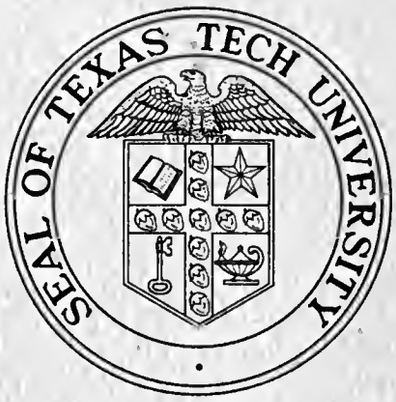
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SPECIAL PUBLICATIONS
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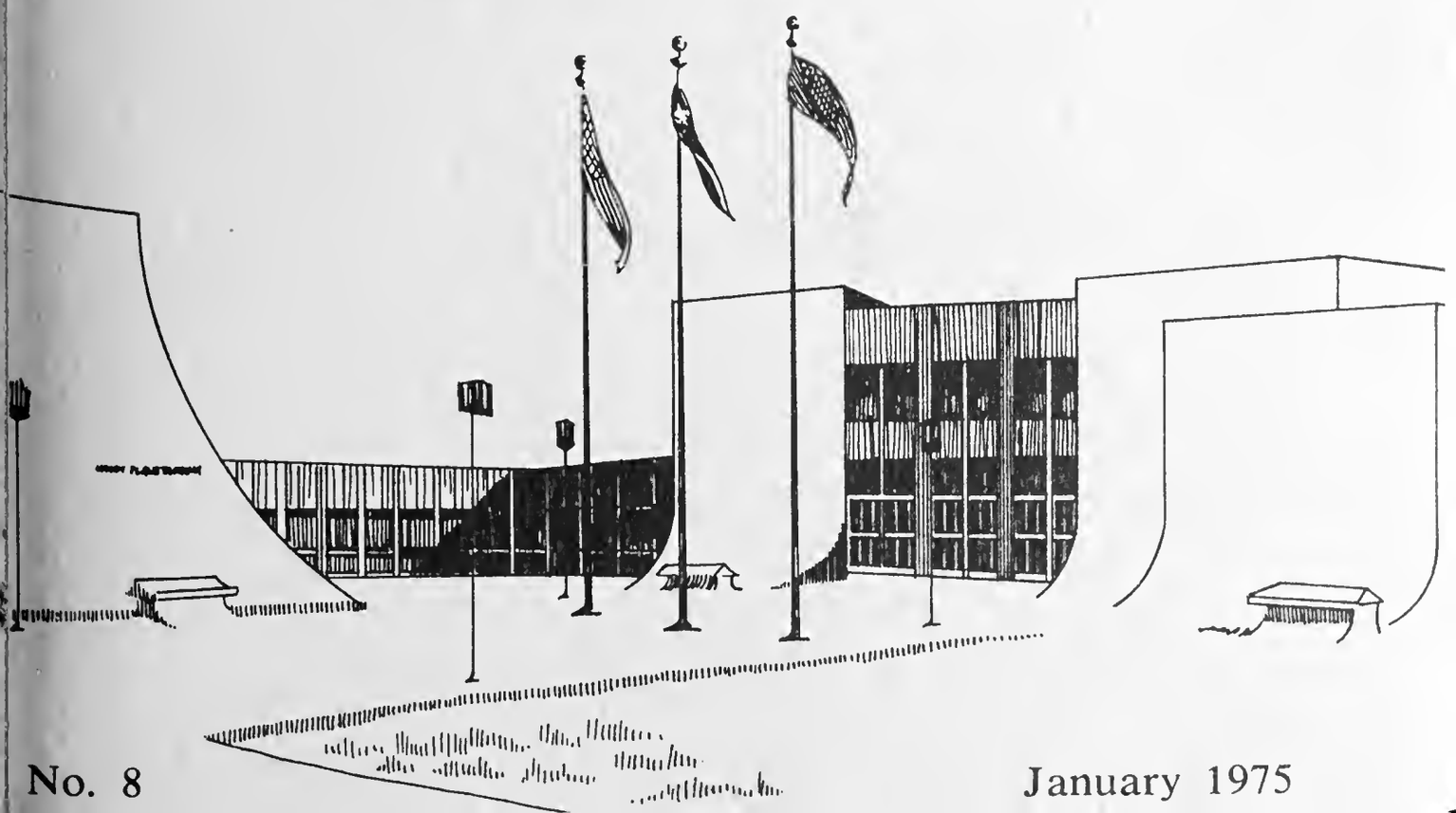
Keys, Species and Host List, and Bibliography for Nasal Mites of North American Birds (Acarina: Rhinonyssinae, Turbinoptinae, Speleognathinae, and Cytoditidae)

Danny B. Pence



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their systematics may prove to be a valuable tool for use in the interpretation of avian systematics and phylogeny. Because assessment of the taxonomy and distribution of these parasites is essential to subsequent studies on their biology and vector potential, the following keys to the known genera and species, list of species and their hosts, and bibliography to the nasal mites of birds endemic to North America (north of México) are presented.

Keys for the genera of each of the major groups precede those for the species. Figures illustrating each species of nasal mite from North American birds follow in chronological order the listing of species as they occur in the keys. The host-parasite list included herein follows an alphabetical listing of species from the various genera of mites.

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Family DERMANYSSIDAE

Subfamily RHINONYSSINAE

Key to Rhinonyssine Genera (Females)

1. Cheliceral shaft diameter uniform throughout; cheliceral digits more than 1/8 total length 2
   Cheliceral shaft at least somewhat attenuated distally; cheliceral digits less than 1/10 total length 6

2.(1) Both cheliceral digits present 3
   Fixed cheliceral digit absent ..... *Rhinoecius* Cooreman

3.(2) Stigmata with peritremes 4
   Stigmata without peritremes .... *Rhinonyssus* Berlese and Trouessart

4.(3) Periterminalia on dorsolateral margins of mesosoma 5
   Periterminalia on posterior margin of opisthosoma ..... *Rallinyssus* Strandtmann

5.(4) Podosomal plate entire; opisthosomal plate entire, fragmented, or absent ..... *Tinaminyssus* Strandtmann and Wharton
   All idiosomal plates fragmentary ..... *Laryinyssus* Strandtmann

6.(1) Stigmata with peritremes; gnathosoma terminal; anal plate subterminal ..... *Ptilonyssus* Berlese and Trouessart
   Stigmata without peritremes; gnathosoma at least partially withdrawn ventrally; anal plate terminal .... *Sternostoma* Berlese and Trouessart

Rhinonyssus

Key to Species (Females)

1. Anal plate present; distal palp segments stubby, barely longer than trochanter 2
   Anal plate absent; distal palp segments well developed, longer than trochanter 5

2.(1) Ventral opisthosomal setae blunt-tipped, heavy 3
   Ventral opisthosomal setae with swollen bases tapering to slender flexible tips 4

3.(2) Two paranal setae, postanal seta, and cribrum on anal plate . . . . . *colymbicola* Fain and Bafort (Figs. 1-6)
   Postanal seta and cribrum absent from anal plate . . . . . *alberti* Strandtmann (Figs. 7-13)

4.(2) Postanal seta absent; podosomal plate triangular anteriorly with angulate posterolateral margins beginning from near middle of plate, midposterior margin straight . . . . . *podilymbi* Pence (Figs. 14-20)
   Postanal seta usually present; podosomal plate triangular anteriorly from near level of stigmata, midposterior margin with a small triangular projection posteriorly . . . . . *rhinolethrum* Berlese and Trouessart (Figs. 21-27)

5.(1) Sternal plate absent 6
   Sternal plate present 9

6.(5) Idiosoma, especially hysterosoma, elongate; podosomal plate horseshoe shaped and fragmented; genital plate elongate 7
   Idiosoma normal, hysterosoma rounded; podosomal plate not horseshoe shaped and little fragmented; genital plate not markedly elongate . . . 8

7.(6) Sternal setae setiform; podosomal plate very eroded with several adjacent small platelets . . . . . *spinactitis* Dusbábek (Figs. 28-34)
   Sternal setae normal; podosomal plate may be somewhat eroded but not broken into small platelets . . . . . *coniventris* Berlese and Trouessart (Figs. 35-41)

8.(6) Four ventral opisthosomal setae; two pairs sternal setae . . . . . *caledonicus* Hirst (Figs. 42-48)
   Eight ventral opisthosomal setae; three pairs sternal setae . . . . . *waterstoni* Hirst

9.(5) Two ventral opisthosomal setae . . . . . *pluvialis* Fain and Johnston (Figs. 49-54)
   More than 15 ventral opisthosomal setae 10

10.(9) Posterior margins of podosomal plate with angulate lateral corners, about 25 microns (average); ventral opisthosomal setae long . . . . . *strandtmanni* Fain and Johnston (Figs. 55-61)

Posterior margins of podosomal plate rounded, 20 microns (average); ventral opisthosomal setae short . . . . . *himantopus* Strandtmann (Figs. 62-68)

Rallinyssus

Key to Species (Females)

Podosomal plate well developed . . . . . *caudistigmus* Strandtmann (Figs. 69-75)
Podosomal plate reduced to fragments representing areas of muscle insertions . . . . . *verheyeni* Fain and Bafort (Figs. 76-82)

Larinyssus

There is a single species, *Larinyssus orbicularis* Strandtmann, known from North American birds (Figs. 83-89).

Tinaminyssus

Key to Species (Females)

1. Tritosternum present . . . . . *ixoreus* Strandtmann and Clifford (Figs. 90-96)
Tritosternum absent 2

2.(1) With 2 large dorsal plates (podosomal and opisthosomal) 3
With 3 large dorsal plates (podosomal, opisthosomal, and pygidial) . . . . . *carapachibeyus* Dusbábek (Figs. 97-102)

3.(2) Small poststigmal platelet present 4
Small poststigmal platelet absent 5

4.(3) Opisthosomal plate widest posteriorly; 10 to 11 pairs of long ventral opisthosomal setae; paranal setae at level of anus . . . . . *zenaidurae* Crossley (Figs. 103-109)
Opisthosomal plate widest anteriorly; seven to nine pairs of long ventral opisthosomal setae; paranal setae anterior to anus . . . . . *melloi* Castro (Figs. 110-116)

5.(3) Lateral ventral opisthosomal setae long, at least as long as width of anal plate; opisthosomal plate triangular . . . . . *triangulus* Strandtmann (Figs. 117-123)
Lateral ventral opisthosomal setae small, much shorter than width of anal plate; opisthosomal plate not triangular 6

6.(5) Sternal plate small, lightly sclerotized 7
Sternal plate absent 8

7.(6) Opisthosomal plate as large as or larger than podosomal plate, as wide as long, covering almost entire dorsal opisthosoma; paranal setae at level of anus . . . . . *bubulci* Zumpt and Till (Figs. 124-130)

Opisthosomal plate rectangular, longer than wide, smaller than above and covering only about 1/2 area of opisthosoma; paranal setae above anus ..... *columbae* Crossley (Figs. 131-137)

8.(6) All ventral setae noticeably shorter than diameter of anal opening; small; paranal setae at level of, or posterior to, anus 9
Some ventral setae as long as diameter of anal opening; paranal setae anterior to anus ..... *geotrygoni* Dusbábek (Figs. 138-144)

9.(8) Opisthosomal plate rectangular, longer than wide, extending to near posterior margin of idiosoma .. *belopolskii* Bregetova (Figs. 145-151)
Opisthosomal plate round to oval, small, extending less than 1/2 distance to posterior margin of idiosoma .... *neoixobrychi* Pence (Figs. 152-158)

Rhinoecius

Key to Species (Females)

1. With a single dorsal plate (either entire or fragmented), the podosomal; without pair of large subposterior setae at posterior margin of podosomal plate 2
With two dorsal plates, podosomal and opisthosomal; two large setae on subposterior margin of podosomal plate .... *bisetosus* Strandtmann (Figs. 159-164)

2.(1) Podosomal plate fragmented with one large anterior platelet and four smaller posterior fragments ..... *tytonis* Fain (Figs. 165-170)
Podosomal plate entire or with two accessory platelets on podosoma but much larger and not as above 3

3.(2) Sternal plate present; 1 accessory platelet at lateral margin of each side of posterior podosomal plate 4
Sternal plate absent; no accessory platelets on podosoma .... *cooremani* Strandtmann (Figs. 171-176)

4.(3) Podosomal plate bell shaped, with two small setae on posterior margin ..... *grandis* Strandtmann (Figs. 177-182)
Podosomal plate broadly rounded anteriorly and laterally with lateral margins not excavated; no setae on podosomal plate .... *oti* Cooreman (Figs. 183-188)

Sternostoma

Key to Species (Females)

1. With a single dorsal plate, the podosomal 2
With two dorsal plates, the podosomal and opisthosomal 4

2.(1) Sternal and coxal setae globose; 6 pairs of setae on podosomal plate, eight pairs on dorsal opisthosoma .... *dumetellae* Pence (Figs. 189-194)

Sternal and coxal setae spatulate; five pairs of setae on podosomal plate, five to six pairs on dorsal opisthosoma 3

3.(2) Podosomal plate triangular anteriorly with angulate lateral margins and posterior margin deflected downward to form a small triangle . . . . . *technaui* Vitzthum (Figs. 195-200)

Podosomal plate rounded anteriorly with slightly rounded lateral margins and posterior margin almost straight; four pairs of ventral opisthosomal setae . . . . . *spatulatum* Furman (Figs. 201-206)

4.(1) All subapical ventral and ventrolateral setae of tarsi II to IV in the form of very minute spines, barely visible 5

At least some subapical setae of tarsi II to IV enlarged, variously modified, pronounced 7

5.(4) Idiosoma in gravid female triangular, greatly enlarged; opisthosomal plate subcircular, wider than long . . . . . *strandtmanni* Furman (Figs. 207-212)

Idiosoma in gravid female normal; opisthosomal plate elongate, much longer than wide 6

6.(5) Tarsus I with one long attenuated seta . . . . . *trachaecolum* Lawrence (Figs. 213-218)

Tarsus I with 3 or 4 long attenuated setae . . . . . *hutsoni* Furman (Figs. 219-224)

7.(4) Subapical ventral and ventrolateral setae of tarsi II to IV long and flattened 8

Subapical ventral and ventrolateral setae of tarsi II to IV short, cylindrical, spatulate, or spinelike but not flattened 9

8.(7) Subapical setae of tarsi II to IV sharply pointed; opisthosomal plate round, wider than long; sternal setae large and blunt . . . . . *motacillae* Pence (Figs. 225-230)

Subapical setae of tarsi II to IV blunt; opisthosomal plate trapizoidal, longer than wide, sternal setae small and hairlike . . . . . *cryptorhynchum* Berlese and Trouessart (Figs. 231-236)

9.(7) Subapical ventral and ventrolateral setae of tarsi II to IV spatulate or scoop shaped but not flattened 10

Subapical setae of tarsi II to IV spinelike, cylindrical, or otherwise, but not spatulate, scoop shaped, or otherwise expanded with distal end larger than proximal end 12

10.(9) Legs I to IV with very minute spinelike setae except apical and subapical tarsal setae; sternal plate with distinct reticular pattern; tarsi II to IV with a distal row of three and proximal row of four large ventral subapical spatulate setae . . . . . *loxiae* Fain (Figs. 237-242)

Legs I to IV with larger, more distinct spinelike setae; sternal plate hardly discernible, without reticulate pattern; tarsi II to IV with a distal

row of two and proximal row of three large ventral subapical spatulate or scoop-shaped setae 11

11.(10) One pair of ventral gnathosomal setae; anal plate with two pairs of setae . . . . . *hirundinis* Fain (Figs. 243-248)
Ventral gnathosomal setae absent; anal plate with one pair of setae . . . . . *sialiphilus* Hyland (Figs. 249-254)

12.(9) Sternal plate 2.5 times as long as wide; one pair paranal setae; postanal seta present 13
Sternal plate only slightly longer than wide; one pair of paranal setae lateral to margin of anal plate present or absent, postanal seta absent 14

13.(12) Pososomal and opisthosomal plates with a network of small subreticular lines on surface; anterior margin of opisthosomal plate straight or slightly rounded; anterior dorsal apical setae of tarsus IV strongly swollen . . . . . *porteri* Hyland (Figs. 255-259, 261)
Podosomal and opisthosomal plates not as above; anterior margin of opisthosomal plate inverted in the form of a "V"; anterior dorsal apical setae of tarsus IV not swollen, hairlike . . . . . *hylandi* Fain and Johnston (Fig. 260)

14.(12) Subapical setae of tarsi II to IV with three papillate setae distally and two papillate setae proximally, with a short, loaf-shaped, blunt seta between them . . . . . *kelloggi* Hyland (Figs. 262-267)
Subapical setae of tarsi II to IV otherwise 15

15.(14) Opisthosomal plate round to oval in shape, wider than long; subapical setae of tarsus II to IV long, cylindrical, blunt; sternal plate with pattern of subcuticular reticulations 16
Opisthosomal plate rectangular or trapizoidal, much longer than wide; subapical setae of tarsi II to IV cylindrical or spinelike, sharply pointed; sternal plate with reticular pattern (except *S. lanorium*) . . . 17

16.(15) Palp tarsus with a modified apical seta expanded and mushroom shaped at tip; podosomal plate longer than wide . . . . . *longisetosae* Hyland (Figs. 268-273)
Palp tarsus without modified apical seta; podosomal plate as wide as or wider than long . . . . . *pirangae* Pence (Figs. 274-279)

17.(15) Subapical setae of tarsus II to IV small, cylindrical, sometimes very slightly flattened; anal plate without chitinized lateral margins; a pair of setae on posterior margin of podosomal plate . . . . . *boydi* Strandtmann (Figs. 280-285)
Subapical setae of tarsi II to IV larger, cylindrical, sharply pointed; anal plate with chitinized lateral margins; two pairs of setae on posterior margin of podosomal plate 18

18.(17) Podosomal plate broadly rounded anteriorly; palp genu with a single

dorsal and one lateral seta; chelicera attentuated, with a lateral membraneous protuberance in region of attenuation . . . . . *tyrannus* Brooks and Strandtmann (Figs. 286-291)
Podosomal plate triangular anteriorly; palp genu with two dorsal and one lateral setae; chelicera not attenuate and without membraneous protuberance . . . . . *lanorium* Fain (Figs. 292-297)

Ptilonyssus

Key to Species (Females)

1. Stigmata with peritremes 2
Stigmata without peritremes . . . . . *angrensis* Castro (Figs. 298-303)

2.(1) Three dorsal plates (excluding mesosomal shieldlets), podosomal, opisthosomal, and pygidial (latter two usually fused into single plate 3
Two dorsal plates (excluding mesosomal shieldlets), podosomal and pygidial 15

3.(2) Chelae with fixed digit almost entirely membraneous and slightly more than 1/5 length of chelicera; dorsal surface of genu III with two short, stout spines located close together . . . . . *fluvicolae* Hyland and Moorehouse (Figs. 304-309)
Chelae otherwise; dorsal surface of genu III without two short spines (although four spines in proximity may be present) 4

4.(3) Oblique row of four stout, proximate spines on dorsum of genu III 5
Oblique row of four spines absent from genu III 7

5.(4) Podosomal, opisthosomal, and pygidial plates present; large heavy spines on venter of legs . . . . . *spinosus* Brooks and Strandtmann (Figs. 310-315)
Only podosomal and opisthosomal plates present (pygidial plate completely fused to opisthosomal plate); smaller spinelike setae on legs 6

6.(5) Podosomal plate oval in outline, longer than wide, with rounded lateral margins . . . . . *tyrannus* Brooks and Strandtmann (Figs. 316-321)
Podosomal plate rounded anteriorly and posteriorly but greatly extended laterally with winglike extensions, wider than long . . . . . *callinectoides* Brooks and Strandtmann (Figs. 322-327)

7.(4) Setae of podosomal, opisthosomal, sternal, and genital plates, on ventral opisthosoma, and on dorsal margins of tarsi II to IV long and inflated distally . . . . . *capitatus* Strandtmann (Figs. 328-333)
Idiosomal and leg setae not inflated at tip 8

8.(7) Posterior margin of opisthosomal plate with small round extension representing incompletely fused pygidial plate; cribrum absent from anal plate . . . . . *corvi* Pence (Figs. 334-339)

Opisthosomal and pygidial plates completely fused, opisthosomal plate rectangular or rounded without round posterior extension; cribrum present 9

9.(8) Sternal plate wider than long, with reticulate pattern, metasternal setae absent; three pairs ventral opisthosomal setae ..... *morofskyi* Hyland (Figs. 340-345)

Sternal plate longer than wide, with or without reticulate pattern, metasternal setae present; at least four or more pairs of ventral opisthosomal setae 10

10.(9) Opisthosomal plate widened anteriorly, lateral margins sharply excavated at middle of plate, posterior margin of plate 1/3 or less than anterior width; dorsal and sternal plates without substructure 11

Opisthosomal plate rectangular or rounded, lateral margins rounded or only very slightly excavated, if at all, posterior margin of plate 1/2 or greater than width of dorsal margin; either or both dorsal and sternal plates with punctations, reticulations, or other substructure 12

11.(10) Opisthosomal plate distinctly mushroom shaped with very excavated lateral margins; idiosoma elongate; four to five pairs of ventral opisthosomal setae ..... *vireonis* Dusbábek (Figs. 346-351)

Opisthosomal plate with midlateral margins less eroded but still sharply excavated; idiosoma rounded, less distinctly elongate; at least seven pairs of ventral opisthosomal setae ..... *hoseini* Fain and Aitken (Figs. 352-357)

12.(10) Tarsi II to IV with two prominent stout spines on ventral apical margins; opisthosomal plate rounded anteriorly, slightly inverted in the form of a "V" posteriorly, nearly as wide as long 13

Tarsi II to IV without, or with only one, small stout spine on ventral apical margin; opisthosomal plate nearly twice as long as wide, posterior margin rounded 14

13.(12) Lateral margins of opisthosomal plate somewhat excavated; five pairs of ventral opisthosomal setae ... *pirangae* Dusbábek (Figs. 358-363)

Lateral margins of opisthosomal plate rounded; six to seven pairs of ventral opisthosomal setae ... *icteridius* Strandtmann (Figs. 364-369)

14.(12) All sternal setae on sternal plate; anterior margin of opisthosomal plate straight; six to seven pairs of ventral opisthosomal setae ..... *pari* Fain and Hyland (Figs. 370-375)

Sternal setae located off sternal plate usually some distance to its lateral margins; anterior margin of opisthosomal plate distinctly rounded; eight to 10 pairs of ventral opisthosomal setae ..... *hirsti* Castro (Figs. 376-381)

15.(2) Tritosternum present ..... *nitzschi* Giebel (Figs. 382-387)

Tritosternum absent 16

16.(15) Pygidial plate absent or fragmented into two very small platelets, subposterior pair of setae absent 17
Pygidial plate entire, large, or if fragmented into two plates, subposterior pair of setae on fragments 19

17.(16) Pygidial plate or fragments thereof absent; lateral margin of anal plate sclerotized; posterior margin of podosomal plate slightly rounded . . . . . *donatoi* Castro (Figs. 392, 394)
Pygidial plate represented by two small vestigial fragments; lateral margins of anal plate not sclerotized; posterior margin of podosomal plate otherwise 18

18.(17) Posterior margin of podosomal plate with posteriorly directed extension in the form of a triangle; sternal plate represented by very small vestigial platelets with eroded margins; three pairs of small punctate platelets on dorsal opisthosoma . . . . . *ohioensis* Fain and Johnston (Figs. 388-391, 393, 395, 396)
Posterior margin of podosomal plate excavated in the form of an inverted "U"; sternal plate well developed without eroded margins with sternal setae at lateral margins of plate; no dorsal platelets on opisthosoma but a single large punctate area just posterior to podosomal plate . . . . . *cerchneis* Fain (Figs. 397-402)

19.(16) Sternogenital area consisting of a small triangular shaped vestigal sternal plate with three pairs of sternal setae adjacent to plate also in form of a triangle and with posterior pair much larger than anterior pairs, genital plate very narrow (about 10 times longer than wide, with posterior end very pointed) 20

Sternogenital area otherwise; sternal plate (if present) and sternal setae not in form of a triangle; genital plate much wider with rounded posterior margin (length/width ratio 1:5 or less) 21

20.(19) Eleven to 12 pairs of large, heavy spinous ventral opisthosomal setae; setae of coxae, trochanters, and on dorsal opisthosoma blunt tipped and inflated . . . . . *echinatus* Berlese and Trouessart (Figs. 403-408)
Four to five small sharp-tipped ventral opisthosomal setae; setae of coxae, trochanters, and on dorsal opisthosoma either sharp tipped and drawn to a fine flexible tip or spinelike . . . . . *tachycinetae* George (Figs. 409-414)

21.(19) Two setae on anal plate 22
Three setae on anal plate 23

22.(21) Four pairs blunt-tipped ventral opisthosomal setae; one long frayed seta on apical margin of tarsus I . . . . . *perisorei* George (Figs. 415-420)
Seven pairs of small spinelike ventral opisthosomal setae; no frayed setae on tarsus I . . . . . *lanii* Fain (Figs. 421-426)

23.(21) All (or sometimes all but one pair) lateral mesosomal setae adjacent to podosomal plate very small, hairlike or spinelike, and of approximately same size; subposterior pair of setae small, off margin of podosomal plate 24
At least two pairs of lateral mesosomal setae (usually pairs adjacent to posterolateral margins of podosomal plate) enlarged and spinelike (2 times length of other mesosomal setae); subposterior pair of setae usually on posterior margin of plate (if not, large and spinelike) 30

24.(23) Pygidial plate fragmented into two platelets 25
Pygidial plate entire 26

25.(24) Podosomal plate entire or only slightly excavated at posterior margin ..... *motacillae* Fain (Figs. 427-432)
Podosomal plate fragmented into a large anterior plate and eight small accessory platelets ..... *troglodytis* Fain (Figs. 433-438)

26.(24) Paranal setae posterior to anus 27
Paranal setae at level of or above anus 28

27.(26) Midposterior margin of podosomal plate considerably excavated in form of inverted "U" ..... *sialiae* George (Figs. 439-444)
Posterior margin of podosomal plate entire, straight ..... *bombycillae* Pence (Figs. 445-450)

28.(26) Podosomal plate widest posteriorly, posterior margin trilobate; ventral opisthosomal setae small .... *agelaii* Fain and Aitken (Figs. 451-456)
Podosomal plate widest anteriorly, posterior margin straight; ventral opisthosomal setae enlarged and spinelike 29

29.(28) Dorsal opisthosomal setae short and blunt tipped; one pair of large posteriorly curved spines on anterior edge of tarsi III and IV; eight pairs of ventral opisthosomal setae .. *salpinctis* George (Figs. 457-462)
Dorsal opisthosomal setae long and spinelike, sharp tipped; spines as described above absent on tarsi III and IV; seven pairs of ventral opisthosomal setae ..... *thryothori* Pence (Figs. 463-468)

30.(23) Subposterior pair of setae on podosomal plate or at posterior margin of plate nearly as large as or as large as the two largest pairs of mesosomal setae, long and spinelike 31
Subposterior pair of setae small (less than 1/2 length of two largest pairs of mesosomal setae), short and thornlike 33

31.(30) Podosomal plate trilobed posteriorly, entire with margins not eroded; setae of dorsal idiosoma short, thornlike 32
Podosomal plate with posterior margin not trilobate, considerably eroded; dorsal idiosomal setae large, slender, sharp tipped ..... *acrocephali* Fain (Figs. 469-474)

32.(31) Idiosoma elongate, posterior margin of opisthosoma with a concave depression; 10 pairs of dorsal opisthosomal setae; four heavy blunt-

tipped setae on proximal dorsal surface of tarsus I . . . . . *toxostomae* Pence (Figs. 475-480)
Idiosoma less elongate, posterior margin broadly rounded; seven pairs of dorsal opisthosomal setae; three heavy, blunt-tipped setae on proximal end of tarsus I . . . . . *mimi* George (Figs. 481-486)

33.(30) Sternal plate distinct with sternal setae on plate; most ventral and dorsal opisthosomal and all anal setae very small and blunt tipped; trochanters I and III with only two setae . . . *nudus* Hirst (Figs. 487-492)
Sternal plate indistinct or if lightly sclerotized setae at lateral margins of plate but not on plate; idiosomal and anal setae longer, sharp tipped; trochanter I with four and III with at least three setae 34

34.(33) Large, heavily sclerotized forms; most dorsal and ventral idiosomal setae and coxal setae very large and spinelike; lateral margins of podosomal plate eroded with some setae at plate margins; podosomal plate widest in middle with rounded lateral margins, not trilobed posteriorly or excavated laterally . . . . . *euroturdi* Fain and Hyland (Figs. 493-498)
Smaller, less sclerotized forms; all dorsal and ventral idiosomal setae spinelike or thornlike but not heavy; podosomal plate entire, widest at anterior margin with distinctly excavated midlateral margins, posterior margin rounded, straight, or trilobed 35

35.(34) Paranal setae considerably below anus . . . . . *richmondinae* George (Figs. 499-504)
Paranal setae at level of or above anus 36

36.(35) Paranal setae above anterior margin of anus, anal setae taper abruptly from their enlarged base to a thin flexible tip . . . . . *phainopeplae* George (Figs. 505-510)
Paranal setae at level of anus, anal setae spinelike and sharp tipped 37

37.(36) Four pairs of mesosomal setae lateral to podosomal plate; posterior margin of podosomal plate distinctly trilobed . . . . . *japuibensis* Castro (Figs. 511-516)
Five pairs of mesosomal setae lateral to podosomal plate; posterior margin of podosomal plate not distinctly trilobate 38

38.(37) Seven pairs of setae on podosomal plate (including subposterior pair) . . . . . *ludovicianus* Černý (Figs. 517-522)
Eight pairs setae on podosomal plate (including subposterior pair) . . . . *sairae* Castro (Figs. 523-528)

Family EPIDERMOPTIDAE

Subfamily TURBINOPTINAE

Key to Genera (Males and Females)

1. Female 2
   Male 5

2.(1) Endogynium absent; vulva transverse . . . . . *Turbinoptes* Boyd
   Endogynium present; vulva in form of inverted "Y" 3

3.(2) Tarsi I and II very short, in form of a very cuticularized ringlike structure with a single curved apical claw . . . . . *Colinoptes* Fain
   Tarsi I and II normal, larger, less cuticularized with a single apical slightly curved claw 4

4.(3) Tarsi III and IV without terminal claws . . . . . *Schoutedenocoptes* Fain
   Tarsi III and IV with a single terminal claw . . . . . *Congocoptes* Fain

5.(1) All tarsi with two claws; legs III and IV subequal . . *Turbinoptes* Boyd
   Tarsi I and II with single claw; legs III and IV unequal 6

6.(5) Tarsi III and IV without claws . . . . . *Schoutedenocoptes Fain*
   Tarsi III and IV with one or two claws 7

7.(6) Posterior idiosomal lobes well developed, flattened, well cuticularized . . . . . *Colinoptes* Fain
   Posterior idiosomal lobes very poorly developed, indistinct, rounded, not well cuticularized . . . . . *Congocoptes* Fain

Turbinoptes

The genus is represented by a single cosmopolitan species, *Turbinoptes strandtmanni* Boyd (Figs. 529-540).

Colinoptes

Colinoptes is represented by a single species, *Colinoptes cubanensis* Fain (Figs. 541-552).

Schoutedenocoptes

There is a single species, *Schoutedenocoptes americanus* Fain and Hyland, from North American birds (Figs. 553-564).

Congocoptes

Key to Species (Males and Females)

1. Female 2
   Male 4

2.(1) Pronounced protuberance on posterior margin of idiosoma; three pairs denticles on dorsal opisthosoma . . . . . *dryocopi* Pence (Figs. 565-570)
   Posterior idiosoma rounded; denticles absent from idiosoma 3

3.(2) Setae l_2 long (50 microns) and spinelike . . . . . *furmani* Fain (Figs. 577-582)
Setae l_2 short (25 microns) and hairlike . . . . . *sphyrapicicola* Pence (Figs. 589-594)

4.(1) Epimera III not fused by punctate band . . . . . *furmani* Fain (Figs. 583-588)
Epimera III fused by punctate band 5

5.(4) Setae l_2 small and hairlike; opisthosomal shield with irregular anterior margin, extending nearly to level of setae l_2 . . . . . *dryocopi* Pence (Figs. 571-576)
Setae l_2 large and spinelike; opisthosomal shield with rounded anterior margin, extending only 1/2 or less distance from posterior to level of setae l_2 . . . . . *sphyrapicicola* Pence (Figs. 595-600)

Family CYTODITIDAE

Key to Genera (Females)

1. Chelicera very small, trident; idiosoma with punctate areas on dorsal and ventral surface . . . . . *Cytonyssus* Fain
Chelicera larger, not trident; idiosoma without punctate areas . . . . . *Cytodites* Oudemans

Cytodites Oudemans

There is a single species, *Cytodites therae* Hyland, from North American birds (Figs. 601-606).

Cytonyssus Fain

Cytonyssus troglodyti Pence is the only species reported from North America (Figs. 607-612).

Family EREYNETIDAE

Subfamily SPELEOGNATHINAE

Key to Genera (Females)

1. All idiosomal and leg setae barbulate; dorsal shield and eyes absent . . . . . *Boydaia* Womersley
Idiosomal and leg setae an admixture of barbulate and filamentous setae; dorsal shield substantial, weak, or absent; eyes present or absent 2

2.(1) Eyes absent . . . . . *Neoboydaia* Fain
Eyes present 3

3.(2) Dorsal shield substantial . . . . . *Astrida* Fain
Dorsal shield absent . . . . . *Opthalomophagus* Dubinin

Astrida

Key to Species (Females)

Dorsal opisthosomal setae of type Nz or BNz or at least some setae divided distally ..... *caprimulgi* Fain (Figs. 613-618)
Dorsal opisthosomal setae of type BEd or barbulate, but not divided distally into two hairlike extensions .. *coccyzae* Pence (Figs. 619-624)

Neoboydaia

Key to Species (Females)

1. Palps with one well formed segment; presensillae normal ..... *aureliania* Fain (Figs. 625-630)
Palps with two or three well-formed segments; presensillae minute .. 2

2.(1) Sensillae with spinose surface; genital setae formula 6:6; anal setae formula 2:2 or 1:1 3
Sensillae with smooth surface; genital setae formula 5:5; anal setae formula 3:3 ..... *lateralli* Fain (Figs. 631-636)

3.(2) Coxal setae formula 2-1-1-1; sternal setae formula 3:3 ..... *colymbiformi* Clark (Figs. 637-642)
Coxal setae formula 2-1-1-0; sternal setae formula 2:2 ..... *philomachi* Fain (Figs. 643-648)

Boydaia

Key to Species (Females)

1. Coxal setae formula 2-1-1-1 ..... *sturni* Boyd (Figs. 649-654)
Coxal setae formula otherwise 2

2.(1) External setae on coxa I minute 3
External setae on coxa I normal 4

3.(2) Two and one setae on dorsolateral margins of tibia I and genu I, respectively, large and swollen, of type Bf, or similar; femur I with five setae ..... *psalidoprocnei* Fain (Figs. 655-660)
Large swollen setae of type Bf, or similar, absent from tibia I and genu I; femur I with six setae ..... *hirundoae* Fain (Figs. 661-666)

4.(3) Coxal setae formula 1-1-2-1 ..... *tyrannus* Ford (Figs. 667-672)
Coxal setae formula otherwise 5

5.(4) Coxal setae formula 2-1-2-0 ..... *agelaii* Fain and Aitken (673-678)
Coxal setae formula 2-1-1-0 6

6.(5) Trochanter setae formula 0-0-0-0 ..... *nigra* group (*nigra* and *sturnellae* differentiated only in larval stage) (Figs. 679-684)
Trochanter setae formula otherwise 7

7.(6) Femoral setae formula 6-4-3-3 ..... *colini* group (*colini* and *clarki* differentiated only in larval stage) (Figs. 685-690)
Femoral setae formula otherwise 8

8.(7) All claws terminating in fine pinpoint endings . . . . . *spatulata* group (*spatulata*, *quiscali*, and *mimi* differentiated only in larval stage) (Figs. 691-696)
Certain claws with relatively fine but rounded apex 9

9.(8) Claws on tarsi II to IV considerably dilated in apical part . . . . . *loxiae* Fain (Figs. 699-702)
Claws of tarsi II to IV with rounded apex but without dilation in apical part 10

10.(9) Sensillae short, distal end inflated to considerably larger diameter than proximal end; palps well developed, tibia twice as long as tarsus . . . . . *rosickyi* Černý and Dusbábek (Figs. 703-704)
Sensillae slender, not markedly inflated at distal end; palps otherwise 11

11.(10) Palp tarsus very short, stubby; sensillae long, slender, slightly larger in diameter at distal end than in proximal end (about 36 microns long) . . . . *faini* Černý and Dusbábek (Figs. 705-706)
Palp tarsus longer, more pronounced; sensillae shorter, slender, not inflated at tip (about 30 microns long) . . . . . *americana* Fain (Figs. 707-708)

Key to Species of nigra *group (Larvae)*

Setiated pluvillus on tarsi absent . . . . . *nigra* Fain (Fig. 716)
Small setiated pluvillus present on tarsi . . *sturnellae* Clark (Fig. 715)

Key to Species of colini *group (Larvae)*

Tarsus II very long with a single long claw . . . . *colini* Clark (Fig. 713)
Tarsus II shorter with two unequal claws . . . *clarki* Fain (Fig. 714)

Key to Species of spatulata *group (Larvae)*

1. Claws of tarsus I of approximately equal length; one terminating in small recurved pinpoint ending, the other with apical extremity curved at a right angle and terminating in a small club . . . . . *jordani* Van Eyndhoven (Fig. 710)
Claws of tarsus I otherwise 2

2.(1) One long recurved claw less than 1/2 (usually about 1/3) length of second claw and curved ventrally downward on tarsus II . . . . . *quiscali* Clark (Fig. 712)
Claws of tarsus II of equal or subequal length 3

3.(2) Claws of tarsus II only very slightly curved (not recurved), thick and heavy, both ending in sharp tips (not pinpoint) . . . . . *mimi* Fain and Hyland (Fig. 711)
Claws of tarsus II otherwise; at least 1 claw ending in a pinpoint tip and very recurved . . . . . *spatulata* Fain (Fig. 709)

Ophthalmophagus

Key to Species (Females)

Anal setae formula 2:2; 1 seta on palp tibia .....
..... *striatus* Crossley (Figs. 717-722)
Anal setae formula 1:1; no setae on palp tibia .....
..... *womersley* Fain (Figs. 723-728)

Species and Host List

Mite species	Host(s)	Locality	Reference
	Rhinonyssinae (Dermanyssidae)		
Rhinonyssus			
R. alberti	*Colymbus caspicus*	Washington	Strandtmann, 1956*a*
R. caledonicus	*Cerorhincha monocerata*	Washington	Strandtmann, 1956*a*
	**Uria grylle*	Shetland Isls.	Hirst, 1921
R. colymbicola	**Podiceps auritus*	Belgium	Fain and Bafort, 1963
R. coniventris	*Arenaria interpres*	Texas, Cuba	Strandtmann, 1951 Černý and Dusbábek, 1970
	Arquatella ptilocenemis	Alaska	Strandtmann, 1956*a*
	Catoptrophorus semipalmatus	Texas, Louisiana	Strandtmann, 1951 Pence, 1972*a*
	Charadrius alexandrinus	Florida	Strandtmann, 1956*a*
	Charadrius hiaticula	Texas	Strandtmann, 1951
	Charadrius melodus	Texas, Cuba	Strandtmann, 1951 Černý and Dusbábek, 1970
	Charadrius wilsoni	Texas, Cuba, Louisiana	Strandtmann, 1951 Černý and Dusbábek, 1970 Pence, 1972*a*
	Erolia alpina	Texas	Strandtmann, 1956*a*
	**Erolia maritima*	Shetland Isls.	Hirst, 1921
	Totanus flavipes	Texas, Louisiana	Strandtmann, 1951 Pence, 1972*a*
R. himantopus	*Himantopus mexicanus*	Texas, Cuba, Louisiana	Strandtmann, 1951 Černý and Dusbábek, 1970 Pence, 1972*a*
	Recurvirostra americana	Texas	Strandtmann, 1959
R. pluvialis	*Pluvialis dominica*	Ohio	Fain and Johnston, 1966
R. podilymbi	*Podilymbus podiceps*	Louisiana	Pence, 1972*a*
R. rhinolethrum	*Anas acuta*	Texas	Strandtmann, 1951 Mitchell and Rhodes, 1960
	Anas carolinensis	California, Texas	Strandtmann, 1951 Mitchell and Rhodes, 1960 Wilson, 1968
	Anas discors	Texas	Mitchell and Rhodes, 1960
	Anas platyrhynchos	Texas, Louisiana	Strandtmann, 1951 Pence, 1972*a* Mitchell and Rhodes, 1960
	Anas strepera	Texas	Strandtmann, 1951

*Collected from locality other than North America.

	Aix sponsa	Louisiana	Pence, 1972*a*
	Aythya affinis	Texas	Strandtmann, 1951
	Aythya valisineria	Texas	Mitchell and Rhodes, 1960
	Mareca americana	Texas	Strandtmann, 1951 Mitchell and Rhodes, 1960
	Melanitta deglandi	Washington	Strandtmann, 1956*a*
	Mergus serrator	Texas	Mitchell and Rhodes, 1960
	Spatula clypeata	Texas, California	Strandtmann, 1951 Mitchell and Rhodes, 1960 Wilson, 1966
	Branta canadensis	Texas	Strandtmann, 1951 Mitchell and Rhodes, 1960
	Chen caerulescens	Texas	Mitchell and Rhodes, 1960
	Chen rossi	Texas	Mitchell and Rhodes, 1960
	Fulica americana	Louisiana	Pence, 1972*a*
R. spinactitis	**Actitis macularia*	Cuba	Dusbábek and Černý, 1969
R. strandtmanni	*Charadrius vociferus*	Texas, Ohio, Louisiana	Strandtmann, 1959 Fain and Johnston, 1966 Pence, 1972*a*
R. waterstoni	**Alca torda*	Shetland Isls.	Hirst, 1921
Rallinyssus			
R. caudistigmus	*Fulica americana*	Texas, Louisiana	Strandtmann, 1948 Pence, 1972*a*
	Rallus elegans	Texas	Strandtmann, 1948
R. verheyeni	*Rallus elegans*	Louisiana	Pence, 1972*a*
	Rallus limicola	Louisiana	Pence, 1972*a*
Larinyssus			
L. orbicularis	*Larus argentatus*	Texas, Louisiana	Strandtmann, 1948 Pence, 1972*a*
	Larus atricilla	Texas, Cuba, Louisiana	Strandtmann, 1948 Pence, 1972*a* Černý and Dusbábek, 1970
	Larus delawarensis	Texas, Louisiana	Strandtmann, 1948 Pence, 1972*a*
	Sterna hirundo	Louisiana	Pence, 1972*a*
	Sterna maxima	Texas	Strandtmann, 1948
	Rynchops nigra	Cuba	Černý and Dusbábek, 1970
Tinaminyssus			
T. belopolskii	*Butorides virescens*	Cuba, Louisiana	Černý and Dusbábek, 1970 Pence, 1972*a*
	Florida caerulea	Cuba, Louisiana	Černý and Dusbábek, 1970 Pence, 1972*a*
	Leucophoyx thula	Cuba, Louisiana	Černý and Dusbábek, 1970 Pence, 1972*a*
	Hydranassa tricolor	Texas, Louisiana	Strandtmann, 1956*b* Pence, 1972*a*
T. bubulci	*Bubulcus ibis*	Cuba, Louisiana	Černý and Dusbábek, 1970 Pence, 1972*a*
T. carapachibeyus	**Geotrygon chrysia*	Cuba	Dusbábek and Černý, 1969
T. columbae	*Columba livia*	Alabama, Georgia, Kentucky	Crossley, 1951 Crossley, 1952 Wilson, 1966
T. geotrygoni	**Geotrygon chrysia*	Cuba	Dusbábek, 1969
T. ixoreus	*Ixoreus naevius*	Montana	Strandtmann and Clifford, 1962

T. melloi	*Columba livia*	Texas,	Crossley, 1950
		Kentucky	Crossley, 1951
			Wilson, 1966
T. neoixobrychi	*Ixobrychus exilis*	Louisiana	Pence, 1972*a*
T. triangulus	*Zenaida asiatica*	Texas	Strandtmann, 1961
T. zenaidurae	*Columbigallina passerina*	Texas	Crossley, 1952
	Zenaidura macroura	Texas, Georgia,	Crossley, 1952
		Alabama,	Owen, 1958
		Mississippi,	Wilson, 1968
		California,	Pence, 1973*b*
		Louisiana	
Rhinoecius			
R. bisetosus	*Speotyto cunicularia*	Texas	Strandtmann, 1952
R. cooremani	*Strix varia*	Texas,	Strandtmann, 1952
		Louisiana	Pence, 1973*b*
R. grandis	*Bubo virginianus*	Texas	Strandtmann, 1952
R. oti	**Asio otus*	Belgium	Correman, 1946
R. tytonis	**Tyto alba*	Africa	Fain, 1957
			Fain, 1960
Sternostoma			
S. boydi	*Arenaria interpres*	Texas	Strandtmann, 1951
	Crocethia alba	Texas	Strandtmann, 1951
	Totanus melanoleucus	Louisiana	Pence, 1972*c*
	Larus argentatus	Louisiana	Pence, 1972*c*
	Larus atricilla	Texas,	Strandtmann, 1951
		Louisiana	Pence, 1972*c*
	Larus delawarensis	Texas,	Strandtmann, 1951
		Louisiana	Pence, 1972*c*
	Sterna hirundo	Louisiana	Pence, 1972*c*
S. crypto-rhynchum	**Passer domesticus*	Europe	Furman, 1957
S. dumetellae	*Dumetella carolinensis*	Louisiana	Pence, 1972*c*
S. hirundinis	*Bombycilla cedrorum*	Louisiana	Pence, 1973*b*
	Hirundo rustica	Louisiana,	Pence, 1972*c*
		Cuba	Černý and Dusbábek, 1970
	Progne subis	Louisiana	Pence, 1972
S. hutsoni	*Hylocichla ustulata*	California	Furman, 1957
S. hylandi	*Dendrocopos pubescens*	Ohio	Fain and Johnston, 1966
S. kelloggi	*Dumetella carolinensis*	Michigan	Hyland and Clark, 1959
	Mimus polyglottos	Cuba	Černý and Dusbábek, 1970
	Toxostoma rufum	Louisiana	Pence, 1972*c*
S. lanorium	**Lanius excubitor*	Africa, Europe	Fain, 1956
			Fain, 1957
			Feider and Mironescu, 1969
	Lanius ludovicianus	Louisiana	Pence, 1973*c*
S. longisetosae	**Empidonax alnorum*	Mexico	Hyland and Moorehouse, 1970
	**Empidonax trailli*	Mexico	Hyland and Moorehouse, 1970
	**Empidonax virescens*	Mexico	Hyland and Moorehouse, 1970
	**Pyrocephalus rubinus*	Mexico	Hyland and Moorehouse, 1970
	Tyrannus tyrannus	Michigan	Hyland, 1961

S. loxiae	**Loxia curvirostra*	Belgium	Fain, 1966
S. motacillae	*Anthus spinoletta*	Louisiana	Pence, 1972*c*
S. pirangae	*Piranga rubra*	Louisiana	Pence, 1973*c*
S. porteri	*Colaptes auratus*	Michigan, Ohio, Louisiana	Hyland, 1962 Fain and Johnston, 1966 Pence, 1972*c*
S. sialiphilus	*Sialia sialis*	Michigan, Louisiana	Hyland and Ford, 1961 Pence, 1972*c*
S. spatulatum	*Hylocichla guttata*	Louisiana	Pence, 1972*c*
	Hylocichla ustulata	California	Furman, 1957
S. strandtmanni	*Agelaius phoeniceus*	California	Furman, 1957
	Agelaius tricolor	California	Furman, 1957
	Cassidix mexicanus	Louisiana	Pence, 1972*c*
	Molothrus ater	California	Furman, 1957
	Quiscalus quiscula	Louisiana	Pence, 1972*c*
S. technaui	*Turdus migratorius*	Louisiana	Pence, 1972*c*
S. trachaecolum	*Melospiza melodia*	Michigan	Fain and Hyland, 1962
	Passerina cyanea	Michigan	Fain and Hyland, 1962
	Passer domesticus	Michigan	Fain and Hyland, 1962
	Passerella iliaca	Massachusetts	Fain and Hyland, 1962
	Pooecetes gramineus	Michigan	Fain and Hyland, 1962
	Spizella pusilla	Michigan	Fain and Hyland, 1962
	Seiurus aurocapillus	Massachusetts	Fain and Hyland, 1962
	Seiurus noveboracensis	Massachusetts	Fain and Hyland, 1962
	**Hirundo rustica*	Russia	Černý, 1969
	Iridoprocne bicolor	Louisiana	Pence, 1972*c*
	Riparia riparia	Michigan	Fain and Hyland, 1962
	Myiarchus crinitus	Louisiana	Pence, 1972*c*
	Agelaius tricolor	California	Furman, 1957
	Icterus bullocki	California	Furman, 1957
	Molothrus ater	Rhode Island, Louisiana	Fain and Hyland, 1962 Pence, 1972*c*
	Sturnella magna	Michigan	Fain and Hyland, 1962
S. tyrannus	*Nuttallornis borealis*	Texas	Brooks and Strandtmann, 1960
Sternostoma sp.	*Thalasseus sandvicensis*	Cuba	Černý and Dusbábek, 1970
Ptilonyssus			
P. acrocephali	*Regalus calendula*	Louisiana	Pence, 1972*e*
P. agelaii	*Agelaius phoeniceus*	Louisiana	Pence, 1972*e*
	Molothrus ater	Louisiana	Pence, 1972*e*
P. angrensis	*Iridoprocne bicolor*	Texas	Strandtmann and Wharton, 1958
	Petrochelidon fluva	Texas	Strandtmann and Wharton, 1958
	Petrochelidon pyrrhonota	Texas	Strandtmann and Wharton, 1958
	Progne subis	Texas, Louisiana	Strandtmann and Wharton, 1958 Pence, 1972*d*
P. bombycillae	*Bombycilla cedrorum*	Louisiana	Pence, 1973*b*
P. callinectoides	*Myiarchus cinerascens*	Texas	Brooks and Strandtmann, 1960
	Myiarchus cinitus	Louisiana	Pence, 1972*d*
P. capitatus	*Octocoris alpestris*	Utah	Strandtmann, 1956*b*
P. cerchneis	*Falco sparverius*	Colorado	Strandtmann, 1961

P. corvi	*Corvus brachyrhynchos*	Louisiana	Pence, 1972*d*
P. donatoi	**Coragyps atratus*	Brazil	Fain and Johnston, 1966
P. echinatus	*Iridoprocne bicolor*	Texas	Strandtmann and Wharton, 1958
	Hirundo rustica	Texas, Florida, Louisiana	Strandtmann and Wharton, 1958.
			George, 1961
			Pence, 1972*c*
	Petrochelidon pyrrhonota	Texas	Strandtmann and Wharton, 1958
	Riparia riparia	Texas, Kansas	George, 1961
			Strandtmann and Wharton, 1958
P. euroturdi	*Dumetella carolinensis*	Michigan, Louisiana	Fain and Hyland, 1963
			Pence, 1972*e*
	Hylocichla mustelina	Louisiana	Pence, 1972*e*
P. fluvicolae	**Pyrocephalus rubinus*	Mexico	Hyland and Moorehouse, 1970
P. hoseini	*Vireo griseus*	Louisiana	Pence, 1972*d*
P. hirsti	*Passer domesticus*	Texas, Cuba	Strandtmann and Furman, 1956
			Černý and Dusbábek, 1970
P. icteridius	*Agelaius phoeniceus*	California, Texas	Strandtmann and Furman, 1956
	Euphagus carolinus	Louisiana	Pence, 1972*d*
	Euphagus cyanocephalus	Texas, Louisiana	Strandtmann and Furman, 1956
			Pence, 1972*d*
	Icterus galbula	Louisiana	Pence, 1972*d*
	Molothrus ater	California, Texas, Louisiana	Strandtmann and Furman, 1956
			Pence, 1972*d*
	Quiscalus quiscula	Texas, Louisiana	Strandtmann and Furman, 1956
			Pence, 1972*d*
	Sturnella magna	Texas, Louisiana	Strandtmann and Furman, 1956
			Pence, 1972*d*
	Xanthocephalus xanthocephalus	California	Strandtmann and Furman, 1956
	Piranga ludoviciana	California	Strandtmann and Furman, 1956
P. japuibensis	*Amphispiza bilineata*	Texas	George, 1961
	Calamospiza melanocorys	Texas	George, 1961
	Chondestes grammacus	Texas	George, 1961
	Melospiza georgiana	Louisiana	Pence, 1972*e*
	Melospiza lincolnii	Texas	George, 1961
	Passerina cyanea	Texas	George, 1961
	Passerculus sandwichensis	Texas	George, 1961
	Pipilo erythrophthalmus	Texas	George, 1961
		Louisiana	Pence, 1972*e*
	Pipilo fuscus	Texas	George, 1961

	Pooecetes gramineus	Texas	George, 1961
	Spizella passerina	British Columbia, Texas	George, 1961
	Spizella pusilla	Louisiana	Pence, 1972*e*
	Zonotrichia albicollis	Louisiana	Pence, 1972*e*
P. lanii	*Lanius ludovicianus*	Texas	George, 1961
P. ludovicianus	**Pheucticus ludovicianus*	Cuba	Černý, 1969
P. mimi	*Mimus polyglottos*	Texas,	George, 1961
		Louisiana	Pence, 1972*e*
P. morofskyi	*Ammospiza maritima*	Louisiana	Pence, 1972*d*
	Junco hyemalis	Rhode Island	Hyland, 1962
	Melospiza georgiana	Louisiana	Pence, 1972*d*
	Melospiza melodia	Michigan, Massachusetts, Rhode Island	Hyland, 1962
	Passerella iliaca	Rhode Island	Hyland, 1962
	Passerculus sandwichensis	Rhode Island	Hyland, 1962
	Pipilo erythrophthalmus	Louisiana	Pence, 1972*d*
	Pooecetes gramineus	Michigan,	Pence, 1972*d*
		Louisiana	Pence, 1972*d*
	Spinus tristus	Michigan	Hyland, 1962
	Spizella pusilla	Nebraska	Hyland, 1962
	Zonotrichia albicollis	Louisiana	Pence, 1972*d*
	Dendroica coronata	Louisiana	Pence, 1972*d*
	Dendroica pinus	Louisiana	Pence, 1972*d*
	Geothlypis trichas	Louisiana	Pence, 1972*d*
	Seiurus motacilla	Louisiana	Pence, 1972*d*
P. motacillae	*Anthus spinoletta*	Louisiana	Pence, 1972*e*
P. nitzschi	*Caprimulgus carolinensis*	Louisiana	Pence, 1972*e*
P. nudus	*Passer domesticus*	Texas	Porter and Strandtmann, 1952
	Parus atricapillus	Texas	George, 1961
			Strandtmann and Wharton, 1958
	Hirundo rustica	?U.S.A.	Strandtmann and Wharton, 1958
	Riparia riparia	?U.S.A.	Strandtmann and Wharton, 1958
	Sturnus vulgaris	?U.S.A.	Strandtmann and Wharton, 1958
P. ohioensis	*Cathartes aura*	Ohio	Fain and Johnston, 1966
P. pari	*Parus atricapillus*	Michigan, Massachusetts, Rhode Island	Fain and Hyland, 1963
	Parus carolinensis	Louisiana	Pence, 1972*d*
P. persorei	*Cyanocitta stelleri*	New Mexico	George, 1961
	Perisoreus canadensis	New Mexico	George, 1961
P. pirangae	*Piranga rubra*	Louisiana	Pence, 1972*d*
	Parus bicolor	Louisiana	Pence, 1972*d*
P. phainopeplae	*Phainopepla nitens*	Texas	George, 1961
P. richmondinae	*Richmondena cardinalis*	Texas, Kansas, Georgia, Louisiana	George, 1961 Pence, 1972*d*
P. sairae	*Dendroica auduboni*	Texas	George, 1961

	Dendroica cerulea	Cuba	Černý and Dusbábek, 1970
	Dendroica coronata	North Carolina,	George, 1961
		Louisiana,	Pence, 1972*e*
		Michigan	Ford, 1961
	Dendroica dominica	Cuba	Černý and Dusbábek, 1970
	Dendroica magnolia	Louisiana	Pence, 1972*e*
	Dendroica petechia	Cuba	Černý and Dusbábek, 1970
	Dendroica pinus	Georgia,	George, 1961
		Louisiana	Pence, 1972*e*
	Dendroica tigrina	Cuba	Černý and Dusbábek, 1970
	Dendroica virens	Cuba	Černý and Dusbábek, 1970
	Dolichonyx oryzivorus	Michigan	Ford, 1961
	Mniotilta varia	Texas,	George, 1961
		Louisiana	Pence, 1972*e*
	Oporornis tolmiei	California	George, 1961
	Parula americana	Louisiana,	Pence, 1972*e*
		Cuba	Černý and Dusbábek, 1970
	Piranga rubra	Louisiana	Pence, 1972*e*
	Pooecetes gramineus	Michigan	Ford, 1961
	Prothonotaria citrea	Louisiana	Pence, 1972*e*
	Setophaga ruticilla	Louisiana	Pence, 1972*e*
	Vermivora chrysopteia	Cuba	Černý and Dusbábek, 1970
	Wilsonia citrina	Texas	George, 1961
	Wilsonia pusilla	Texas	George, 1961
	Empidonax flaviventris	Louisiana	Pence, 1972*e*
	Parus carolinensis	Louisiana	Pence, 1972*e*
P. salpinctis	*Salpinctes obsoletus*	Texas	George, 1961
P. sialiae	*Sialia currucoides*	Texas	George, 1961
P. spinosus	*Muscivora forficata*	Texas	Brooks and Strandtmann, 1960
	Tyrannus dominicensis	Texas	Brooks and Strandtmann, 1960
	Tyrannus tyrannus	Texas,	Brooks and Strandtmann, 1960
		Michigan	Hyland, 1961
	Tyrannus verticalis	Texas	Brooks and Strandtmann, 1960
P. tachycinetae	*Iridoprocne bicolor*	Florida	George, 1961
P. thryothori	*Thryothorus ludovicianus*	Louisiana	Pence, 1972*e*
P. toxostomae	*Toxostoma rufum*	Louisiana	Pence, 1972*e*
P. troglodyti	**Troglodytis troglodytis*	Belgium	Fain, 1964
P. tyrannus	*Contopus sordidulus*	Texas	Brooks and Strandtmann, 1960
	Contopus virens	Louisiana	Pence, 1972*d*
	**Empidonax alnorum*	Mexico	Hyland and Moorehouse, 1970
	**Empidonax flaviventris*	Mexico	Hyland and Moorehouse, 1970
	**Empidonax trailli*	Mexico	Hyland and Moorehouse, 1970
	Empidonax mimimus	Texas	Brooks and Strandtmann, 1960
	Empidonax virescens	Louisiana	Pence, 1972*d*
	Sayornis phoebe	Louisiana	Pence, 1972*d*

	Sayornis sayi	Texas	Brooks and Strandtmann, 1960
	Nuttallornis borealis	Texas	Brooks and Strandtmann, 1960
P. vireonis	* *Vireo falvifrons*	Cuba	Dusbábek, 1969
	Vireo olivaeus	Louisiana	Pence, 1972*d*
Ptilonyssus sp.	*Archilochus colubris*	Louisiana	Pence, 1972*d*

Turbinoptinae (Epidermoptidae)

Colinoptes			
C. cubanensis	*Colinus virginianus*	Louisiana,	Pence, 1972*f*
		Cuba	Fain, 1960
Schoutedenocoptes			
S. americanus	*Coccyzus erythropthalmus*	Michigan	Fain and Hyland, 1967
	Coccyzus americanus	Louisiana	Pence, 1972*f*
Turbinoptes			
T. strandtmanni	*Hydroprogne caspia*	Louisiana	Pence, 1972*f*
	Larus argentatus	Louisiana	Pence, 1972*f*
	Larus atricilla	Louisiana	Pence, 1972*f*
	Larus delawarensis	Massachusetts,	Boyd, 1949
		Louisiana	Pence, 1972*f*
Congocoptes			
C. dryocopi	*Dryocopus pileatus*	Louisiana	Pence, 1972*f*
C. furmani	*Centurus carolinus*	Louisiana	Pence, 1972*f*
C. sphyrapicicola	*Sphyrapicus varius*	Louisiana	Pence, 1972*f*
Congocoptes sp.	*Dendrocopos pubescens*	Louisiana	Pence, 1972*f*

Cytoditidae

Cytodites			
C. therae	*Coccyzus americanus*	Louisiana	Pence, 1973*b*
Cytonyssus			
C. troglodyti	*Thryothorus ludovicianus*	Louisiana	Pence, 1972*b*
			Pence, 1972*f*

Speleognathinae (Ereynetidae)

Neoboydaia			
N. aureliani	* *Tyto alba*	Africa, Belgium	Fain, 1955
			Fain, 1963
N. colymbiformi	*Colymbus nigricollis*	California	Clark, 1964
	Podilymbus podiceps	Louisiana	Pence, 1973*a*
N. lateralli	*Fulica americana*	Louisiana	Pence, 1973*a*
N. philomachi	*Capella gallinago*	Louisiana	Pence, 1973*a*
	Erolia minutilla	Louisiana	Pence, 1973*a*
	Limnodromus scolapaceus	Louisiana	Pence, 1973*a*
	Erolia melanotos	Texas	Clark, 1964
	Totanus flavipes	Texas,	Clark, 1964
		Louisiana	Pence, 1973*a*
	Totanus melanoleucus	Texas,	Clark, 1964
		Louisiana	Pence, 1973*a*
Neoboydaia sp.	*Tyto alba*	Cuba	Černý and Dusbábek, 1970
Boydaia			
B. americana	* *Piranga rubra*	South America	Fain, 1963

B. agelaii	*Agelaius phoeniceus*	Delaware	Fain and Aitken, 1967
B. clarki	**Callipepla squamata*	Belgium	Fain, 1963
B. colini	*Colinus virginianus*	Maryland,	Clark, 1958
		Louisiana	Pence, 1973*a*
B. faini	*Dendroica cerulea*	Cuba	Dusbábek and Černý, 1969
B. hirundoae	*Hirundo rustica*	Louisiana	Pence, 1973*a*
	**Progne subis*	Mexico	Fain and Hyland, 1970
B. jordani	*Turdus migratorius*	Montana	Clark, 1967
B. loxiae	**Loxia curvirostra*	Belgium	Fain, 1963
B. mimi	*Mimus polyglottos*	Louisiana	Pence, 1973*a*
B. nigra	*Anthus spinoletta*	Louisiana	Pence, 1973*a*
	Passer domesticus	Texas	Fain, 1963
B. psalidoprocnei	*Iridoprocne bicolor*	Louisiana	Pence, 1973*a*
B. quiscali	*Agelaius phoeniceus*	Louisiana	Pence, 1973*a*
	Cassidix mexicanus	Louisiana	Pence, 1973*a*
	Molothrus ater	Louisiana	Pence, 1973*a*
	Quiscalus quiscala	Pennsylvania,	Clark, 1960
		Louisiana	Pence, 1973*a*
B. rosickyi	*Passerina cyanea*	Cuba	Černý and Dusbábek, 1970
B. spatulata	**Piranga rubra*	Brazil	Fain, 1963
	Sialia sialis	Louisiana	Pence, 1973*c*
B. sturnellae	*Sturnella magna*	Maryland	Clark, 1960
B. sturni	*Sturnus vulgaris*	Massachusetts,	Boyd, 1948
		Louisiana	Pence, 1973*a*
	Passer domesticus	Texas	Porter and Strandtmann, 1952
B. tyrannus	*Tryannus dominicensis*	Cuba	Dusbábek and Černý, 1969
	Tyrannus tyrannus	Michigan	Ford, 1959
	Tyrannus verticalis	Texas	Brooks and Strandtmann, 1960
Opthalmophagus			
O. striatus	*Columba livia*	Texas	Crossley, 1951
			Crossley, 1952
O. womersleyi	*Anas acuta*	Minnesota,	Clark, 1958
		Texas	
	Anas strepera	Texas	Clark, 1958
	Aythya affinis	Texas	Clark, 1958
Astrida			
A. caprimulgi	*Caprimulgus carolinensis*	Louisiana	Pence, 1973*c*
A. coccyzae	*Coccyzus americanus*	Louisiana	Pence, 1973*a*

