

A REDESCRIPTION OF *FELTRIA DENTICULATA* ANGELIER
(HYDRACHNELLAE, ACARI)
BASED ON TYPE MATERIAL AND SPECIMENS FROM SCOTLAND

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SPECIES REDESCRIBED	ABSTRACT : The male and female of the water-mite <i>Feltria denticulata</i> Angelier, 1949 are redescribed. Type material and the descriptions and figures presented by ANGELIER (1949 <i>a & b</i>) are compared with specimens from the hyporheic zone of a small stony stream in the Highlands of Scotland.
REDESCRIPTION D'ESPÈCE	RÉSUMÉ : Nous redécrivons le mâle et la femelle de <i>Feltria denticulata</i> Angelier, 1949. Les types, la description et les figures du Prof. Dr. ANGELIER (1949 <i>a et b</i>) sont comparés à des spécimens de la zone hyporhéique d'un petit torrent rocailleux des Highlands d'Écosse.

INTRODUCTION

Two males and two females, tentatively identified as *Feltria denticulata* Angelier, 1949, were found in Karaman/Chappuis samples (CHAPPUIS, 1942) taken in 1972 from the superficial gravels of the Fender Burn, Blair Athol, Perthshire in Scotland (National Grid References NN 887669 and NN 894673). A detailed examination of these specimens was undertaken later and comparisons made with the descriptions and figures of *F. denticulata* presented by ANGELIER (1949 *a et b*). Several distinct differences were noted between the specimens from Scotland and ANGELIER's (*op. cit.*) figures and description. These were sufficient to warrant designation of the Scottish material as new to science. However when the type material from the Pyrénées was examined this was found

to be conspecific with the specimens from Scotland. Because of the discrepancies between the published description and figures (ANGELIER, 1949 *b*) and the type material it is necessary to redescribe *Feltria denticulata* Angelier.

DESIGNATION OF TYPE MATERIAL

ANGELIER (1949 *a et b*) did not designate any type specimens. According to ANGELIER (1949 *b*, p. 229 & p. 240) all three specimens (♂, 2 ♀♀) upon which he based his description came from the Ruisseau du Grave and were collected on the same date. Data on the microscope preparations of the male and one female were extremely difficult to observe due to fading of the ink used for labelling. This problem was resolved by means

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of an Infra Red Sensitive Closed Circuit Television using blue light (485-510 mm) as the exciting source and an infra red barrier filter (665 mm). The data observed on the preparation of the female showed that specimen to have been found at l'Hospitalet, Ariège on 7-IV-1949.

In the absence of other primary type specimens of this species these three specimens may be considered as syntypes from which the male is here designated as lectotype and the females as paralectotypes.

Feltria (Feltria) denticulata Angelier, 1949. Lectotype — adult male. Ruisseau du Grave, Massif du Carlitte, Pyrénées Orientales, France, coll. 24-VIII-1948. [Preparation data reads : — *Feltria denticulata* ♂. E. Angelier. Te'l Carlitte (Pyr.-Or.). 24-VII-1948 Phreaticole].

Feltria (Feltria) denticulata Angelier, 1949. Paralectotype A — adult female. Ruisseau du Grave, Massif du Carlitte, Pyrénées Orientales, France, coll. 24-VIII-1948. [Preparation data reads : — *Feltria denticulata* ♀ n. sp. Massif du Carlitte, Ruis. du Grave, Pyr.-Or. 24-VIII-48. Phreaticole].

Feltria (Feltria) denticulata Angelier, 1949. Paralectotype B — adult female. Ruisseau du Grave, Massif du Carlitte, Pyrénées Orientales,

France, coll. 24-VIII-1948. [Preparation data reads : — *Feltria denticulata* ♀ E. Ang. Ariège, l'Hospitalet (Ariège). 7-IX-1949 Phreaticole].

In the following description the ranges of measurements are derived from all the specimens available, both from Scotland and from the type material. Precise measurements of each specimen as well as the original measurements of the type specimens are presented in Table 1. All measurements are given in micrometres (µm).

Feltria denticulata Angelier

FELTRIIDAE Viets

Subfamily Feltriinae Viets

Genus *Feltria* Koenike

Feltria (Feltria) denticulata Angelier, 1949

Synonymy :

Feltria denticulata : E. ANGELIER, 1949 a, p. 89.

