

Notes on *Walckenaeria alticeps* (Denis), new to Sweden, and *W. antica* (Wider) (Araneae, Linyphiidae)

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Summary

The males of *Walckenaeria (Wideria) alticeps* and *W. (W.) antica* are compared. The males are very similar, hitherto regarded as indistinguishable, but differ in the shape of the embolus. Specific characters are illustrated for both sexes of the two species. *W. alticeps* has not previously been recorded from Scandinavia.

Introduction

Wideria was retained by Wunderlich (1972) as a subgenus within the genus *Walckenaeria*. Within this subgenus the following species were placed, viz. *Walckenaeria alticeps* (Denis), *W. antica* (Wider), *W. quarta* Wunderlich (only ♀ known), *W. stylifrons* (O. P.-Cambridge), *W. suspecta* (Kulczyński), and a probably undescribed species; *W. jubata* (L. Koch) was also included but later (Wunderlich, 1974) found to be conspecific with *W. stylifrons*.

The males of *W. alticeps*, *W. antica* and *W. suspecta* are morphologically very similar, both in the shape of the cephalic part and in the configuration of the palp. Especially the males of *W. alticeps* and *W. antica* are very similar (Wunderlich, 1972, p. 396: "... habituell wie genitalmorphologisch nicht zu separieren"). The females are, however, distinguishable in the shape of the vulva. Recently Millidge (1979) described *W. insperata* from Italy. In comparison with *W. antica* he was not able to detect any differences in the male palpal organs and tibial apophyses, but the vulva of *W. insperata* was found to be distinct. Wunderlich (1972) examined specimens of *W. alticeps* from West and East Germany, Poland and Austria as well as the holotype (♀) from Rumania (insufficiently figured by Denis, 1952), and pointed

out that this species probably has a wide distribution in Europe but has not been properly recognized, being confused with *W. antica*. This can be demonstrated by the fact that Wiehle (1960) figured the vulvae of both species as *W. antica*. Moreover, Wunderlich (1972) remarked on the differences found in habitat preference between *W. alticeps* and *W. antica*, the former preferring shady, moist sites in contrast to the latter, which is found in drier, often sun-exposed sites, and he stated this difference as being the only possibility to distinguish the males of the two species when no females are found. This challenged me to a closer re-examination of my Swedish material identified as *W. antica*. Females with vulvae corresponding to Wunderlich's (1972, fig. 94) and Wiehle's (1960, fig. 192b) drawings of *W. alticeps* were found from boggy habitats together with males, assumed to be conspecific. These males were subjected to an investigation in order to reveal any specific characters.

Material and Methods

The study was carried out on Swedish material, collected by the author when not otherwise indicated. Only material of *W. antica* used for illustrations is listed.

W. alticeps (all available material). *Skåne*: Höör, by pond in wood, 5 June 1943, 1♂ (A. Tullgren leg., det. as *antica*). *Östergötland*: V. Eneby, Mögöl, *Sphagnum* bog, 22 August 1970, 1♂ 2♀♀ (Figs. 14, 22), 16 August 1976, 1♀ (Figs. 12, 13, 24). *Dalarna*: Ore, Näset, Råmåfaxmyren, *Sphagnum* bog, 8 October 1972, 1♀, 20 October 1975, 3♂♂ 1♀ (Figs. 1, 4, 6, 7, 10, 21).

W. antica. *Södermanland*: Trosa-Vagnhärads, N. Askö, in lichen cover, 16 October 1966, 3♂♂ (Figs. 2, 3, 8, 9, 11, 20); Nacka, at Dammtorpssjön, 29 May – 9 June 1966 (trap), 1♂ (Fig. 18). *Uppland*: Lidingö, Fågelöudde, pine wood, 25 November 1967, 1♀ (Fig. 17); Lovö, Kårsö, *Calluna*, 30 August 1977, 1♂ (Fig. 5); Sånge, Sockarbytorp, grassland, 28 April – 12 May 1970 (trap), 1♂ (Fig. 19); Vallentuna, Kusta, grassland, 4 November 1973, 1♀ (Figs. 15, 16, 23).