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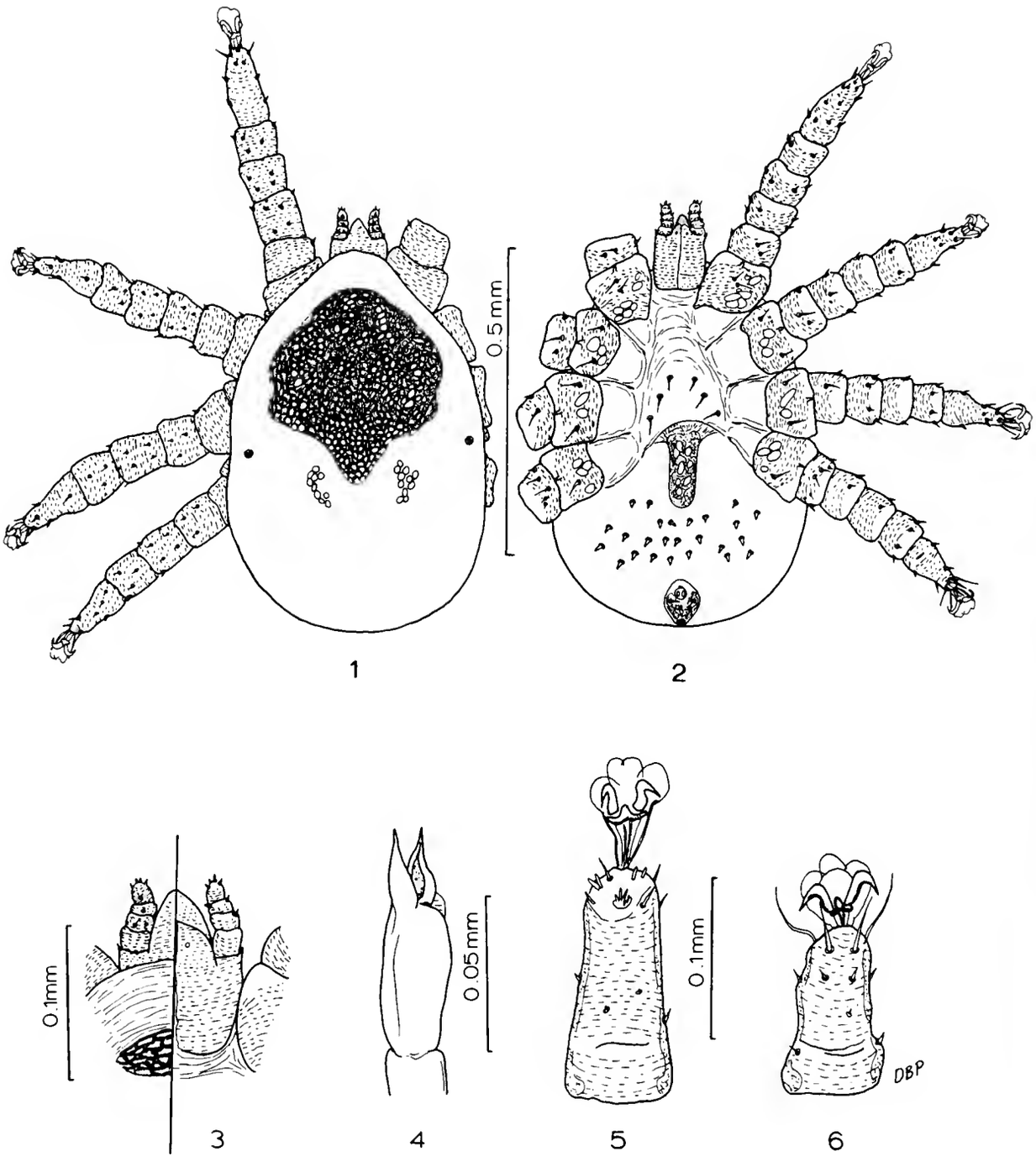
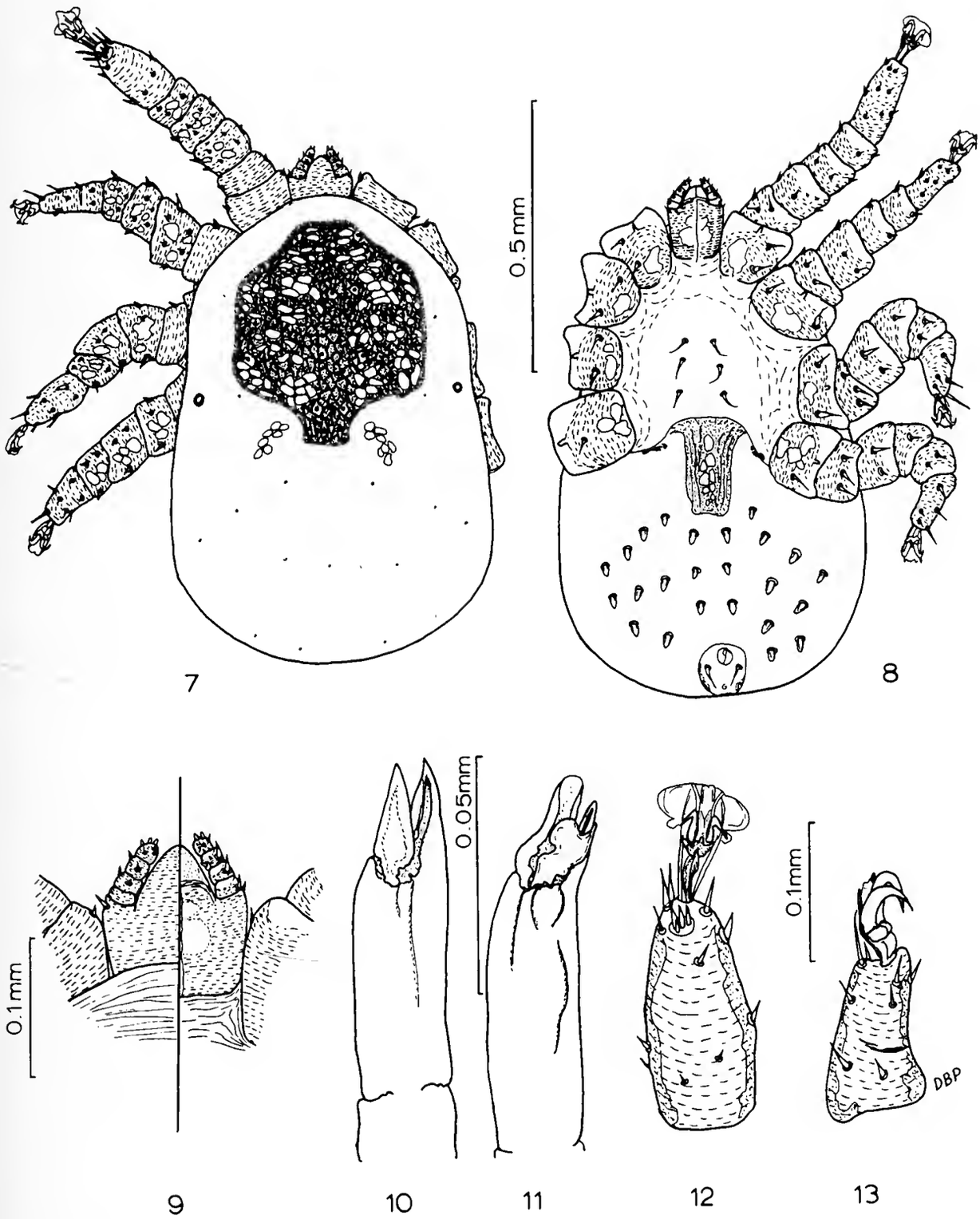
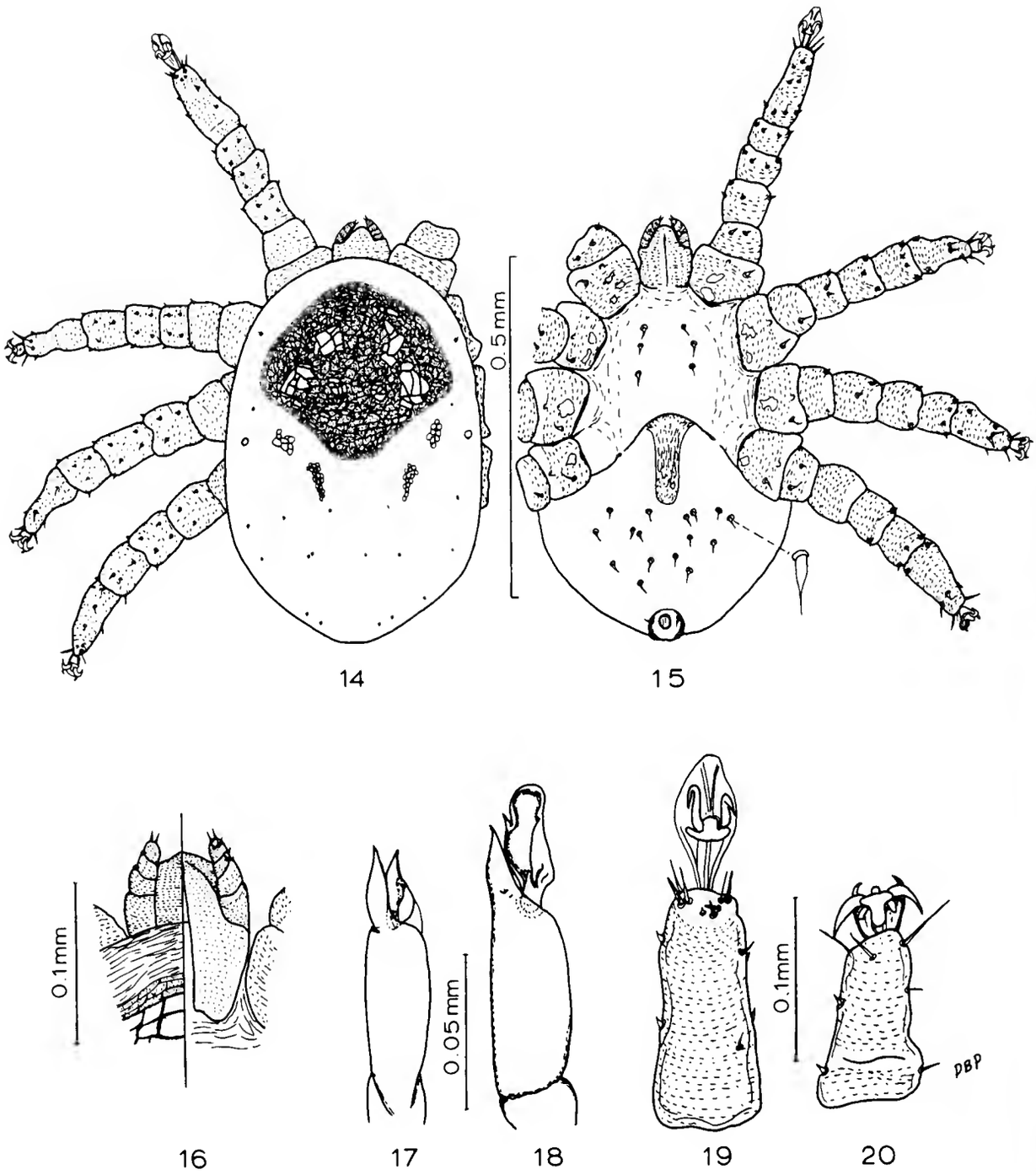


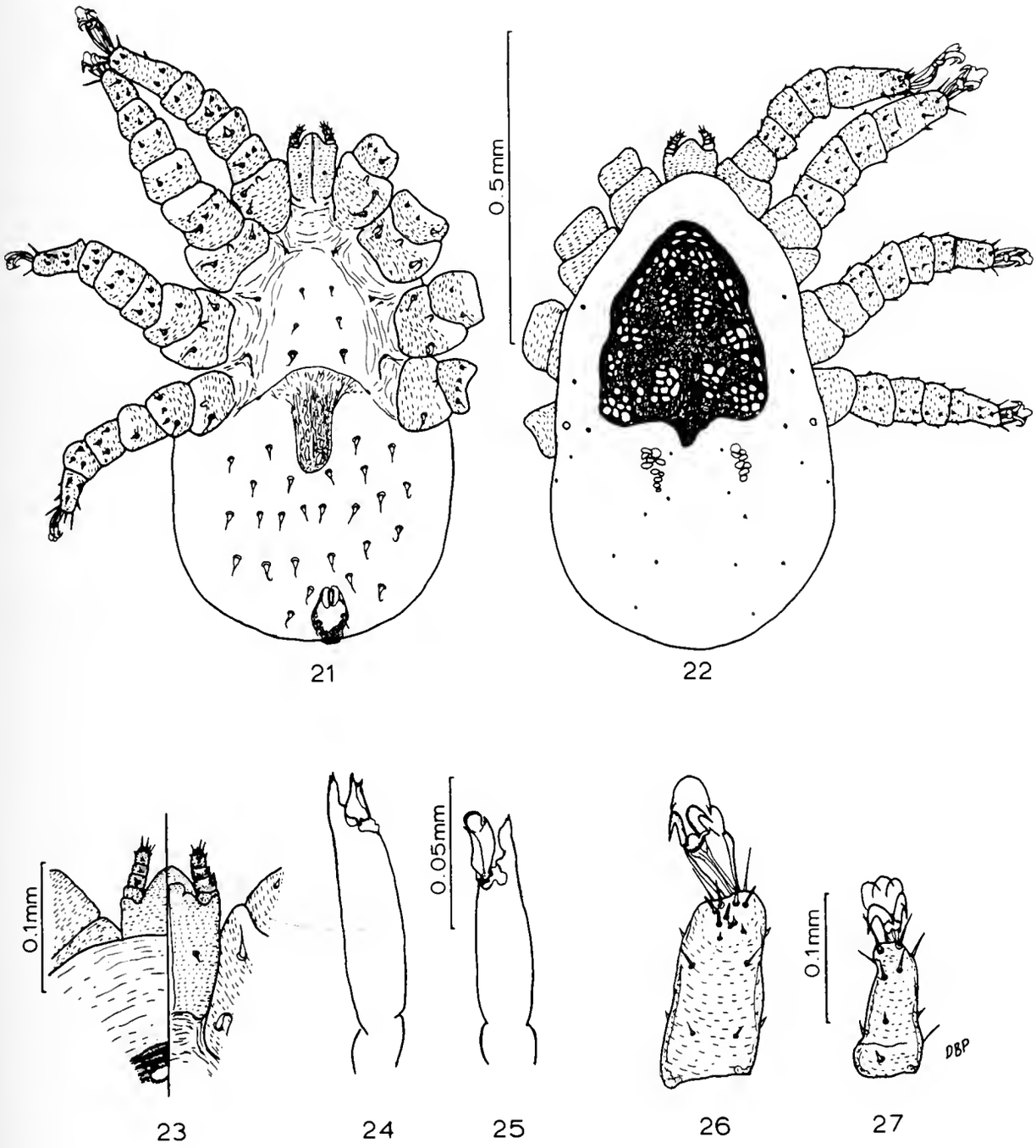
FIGS. 1-6.—*Rhinonyssus colymbicola* Fain and Bafort: 1, female dorsum; 2, female venter; 3, gnathosoma, dorsal and ventral views, respectively; 4, female chelicera; 5, tarsus I, dorsal view; 6, tarsus IV, ventral view.



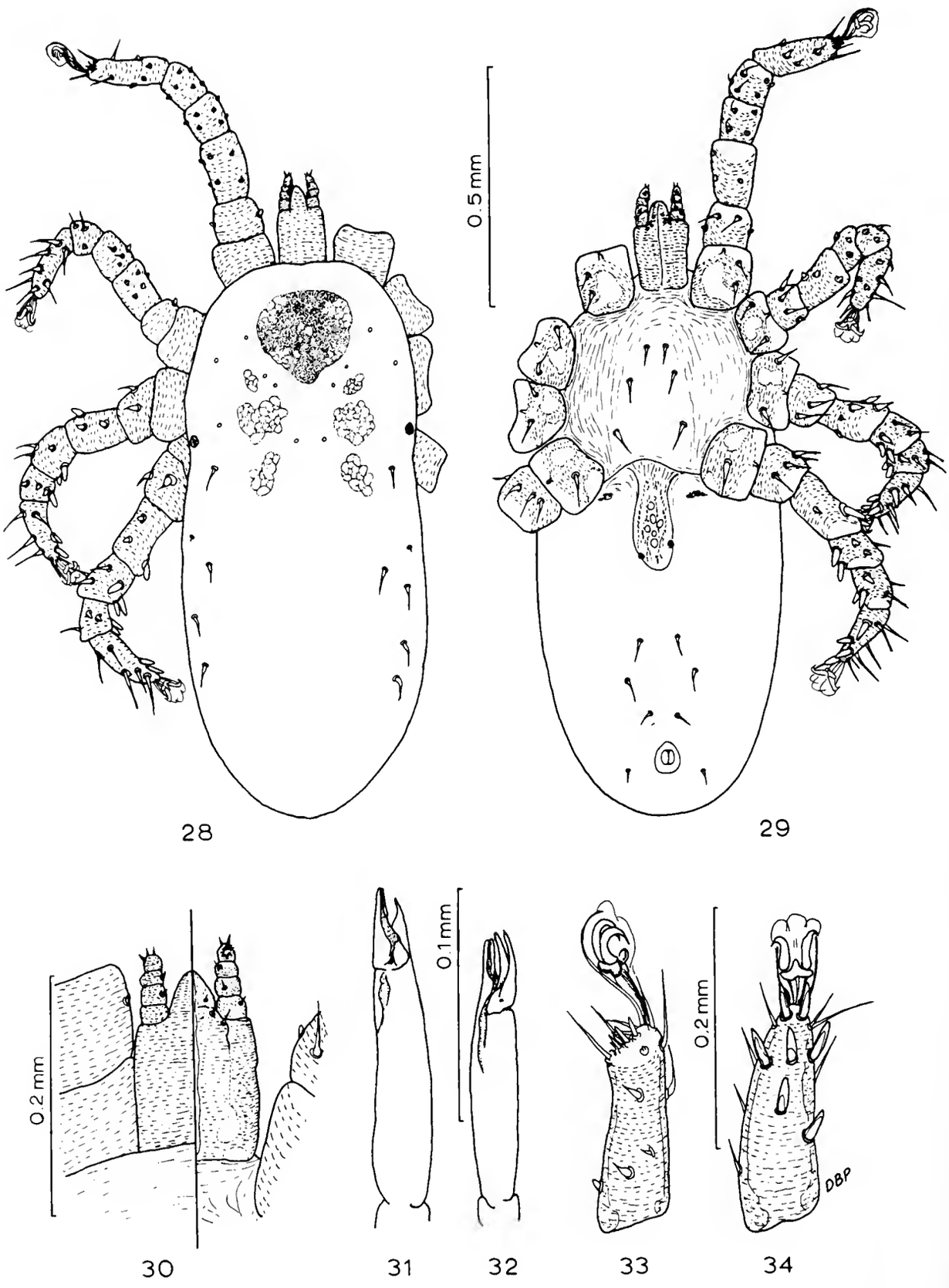
FIGS. 7-13.—*Rhinonyssus alberti* Strandtmann: 7, female dorsum; 8, female venter; 9, gnathosoma, dorsal and ventral views, respectively; 10, female chelicera; 11, male chelicera; 12, tarsus I, dorsal view; 13, tarsus IV, ventral view.



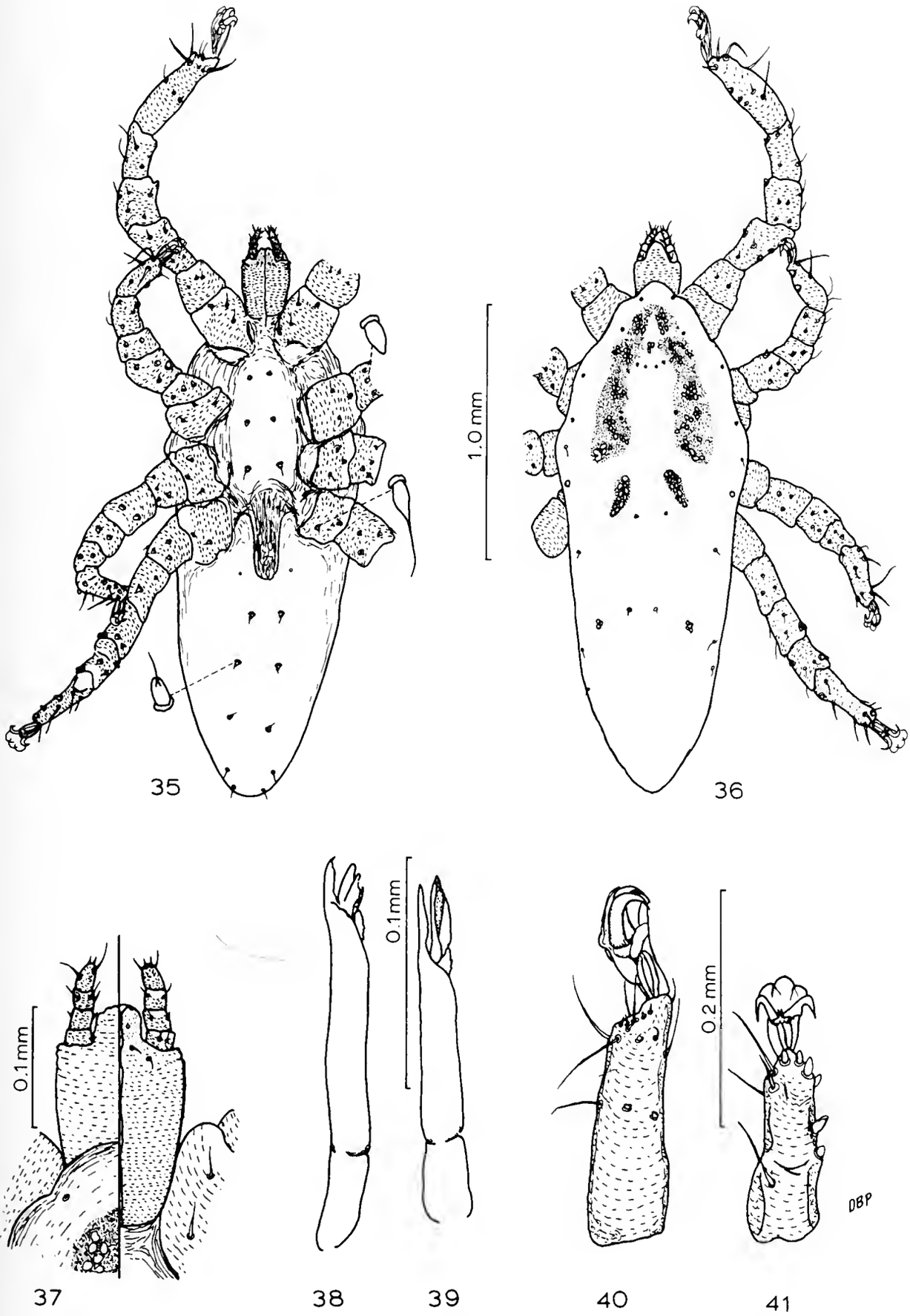
FIGS. 14-20.—*Rhinonyssus podilymbi* Pence: 14, female dorsum; 15, female venter; 16, gnathosoma, dorsal and ventral views, respectively; 17, female chelicera; 18, male chelicera; 19, tarsus I, dorsal view; 20, tarsus IV, ventral view.



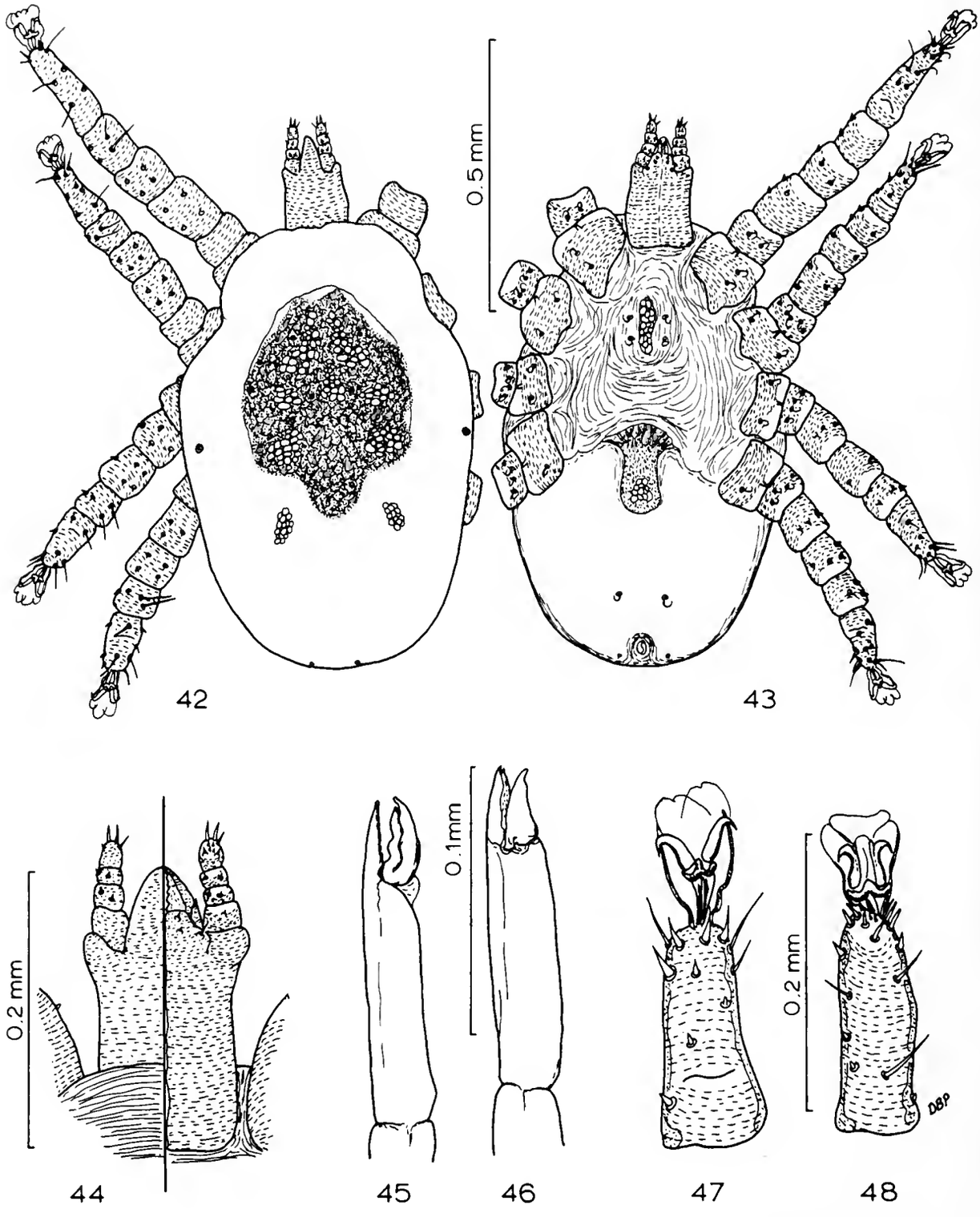
FIGS. 21-27.—*Rhinonyssus rhinolethrum* Berlese and Trouessart: 21, female venter; 22, female dorsum; 23, gnathosoma, dorsal and ventral views, respectively; 24, female chelicera; 25, male chelicera; 26, tarsus I, dorsal view; 27, tarsus IV, ventral view.



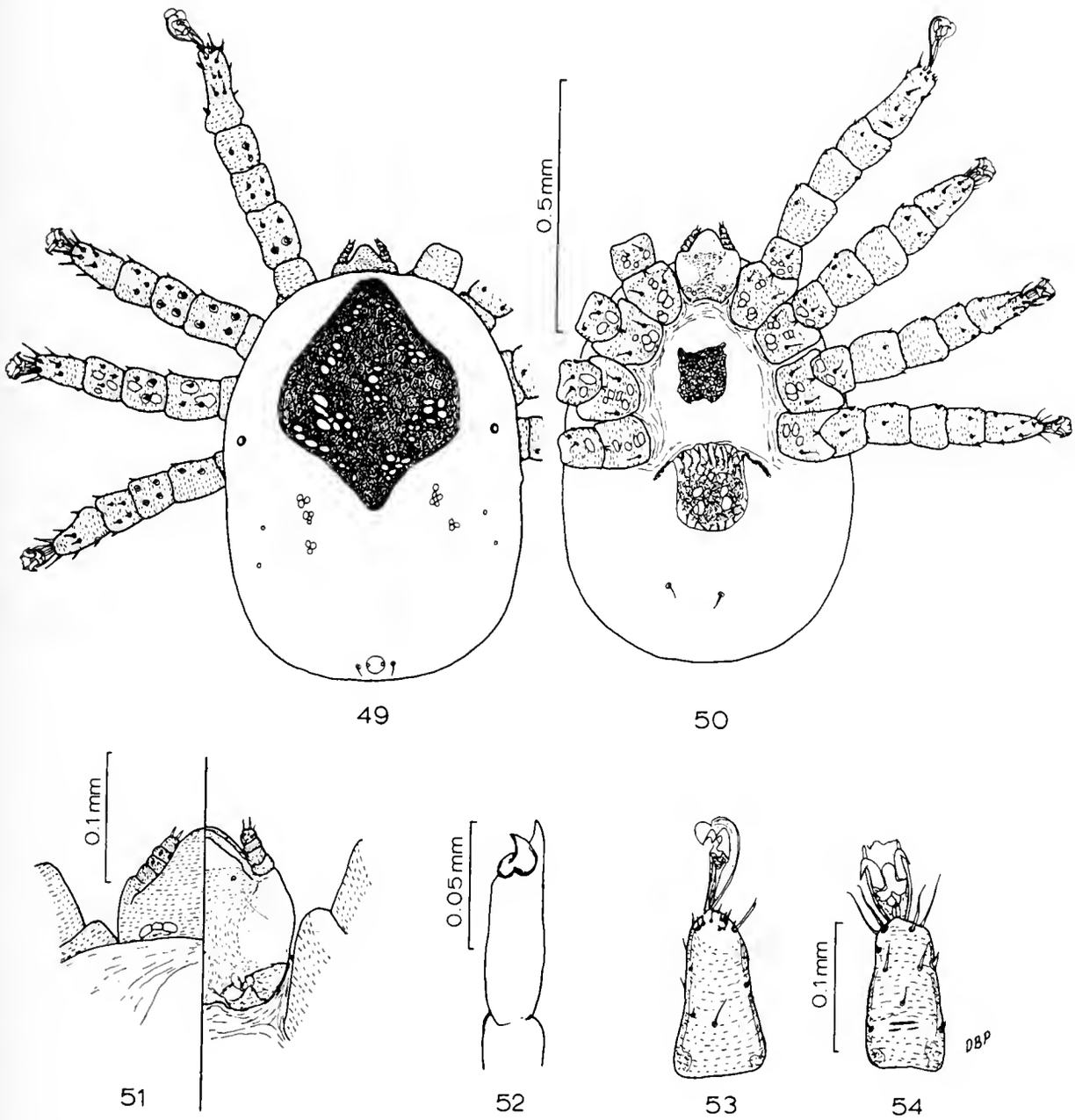
FIGS. 28-34.—*Rhinonyssus spinacitis* Dusbábek: 28, female dorsum; 29, female venter; 30, gnathosoma, dorsal and ventral views, respectively; 31, female chelicera; 32, male chelicera; 33, tarsus I, dorsal view; 34, tarsus IV, ventral view..



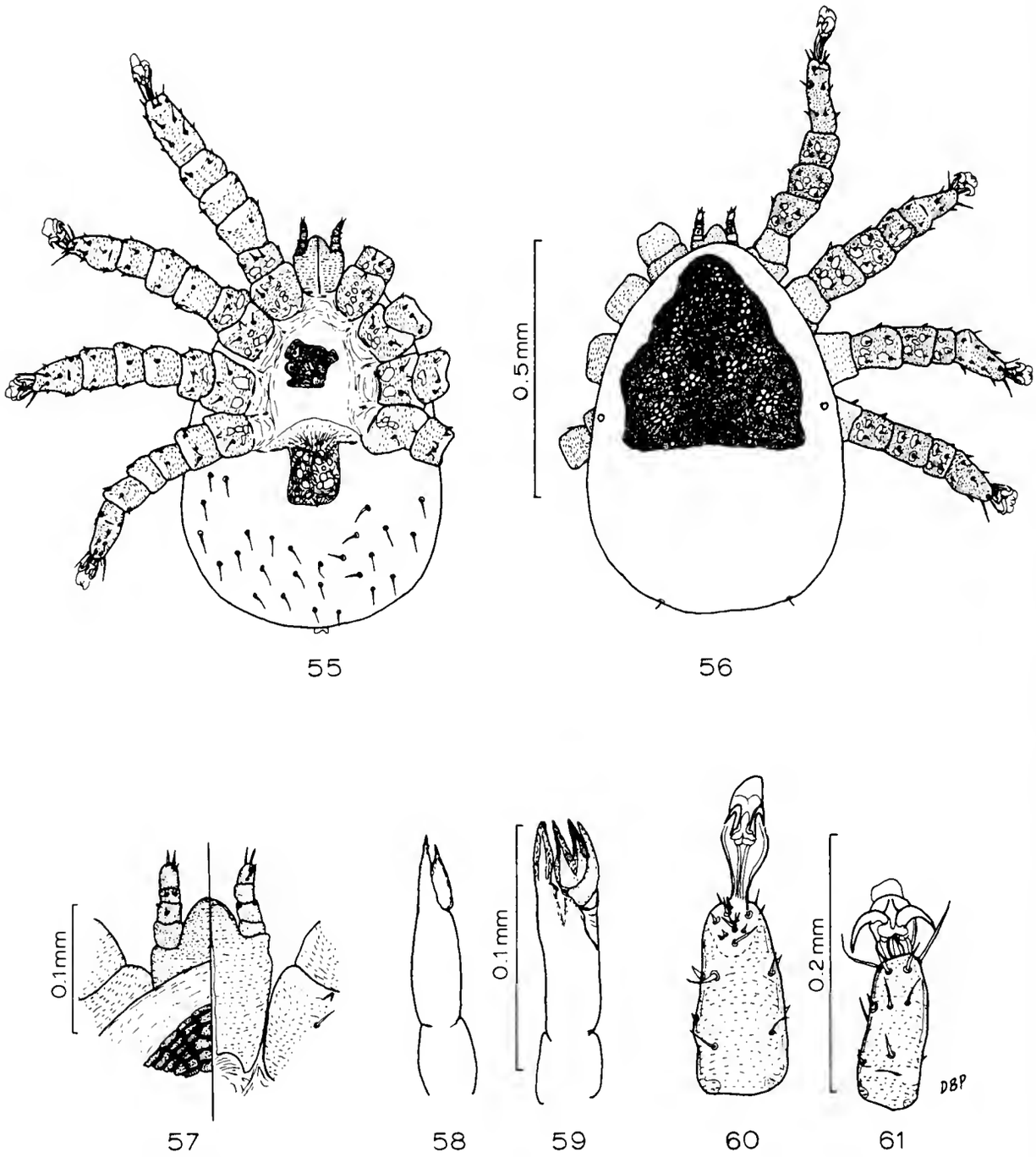
FIGS. 35-41.—*Rhinonyssus coniventris* Berlese and Trouessart: 35, female venter; 36, female dorsum; 37, gnathosoma, dorsal and ventral views, respectively; 38, female chelicera; 39, male chelicera; 40, tarsus I, dorsal view; 41, tarsus IV, ventral view.



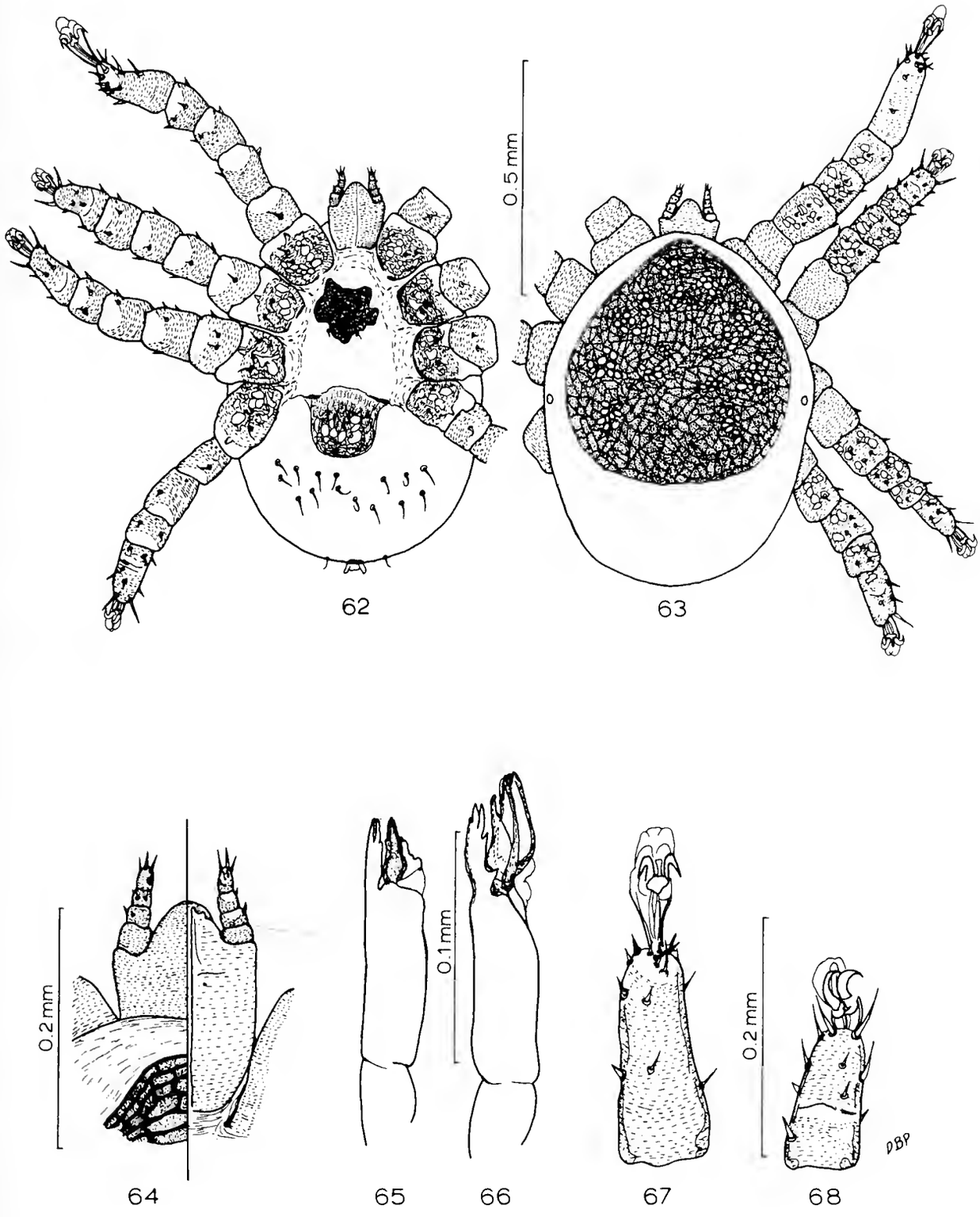
FIGS. 42-48.—*Rhinonyssus caledonicus* Hirst: 42, female dorsum; 43, female venter; 44, gnathosoma, dorsal and ventral views, respectively; 45, male chelicera; 46, female chelicera; 47, tarsus I, dorsal view; 48, tarsus IV, ventral view.



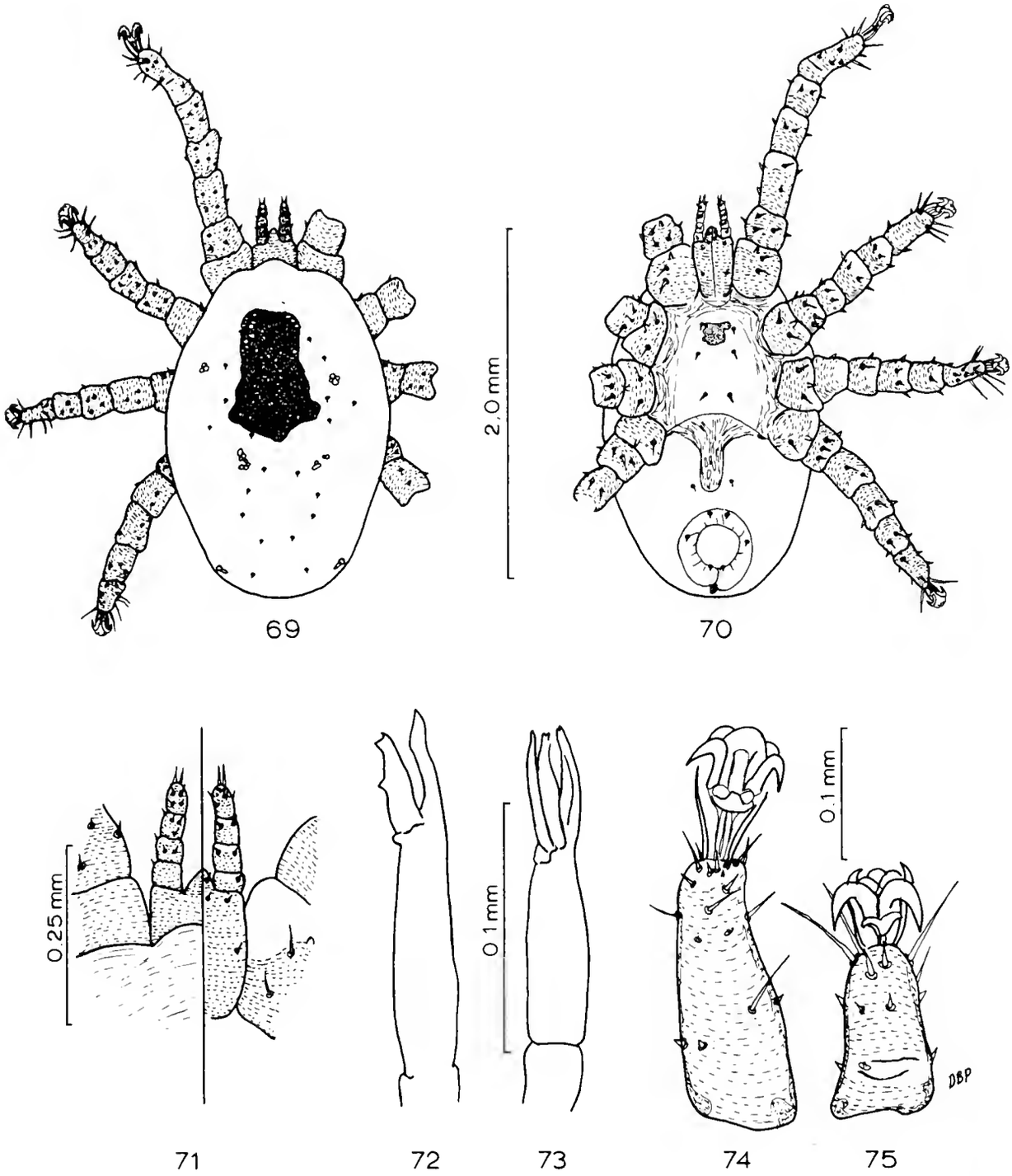
FIGS. 49-54.—*Rhinonyssus pluvialis* Fain and Johnston: 49, female dorsum; 50, female venter; 51, gnathosoma, dorsal and ventral views, respectively; 52, female chelicera; 53, tarsus I, dorsal view; 54, tarsus IV, ventral view.



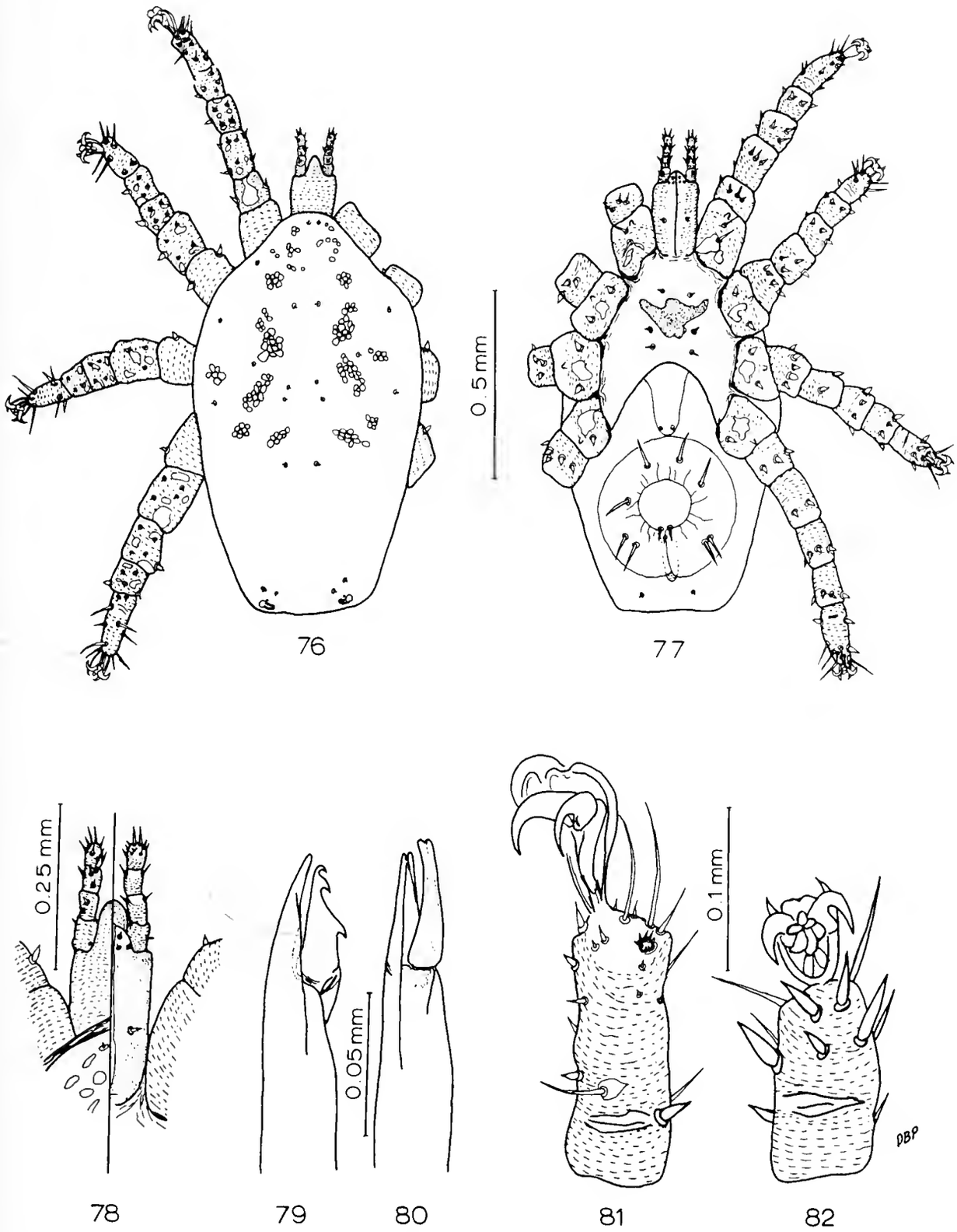
FIGS. 55-61.—*Rhinonyssus strandtmanni* Fain and Johnston: 55, female venter; 56, female dorsum; 57, gnathosoma, dorsal and ventral views, respectively; 58, female chelicera; 59, male chelicera; 60, tarsus I, dorsal view; 61, tarsus IV, ventral view.



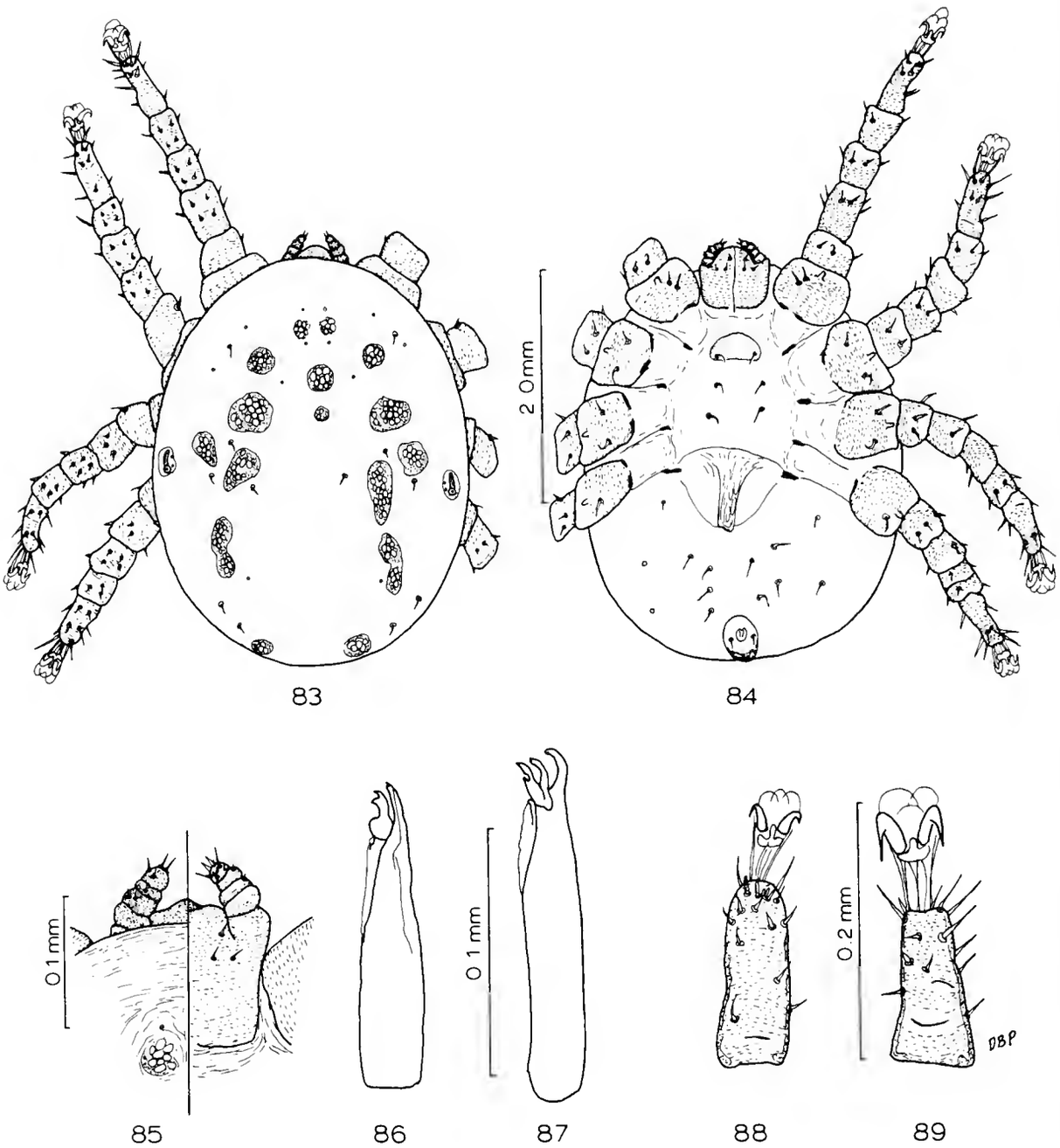
FIGS. 62-68.—*Rhinonyssus himantopus* Strandtmann: 62, female venter; 63, female dorsum; 64, gnathosoma, dorsal and ventral views, respectively; 65, female chelicera; 66, male chelicera; 67, tarsus I, dorsal view; 68, tarsus IV, ventral view.



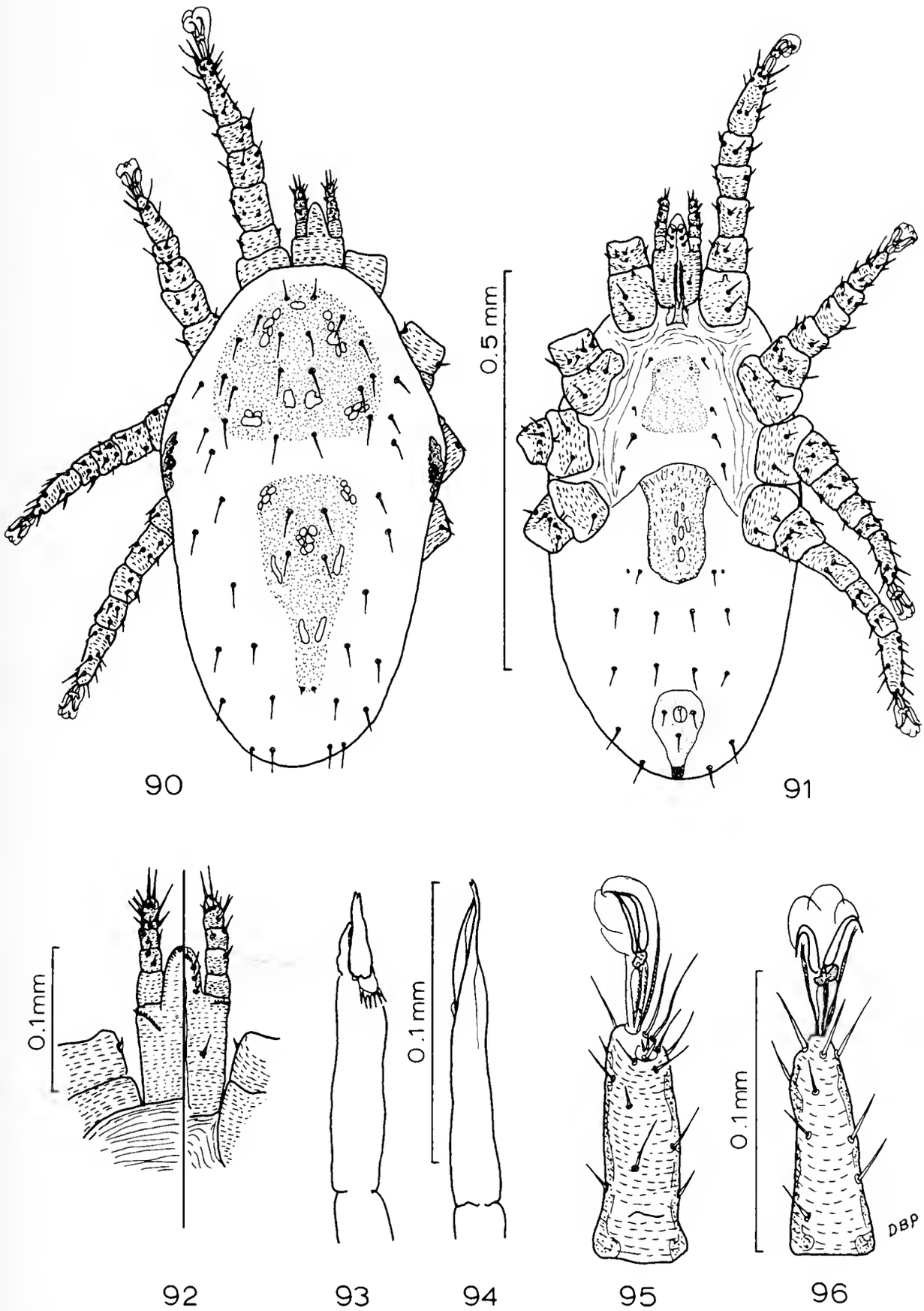
FIGS. 69-75.—*Rallinyssus caudistigmus* Strandtmann: 69, female dorsum; 70, female venter; 71, gnathosoma, dorsal and ventral views, respectively; 72, female chelicera; 73, male chelicera; 74, tarsus I, dorsal view; 75, tarsus IV, ventral view.



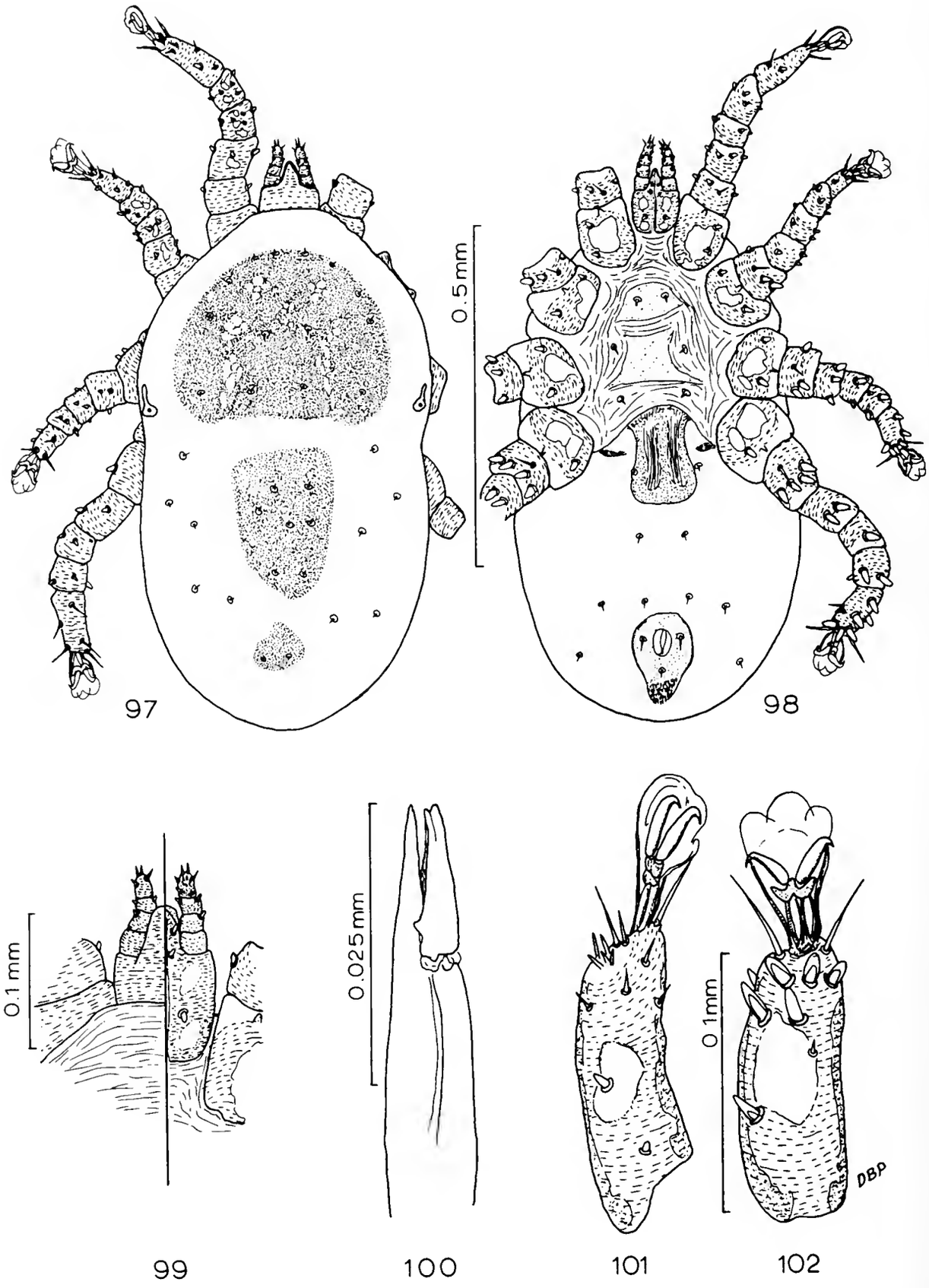
FIGS. 76-82.—*Rallinyssus verheyeni* Fain and Bafort: 76, female dorsum; 77, female venter; 78, gnathosoma, dorsal and ventral views, respectively; 79, female chelicera; 80, male chelicera; 81, tarsus I, dorsal view; 82, tarsus IV, ventral view.



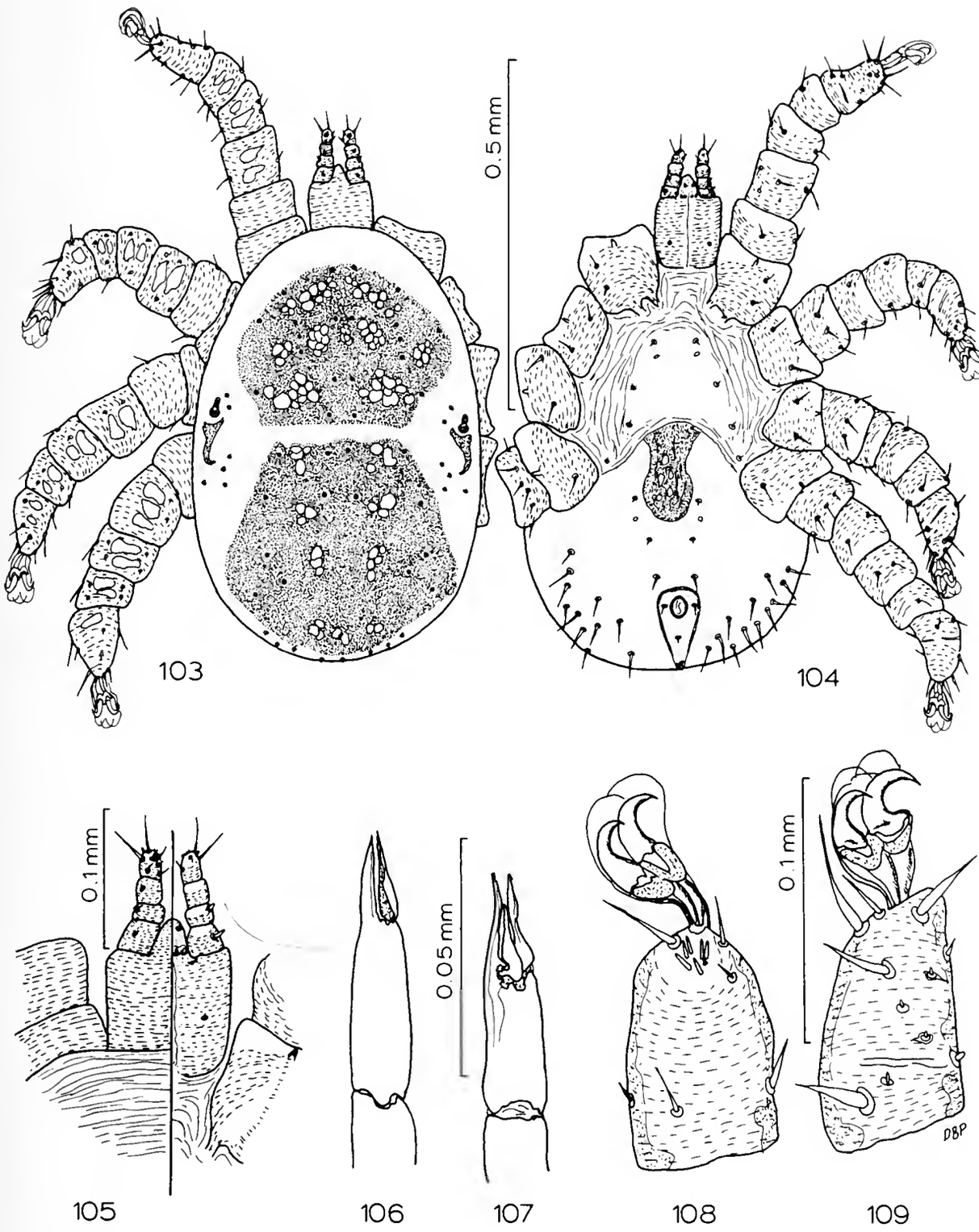
FIGS. 83-89.—*Larinyssus orbicularis* Strandtmann: 83, female dorsum; 84, female venter; 85, gnathosoma, dorsal and ventral views, respectively; 86, female chelicera; 87, male chelicera; 88, tarsus I, dorsal view; 89, tarsus IV, ventral view.



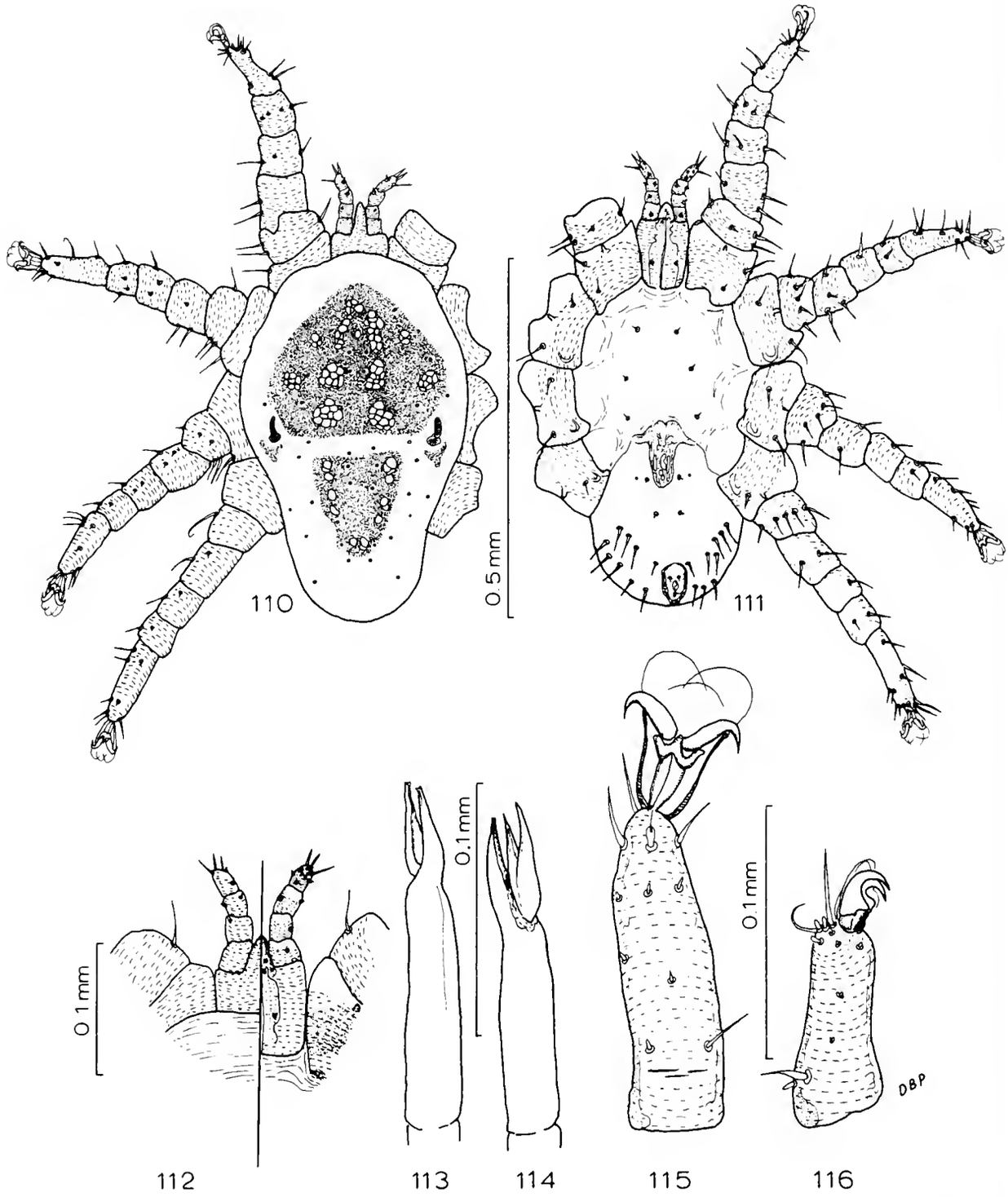
FIGS. 90-96.—*Tinaminyssus ixoreus* Strandtmann and Clifford: 90, female dorsum; 91, female venter; 92, gnathosoma, dorsal and ventral views, respectively; 93, female chelicera; 94, male chelicera; 95, tarsus I, dorsal view; 96, tarsus IV, ventral view.



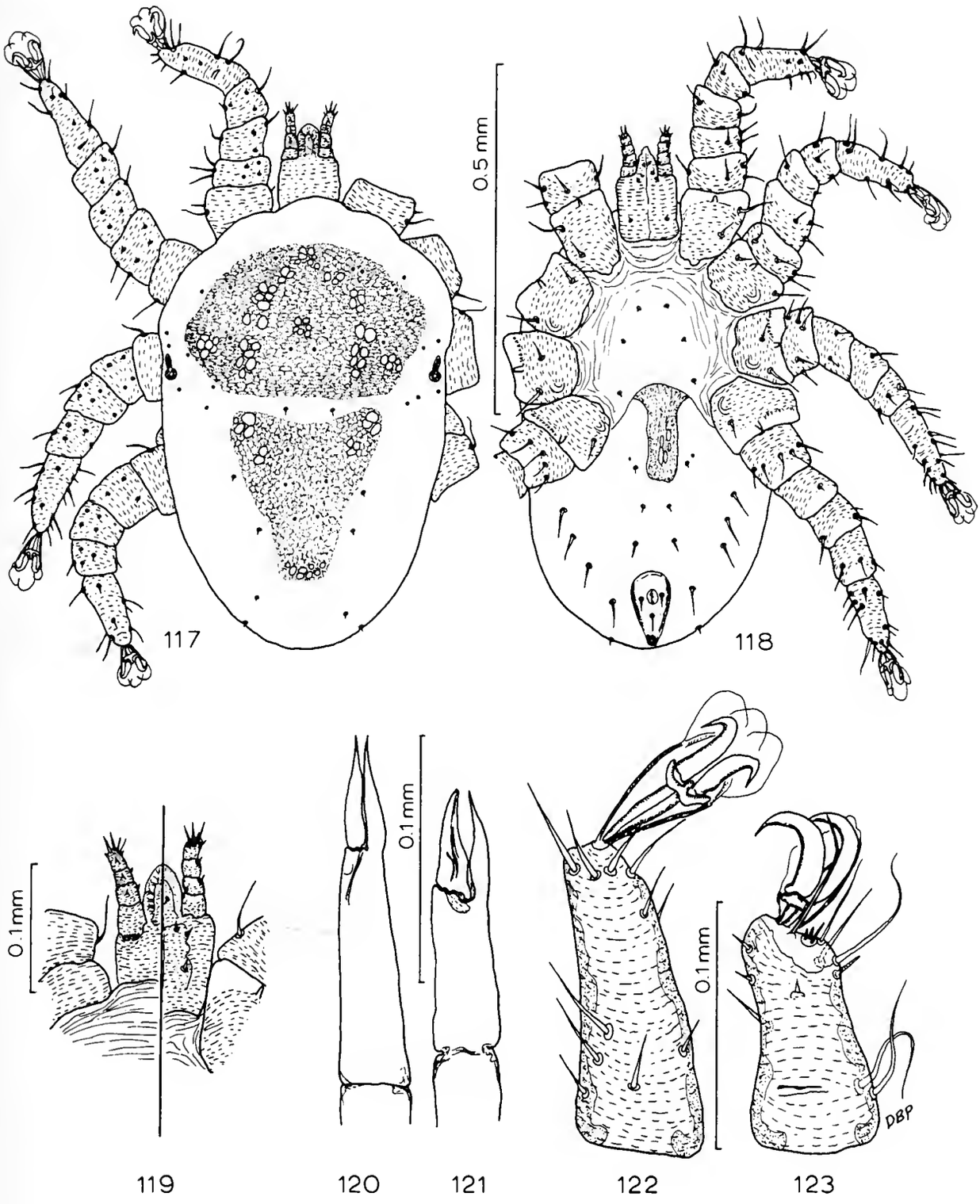
FIGS. 97-102.—*Tinaminyssus carapachibeyus* Dusbábek: 97, female dorsum; 98, female venter; 99, gnathosoma, dorsal and ventral views, respectively; 100, female chelicera; 101, tarsus I, dorsal view; 102, tarsus IV, ventral view.