Feltria denticulata : E. ANGELIER, 1949 b, pp. 238-240, Figs 25-29.

Feltria (Feltria) denticulata : K. VIETS, 1956, p. 406.

F. denticulata : COOK, 1963, p. 499.

F. denticulata : COOK, 1970, p. 69.

Feltria (Feltria) denticulata : GLEDHILL & K. O. VIETS, 1976, p. 30.

F. denticulata : GLEDHILL, 1979, p. 155.

	Lectotype ♂ *	Lectotype ♂	Prep. 654 ♂	Prep. 655 ♂	♀ *	Para- lectotype ♀ A	Para- lectotype ♀ B	Prep. 643 ♀	Prep. 652 ♀
Ventral length	460	475	428	428	480	489	489	451	451
Ventral breadth	330	352	310	315	350	394	362	366	357
Distance between ant. point epimeron 1 and post. marg. epimeron 4	245	324	296	301	335	334	334	305	301
Epimera width	245	343	310	306	260	385	352	343	343
Infracapitular bay depth	125	122	116	122	127	127	118	118	118
Infracapitular bay anterior width	—	85	80	85	—	75	—	80	80
Male genital shield length	125	141	136	132					
Male genital shield width	250	268	249	263					
Gonopore length	34	28	33	34					
Female genital shield length (right)					132	122	127	118	113
Female genital shield length (left)						122	127	113	118
Female genital shield width (right)						160	155	141	141
Female genital shield width (left)					132	160	155	141	141
Acetabula, number each side	17 + 17	18 + 17	11 + 14	10 + 12	21 + 21	22 + 20	20 + 22	16 + 17	15 + 16
Dorsal shield length	372	381	343	352	352	338	343	306	310
Dorsal shield width	230	273	340	254	235	273	277	244	240
Female posterior dorsal shield length					70	94	94	89	89
Female posterior shield width					190	193	197	188	188

TABLE 1. Measurements of *Feltria denticulata* Angelier, specimens from France and Scotland. * denotes original measurements given by ANGELIER (1949 a et b).

MALE : Ventral length 428-475, ventral width 310-352. Epimeral, sensu VAN DER HAMMEN, 1980, groups [= coxal groups sensu COOK, 1974] close together but separate with exception of anterior groups which are fused (Fig. 1B); distance between anterior point of first epimeron and posterior margin of fourth epimeron (including posterior extension) 296-324; width of epimera 306-343. Depth of infracapitulum, sensu VAN DER HAMMEN, 1980, bay [= capitular bay sensu COOK, 1974] 116-122, anterior width 80-85. Second epimera not extending to mid line; posterior apodemes of first epimera short and posterolaterally directed. Medial pair of glandularia between fourth epimera and genital shield possessing gland portions and fused with posterior extensions of fourth epimera; lateral pair of glandularia lying free. Ventrolateral plates free and extending between fourth epimera and genital shield. Genital shield separate from epimera, length 132-141, width 249-268; gonopore towards anterior margin of genital shield, length 28-34; genital acetabula 10-18 on each side. Excretory pore and associated glandularia fused with genital shield. The form of the male ventral surface is illustrated in Fig. 1B. The posterior portion of the fourth epimera, genital shield and associated plates and glandularia of the Lectotype (Fig. 3B) as well as the whole ventral surface (Fig. 3A, redrawn from ANGELIER, 1949 *b*) are illustrated for comparative purposes.

Dorsum with large dorsal shield composed of fused prae- and postfrontale, postokulare, dorso-centralia 1-4, dorsolateralia 1-4 and dorsoglandularia 1-4 of each side sensu BADER (1979) [= fused anteromedial plate, dorsal plates A-E and dorsoglandularia A-D of each side sensu COOK (1961)]. Dorsal shield length 343-381, width 240-273. Large anterolateral plates indicated by arrow 1 on Fig. 1A not generally seen in dorsal view being normally in position indicated by arrow 1 on Fig. 1B. Similarly only posterior margin of pre-antenniform (sensu BADER, 1979) with its antenniform seta (arrow 2 on Fig. 1A) would normally be observed in dorsal view. Gland portion of all dorsoglandularia absent. The form and pattern of the dorsal shield is illustrated in Fig. 1A.

