

Ohio University, Athens, Ohio, USA, for his helpful suggestions and for access to unpublished observations.

Summary

Seventy-one encounters between individuals of *Lycosa carolinensis* Walckenaer were observed. Male-female encounters, male-male encounters, and sex pheromone experiments were performed using adult spiders captured in the field. The courtship behaviour of the males involved extension and simultaneous horizontal waving of the first legs, typical palpal movements and abdominal vibrations. No sound production was detected, but remains a possibility because of the limitations of the experiments. Copulation was not observed. Males were seen to court each other simultaneously, as well as alternately. Some evidence was gathered which

supports the presence of a sex pheromone produced by the females.

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Two spiders of the genus *Erigone* Audouin from New Zealand

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The following is an account of eleven specimens found in New Zealand of the genus *Erigone* given to me by Mr C. L. Wilton under the label "18.VI.70. Parkes - Valley Nelson. 369064. N. A. Martin." Five are males (here labelled 1 to 5) and six are females (6 to 11). In view of their having been introduced into the country their occurrence and possible origin is of interest. Two species are present: *Erigone prominens* Bösenberg and Strand, and a new species, here named *Erigone wiltoni* sp.n.

Erigone prominens Bösenberg and Strand

Two males (2 and 3) have been compared with specimens from Japan in the Senckenberg collection (Frankfurt). The species is described by Oi (1960,

p.180) the leg measurements he gives are somewhat shorter than those of the Senckenberg specimens of the same carapace length. While his Fig. 175 does not show the teeth present on the dens medius of the embolic division of the palpal organs, it otherwise agrees with the Senckenberg specimens; these are bleached white and are difficult to examine, but this outline is clear enough and it agrees closely with the corresponding outline in the New Zealand specimens 2 and 3. (It seems clear that the inside of the tibia viewed from exactly the same position appears very much the same in all these species and is not likely to be very useful in separating them). The figure of the palp given by Bösenberg and Strand in 1906 is small, but that by Strand (1918, Tab.II Fig. 21) is good and shows clearly the teeth on the dens medius, as well as the patella length and form of the carapace. Another species described by Oi (ibid. p.181) is *E. koshiensis* Oi, which is close to *E. prominens*, but differs in the position of the metatarsal trichobothrium (Tm. 1 = 0.53).