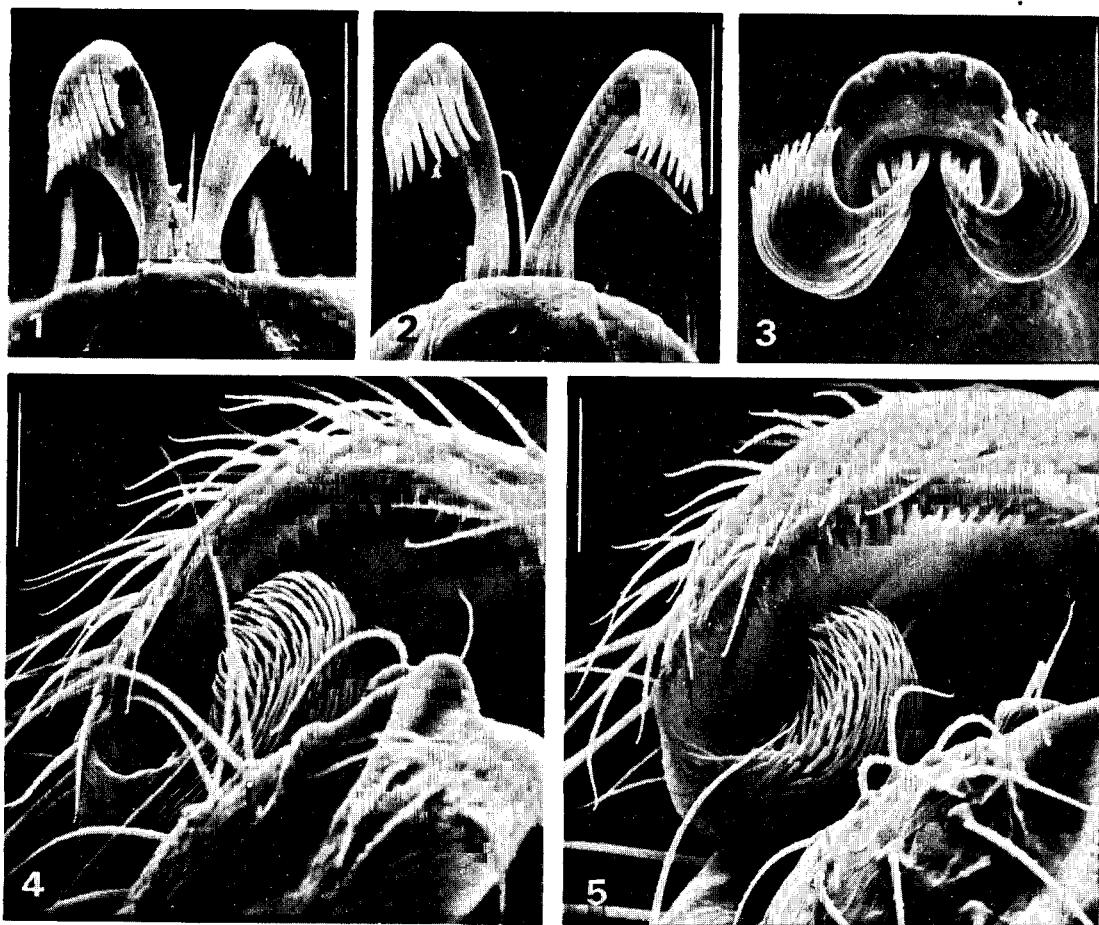
Material preserved in ethanol was used for scanning electron microscopy. The parts to be studied were dehydrated in ethanol of increasing concentration, then kept in xylene, air-dried, mounted on SEM stubs and sputter-coated with gold. Examination was carried out in a Cambridge Stereoscan Mark IIa.

