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REVISION OF *BRENNANELLA* RADFORD, 1954  
(ACARINA : LEEUWENHOEKIIDAE) <sup>1</sup>

BY

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I — INTRODUCTION.

On the occasion of a visit to the Smithsonian Institution, U. S. National Museum WASHINGTON, D. C., the senior author was able to study the type of *Brennanella longispina* Radford, 1954 (3). During the study, it became clear that the species is very close to *Whartonia scarcella* Vercammen-Grandjean, 1963 (6). The differentiating characters will appear in the following redescription of RADFORD's species, and will be summarized in a final discussion.

Moreover, *Whartonia* and *Brennanella* do not present characters of sufficient importance to be separated at the generic level, but they are sufficient for subgeneric separation. In his description, RADFORD himself stated that the chelicerae were not visible on the specimen he handled. On the holotype in the U.S.N.M. collection, the chelicerae and their chelobases were torn off and missing (fig. 1). But in *W. scarcella* the chelicerae are typical of the genus *Whartonia*, and it is presumed that the chelicerae in RADFORD's species are very similar.

II — WHARTONIA (*BRENNANELLA*) n. comb.

= *Brennanella* Radford, 1954 (3)

= *Whartonia* Ewing, 1944 (1), Vercammen-Grandjean, 1963 (6), Domrow, 1962 (0).

*Diagnosis* : Scutum with two antero-median setae, two AL, two PL, all barbed, and two nude, whip-like sensillae ; no nasus ; eyes ; stigmata and trachea ; strong cheliceral blades, considerably elongate and armed with dorso-lateral and ventral

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rows of strong hooks ; palpo-tarsal gross formula :  $fT = 6B$  ; galeal setae ciliate ; legs with considerably elongate segments ( $fsp = 6.6.6.$ ) ; considerably elongate genualae 2 and 3, and tibiala 3 ; mastitarsala 3 with minute ciliae ; terminal leg claws and empodia ciliate ; body covered by innumerable barbed setae.

*Type species* : *Brennanella longispina* Radford, 1954 (3).

*Hosts* : Bats.

### III — REDESCRIPTION OF *WHARTONIA (BRENNANELLA) LONGISPINA* RADFORD, 1954 n. comb.

= *Brennanella longispina* Radford, 1954 (3).

= *Whartonia longispina*, Domrow, 1962 (0).

#### A. MORPHOLOGY.

1) *Measurements* : in micra, of the holotype #6,203 seen in U.S.N.M., compared with RADFORD'S standard data and with the standard data for *W. scarcella*.

	AA	AW	PW	SB	ASB	PSB	SD	AP	AM	AL	PL
Radford, 1954 :	—	90	130	33	70	15	85	60	95	90	90
Type # 6,203 :	14	74	112	31	61	24	85	54	65	62	70
<i>scarcella</i> :	9	68	104	30	56	32	88	48	88	62	66