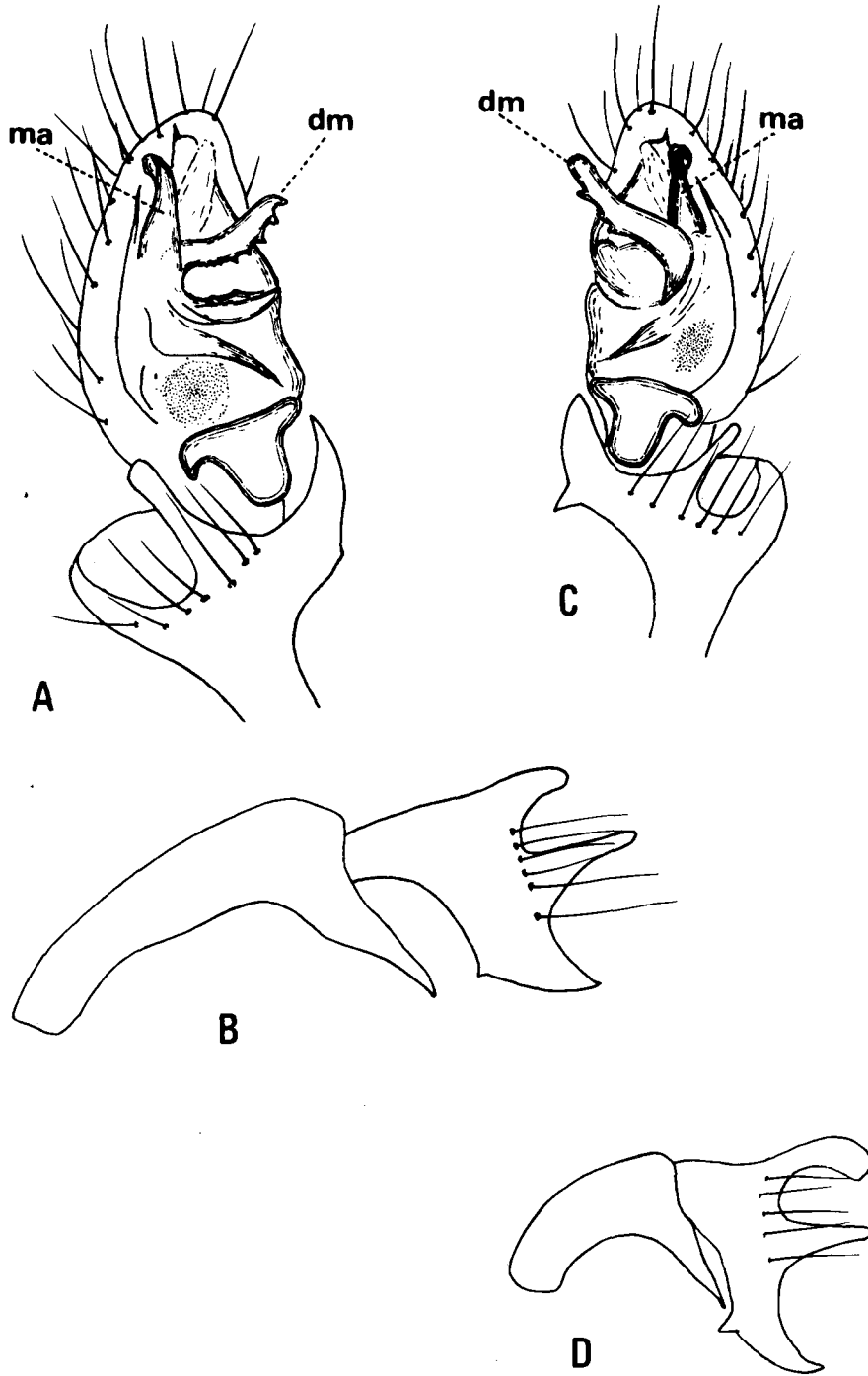


Fig. 1: A, B. *Erigone prominens* (New Zealand specimen) right palp; C, *E. ourania* left palp in comparable position; D, patella and tibia of right palp. (dm = dens medius; ma = median apophysis)