Dorsal lengths of palp segments : PI, 23-28; PII, 62-71; PIII, 37-43; PIV, 106-117; PV, 25-30. Precise measurements of dorsal and ventral lengths of palp segments of all specimens examined are presented in Table 2. PII ventrally with proximoventrally directed projection bearing several small sharp-pointed extensions. PIV relatively long, ventrally with 2 fine setae distally. The form and chaetotaxy of the palp is illustrated in Fig. 2 & D. Infracapitulum length 108 (prep. 654), 113 (prep. 655).

In the following presentation of the dorsal lengths of the distal segments of the third leg, measurements of the Lectotype are given first followed by those of prep. 655 : III leg 4 — right 80, 76 — left 80, 78; III Leg 5 — right 113, 110 — left 108, 113; III Leg 6 — right 89, 87 — left 89, 87. III Leg 6 expanded distally, modified setae on ventral side broad and blade-like, 4-5 in number, a single long unmodified seta also present (Fig. 1C-G; Fig. 4D-G).

FEMALE : Ventral length 451-489, ventral width 357-394. Epimeral groups 1 & 2 fused medially, groups 3 & 4 close together but not fused medially; distance between anterior point of first epimeron and posterior margin of fourth epimeron (including posterior extension) 301-334; width of epimera 343-385. Depth of infracapitulum bay 118-127, anterior width 75-80. Second epimera not extending to mid line; posterior apodemes of first epimera short and directed more-or-less laterally. Medial pair of glandularia between fourth epimera and genital area having gland portions and fused with posterior extensions of fourth epimera; lateral pair of glandularia lying free. Ventrolateral plates free. Genital area separate from epimera; acetabular plates separate from each other, pregenital sclerite longer than wide; genital area width 315-338; acetabular plate length — right 113-127, left 113-127; acetabular plate width — right 141-160, left 141-160; genital acetabula 15-22 on each plate. The form of the female ventral surface is illustrated in Fig. 2B. The posterior portion of the fourth epimera, genital area and associated plates and glandularia of the Paralectotype (♀ A) as well as the