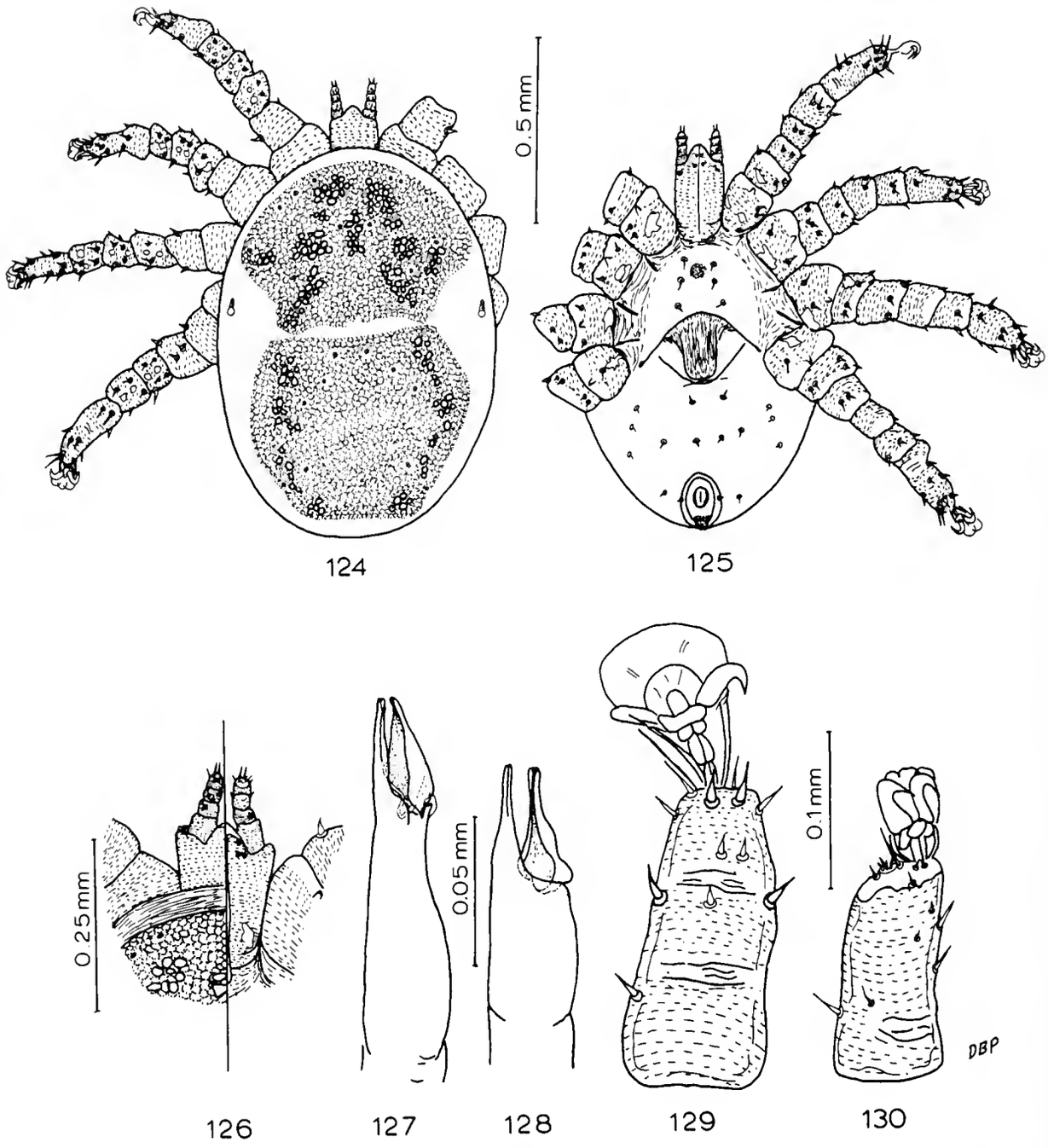
FIGS. 103-109.—*Tinaminyssus zenaidurae* Crossley: 103, female dorsum; 104, female venter; 105, gnathosoma, dorsal and ventral views, respectively; 106, female chelicera; 107, male chelicera; 108, tarsus I, dorsal view; 109, tarsus IV, ventral view.



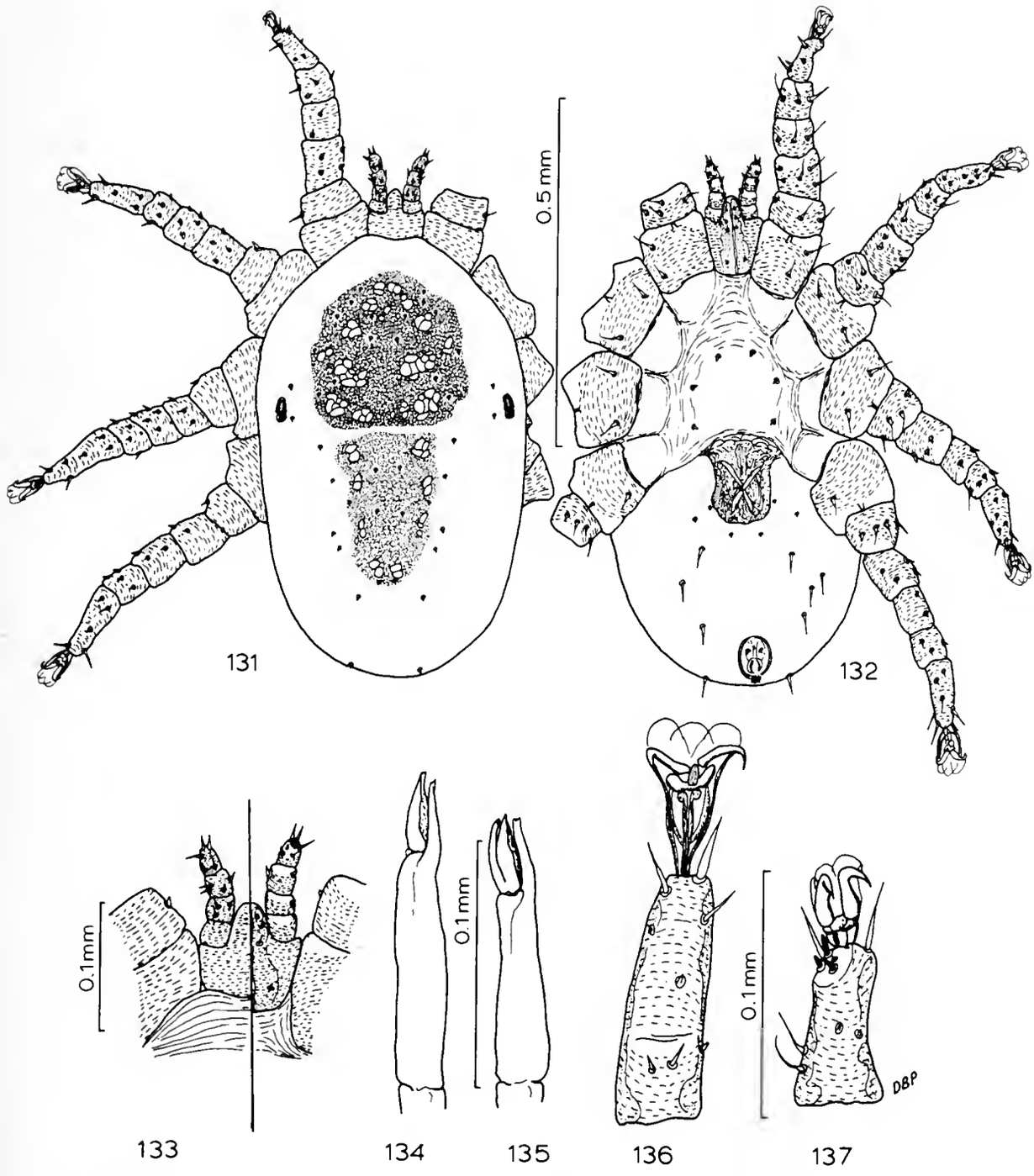
FIGS. 110-116.—*Tinaminyssus melloi* Castro: 110, female dorsum; 111, female venter; 112, gnathosoma, dorsal and ventral views, respectively; 113, female chelicera; 114, male chelicera; 115, tarsus I, dorsal view; 116, tarsus IV, ventral view.



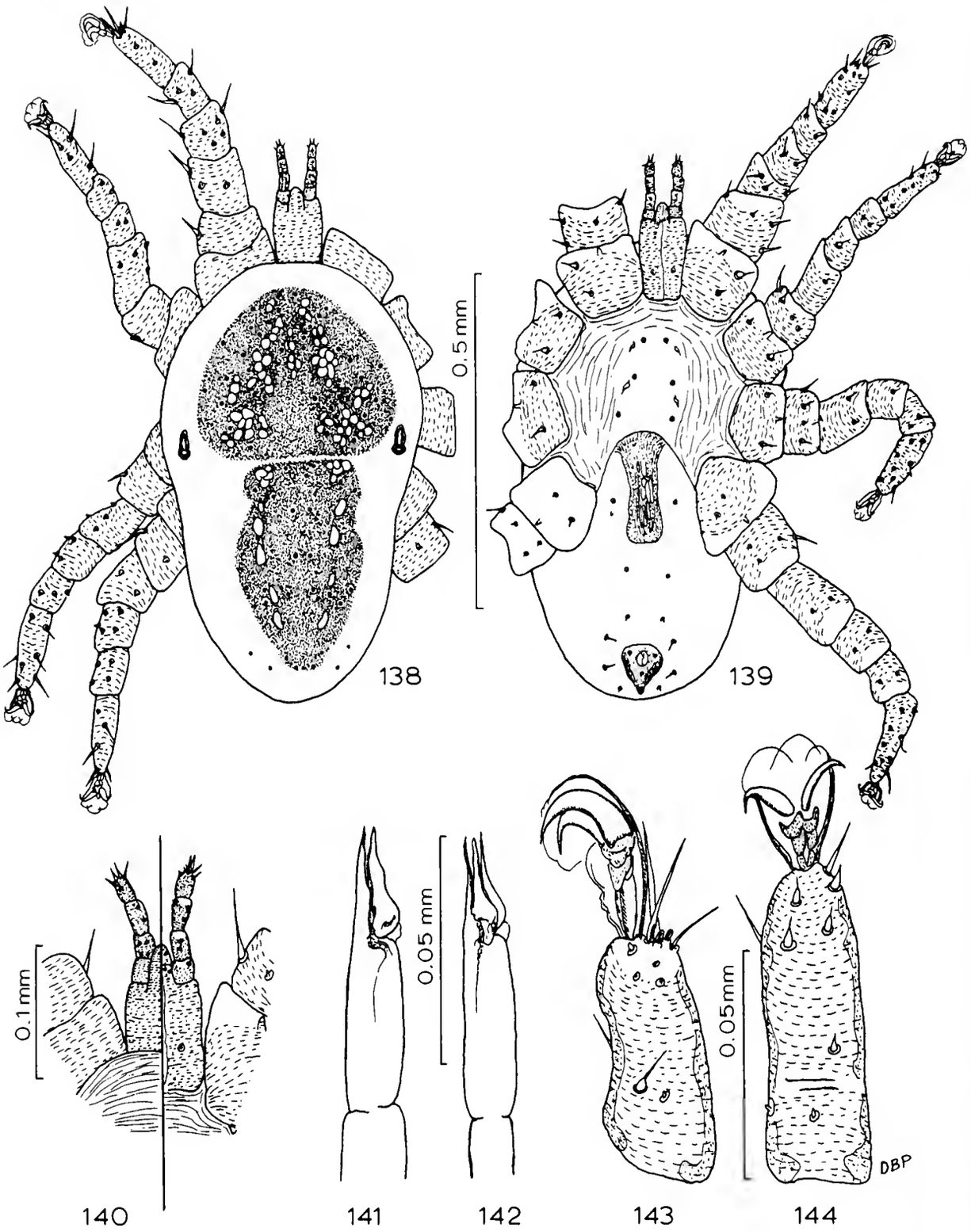
FIGS. 117-123.—*Tinaminyssus triangulus* Strandtmann: 117, female dorsum; 118, female venter; 119, gnathosoma, dorsal and ventral views, respectively; 120, female chelicera; 121, male chelicera; 122, tarsus IV, ventral view; 123, tarsus I, dorsal view.



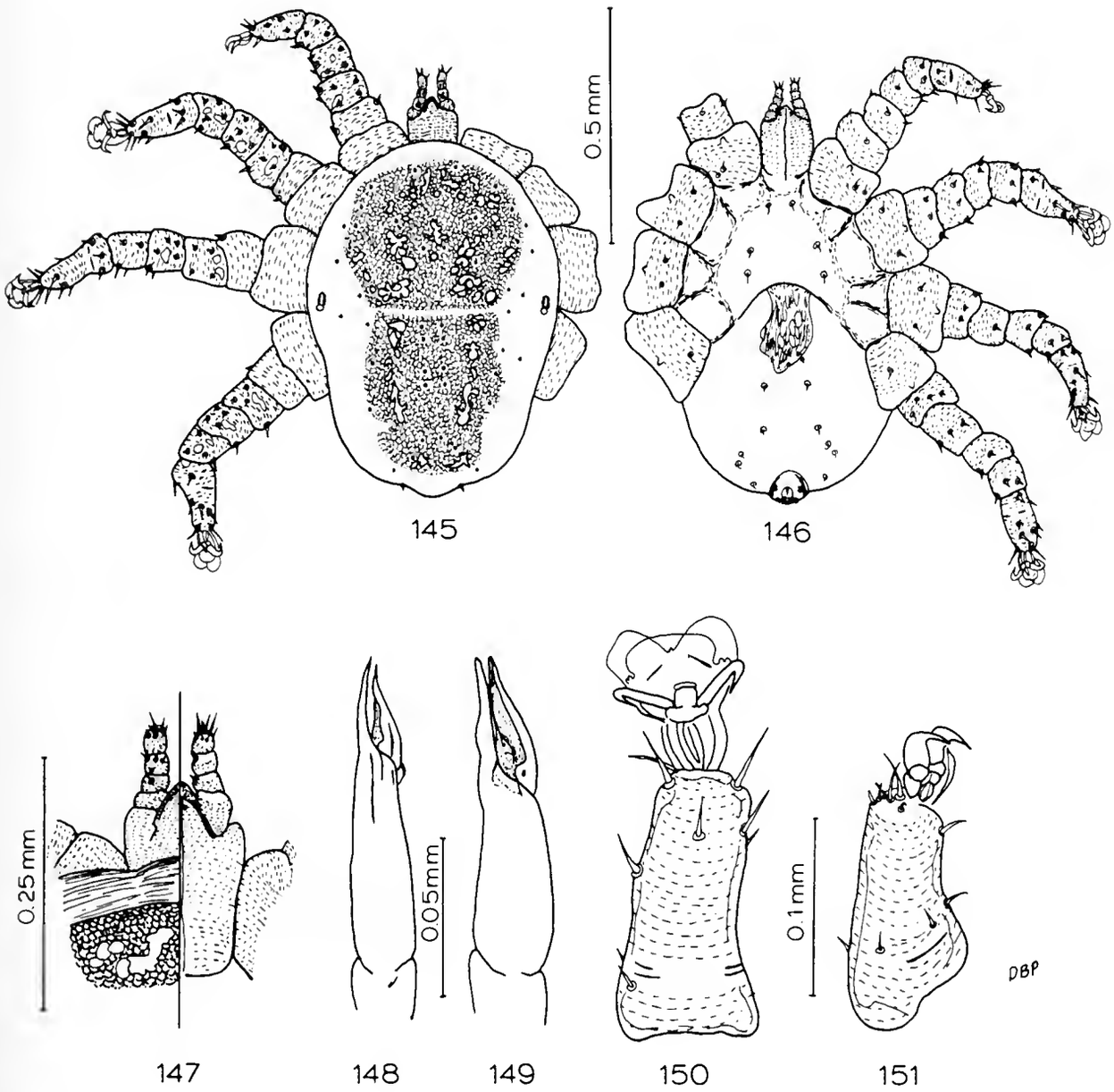
FIGS. 124-130.—*Tinaminyssus bubulci* Zumpt and Till: 124, female dorsum; 125, female venter; 126, gnathosoma, dorsal and ventral views, respectively; 127, female chelicera; 128, male chelicera; 129, tarsus IV, ventral view; 130, tarsus I, dorsal view.



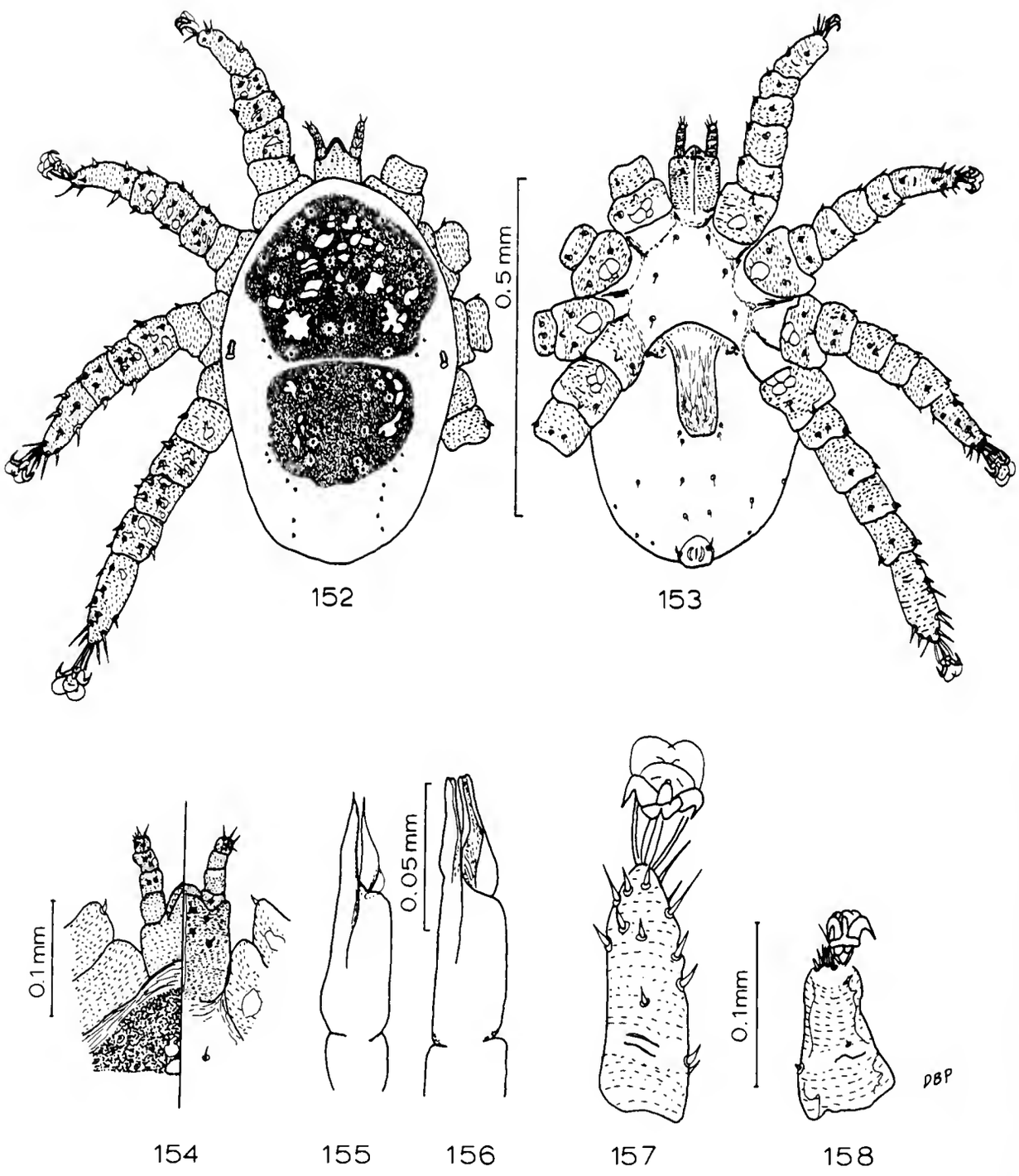
FIGS. 131-137.—*Tinaminyssus columbae* Crossley: 131, female dorsum; 132, female venter; 133, gnathosoma, dorsal and ventral views, respectively; 134, female chelicera; 135, male chelicera; 136, tarsus IV, ventral view; 137, tarsus I, dorsal view.



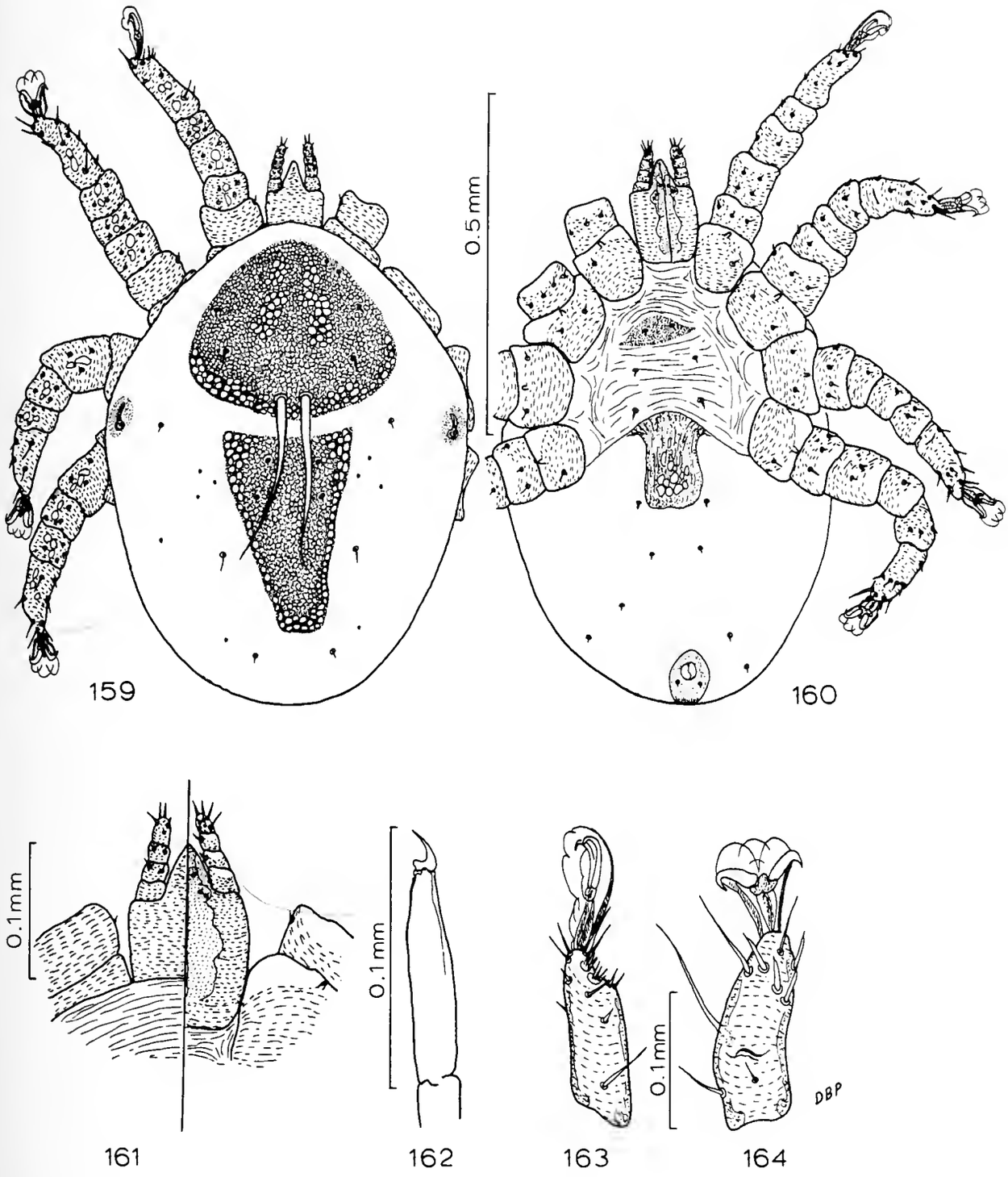
FIGS. 138-144.—*Tinaminyssus geotrygoni* Dusbábek: 138, female dorsum; 139, female venter; 140, gnathosoma, dorsal and ventral views, respectively; 141, female chelicera; 142, male chelicera; 143, tarsus I, dorsal view; 144, tarsus IV, ventral view.



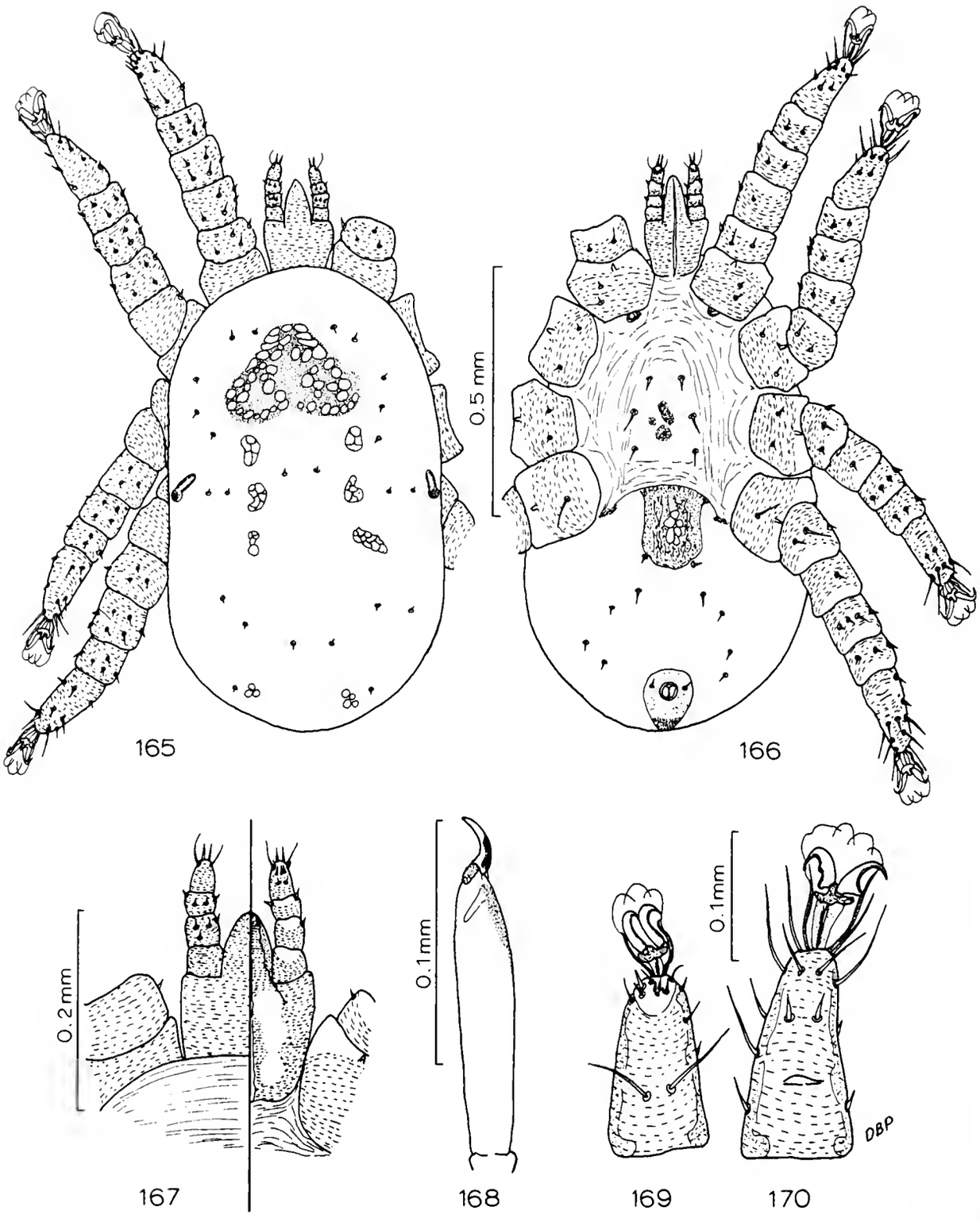
FIGS. 145-151.—*Tinaminyssus belopolskii* Bregetova: 145, female dorsum; 146, female venter; 147, gnathosoma, dorsal and ventral views, respectively; 148, female chelicera; 149, male chelicera; 150, tarsus IV, ventral view; 151, tarsus I, dorsal view.



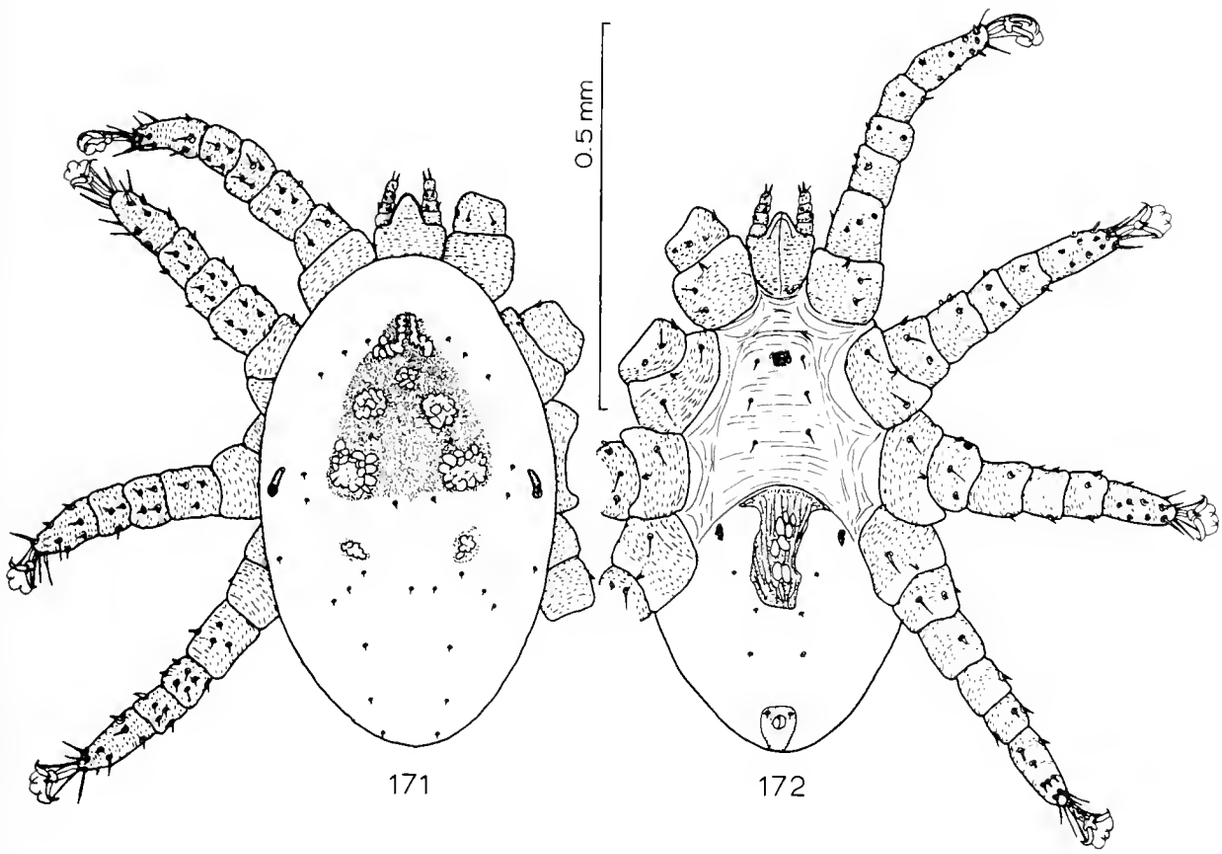
FIGS. 152-158.—*Tinaminyssus neoixobrychi* Pence: 152, female dorsum; 153, female venter; 154, gnathosoma, dorsal and ventral views, respectively; 155, female chelicera; 156, male chelicera; 157, tarsus IV, ventral view; 158, tarsus I, dorsal view.

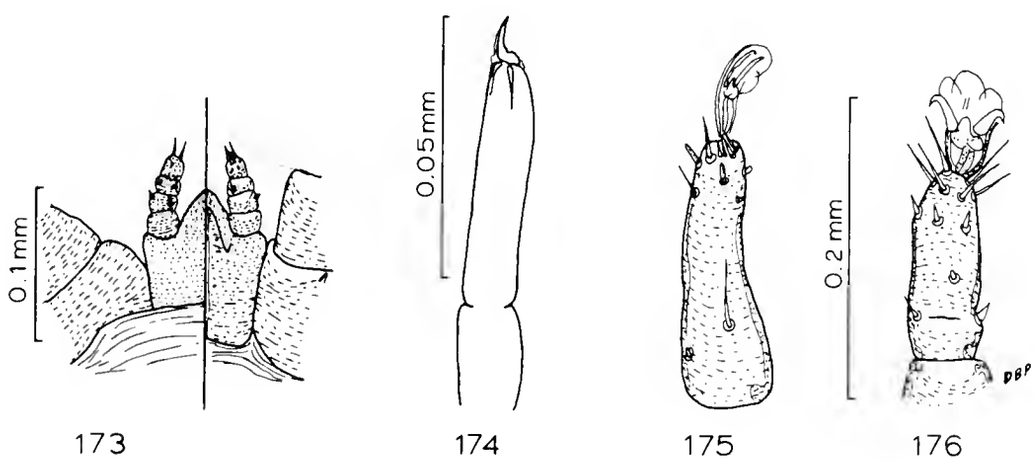


FIGS. 159-164.—*Rhinoecius bisetosus* Strandtmann: 159, female dorsum; 160, female venter; 161, gnathosoma, dorsal and ventral views, respectively; 162, female chelicera; 163, tarsus I, dorsum; 164, tarsus IV, venter.

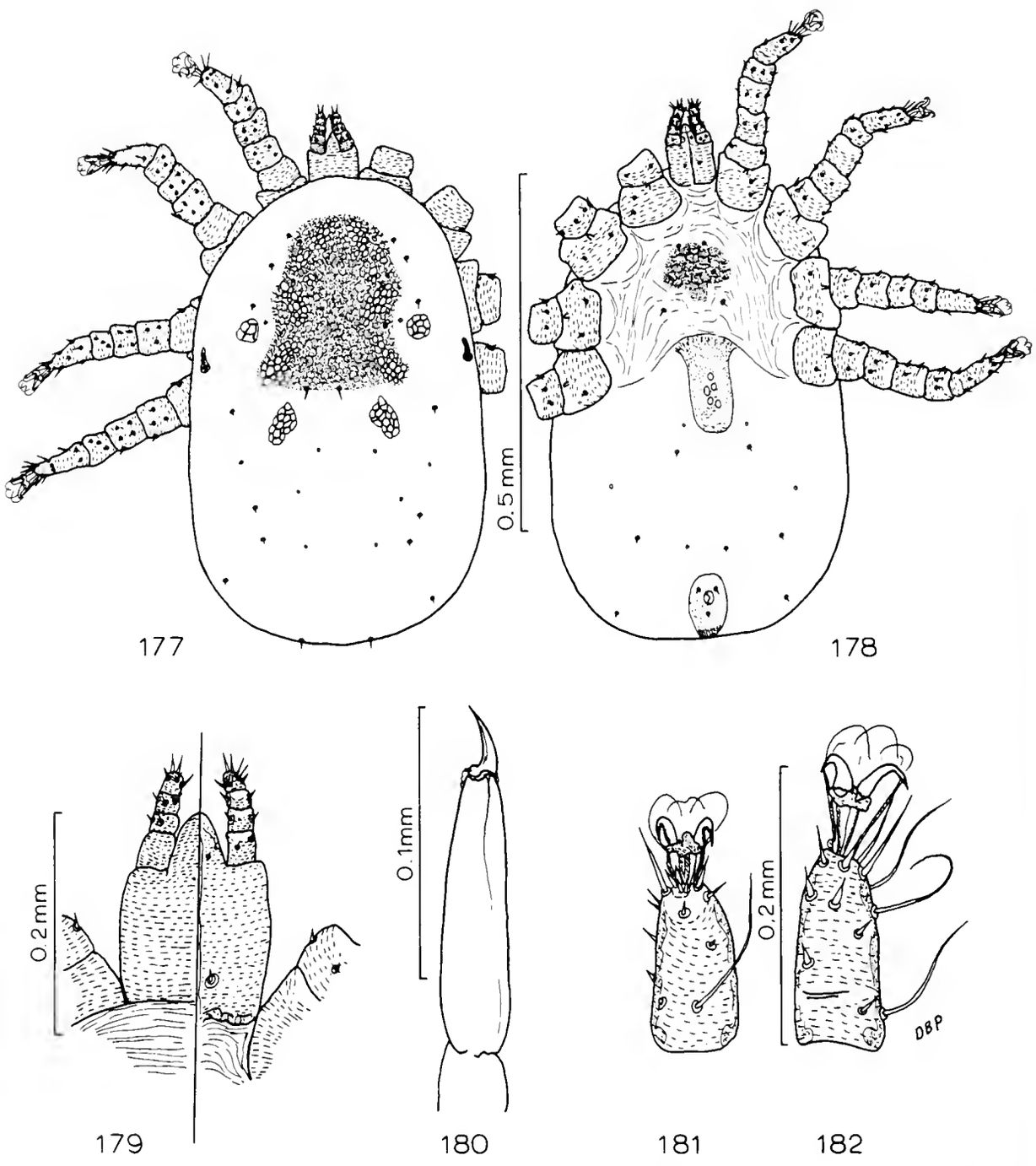


FIGS. 165-170.—*Rhinoecius tytonis* Fain: 165, female dorsum; 166, female venter; 167, gnathosoma, dorsal and ventral views, respectively; 168, female chelicera; 169, tarsus I, dorsal view; 170, tarsus IV, ventral view.

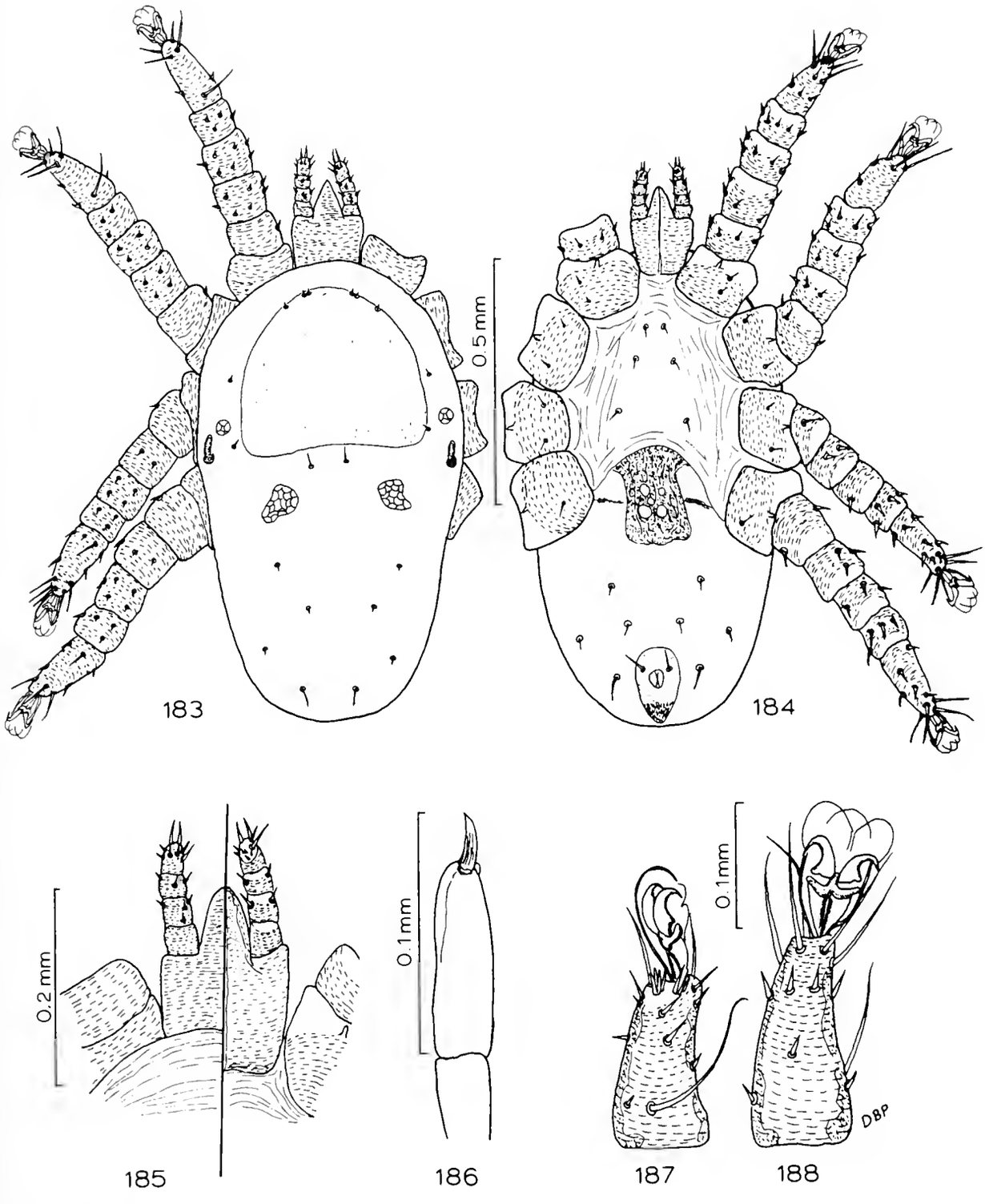




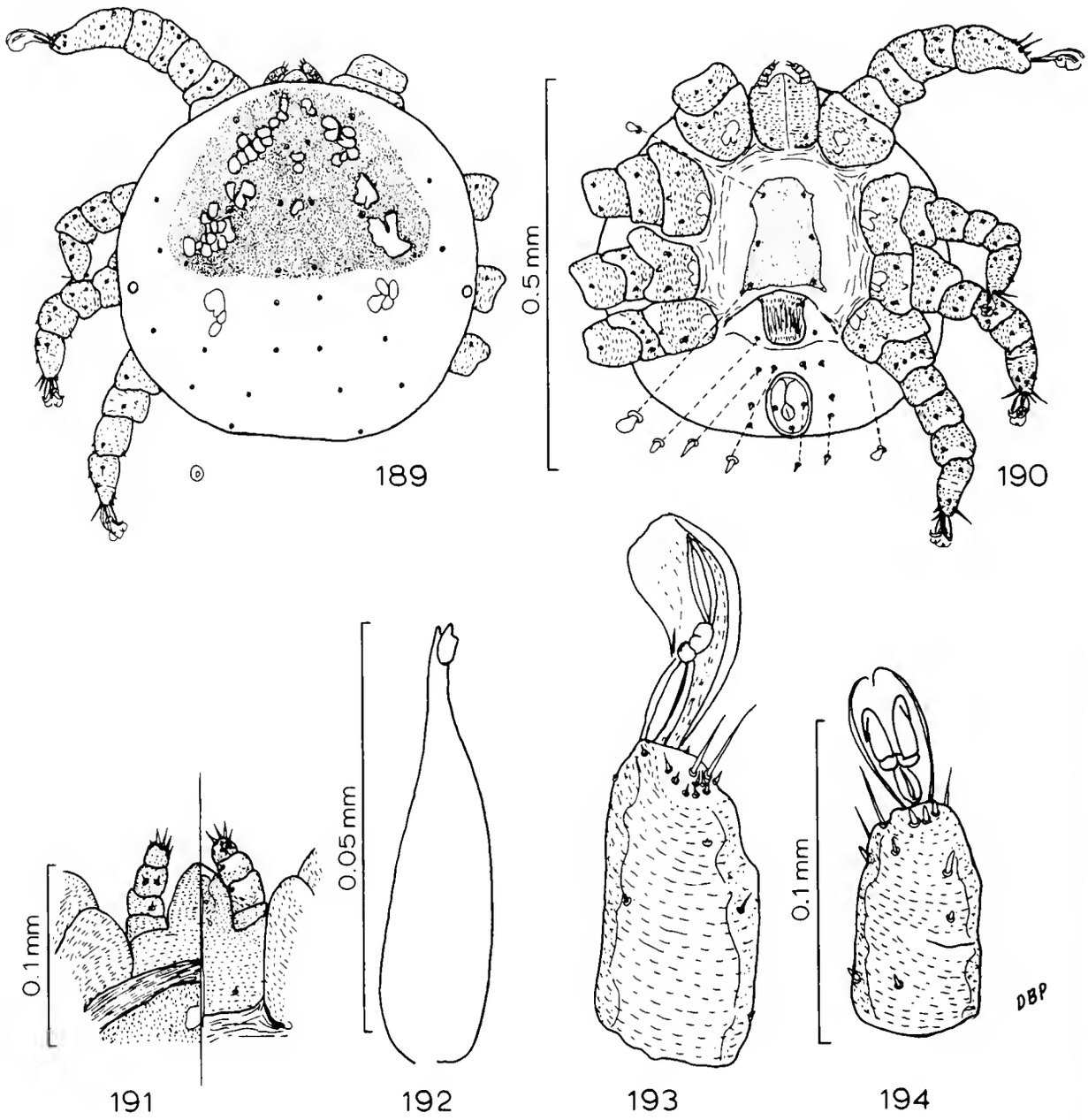
FIGS. 171-176.—*Rhinoecius cooremani* Strandtmann: 171, female dorsum; 172, female venter; 173, gnathosoma, dorsal and ventral views, respectively; 174, female chelicera; 175, tarsus I, dorsal view; 176, tarsus IV, ventral view.



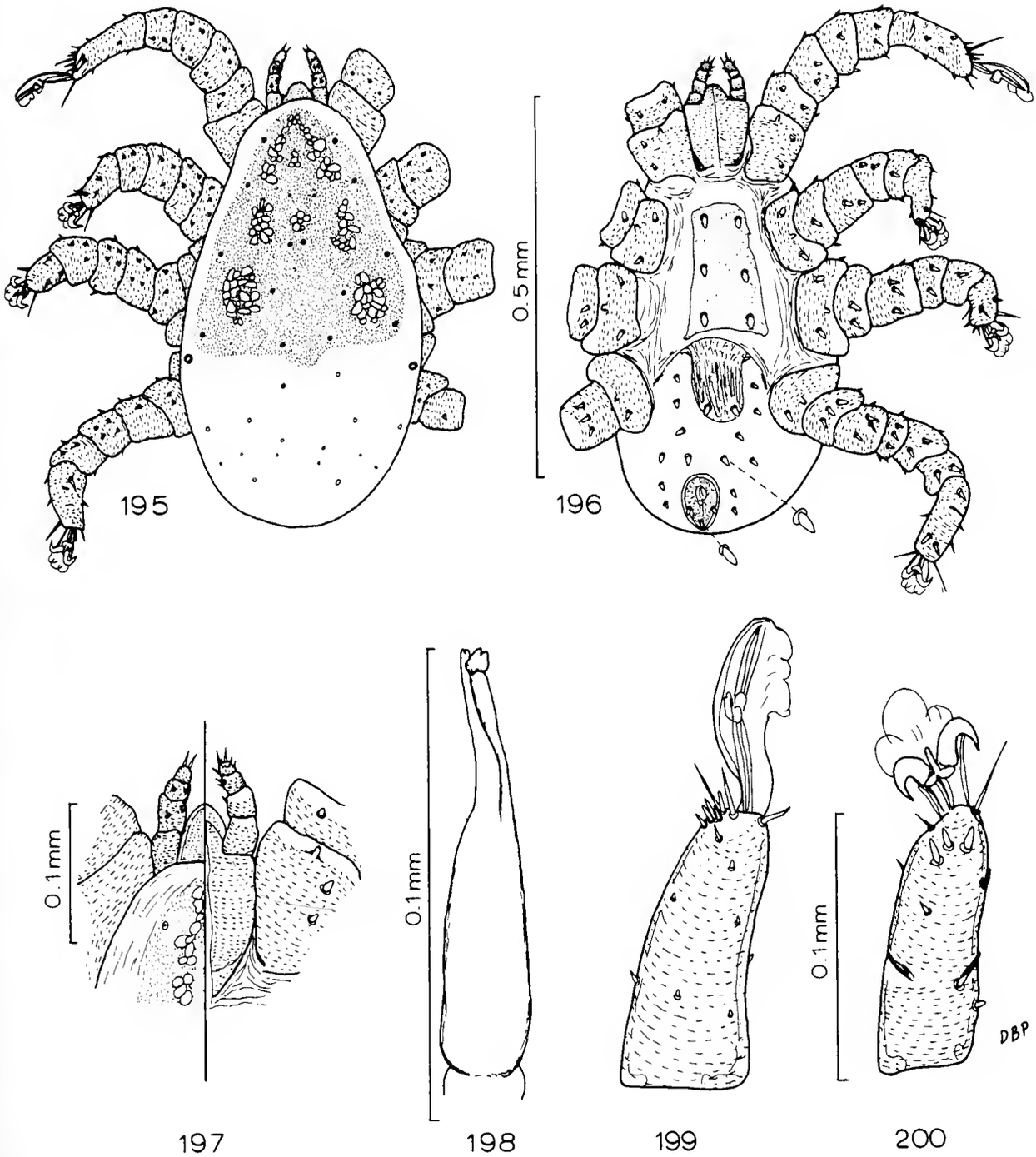
FIGS. 177-182.—*Rhinoecius grandis* Strandtmann: 177, female dorsum; 178, female venter; 179, gnathosoma, dorsal and ventral views, respectively; 180, female chelicera; 181, tarsus I, dorsal view; 182, tarsus IV, ventral view.



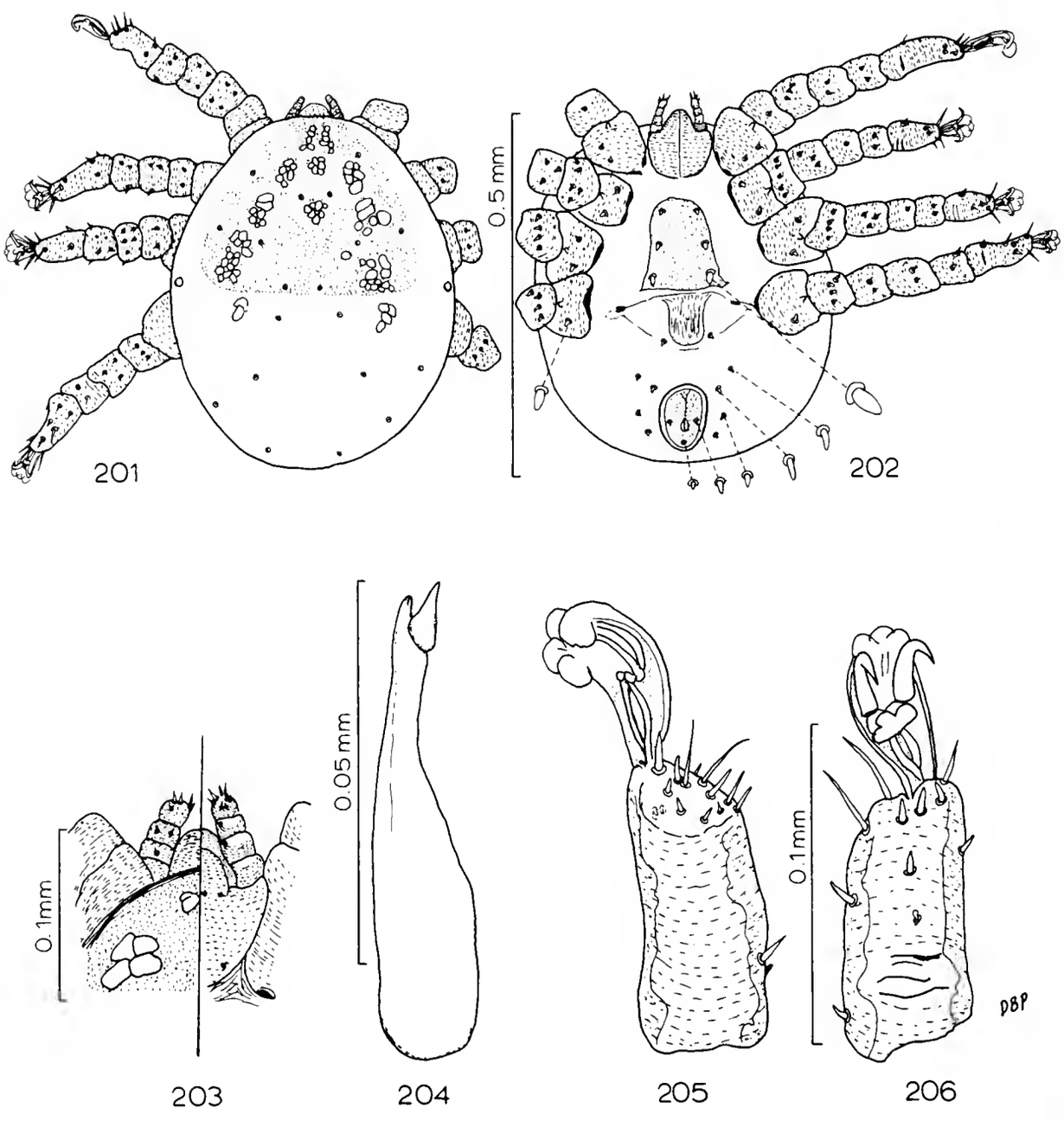
FIGS. 183-188.—*Rhinoecius oti* Cooreman: 183, female dorsum; 184, female venter; 185, gnathosoma, dorsal and ventral views, respectively; 186, female chelicera; 187, tarsus I, dorsal view; 188, tarsus IV, ventral view.



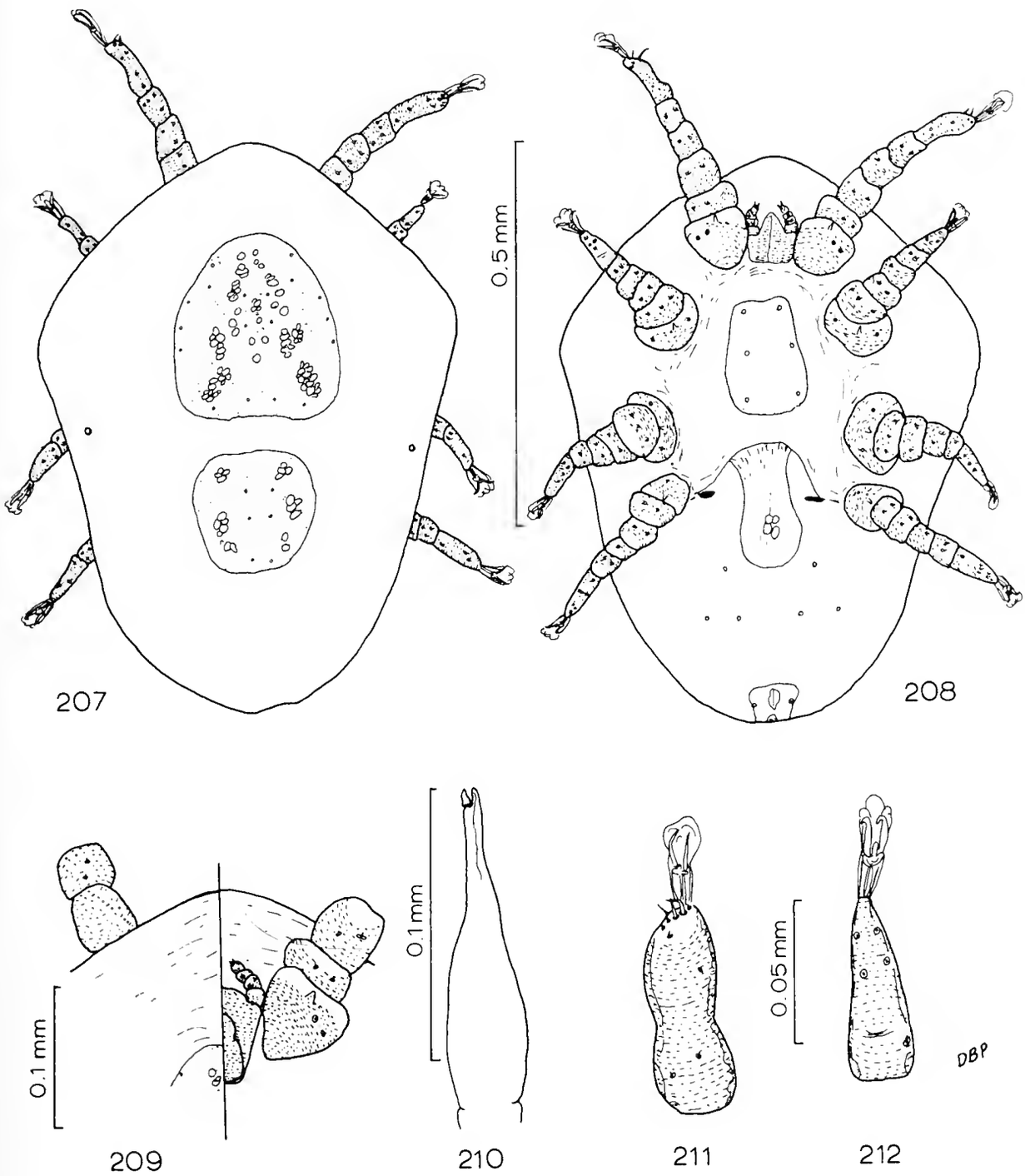
FIGS. 189-194.—*Sternostoma dumetellae* Pence: 189, female dorsum; 190, female venter; 191, gnathosoma, dorsal and ventral views, respectively; 192, female chelicera; 193, tarsus I, dorsal view; 194, tarsus IV, ventral view.



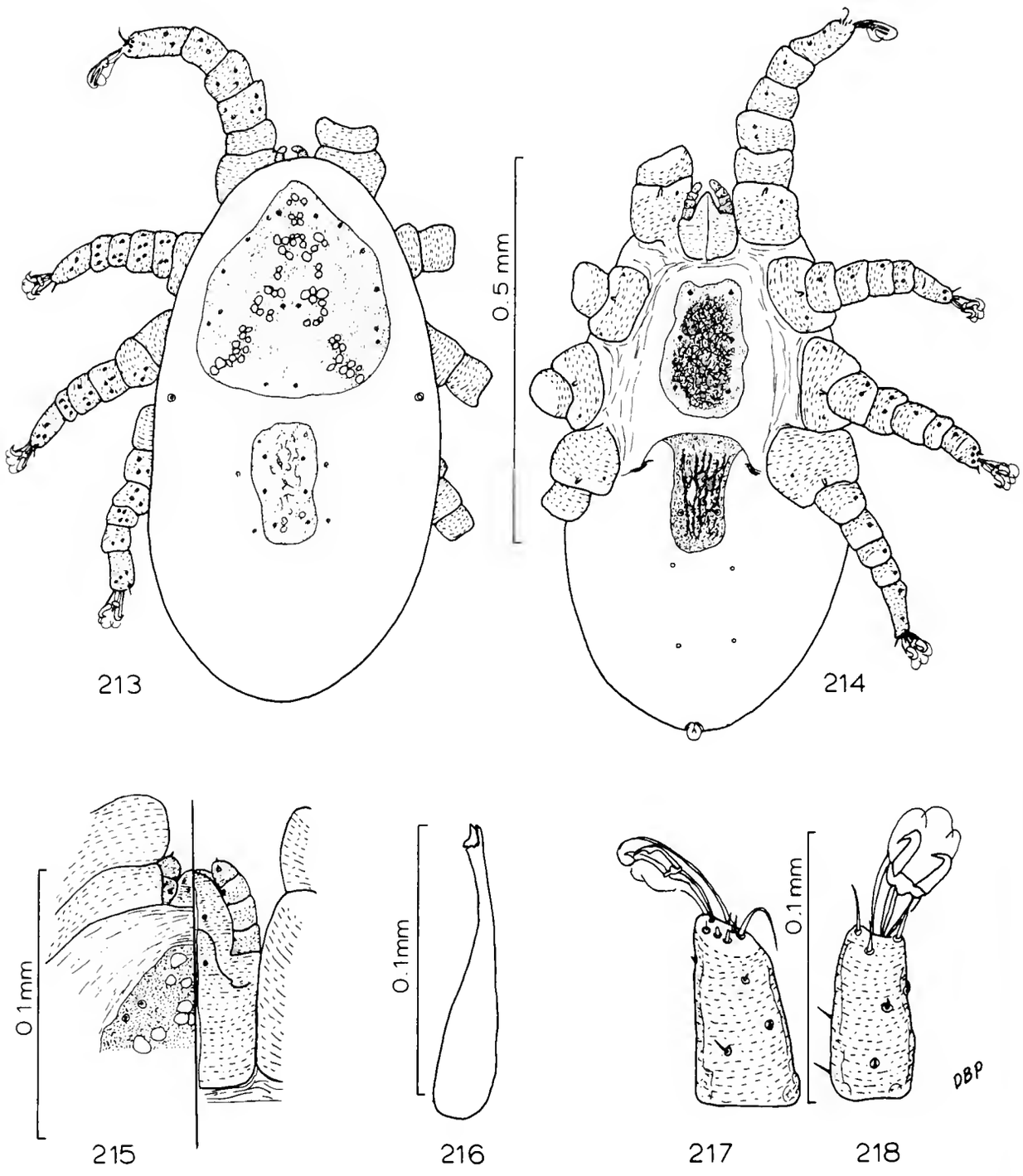
FIGS. 195-200.—*Sternostoma technaui* Vitzthum. 195, female dorsum; 196, female venter; 197, gnathosoma, dorsal and ventral views, respectively; 198, female chelicera; 199, tarsus I, dorsal view; 200, tarsus IV, ventral view.



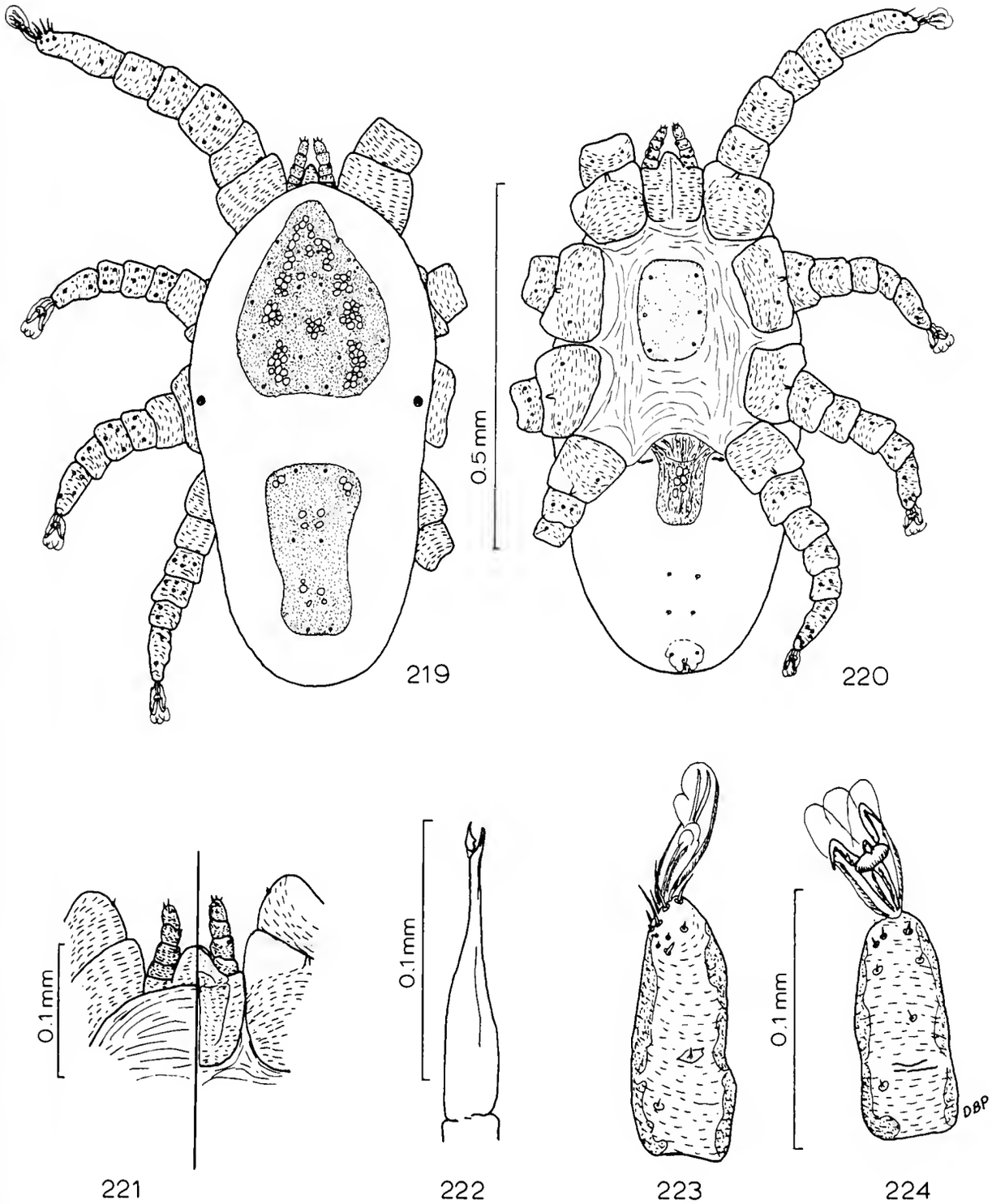
FIGS. 201-206.—*Sternostoma spatulatum* Furman: 201, female dorsum; 202, female venter; 203, gnathosoma, dorsal and ventral views, respectively; 204, female chelicera; 205, tarsus I, dorsal view; 206, tarsus IV, ventral view.



