FIVE NEW MITES OF THE SUBFAMILY EREYNETINAE
(ACARINA: EREYNETIDAE)\textsuperscript{1}

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The Ereynetinae, some of which are known to be important vertebrate parasites, are small, soft bodied proetigmatic mites. The subfamilial and generic classifications for these mites have been given by Fain (1957) and Fain and Nadchatram (1962). Only five species of Ereynetinae have been reported from North America (Baker 1945); however, a number of ereynetine species have been reported from widely separated regions of the world including Europe, Asia, and the Antarctic area. Undoubtedly much taxonomic work remains to be done and additional species will likely be found with more extensive collecting.

Thor (1933) relied heavily upon the pattern of the propodosomal shield for key characteristics of the genus \textit{Ereynetes}. This pattern is often difficult to describe, but a large number of characteristics which readily lend themselves to use in a key have not been used for this group of mites to date. In the material available to me for study, the position of the body setae in the anterior sensory setal area has proved a possible character which in combination with other characters may be useful for species determination. The location of the two body setae (setae cc of Grandjean) between the sensory setae was given as a generic characteristic of \textit{Ereynetoides}; I am inclined to believe that this is not a stable generic character, but is of specific value. Further study on a wider range of species should indicate the value of propodosomal chaetotaxy as a species characteristic.

The present paper describes five new species of Ereynetinae, four from North America and one from China. The setal notations are those of Grandjean (1939).

\textit{Ereynetoides} Fain and Nadchatram, 1962.

This genus was set up to include those \textit{Ereynetes} which have lenslike eyes on the propodosoma. Although reported only from Asia, the Antarctic area, and now from North America, the genus is probably world wide in distribution. The United States National Museum collection contains four specimens apparently imported from Europe, three from Denmark and one from England, all intercepted at Boston, Mass., which belong to this genus. Willmann (1953) in describing \textit{Ereynetes bipilosa}, taken in Austria, reported but did not illustrate a pair of small bubble-vesicles, resembling the cornea of an eye anterior to the sensory setae. He pointed out that these were different from the pigmented eyes typical of the genus \textit{Opsereynetes}. Based on the location and description of the structures, it would seem that these were probably lenslike eyes. If so this would provide another record for the genus from Europe.

\textit{Ereynetoides scutalis} new species

Fig. 1

This species is unusual in having a very large subcutaneous propodosomal shield extending well back on the opisthosoma, setae ca and cn missing, and setae cc arising well in front of the sensory setae.

\textsuperscript{1} Journal Paper No. 307 of the College Experiment Station of the University of Georgia College of Agriculture Experiment Station.
Fig. 1. *Ereynetoides scutulis*, n. sp. Female: A, dorsal view; B, ventral view; C, ereynetal organ of tibia I. Male: D, genital area.
Female: Yellowish-white in life. Idiosoma of holotype 320µ long, 190µ at greatest width. Dorsal surface. Cuticle finely striated, striae punctated; striations less distinct but punctuations more pronounced above shield. Subcutaneous shield measures 190µ long, 110µ wide having the general shape of the idiosoma; heavier pattern of the shield as figured. One pair of lens-like eyes anterolateral of shield margin. Dorsal setae barbed, of varying lengths, setae ce 20µ long; setae ca absent, small porelike structure anterolateral of sensilla which may be remnant of ca setal base; setae cc well in front of sensory setae; setae cn missing. Chaetotaxy of dorsum, not including sensory setae, as follows: 4-4-2-2-4. Sensillae more sparsely barbed than body setae; anterior and posterior sensillae about 80µ long. Ventral surface. Ventral setae similar to dorsal, but shorter. Chaetotaxy of coxae as follows: I-3; II-1; III-3; IV-2. One pair of median setae behind coxae II, one pair between coxae IV. Five pairs of setae adjacent to genital opening, position of other ventral body setae as figured. Genital suckers greatly reduced, if present. (The only indication of genital suckers observed were small circles near the third and fourth pairs of genital setae.)