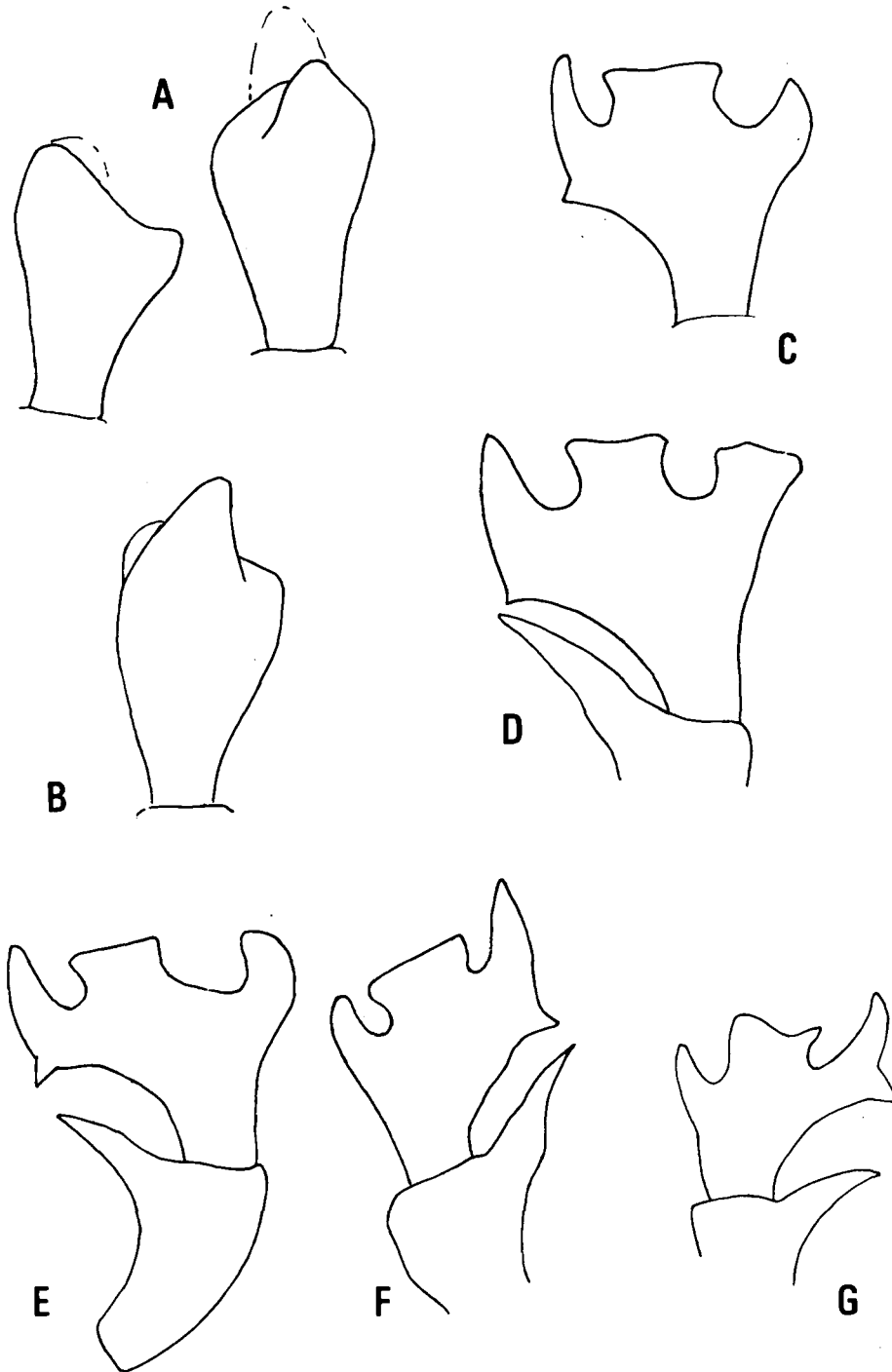


Fig. 2: *E. prominens*: A, palpal tibiae, dorsal view (New Zealand specimen, No. 2); B, ditto (Japanese specimen, from Senckenberg collection); C, palpal tibia, inside (New Zealand specimen); D, E, F, ditto (Japanese specimens); G, *E. wiltoni* ditto.

Description of New Zealand male No. 2

Carapace length: 0.94 mm. Total length: 1.94 mm. CARAPACE: as in *prominens*; head drawn up rather abruptly (Fig. 3D). EYES: Anteriors nearly equal; medians separated by 1 diam., a little nearer to laterals than to each other. Posteriors equal, separated by about 1 diam. CHELICERAE: armed antero-laterally with a row of 6 strong teeth. LEGS: (measurements are in mm x 100)

	Fem.	Pat.	Tib.	Met.	Tars.	Total	Tm.
I	70	22	62	56	42	248	0.48
II	64	20	50	48	38	220	0.48
III	52	18	36	38	28	172	0.47
IV	64	20	56	50	34	224	—

Tibia I: length/breadth = 6.9

MALE PALP: Ventral tibial tooth sometimes weak or absent. Dens medius of the embolic division with teeth (Fig. 1A).

Male No. 3 is conspecific; the leg measurements are as follows and correspond quite closely to those of Oi.