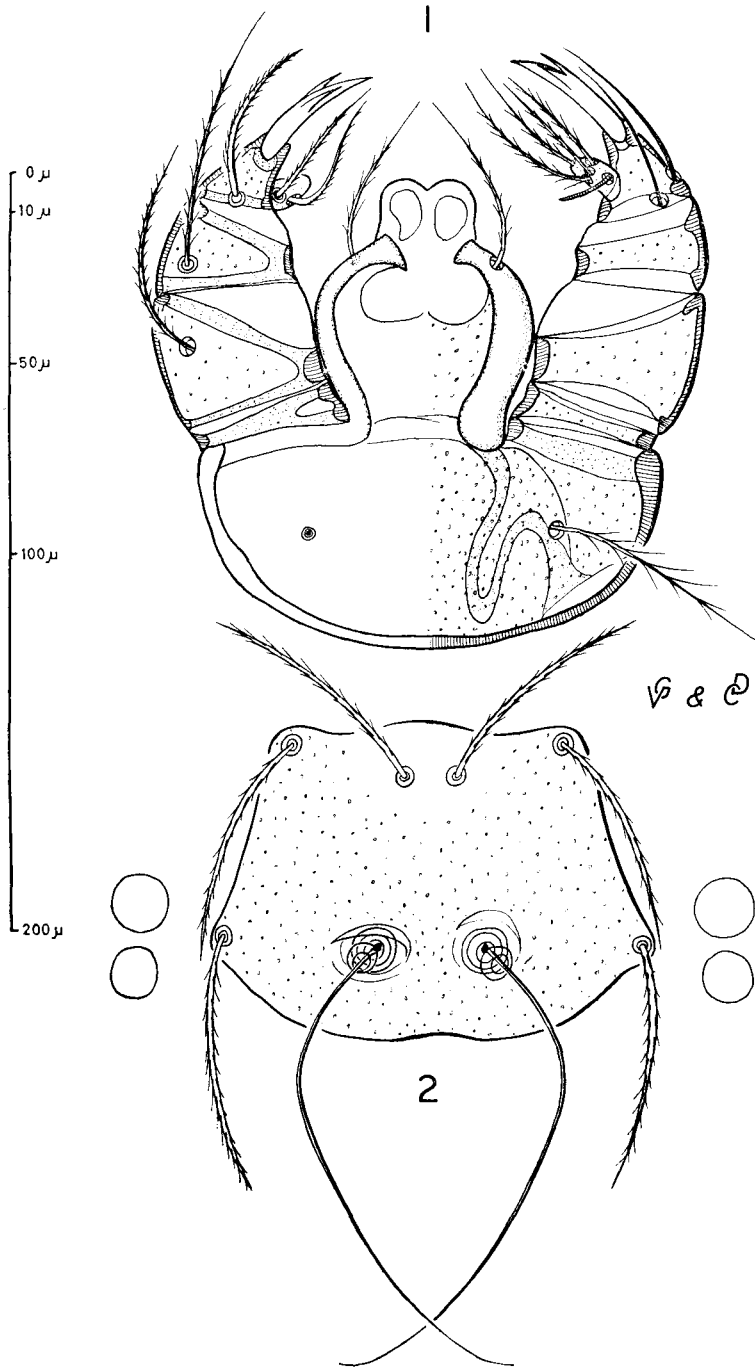
	S	H	D	V	pa	pm	pp	Ip
Radford, 1954 :	160	—	55/—	—/—	—	—	—	—
Type # 6,203 :	135	74	60/50	45/55	644	590	668	1906
<i>scarcella</i> :	128	60	50/40	32/46	590	554	622	1766

2) *Scutum* : (fig. 2). Reminiscent of that of *W. scarcella*, but without shoulders ; punctation sparse but uniformly distributed ; sensillae glabrous and whip-like ; the three pairs of scutal setae are thin, flexible, and covered by short, thin barbs ;  $PL > AM > AL$  (for *scarcella* the formula is  $AM > PL > AL$ ) ; SB and PLs on the same line ; eyes biocellate. Other differential features :

- i) In *scarcella* the AM and ALs are on the same line. In *longispina* the AL line is anterior to that of the AMs.
- ii) In *scarcella* the anterior margin of the scutum is somewhat concave in the middle. In *longispina* it is somewhat convex.
- iii) In *scarcella* the posterior margin is somewhat convex, even pointed. In *longispina* this margin is slightly concave in the middle.
- iv) In *scarcella* the lateral margins are sigmoid. In *longispina* they are straight.

