

**A Contribution to the Study of the Genus *Porrhomma*
(Araneae: Linyphiidae). Notes on a Population of *P. egeria*
(Simon) and Other Cavernicolous Species**

by

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INTRODUCTION

This second paper in a series of notes revising the genus *Porrhomma* deals with a population of *P. egeria* and two apparently synonymous species, *Porrhomma moravicum* (Miller and Kratochvil) and *Porrhomma obambulatum* (Kritscher). Some biometrical comparisons will be made with three other cavernicolous species: *P. myops* (Simon), *P. convexum* (Westring) and *P. rosenhaueri* (L. Koch).

The original description of *P. egeria* (Simon, 1884) characterized the species principally by the size and the relative position of the eyes. At the population level these are variable characters, however, being of little use in the identification of isolated specimens. Another unstable character used by Simon is the number and position of spines on femur I. He mentions one dorsal and two prolateral spines on femur I for *P. egeria* whereas in the population in question only 23% of adult spiders possess the supplementary prolateral spine. Locket and Millidge (1953) also mention the presence of these two prolateral spines, however they insist upon the necessity of a close examination of the male palp and the epigyne.

Miller and Kratochvil (1940) separated the *P. egeria* of Czechoslovakia from the Western European form in erecting a new species, *P. moravicum*. I have examined three specimens kindly given by Dr. Miller and when compared with the population in question this species seems to me an unnecessary complication of the genus.

The small depigmented form described by Kritscher (1968), *P. obambulatum*, shows typical *egeria* characters and in particular the male palp when viewed correctly is certainly that of *P. egeria*.

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The species *P. moderatum* described by Silhavy (1958) from a Moravian Cave is probably another synonymous *egeria* species.

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MATERIAL

1. *Porrhomma egeria*. France, Bange Cave, Haute-Savoie, altitude 620 m. (52 ♀, 26 ♂ collected by author 1976/1977).
Switzerland, Fribourg, under stone (1 ♀, June 1976, don. S. Vit).
2. *Porrhomma moravicum*. Czechoslovakia, ?, (don. F. Miller, 1 ♂, 2 ♀).
3. *Porrhomma obambulatum*. Italy, Cave, (holotype, 1 ♂, loan G. Osella).
4. *Porrhomma myops*. France, Scierie Cave, Haute-Savoie, altitude 580 m. (54 ♀, collected by author 1974/1976).
5. *Porrhomma convexum*. Austria, Sünser See and Sünser Alm, Damüls, altitude 1850 m. (22 ♀, loan K. Thaler).
Italy, from several caves. (13 ♀, loan P. Brignoli)
France, Bouna Cave, Ain, altitude 360 m. (51 ♀, collected by author 1975/1976).
6. *Porrhomma rosenhaueri*. Germany, Wandeishöle, Oswaldhöhle, Vitzenhöle. (9 ♀, loan M. Hubert, tube No. 25638).

DESCRIPTION OF THE BANGE CAVE POPULATION

Habitat: the density of the population, habitat conditions and sex ratios for the months of January and May are given in Table 1. In order to obtain the densities within the habitat limits 16 quadrates (1 m²) were chosen at random. All the stones found within the squares were turned and the number of *P. egeria* and cocoons counted. These were invariably found on the undersides of the stones near to the damp clay surface of the cave floor. The following species share the same habitat: *Onychiurus armatus* Gisin, *Arrhopalites pygmaeus* Vankel, (Collembola); *Speolepia leptogaster* Winn. *Phora aptina* Schiner, *Leptocera* sp., *Sciara* sp. (Diptera); *Catops picipes* F. (Coleoptera).

Description: Length ♂ ♀: 1.80-2.60 mm. Carapace: orange-brown to orange. Abdomen: pale yellow to white. Sternum: pale orange to orange with coarse hairs. Legs: orange. Eyes: small and slightly convex, pigmentation is variable (Figs. 1f, 1g). Femur I: one dorsal and one or two prolateral spines. Femur II: one dorsal spine. Femurs III and IV without spines. Table 2 compares the Bange Cave population with the other two "species" for these morphological characters. The pale colour of *P. obambulatum* is very similar to that of young males from the population in question. The ocular pigmentation is more intense among the younger specimens (Figs. 1g, 1i).

Table 1. Ecological data for a population of *Porrhomma egeria* from the Bange Cave.