Observations and Discussion

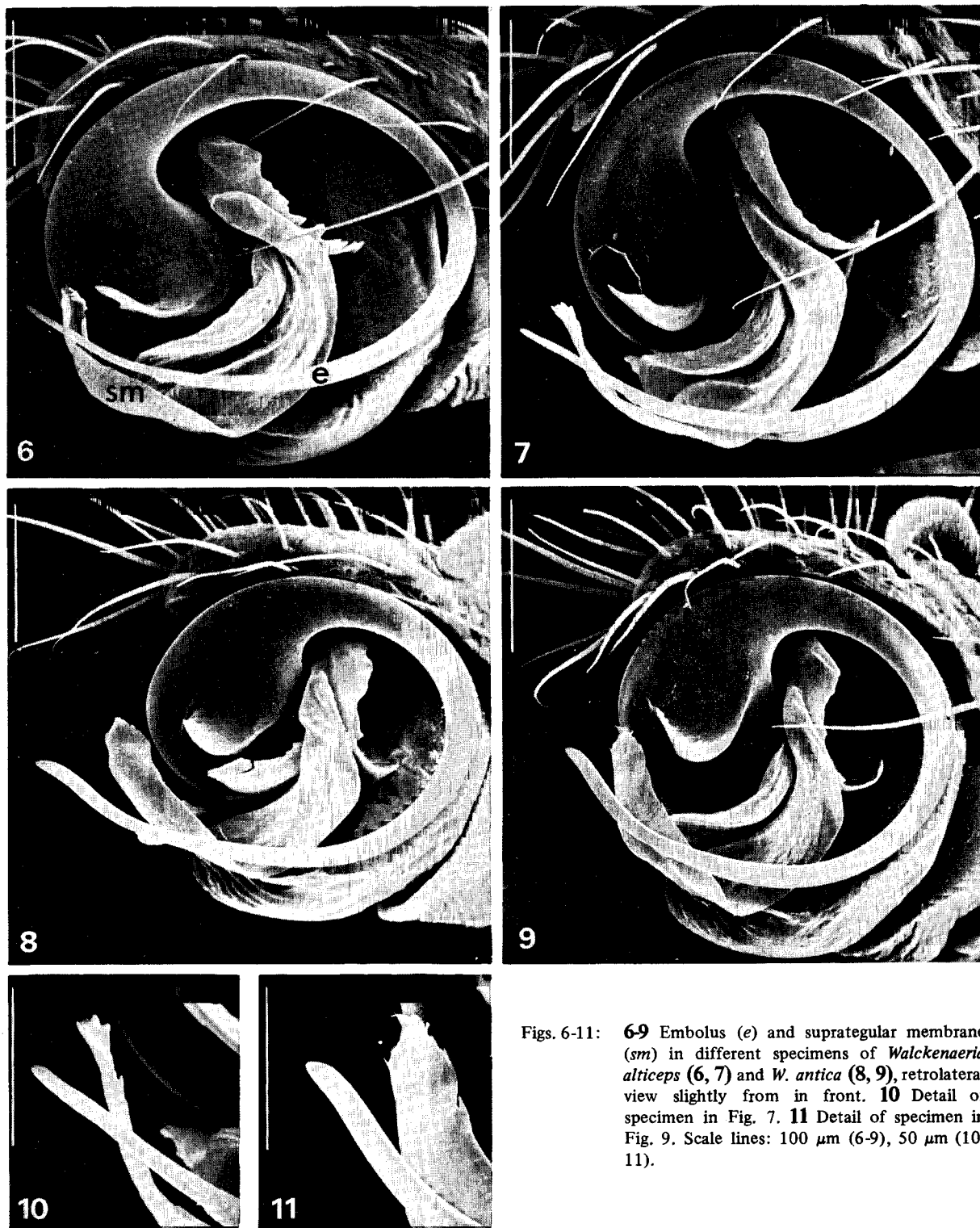
The males of the genus *Walckenaeria*, as delimited by Wunderlich (1972) and Locket, Millidge & Merrett (1974), are known to be "identified readily by the form of the head, and of the tibial apophyses" (Locket & Millidge, 1953, p. 191). In these respects the males in the present material of *W. alticeps* and *W. antica* do not show any significant differences. Also the two cephalic "horns" (Figs. 1, 2), consisting of fused hair-like structures surrounded by a common socket (Fig. 3), are similarly shaped in the two species. The illustrations (Figs. 1-5) are given to present the fine structure of these characters, difficult to observe under a dissecting microscope, and not to

demonstrate any significance in minor differences between the species, as intraspecific variability is not known.