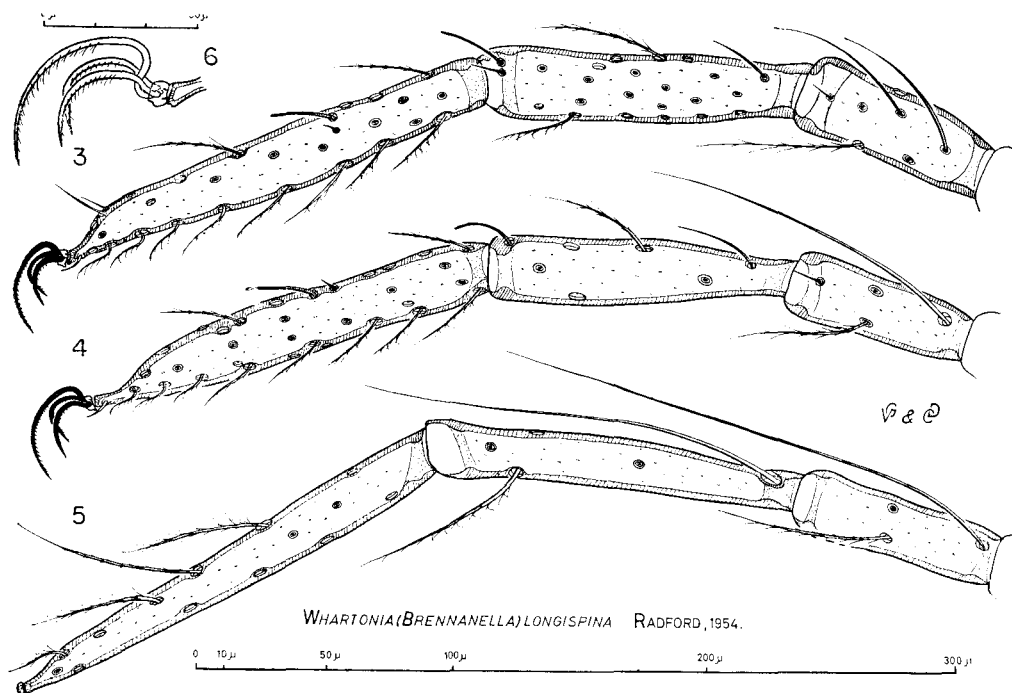
3) *Idiosoma* : Body 8-shaped, as in *scarcella*, covered with innumerable barbed setae, a great number of humeral setae extending to the area between coxae 2 and 3 and into the sternal zone. NDV more than 200. Stigmata and trachea, as in *scarcella*, between the gnathobase and coxa 1.

*WHARTONIA (BRENNANELLA) LONGISPINA* (RADFORD, 1954.)



4) *Legs* : (Left legs 1, 2 and 3 figured respectively in figs. 3, 4 & 5). The leg index,  $Ip = 1906$ , is noticeably greater than that of *scarcella* ( $Ip = 1766$ ) and indicates a very large species. Subterminala, parasubterminala, and the two pretarsalae are present.

*Leg 1* : The tarsal solenidion is situated on the proximal third of the article (in *scarcella* it is in the middle). The famulus is inserted near or slightly behind the solenidion (in *scarcella* it is in front of the solenidion). The tarsus and genu lengths are approximately the same in *longispina* and *scarcella* ( $175-80 \mu$ ). The



tibia is  $127 \mu$  long, whereas in *scarcella* it is  $98 \mu$ . The posterior tibiala is basal (in *scarcella* it is inserted near the middle of the article). The genu bears one apical famulus and two nude, whip-like genualae ( $60 \mu$ ). The anterior one is internal (in *scarcella* it is external).

*Leg 2* : Again, the solenidion is inserted more proximally than in *scarcella*. The tarsal and genual lengths are approximately the same for *longispina* and *scarcella* ( $160-74 \mu$ ). The tibia is  $120 \mu$  long (that of *scarcella* is only  $98 \mu$ ). The posterior tibiala is also more proximal and slightly longer ( $34 \mu$ ) than in *scarcella* ( $26 \mu$ ). The genu bears the usual apical famulus and a very long, whip-like basal genuala ( $130 \mu$ ).

*Leg 3* : The tarsal, tibial, and genual lengths are approximately the same as in *scarcella* ( $180-140-85 \mu$ ). An erect, slender, ciliate seta ( $75 \mu$  long) is located at the

distal  $2/5$  of the tarsal dorsum ; it is morphologically different from the surrounding reclining, shorter, barbed setae, and may therefore be considered a mastitarsala. The whip-like tibiala is inserted basally ( $170 \mu$  instead of  $130 \mu$  in *scarcella*). The genuala is much longer ( $205 \mu$  instead of  $154 \mu$  in *scarcella*).

The coxae are provided with plumose setae :  $fCx = 2.1.1.$

The two claws and the empodium of each leg are fringed with short, inconspicuous setae (fig. 6).