	Fem.	Pat.	Tib.	Met.	Tars.	Total	Tm.
I	64	21	56	48	38	227	0.40
II	54	20	44	41	32	191	0.40
III	44	20	34	30	26	154	0.39
IV	60	20	50	44	32	206	—

Tibia I: length/breadth = 7.0

Carapace length: 0.86 mm. Total length: 1.64 mm.

The following are measurements for one of the Senckenberg males (A):

	Fem.	Pat.	Tib.	Met.	Tars.	Total	Tm.
I	72	24	64	56	42	258	0.42
II	62	22	56	50	36	226	—
III	50	20	42	42	28	182	—
IV	64	20	64	54	32	234	—

Tibia I: length/breadth = 7.1

Carapace length: 0.96 mm. Total length: 1.94 mm.

The other two Senckenberg males, B and C, give measurements very close to these figures.

Description of New Zealand female No. 6, thought to be *E. prominens* Bösenberg and Strand.

Carapace length: 0.83 mm. Total length: 1.95 mm. CARAPACE: Coloured as the male; head slightly raised; a definite depression between head and thorax seen in profile (unlike *wiltoni* where there is no such depression and the head is not raised). EYES: Anteriors equal and very nearly equidistant, separated by 1 diam. Posteriors equal and equidistant, equal to anterior medians, separated by about 1½ diams.

	Fem.	Pat.	Tib.	Met.	Tars.	Total	Tm.	Tibial spines
I	72	22	55	53	40	242	0.47	0.12 and 0.71
II	62	22	43	45	35	207	0.43	0.16 and 0.68
III	50	18	37	40	30	175	0.43	0.13 and 0.67
IV	68	22	57	53	35	235	—	0.13

Tibia I: length/breadth = 5.5

EPIGYNE: In agreement with Oi's Fig. 178 (loc.cit.) and with that of the Senckenberg female (as far as can be made out, being very bleached).

The following measurements are for the Senckenberg female of *E. prominens* as far as can be determined.

	Fem.	Pat.	Tib.	Met.	Tars.	Total
I	—	18	52	50	40	—
II	—	18	48	44	36	—
III	48	18	30	36	26	148
IV	—	20	50	44	32	—

Tibia I: length/breadth = 5.2 - 5.8

Carapace length: 0.64 mm. Total length: 1.30 mm.

Erigone prominens is close to *E. ourania* Crosby and Bishop (of which the holotype from Peking is the sole representative). It is difficult to bring out the differences in the sclerites of the palpal organs since their appearance changes so quickly with position, and dissection is not possible until more material is found. Fig. 1 A, C shows them as nearly as possible in comparable positions. In *ourania* the dens medius is slightly longer and more tapering than in *prominens*, whose median apophysis appears more obtuse in most positions. Other characters which distinguish these

species from each other and from *E. wiltoni* are as follows:

	Carapace	Anterio-lateral chelicera teeth	Palp patella	Ventral tooth of palp tibia	Tm. I	Tm. II	Tib. I length Carapace length	Tib. I length breadth
<i>E. prominens</i>	Head raised	6-7	long	sometimes weak or absent	0.40 to 0.48		2.7	7.1
<i>E. ourania</i>	„	7	short	strong	0.35	0.35	2.3	6.3
<i>E. wiltoni</i>	Head not raised	4	short	strong	0.48	0.47	2.6	5.3

(Tm = position of the metatarsal trichobothrium. Tm I. for *ourania* needs to be considered with caution because the left leg of the type is shorter than the right and any regeneration, as is well known, could affect the growth of the spines or trichobothria on the opposite leg. Tm II however is unlikely to be affected.)