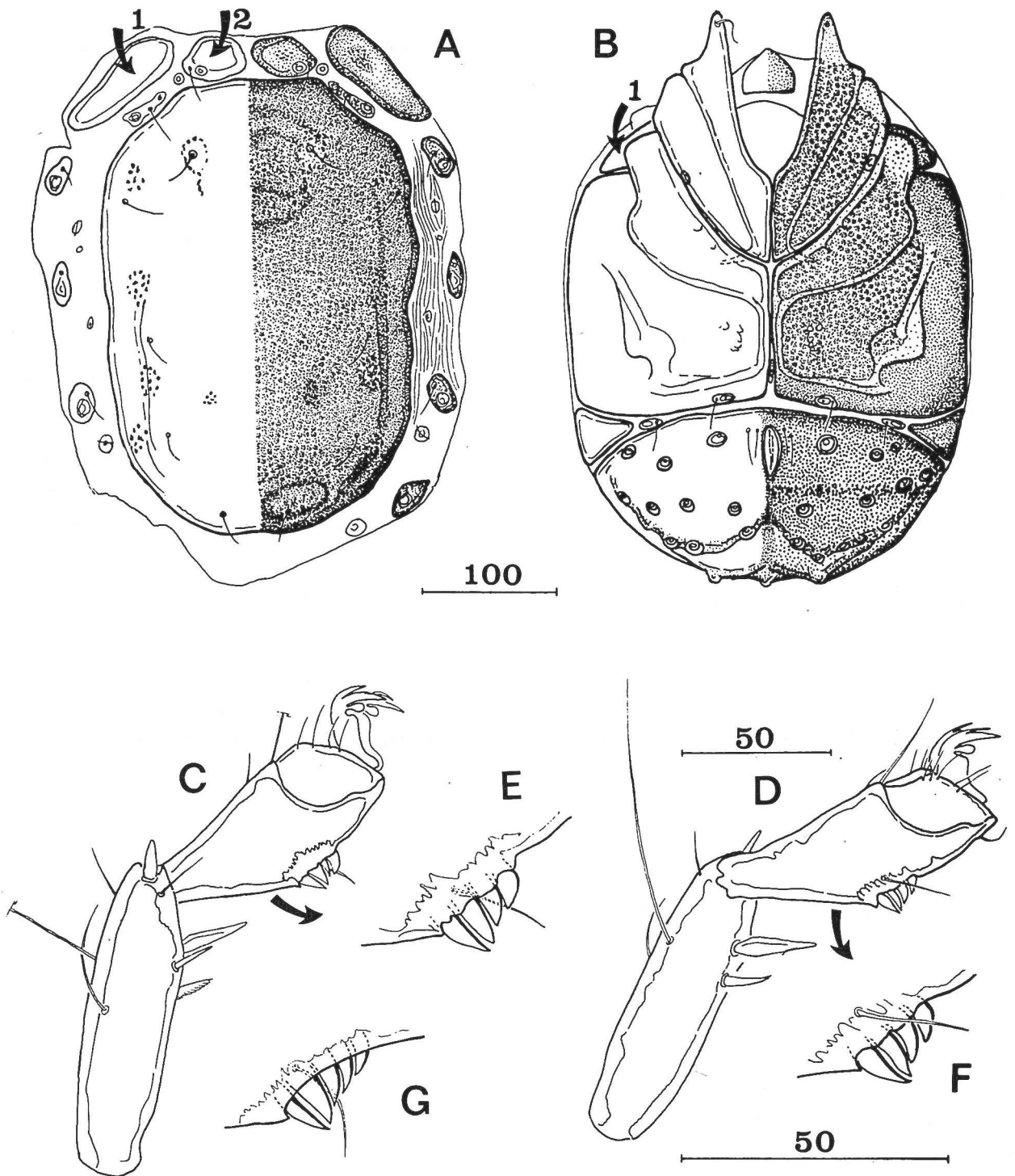


FIG 1 : *Feltria denticulata* Angelier. Male.

A. — Dorsal surface, prep. 654. B. — Ventral surface, prep. 655. C. — III Leg 5 & 6 left, prep. 655. D. — III Leg 5 & 6 right, prep. 655. E, F & G. — Detail of modified setae of III Leg 6, E & F, prep. 655, G, prep. 654.