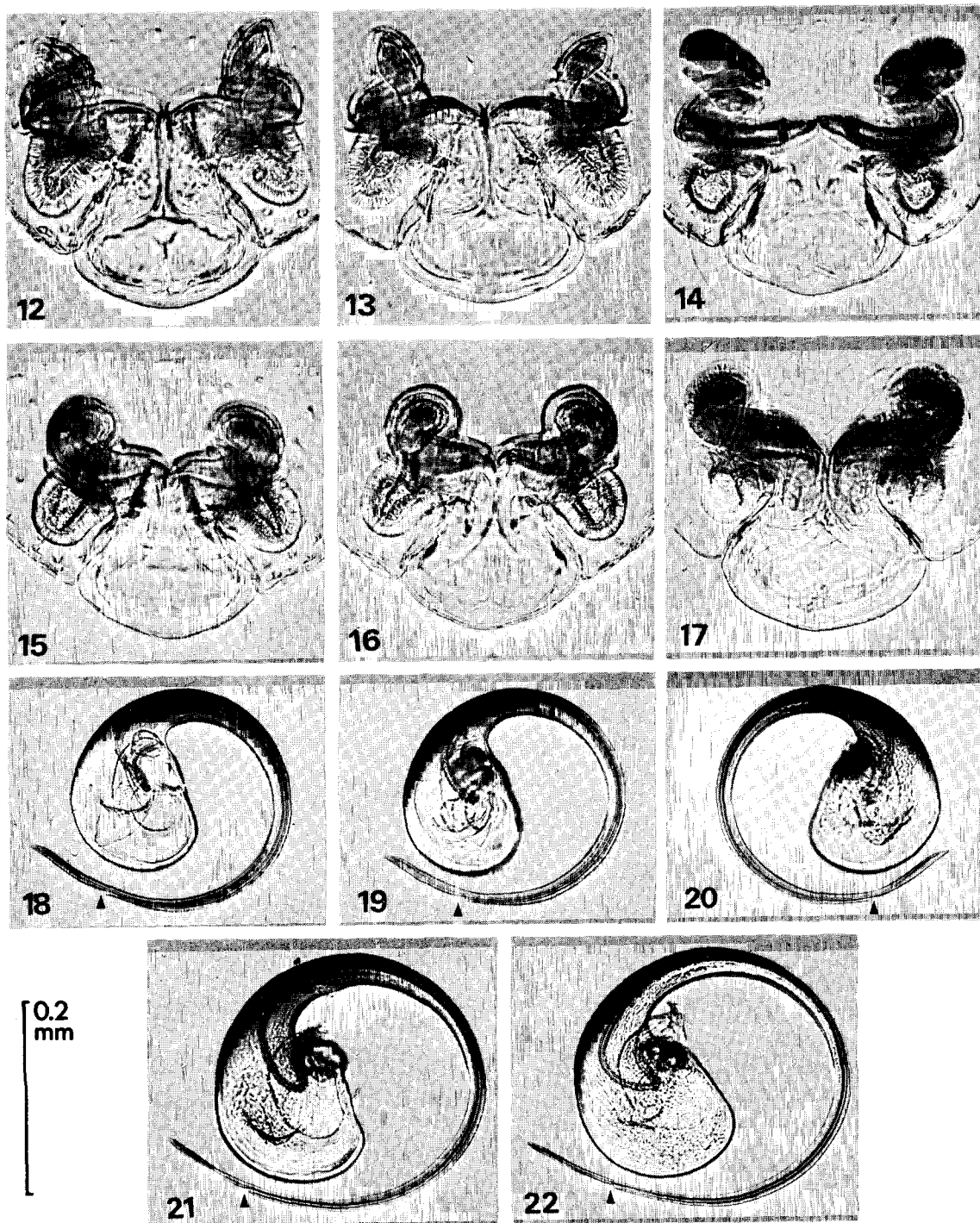
Turning to the bulb, Wunderlich (1972) did not find any differences between *W. alticeps* and *W. antica*, not even in the shape of the embolus. Comparison of the two species in the present material shows that the seminal duct opens to the exterior at some distance from the embolic tip in both species (Figs. 18-22), but that the apical part of the embolus, distad to the ductal orifice, differs between the two species. In *W. alticeps* this apical part is slender (Figs. 6, 7, 10), while in *W. antica* it is broader and slightly bent at the tip (Figs. 8, 9, 11). Also the loop described by the embolus is wider in *W. alticeps*



Figs. 1-5: 1 *Walckenaeria alticeps*, male horns from above. 2-3 *W. antica*, male horns from above (2) and from in front (3). 4-5 Detail of outer tibial apophysis in *W. alticeps* (4) and *W. antica* (5). Cf. text. Scale lines: 50 μ m.



Figs. 6-11: **6-9** Embolus (*e*) and supratregular membrane (*sm*) in different specimens of *Walckenaeria alticeps* (**6, 7**) and *W. antica* (**8, 9**), retrolateral view slightly from in front. **10** Detail of specimen in Fig. 7. **11** Detail of specimen in Fig. 9. Scale lines: 100 μm (**6-9**), 50 μm (**10, 11**).



Figs. 12-22: 12-14 *Walckenaeria alticeps*, vulva, ventral view (12), same specimen, dorsal view (13), another specimen, dorsal view (14). 15-17 *W. antica*, vulva, ventral view (15), same specimen, dorsal view (16), another specimen, dorsal view (17). 18-22 Embolus of different specimens of *W. antica* (18-20) and *W. alticeps* (21, 22). Arrows point to orifice of seminal duct. All to same scale.

(carapace length of male in Fig. 21 = 1.15 mm, in Fig. 22 = 1.24 mm) than in *W. antica* (carapace length of male in Fig. 18 = 1.00 mm, in Fig. 19 = 0.98 mm, in Fig. 20 = 1.05 mm). Some intraspecific variation was found in the curvature of the embolus.