Legs. With some subcutaneous sclerotization; chaetotaxy of segments beyond coxae given in Table 1; tarsus I with sensory pitlike structure on dorsal surface; tibia I with ereyntial organ, bulbous portion asymmetrical in shape (Fig. 1C); leg IV 7 segmented-genun divided—other legs 6 segmented. Gnathosoma. 70µ long, 43µ at widest point behind free palpal segments; one pair of barbed setae in position figured. Palps extend well beyond chelicerae; palpal segments relatively slender. Chelicerae 70µ long, basal segment strongly enlarged.

Male: Very similar to female, distinguished from female by genital area (Fig. 1D). Idiosoma 320µ long, 190µ wide, shape as in female. Propodosomal shield of allotype 200µ long, 115µ wide, shape as in female. Dorsal setae as in female. Ventrum as in female except in genital area; three pairs of very small setae similar in size arising from within genital opening; anterior arms of genital structure curve laterally to form a T-shaped structure; genital suckers more distinct than in female; genital area as figured. Gnathosoma slightly smaller than in female. Leg chaetotaxy as in female (Table 1).

Nymph: Three tritonymphs and one deutonymph were collected with the adults. The chaetotaxy of the leg segments are given in Table 1. The leg chaetotaxy of the tritonymph agrees with that given by Fain and Nadchatram (1962) for E. malayi, but I found some differences for the deutonymph. Some structures were partially obscured on the deutonymph and additional specimens would be desirable to determine if these differences are consistent between the two species.

The type series consists of eight females and ten males. Holotype (female) data: Athens, Georgia; 17 Jan. 1962; from tunnel of Ips calligraphus; P. E. Hunter. Five female paratypes with same data; two paratypes from under bark of rotten lobolly pine. Athens, Georgia. 2 June 1961, R. Davis. Allotype data: Athens, Ga.; 11 May 1961; from Ips tunnel in pine log; R. Davis. Male paratypes with same data or with data as for females. All nymphs were taken from Ips beetle tunnels in conjunction with adults. The holotype, allotype, and two paratypes of each sex will be deposited in the U. S. National Museum, Washington, D. C. One paratype of each sex will be deposited with Dr. A. Fain, Institut de Médecine
TABLE 1. NUMBER OF SETAE PER SEGMENT FOR LEG SEGMENTS BEYOND COXA.

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Tropicale, Prince Léopold, Anvers, Belgium. The remaining paratypes will be retained in the Department of Entomology Collection, University of Georgia, Athens.

A series of eight females and three males were collected with the type series. This second series differs from the type specimens in having distinctly longer dorsal setae (up to two times as long as those of types and paratypes), idiosoma slightly smaller—285μ long, 170μ wide—and in having the body more pointed posteriorly. No other differences between the specimens of the two series were noted. Despite the conspicuous difference in
Fig. 2. *Ereynetoides amplectorus*, n. sp. Female: A, dorsal view; B, ventral view; C, lenslike eye with seta ca; D, ereynetal organ of tibia I. Male: E, genital area.
appearance in body shape and setal length it seemed questionable that the second series represented a separate species.

This species was rather common in some of the older Ips beetle tunnels, but attempts to rear the mite in the laboratory were unsuccessful. The mites were extremely fast moving and were usually seen running among the frass particles of the tunnels. On occasions this mite has been found on adult Ips beetles (Hunter and Davis, 1963).

*Ereynetoides amplexorus* new species

*Fig. 2*

This species has circular striations around the lenslike eyes, delicate dorsal setae, and setae cc slightly in front of the anterior sensory setae. The heavy pattern on the propodosomal shield consists of a curved posterior portion separated from the more elaborate anterior part.

**FEMALE**: Idiosoma of holotype 340µ long, 200µ wide at greatest width. 

*Dorsal surface*. Integument striated, striae punctated, more heavily punctated over propodosomal shield. Lenslike eyes surrounded by circular, non-punctated striations which in turn are surrounded by longitudinal punctated striae; posterior to eye several rows of punctations ending at circular striations (Fig. 2C). Dorsal body setae very slender, barbed, about 15µ long; setae cc arise slightly anterior to the sensory setae; chaetotaxy, excluding sensory setae, as follows: 2-4-4-2-2-2-4-2; sensory setae pilose, anterior and posterior setae approximately 70µ long. *Ventral surface*. Ventral body setae delicate, barbed, shorter than dorsal setae. Position of ventral setae as figured. Five pairs of genital setae; genital setae more strongly barbed than other ventral body setae. Coxae with setae as follows: I-3; II-1; III-3; IV-2; all coxal setae of about same length. Two pairs of genital suckers. 

