *L. californicus* with *Ethopolys sierravagus* (Chamberlin, 1903) which he later (1925) recorded from several localities in California and Oregon.

Although the holotype of *californicus* differs from *sierravagus* as described by Chamberlin (1925) in having asymmetrical prosternal teeth (Fig. 3) and only one dorsal spine on the 13th tibia, the teeth on the right, the gonopods, and all the other characters as well as the type locality are in such close agreement with Chamberlin's description that there is little doubt that *californicus* is the senior synonym of *E. sierravagus*. On the other hand, the prosternal teeth on the left side of the holotype are exactly as described by Chamberlin (1951) for *Ethopolys calibius* which he described from a single female from Prarie Creek, California: nine teeth on either side and neither diastema nor porodont present. Although this specimen was described as having the gonopod with four spurs and a claw with small basal denticles, and no 14th accessory apical claw, it may be a variant individual of *E. californicus*.

*Ethopolys bipunctatus* (Wood, 1863) can, according to Chamberlin's 1925 description, only be separated from *sierravagus* (= *californicus*) by its paler colour and longer antennae, neither very reliable taxonomic characters in the Lithobiidae. But Chamberlin only recorded *bipunctatus* from Utah and Nevada, and since he

seems to have examined numerous examples of both forms, he must have decided that these characters are sufficiently stable to justify regarding them as distinct species.

### **Lithobius filicium** Attems.

*Lithobius filicium* Attems, 1901, Mitt. naturh. Mus. Hamburg, **18**: 111.

*Type locality*: "North America".

*Holotype*: A female labelled "*Lithobius (Polybothrus) filicium* Att., nov. sp., holotypus. An Farn Wurzeln v. Nord Amerika, 3. XII. 98. St. f. Pflanzenschutzel, 1. II. 99." and also "*Lithobius filicium* = *Bothropolys multidentatus* H. C. Wood det. R. E. Crabill VI. 6. 61 Hamburg": Zoologisches Museum, Hamburg.

*Description*: Colour: brown. Length: 22 mm. Prosternum: with 7+8 teeth, the lateral tooth and porodont on each side as figured by Chamberlin (1925: pl. 1, fig. 7) for *Bothropolys multidentatus*. Tergites: posterior angles of T.4 with small but distinct projections; posterior border of T.14 strongly emarginate. 14th and 15th legs: without accessory apical claws. In other respects agreeing with Chamberlin's (1925) detailed description of *Bothropolys multidentatus* (Newport).

*Remarks*. Apart from the small posterior projections on T.4 and broad posterior projections on T.14, Attems' description of *L. filicium* is in complete agreement with Chamberlin's description of *B. multidentatus*. And four of the seven specimens of *B. multidentatus* preserved in the Zoological Museum, Copenhagen, have small but distinct projections on T.4 and they all show fairly marked emargination of the posterior border of T.14 which thus appears to have broad projections. An additional feature shown by all the above specimens with an intact 14 leg, as well as by the holotype of *filicium*, is the absence of 14th accessory apical claws. This conflicts with Chamberlin's statement that these claws are present but very small, suggesting that apical claws of the 14th legs are variable in this species.

Although Attems described the coxal pores in *L. filicium* as numerous and disorderly, and his labelling of the holotype reveals its affinities, the sub-generic name (*Polybothrus* = *Bothropolys*) was not included in the original description so that its true nature has been overlooked. Dr. R. E. Crabill examined the holotype in 1961 and correctly identified it (although he mistakenly attributed *multidentatus* to Wood instead of Newport), but this synonymy was never published.

*Bothropolys nobilis* Wood, 1863, was synonymized with *multidentatus* by Wood himself in 1865, and *Lithobius planus* Newport, 1845, with *multidentatus* by Eason in 1972. To these two junior synonyms for this common species, widespread through eastern United States, must now be added *Lithobius filicium* Attems, 1901.

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