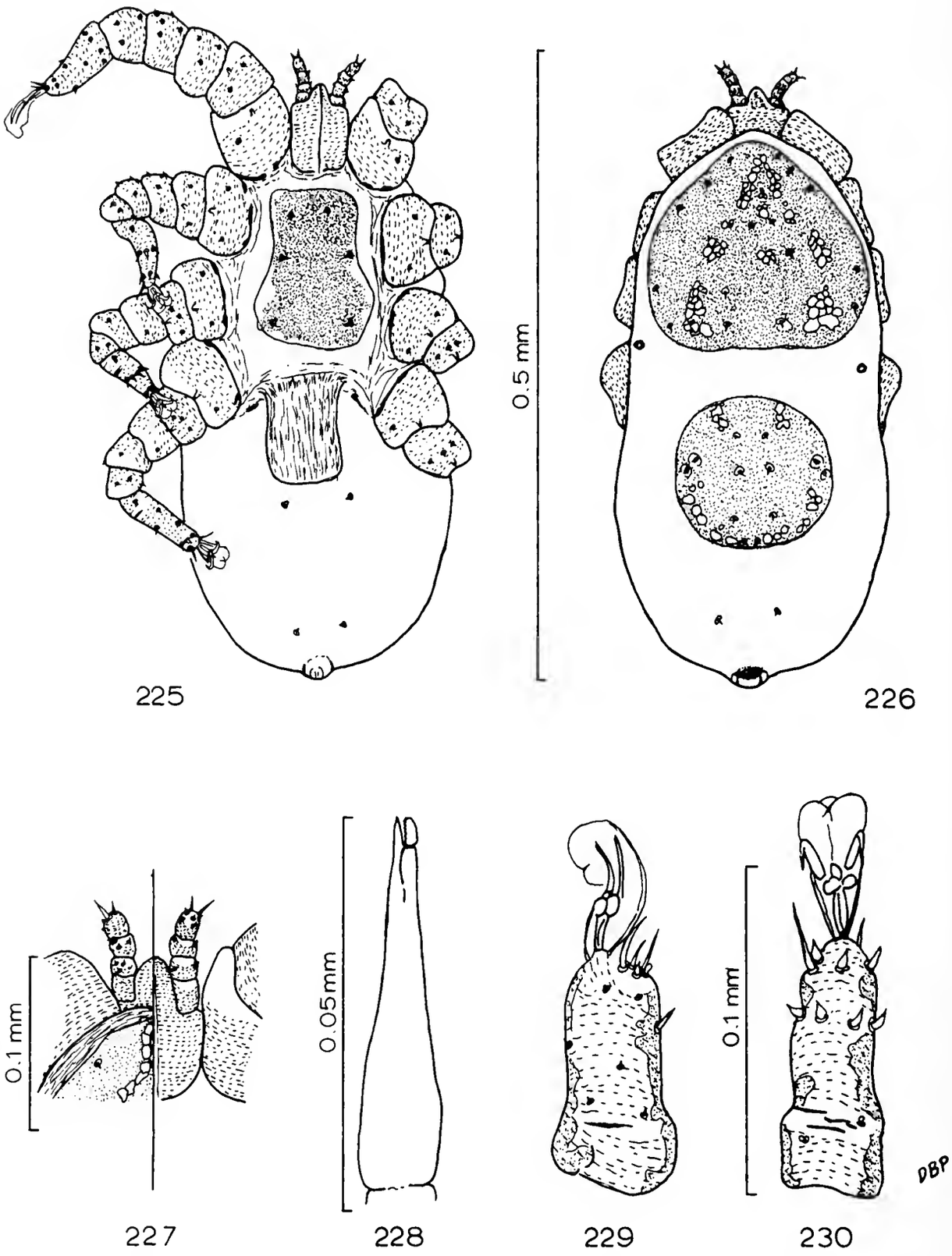
FIGS. 207-212.—*Sternostoma strandtmanni* Furman: 207, female dorsum; 208, female venter; 209, gnathosoma, dorsal and ventral views, respectively; 210, female chelicera; 211, tarsus I, dorsal view; 212, tarsus IV, ventral view.



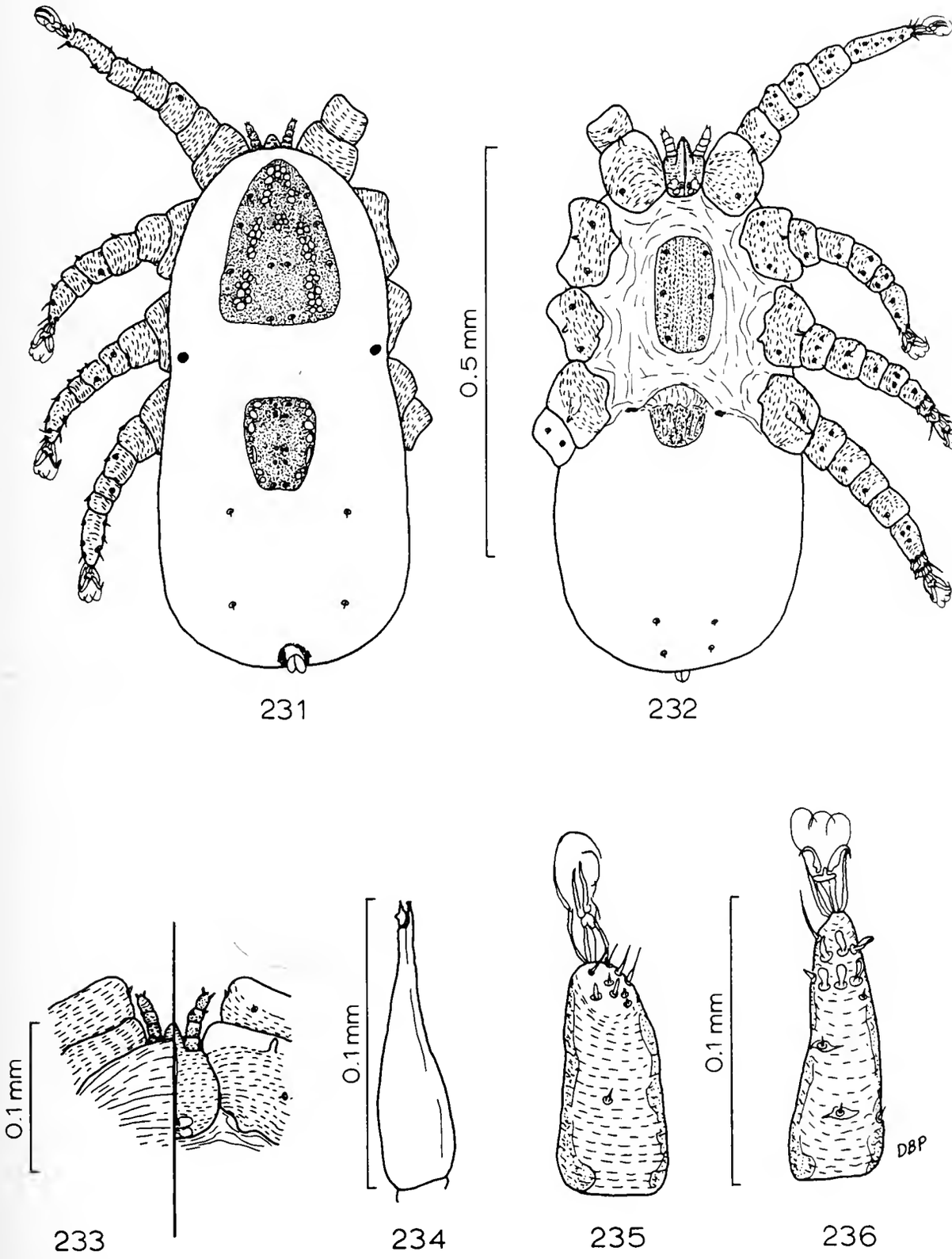
FIGS. 213-218.—*Sternostoma trachaecolum* Lawrence: 213, female dorsum; 214, female venter; 215, gnathosoma, dorsal and ventral views, respectively; 216, female chelicera; 217, tarsus I, dorsal view; 218, tarsus IV, ventral view.



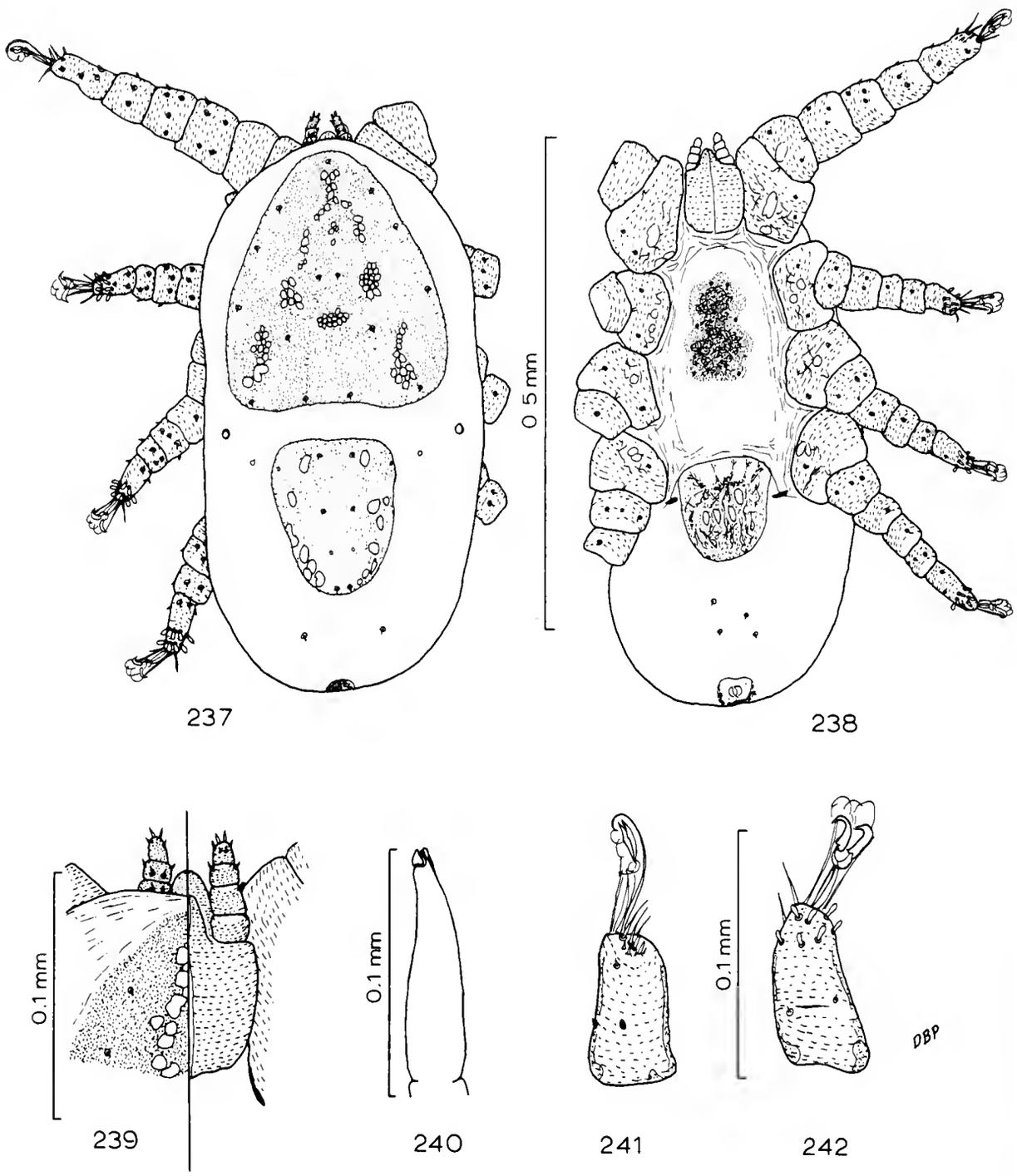
FIGS. 219-224.—*Sternostoma hutsoni* Furman: 219, female dorsum; 220, female venter; 221, gnathosoma, dorsal and ventral views, respectively; 222, female chelicera; 223, tarsus I, dorsal view; 224, tarsus IV, ventral view.



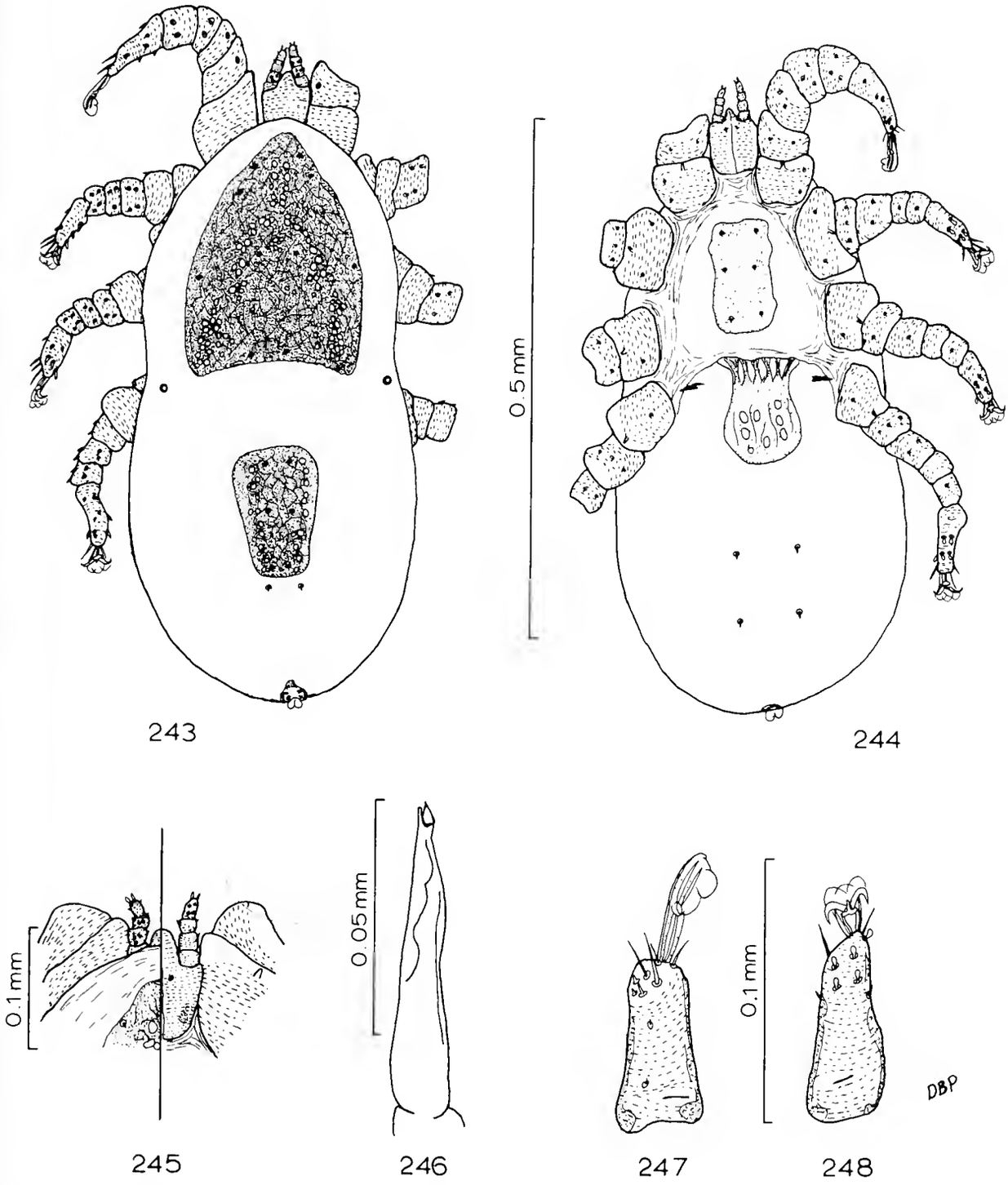
FIGS. 225-230.—*Sternostoma motacillae* Pence: 225, female venter; 226, female dorsum; 227, gnathosoma, dorsal and ventral views, respectively; 228, female chelicera; 229, tarsus I, dorsal view; 230, tarsus IV, ventral view.



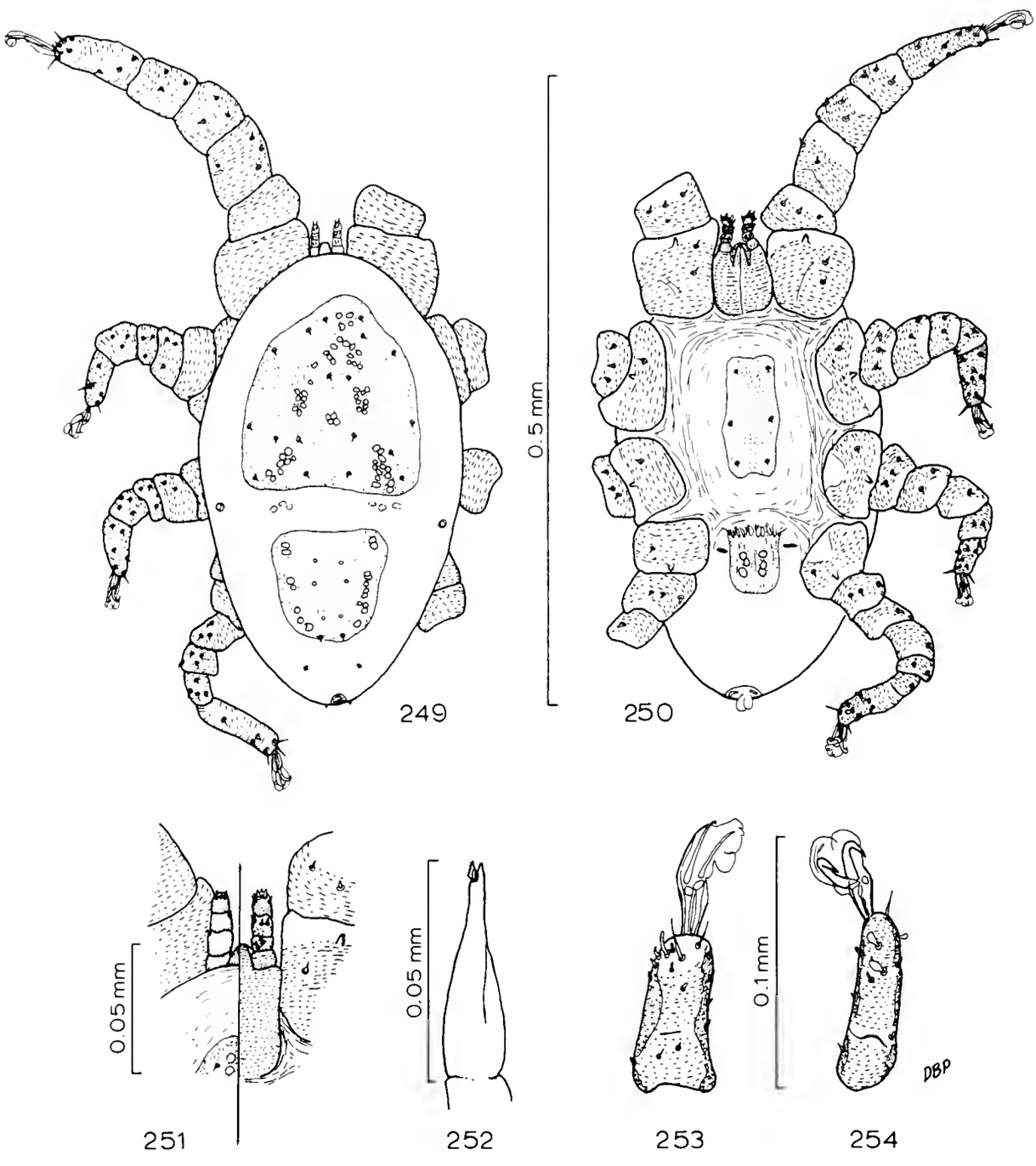
FIGS. 231-236.—*Sternostoma cryptorhynchum* Berlese and Trouessart: 231, female dorsum; 232, female venter; 233, gnathosoma, dorsal and ventral views, respectively; 234, female chelicera; 235, tarsus I, dorsal view; 236, tarsus IV, ventral view.



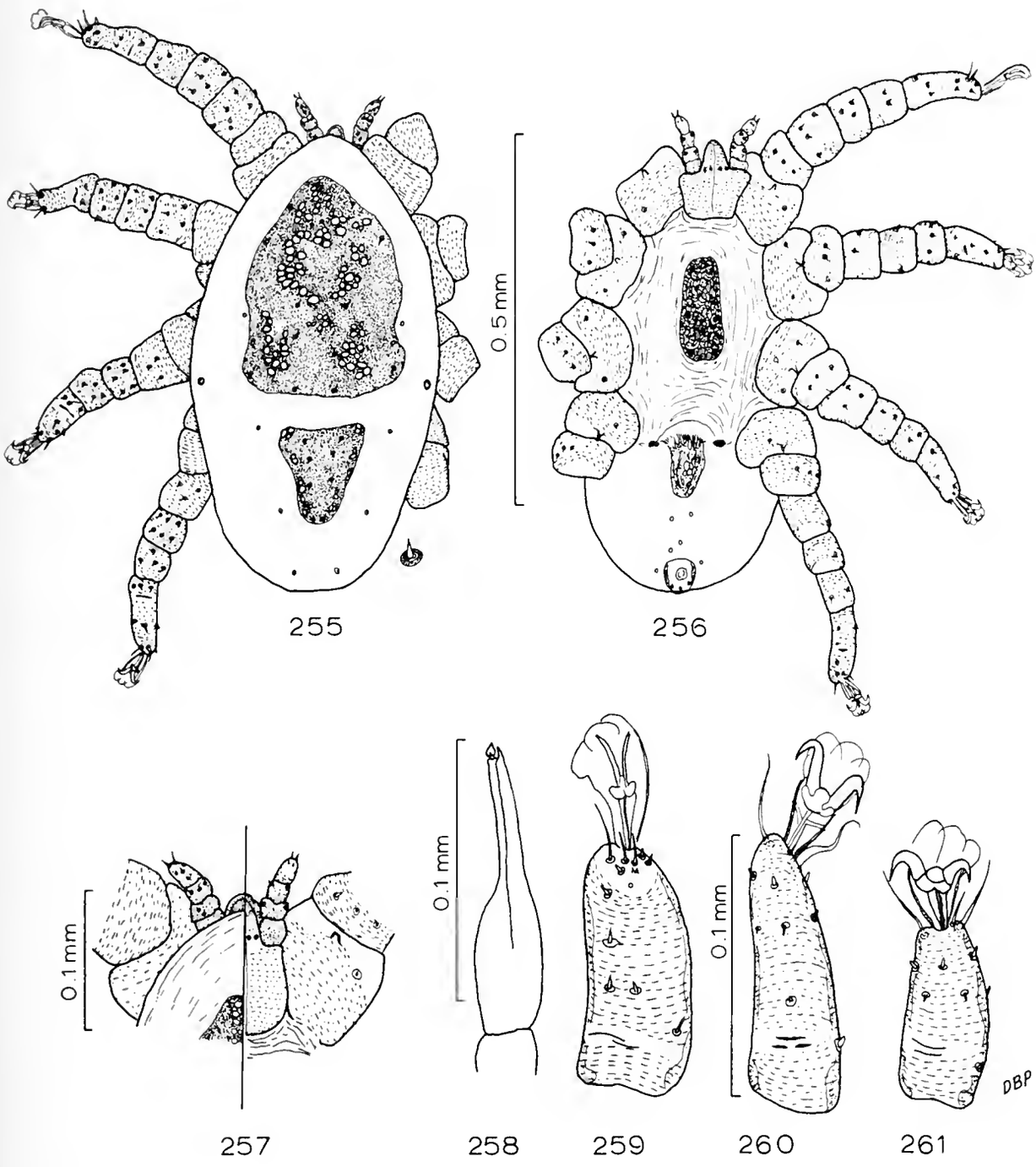
FIGS. 237-242.—*Sternostoma loxiae* Fain: 237, female dorsum; 238, female venter; 239, gnathosoma, dorsal and ventral views, respectively; 240, female chelicera; 241, tarsus I, dorsal view; 242, tarsus IV, ventral view.



FIGS. 243-248.—*Sternostoma hirundinis* Fain: 243, female dorsum; 244, female venter; 245, gnathosoma, dorsal and ventral views, respectively; 246, female chelicera; 247, tarsus I, dorsal view; 248, tarsus IV, ventral view.

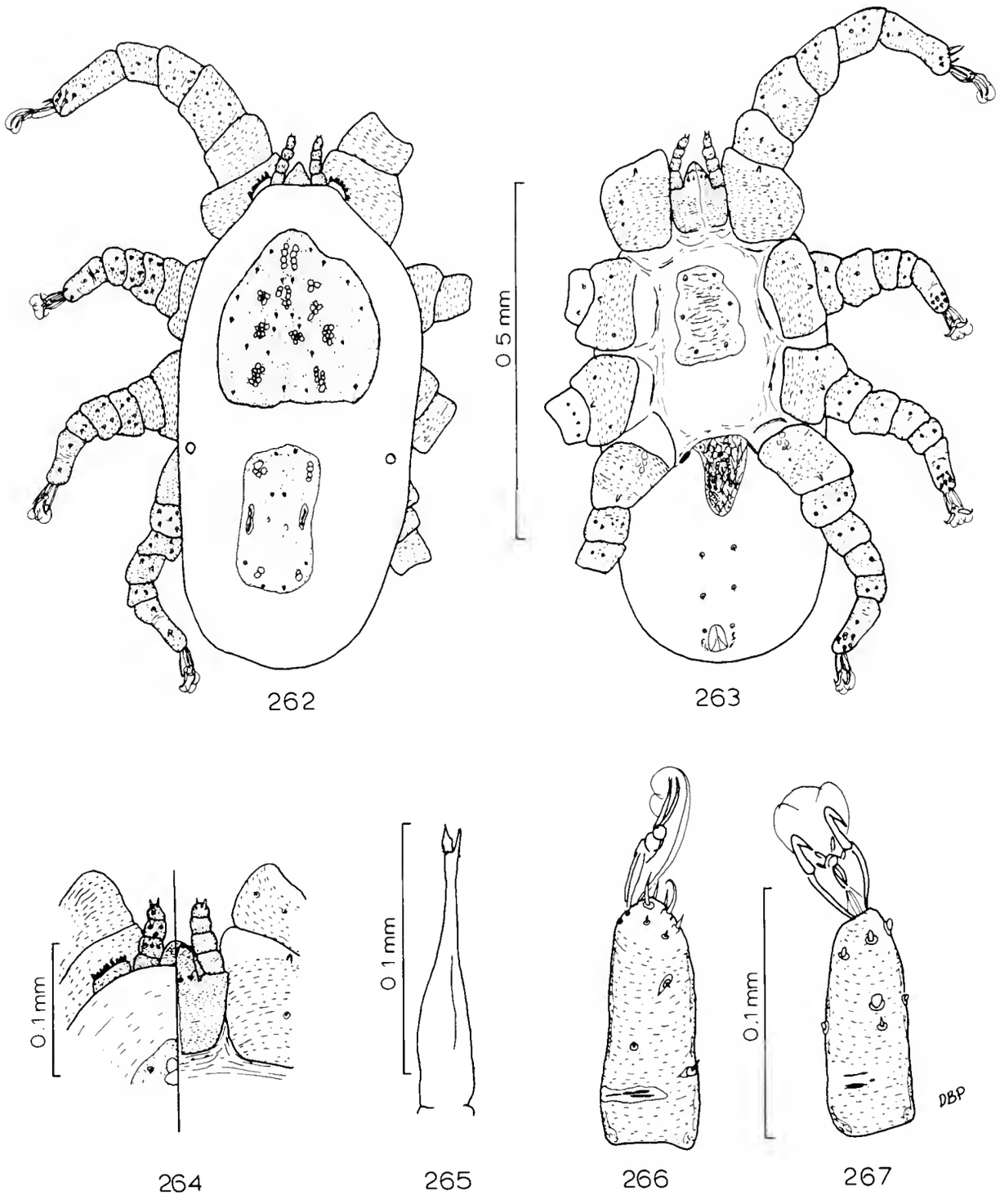


FIGS. 249-254.—*Sternostoma sialiphilus* Hyland: 249, female dorsum; 250, female venter; 251, gnathosoma, dorsal and ventral views, respectively; 252, female chelicera; 253, tarsus I, dorsal view; 254, tarsus IV, ventral view.

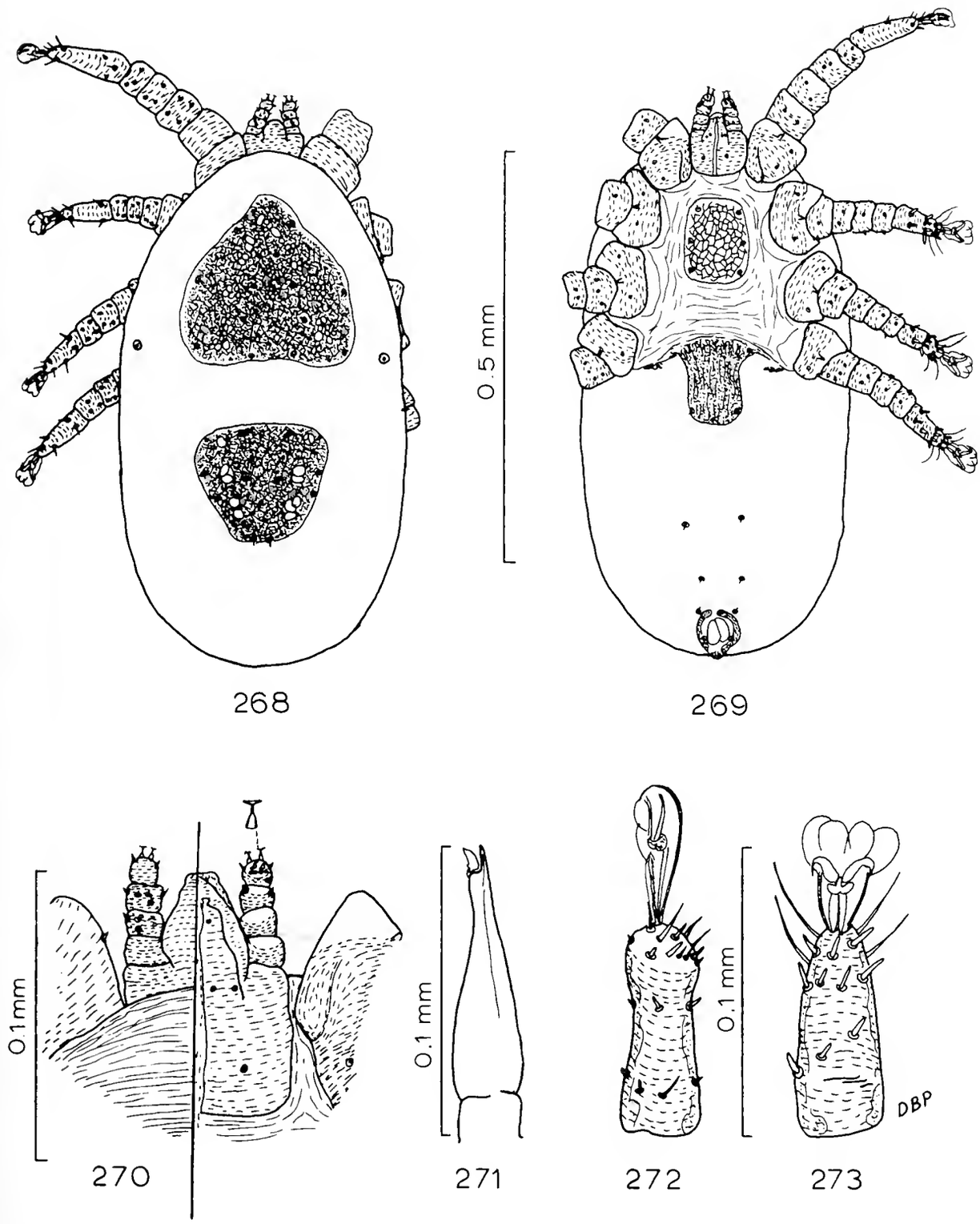


FIGS. 255-260.—*Sternostoma porteri* Hyland: 255, female dorsum; 256, female venter; 257, gnathosoma, dorsal and ventral views, respectively; 258, female chelicera; 259, tarsus I, dorsal view; 260, tarsus IV, ventral view.

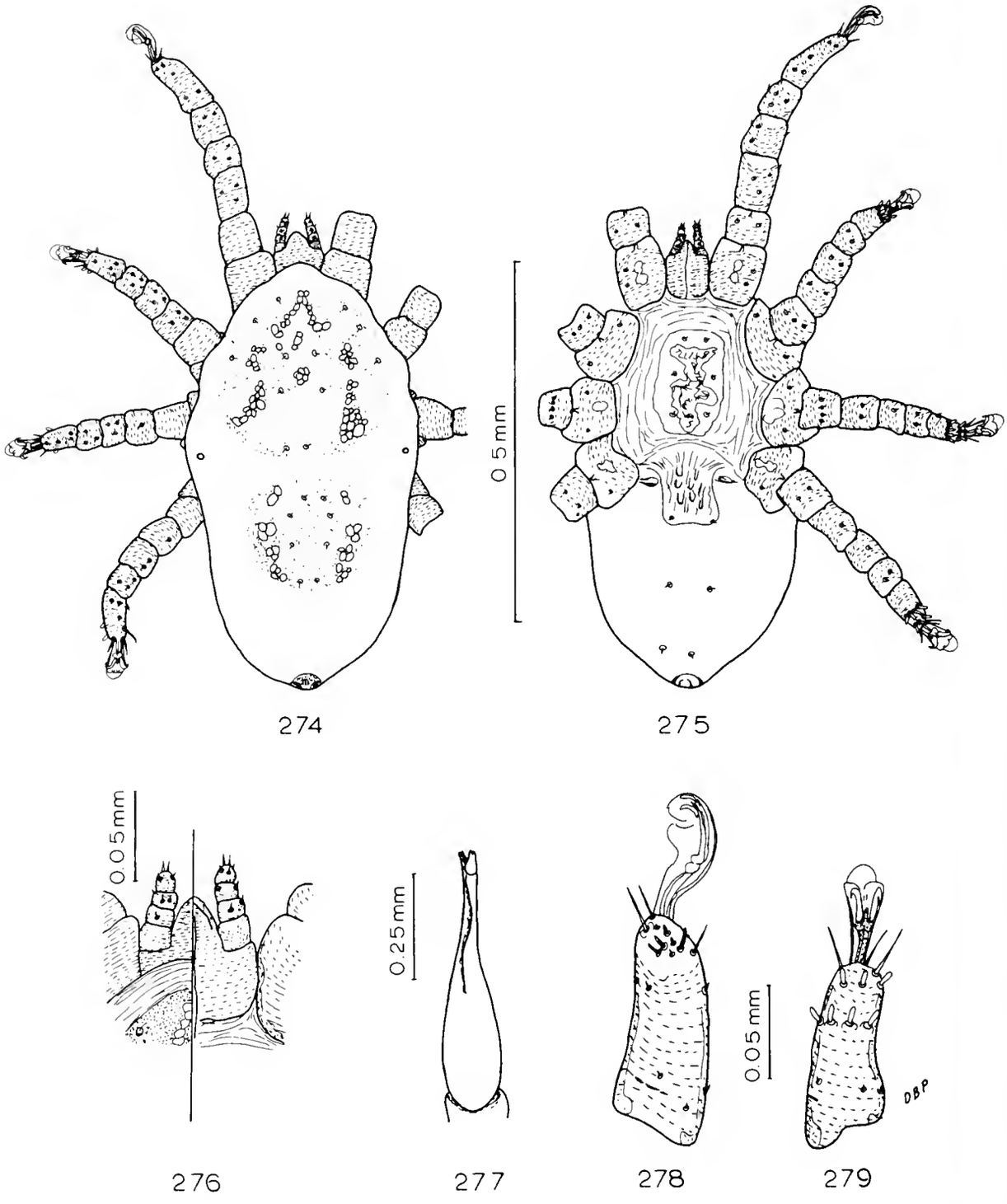
FIG. 261.—*Sternostoma hylandi* Fain and Johnston, tarsus IV.



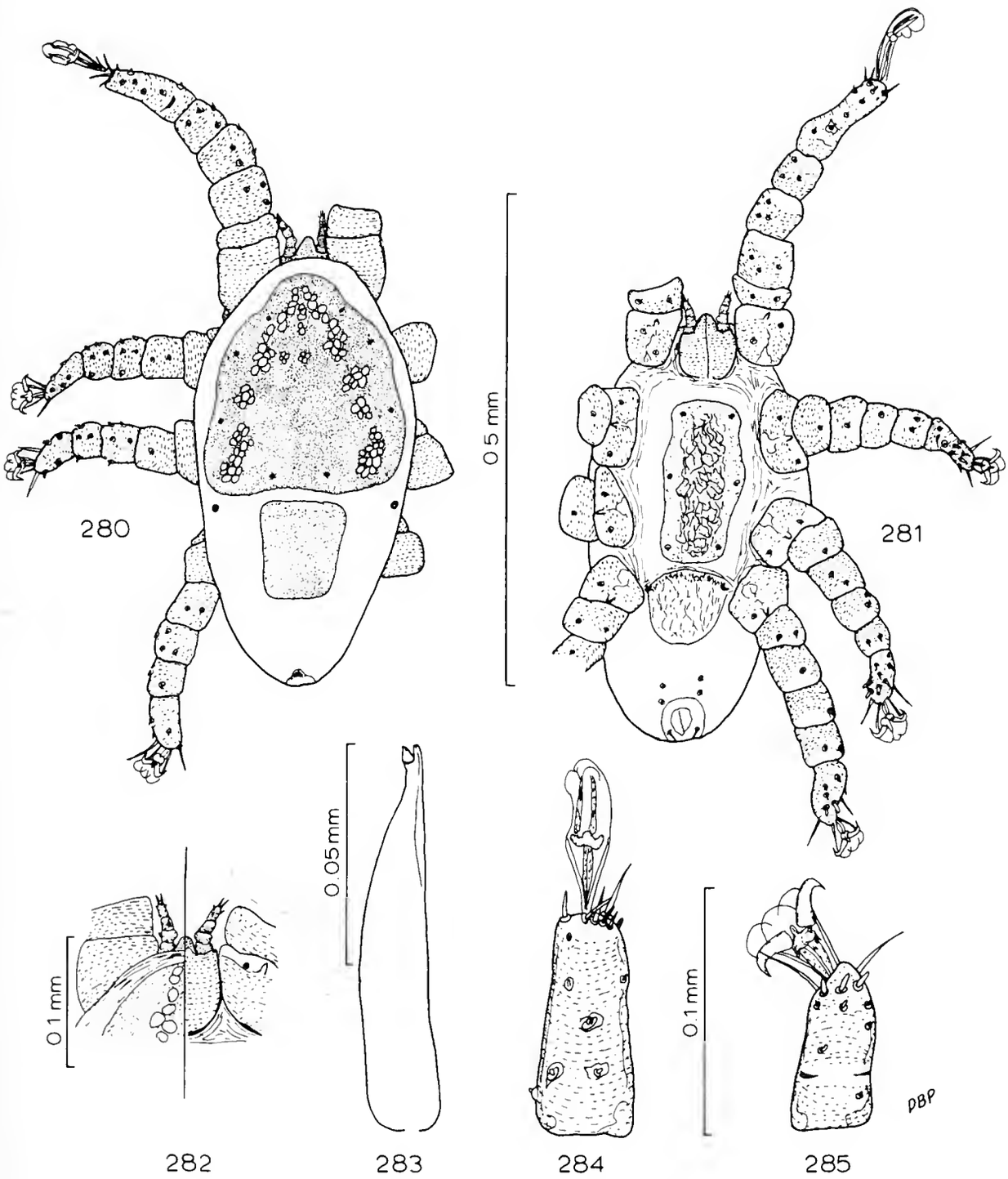
FIGS. 262-267.—*Sternostoma kelloggi* Hyland: 262, female dorsum; 263, female venter; 264, gnathosoma, dorsal and ventral views, respectively; 265, female chelicera; 266, tarsus I, dorsal view; 267, tarsus IV, ventral view.



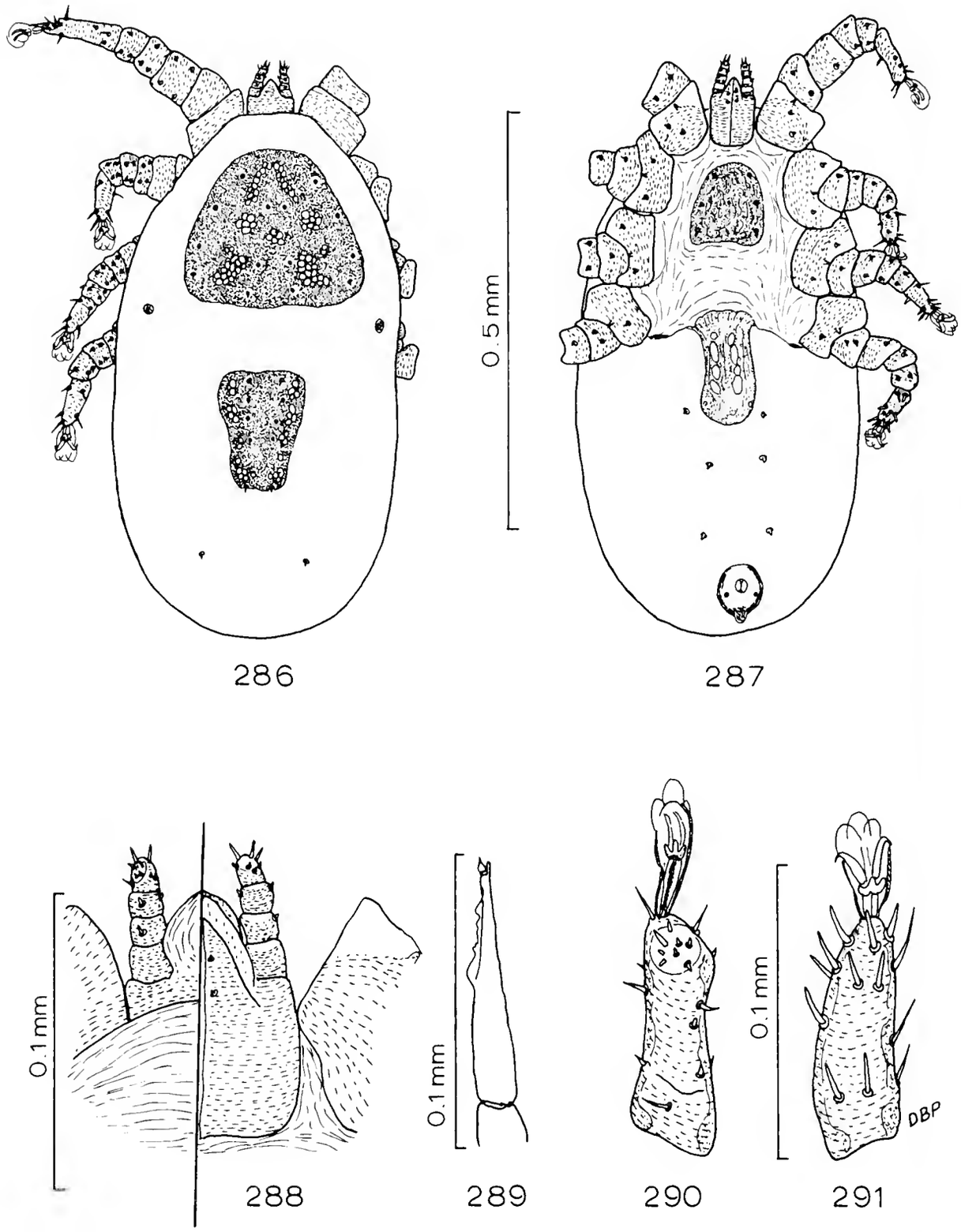
FIGS. 268-273.—*Sternostoma longisetosae* Hyland: 268, female dorsum; 269, female venter; 270, gnathosoma, dorsal and ventral views, respectively; 271, female chelicera; 272, tarsus I, dorsal view; 273, tarsus IV, ventral view.



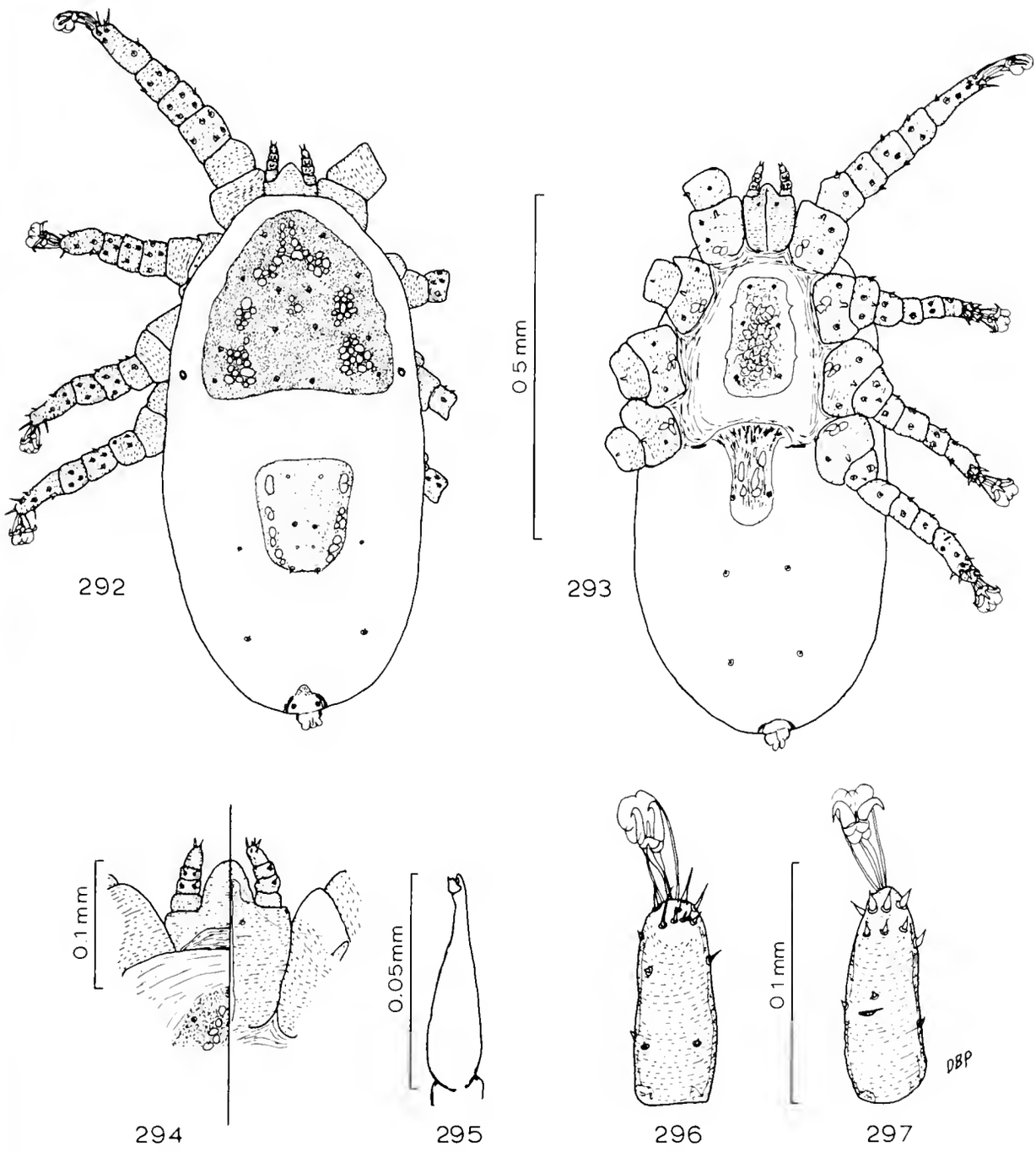
FIGS. 274-279.—*Sternostoma pirangae* Pence: 274, female dorsum; 275, female venter; 276, gnathosoma, dorsal and ventral views, respectively; 277, female chelicera; 278, tarsus I, dorsal view; 279, tarsus IV, ventral view.



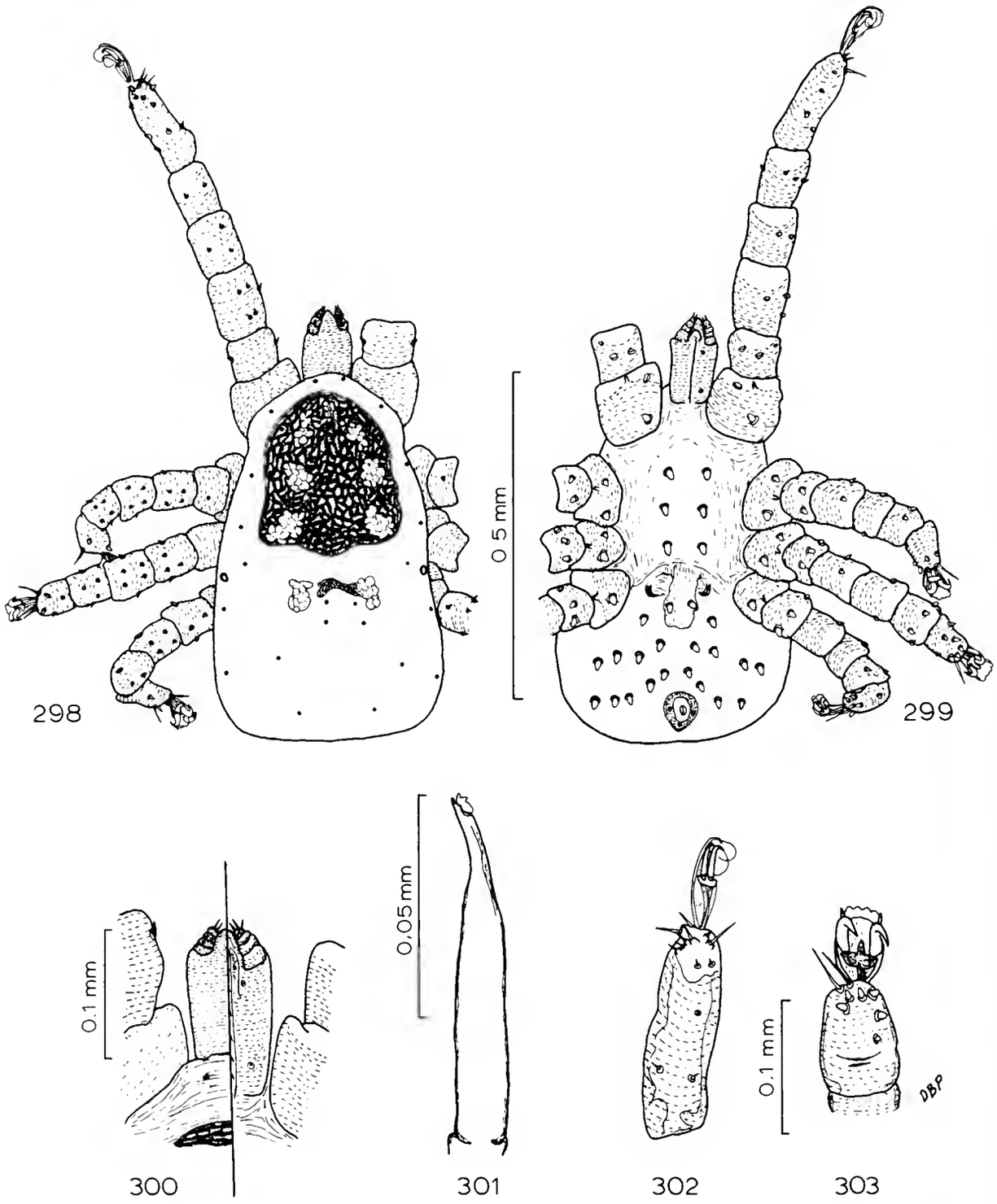
FIGS. 280-285.—*Sternostoma boydi* Strandtmann: 280, female dorsum; 281, female venter; 282, gnathosoma, dorsal and ventral views, respectively; 283, female chelicera; 284, tarsus I, dorsal view; 285, tarsus IV, ventral view.



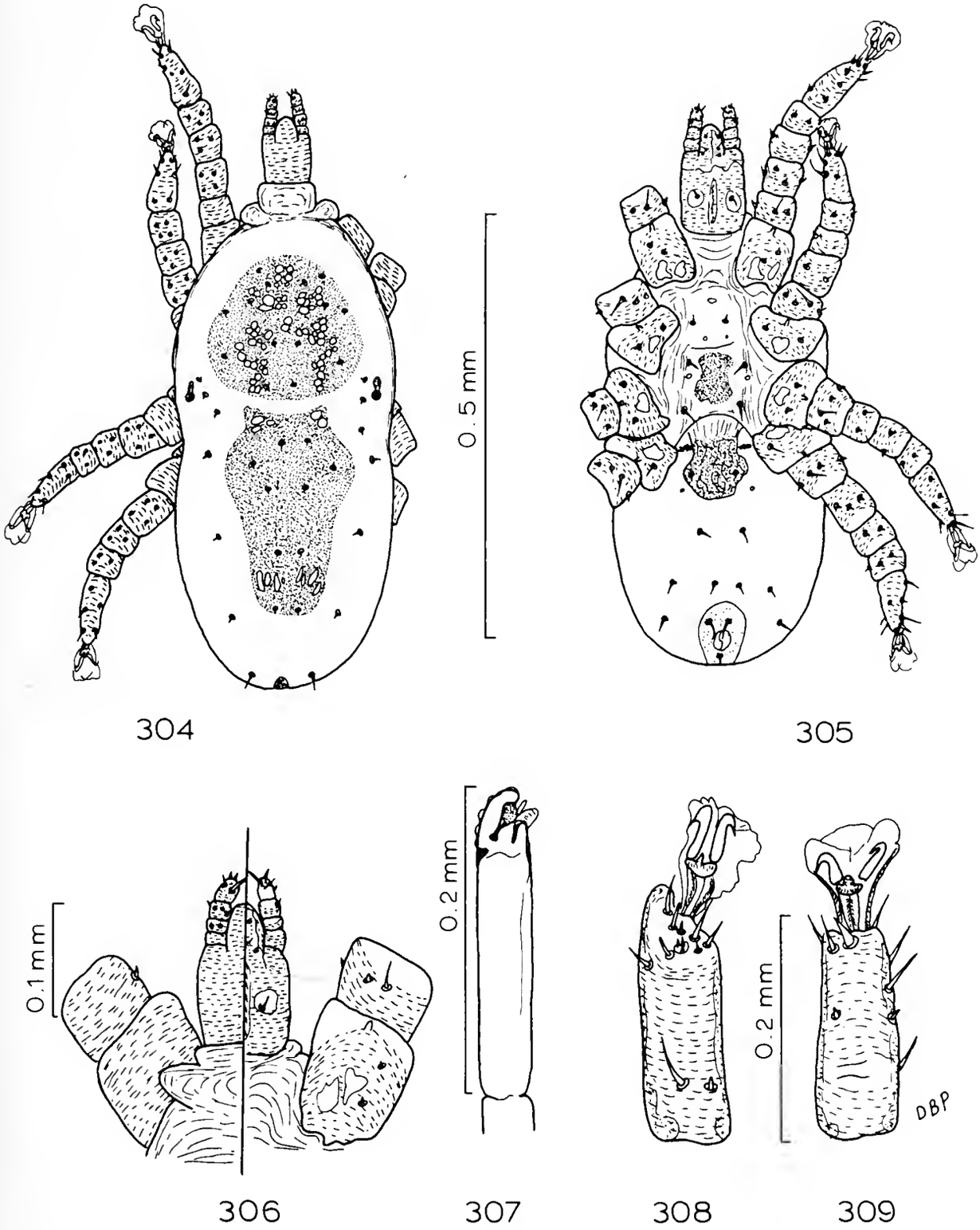
FIGS. 286-291.—*Sternostoma tyrannus* Brooks and Strandtmann: 286, female dorsum; 287, female venter; 288, gnathosoma, dorsal and ventral views, respectively; 289, female chelicera; 290, tarsus I, dorsal view; 291, tarsus IV, ventral view.



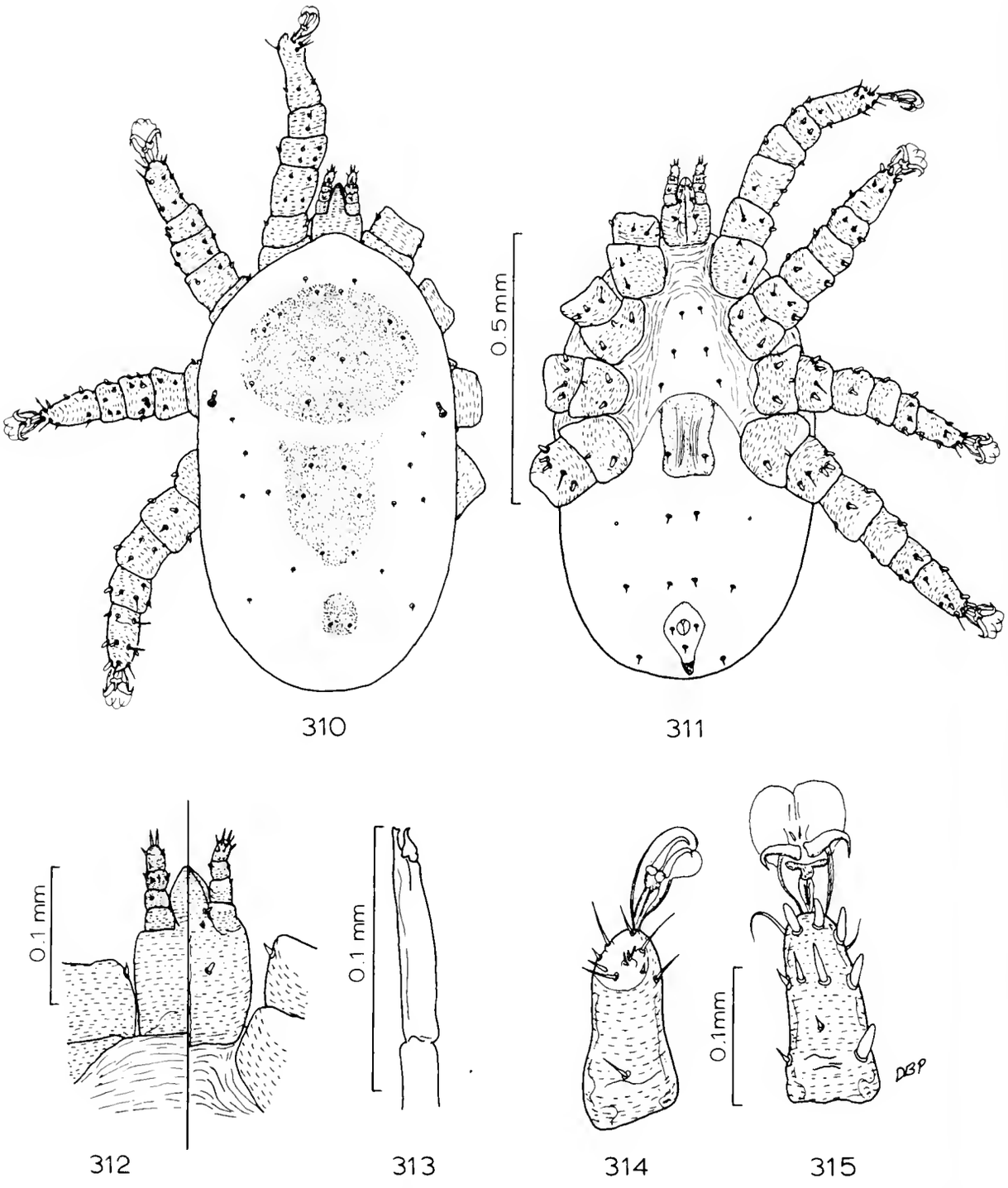
FIGS. 292-297.—*Sternostoma lanorium* Fain: 292, female dorsum; 293, female venter; 294, gnathosoma, dorsal and ventral views, respectively; 295, female chelicera; 296, tarsus I, dorsal view; 297, tarsus IV, ventral view.



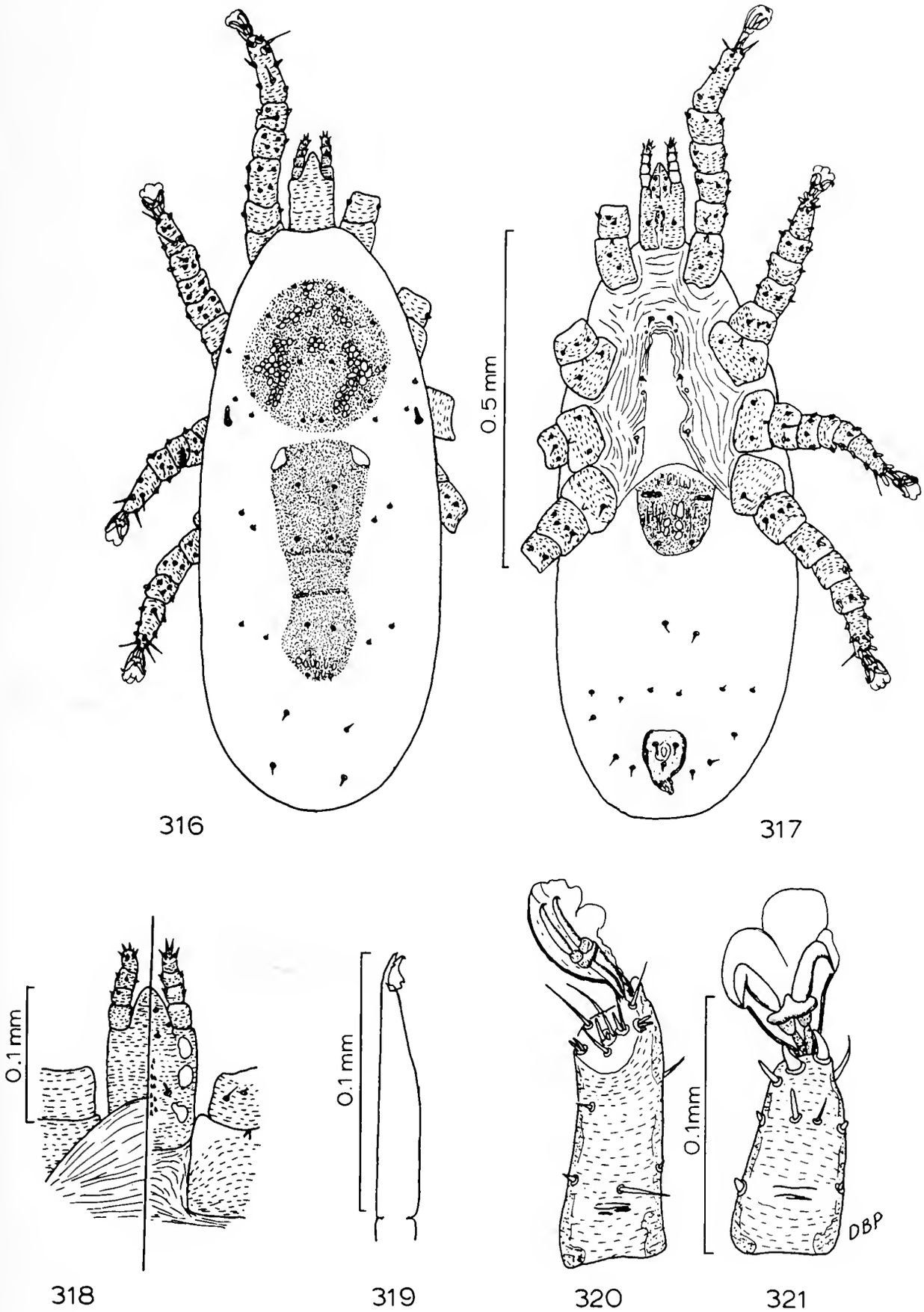
FIGS. 298-303.—*Ptilonyssus angrensis* Castro: 298, female dorsum; 299, female venter; 300, gnathosoma, dorsal and ventral views, respectively; 301, female chelicera; 302, tarsus I, dorsal view; 303, tarsus IV, ventral view.



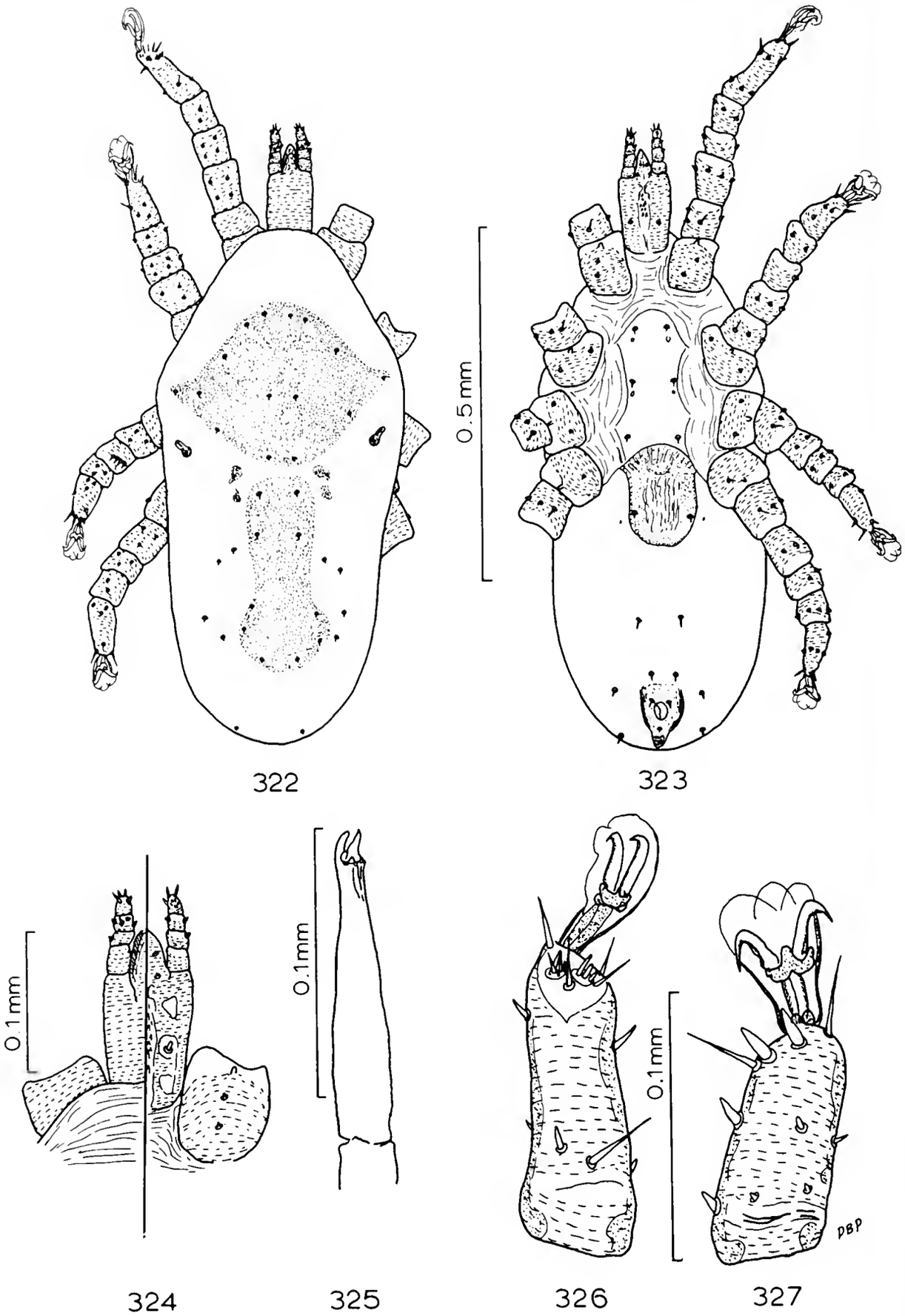
FIGS. 304-309.—*Ptilonyssus fluvicolae* Hyland and Moorehouse: 304, female dorsum; 305, female venter; 306, gnathosoma, dorsal and ventral views, respectively; 307, female chelicera; 308, tarsus I, dorsal view; 309, tarsus IV, ventral view.