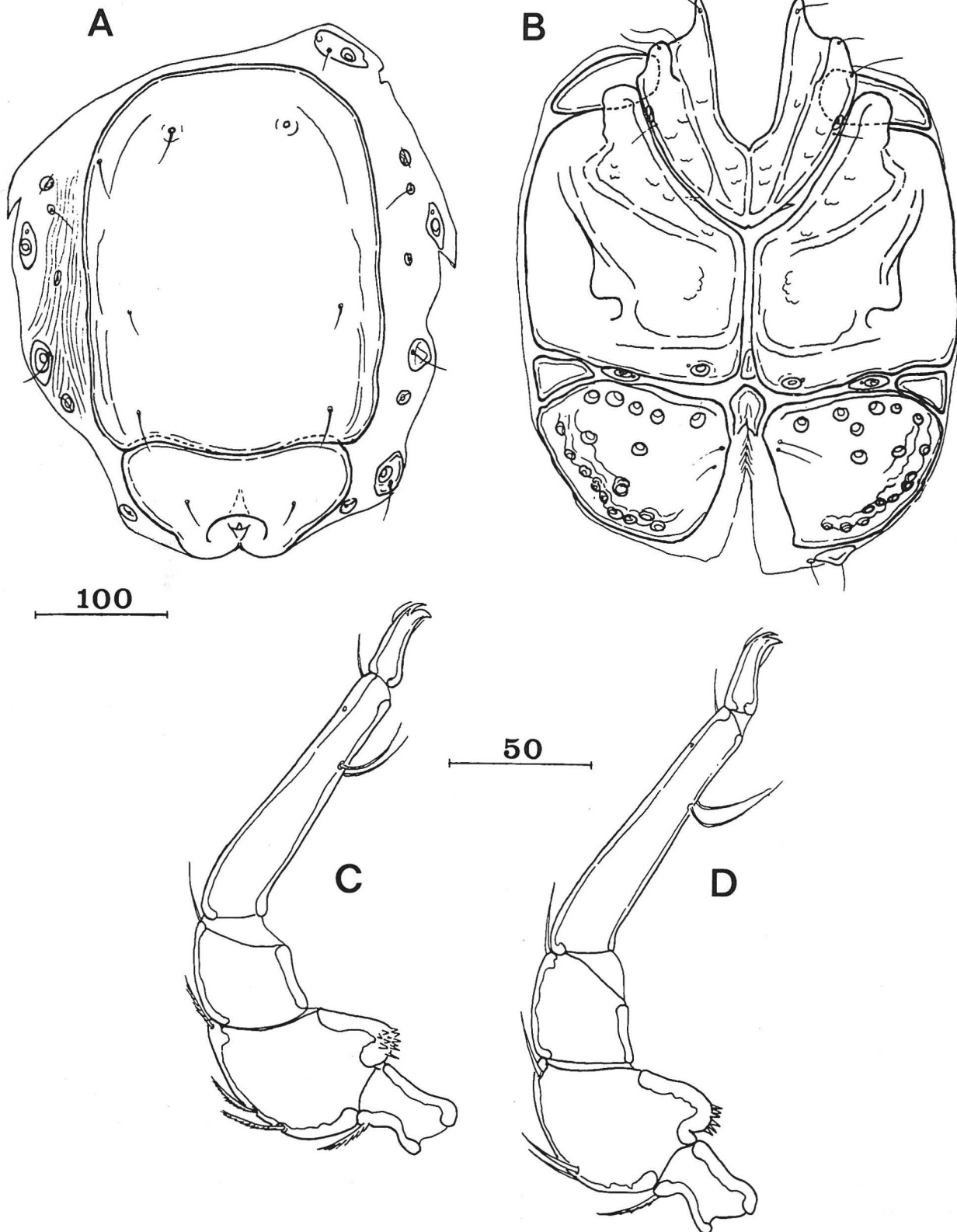


FIG. 2 : *Feltria denticulata* Angelier.

A. — Dorsal surface, female, prep. 652. B. — Ventral surface, female, prep. 643. C. — Left palp, male, prep. 655.
D. — Right palp, male, prep. 655.

whole ventral surface (redrawn from ANGELIER, 1949 b) are illustrated in Fig. 3C & D for comparative purposes.

Dorsum with large dorsal plate composed of prae- and postfrontale, postokulare, dorsocentralia 1-4, dorsolateralia 1-3 and dorsoglandularia 1-3 of each side sensu BADER (1979) [= fused antero-medial plate, dorsal plates A-E and dorsoglandularia A-C of each side sensu COOK (1961)]. Dorsal plate length 306-343, width 240-277. Dorsoglandularia 4, dorsolaterale 4 (sensu BADER, 1979) of each side, fused with excretory pore and postgenital sclerite to form a posterior dorsal plate; length 89-94, breadth 188-197. Gland portion of all dorsoglandularia absent. The form of the female dorsal plates is illustrated in Fig. 2A and Fig. 4C (Paralectotype ♀ A). The whole of the female dorsal surface (redrawn from ANGELIER,

1949) is illustrated in Fig. 4B for comparative purposes.

Dorsal lengths of palp segments : PI, 25-28 ; PII, 60-69 ; PIII, 41-46 ; PIV, 106-115 ; PV, 23-30. Measurements of dorsal and ventral lengths of palp segments are presented in Table 2. Palp form and chaetotaxy as illustrated for male (Fig. 2C & D). Capitulum length 108 (preps 643 & 652).

Dorsal measurements of distal segments of first leg are presented in the following order : Paralectotype A, Paralectotype B, prep. 643 and prep. 652. I Leg 4 — right, 64, 62, 60, 60 — left, 64, 60, 60, 60 ; I Leg 5 — right, 80, 80, 80, 76 — left, 83, 80, 78, 78 ; — I Leg 6 — right, 58 (90), 58 (90), 58 (90), 55 (87) — left, 60 (90), 58 (90), 58 (87), 58 (87), figures in parentheses are total segment lengths.

		Lectotype ♂ *	Lectotype ♂	Prep. 654 ♂		Prep. 655 ♂		♀ *	Para- lectotype ♀ A	Para- lectotype ♀ B		Prep. 643 ♀		Prep. 652 ♀	
				Left	Right	Left	Right			Left	Right	Left	Right	Left	Right
PI	Dorsal length	30	28	23	23	28	27			28	28	25	25	25	25
	Ventral length	34	34	30	32	35	35			32	34	32	34	32	30
PII	Dorsal length	88	71	62	62	67	65	75	69	64	64	62	62	62	60
	Ventral length	40	39	32	30	32	32	37	39	34	32	32	34	30	30
PIII	Dorsal length	51	43	37	37	39	39	50	44	41	41	46	46	43	41
	Ventral length	29	21	21	21	23	23	28	23	23	23	23	23	23	23
PIV	Dorsal length	120	117	106	106	113	113	100	113	115	115	113	113	106	106
	Ventral length	102	94	87	85	97	97	93	99	97	99	94	94	90	87
PV	Dorsal length	30	30	25	25	28	28	28	28	30	30	23	23	23	23
	Ventral length	—	28	23	23	25	25	—	25	28	28	21	21	21	21

TABLE 2. Palp measurements of *Feltria denticulata* Angelier, specimens from France and Scotland. * original measurements given by ANGELIER (1949 a et b).