The leg measurements of the type of *E. ourania* are as follows:

	Fem.	Pat.	Tib.	Met.	Tars.	Total	Tm.	Tibial spines
I	62	22	50	40	36	210	0.48	0.12 and 0.69
II	54	22	44	36	32	188	0.47	0.12 and 0.66
III	44	20	32	30	24	150	0.48	0.15 and 0.67
IV	58	22	50	45	34	209	—	0.20 —

Tibia I: length/breadth = 5.3

The corresponding measurements for the paratypes agree closely with these figures.

Tibia I: length/breadth = 6.3

Carapace length: 0.88 mm. Total length: 1.64 mm.

Erigone wiltoni sp.n.

Description of the male

Carapace length: 0.81 mm. Total length 1.80 mm. CARAPACE: Not raised as in *E. prominens* and *E. ourania* (Fig. 3C); marginal teeth small. Coloured dark brown. EYES: Anteriors equidistant separated by a little less than 1 diam. of a median. Diam. laterals (long axis) $1\frac{3}{4}$ x diam. of a median. Posteriors equal and equidistant, separated by little less than 1 diam. which is about $1\frac{1}{2}$ x diam. of an anterior median. CHELICERAE: Reddish brown, lighter than carapace. Outer margin of fang groove has 5 teeth, the inner has 4. Only 4 strong teeth on the anterio-lateral surface (Fig. 3C). LEGS: A little lighter than the chelicerae.

MALE PALP: Patella very short; its ventral apophysis acutely pointed and directed a little forward. Tibia with a prominent ventral tooth; otherwise characteristic of this group of the genus (Fig. 3A, B). Dens medius of the embolic division of the palpal organs different in outline from those of *E. prominens* and *E. ourania*, wider at the distal end (Fig. 3A).

OCCURRENCE: Collected by Mr N. A. Martin in emergence traps in the neighbourhood of Nelson. The holotype male (No. 4) will be placed in the Otago Museum, Wellington, New Zealand; two paratypes (Nos. 1 and 5) in the British Museum (Natural History), London.

Description of the female (No. 9).

Carapace length: 0.76 mm. Total length: 1.80 mm.