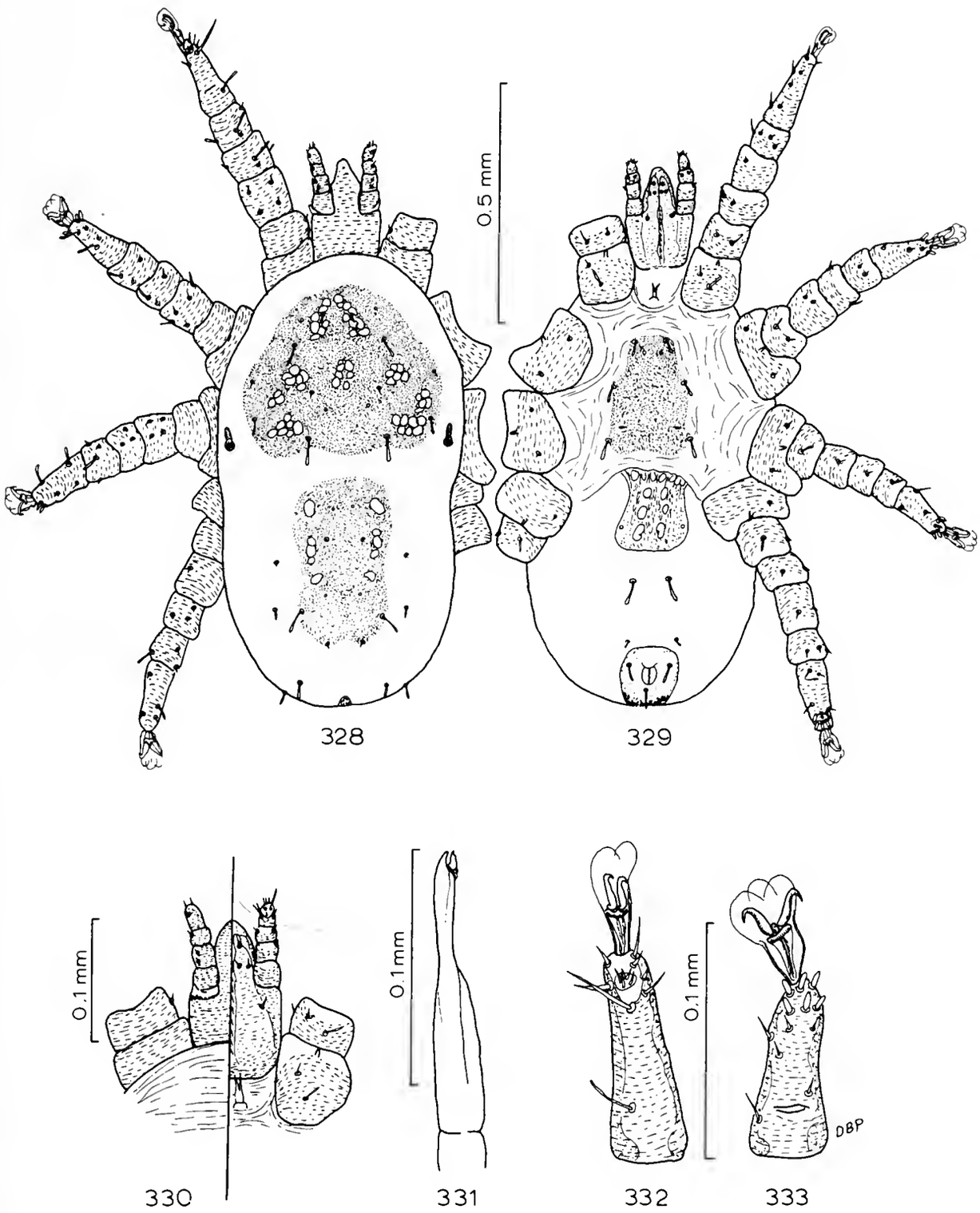
FIGS. 310-315.—*Ptilonyssus spinosus* Brooks and Strandtmann: 310, female dorsum; 311, female venter; 312, gnathosoma, dorsal and ventral views, respectively; 313, female chelicera; 314, tarsus I, dorsal view; 315, tarsus IV, ventral view.



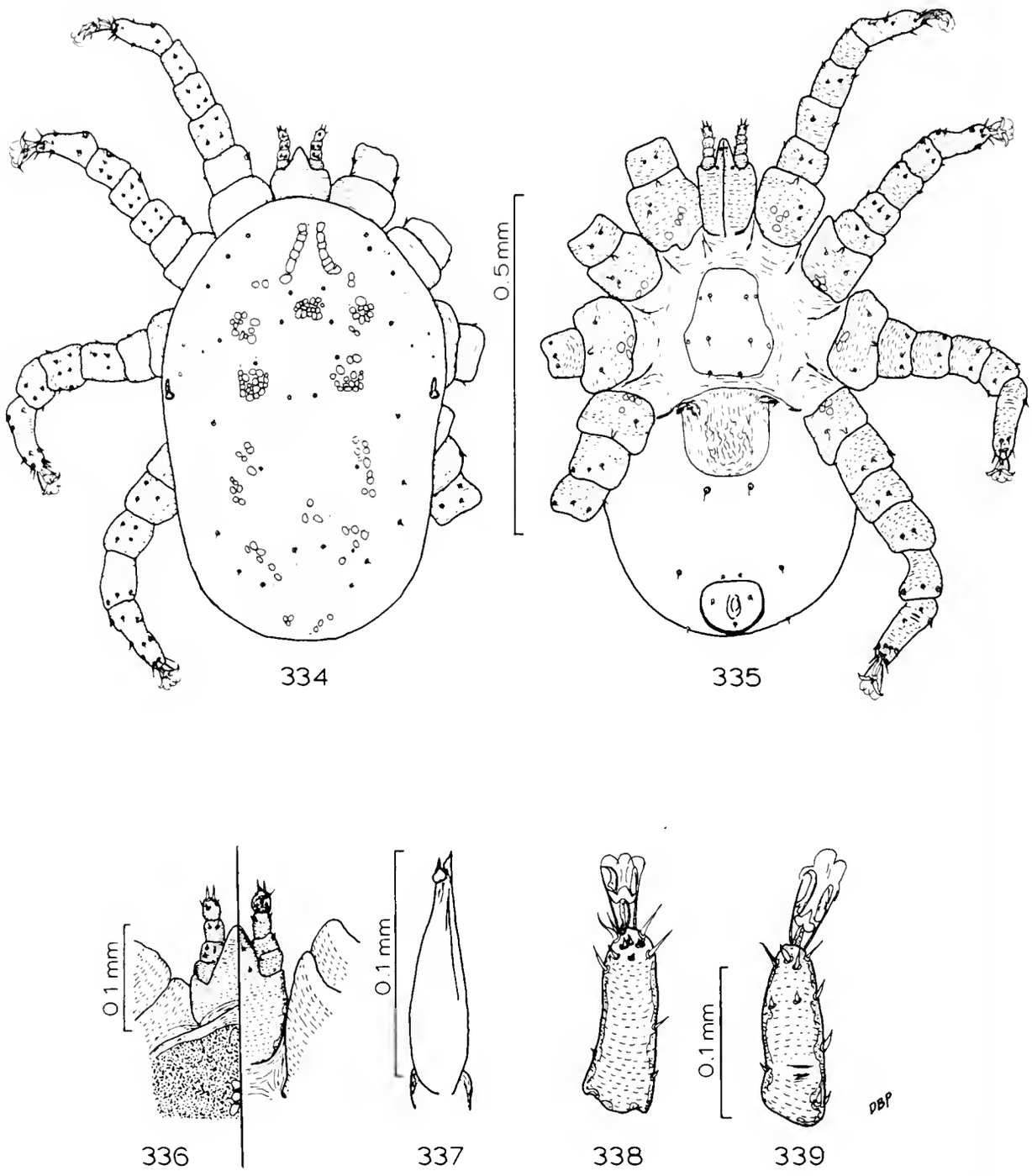
FIGS. 316-321.—*Ptilonyssus tyrannus* Brooks and Strandtmann: 316, female dorsum; 317, female venter; 318, gnathosoma, dorsal and ventral views, respectively; 319, female chelicera; 320, tarsus I, dorsal view; 321, tarsus IV, ventral view.



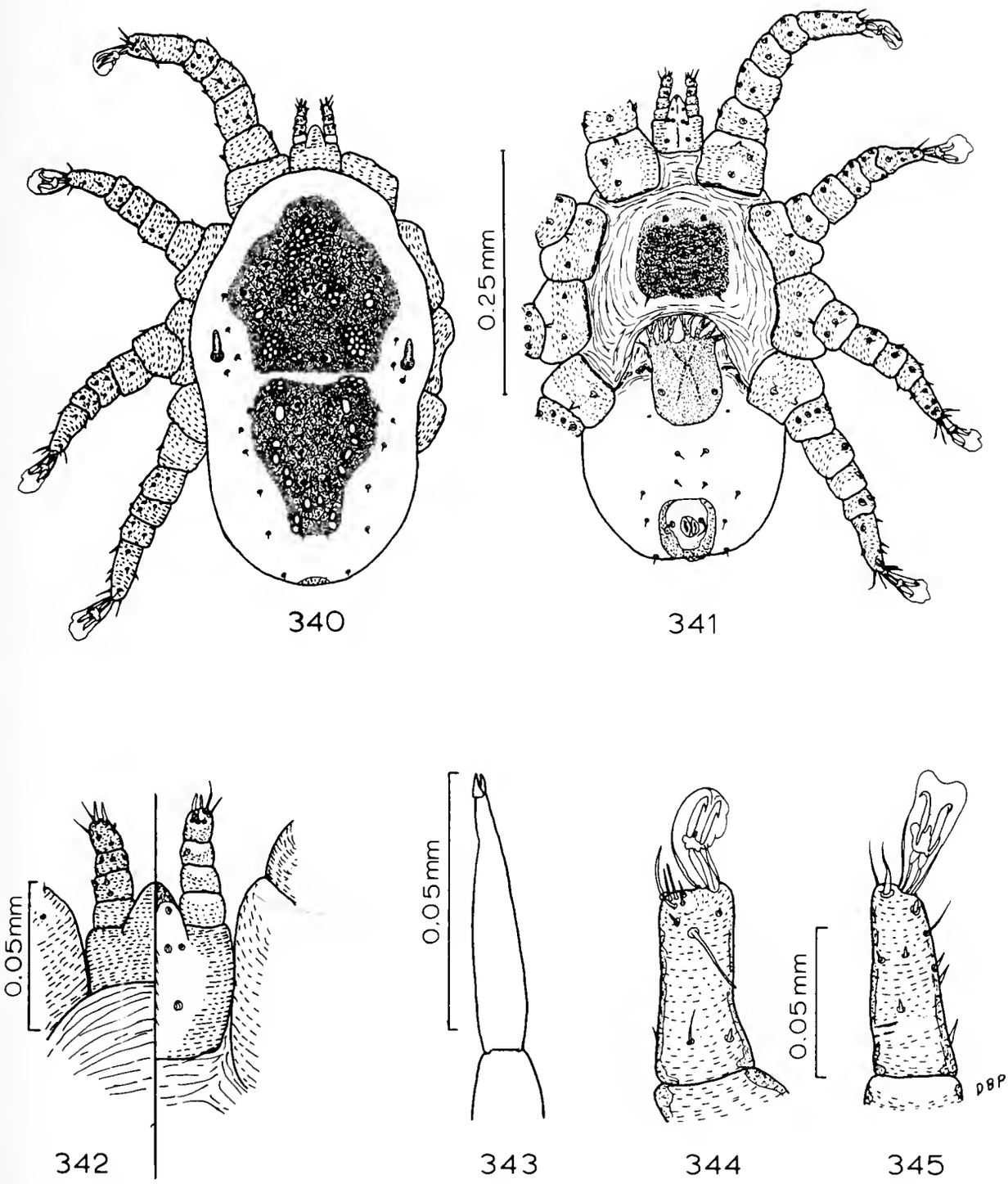
FIGS. 322-327.—*Ptilonyssus callinectoides* Brooks and Strandtmann: 322, female dorsum; 323, female venter; 324, gnathosoma, dorsal and ventral views, respectively; 325, female chelicera; 326, tarsus I, dorsal view; 327, tarsus IV, ventral view.



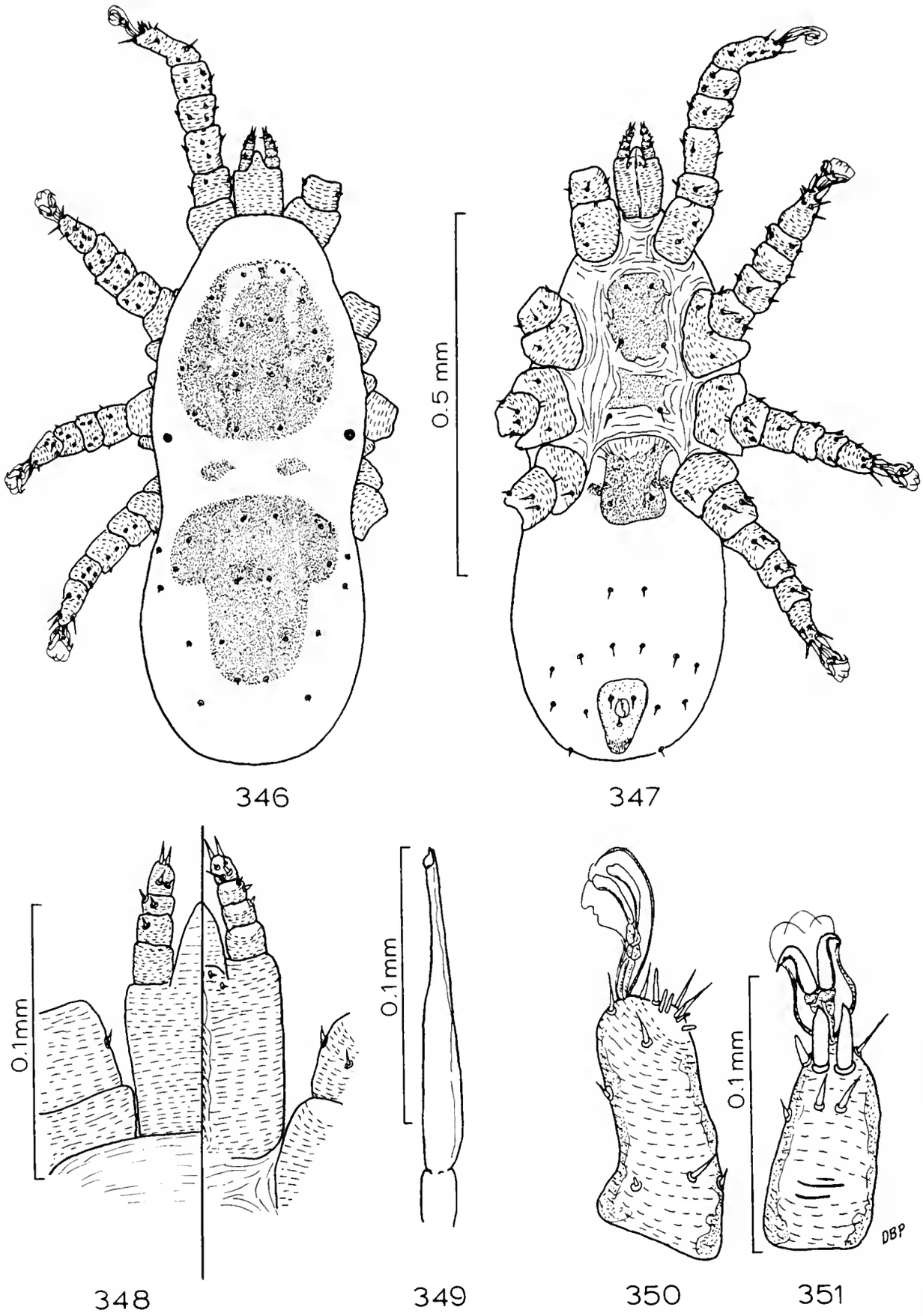
FIGS. 328-333.—*Ptilonyssus capitatus* Strandtmann: 328, female dorsum; 329, female venter; 330, gnathosoma, dorsal and ventral views, respectively; 331, female chelicera; 332, tarsus I, dorsal view; 333, tarsus IV, ventral view.



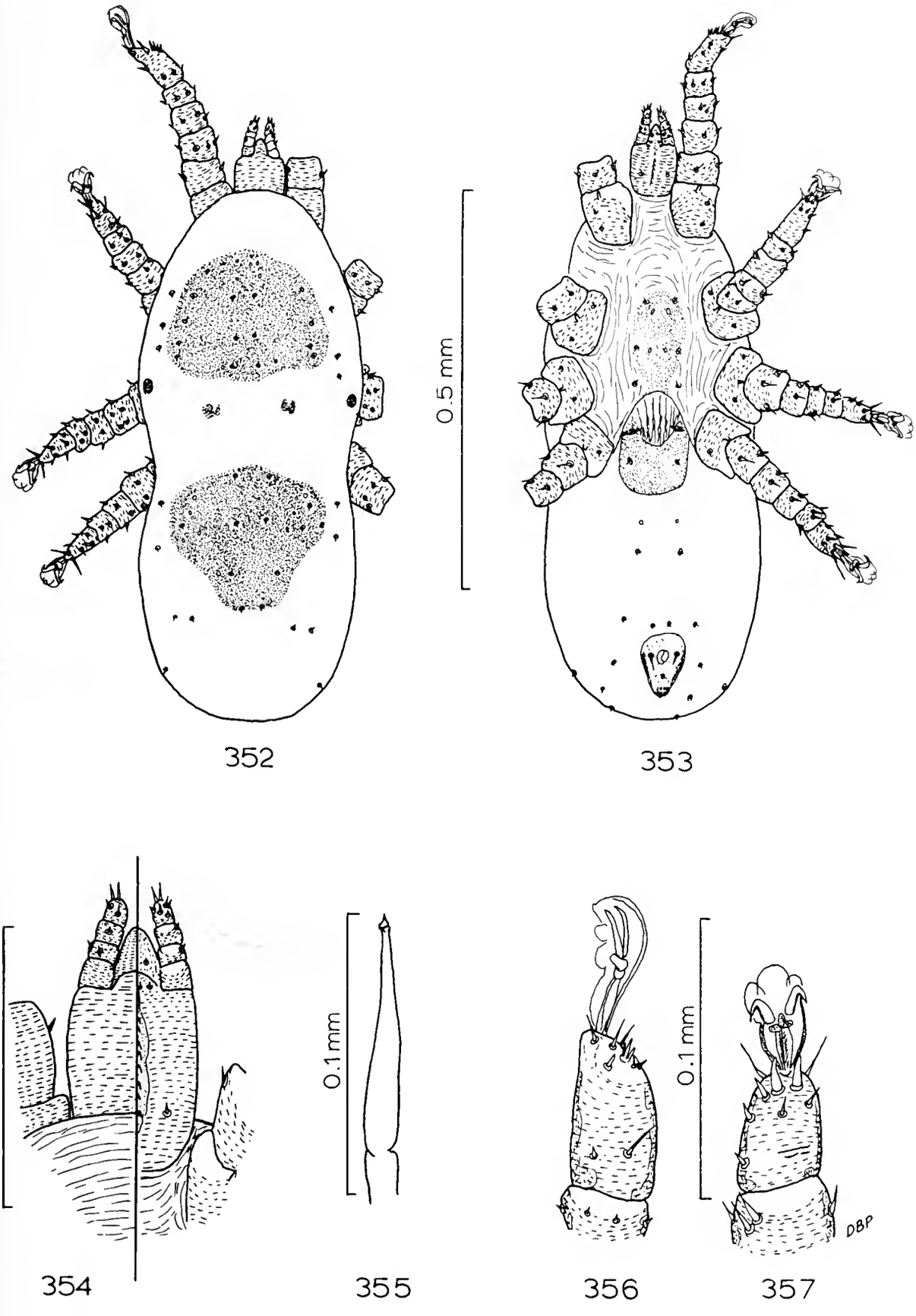
FIGS. 334-339.—*Ptilonyssus corvi* Pence: 334, female dorsum; 335, female venter; 336, gnathosoma, dorsal and ventral views, respectively; 337, female chelicera; 338, tarsus I, dorsal view; 339, tarsus IV, ventral view.



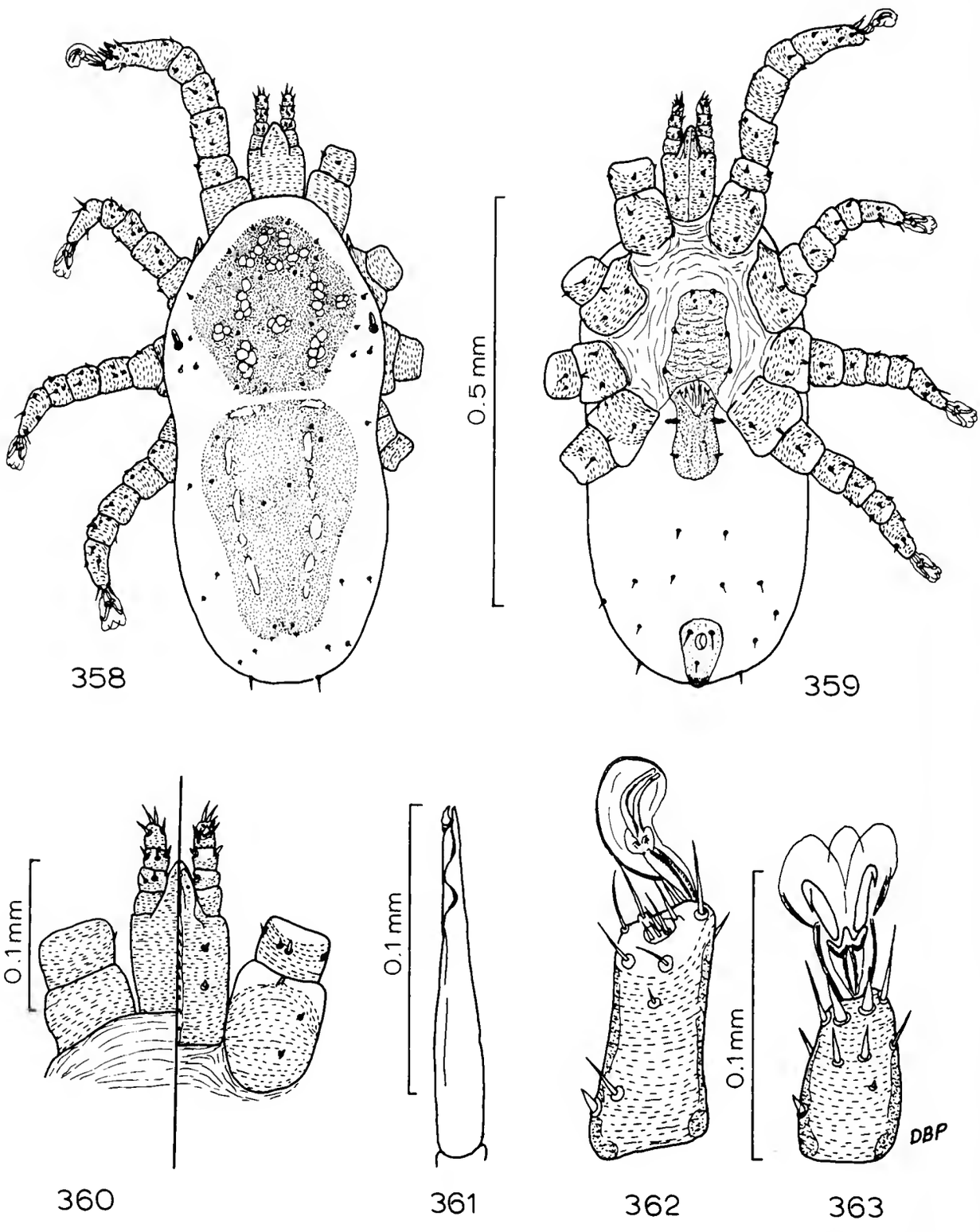
FIGS. 340-345.—*Ptilonyssus morofskyi* Hyland: 340, female dorsum; 341, female venter; 342, gnathosoma, dorsal and ventral views, respectively; 343, female chelicera; 344, tarsus I, dorsal view; 345, tarsus IV, ventral view.



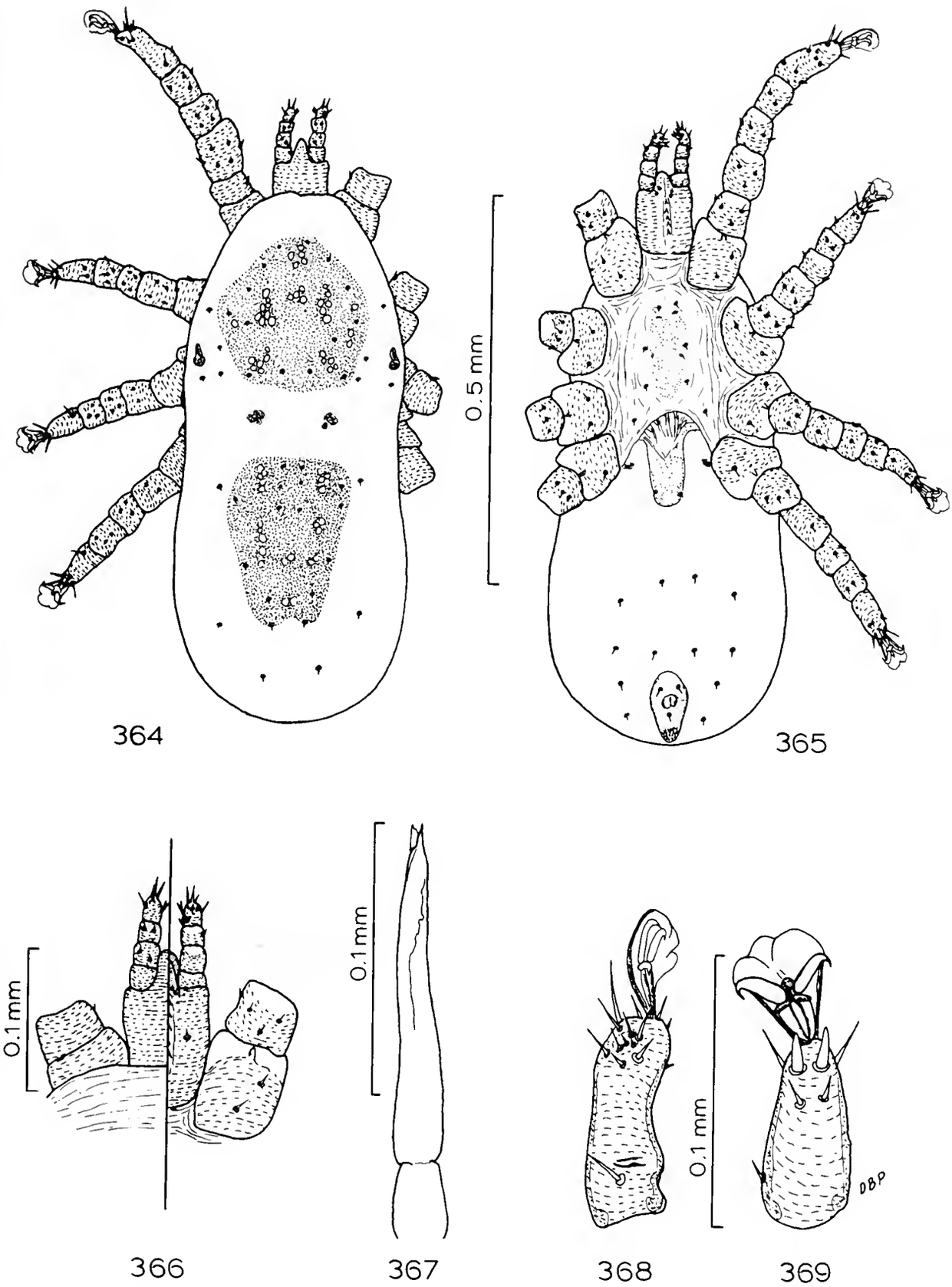
FIGS. 346-351.—*Ptilonyssus vireonis* Dusbábek: 346, female dorsum; 347, female venter; 348, gnathosoma, dorsal and ventral views, respectively; 349, female chelicera; 350, tarsus I, dorsal view; 351, tarsus IV, ventral view.



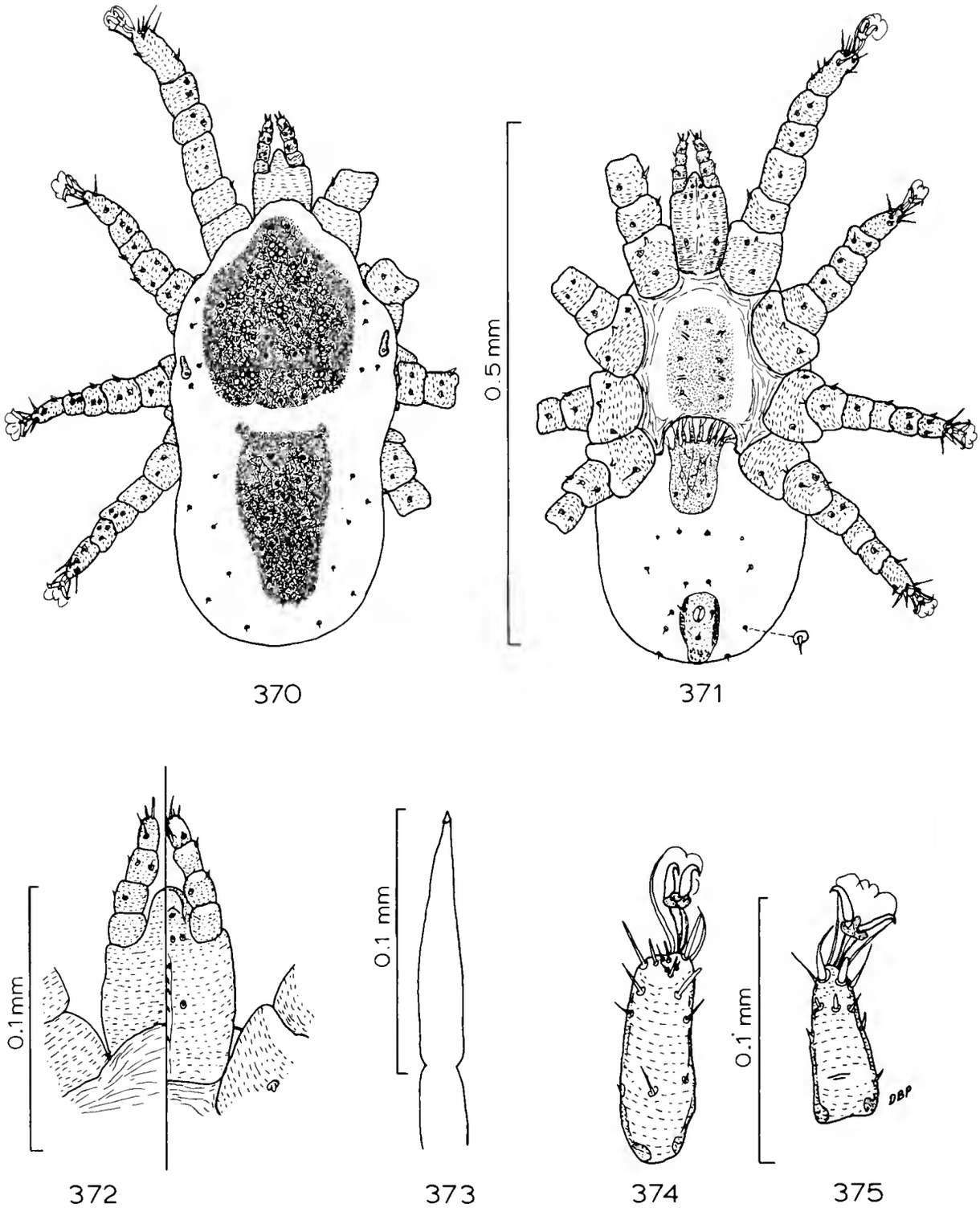
FIGS. 352-357.—*Ptilonyssus hoseini* Fain and Aitken: 352, female dorsum; 353, female venter; 354, gnathosoma, dorsal and ventral views, respectively; 355, female chelicera; 356, tarsus I, dorsal view; 357, tarsus IV, ventral view.



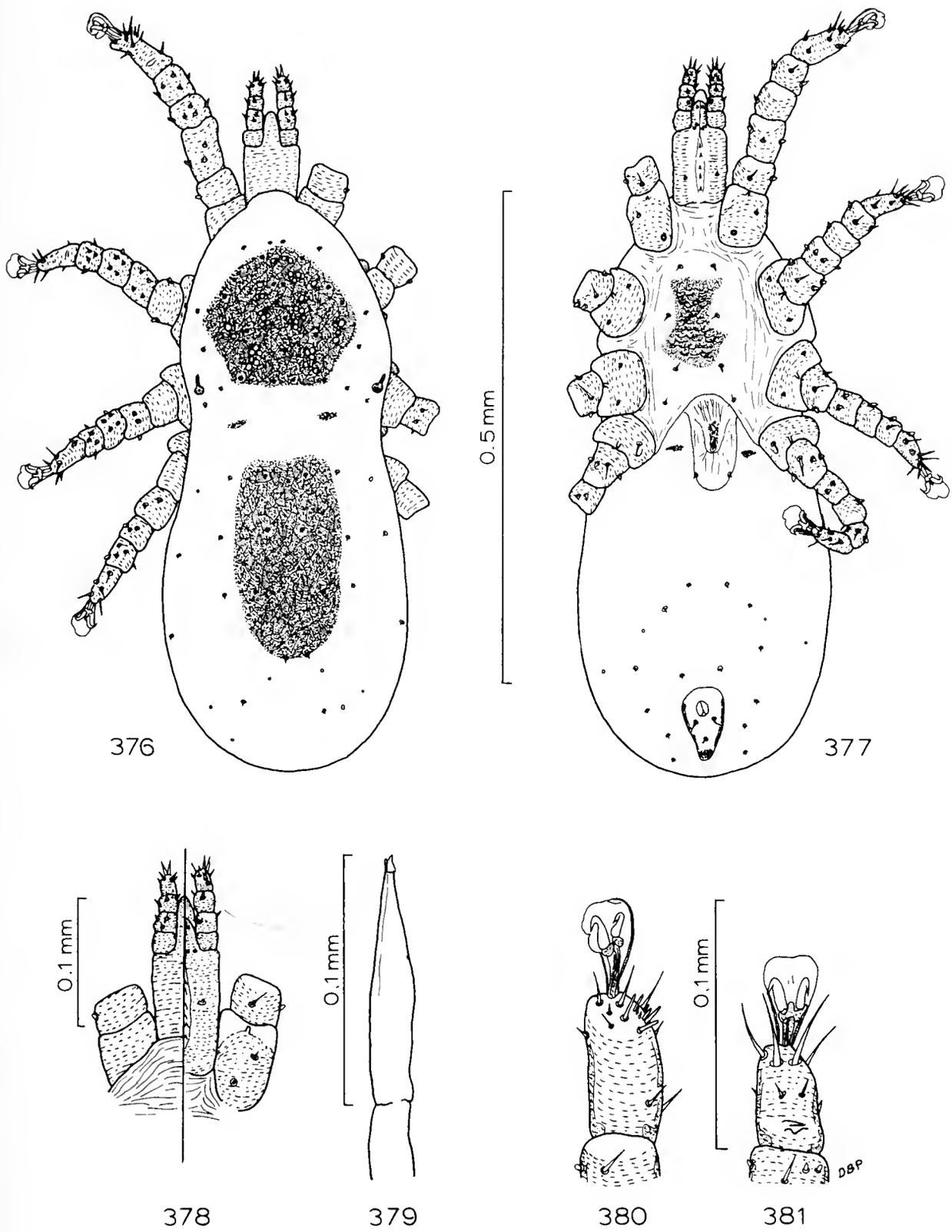
FIGS. 358-363.—*Ptilonyssus pirangae* Dusbábek: 358, female dorsum; 359, female venter; 360, gnathosoma, dorsal and ventral views, respectively; 361, female chelicera; 362, tarsus I, dorsal view; 363, tarsus IV, ventral view.



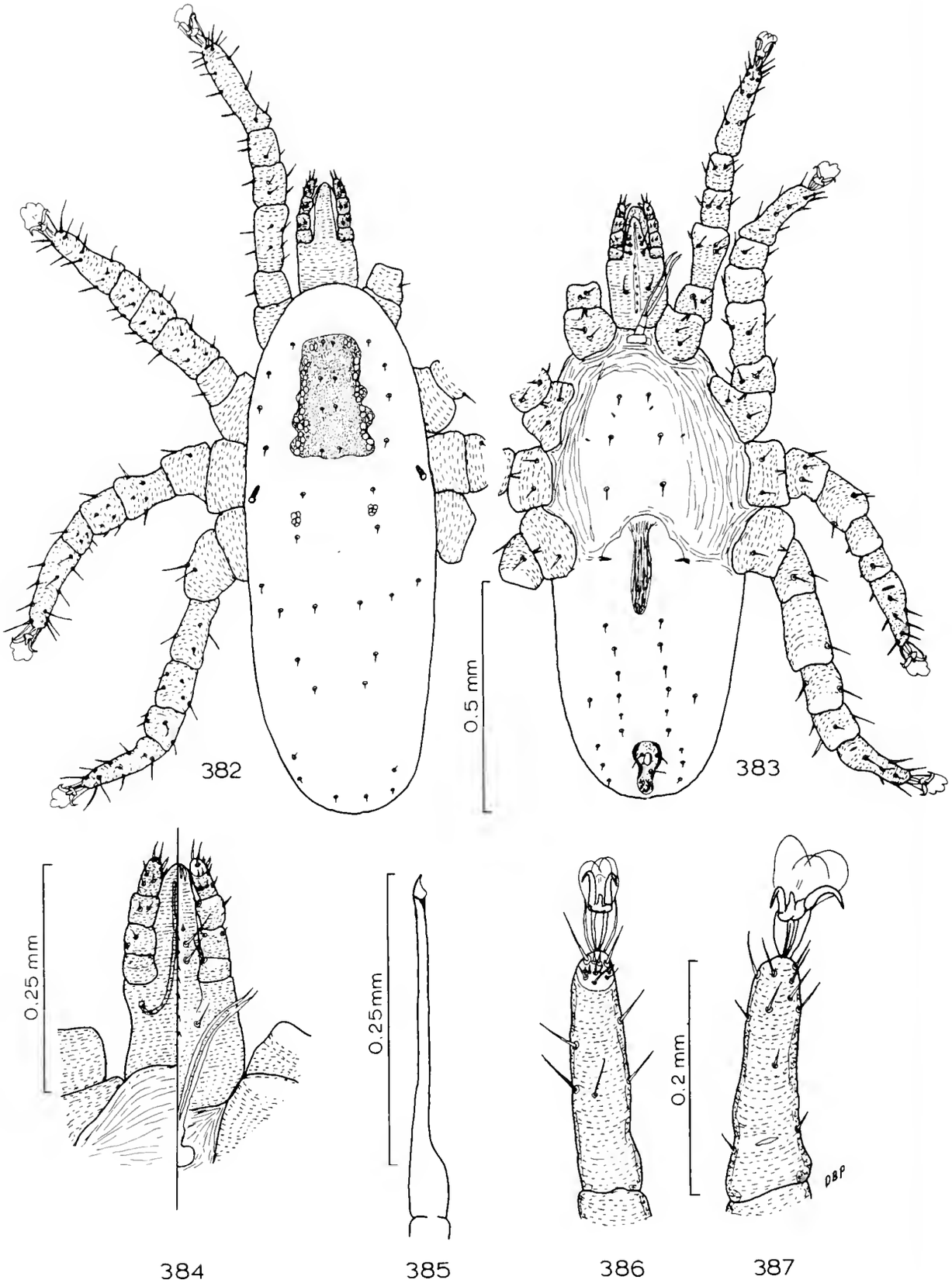
FIGS. 364-369.—*Ptilonyssus icteridius* Strandtmann: 364, female dorsum; 365, female venter; 366, gnathosoma, dorsal and ventral views, respectively; 367, female chelicera; 368, tarsus I, dorsal view; 369, tarsus IV, ventral view.



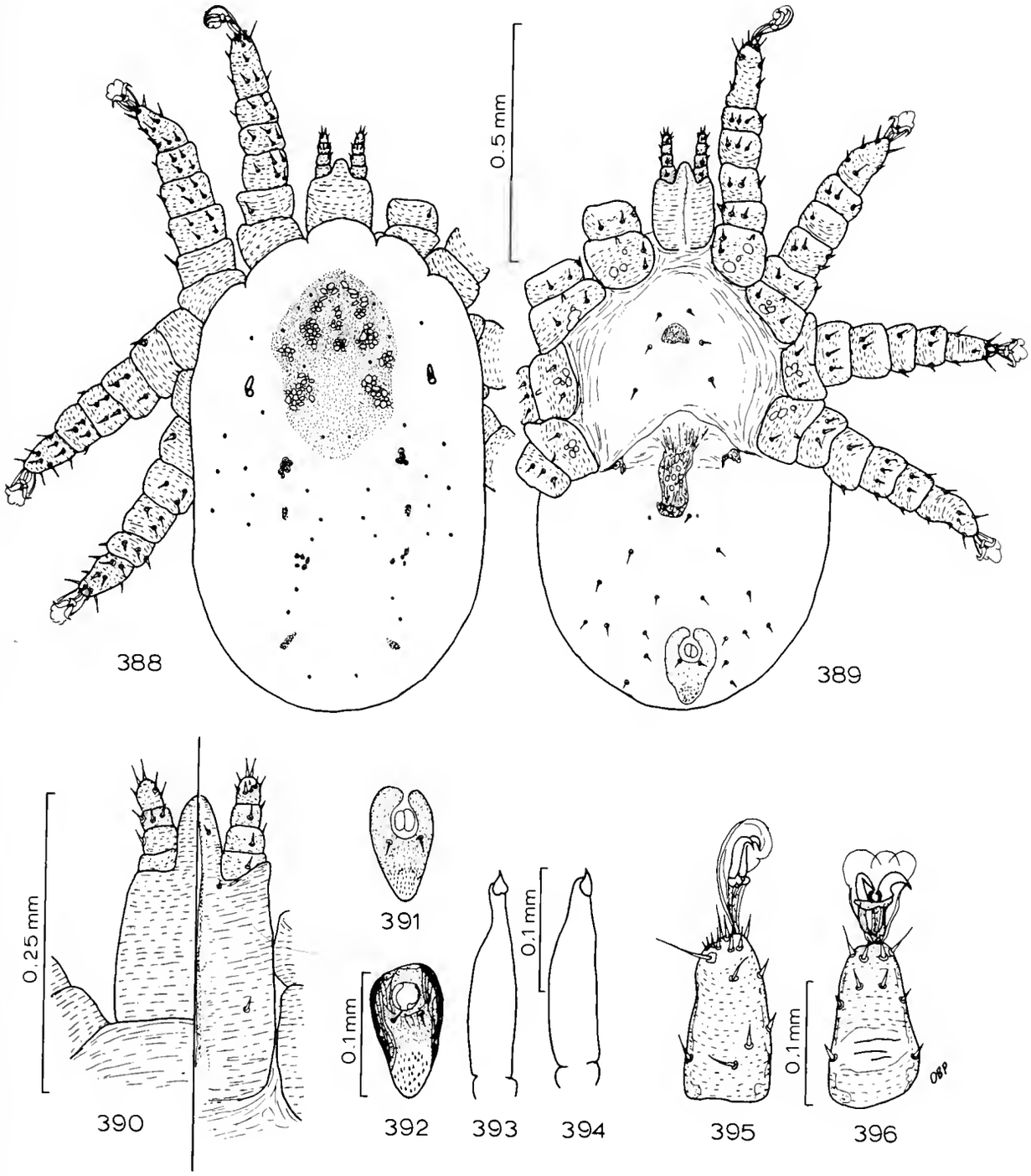
FIGS. 370-375.—*Ptilonyssus pari* Fain and Hyland: 370, female dorsum; 371, female venter; 372, gnathosoma, dorsal and ventral views, respectively; 373, female chelicera; 374, tarsus I, dorsal view; 375, tarsus IV, ventral view.



FIGS. 376-381.—*Ptilonyssus hirsti* Castro: 376, female dorsum; 377, female venter; 378, gnathosoma, dorsal and ventral views, respectively; 379, female chelicera; 380, tarsus I, dorsal view; 381, tarsus IV, ventral view.

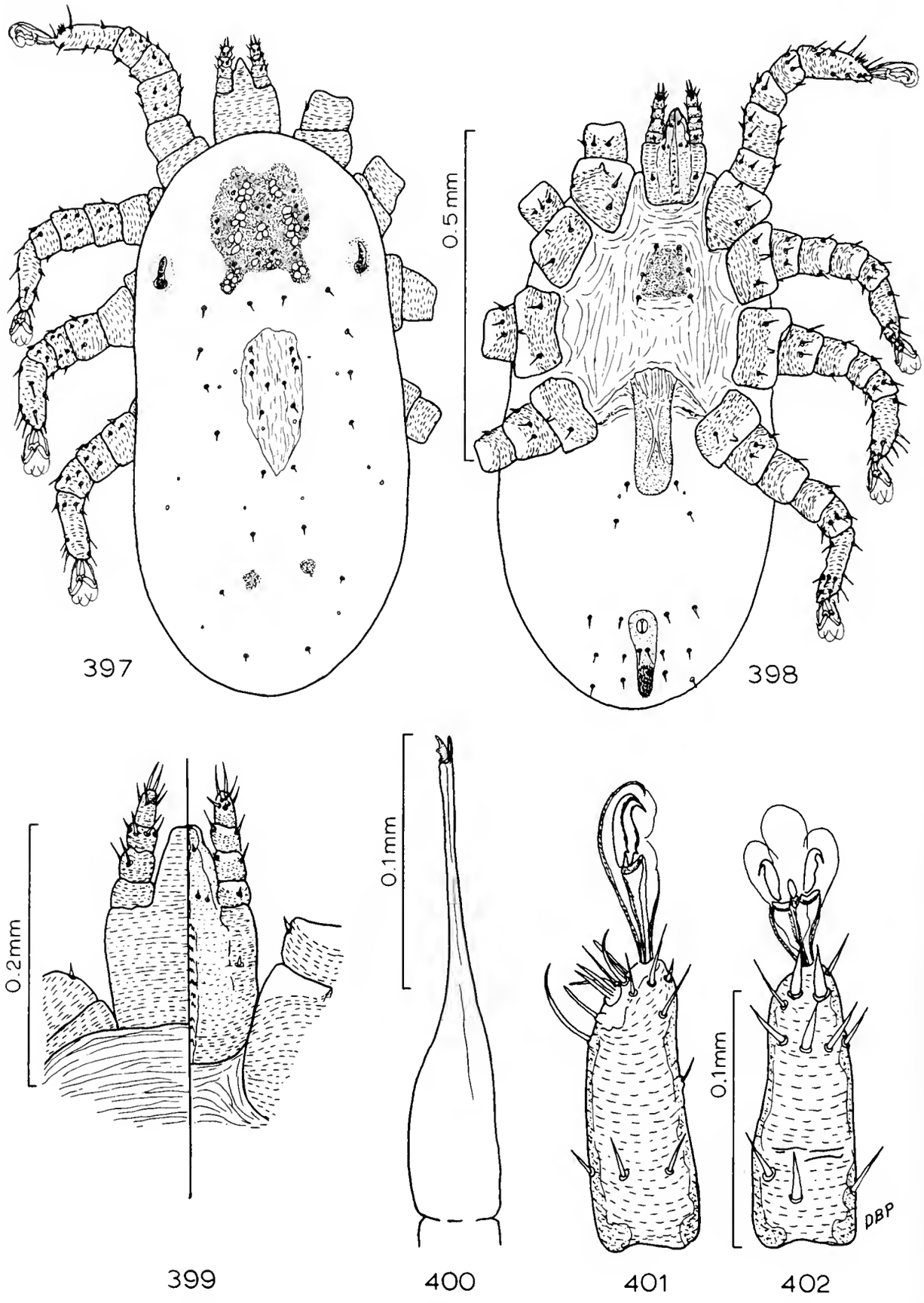


FIGS. 382-387.—*Ptilonyssus nitzschi* Giebel: 382, female dorsum; 383, female venter; 384, gnathosoma, dorsal and ventral views, respectively; 385, female chelicera; 386, tarsus I, dorsal view; 387, tarsus IV, ventral view.

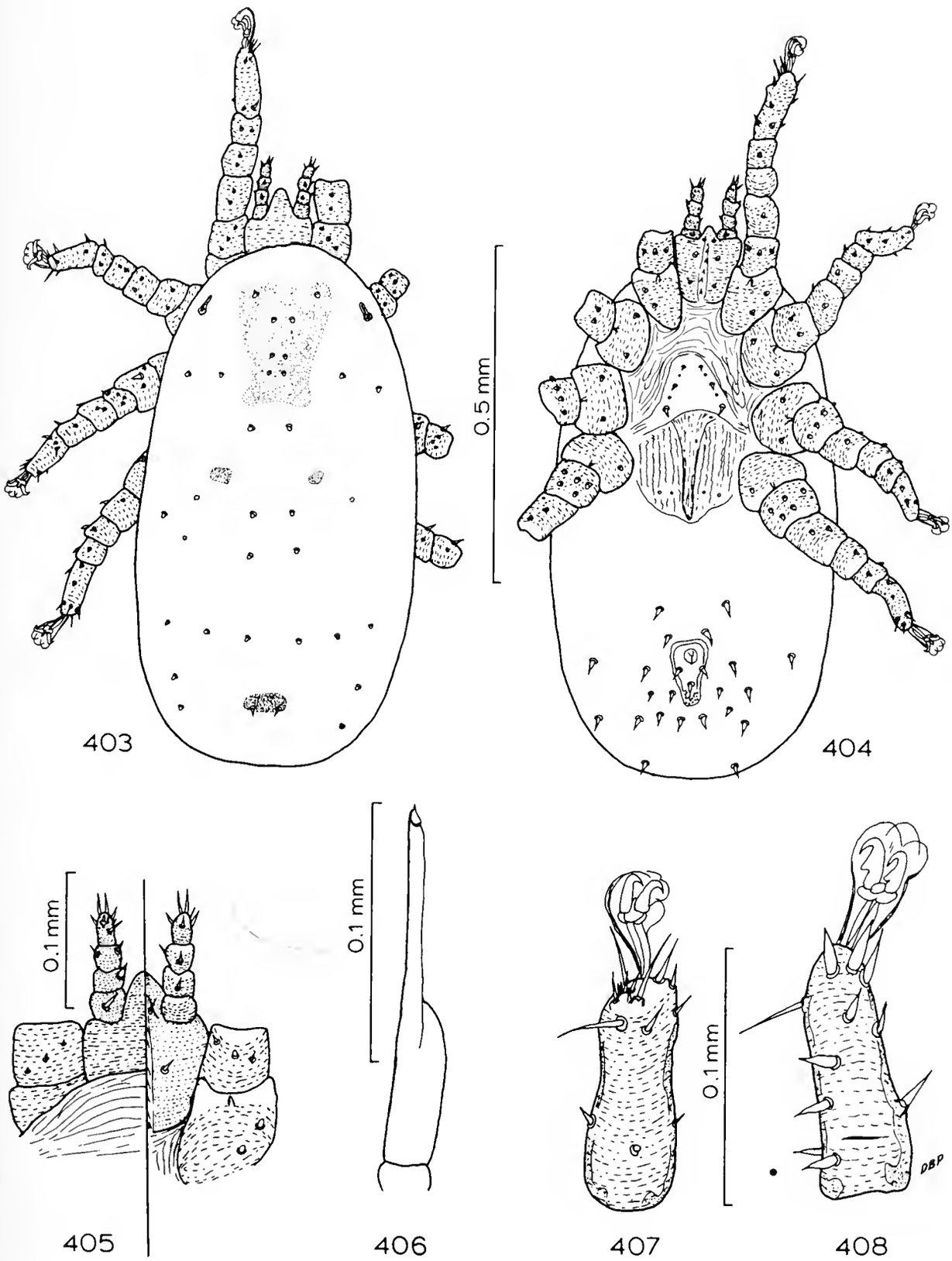


FIGS. 388-391, 393, 395, 396.—*Ptilonyssus ohioensis* Fain and Johnston: 388, female dorsum; 389, female venter; 390, gnathosoma, dorsal and ventral views, respectively; 391, female anal plate; 393, female chelicera; 395, tarsus I, dorsal view; 396, tarsus IV, ventral view.

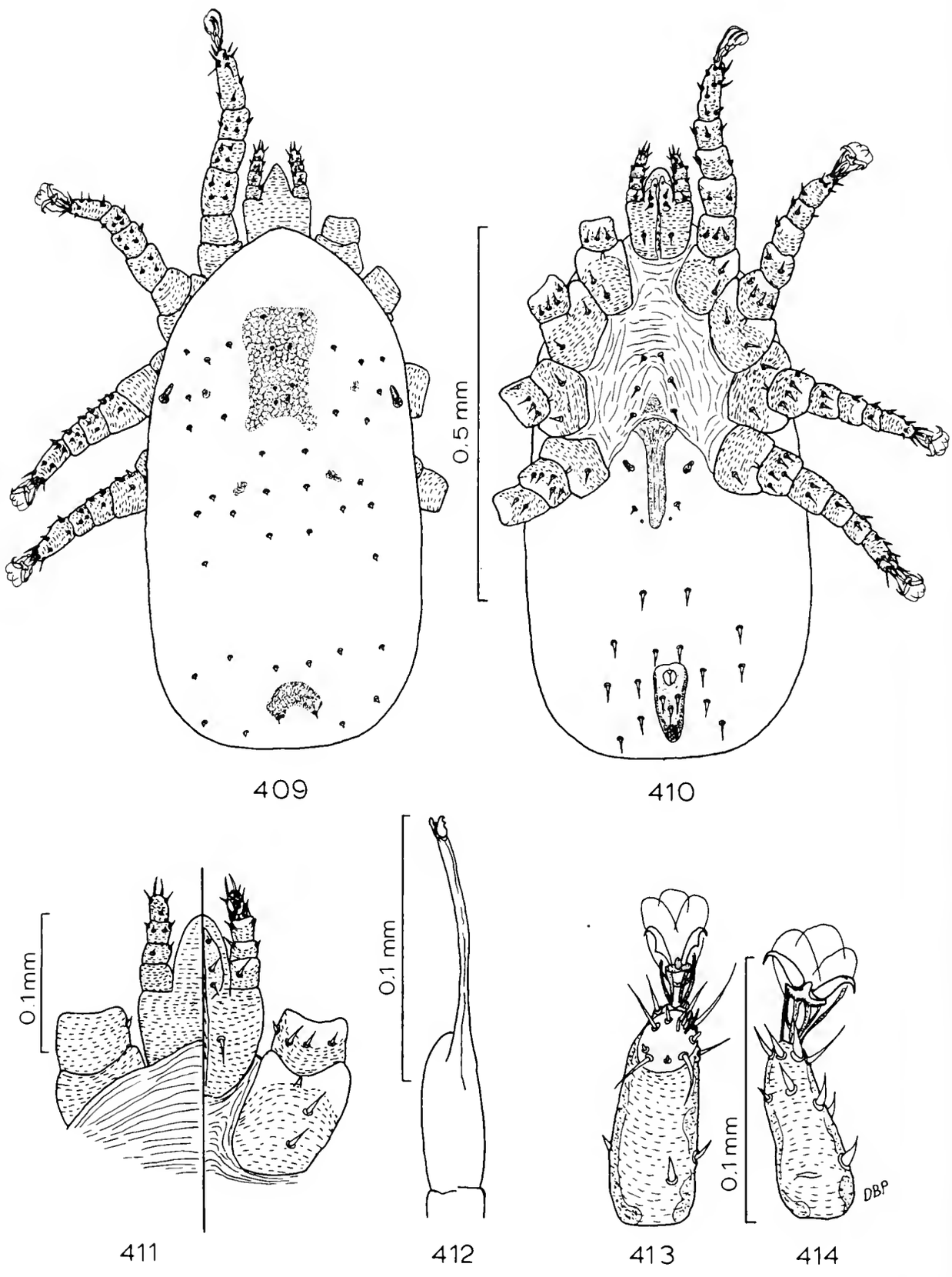
FIGS. 392, 394.—*Ptilonyssus donatoi* Castro: 392, female anal plate; 394, female chelicera.



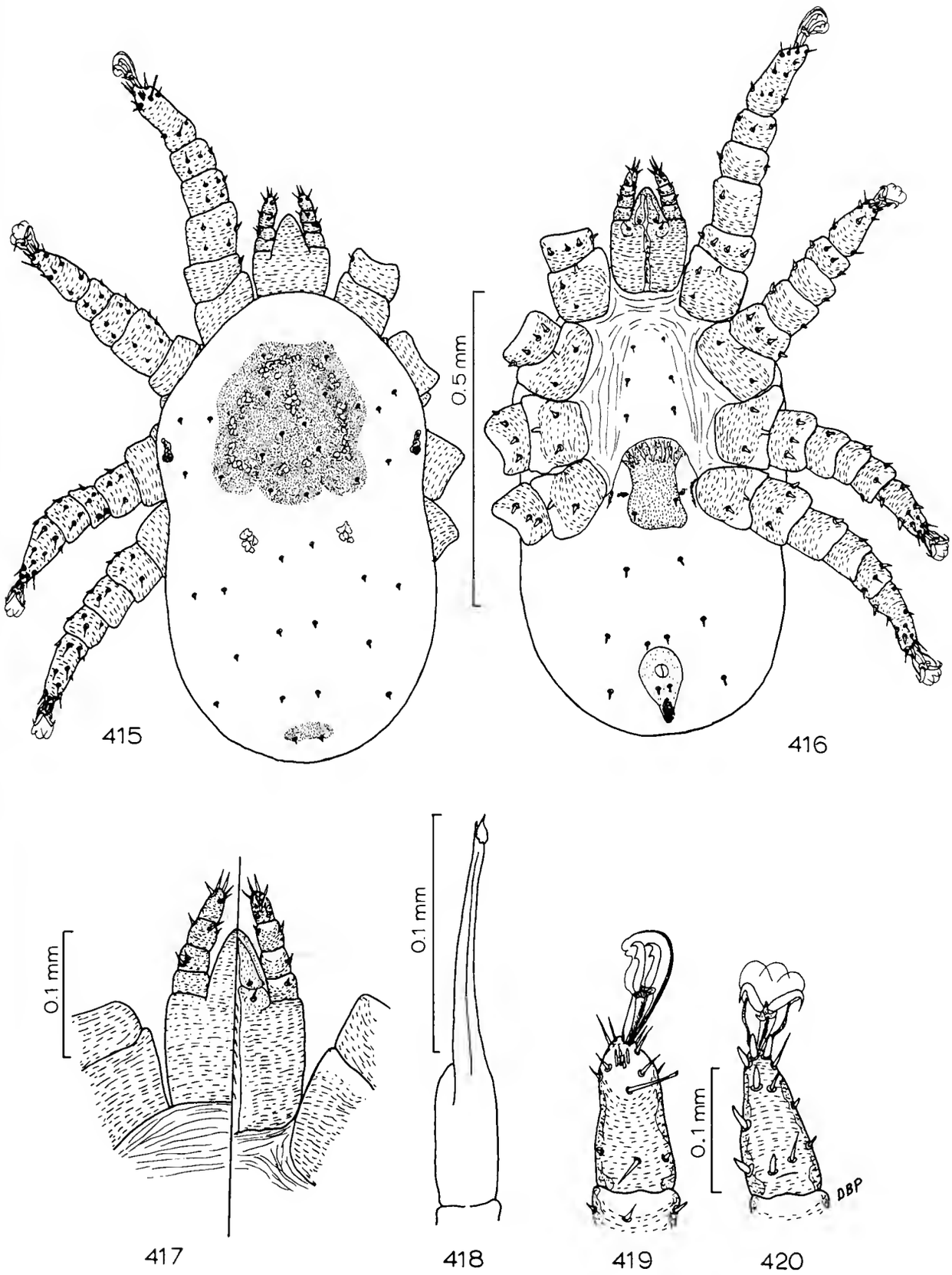
FIGS. 397-402.—*Ptilonyssus cerchneis* Fain: 397, female dorsum; 398, female venter; 399, gnathosoma, dorsal and ventral views, respectively; 400, female chelicera; 401, tarsus I, dorsal view; 402, tarsus IV, ventral view.



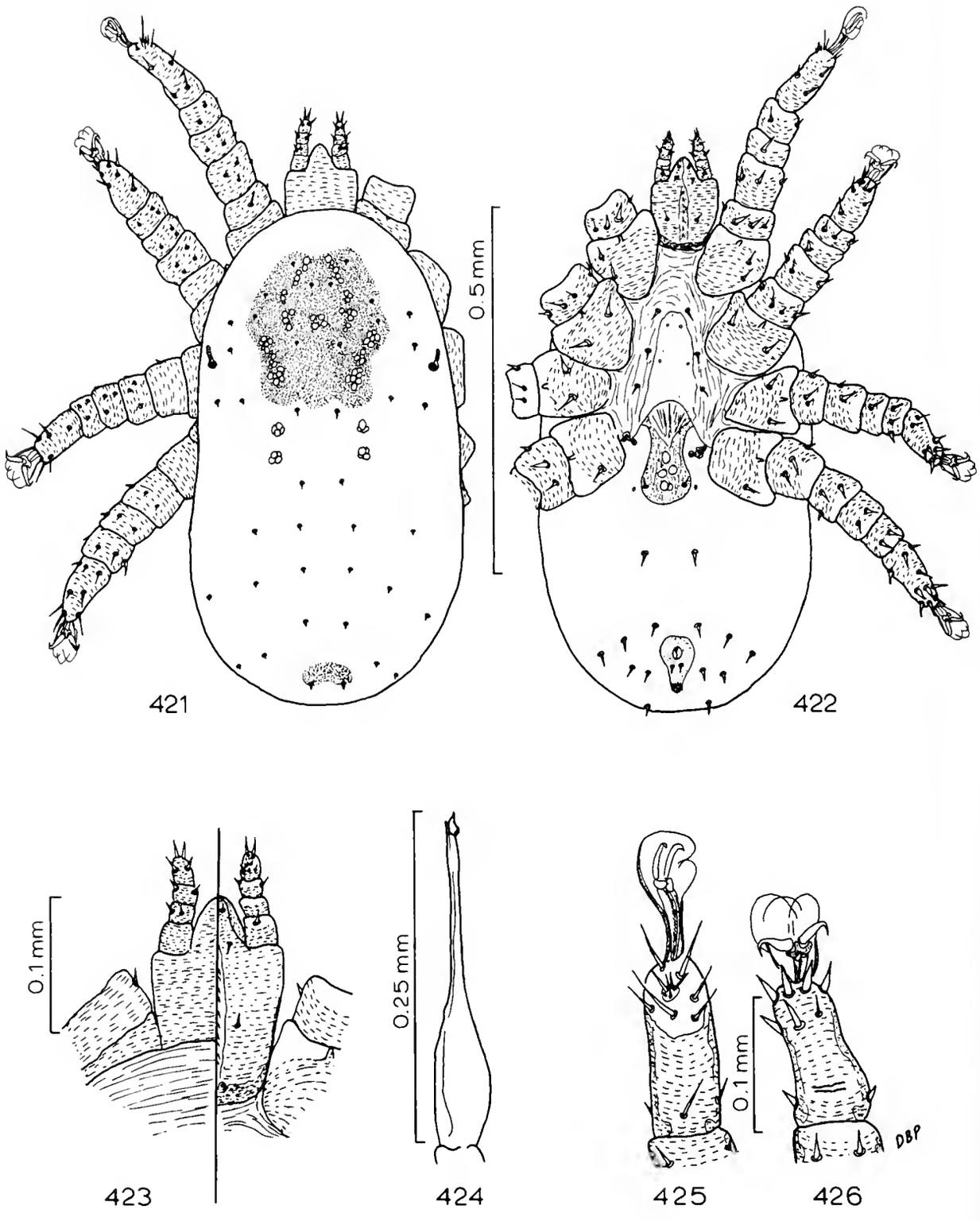
FIGS. 403-408.—*Ptilonyssus echinatus* Berlese and Trouessart: 403, female dorsum; 404, female venter; 405, gnathosoma, dorsal and ventral views, respectively; 406, female chelicera; 407, tarsus I, dorsal view; 408, tarsus IV, ventral view.