DISCUSSION

A difference in the number of genital acetabula occurred between the French specimens and those from Scotland, there being fewer in the latter. However the number of acetabula is known to be variable in *Feltria* species, therefore this difference may not hold when more specimens become available. At present it seems wise to consider the specimens from Scotland as conspecific with those from France.

There are several distinct differences between

the published description and figures by ANGELIER (1949 b) and the specimens upon which the description was based. These differences may be due to the description and figures being made from undissected specimens, i.e., the dorsal and ventral surfaces of the specimens were not separated. The main points to note are : in the male the anterior epimeral groups (coxae 1 & 2 of each side) are fused as in Fig. 1B and not separate as in Fig. 3A ; postepimeral ventrolateral plates are present (compare Fig. 3A & B) ; the genital shield is more angular laterally, is fused with the excre-

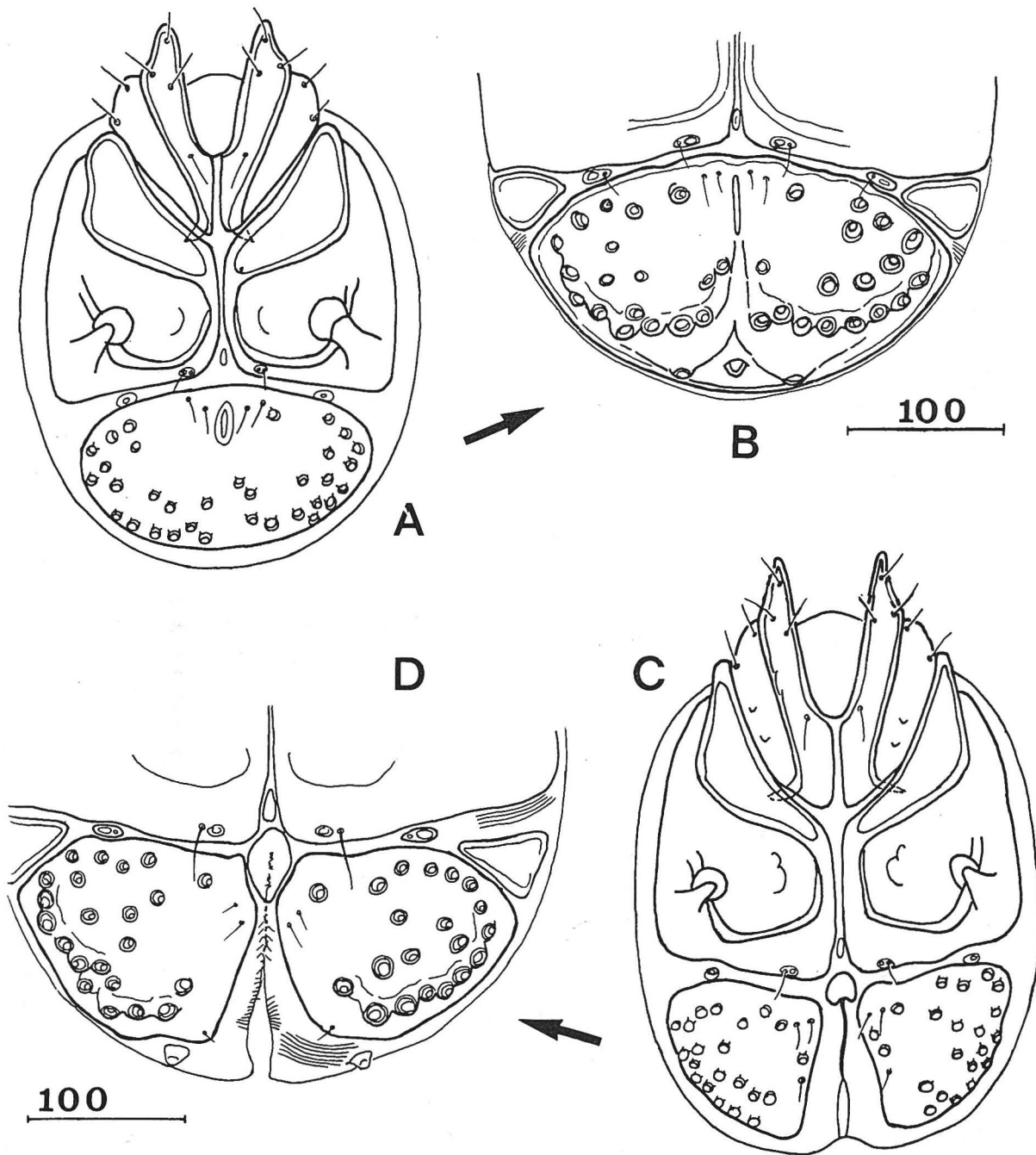


FIG. 3 : *Feltria denticulata* Angelier.

A. — Ventral surface, male, lectotype. B. — Posteroventral area, male, lectotype. C. — Ventral surface, female, paralectotype.
 D. — Posteroventral area, female, paralectotype A. (A & C redrawn from ANGELIER, 1949 b).

tory pore and has 18 + 17 acetabula (compare Fig. 3A & B); the dorsal shield is as in Fig. 1A possessing only four dorsoglandularia, gland portions of these could not be observed (compare Fig. 1A and Fig. 4A); the modified setae on III Leg 6 are broad and blade-like (Fig. 4D-G) not fine and comb-like (Fig. 4H); the claws are complex (Fig. 4D-G) not simple (Fig. 4H). In the female (Paralectotypes A & B) the anterior epimeral groups are fused as in Fig. 2B and not separate as in Fig. 3C; postepimeral ventrolateral plates are present (compare Fig. 3C & D); genital acetabula number is 20 + 22 not 21 + 21 (Fig. 3C & D); there are three pairs of dorsoglandularia all lacking the gland portion on the large anterior dorsal plate (Fig. 4C), only two pairs are shown by ANGELIER (1949) (see Fig. 4B), the two anterior setae being postokularia (sensu BADER, 1979); the posterior dorsal plate is concave posterolaterally and has a posterior indentation (Fig. 4C) and is not posteriorly convexly rounded as in Fig. 4B.