Habitat	T°C	H.R.	Density		Sex ratios	
			spiders	cocoons	♂	♀ juv.
May 1976	Under stones 25 to 80 meters	max. 8.2°C min. 6.5°C	0.8/m²	0	0.35	1
January 1976	from cave entrance	max. 5.7°C min. 1.1°C	1.2/m²	0.2/m²	1	2.7
					1	1.2

Table 2. Morphological characters for *Porrhomma egeria*, *Porrhomma moravicum* and *Porrhomma obambulatium*. (* adult specimens only)

Species	Sex	Total length mm	Carapace	Abdomen	Sternum	Legs	Spines on femur I
<i>P. egeria</i> * (pop.)	♂	1.8-2.6	orange-brown to orange	pale yellow to white	orange	orange	1 dorsal 1 or 2 pl.
	♀						
<i>P. moravicum</i>	♂	2.20	orange-brown	white	orange	orange	1 dorsal 1 prolateral
	♀	2.20 et 2.40					
<i>P. obambulatium</i>	♂	1.85	yellow	white	yellow	yellow	1 dorsal 1 prolateral

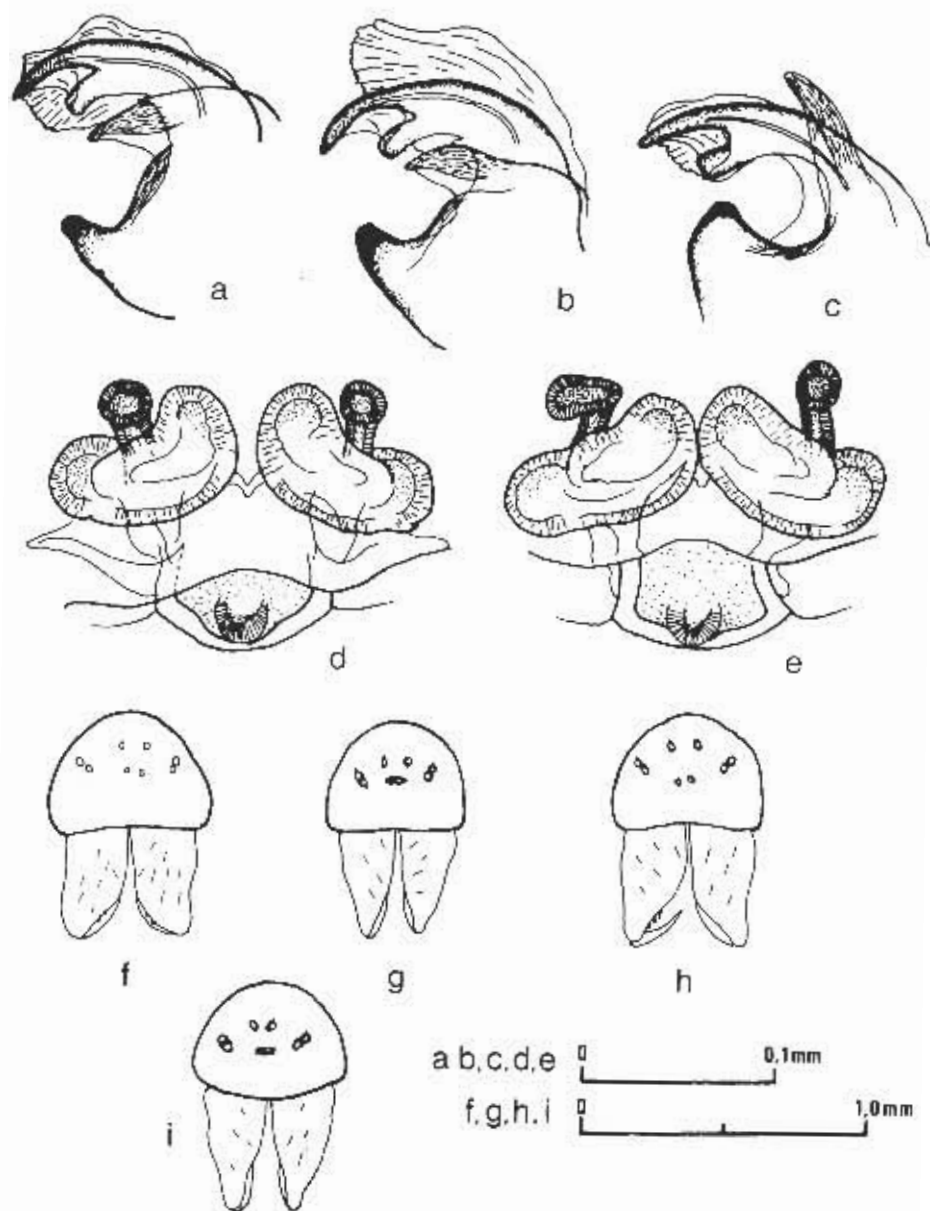


Fig. 1. *Porrhomma egeria* (Bange Cave). a) Terminal part of embolic division, ventral view. d) Epigyne, ventral view. f) Carapace, anterior view. g) Carapace of young male, anterior view. *Porrhomma moravicum*. b) Terminal part of embolic division, ventral view. e) Epigyne, ventral view. h) Carapace, anterior view. *Porrhomma obambudatum*. c) Terminal part of embolic division, ventral view. i) Carapace, anterior view.