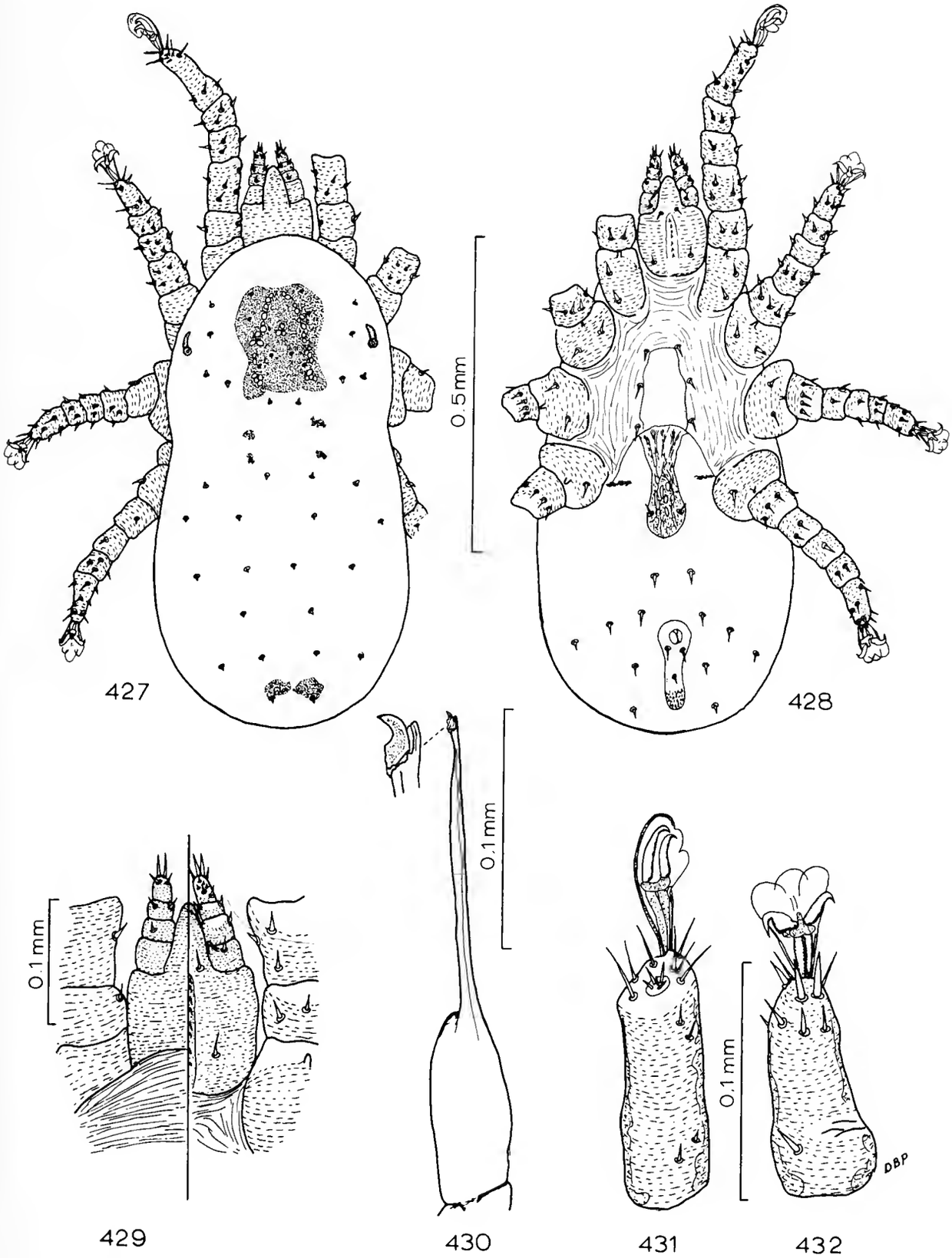
FIGS. 409-414.—*Ptilonyssus tachycinetae* George: 409, female dorsum; 410, female venter; 411, gnathosoma, dorsal and ventral views, respectively; 412, female chelicera; 413, tarsus I, dorsal view; 414, tarsus IV, ventral view.



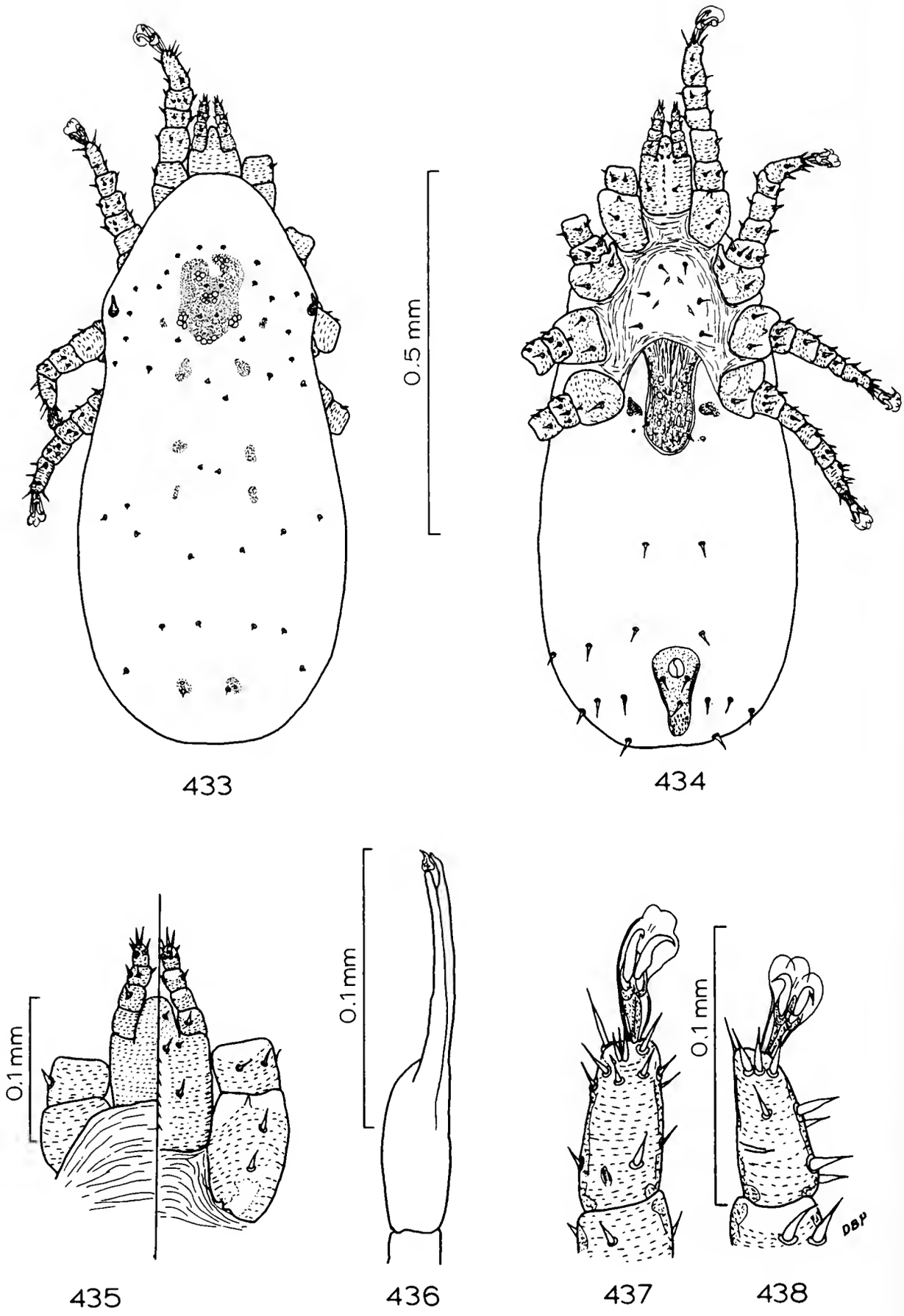
FIGS. 415-420.—*Ptilonyssus perisorei* George: 415, female dorsum; 416, female venter; 417, gnathosoma, dorsal and ventral views, respectively; 418, female chelicera; 419, tarsus I, dorsal view; 420, tarsus IV, ventral view.



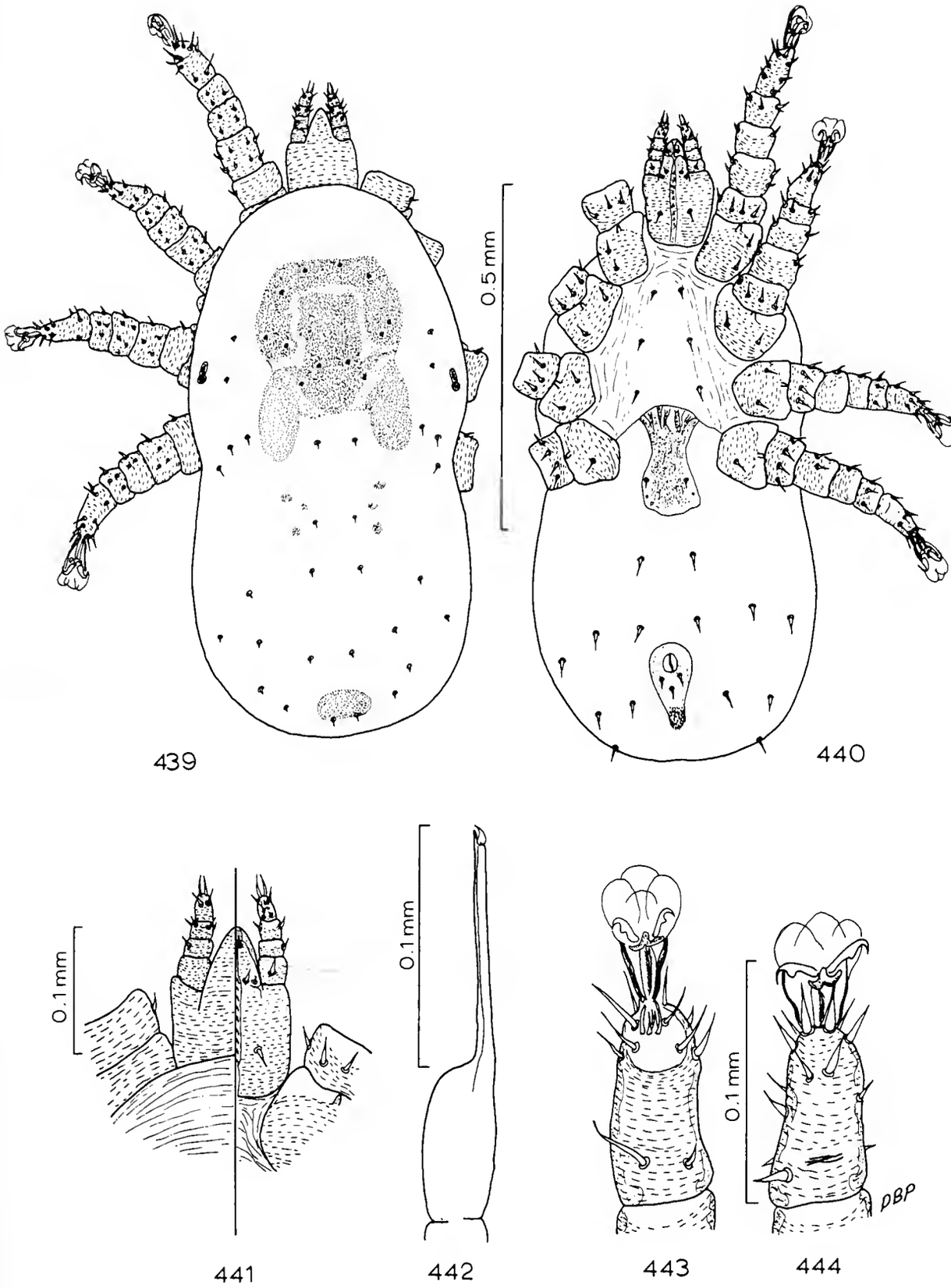
FIGS. 421-426.—*Ptilonyssus lanii* Fain: 421, female dorsum; 422, female venter; 423, gnathosoma, dorsal and ventral views, respectively; 424, female chelicera; 425, tarsus I, dorsal view; 426, tarsus IV, ventral view.



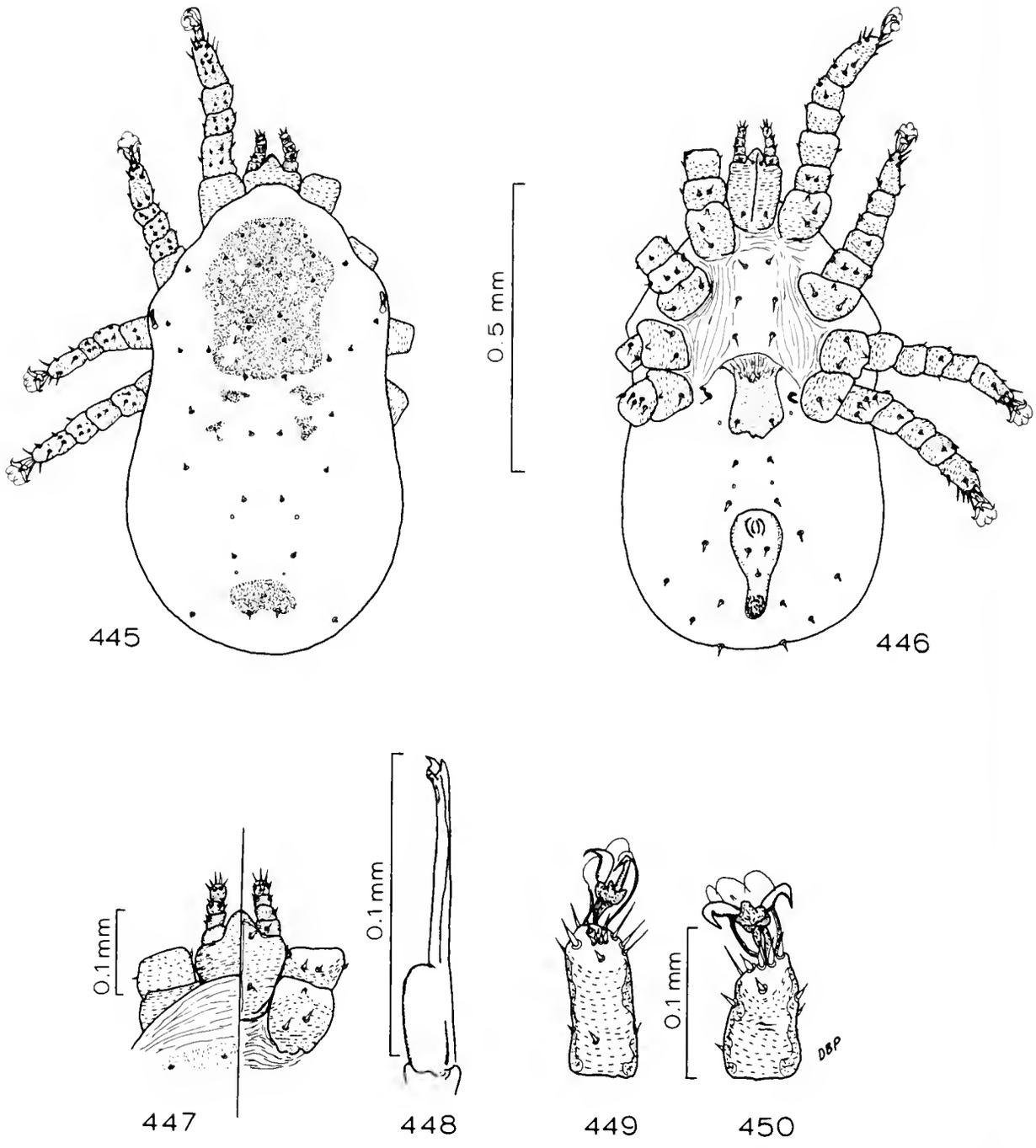
FIGS. 427-432.—*Ptilonyssus motacillae* Fain: 427, female dorsum; 428, female venter; 429, gnathosoma, dorsal and ventral views, respectively; 430, female chelicera; 431, tarsus I, dorsal view; 432, tarsus IV, ventral view.



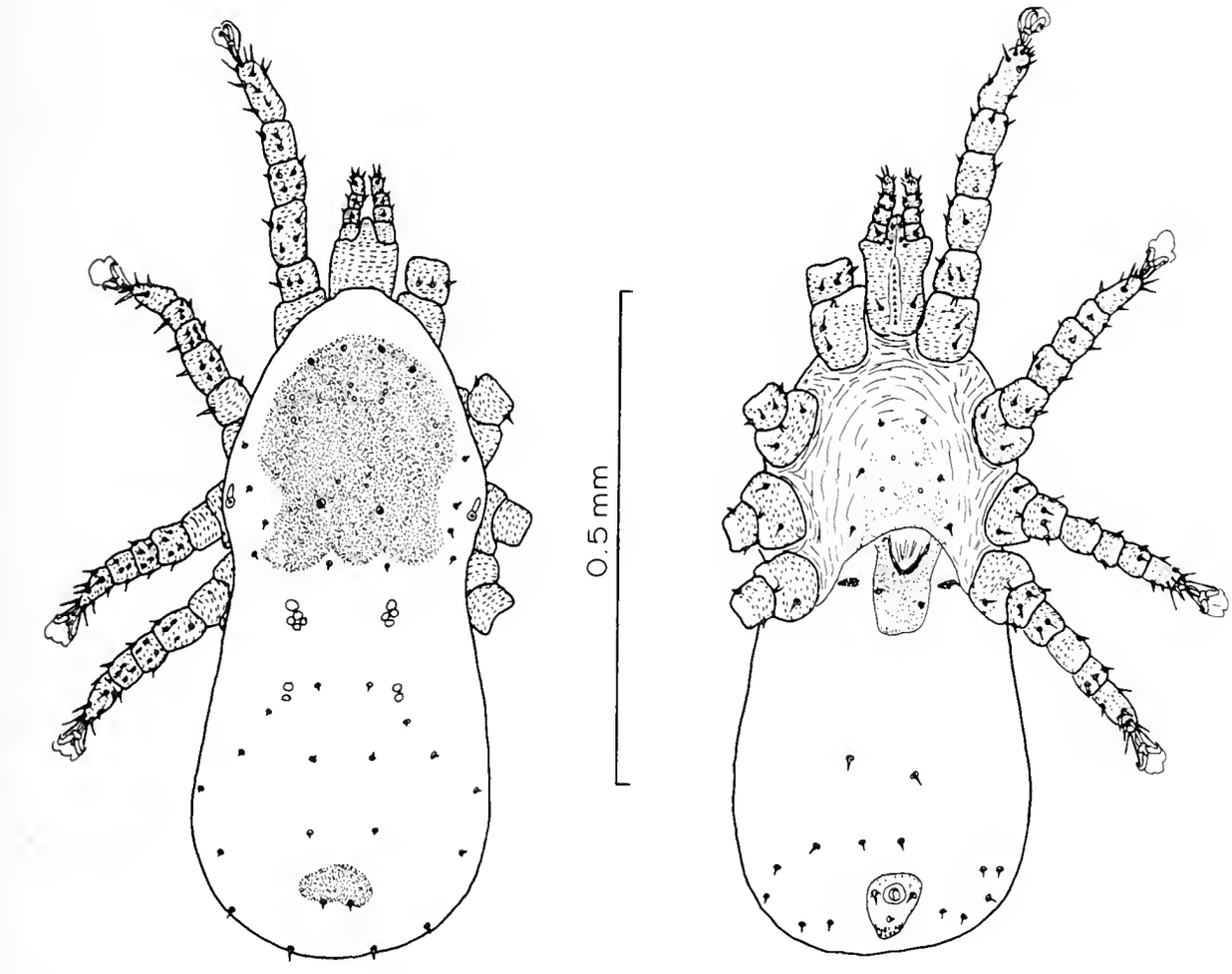
FIGS. 433-438.—*Ptilonyssus troglodytis* Fain: 433, female dorsum; 434, female venter; 435, gnathosoma, dorsal and ventral views, respectively; 436, female chelicera; 437, tarsus I, dorsal view; 438, tarsus IV, ventral view.

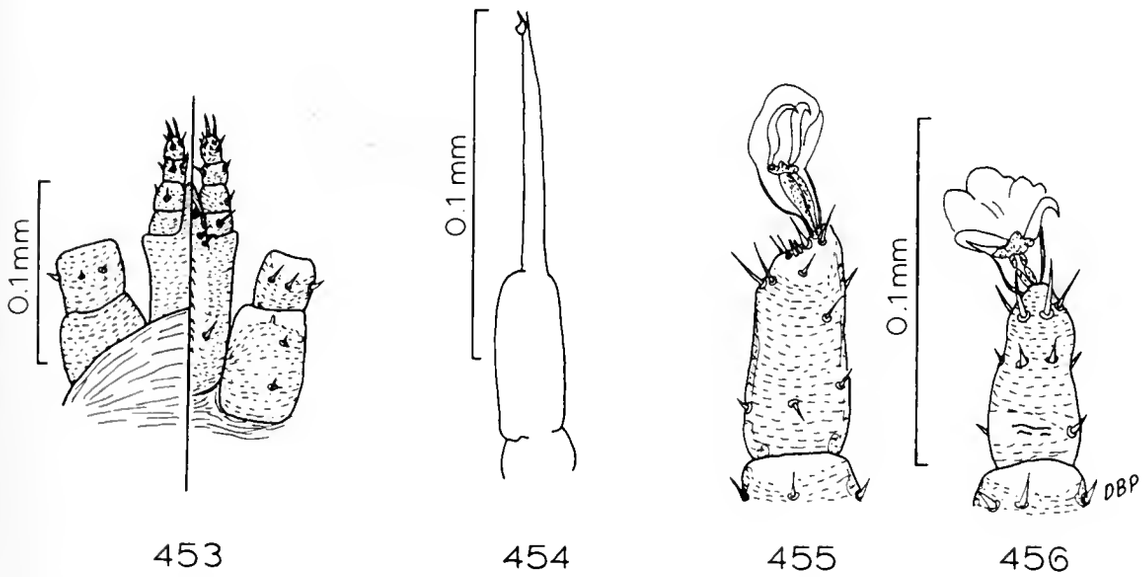


FIGS. 439-444.—*Ptilonyssus sialiae* George: 439, female dorsum; 440, female venter; 441, gnathosoma, dorsal and ventral views, respectively; 442, female chelicera; 443, tarsus I, dorsal view; 444, tarsus IV, ventral view.

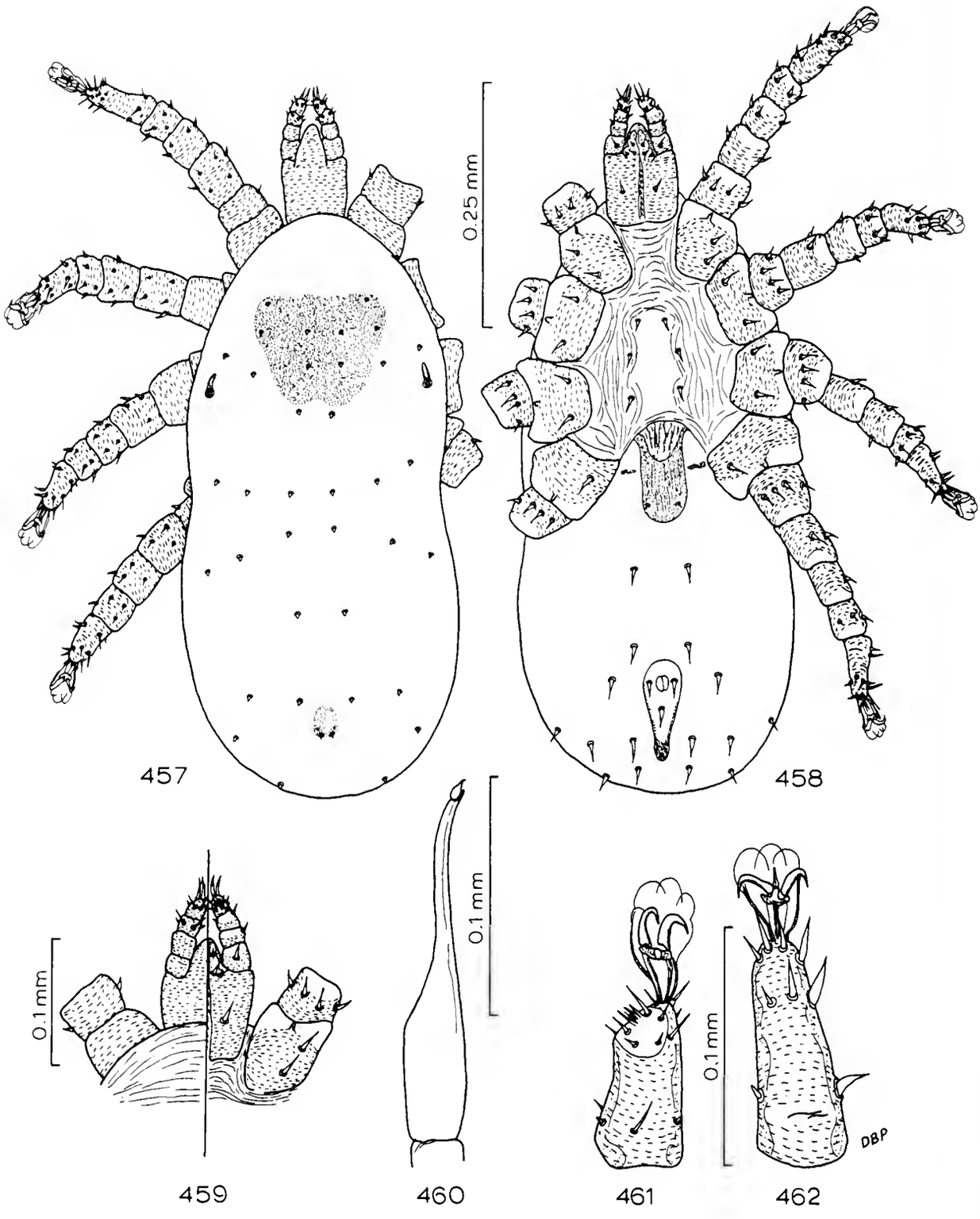


FIGS. 445-450.—*Ptilonyssus bombycillae* Pence: 445, female dorsum; 446, female venter; 447, gnathosoma, dorsal and ventral views, respectively; 448, female chelicera; 449, tarsus I, dorsal view; 450, tarsus IV, ventral view.

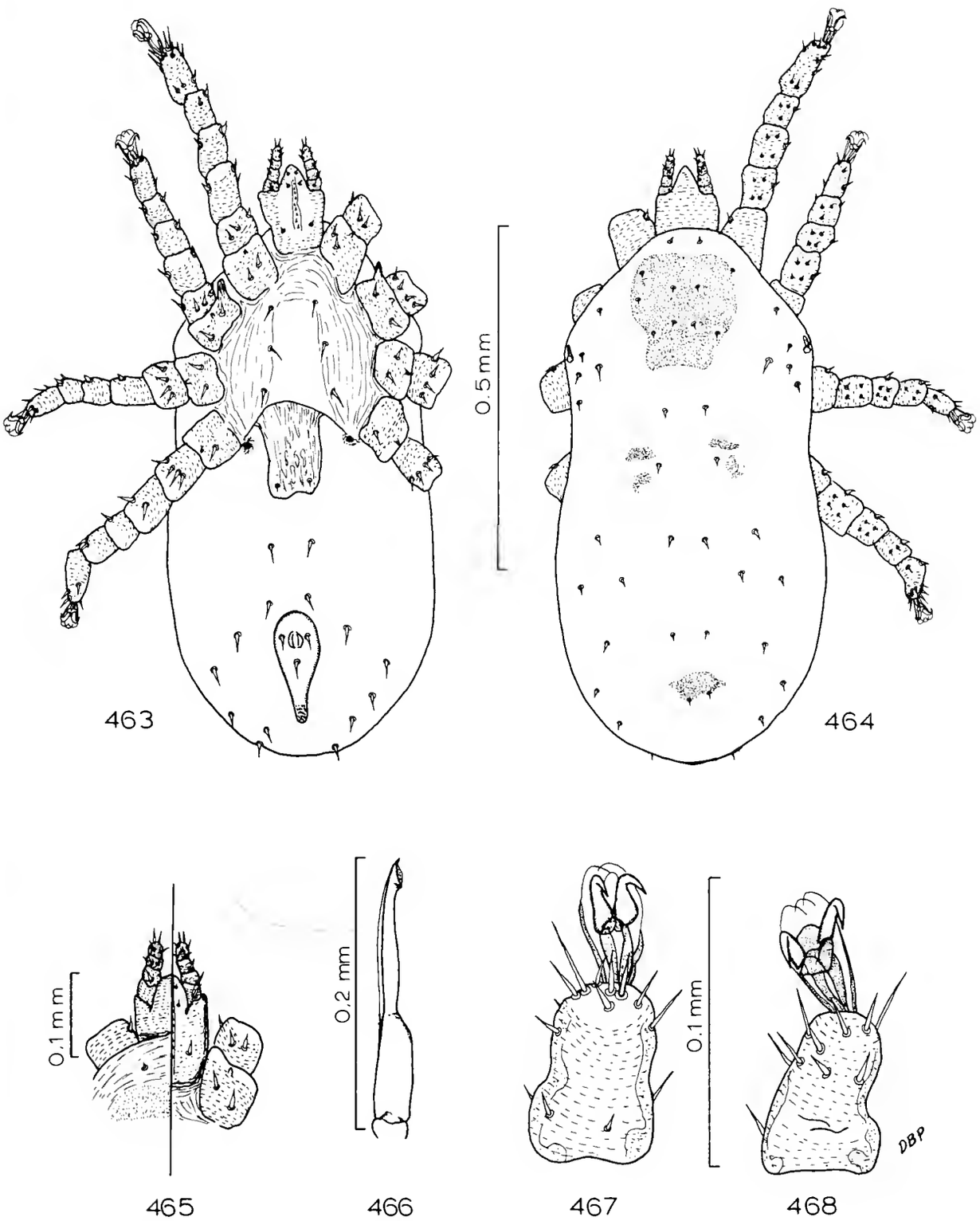




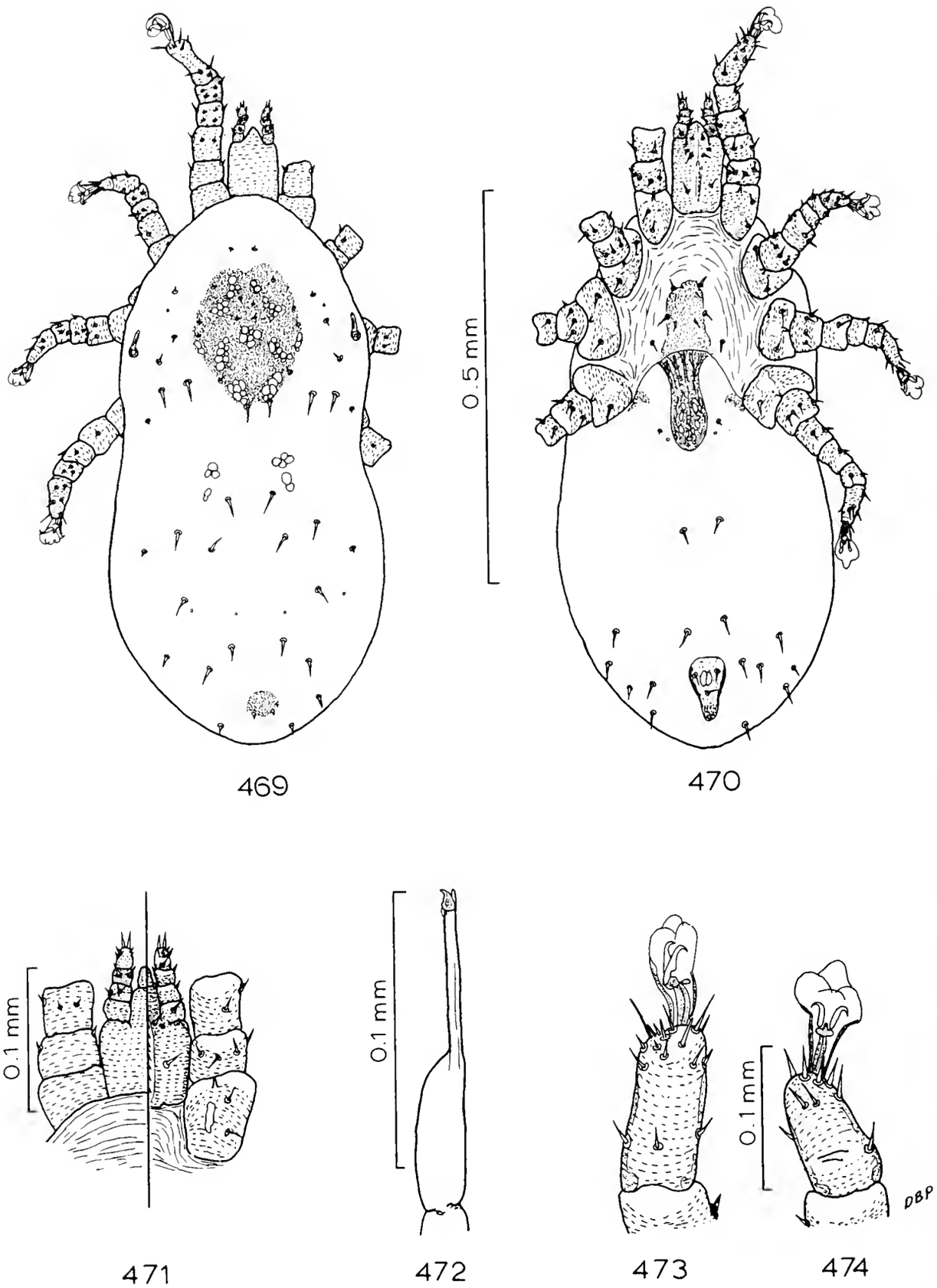
FIGS. 451-456.—*Ptilonyssus agelaii* Fain and Aitken: 451, female dorsum; 452, female venter; 453, gnathosoma, dorsal and ventral views, respectively; 454, female chelicera; 455, tarsus I, dorsal view; 456, tarsus IV, ventral view.



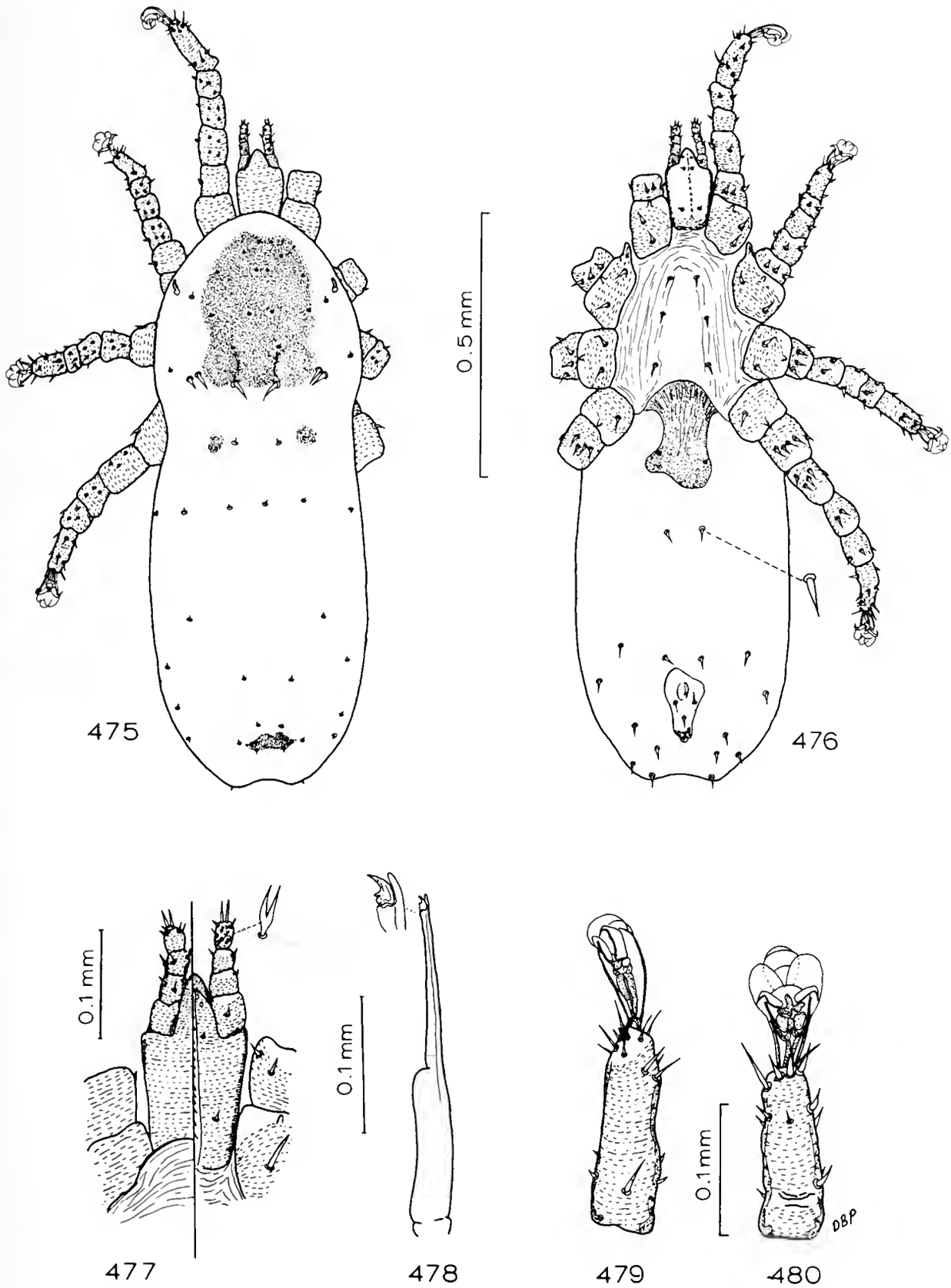
FIGS. 457-462.—*Ptilonyssus salpinctis* George: 457, female dorsum; 458, female venter; 459, gnathosoma, dorsal and ventral views, respectively; 460, female chelicera; 461, tarsus I, dorsal view; 462, tarsus IV, ventral view.



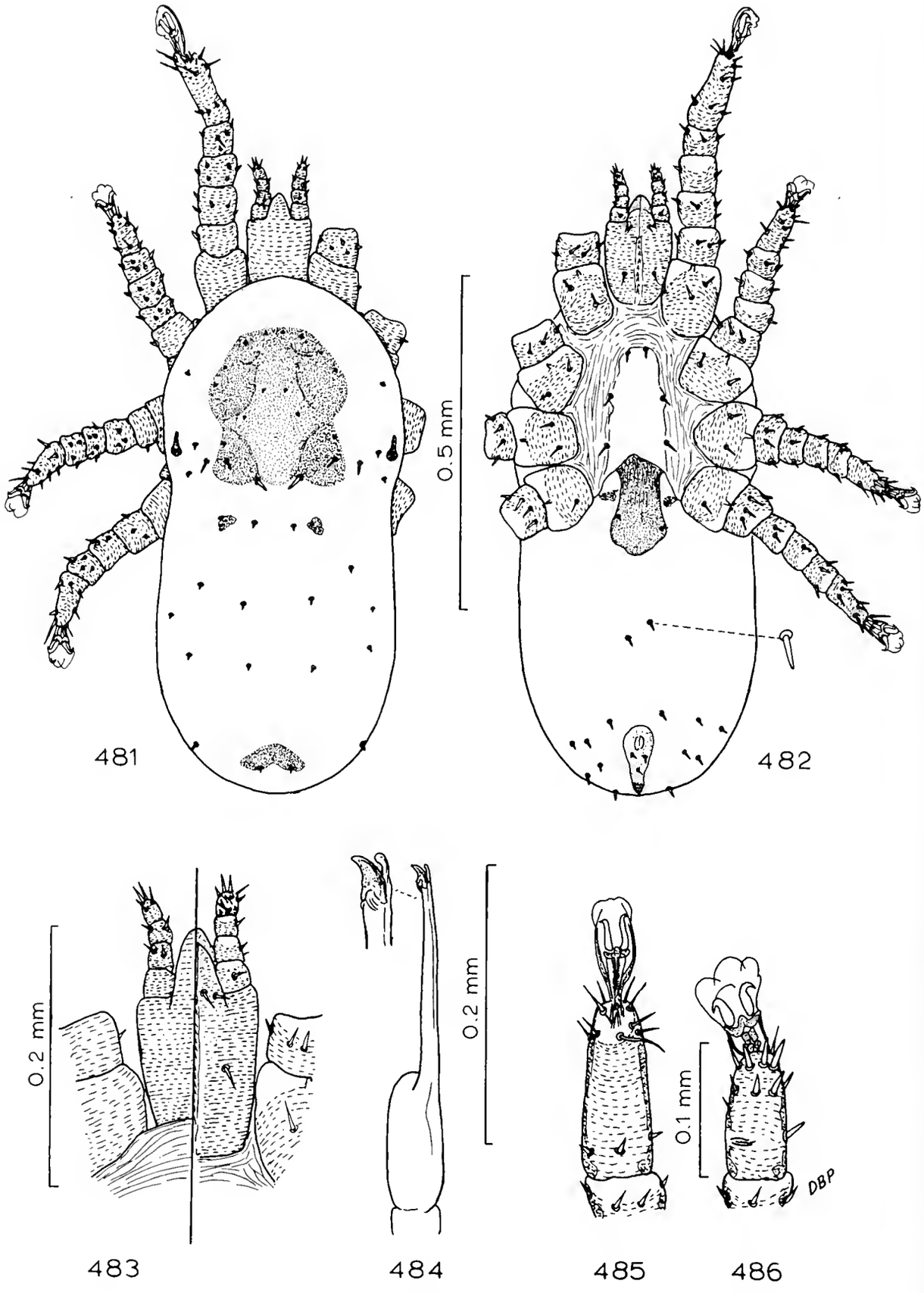
FIGS. 463-468.—*Ptilonyssus thryothori* Pence: 463, female venter; 464, female dorsum; 465, gnathosoma, dorsal and ventral views, respectively; 466, female chelicera; 467, tarsus I, dorsal view; 468, tarsus IV, ventral view.



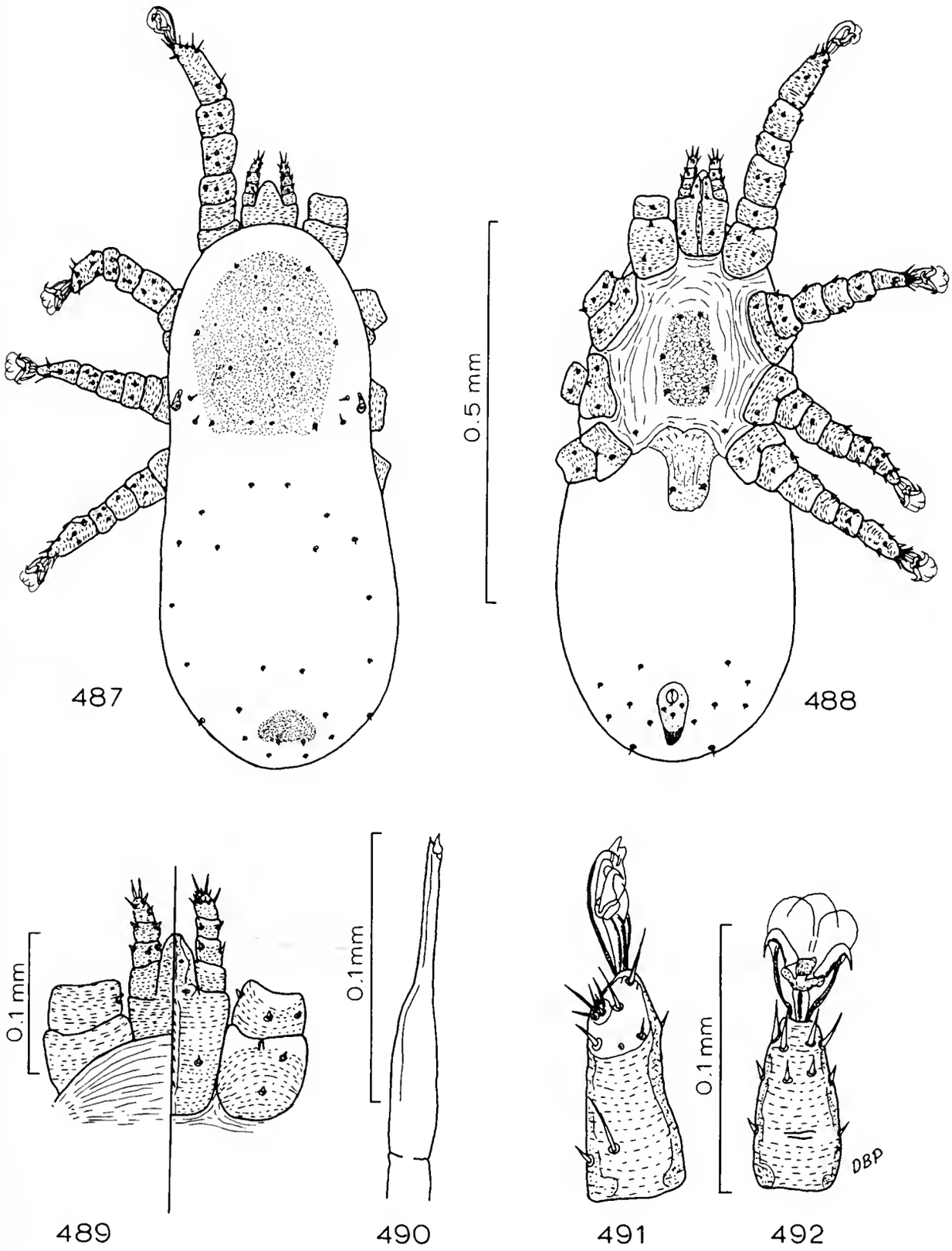
FIGS. 469-474.—*Ptilonyssus acrocephali* Fain: 469, female dorsum; 470, female venter; 471, gnathosoma, dorsal and ventral views, respectively; 472, female chelicera; 473, tarsus I, dorsal view; 474, tarsus IV, ventral view.



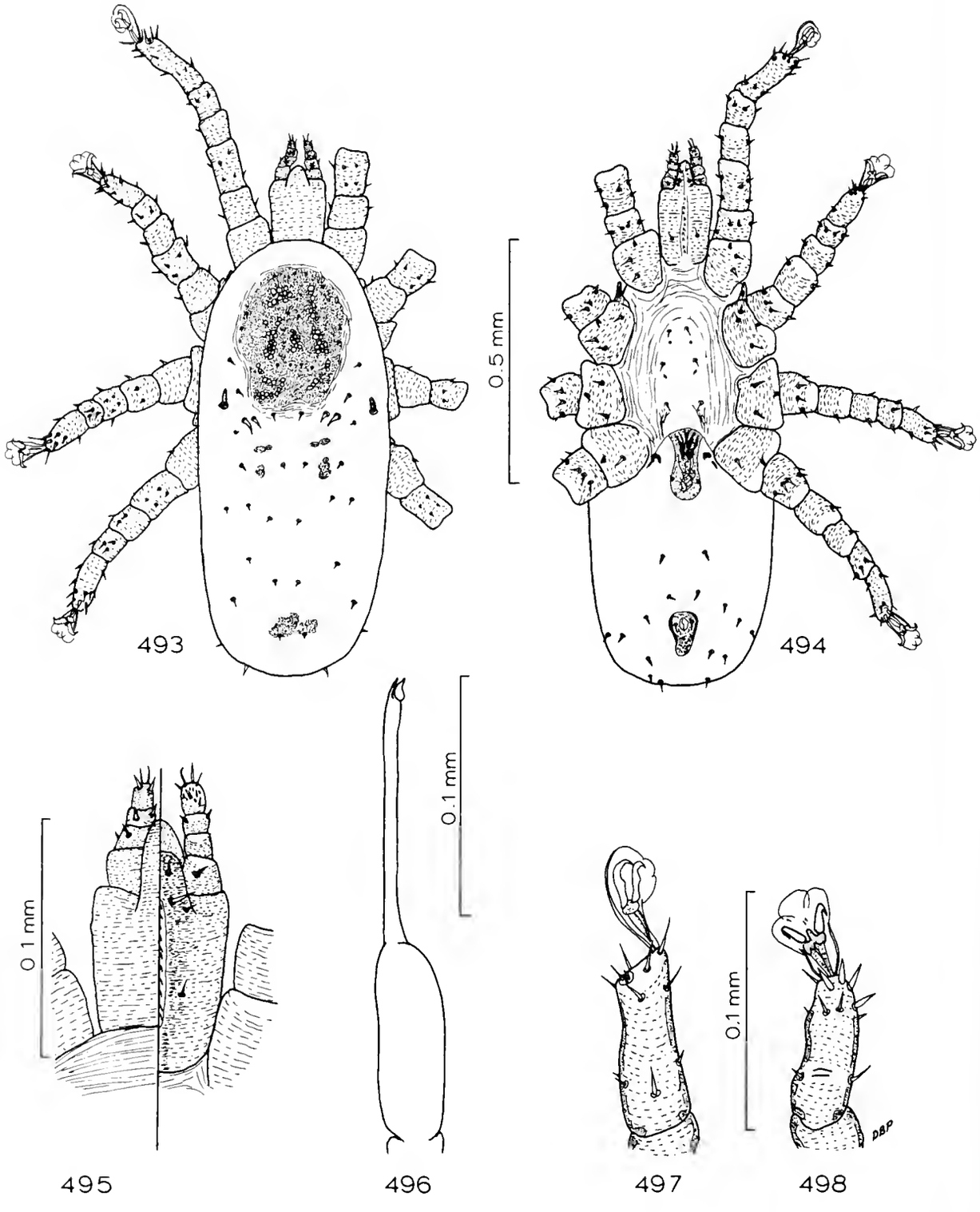
FIGS. 475-480.—*Ptilonyssus toxostomae* Pence: 475, female dorsum; 476, female venter; 477, gnathosoma, dorsal and ventral views, respectively; 478, female chelicera; 479, tarsus I, dorsal view; 480, tarsus IV, ventral view.



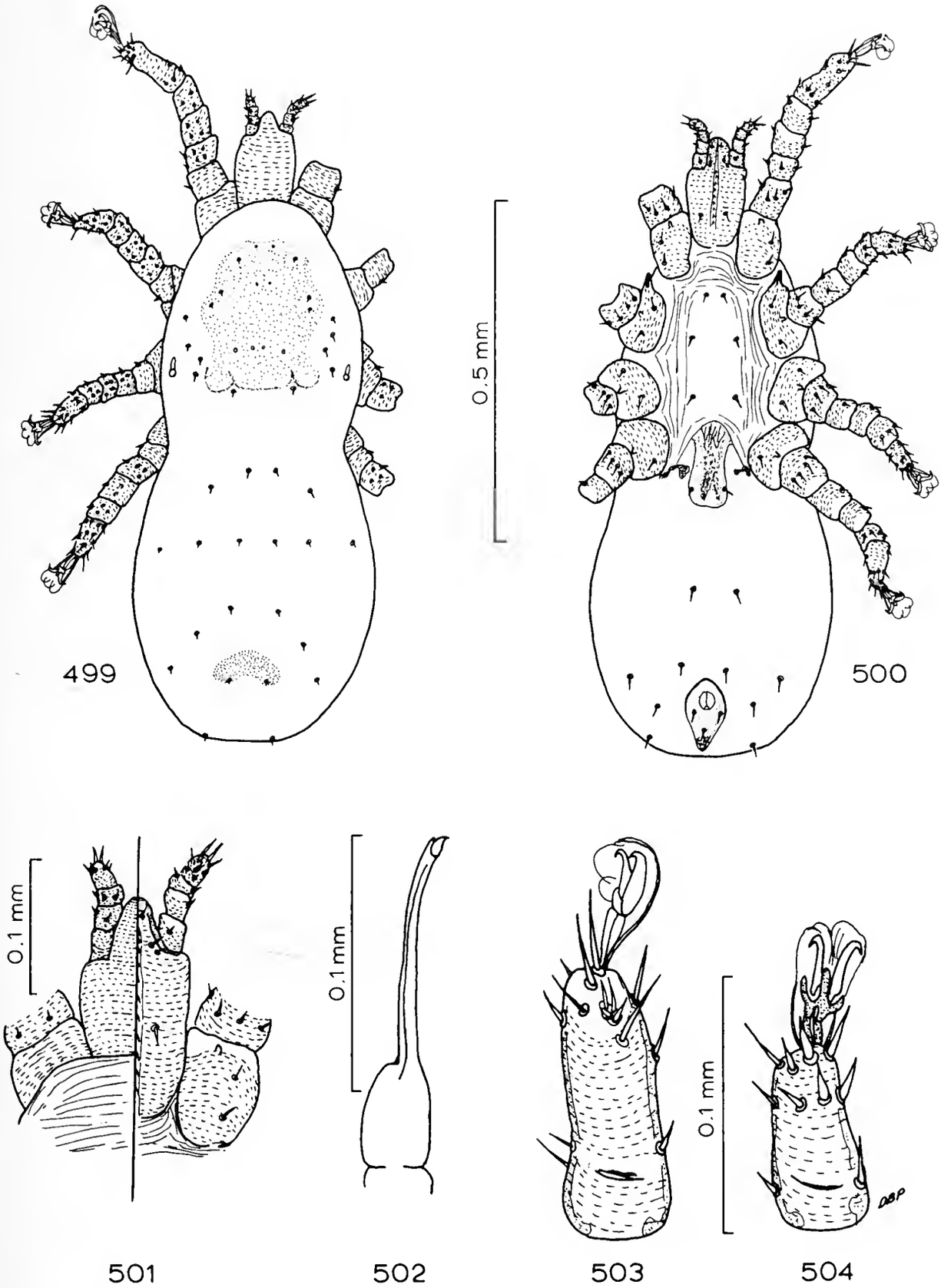
FIGS. 481-486.—*Ptilonyssus mimi* George: 481, female dorsum; 482, female venter; 483, gnathosoma, dorsal and ventral views, respectively; 484, female chelicera; 485, tarsus I, dorsal view; 486, tarsus IV, ventral view.



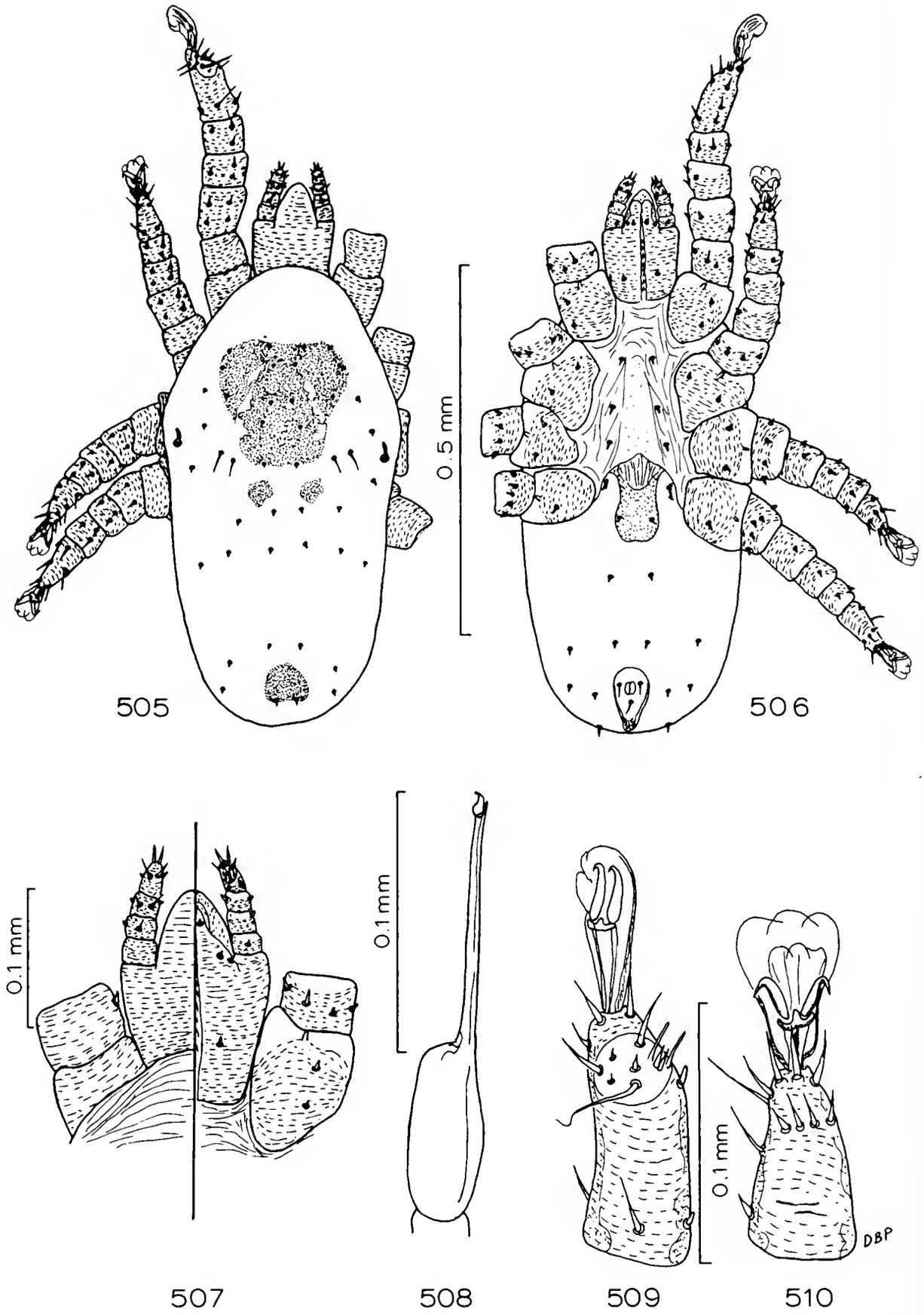
FIGS. 487-492.—*Ptilonyssus nudus* Hirst: 487, female dorsum; 488, female venter; 489, gnathosoma, dorsal and ventral views, respectively; 490, female chelicera; 491, tarsus I, dorsal view; 492, tarsus IV, ventral view.



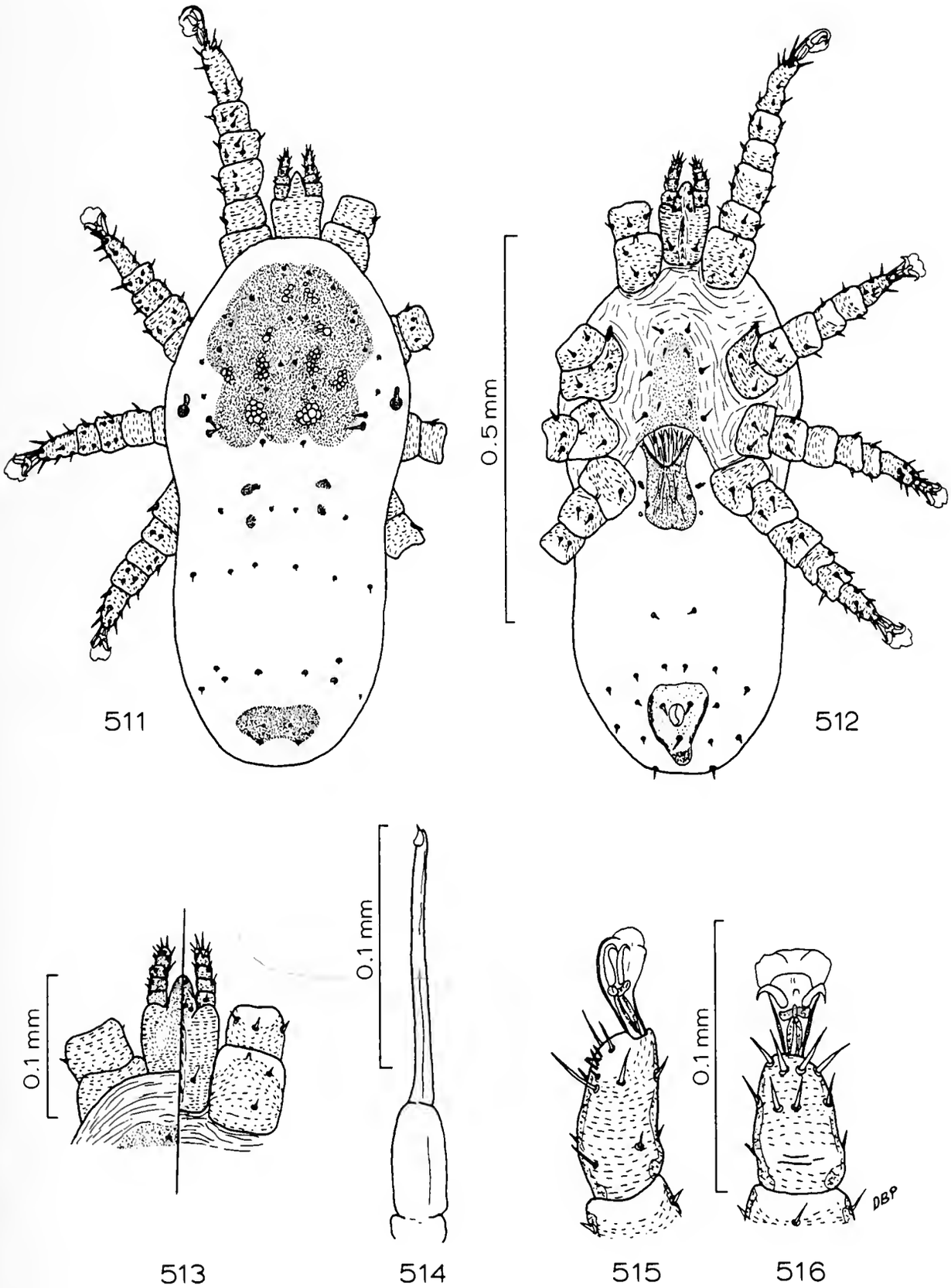
FIGS. 493-498.—*Ptilonyssus euroturdi* Fain and Hyland: 493, female dorsum; 494, female venter; 495, gnathosoma, dorsal and ventral views, respectively; 496, female chelicera; 497, tarsus I, dorsal view; 498, tarsus IV, ventral view.



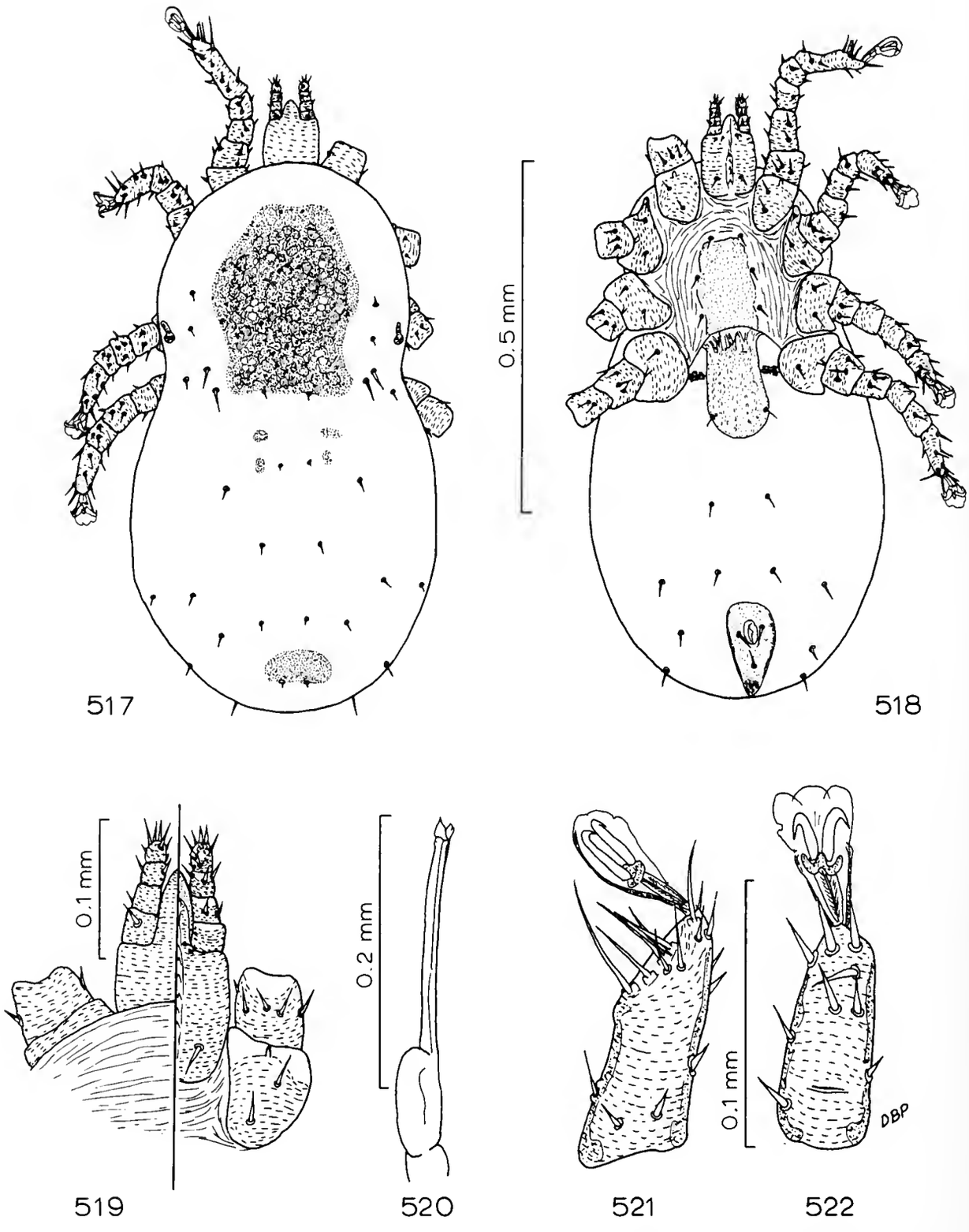
FIGS. 499-504.—*Ptilonyssus richmondinae* George: 499, female dorsum; 500, female venter; 501, gnathosoma, dorsal and ventral views, respectively; 502, female chelicera; 503, tarsus I, dorsal view; 504, tarsus IV, ventral view.



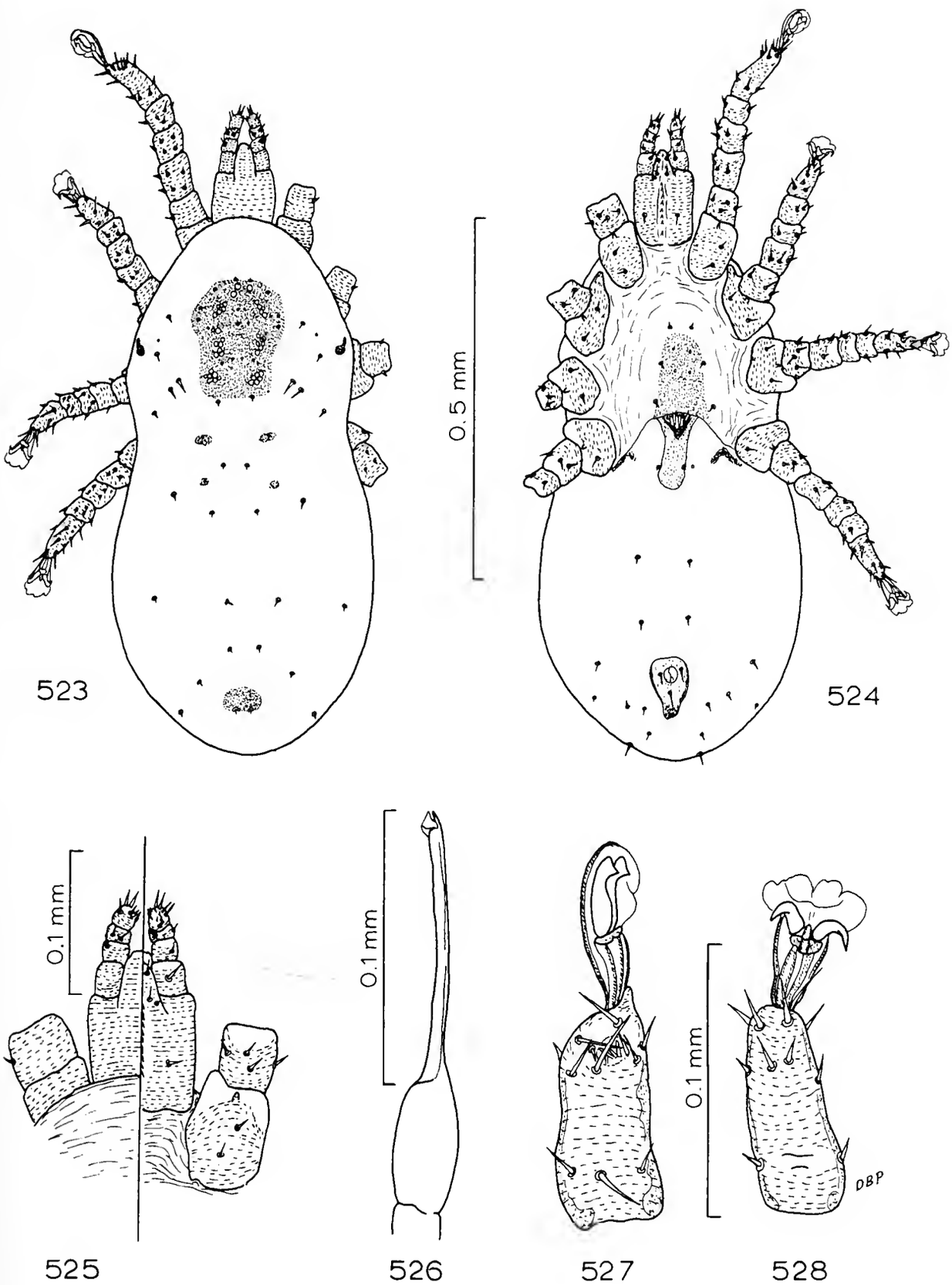
FIGS. 505-510.—*Ptilonyssus phainopeplae* George: 505, female dorsum; 506, female venter; 507, gnathosoma, dorsal and ventral views, respectively; 508, female chelicera; 509, tarsus I, dorsal view; 510, tarsus IV, ventral view.