ANGELIER (1949 b) based his description of *F. denticulata* on one male and two female specimens found in phreatic water from the Ruisseau du Grave, Massif du Carlitte, Pyrénées Orientales at an altitude of 2 100 m on 24-VIII-1948. No more specimens of this species were found until the two males and two females were found in Scotland in 1972 and recorded by GLEDHILL & VIETS (1976), GLEDHILL (1979) and GLEDHILL (in press). COOK (1963) described *Feltria echinopalpis* from western North America and compared it with *F. denticulata* noting that "Fusion of the dorsal plates is similar in both species, but the coxal groups are separated in *denticulata*, completely fused in *echinopalpis*". The present study shows that the anterior epimeral [= coxal] groups in *denticulata* are fused. The modified setae on III Leg 6 of *denticulata* are also now known to be very similar to those of *echinopalpis*. However the projection on the ventral side of PII of *echinopalpis* is more pronounced and generally the pregenital sclerite of females is smaller than in *denticulata* and usually fused with the genital plates. COOK (op. cit.) found that "even in those individuals in which the acetabular plates

are separated, the pregenital sclerite is small and more posterior in position". The subspecies *Feltria echinopalpis projecta* was described from eastern North America by COOK (1970) who states that "The North American species is closely related to the European *F. denticulata* Angelier. *Feltria denticulata* also possesses unfused coxal groups, but the European species exhibits less loss of the gland portions of the dorsal and ventral glandularia". However the present study of the *denticulata* type material has shown that the anterior epimeral groups are fused and that the gland portions of dorsoglandularia 1-4 are absent.

It is hoped that this redescription of *F. denticulata* will clarify the taxonomic situation within the *F. denticulata* — group.

All specimens of species of the *denticulata* — group, i.e., *F. denticulata* Angelier, *F. echinopalpis echinopalpis* Cook and *F. echinopalpis projecta* Cook, have been found from the interstitial habitat provided by superficial riverine gravels, the hyporheic zone (sensu ORGHIDAN, 1955, 1959 and SCHWOERBEL, 1961 a et b). It is therefore probable that future finds of species in this group will come from this habitat.

