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- 1894b. Notes on some species of North American Orthoptera, with descriptions of new species. Bull. Amer. Mus. Nat. Hist. 6(11): 249-52.
- Blatchley, W. S. 1920. Orthoptera of Northeastern America. Indianapolis: Nature Publishing Co. 784 pp.
- Cantrall, I. J. 1943. The ecology of the Orthoptera and Dermaptera of the George Reserve, Michigan. Univ. Michigan Mus. Zool. Misc. Publ. 54: 1-182.
- De Geer, C. 1773. Mémoires pour servir à l'histoire des insectes. Tome III. 696 pp. Stockholm.
- Fernald, M. L. 1950. Gray's Manual of Botany. 8th edn. New York: American Book Co. 1632 pp.
- Fitch, A. 1856. Third report on the noxious and other insects of the State of New York. Trans. New York State Agric. Soc. 16: 321-507.
- Folsom, J. W. 1909. The insect pests of clover and alfalfa. Univ. Illinois Agric. Expt. Sta. Bull. 134: 111-97.
- Fulton, B. B. 1915. The tree crickets of New York: Life history and bionomics. New York Agric. Expt. Sta. Tech. Bull. 42: 1-47.
- 1926a. Geographical variation in the *nigricornis* group of *Oecanthus* (Orthoptera). Iowa State College Jour. Sci. 1(1): 43-61.
- 1926b. The tree crickets of Oregon. Oregon Agric. Expt. Sta. Bull. 223: 1-20.
1951. The seasonal succession of orthopteran stridulation near Raleigh, North Carolina. Jour. Elisha Mitchell Sci. Soc. 67(1): 87-95.
- Hebard, M. 1928. The Orthoptera of Montana. Proc. Acad. Nat. Sci. Philadelphia 80: 211-306.
1938. Where and when to find the Orthoptera of Pennsylvania, with notes on the species which in distribution reach nearest this State. Oecanthinae. Entomol. News 49: 101-2.
- Houghton, C. O. 1909. Notes on *Oecanthus*. Canadian Entomol. 41(4): 113-5.
- Morse, A. P. 1920. Manual of the Orthoptera of New England, including the locusts, grasshoppers, crickets, and their allies. Proc. Boston Soc. Nat. Hist. 35(6): 197-556.
- Procter, W. 1946. Biological Survey of the Mount Desert Region. Part. VII. The Insect Fauna. Philadelphia: Wistar Institute of Anatomy and Biology. 566 pp.
- Saussure, H. de. 1874. Recherches zoologiques pour servir à l'histoire de la faune de l'Amérique Centrale et du Mexique. 6<sup>me</sup> partie. Études sur les Orthoptères, 3<sup>me</sup> livr.: 293-516. Paris: Imprimerie Impériale.
1897. Oecanthinae. In: Biologia Centrali-Americana. Insecta. Orthoptera 1: 251-5.
- Scudder, S. H. 1862. Materials for a monograph of the North American Orthoptera, including a catalogue of the known New England species. Jour. Boston Soc. Nat. Hist. 7: 409-80.
- Thomas, E. S., and R. D. Alexander. 1957. *Nemobius melodius*, a new species of cricket from Ohio (Orthoptera: Gryllidae). Ohio Jour. Sci. 57(3): 148-52.
- Titus, E. S. G. 1903. A new *Oecanthus* from Illinois. Canadian Entomol. 35(9): 260-1.
- Transeau, E. N. 1935. The prairie peninsula. Ecology 16(3): 423-37.
- Walker, E. M. 1910. The Orthoptera of western Canada. Canadian Entomol. 42: 269-76, 293-300, 333-40, 350-6.
- Walker, F. 1869. Catalogue of the Specimens of Dermaptera Saltatoria and Supplement to the Blattariae in the Collection of the British Museum. London: British Museum. 224 pp.
- Walker, T. J. 1957. Specificity in the response of female tree crickets (Orthoptera, Gryllidae, Oecanthinae) to calling songs of the males. Ann. Entomol. Soc. Amer. 50(6): 626-36.
- 1962a. The taxonomy and calling songs of United States tree crickets (Orthoptera: Gryllidae: Oecanthinae). I. The genus *Neoxabea* and the *niveus* and *varicornis* groups of the genus *Oecanthus*. Ann. Entomol. Soc. Amer. 55(3): 303-22.
- 1962b. Factors responsible for intraspecific variation in the calling songs of crickets. Evolution 16(4): 407-28.