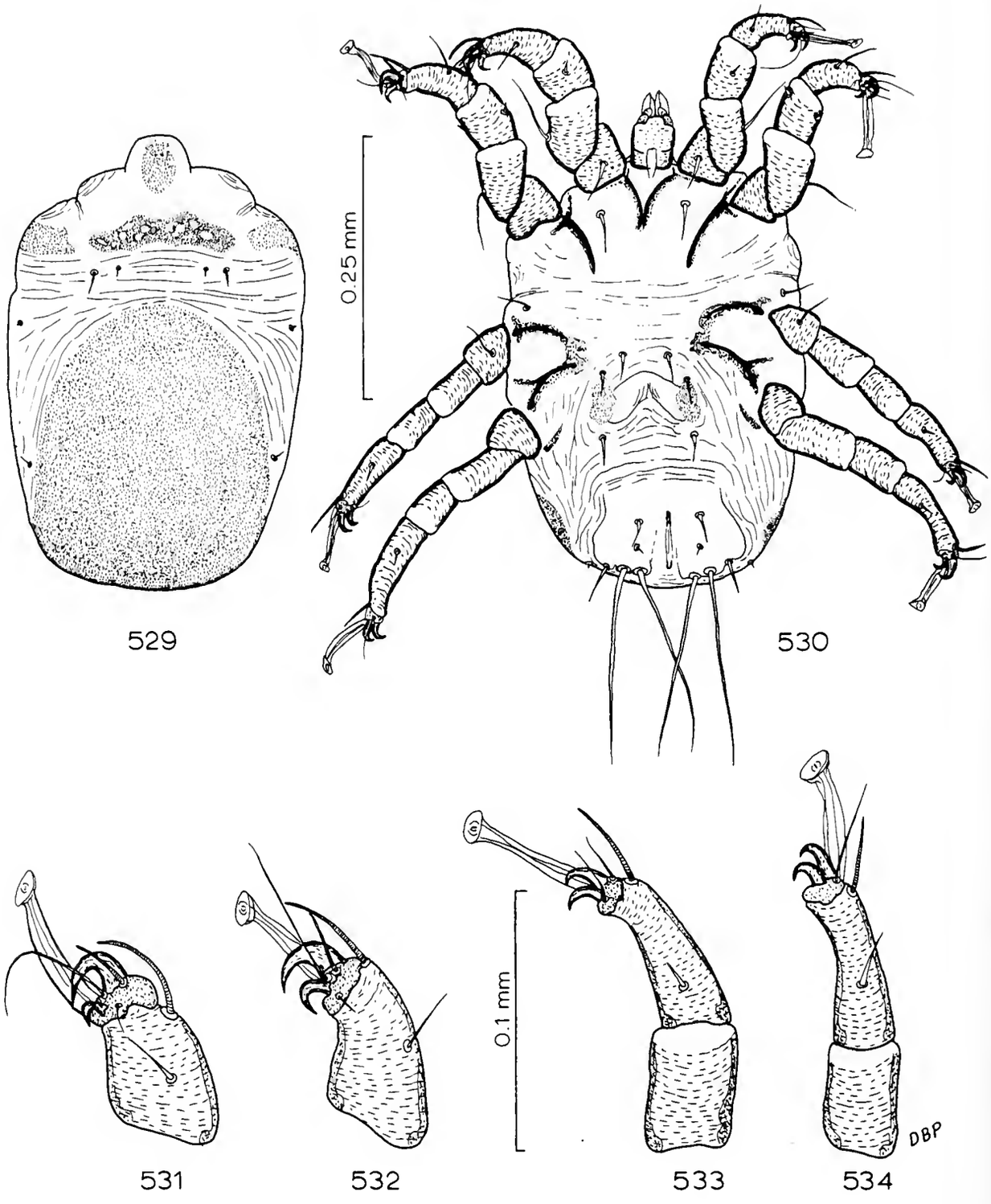
FIGS. 511-516.—*Ptilonyssus japuibensis* Castro: 511, female dorsum; 512, female venter; 513, gnathosoma, dorsal and ventral views, respectively; 514, female chelicera: 515, tarsus I, dorsal view; 516, tarsus IV, ventral view.



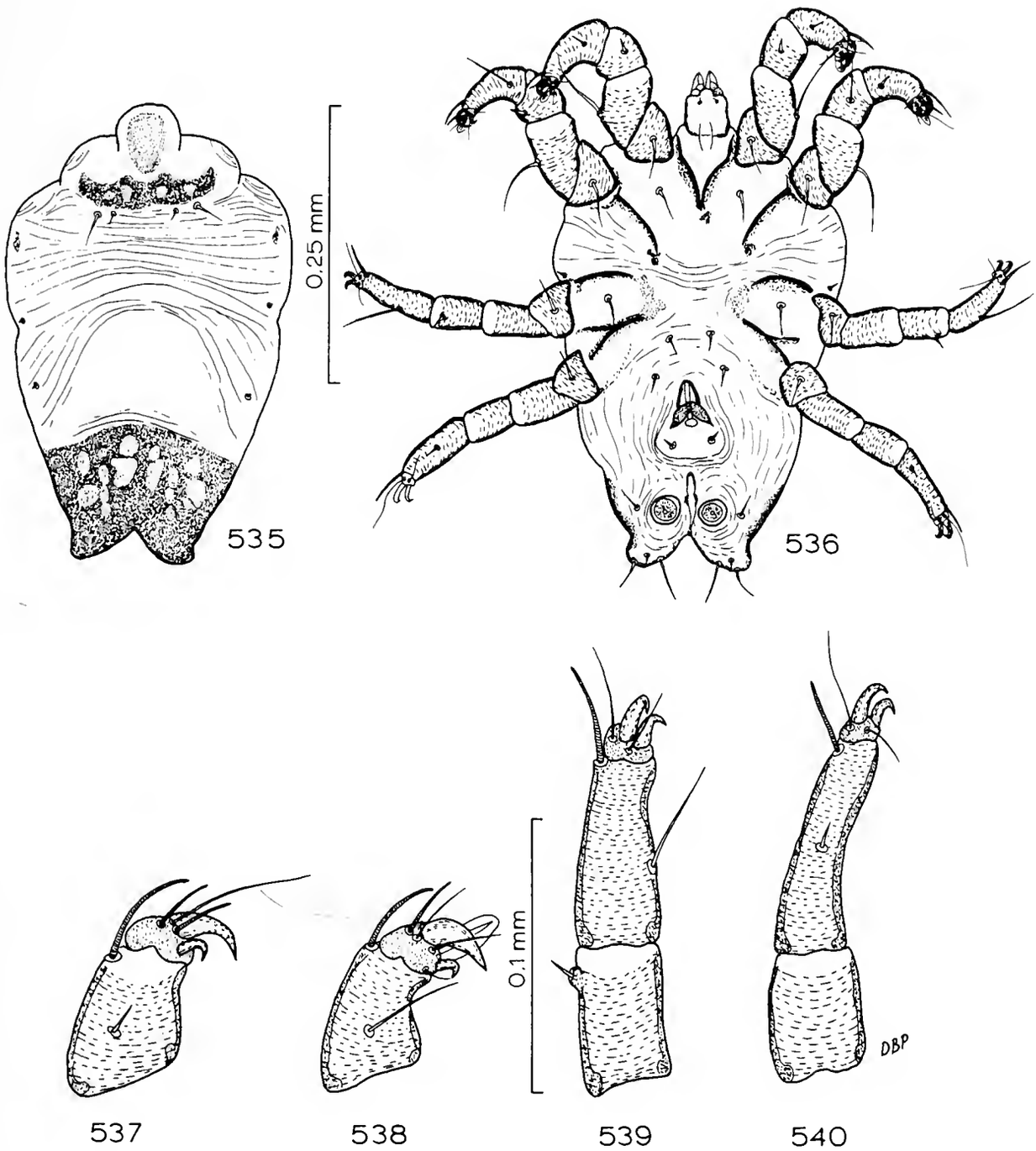
FIGS. 517-522.—*Ptilonyssus ludovicianus* Černý: 517, female dorsum; 518, female venter; 519, gnathosoma, dorsal and ventral views, respectively; 520, female chelicera; 521, tarsus I, dorsal view; 522, tarsus IV, ventral view.



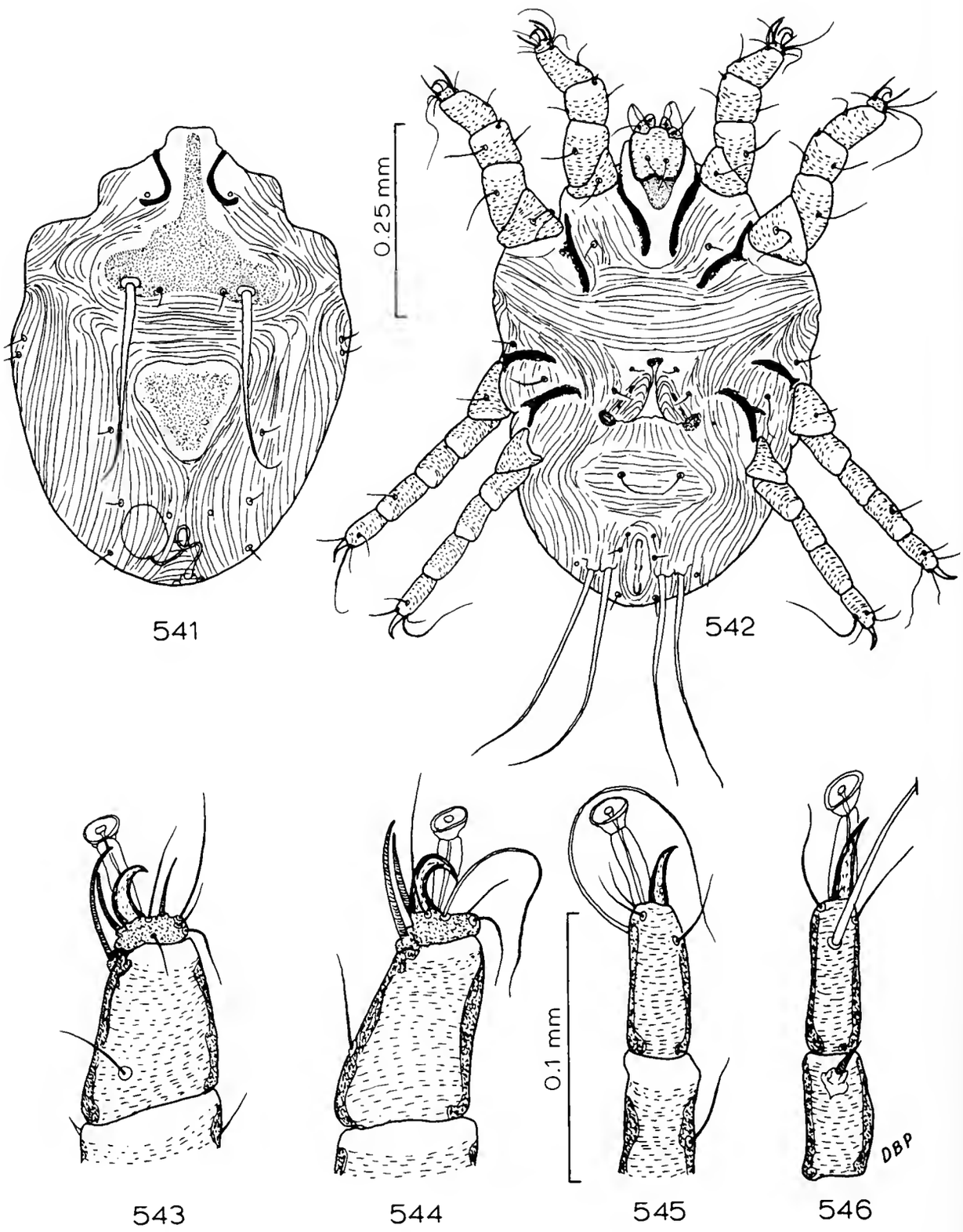
FIGS. 523-528.—*Ptilonyssus sairae* Castro: 523, female dorsum; 524, female venter; 525, gnathosoma, dorsal and ventral views, respectively; 526, female chelicera; 527, tarsus I, dorsal view; 528, tarsus IV, ventral view.



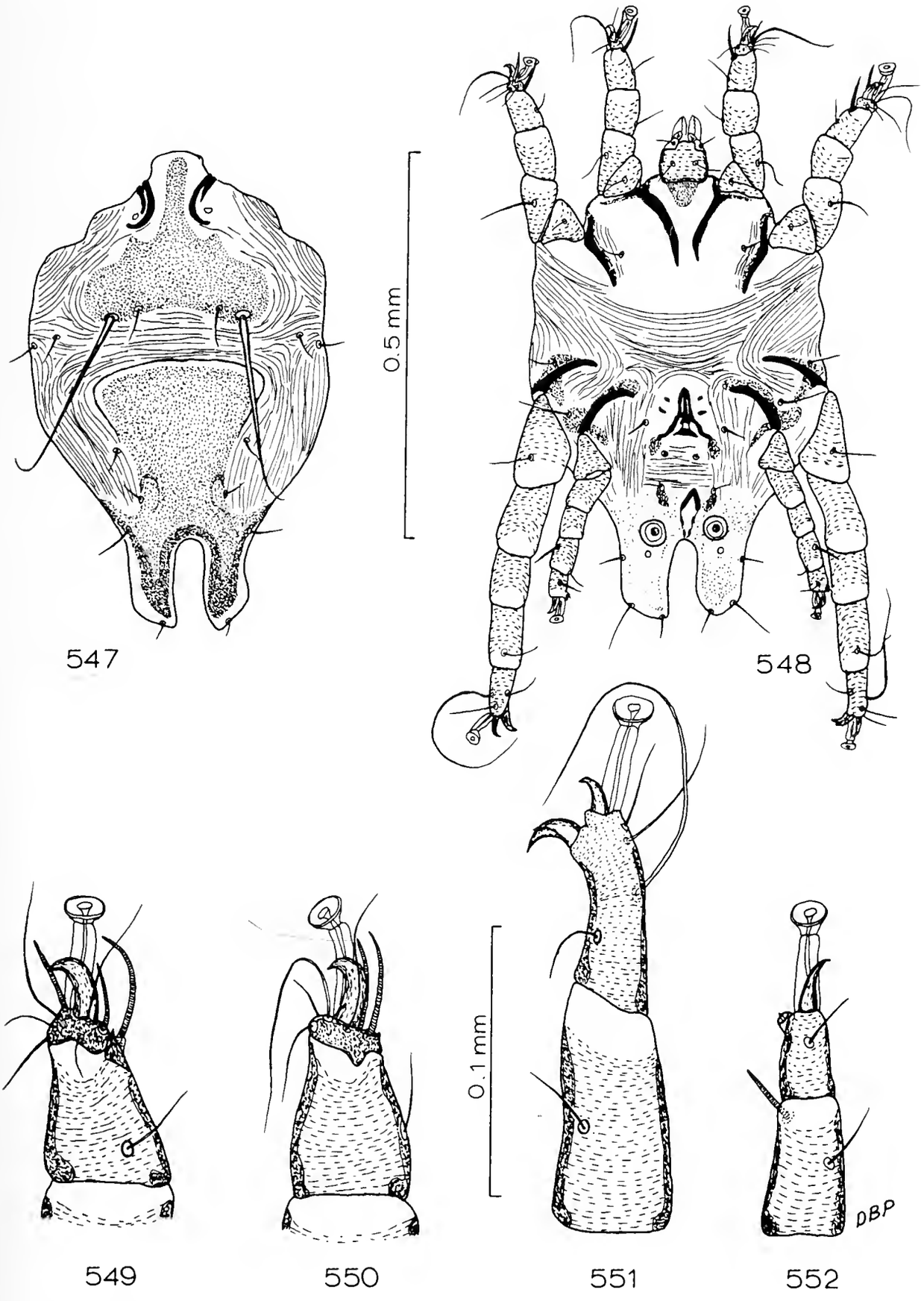
FIGS. 529-534.—*Turbinoptes strandtmanni* Boyd, female: 529, dorsum; 530, venter; 531, tarsus and tibia I; 532, tarsus and tibia II; 533, tarsus and tibia III; 534, tarsus and tibia IV.



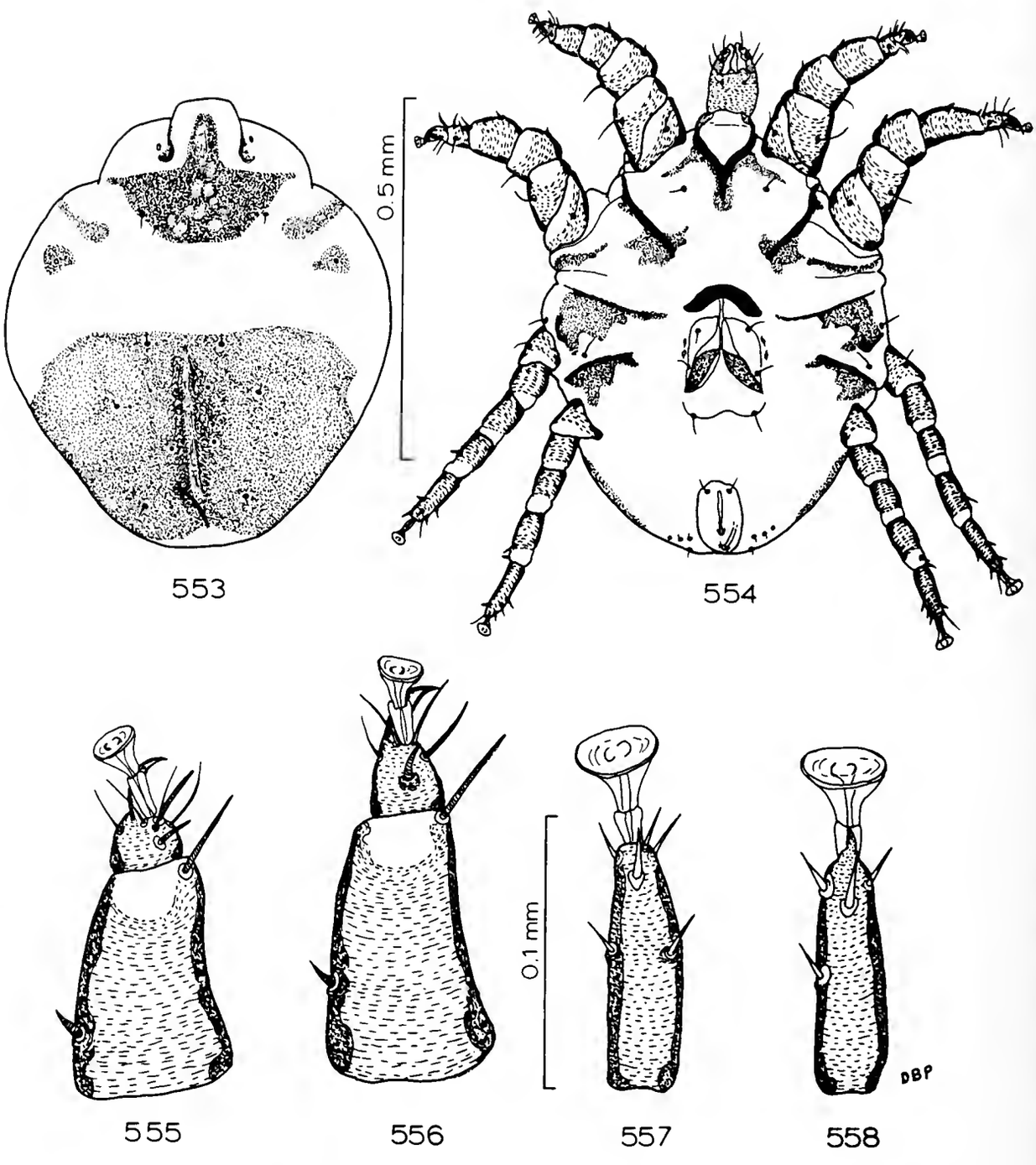
FIGS. 535-540.—*Turbinoptes strandtmanni* Boyd, male: 535, dorsum; 536, venter; 537, tarsus and tibia I; 538, tarsus and tibia II; 539, tarsus and tibia III; 540, tarsus and tibia IV.



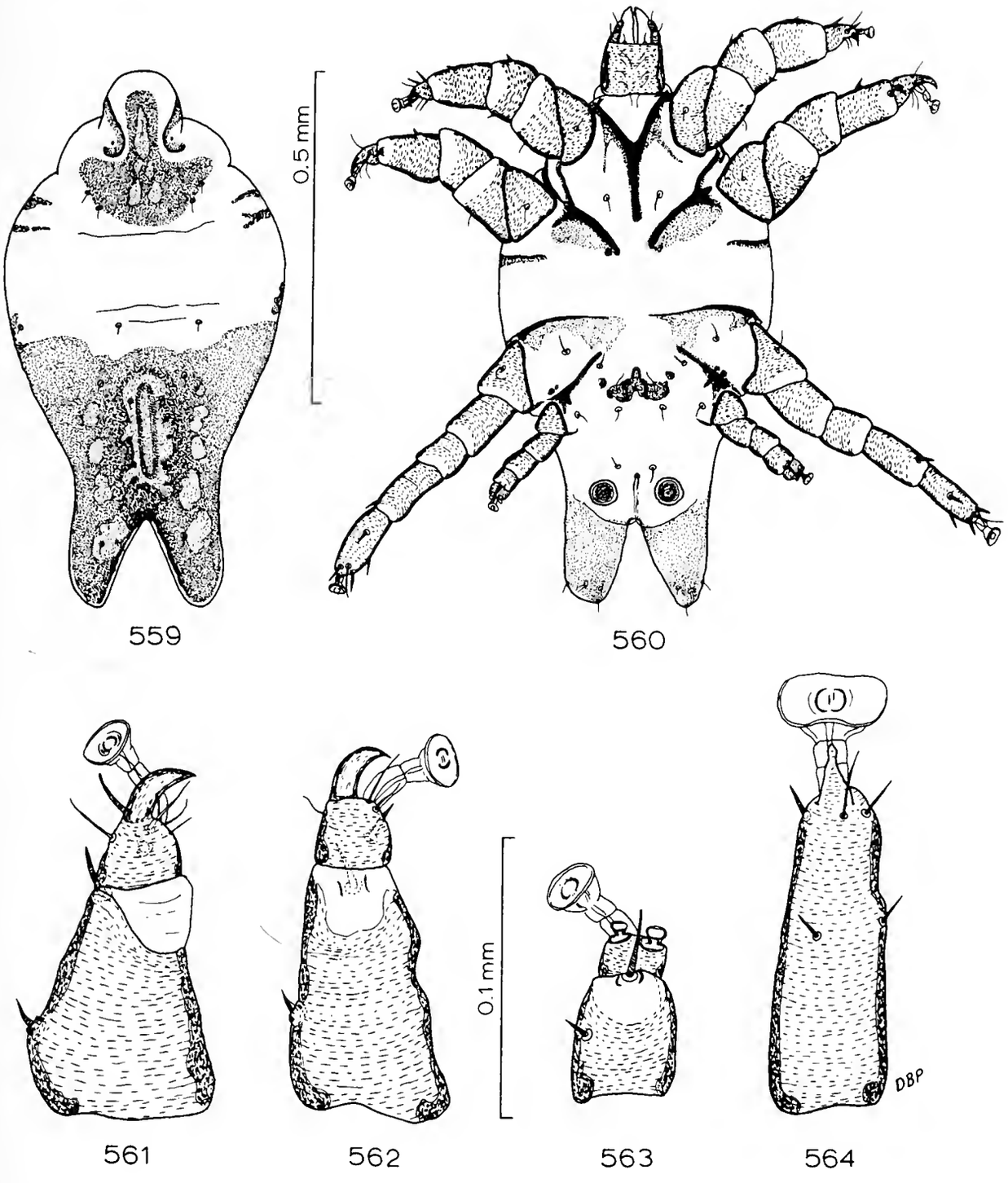
FIGS. 541-546.—*Colinoptes cubanensis* Fain, female: 541, dorsum; 542, venter; 543, tarsus and tibia I; 544, tarsus and tibia II; 545, tarsus and tibia III; 546, tarsus and tibia IV.



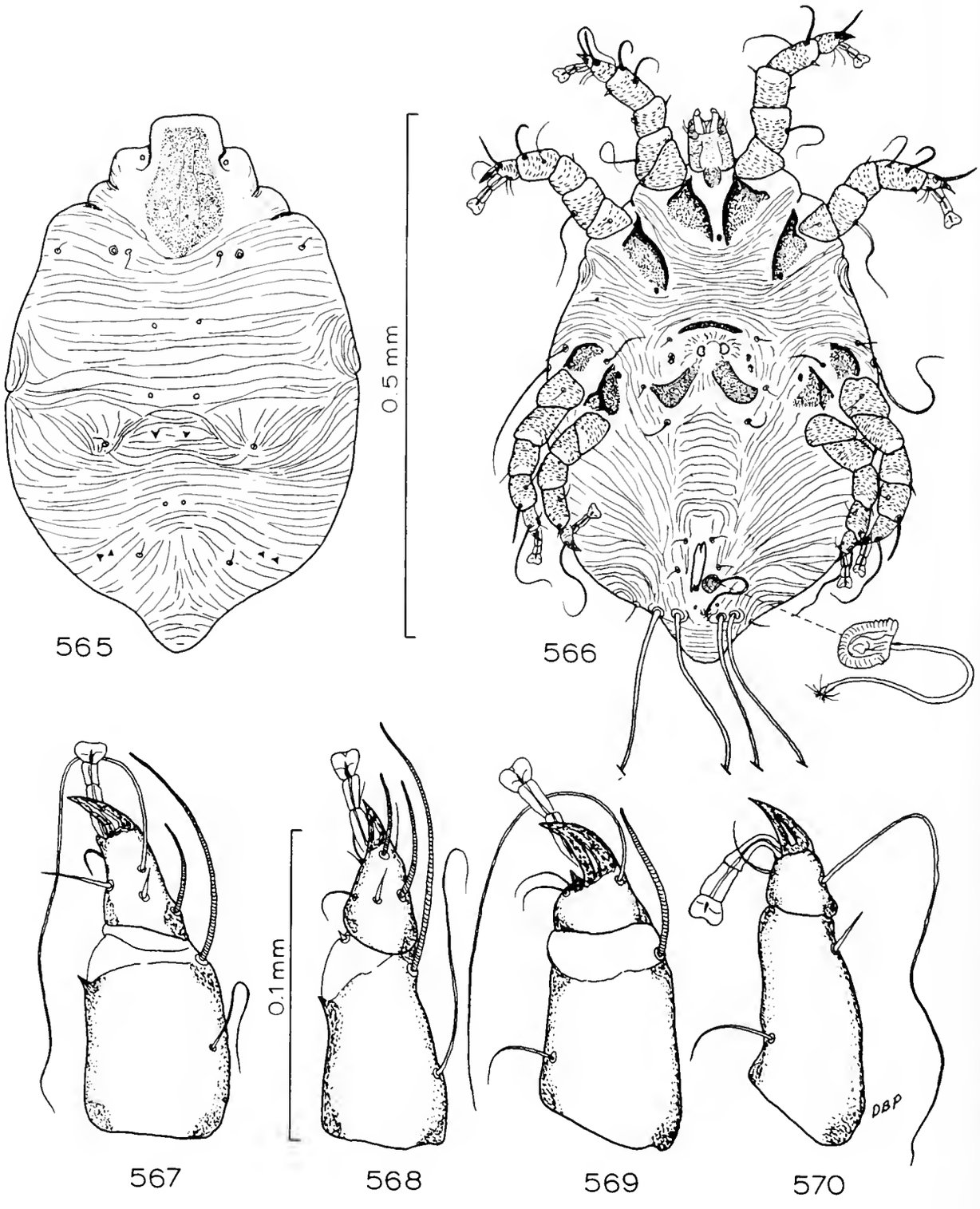
FIGS. 547-552.—*Colinoptes cubanensis* Fain, male: 547, dorsum; 548, venter; 549, tarsus and tibia I; 550, tarsus and tibia II; 551, tarsus and tibia III; 552, tarsus and tibia IV.



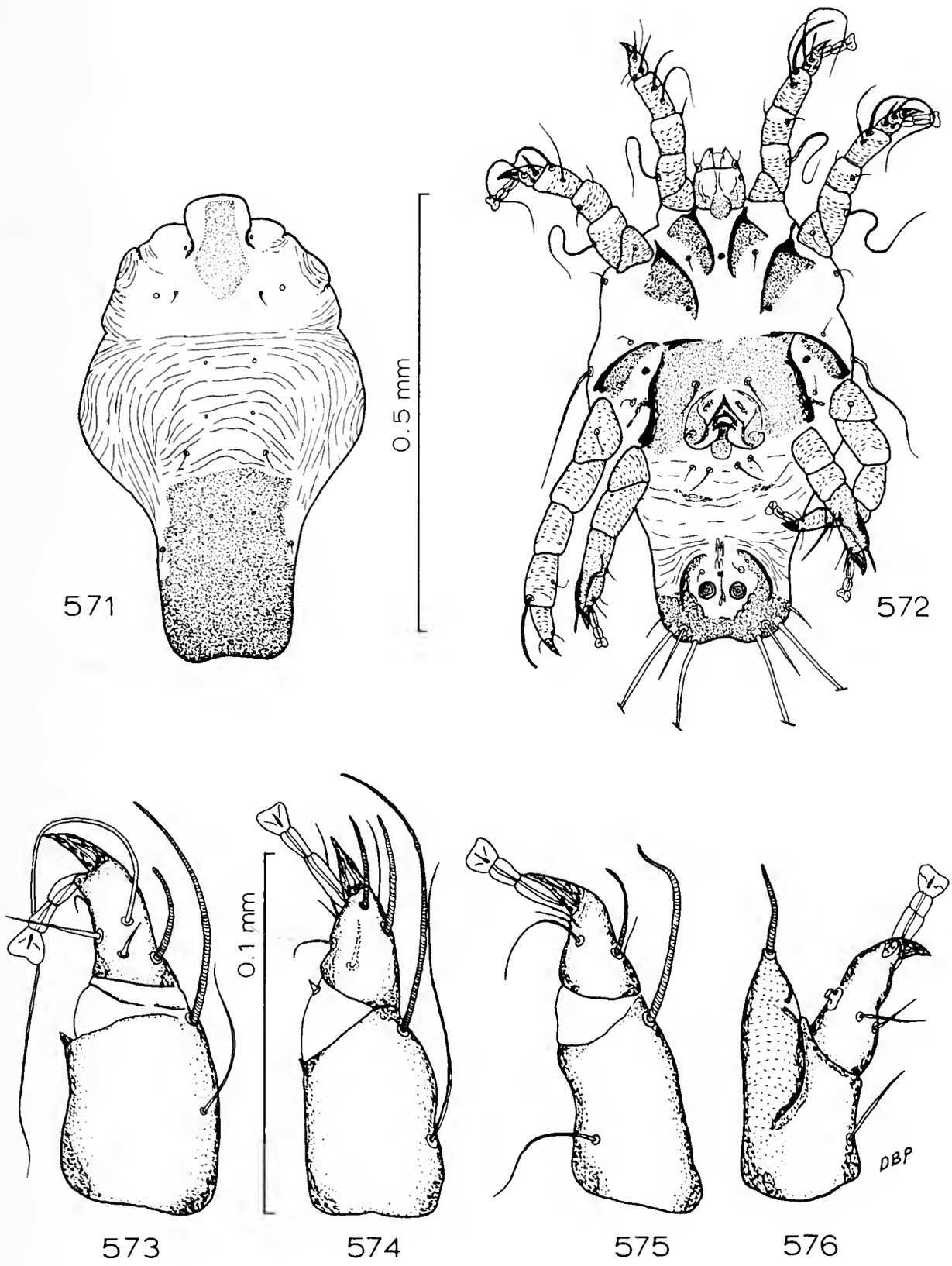
FIGS. 553-558.—*Schoutedenocoptes americanus* Fain and Hyland, female: 553, dorsum; 554, venter; 555, tarsus and tibia I; 556, tarsus and tibia II; 557, tarsus and tibia III; 558, tarsus and tibia IV.



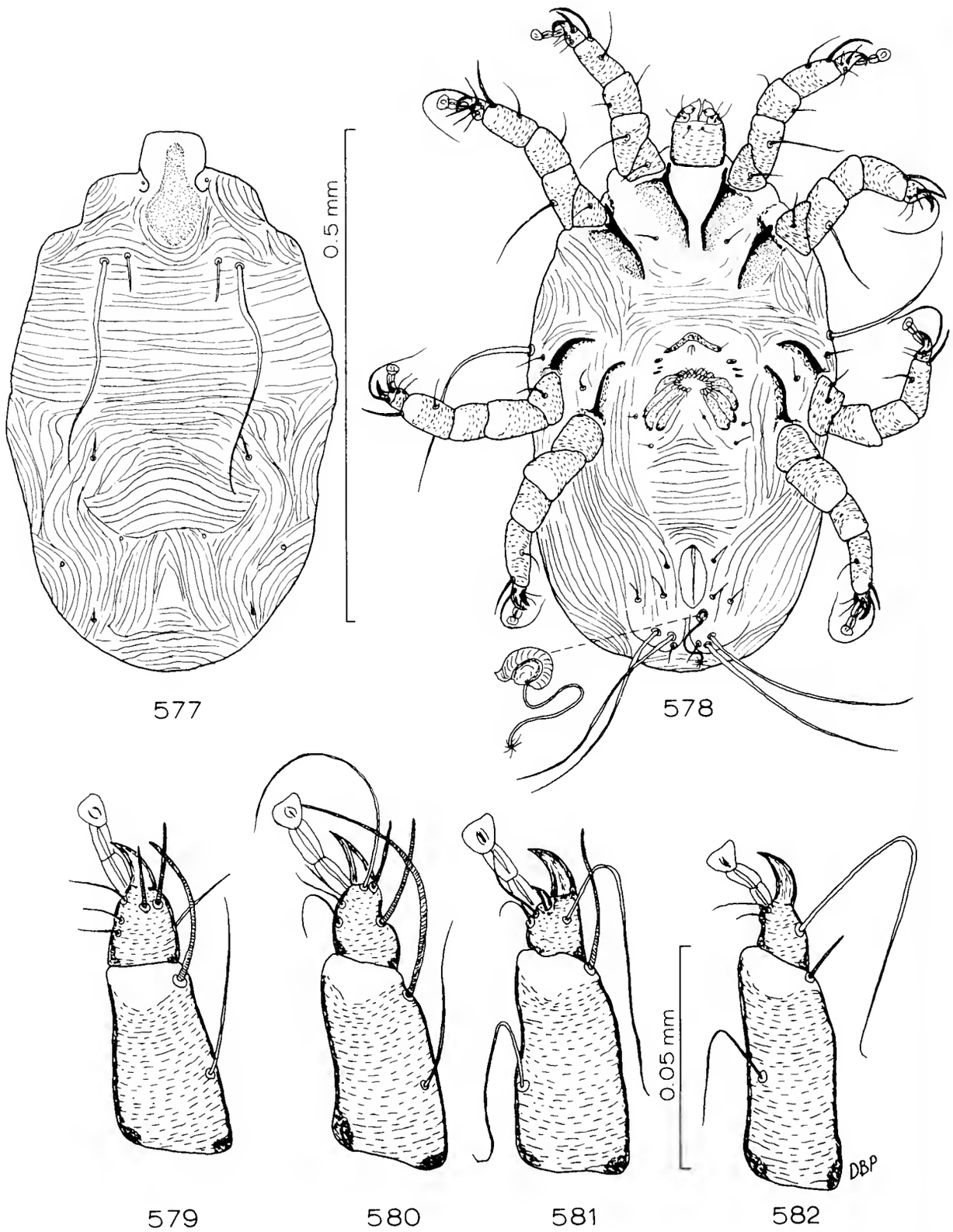
FIGS. 559-564.—*Schoutedenocoptes americanus* Fain and Hyland, male: 559, dorsum; 560, venter; 561, tarsus and tibia I; 562, tarsus and tibia II; 563, tarsus and tibia III; 564, tarsus and tibia IV.



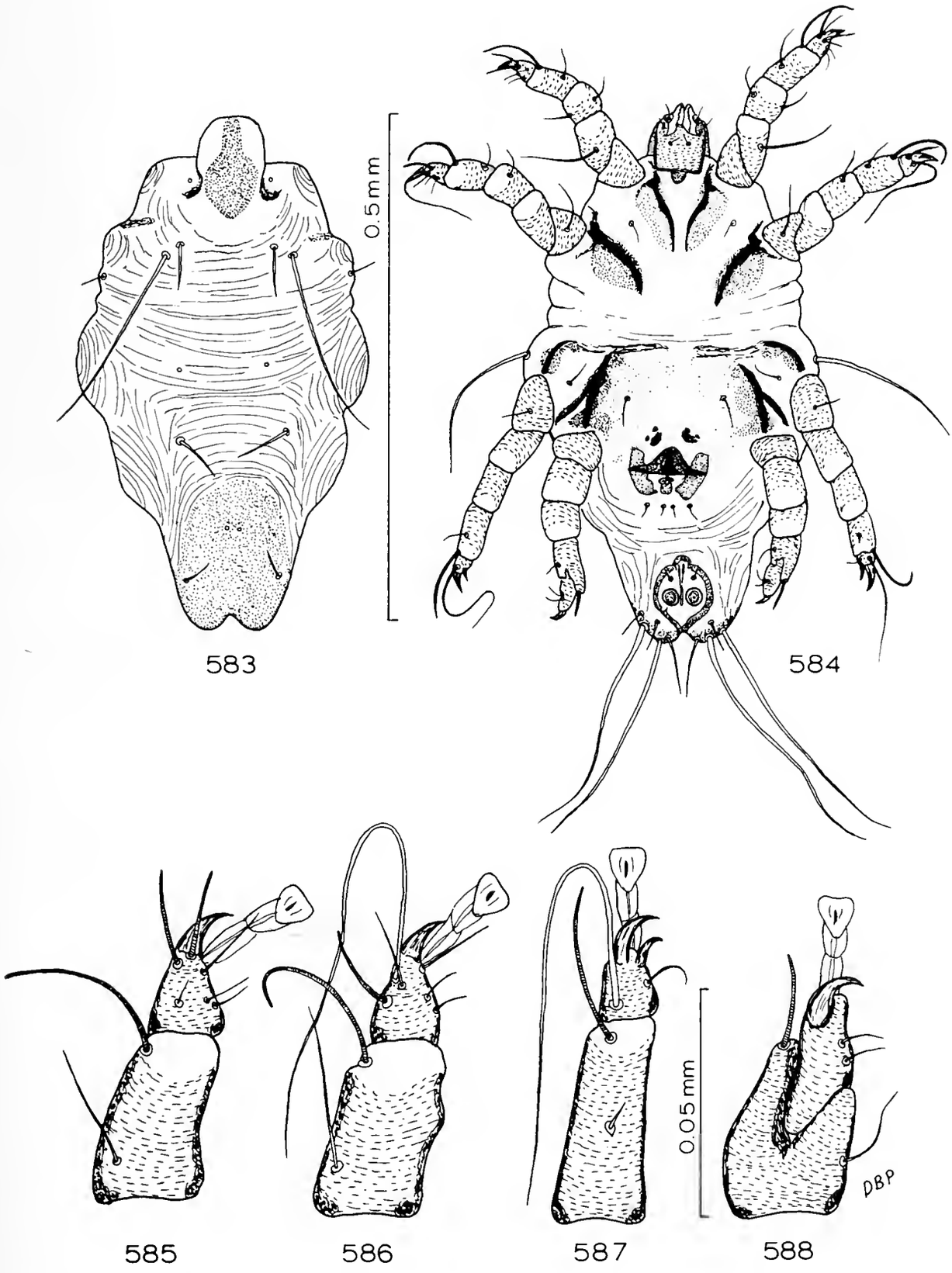
FIGS. 565-570.—*Congocoptes dryocopi* Pence, female: 565, dorsum; 566, venter; 567, tarsus and tibia I; 568, tarsus and tibia II; 569, tarsus and tibia III; 570, tarsus and tibia IV.



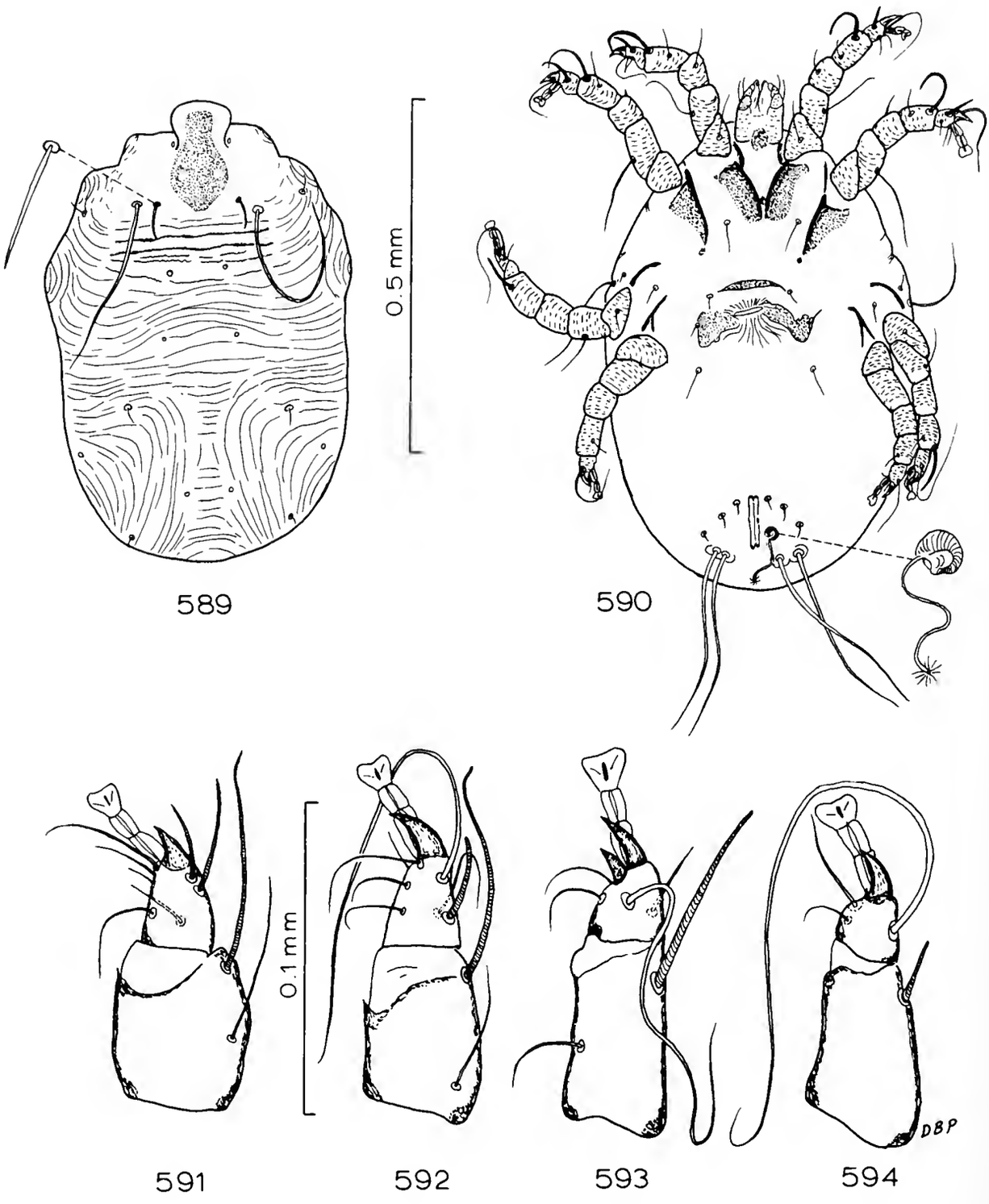
FIGS. 571-576.—*Congocoptes dryocopi* Pence, male: 571, dorsum; 572, venter; 573, tarsus and tibia I; 574, tarsus and tibia II; 575, tarsus and tibia III; 576, tarsus and tibia IV.



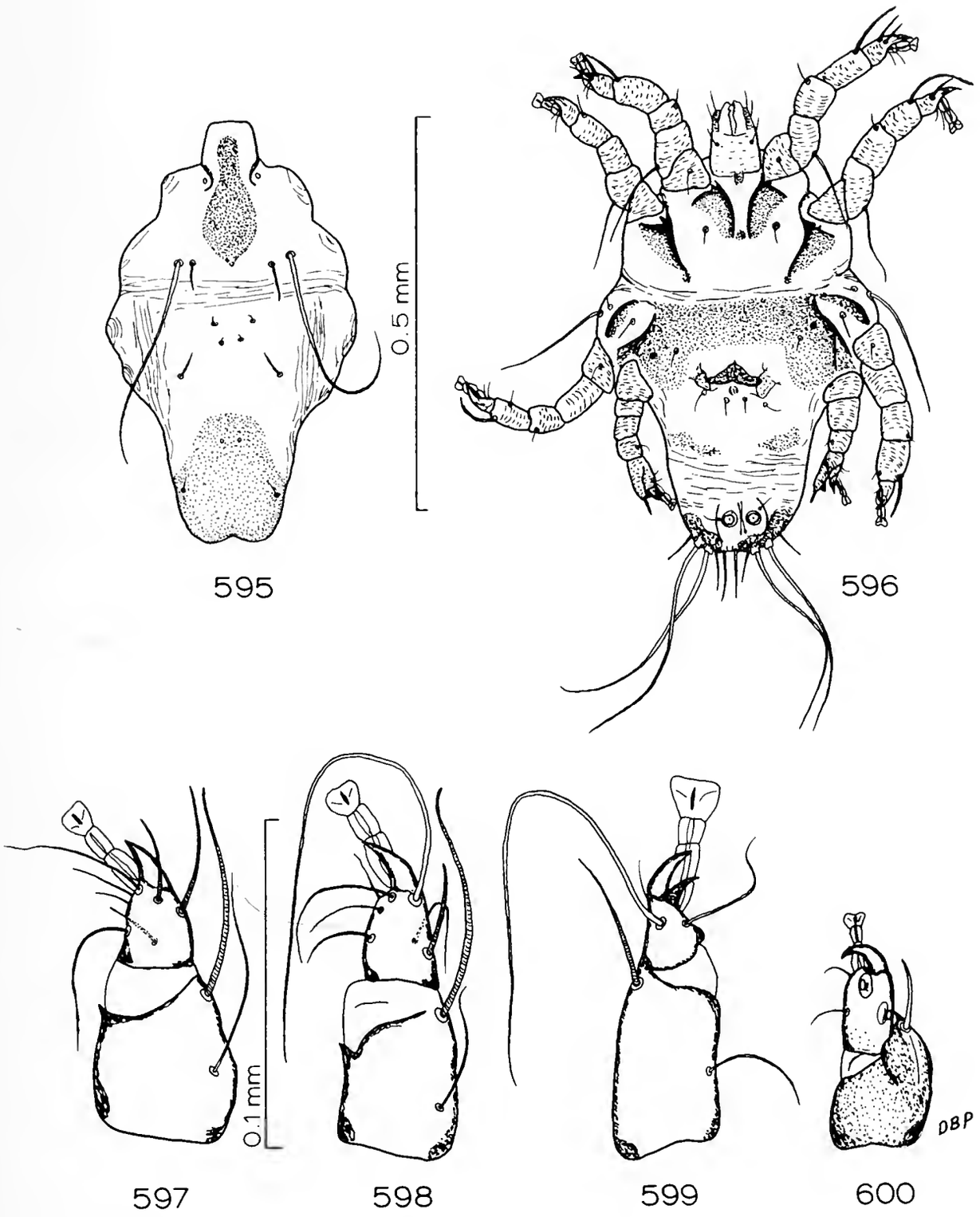
FIGS. 577-582.—*Congocoptes furmani* Fain, female: 577, dorsum; 578, venter; 579, tarsus and tibia I; 580, tarsus and tibia II; 581, tarsus and tibia III; 582, tarsus and tibia IV.



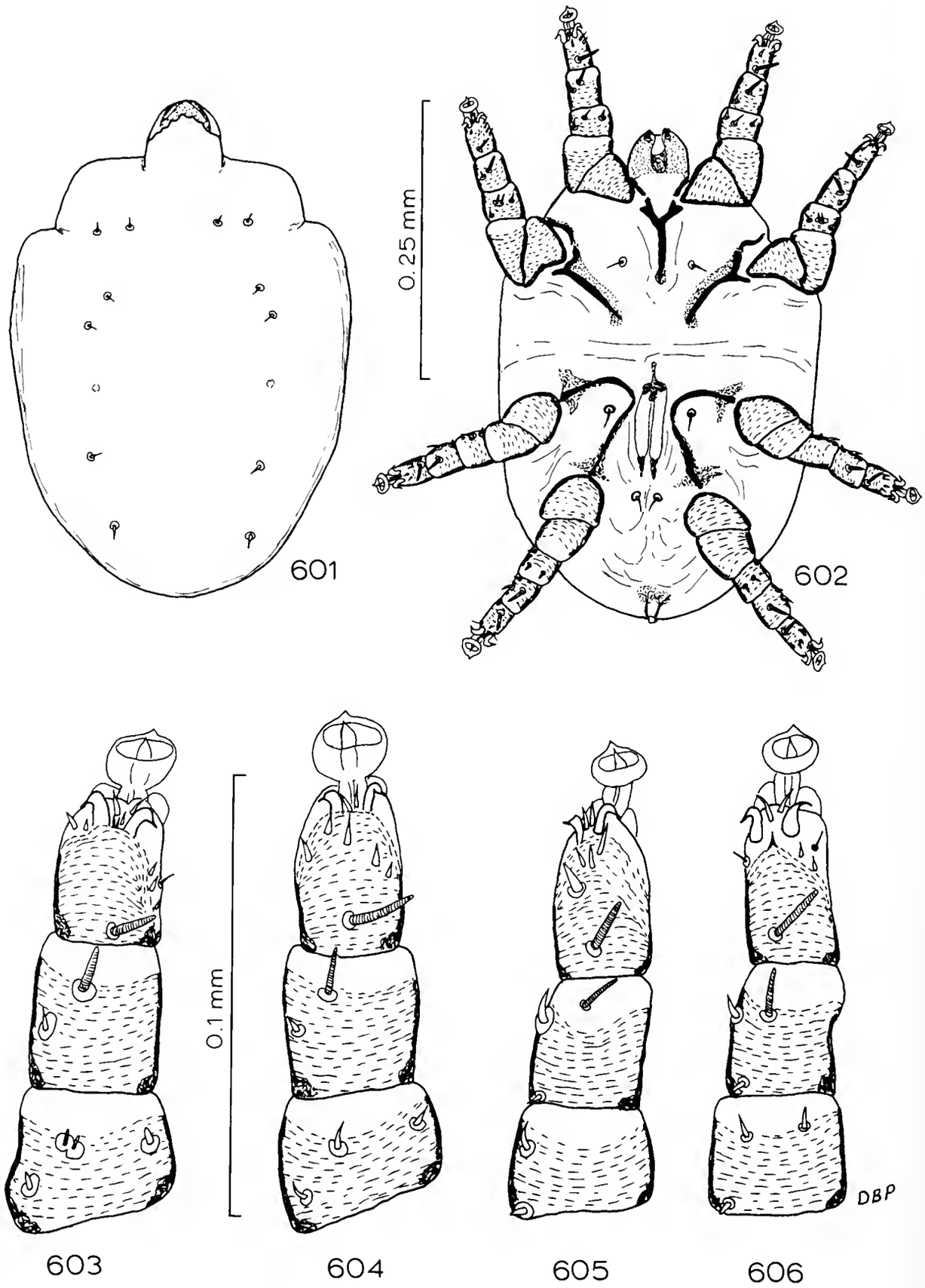
FIGS. 583-588.—*Congocoptes furmani* Fain, male: 583, dorsum; 584, venter; 585, tarsus and tibia I; 586, tarsus and tibia II; 587, tarsus and tibia III; 588, tarsus and tibia IV.



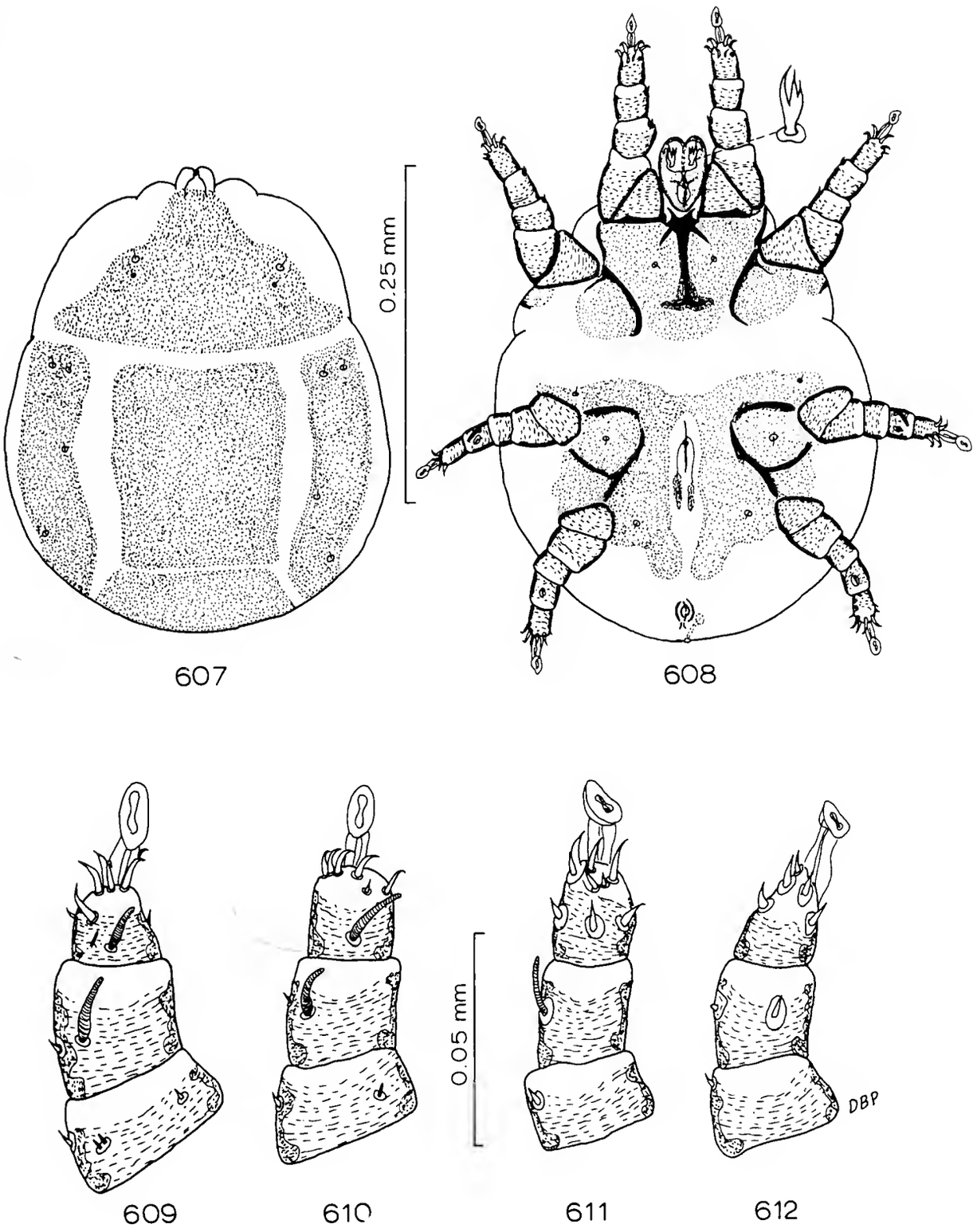
FIGS. 589-594.—*Congocoptes sphyrapicicola* Pence, female: 589, venter; 590, dorsum; 591, tarsus and tibia I; 592, tarsus and tibia II; 593, tarsus and tibia III; 594, tarsus and tibia IV.



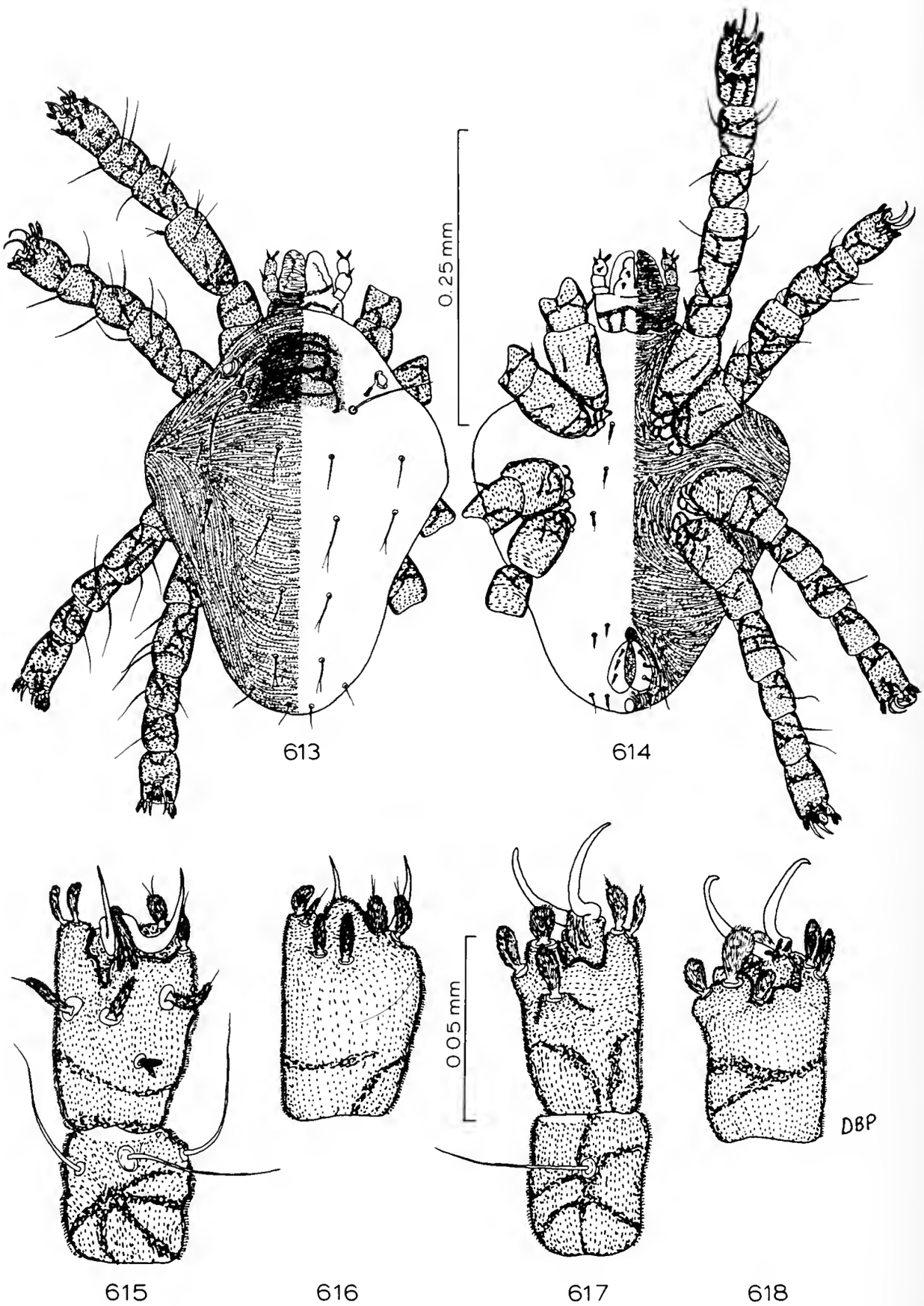
FIGS. 595-600.—*Congocoptes sphyrapicicola* Pence, male: 595, dorsum; 596, venter; 597, tarsus and tibia I; 598, tarsus and tibia II; 599, tarsus and tibia III; 600, tarsus and tibia IV.



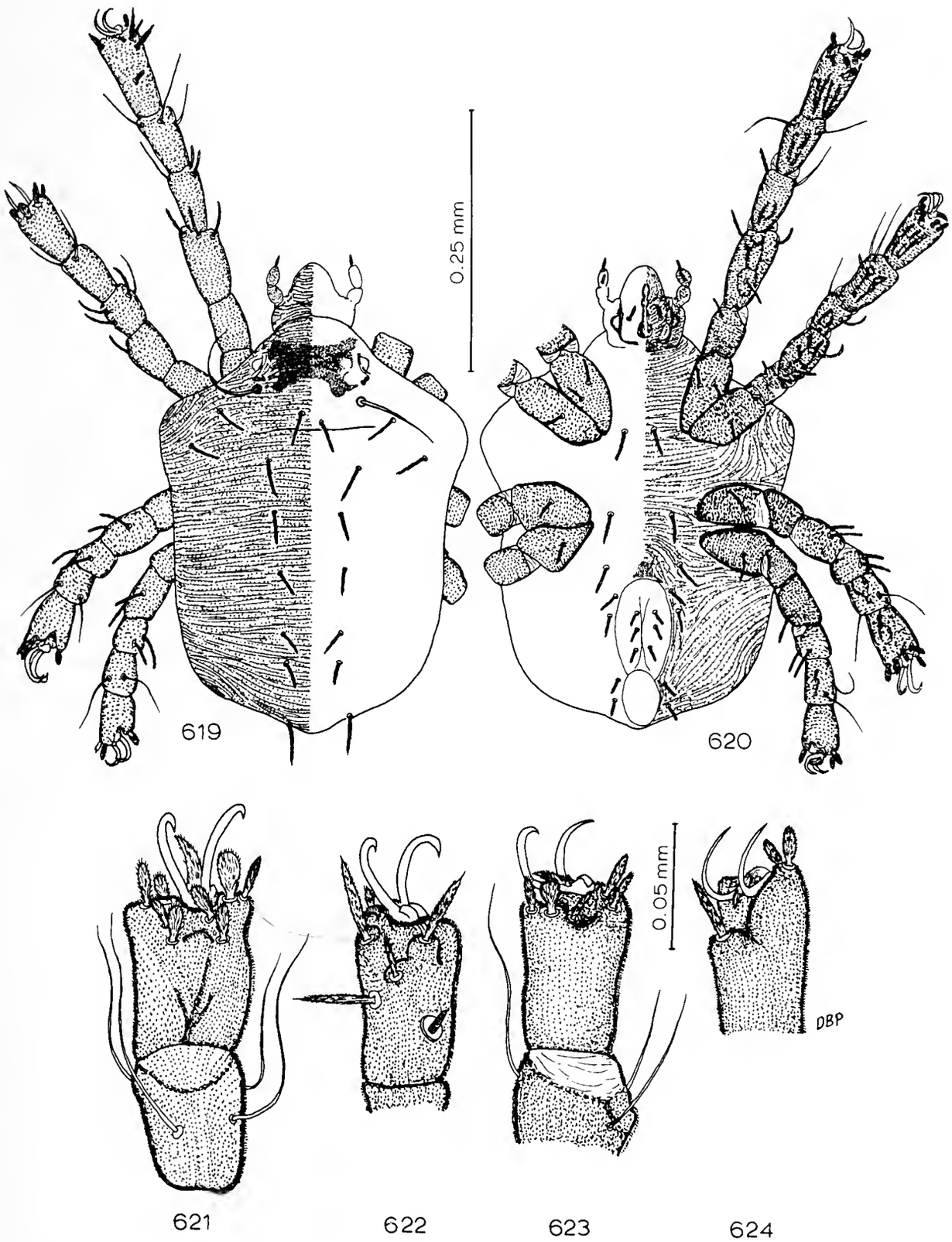
FIGS. 601-606.—*Cytodites therae* Hyland, female: 601, dorsum; 602, venter; 603, tarsus, tibia, and genu I; 604, tarsus, tibia, and genu II; 605, tarsus, tibia, and genu III; 606, tarsus, tibia, and genu IV.



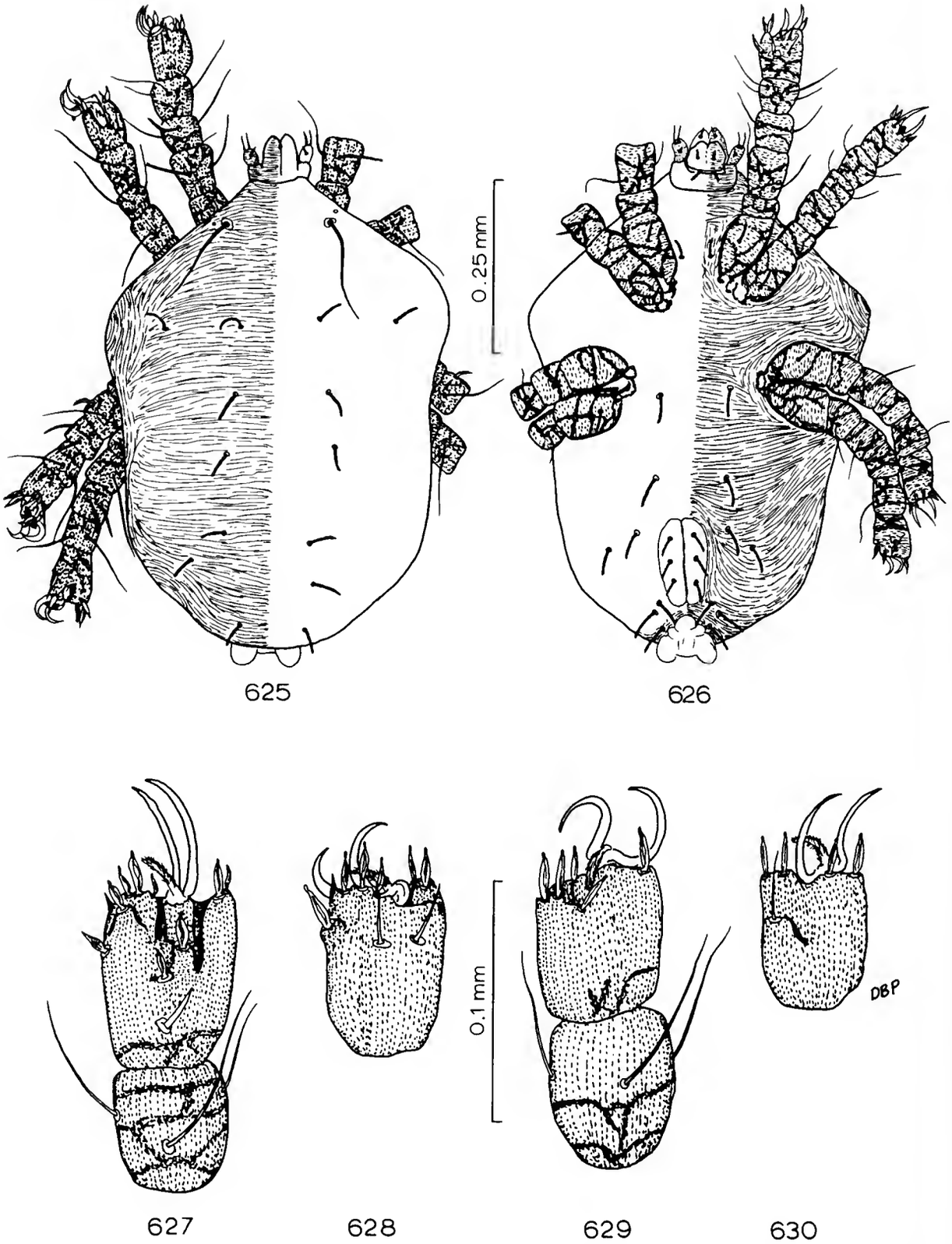
FIGS. 607-612.—*Cytonyssus thryothori* Pence, female: 607, dorsum; 608, venter; 609, tarsus, tibia, and genu I; 610, tarsus, tibia, and genu II; 611, tarsus, tibia, and genu III; 612, tarsus, tibia, and genu IV.