The male palp (Fig. 1a) of the group *egeria* is characterized by the modified simple embolus having a large barb, which should not be confused with the superior apophysis. It is imperative to place the palp in the right position for microscope work. The embolus must be parallel to the slide so that it can be seen entirely without having to adjust the microscope.

In the description of *P. moravicum* (Miller and Kratochvil, 1940) the characters used to distinguish the male palp of *P. egeria* from that of *P. moravicum* are not constant at the population level. The instability of these specific characters can be summarized as follows:

- point of embolus free (this is an extremely variable character and may even differ between the right palp and the left palp of the same spider).
- inferior edge of the membrane with a small tooth which is much larger in *P. egeria* (this "tooth" is in fact a fold in the membrane near to its attachment to the superior apophysis. Under the microscope it can be seen clearly on a single plane and unlike a tooth it disappears with the slightest movement. This fold may have a variety of shapes.)
- in *P. moravicum* the inferior apophysis has a denticulated extremity — Miller and Kratochvil — (again this character is variable at the population level and is possibly due to damage following copulation and is not found among young males).

Due to manipulation, the superior apophysis of the *P. obambulatum* palp is seen in a unnatural position (Fig. 1c), however the embolus has a typical *egeria* form. The palps of the three "species" are compared in Figure 1.

The epigyne of females from the Bange Cave population (Fig. 1d) resemble that of *P. moravicum* (Fig. 1e) and are very similar to that illustrated in Locket and Millidge (p. 332) for *P. egeria*. Unfortunately the female of *P. obambulatum* is unknown.

BIOMETRICS

The use of the same biometrical ratios as for *P. myops* and *P. convexum* (Bourne, 1977) illustrates the utility of this method in the study of the genus *Porrhomma* (Fig. 2). The ratios used are as follows:

- Tm1 (see Locket and Millidge, page 175).
- La/Lo Fl (maximum width of femur 1/length of femur 1).

Table 3 gives these measurements with those of the carapace for the three species in mm.

The scatter diagram (Fig. 2) shows the relationship between the population biometrics of the Bange Cave species (*P. egeria*) and the two "contested" species, *P. moravicum* (M) and *P. obambulatum* (O).

The use of the two biometrical ratios is not, of course, very useful for the identification of isolated specimens at the present stage of this approach to the "Porrhomma problem". It is hoped, however, that by a careful examination of a maximum of European specimens a key to the identification of the species of this genus based on biometrics will be published.