5) *Gnathosome* : (fig. 1). Powerful. Cheliceral blades and their chelobases are missing, but it is assumed that they probably resemble those of *scarcella*. The galeal pair of setae is provided with ciliae. The femoral and genual setae are fairly long and covered with numerous thin barbs. The external tibial seta is shorter and thick, abundantly covered with ciliae.

The dorsal and internal tibialae are nude.

The tarsus bears the usual internal solenidion on its base and six barbed setae, the large external one being thick and considerably ciliate. The palpal claw has four to five prongs. Palpal formula :

$$fPp = (B) - (B) - (P).N.N.G_4 - 5 - E.B.B.B.B.(B).(P) \text{ and } fT = 6B.$$

B. LOCALITY AND DATE : TA'IZZ, YEMEN, 1951. Coll. Harry HOOGSTRAAL and Kenneth L. KNIGHT, United States Naval Medical Research Unit No. 3.

C. HOST AND PARASITOPHORE : *Rhinolophus clivosus acrotis* Heuglin ; wing membranes.

D. TYPE MATERIAL : Holotype in United States National Museum, WASHINGTON, D. C. Paratypes in the Chicago Natural History Museum (CHICAGO, ILLINOIS).

#### IV — DISCUSSION.

The differences between the two species, *longispina* and *scarcella*, were detailed in the preceding redescription. They are summarized as follows :

- 1) Scutal shape and measurements.
- 2) Scutal seta formula :

$$\begin{aligned} PL > AM > AL \text{ in } longispina, \\ AM > PL > AL \text{ in } scarcella. \end{aligned}$$

- 3) Leg lengths ; larger in *longispina* ( $Ip = 1906$ ) than in *scarcella* ( $Ip = 1766$ ). Leg tibiae 1 and 2 noticeably longer in *longispina* than in *scarcella*.
- 4) Relative positions of certain specialized setae on different leg articles.
- 5) Dorsal and internal palpo-tibial setae are nude in *longispina*, barbed in *scarcella*.

Also noticeable are the similarity of hosts, both members of the genus *Rhinolophus* on one hand, and on the other hand the differences in locality : *longispina* being recorded from YEMEN and *scarcella* from AFGHANISTAN. Previously, the senior author (6) pointed out the peculiar dispersion of certain trombiculid mites found throughout the desert line from the SAHARA to the GOBI by way of AFGHANISTAN. For instance, three species of *Sasatrombicula* illustrate this case : *S. komori* from Kyoto (JAPAN), *S. cherrata* from CASABLANCA (MOROCCO), and *S. hexasternalae* from DJALALABAD (AFGHANISTAN). The present two species apparently adopt the same dispersion lines, and it would not be too surprising to find eventually a *Brennanella* in JAPAN.

In the above cited work (6) the senior author established a comparison between *scarcella* and two other large-sized *Whartonia* found on African bats : *W. oweni* Vercammen-Grandjean and Brennan, 1957 (7), collected on *Rhinolophus eloquens* and *Rousettus* sp. in SUDAN, and *W. atracheata* Taufflieb and Mouchet, 1959 (4), from *Hipposideros caffer* in the CAMEROONS. These two species belong in fact to a group of *Whartonia* in which the scutal shape resembles that of *Leptotrombidium* and in which no spiracles nor tracheae can be seen. Their  $fT = 7B$ . In a future paper, this group will be placed under the name of *Whartonia (Atracheata)* n. sg., with *W. oweni* as type species.

#### SUMMARY.

Genus *Brennanella* Radford, 1954 is placed as subgenus of *Whartonia* Ewing, 1944. *Whartonia (Brennanella) longispina* (Radford, 1954) is the subgenus type. It is redescribed and compared to *Whartonia (Brennanella) scarcella* Vercammen-Grandjean, 1963. Notes on the distribution of bat chiggers are appended.

#### SOMMAIRE.

Le genre *Brennanella* Radford, 1954 est placé en sous-genre de *Whartonia* Ewing, 1944. *Whartonia (Brennanella) longispina* (Radford, 1954) est le type du sous-genre. Il est redécrit et comparé morphologiquement à *Whartonia (Brennanella) scarcella* Vercammen-Grandjean, 1963. Des notes sur l'écologie des trombiculidés de chiroptères sont données.

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