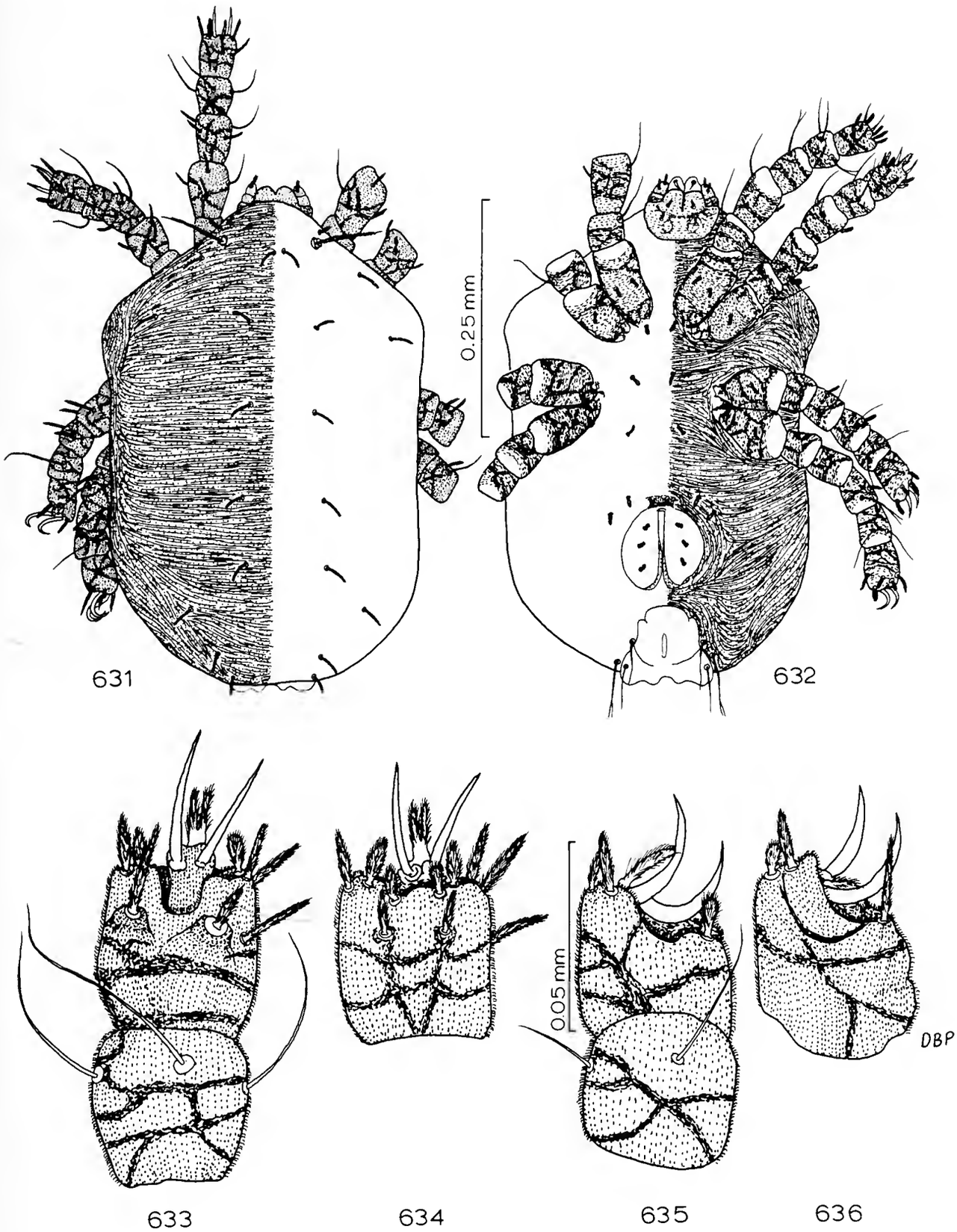
FIGS. 613-618.—*Astrida caprimulgi* Fain, female: 613, dorsum; 614, venter; 615, tarsus and tibia I, dorsal view; 616, tarsus I, ventral view; 617, tarsus and tibia IV, dorsal view; 618, tarsus IV, ventral view.



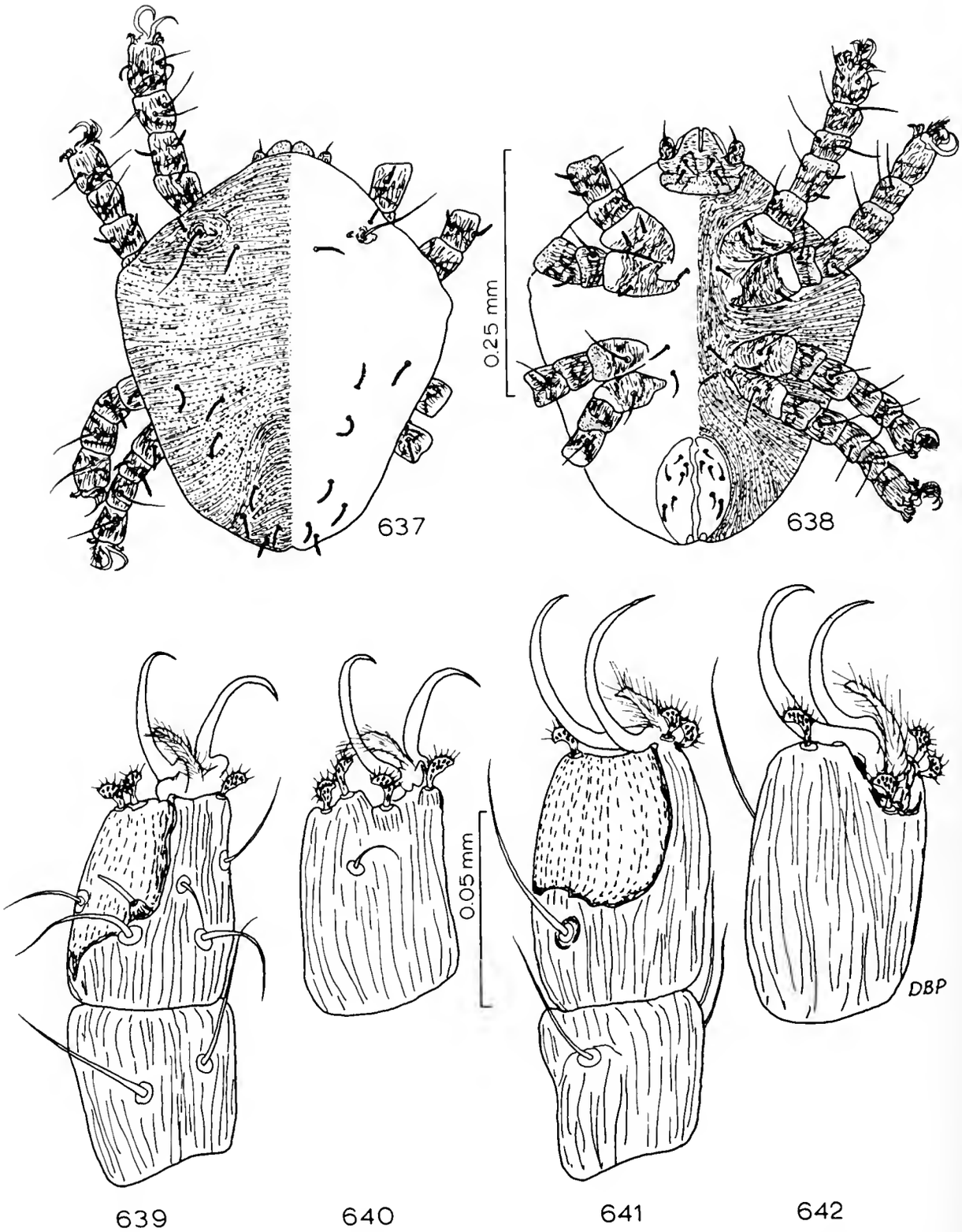
FIGS. 619-624.—*Astrida coccyzae* Pence, female: 619, dorsum; 620, venter; 621, tarsus and tibia I, dorsal view; 622, tarsus I, ventral view; 623, tarsus and tibia IV, dorsal view; 624, tarsus IV, ventral view.



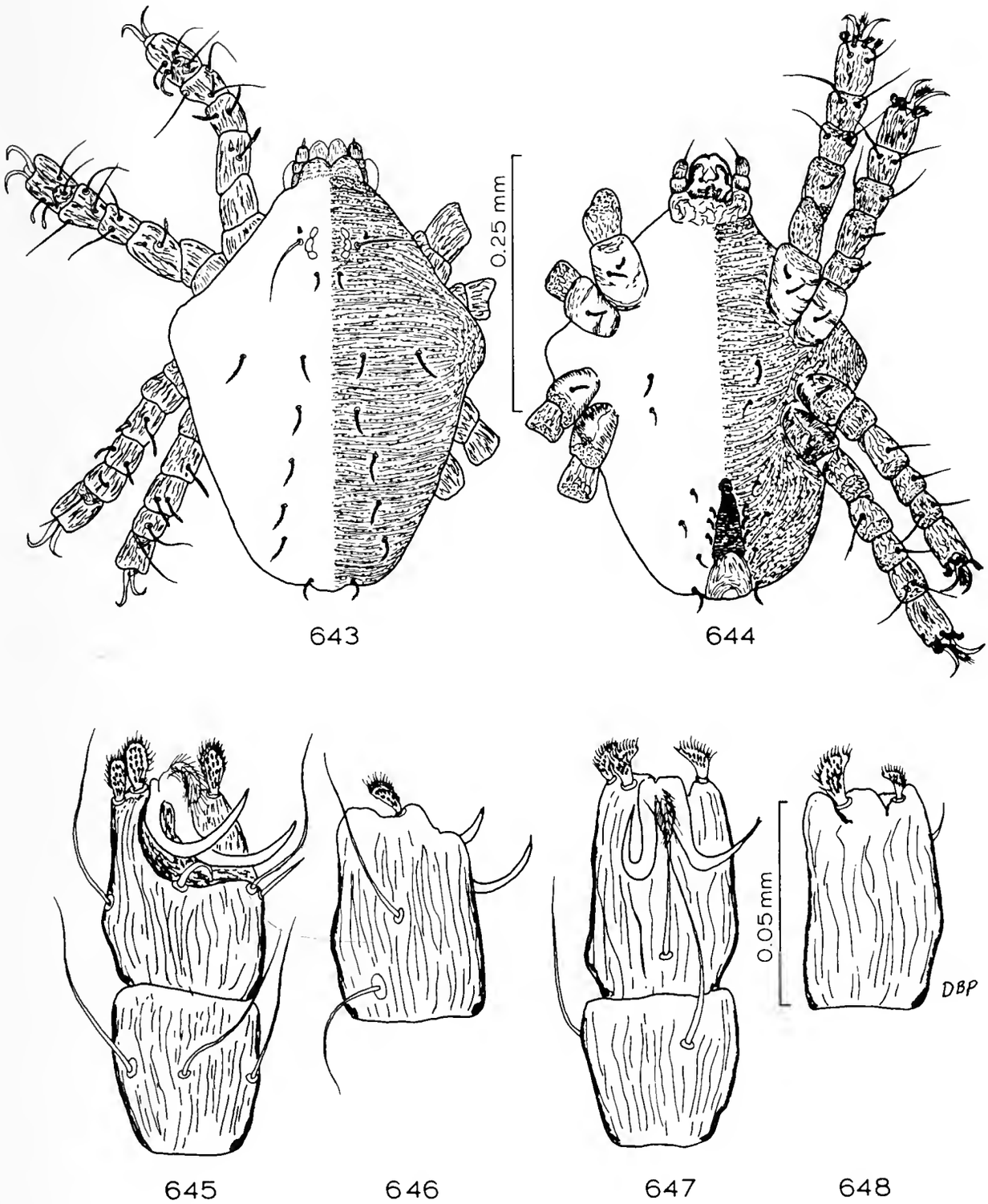
FIGS. 625-630.—*Neoboydaia aureliania* Fain, female: 625, dorsum; 626, venter; 627, tarsus and tibia I, dorsal view; 628, tarsus I, ventral view; 629, tarsus and tibia IV, dorsal view; 630, tarsus IV, ventral view.



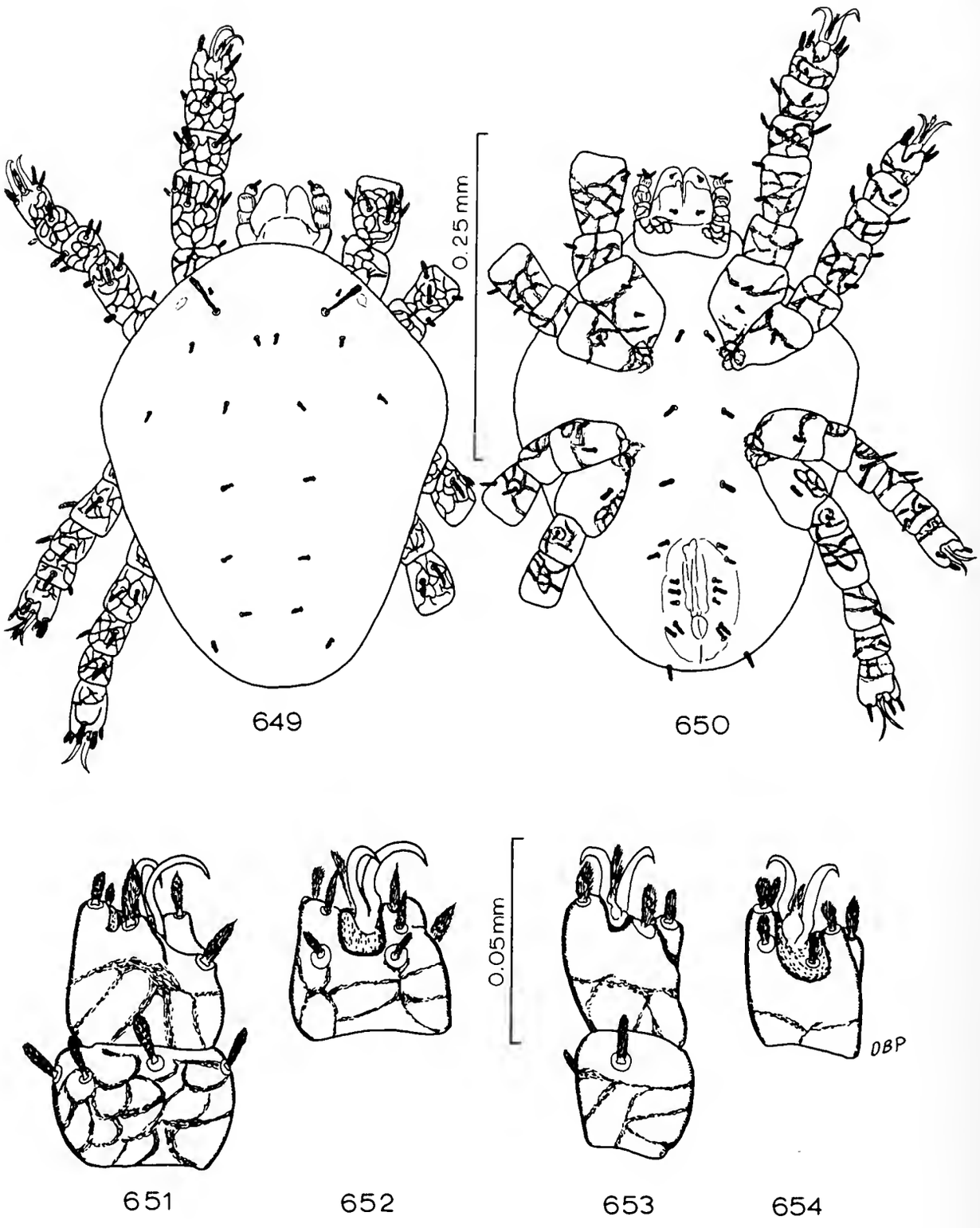
FIGS. 631-636.—*Neoboydaia lateralli* Fain, female: 631, dorsum; 632, venter; 633, tarsus and tibia I, dorsal view; 634, tarsus I, ventral view; 635, tarsus and tibia IV, dorsal view; 636, tarsus IV, ventral view.



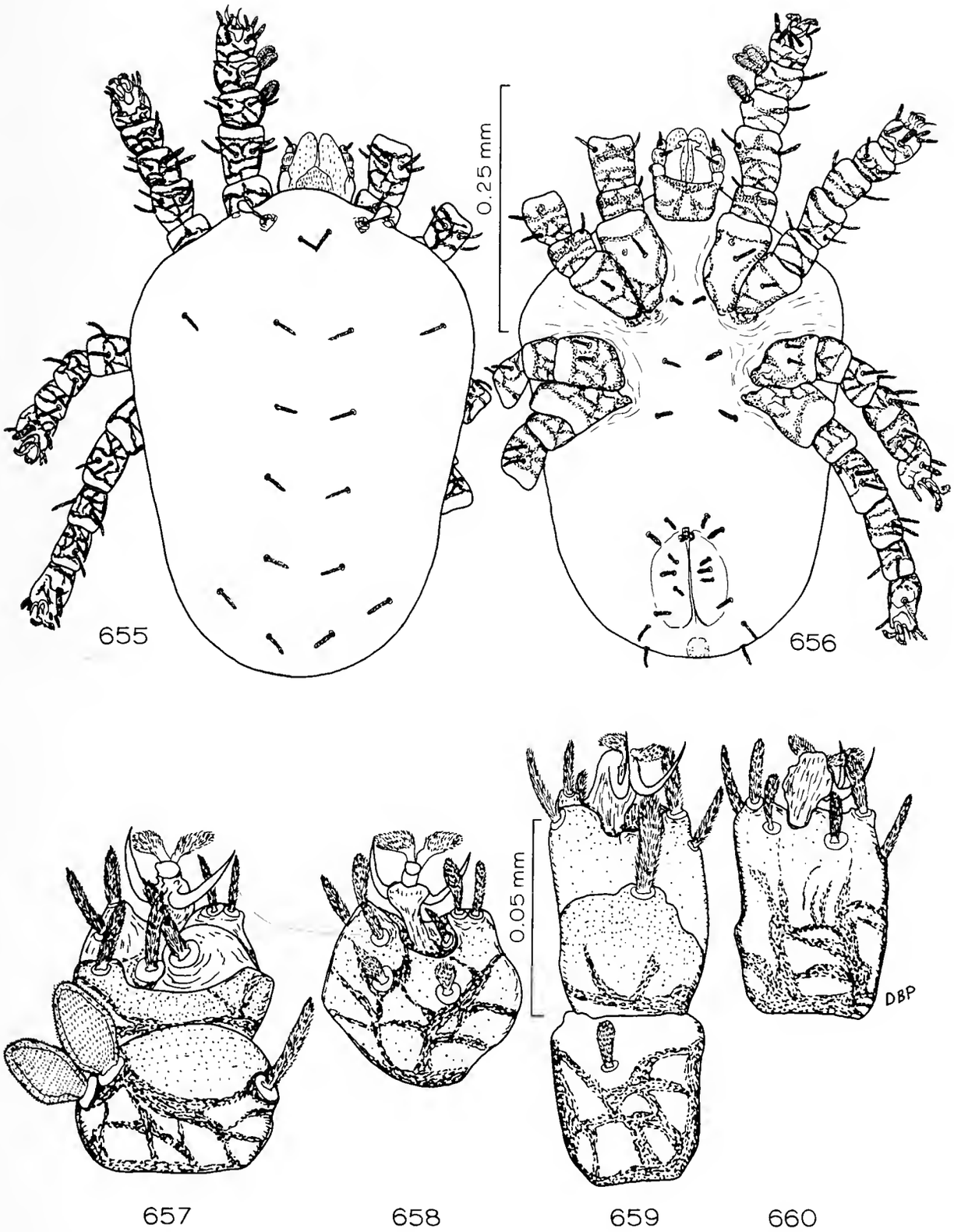
FIGS. 637-642.—*Neoboydaia colymbiformi* Clark, female: 637, dorsum; 638, venter; 639, tarsus and tibia I, dorsal view; 640, tarsus I, ventral view; 641, tarsus and tibia IV, dorsal view; 642, tarsus IV, ventral view.



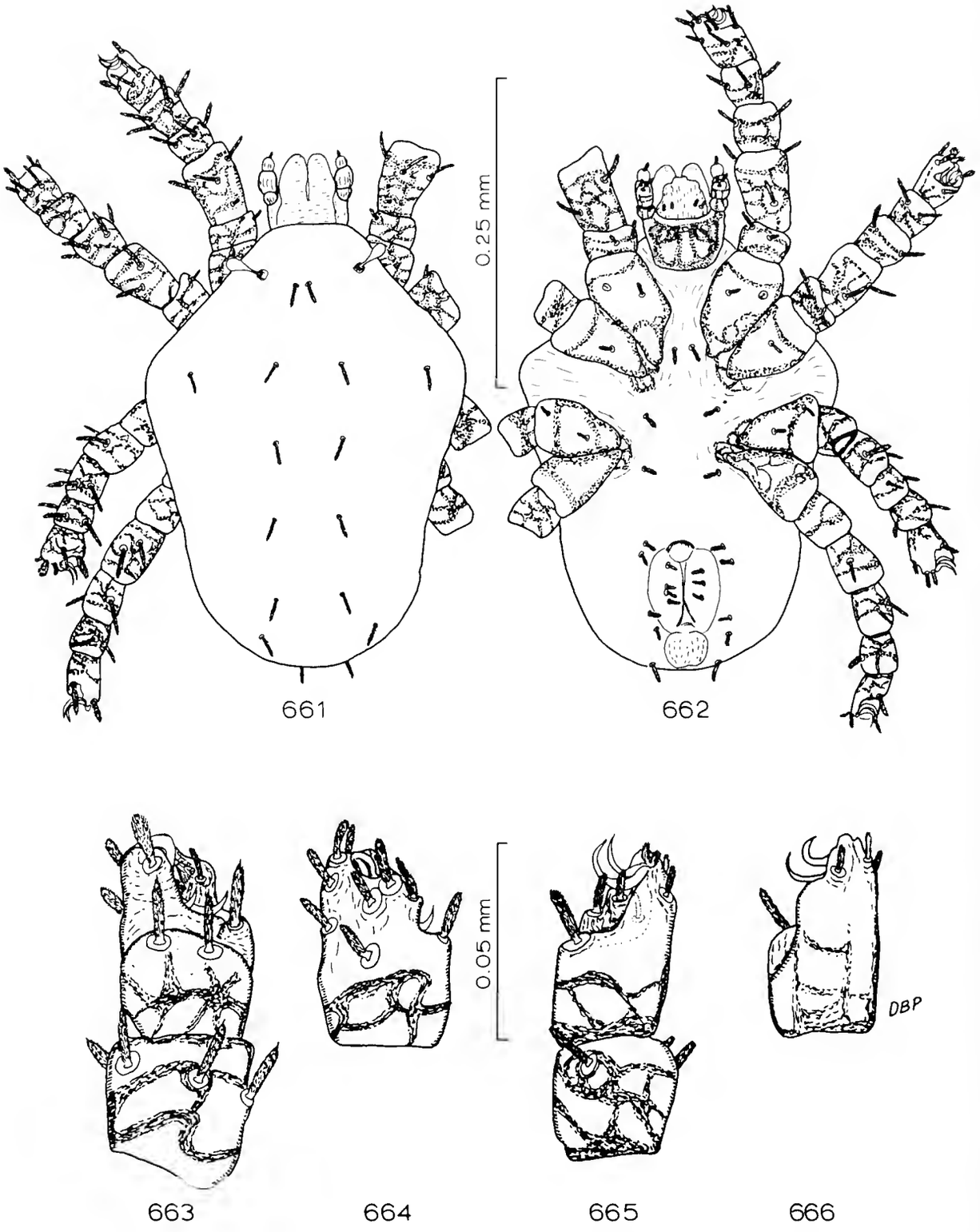
FIGS. 643-648.—*Neoboydaia philomachi* Fain, female: 643, dorsum; 644, venter; 645, tarsus and tibia I, dorsal view; 646, tarsus I, ventral view; 647, tarsus and tibia IV, dorsal view; 648, tarsus IV, ventral view.



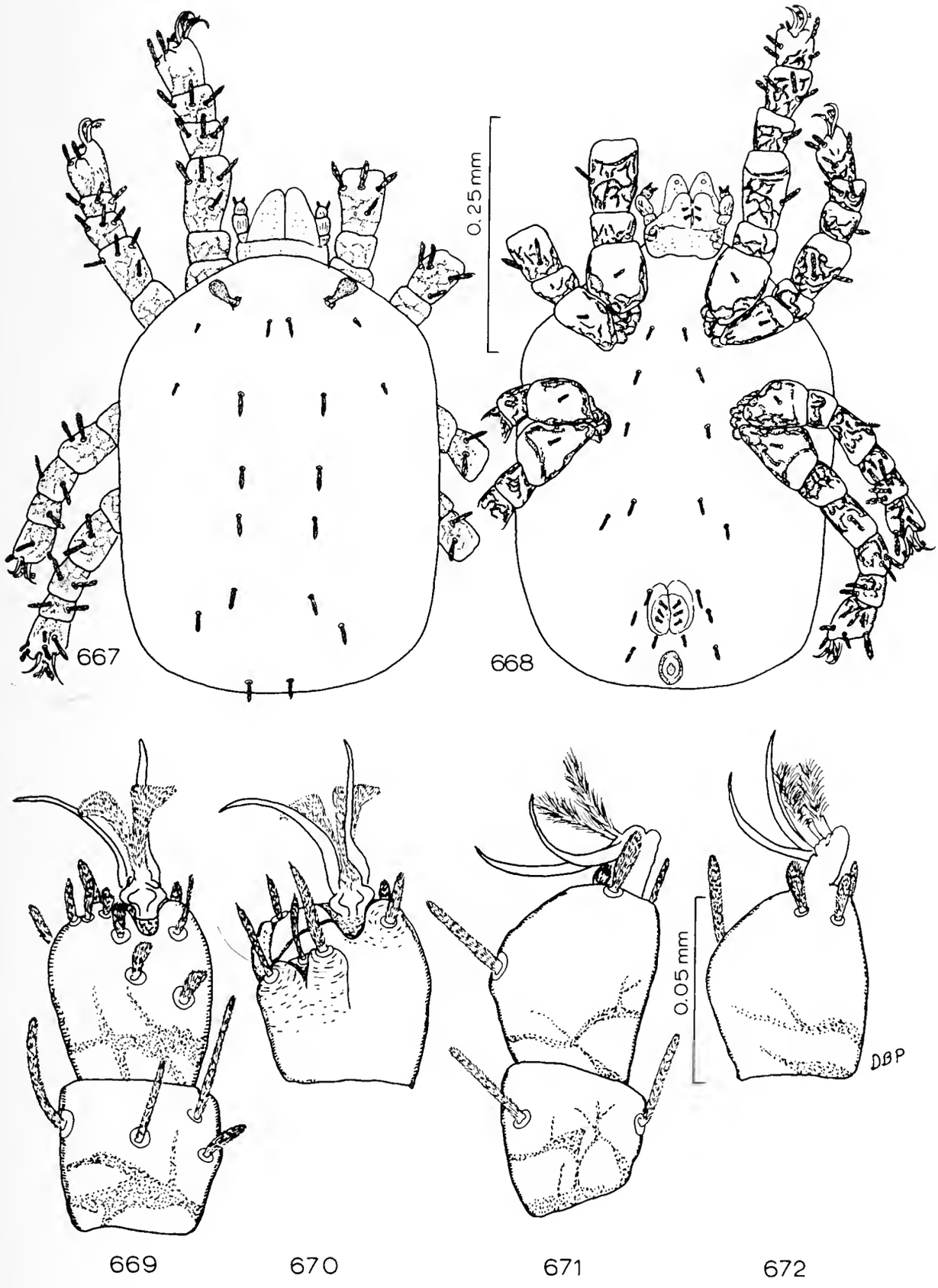
FIGS. 649-654.—*Boydaia sturni* Boyd, female: 649, dorsum; 650, venter; 651, tarsus and tibia I, dorsal view; 652, tarsus I, ventral view; 653, tarsus and tibia IV, dorsal view; 654, tarsus IV, ventral view.



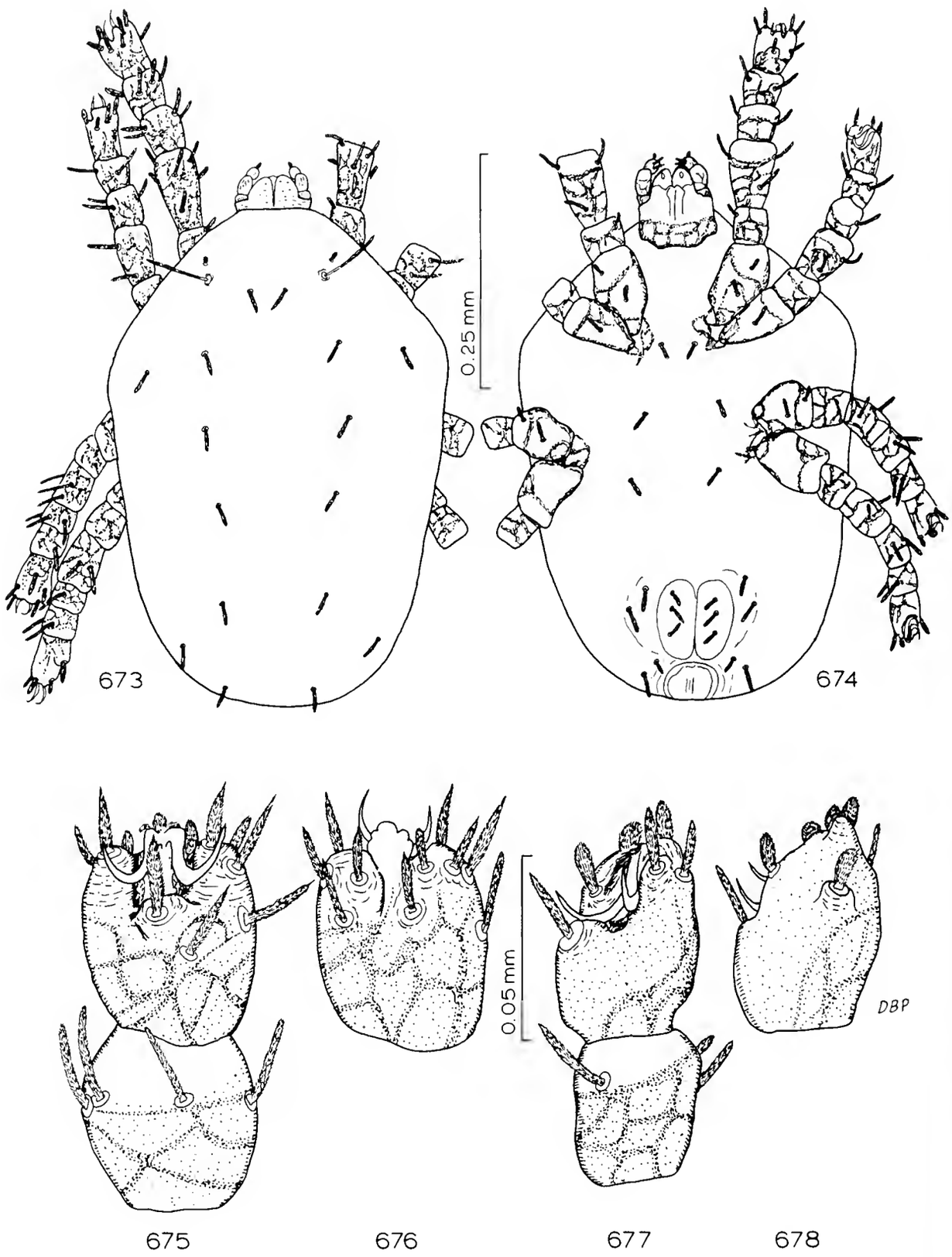
FIGS. 655-660.—*Boydaia psalidoprocnei* Fain, female: 655, dorsum; 656, venter; 657, tarsus and tibia I, dorsal view; 658, tarsus I, ventral view; 659, tarsus and tibia IV, dorsal view; 660, tarsus IV, ventral view.



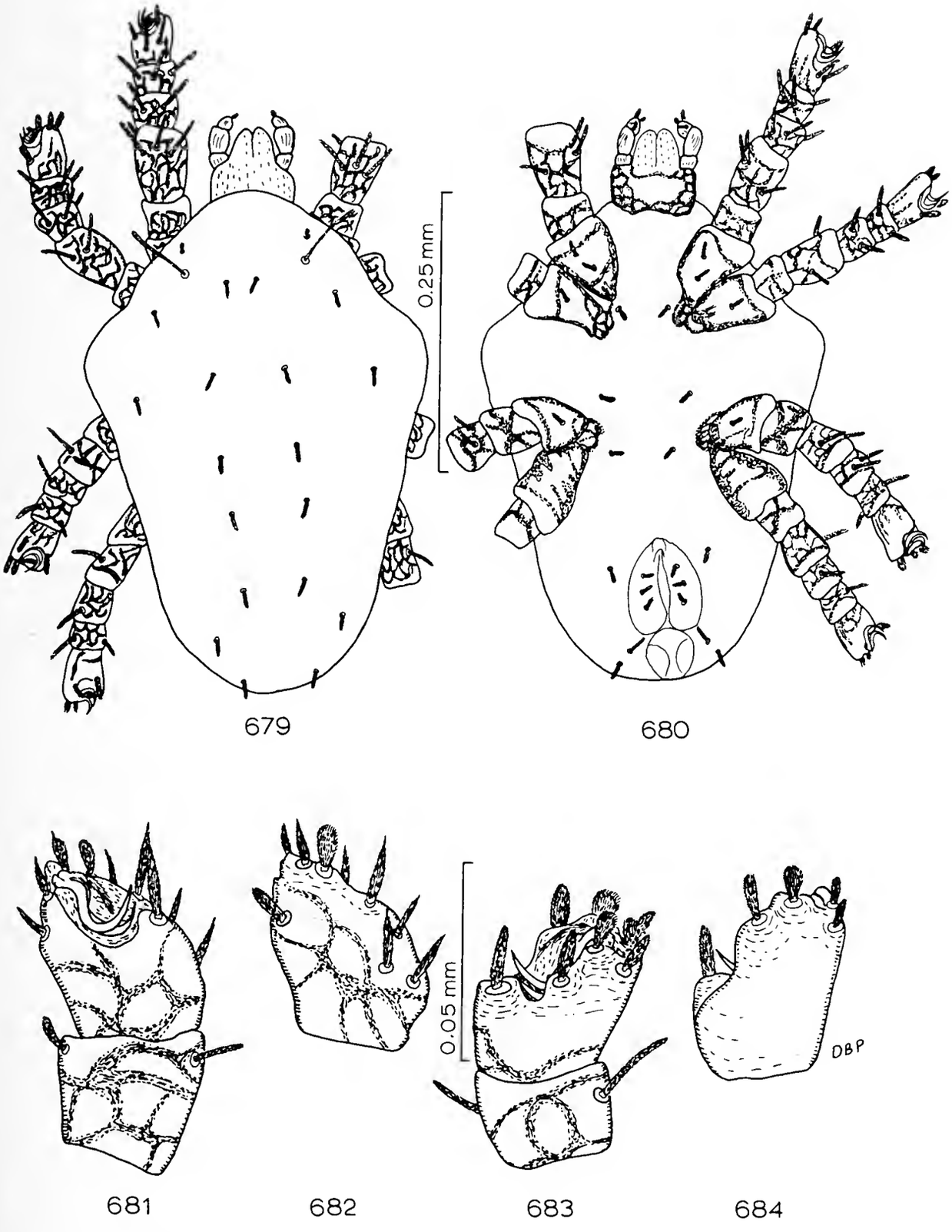
FIGS. 661-666.—*Boydaia hirundoae* Fain, female: 661, dorsum; 662, venter; 663, tarsus and tibia I, dorsal view; 664, tarsus I, ventral view; 665, tarsus and tibia IV, dorsal view; 666, tarsus IV, ventral view.



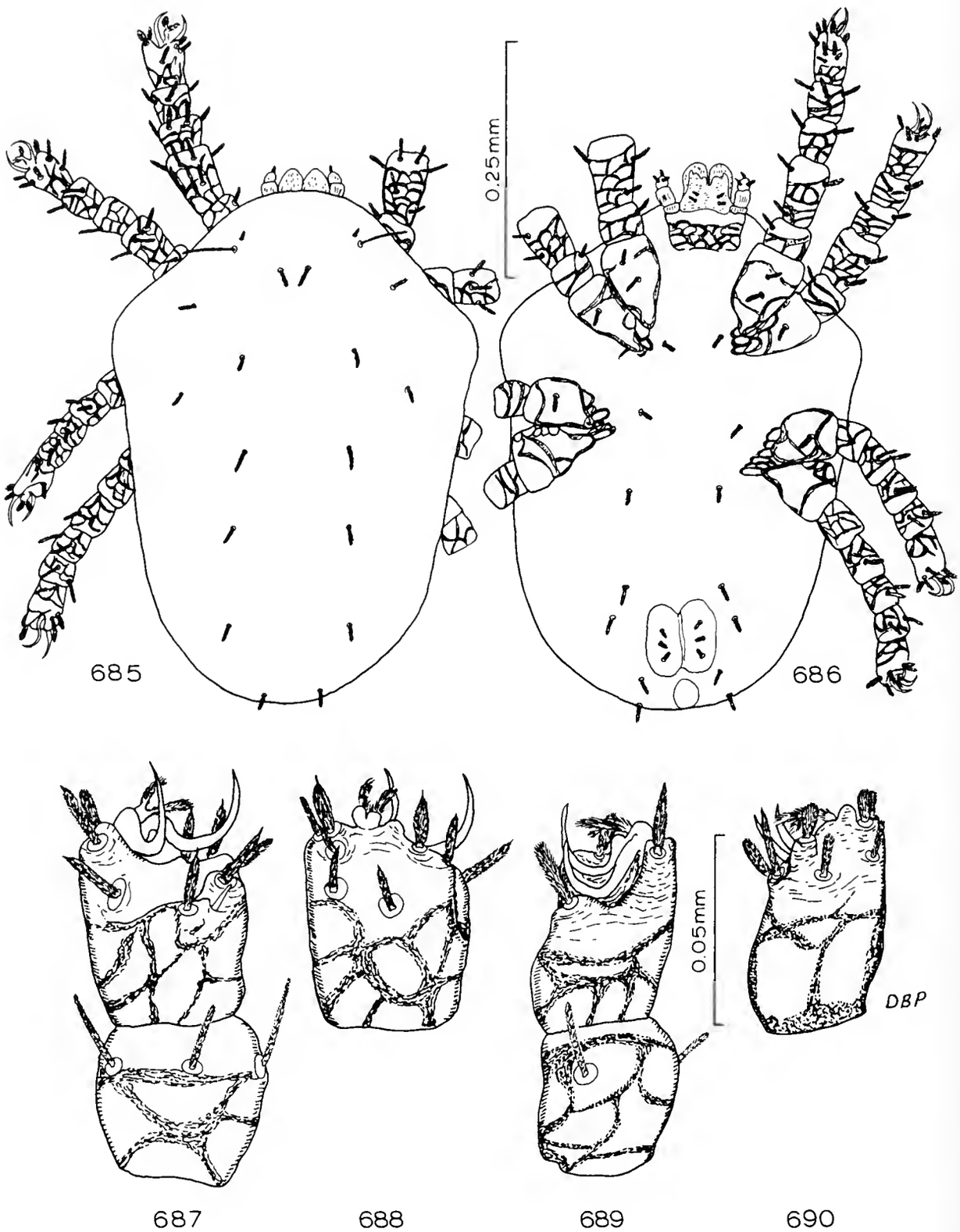
FIGS. 667-672.—*Boydaia tyrannus* Ford, female: 667, dorsum: 668, venter; 669, tarsus and tibia I, dorsal view; 670, tarsus I, ventral view; 671, tarsus and tibia IV, dorsal view; 672, tarsus IV, ventral view.



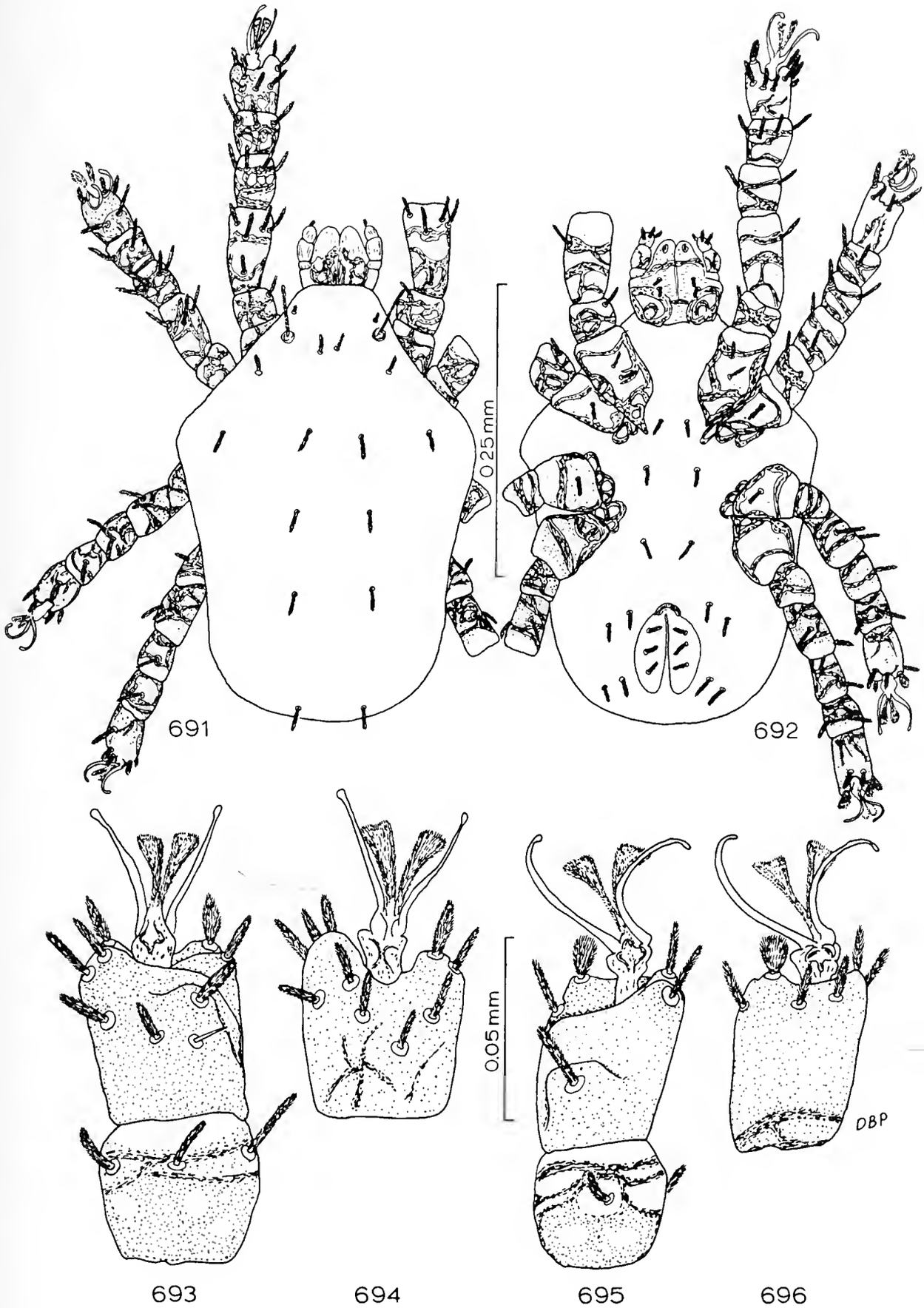
FIGS. 673-678.—*Boydaia agelaii* Fain, female: 673, dorsum; 674, venter; 675, tarsus and tibia I, dorsal view; 676, tarsus I, ventral view; 677, tarsus and tibia IV, dorsal view; 678, tarsus IV, ventral view.



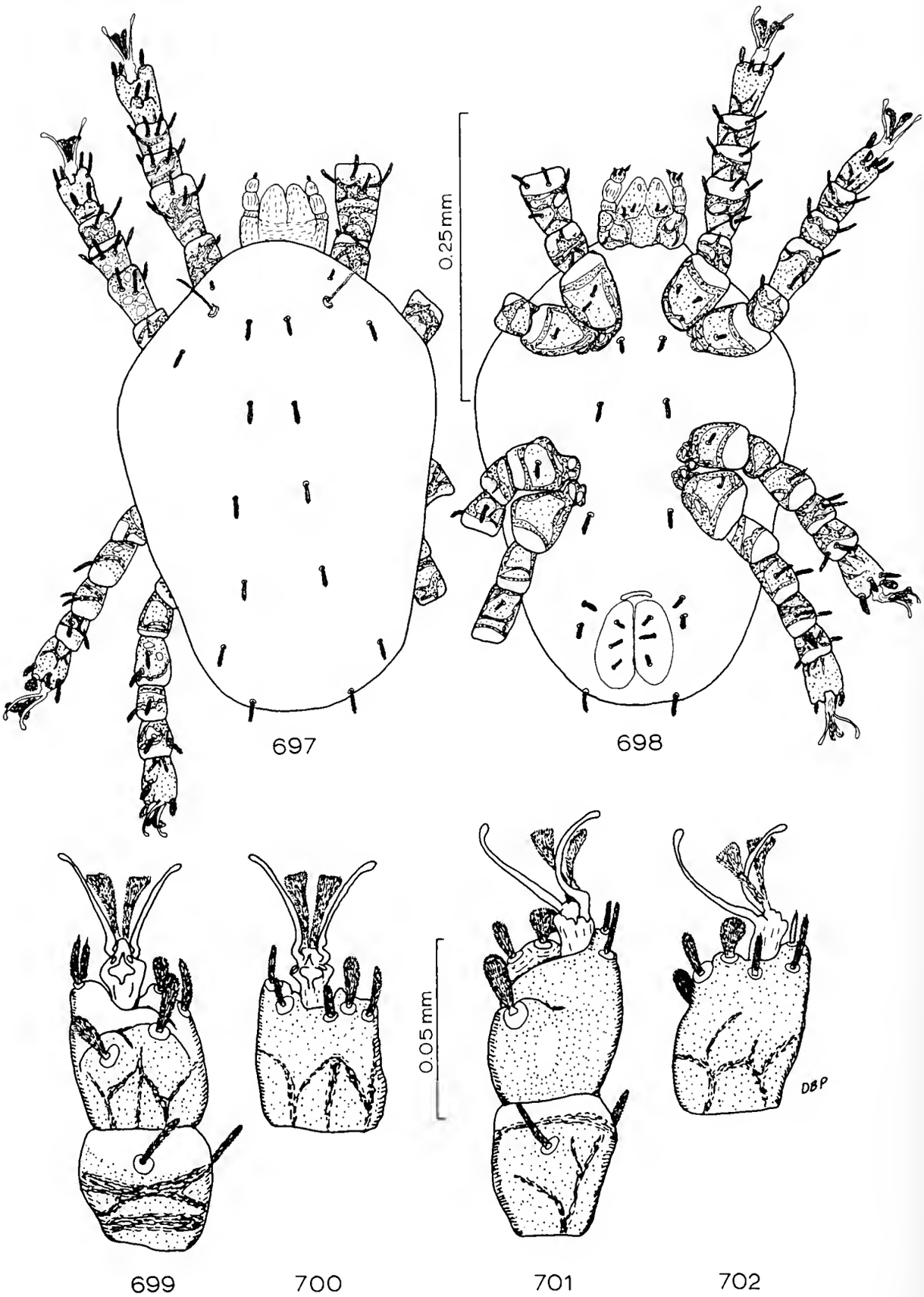
FIGS. 679-684.—*Boydaia nigra* Fain, female: 679, dorsum; 680, venter; 681, tarsus and tibia I, dorsal view; 682, tarsus I, ventral view; 683, tarsus and tibia IV, dorsal view; 684, tarsus IV, ventral view.



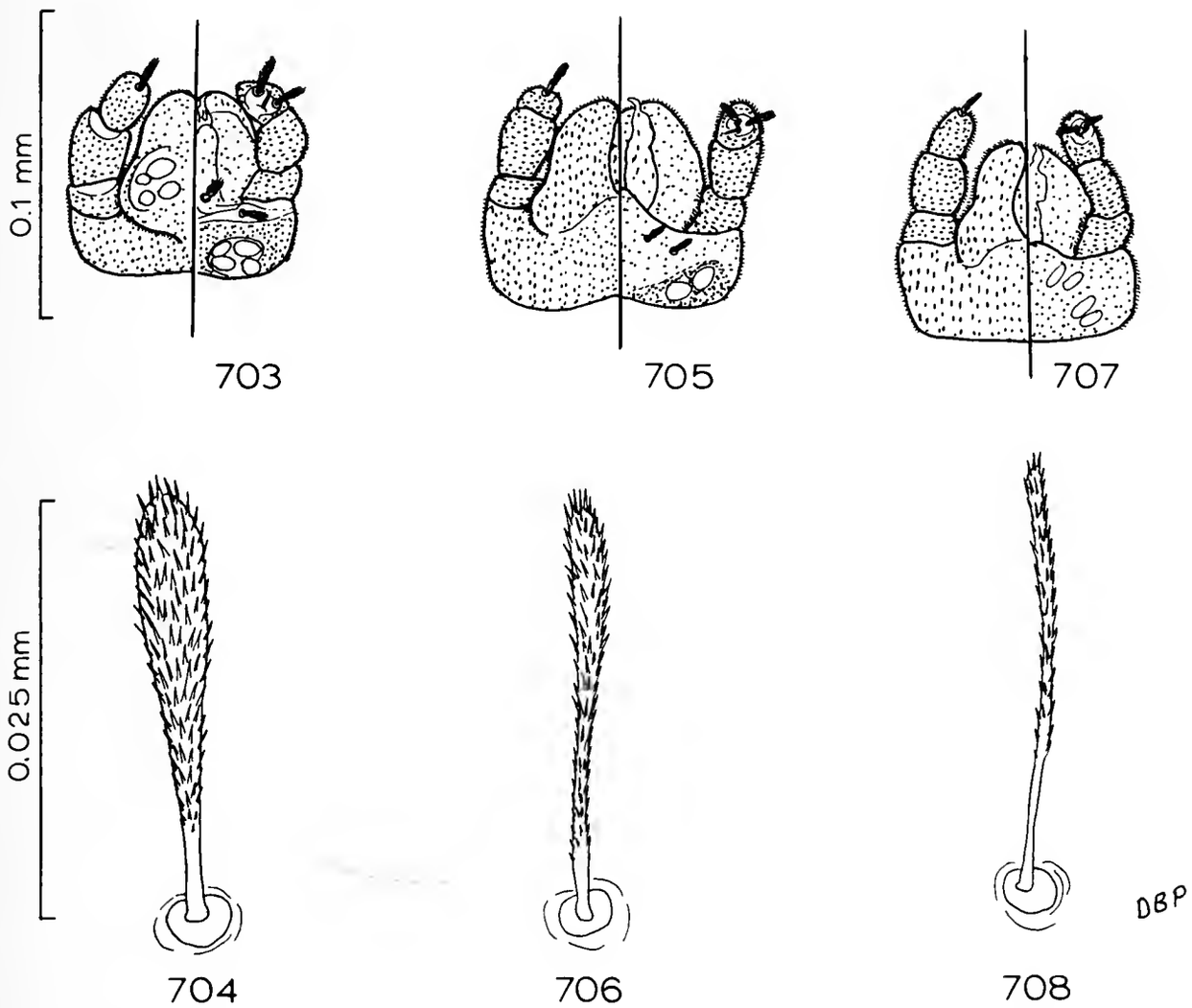
FIGS. 685-690.—*Boydaia colini* Clark, female: 685, dorsum; 686, venter; 687, tarsus and tibia I, dorsal view; 688, tarsus I, ventral view; 689, tarsus and tibia IV, dorsal view; 690, tarsus IV, ventral view.



FIGS. 691-696.—*Boydaia spatulata* Fain, female: 691, dorsum; 692, venter; 693, tarsus and tibia I, dorsal view; 694, tarsus I, ventral view; 695, tarsus and tibia IV, dorsal view; 696, tarsus IV, ventral view.



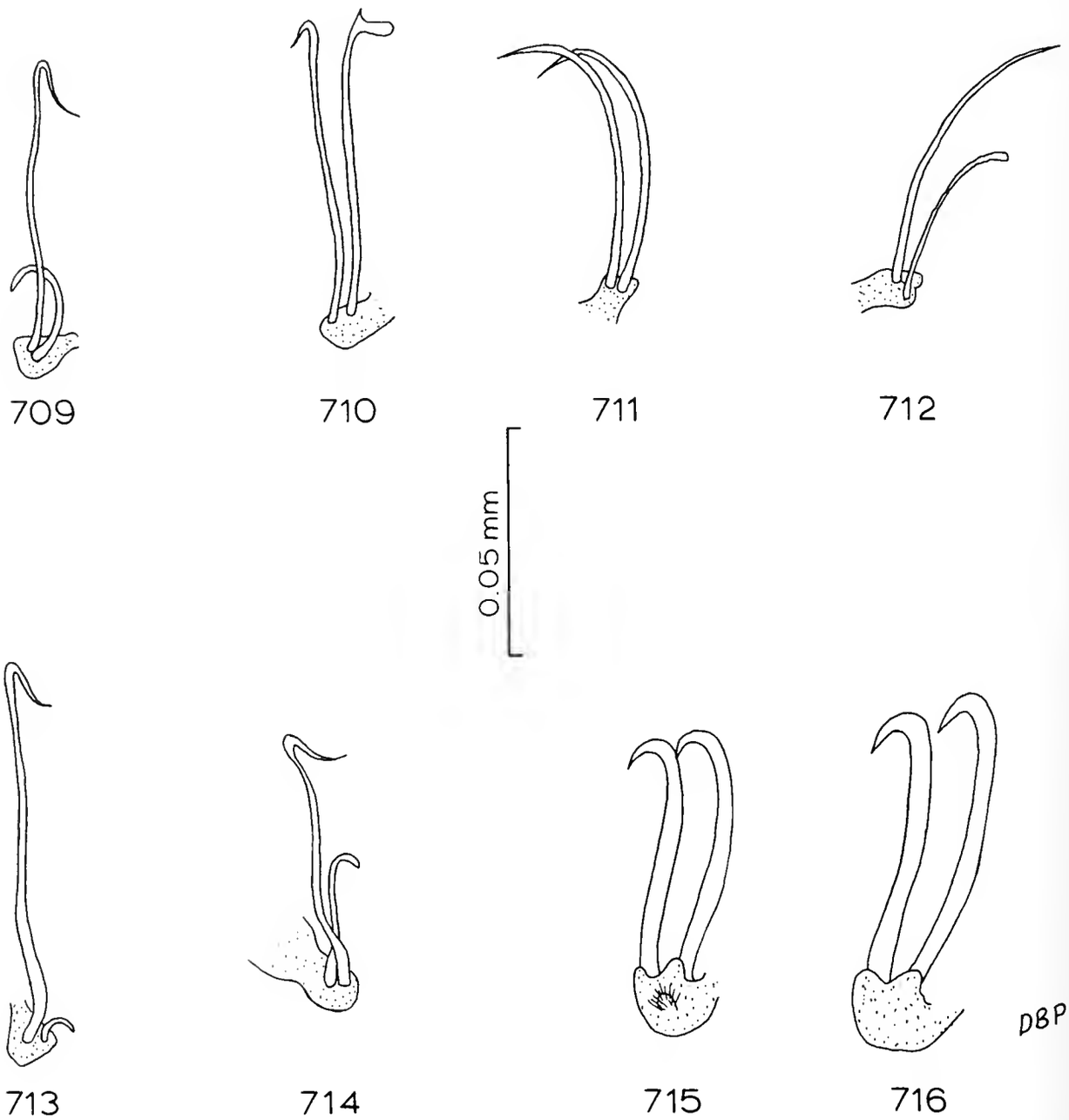
FIGS. 697-702.—*Boydaia loxiae* Fain, female: 697, dorsum; 698, venter; 699, tarsus and tibia I, dorsal view; 700, tarsus I, ventral view; 701, tarsus and tibia IV, dorsal view; 702, tarsus IV, ventral view.



FIGS. 703-704.—*Boydaia rosickyi* Černý and Dusbábek, female: 703, dorsal and ventral views of gnathosoma, respectively; 704, sensilla.

FIGS. 705-706.—*Boydaia faini* Černý and Dusbábek, female: 705, dorsal and ventral views of gnathosoma, respectively; 706, sensilla.

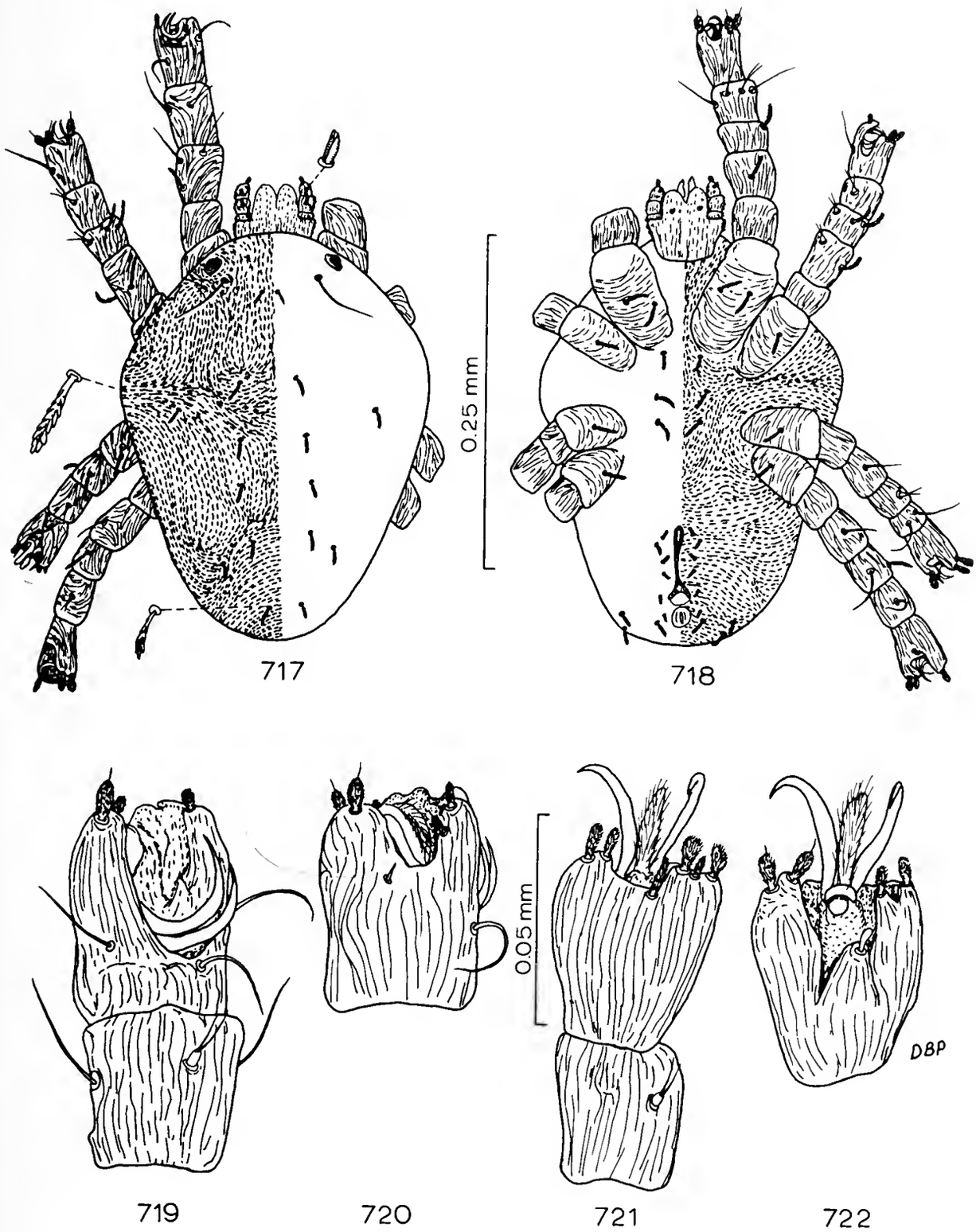
FIGS. 707-708.—*Boydaia americana* Fain, female: 707, dorsal and ventral views of gnathosoma, respectively; 708, sensilla.



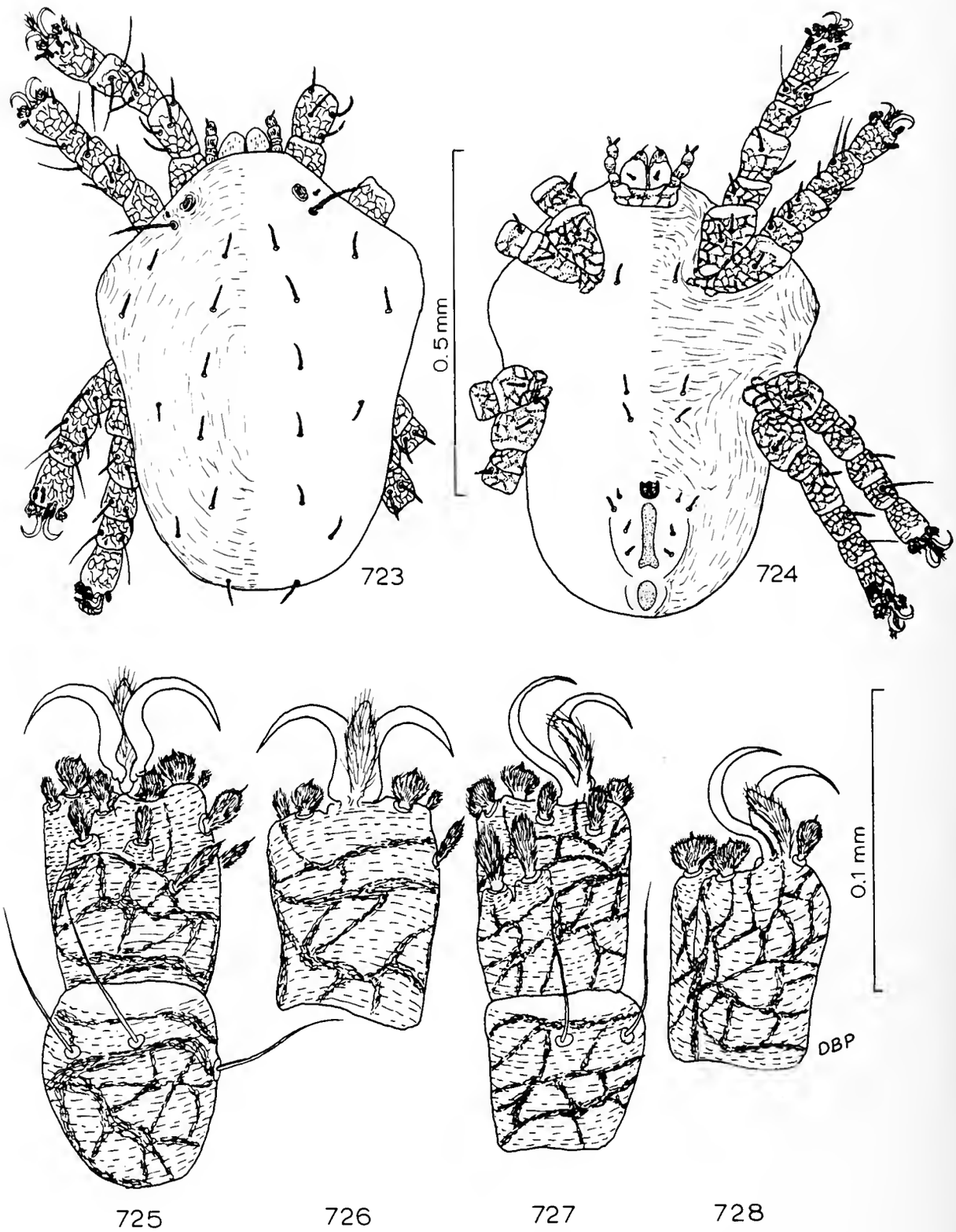
FIGS. 709-712.—Claws of tarsi I of larvae of "*spatulata*" group of genus *Boydaia*: 709, *Boydaia spatulata* Fain; 710, *Boydaia jordani* Van Eyndhoven; 711, *Boydaia mimi* Fain and Hyland; 712, *Boydaia quiscali* Clark.

FIGS. 713-714.—Claws of tarsi II of larvae of "*colini*" group of genus *Boydaia*: 713, *Boydaia colini* Clark; 714, *Boydaia clarki* Fain.

FIGS. 715-716.—Claws and pluvillus of tarsi I of larvae of "*nigra*" group of genus *Boydaia*: 715, *Boydaia sturnellae* Clark; 716, *Boydaia nigra* Fain.



FIGS. 717-722.—*Ophthalmophagus striatus* Crossley, female: 717, dorsum; 718, venter; 719, tarsus and tibia I, dorsal view; 720, tarsus I, ventral view; 721, tarsus and tibia IV, dorsal view; 722, tarsus IV, ventral view.



FIGS. 723-728.—*Ophthalmophagus womersleyi* Fain, female: 723, dorsum; 724, venter; 725, tarsus and tibia I, dorsal view; 726, tarsus I, ventral view; 727, tarsus and tibia IV, dorsal view; 728, tarsus IV, ventral view.

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