## A New Species of *Pteronyssus* from Woodpeckers in Texas (Acarina: Analgesoidea: Pterolichidae)<sup>1</sup>

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### ABSTRACT

*Pteronyssus centurus* is described from the golden-fronted woodpecker, *Centurus aurifrons*, and the ladder-backed woodpecker, *Dendrocopos scalaris*. It is closely related to *P. glossifer* Gaud but has a differently shaped propodosomal shield in both sexes, and the hysterosomal

plate of the female is composed of two sections rather than three as in *P. glossifer*. The three lots of material on which the description is based were collected in Kleberg and Hidalgo Counties in South Texas, and in Palo Pinto County in the north-central part of the State.

The genus *Pteronyssus* was erected by Robin (1868) to contain *Acarus gracilis* Nitzsch. Trouesart and Megnin (1884) considered *Pteronyssus* intermediate between *Pterolichus* and *Analges*. In the family Pterolichidae they recognized three subfamilies (Pterolichinae, Proctophyllodinae, and Analgesinae) and included *Pteronyssus* in the last mentioned. Oudemans (1908) and Vitzthum (1929)

referred to *Pteronyssus* as belonging to Avenzoariidae Oudemans, and allied to such genera as *Avenzoaria*, *Rivoltasia*, *Protalges*, *Ingrassia*, and *Mesalges* which are, by recent classification, a very heterogeneous lot. The genera *Ingrassia*, *Protalges*, and *Mesalges* are considered belonging to the Analgesidae; *Rivoltasia*, to Epidermoptidae; and *Avenzoaria*, to Pterolichidae. Hull (1934) classed *Pteronyssus* under the group Heteropodina which included such genera as *Analges*, *Protalges*, and *Megninia*. The last mentioned three genera are currently placed in Analgesidae. Therefore, Hull's classification would indicate that *Pteronyssus* also belonged to the family

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Analgesidae. Radford (1950) placed *Pteronyssus* in the family Pterolichidae along with *Avenzoaria*. Baker and Wharton (1952) considered the family Pterolichidae Trouessart a synonym of Dermoglyphidae Megnin and Trouessart, and placed *Pteronyssus* in this family, which also included the genus *Avenzoaria*. Dubinin (1953) treated all feather mites as belonging to the superfamily Analgesoidea and placed *Pteronyssus* in the family Analgesidae under a new subfamily, Pteronyssinae. Gaud and Mouchet (1959), in a treatment of the feather mites of the birds of Cameroons, Africa, placed *Pteronyssus* in Pterolichidae. A study of the morphology of *Pteronyssus* tends to relate it to Pterolichidae, especially when studied along with *Avenzoaria*, *Pteronyssoides* and *Pterolichus*. However, it must be pointed out that the subfamily classification proposed by Gaud and Mouchet (1959) cannot be applied to the male of the new species found in Texas. This is due to the structure of the ambulacras, which are utilized to distinguish the two subfamilies Avenzoriinae and Pterolichinae. In the Avenzoriinae the ambulacras are terminated by a fine point, whereas in the Pterolichinae they are rounded. *Pteronyssus* has been placed in the subfamily Avenzoriinae but it will be seen that the male specimen (taken from a wood-

pecker) herein described as new has the ambulacras rounded as in the subfamily Pterolichinae, while the ambulacras on all legs of the female are pointed.