For comparison of the vulvae in *W. alticeps* and *W. antica* see Figs. 12-14, 15-17, and 23-24. In the receptacular complex the anterior portion with its ductal system is decisive for separating these species.

Wunderlich (1972, p. 421) assumed that *W. alticeps* and *W. antica* are biospecies and not "ecological subspecies". Staręga (1976), on the other hand, raised doubts as to whether these species should be regarded as distinct and proposed that the name *antica* should be used until the two forms are better known in detail. However, the manifestation of constant morphological differences between the two forms in both sexes, and their at least partially different habitat preference, strongly supports the condition of the two being "full" species.

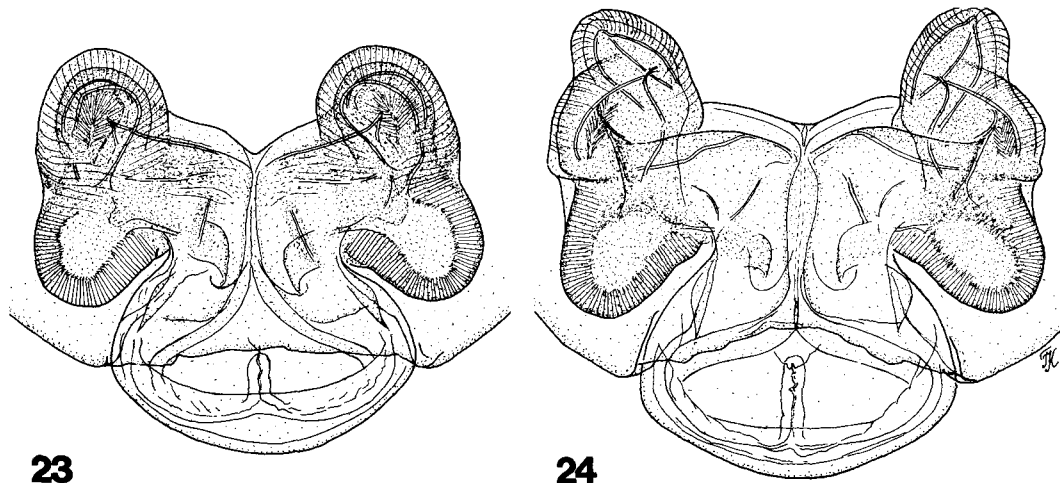
The contradictory information in the literature about the habitat preference of *W. antica*, summarised by Wunderlich (1972), is probably partly caused by the inclusion of finds of *W. alticeps*. Recently Palmgren (1976) stated that *W. antica* in Finland is fairly eurytopic but prefers relatively dry habitats and is seldom found in wet *Sphagnum* bogs.

Although the habitat range of *W. antica* does not exclude bogs, a re-examination of the bog finds may reveal the presence there of the probably more stenoeicous *W. alticeps*. Staręga (1976) claimed that he could not find a difference in habitat between the females of these two species, identified according to Wunderlich's (1972) figures, both being found in the same beech wood in the Pieniny Mts. (in the Polish part of the Carpathians). Wunderlich (1972, p. 421) indicated that the two species may occur within short distances in mixed habitats.

Wunderlich (1971) reported ♂♂ and ♀♀ of *W. alticeps* from May – July. The present material was mainly collected in late summer – autumn. In this species, as in *W. antica* and some other *Walckenaeria* species (cf. Palmgren, 1976; Toft, 1976, 1978), the adult population probably builds up in late summer-autumn and overwinters, gradually disappearing during the following warm season.

Acknowledgement

I am grateful to Mr J. Wunderlich, Straubenhardt, West Germany, for reading the manuscript and from his material confirming the differences in the males of *W. alticeps* and *W. antica* set out in this paper.



Figs. 23-24: Vulva of *Walckenaeria antica* (23) and *W. alticeps* (24). The ductal systems could not be worked out completely and are only indicated.

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Corrigendum

In my recent paper on reproductive behaviour of the tarantula *Aphonopelma chalcodes* in *Bull.Br.arachnol.Soc.* **4**(9): 416-420 (1979) I stated (p. 420) that Kaston (1948) claimed the existence of only a single spermathecal opening. From correspondence with Dr Kaston following publication of my paper, it

has become clear to me that I misinterpreted Dr Kaston's comments, and that no contradiction exists. Careful reading of Dr Kaston's text indicates that each of the two spermathecae has its own individual opening to the uterus. I wish to apologize to Dr Kaston and to my readers for this error.

E. W. Minch