**Legs**. Legs II and III of about same length, shorter than I and IV; chaetotaxy of segments beyond coxae given in Table 1; leg setae similar to dorsal body setae, except seta on trochanter II more pointed and tarsi of all legs have some heavy, clublike setae. Ereynetid organ of tibia I with symmetrically shaped bulbous portion (Fig. 2D). 

**Gnathosoma**. About as long as wide, 50µ long, 50µ at widest point behind free palpal segments; two pairs of barbed setae on ventral surface. Palpal segment with longitudinal ringlike subcutaneous markings on lateral surface similar to that found on legs. Chelicerae 52µ long, basal segment moderately heavy.

**MALE**: Smaller than female, allotype 240µ long, 160µ wide; chaetotaxy of legs as in female; type and position of body setae as in female except in genital area; genital area (Fig. 2E) with extra setae in area of genital opening as follows: one larger anterior pair and a smaller, weakly barbed posterior pair; two ringlike structures between these setae. (These ringlike structures are in the normal position of the second pair of setae and very likely are the setal bases; however, no setae were seen in the single male specimen available.) The anterior arms of the genital structure extend at right angles to the midline to produce a T-shaped arrangement. Two internal hornlike structures extend from the posterior part of the genital area, and an internal aedeaguslike structure was seen on one side of the genital area. Two pairs of small genital suckers present.

This description was based on a series of 14 females and 1 male. All specimens with the following data: on celery; American Fork, Utah; 19
Fig. 3. *Ereynetoides faini*, n. sp. Female: A, dorsal view; B, ventral view; C, ereynetial organ of tibia I. Male: D, genital area.
Sept. 1949; B. F. Knowlton. Holotype (female), six paratypes, and allotype in the U. S. National Museum, Washington, D. C. Two female paratypes deposited with Dr. A. Fain, Institut de Mèdecine Tropicale, Prince Léopold, Anvers, Belgium; remaining paratypes in Department of Entomology Collection, University of Georgia, Athens.

*Eroyneotidae faini* new species

Fig. 3

In this species setae cc are positioned slightly behind the sensory setae, the dorsal setae are thickly barbed compared to other species, and the propodosomal shield margin is indistinct anterior to setae ca. The shield pattern is distinct for the species.

**Female:** Idiosoma of holotype 380μ long, 230μ at greatest width. *Dorsal surface.* Integument finely striated, striae punctated; striations less conspicuous and punctations more pronounced over shield; striations absent around base of sensory setae. Propodosomal shield with distinct posterior margin, anterior margin indistinct; pattern as figured. One pair of small lenslike eyes located anterolaterally of first pair of body setae. Dorsal body setae thickly barbed; ca short, other setae of approximately the same length, about 25μ long, cb slightly shorter; anterior sensory setae 11μ long; posterior pair 10μ long; setae cc arise slightly behind base of anterior sensory setae; dorsal chaetotaxy, excluding sensory setae, as follows: 2-4-4-2-2-4-2; relative positions of setae as figured. *Ventral surface.* Ventral body setae similar in structure to dorsal setae, but shorter; coxal setae slightly longer than ventral body setae except for last two pairs of body setae; chaetotaxy of coxae as follows; I-3; II-1; III-3; IV-2; lateral setae of coxae III longer than other coxal setae; coxae with some internal sclerotization as figured. One pair of body setae slightly behind and between coxae II and one pair between coxae IV; position of other ventral setae as figured; five pairs of setae associated with genital opening, these setae of same type but shorter than ventral body setae; two pairs of genital suckers. *Legs.* Legs rather heavy; legs I longest, other legs of about same length; chaetotaxy of segments beyond coxae given in Table 1; bulbus ereynetal organ of tibia I as figured; tube of ereynetal organ curves around area of ota base (Fig. 3C). *Gnathosoma.* Meacurcs 105μ long, 65μ at widest point behind free segments of palps; two pairs of barbed setae arising from ventral surface. Chelicerae 80μ long, basal segment heavy. Palps five segmented, no special modification of palpal segments noted.