*Pteronyssus centurus*, new species

*Male*.—Body oval, without a line separating the propodosomal and hysterosomal regions (Fig. 1). Legs arising from margin of body, with reduced propodosomal shield and well-developed hysterosomal shield separated by striated middle section of propodosomal region. Propodosomal region anterior to external scapular setae and internal scapular setae bearing only the reduced propodosomal shield and a pair of pseudostigmatic organs, the latter being well developed and plainly visible in prepared mounts of male and female. Propodosomal shield beset with small raised areas that appear as punctures; shield more heavily sclerotized in midregion, becoming lighter near edges. Small, hairlike, single vertical setae at anterior margin of shield. External scapular setae large, extending beyond body margin; internal scapular setae minute microseta placed adjacent to and posterior to large external scapular setae. These not located on propodosomal shield but found between the lateral propodosomal shields and propodosomal shield within a clearly marked striated area. Lateral propodosomal shields below legs II, extend-

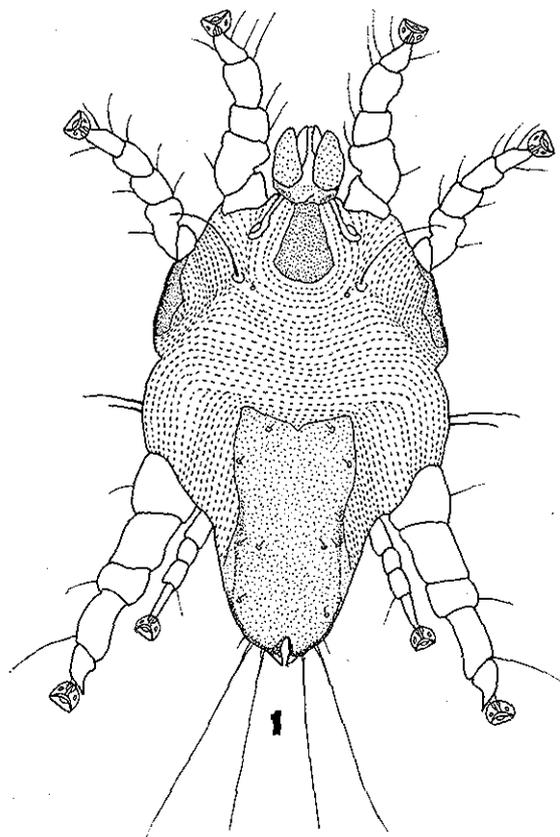


FIG. 1.—*Pteronyssus centurus*, n. sp. Dorsal view of male holotype, showing propodosomal and hysterosomal plates.

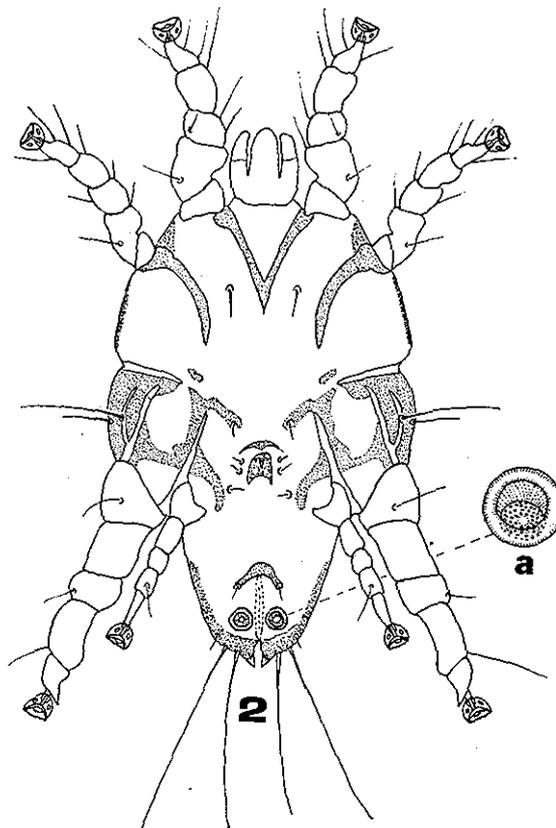


FIG. 2.—*Pteronyssus centurus*, n. sp. Ventral view of male holotype. a, Copulatory sucker, enlarged.

ing to midsection of dorsum. One pair of lateral setae anterior to legs III on margin of body, similar in structure to external scapular setae. Hysterosomal shield beset with 10 microsetae, 8 placed singly near margin of shield, 2 placed internal to single marginal pair that are adjacent to legs IV. Shield with small raised areas similar to those on propodosomal shield.