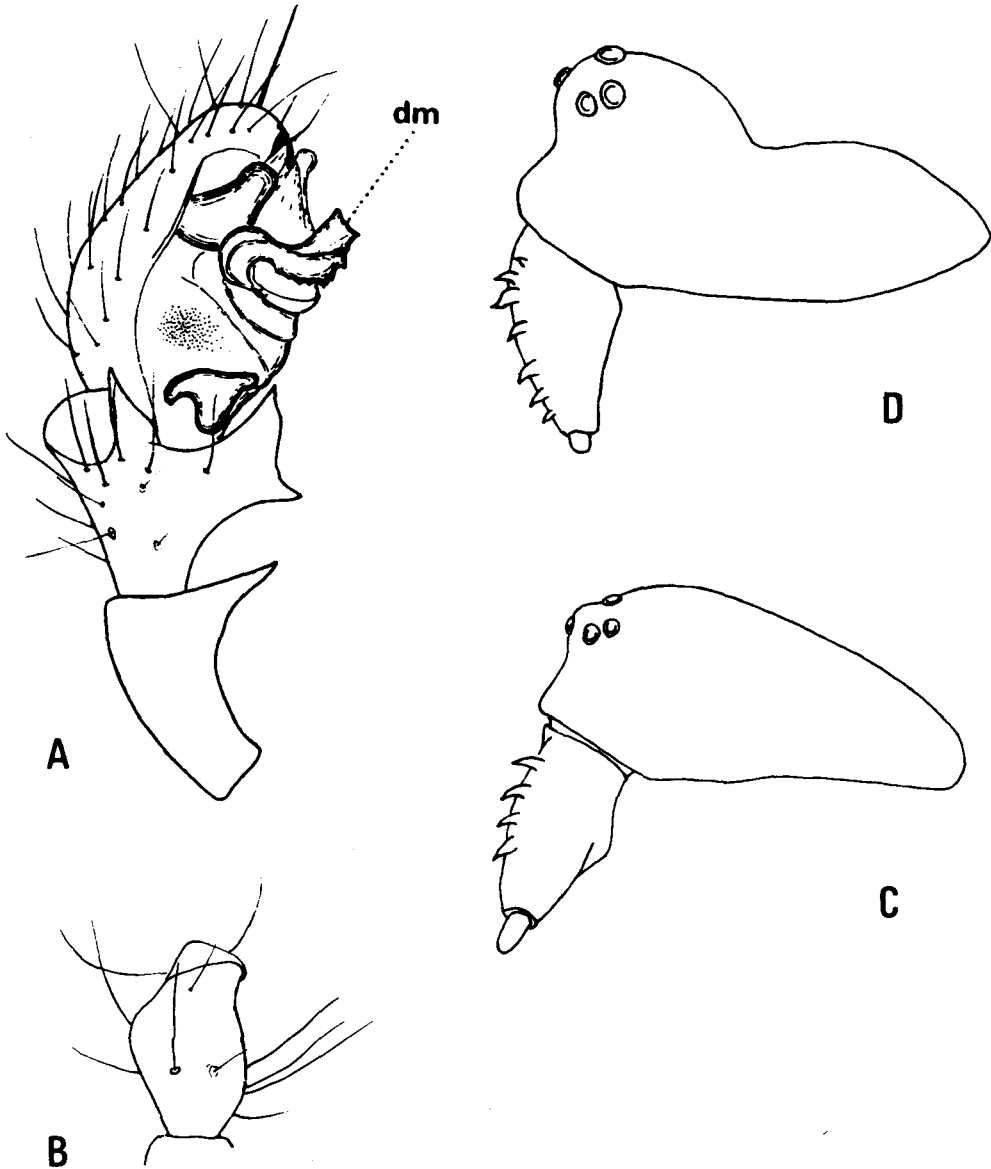


Fig. 3: *Erigone wiltoni* sp. n.: A, B, right palp; C, carapace and chelicerae; D, *E. prominens*, carapace and chelicerae.