**Male:** Allotype 340μ long, 210μ wide; body shape and setal pattern on body and legs as in female. Genital area as figured (Fig. 3D); three pairs of small setae in area of genital opening, anterior pair largest, posterior pair smallest and with more and finer barbs; anterior arms of genital structure point anterolaterally to form a Y-shaped structure; genital suckers large and appear stalked. Gnathosoma 75μ long, 60μ wide behind free palpal segments. Chelicerae 70μ long.

**Nymph:** A single tritonymph was included in the material studied. The leg chaetotaxy was the same as that found for the tritonymph of *E. scutul. This was the only nymphal stage found.

This species was described from a series of 9 males and over 20 females in the collection of the U. S. National Museum. All were collected by F.
Bonet. Holotype (female) data: Teoman, Colima, Mexico, 19 Jan. 1943. Allotype with same data as holotype. Some paratypes with same data as types, others with following data: leaf mold, El Vergel, Chiapas, Mexico, 5 Jan. 1940; leaf mold, Apatzungen, Michoacan, Mexico, 21 April 1943; soil, El Vergel, Chiapas, Mexico, 13 July 1941; and leaves, Mexico, 13 July 1941.

The USNM collection contained one slide with three specimens taken at Boston, Mass., collected from beet root from Denmark and a slide with one specimen, also taken at Boston, off lily bulbs from England. These mites appear to be *E. faini* and are tentatively labelled as such; however, the specimens were not in good shape, and a series of well mounted specimens may show this determination to be in error.

*Ereynetoides faini* is very similar to *Ereynetes hydrophilus* Coor., but the lenslike eyes are missing in *hydrophilus* (see Fain and Nadchatram 1962).

*Ereynetes* Berlese, 1883.

This genus is characterized by the absence of lenslike or pigmented eyes and by having a five segmented palps and a propodosomal shield. On the basis of the present classification a re-examination of type material of *Ereynetes* species would seem desirable as some of the mites placed in this genus, for example *E. bipilosus* Willmann, may possess lenslike eyes and, if so, would belong in *Ereynetoides*.

*Ereynetes beauchampi* new species

Fig. 4

This unusual species, known only from the female, is distinct in having a very simplified pattern on the propodosomal shield, dorsal setae cc in line with ca, and in possessing only two setae on coxae I and III.

**FEMALE:** Idiosoma 330μ long, 190μ at greatest width. *Dorsal surface.* Lenslike eyes absent; integument faintly striated, striae weakly punctate over propodosomal shield, otherwise striae nonpunctate. Dorsal setae delicate, barbed; setae cc 18μ long, relative lengths of other setae as figured; setae cc in line with ca; dorsal chaetotaxy, exclusive of sensory setae, as follows: 4-2-4-2-2-4-2. Anterior and posterior sensory setae approximately 80μ long. Propodosomal shield outline as figured; shield 50μ long; pattern on shield consists of a median inverted Y and a bar running obliquely to the stem of the Y on each side behind the sensillae. This pattern is distinct among the species of the genus. *Ventral surface.* Ventral body setae delicate, shorter than dorsal setae. Coxae with setae as follows: I-2; II-1; III-2; IV-1. One pair median setae between anterior margins of coxae III, one pair between coxae IV; five pairs of short, thicker setae associated with genital opening; two pairs of small genital suckers. *Legs.* Leg setae similar to dorsal body setae except on the tarsi and on trochanter II; tarsi, especially I and II, with ventral spatulate, barbed setae; tarsus I with long, thickened dorsal and lateral setae; trochanter II with a shorter more pointed seta compared to other leg setae. Chaetotaxy of leg segments beyond coxae given in Table 1. Ereynetetal organ of tibia I with a distinct funnel-like structure on proximal end (Fig. 4C). *Gnathosoma.* 80μ long, 55μ wide behind first free segment of palps; one pair of delicate, barbed
setae at level of anterior margin of palpal trochanter, two pairs of short simple setae on anterior margin. Palps slender, distal end of femur extends slightly beyond ventral end of gnathosoma; palpal segments more or less cylindrical. Chelicerae 100μ long; terminal segment long, needlelike.

This species was described from a single female in the collection of the U. S. National Museum. Habitat data as follows: on ginger root, from China at Boston, Massachusetts; J. T. Beauchamp; 16 June 1933. Holotype slide in USNM.