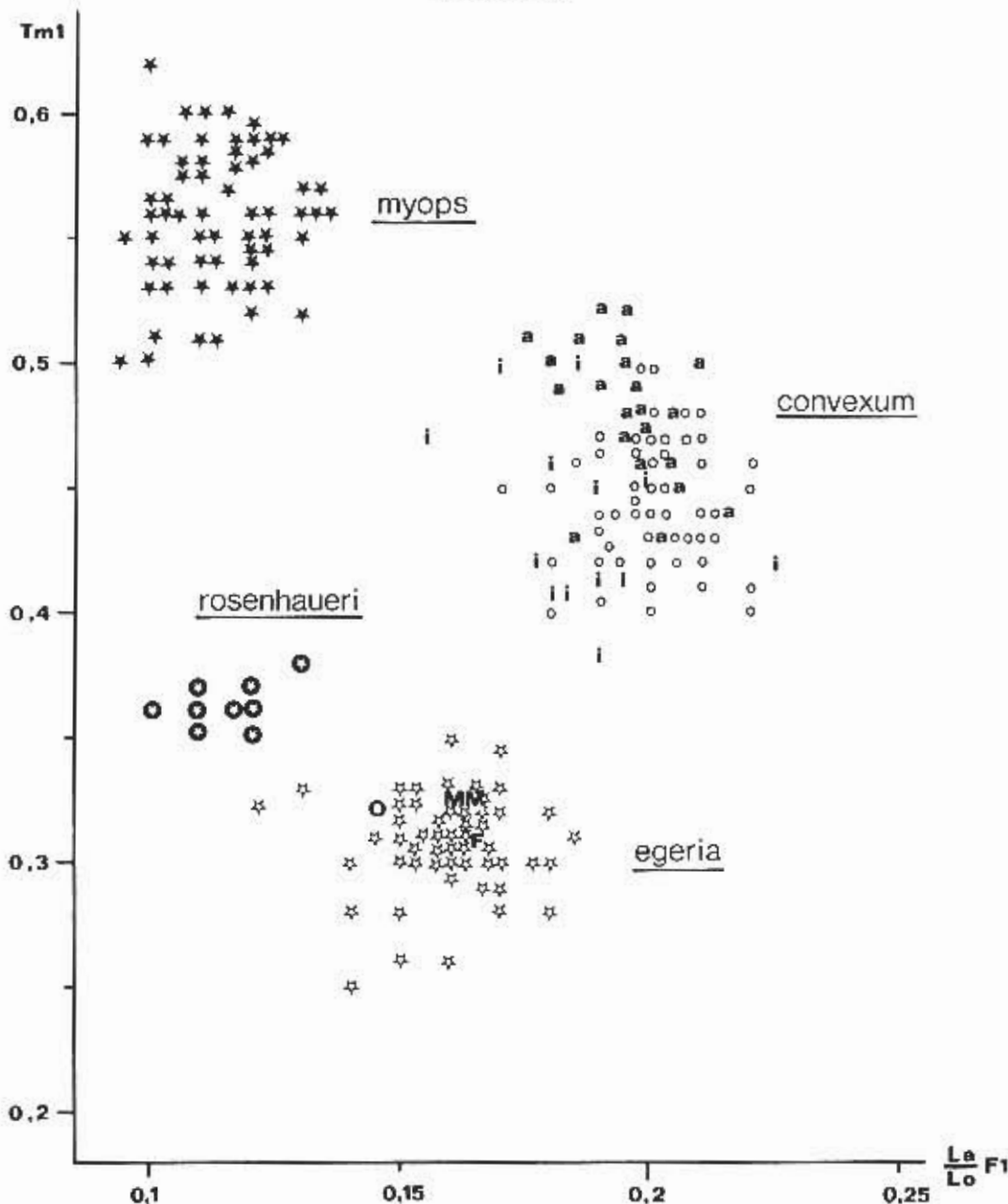


Fig. 2. Pictorialized scatter diagram using the two biometrical ratios (see text) for *Porthomma myops*, *Porthomma convexus* (a = Austrian specimens; i = Italian specimens; o = Bouna Cave France), *Porthomma rosenhaueri*, and *Porthomma egeria* (* = Bange Cave population; M = *P. moravicum*; O = *P. obambulatorum*; F = Fribourg, Suisse). (females only).

Table 3. Measurements in mm of femur I, the carapace and Tml for *Porrhomma egeria*, *P. moravicum* and *P. obambulatum*.

Species		Length Fel		Width Fel		Length carapace		Width carapace		Tml	
		max.	min.	max.	min.	max.	min.	max.	min.	max.	min.
<i>P. egeria</i> (Bange Cave)	♂	1.10	0.74	0.17	0.11	1.06	0.80	0.84	0.58	0.37	0.30
	♀	1.20	0.75	0.18	0.11	1.20	0.80	1.00	0.56	0.35	0.30
<i>P. moravicum</i>	♂	1.04		0.17		1.08		0.80		0.32	
	♀	1.04	1.04	0.18	0.17	1.10	1.08	0.82	0.80	0.32	0.317
<i>P. obambulatum</i>	♂	0.74		0.14		0.76		0.56		0.35	

CONCLUSIONS

Due to their similitude of morphological and biometrical characters as described in this paper, it is proposed that *Porrhomma moravicum* M&K and *Porrhomma obambulatum* K. should be considered as synonymous to *Porrhomma egeria* Simon.

Slight morphological variations are common among widely distributed species where such phenomena as geographical and ecological isolation have been evoked (Mayr, 1963). In this sense polytypism among cavernicolous species would appear highly probable.

By its position in the scatter diagram (Fig. 2), *P. rosenhaueri* remains an enigmatic species having affinities with *P. myops* and *P. egeria*. For this reason a careful study of this species will be necessary and I take this opportunity to appeal for the loan of material, particularly for this species and similar depigmented *Porrhomma*.

RESUME

Une étude de la morphologie et de la biométrie d'une population de *Porrhomma egeria* (Simon) m'a permis de faire tomber dans la synonymie de cette espèce les *Porrhomma moravicum* (Miller and Kratochvil) et *obambulatum* (Kritscher).

L'utilité des mesures biométriques pour l'étude de ce genre est abordée.

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