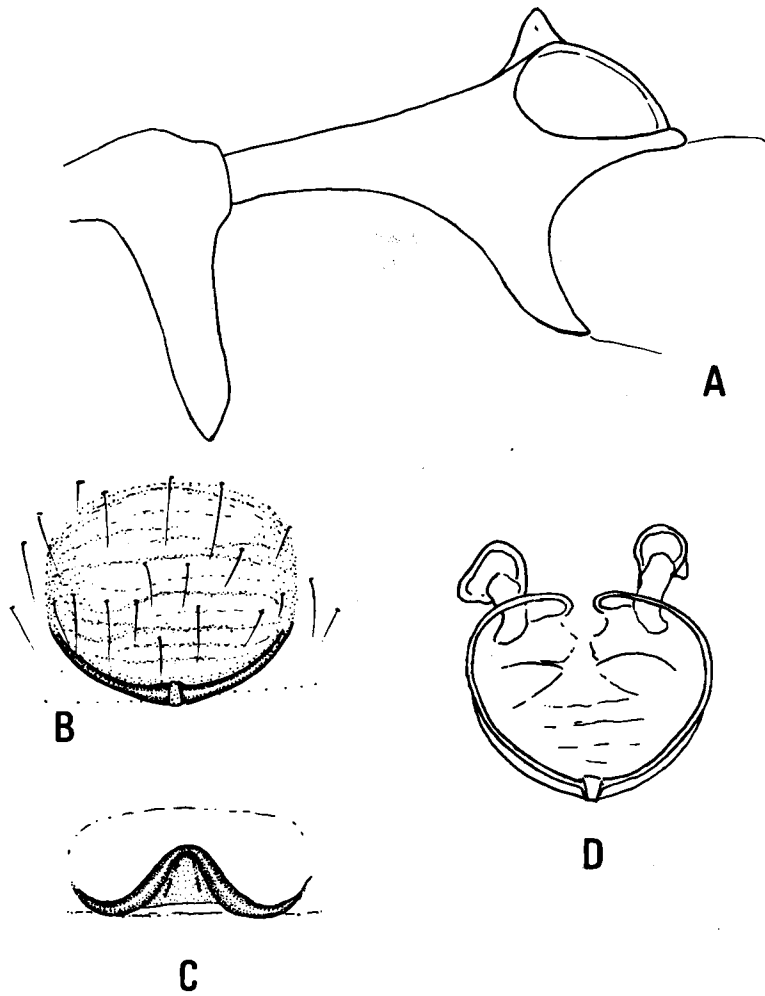


Fig. 4: A, *E. cristatopalpus* right palpal tibia; B, C, *E. wiltoni*, epigyne; D, ditto, vulva outlines.

Colouration generally is as in *E. wiltoni* male. EYES: Anterior medians separated by 1 diam.; nearly 1 diam. from laterals. Diam. laterals $1\frac{1}{4}$ x diam. of a median. Posteriors equal and diam. same as of anterior medians; slightly closer to each other than to adjacent laterals.

LEGS:

	Fem.	Pat.	Tib.	Met.	Tars.	Total	Tm.
I	52	20	44	36	30	182	0.42
II	44	20	40	32	28	164	0.42
III	42	18	32	30	24	144	0.37
IV	56	20	52	40	30	198	—

Tibia I: length/breadth = 4.6

(Measurements for the other females are very close to these.)

EPIGYNE: Fig. 4B, C. Close to that of *E. prominens* in appearance (cf. Fig. 178 by Oi (loc.cit.)). That of the single Senckenberg specimen is very bleached, the posterior margin is similar. (It is probable that the epigynes of the three species considered here will be very much alike.) Fig. 4D shows the vulva outlines. No. 9 is the allotype female and is lodged with the holotype.

Erigone wiltoni belongs to Crosby and Bishop's *psychrophila* group (1928, p.45), which includes *E. aletris* C. and B., *E. dentosa* Cambr., *E. metlakatla* C. and B., *E. ourania* C. and B., *E. psychrophila* Thor., *E. whymperi* Cambr., *E. zographica* C. and B., *E. olympias* C. and B. and *E. hypenema* C. and B., to which must be added *E. cristatopalpus* Simon and *E. prominens* Bösenberg and Strand. They are characterised by a fluted dens medius (with a toothed edge) of the embolic division of the palpal organ and the lateral (ectal) apophysis of the palpal tibia being drawn out; Fig. 4A shows that of *E. cristatopalpus*. All these species, however, except *E. psychrophila*, *ourania* and *prominens*, have the ventral apophysis of the patella more or less obtuse and vertical to the segment (as in Fig. 4A) whereas in the last three species and in *E. wiltoni* it is acute and more or less directed forwards.

E. wiltoni is close to *E. ourania*, but differs in having only 4 strong teeth on the anterior-lateral

surface of the chelicerae (Fig. 3C), whereas in *ourania* there are 7. The dens medius is also quite different in form and disposition to that of *ourania*. The legs of *wiltoni* are relatively shorter.

It is interesting that this, no doubt artificial, group of *Erigone* species should be found so widely; e.g. *E. psychrophila* is holarctic, *E. whymperi* is found in Labrador and Greenland, *E. cristatopalpus* in the European Alps, *E. dentosa* in Antigua, Guatemala and U.S.A. (According to Crosby and Bishop it varies a good deal but the embolic division remains remarkably constant.) *E. ephala*, *hypenema*, *aletris*, *olympias* are found in the United States, *E. metlakatla* in British Columbia, *E. ourania* in China and *E. prominens* in Japan. The last species seems now to have reached New Zealand and it remains to be seen if *E. wiltoni* will be found in East Asia.

Acknowledgements

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