Fig. 4. *Ereynetes beukampi*, n. sp. Female: A, dorsal view; B, ventral view; C, ereyntal organ of tibia I.

*Ereynetes davisi* new species

Fig. 5

This small *Ereynetes* can be recognized by the four setae arising from above the propodosomal shield, setae cc in line with the sensory setae, and tibia I with a duplex setae on the dorsal surface.

**Female:** Idiosoma of holotype 230μ long, 150μ at greatest width. **Dorsal surface.** Integument finely striated, striae with punctations; puncta-
Fig. 5. *Ereynetes davisi*, n. sp. Female: A, dorsal view; B, ventral view; C, tibia I showing duplex setae and erynetal organ.

Sections more distinct over the posterior area of propodosomal shield. Margins of propodosomal shield distinct posterior to sensillae, indistinct anterior to sensillae; pattern of shield anterior to sensillae consisting of three long, rodlike extensions, outer two curving slightly toward the middle, middle rod not as thick as outer ones and appears to be somewhat deeper and of slightly different texture; the rods connect to the more elaborate pattern of the shield behind the sensory setae. Dorsal setae barbed, rather thick, those on middle of dorum measure 18μ long; setae ca small, short; two pairs of setae—cc and ce—arise from above the propodosomal shield; setae cc in line with sensory setae; chaetotaxy of dorum, not including sensory setae, as follows: 2-4-4-2-2-2-4-2; second and third rows with median setae forward of lateral setae so that rows arch forward, setae cg not in a longitudinal line with setae ce and ch; anterior sensilla 60μ long, posterior ones 50μ. Ventral surface. Ventral body setae similar to dorsal setae, shorter; chaetotaxy of coxae as follows: I-3; II-1; III-3; IV-2; other ventral setae as shown; five pairs of genital setae associated with genital opening; two pairs of distinct genital suckers. Legs. Relatively thick; setae similar to body setae except for trochanter II which has small, slender pointed seta, and tarsi which have some heavier clublike setae; chaetotaxy of segments beyond coxae given in Table 1; tarsi show a reduction in the number of setae compared to other species. Tibia I with a duplex setae arising from dorsal surface in conjunction with ereyne-
tal organ (Fig. 5C), both setae of duplex setae barbed, one slightly shorter and more sparsely barbed than other. Ereynetal organ with a tubelike part which narrows abruptly at about half its length and is enclosed within, but does not extend beyond, the bulbous portion; tube from bulbous portion curves around base of duplex setae. Gnathosoma. 52µ long, 50µ at widest point behind free segments of palps; one pair of barbed setae on ventral surface; palps extend slightly beyond chelicerae; palpal femur enlarged; chelicerae 60µ long, basal segment heavy.

Male unknown.

Holotype with following data: Under bark, cottonwood; Gadsden, Arizona; 28 March 1945; Anderson. One paratype with same data on same slide as type (type on left, paratype designated as specimen on right side of slide). Second paratype on separate slide with following data: with rotted muguey flower stalk; Douglas, Arizona; 17 Nov. 1956; J. H. Russell. All specimens in USNM, Washington, D. C.

This species is similar to E. berlesei Oudem. in having the palpal femur enlarged and having four setae arising from above the shield. The illustration of berlesei by Sig Thor (1933) shows only one pair of setae above the shield but the text states that a second pair arises from the posterior corners of the shield area. The species described here differs from berlesei in being smaller, by the pattern of the propodosomal shield, and by having setae cc arising from between the sensory setae rather than behind as in berlesei.

Benoinyssus tuberculatus (Baker) new combination


The genus Benoinyssus was erected by Fain (1958) as the type genus of a new subfamily of Eupodidae. Benoinyssus is distinct as a eupodid in having posterior as well as anterior sensory setae. This genus appears to be somewhat intermediate in many respects between the Eupodidae and Ereynetidae, and the main eupodid and ereynetid characteristics of Benoinyssus were listed by Fain (1958).

Included in the ereynetid slides from the U. S. National Museum were specimens of Opsereyinetes tuberculatus. The presence of a dorsal anterior median lobe bearing one pair of setae, the enlargement of femur IV, and the more median position of the posterior sensory setae indicated that tuberculatus should be placed in the genus Benoinyssus.

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