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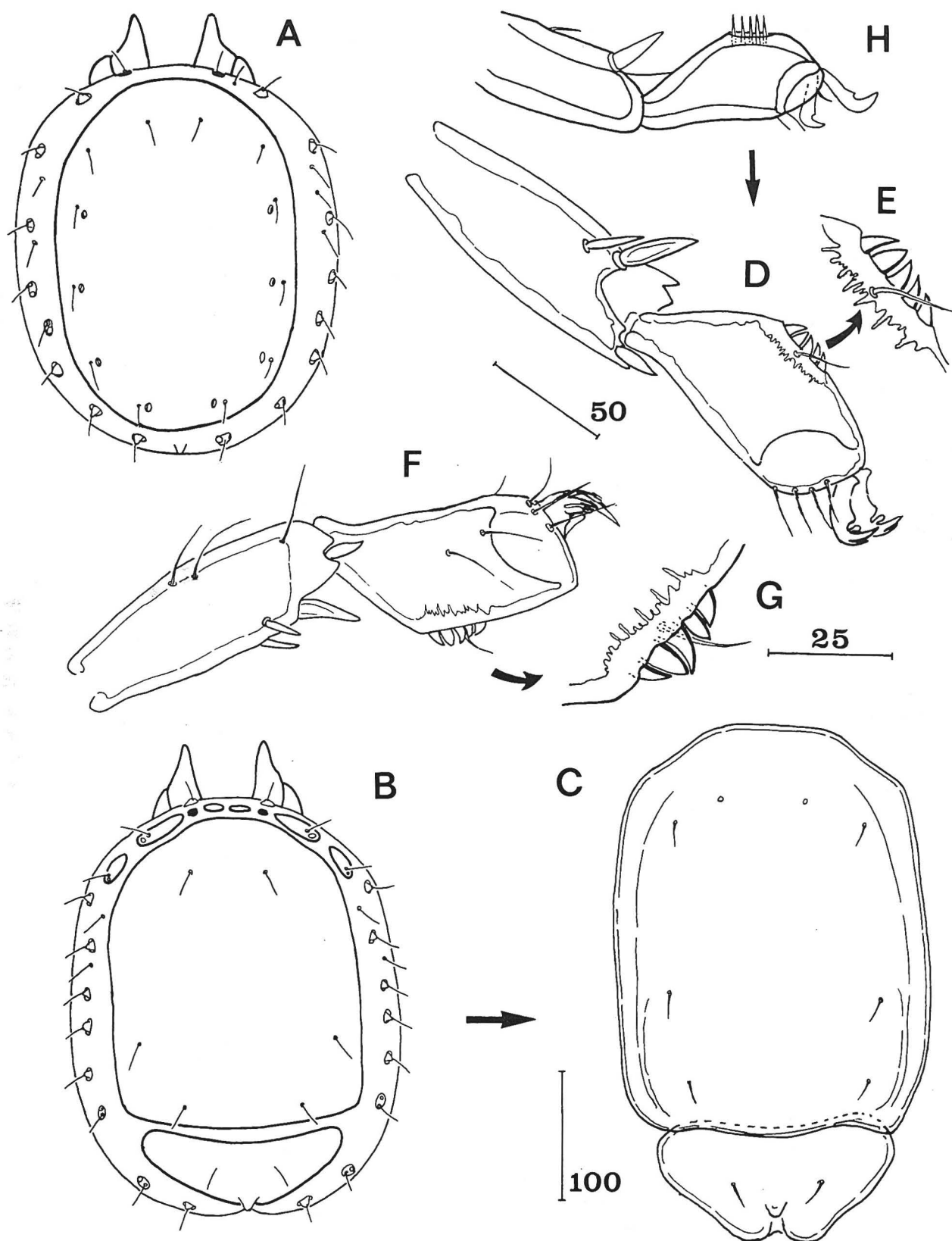


FIG. 4 : *Feltria denticulata* Angelier.

A. — Dorsal surface, male, lectotype. B. — Dorsal surface, female, paralectotype. C. — Dorsal surface, female, paralectotype A.
D. — III Leg 5 & 6 right, male lectotype. E. — Detail of modified setae. F. — III Leg 5 & 6 left, male lectotype.
G. — Detail of modified setae. H. — III Leg 5 & 6 right, lectotype, (redrawn from ANGELIER, 1949 b).

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