Apodemes of legs I joined ventrally to form "V"; pair of small setae between apodemes of legs II and fused portion of legs I (Fig. 2). One pair of lateral setae inserted on sclerotized portion of apodemes of legs III. Pair of small setae between apodemes of legs III and IV, anterior to genitalia. Another pair posterior to genitalia, adjacent to apodemes of legs IV. Genitalia between apodemes of legs III and IV, anterior to coxae of legs III and IV. Two pairs genital setae below crescent-shaped sclerotized genital arch, just anterior to sclerotized portion of genitalia containing male aedeagus. Anus elongate slitlike with sclerotized arch at anterior end. This arch bears a pair of anal setae. Anal suckers behind anal arch. Posterior portion of hysterosomal region heavily sclerotized, beset with two pairs of long external sacral setae. Pair of small microseta at rounded portion of indentation of hysterosomal region. Pair

of hairlike setae anterior to paired external sacra. Posterior end with membranouslike projections arising from dorsum. Each leg bearing truncate caruncles with five distinct segments. Legs III hypertrophied. Legs IV smaller than others.

*Female*.—Larger than male, with reduced propodosomal shield beset with small raised areas. Hysterosomal shield separated into two sclerotized sections at extreme posterior of hysterosomal region. Entire dorsal portion of female devoid of setae except single vertical seta on propodosomal shield and two pairs of scapular setae; these of same type and structure as described for male. Dorsum striated (Fig. 3). Two well-developed lateral shields below legs II.

Apodemes of legs I joined ventrally as described for male, pair of small setae between apodemes of legs II and fusion of apodemes of legs I (Fig. 4). Lateral plates well developed, below coxae of legs II, separating propodosomal region from hysterosomal region, anterior portion heavily sclerotized, beset with pair of lateral setae of same structure and type as found on male. Pair of setae just below this lateral plate and adjacent to genital arch. Genital arch well developed. Two pair of genital setae be-

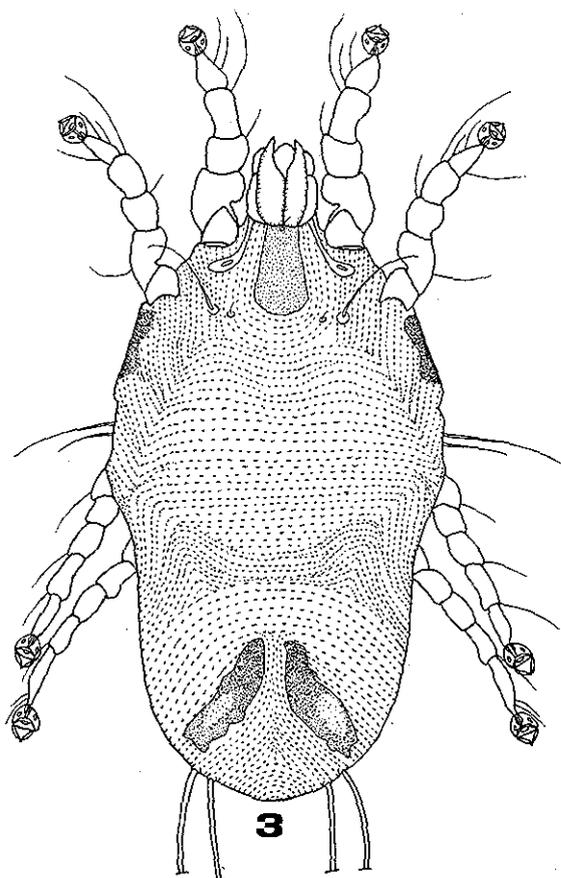


FIG. 3.—*Pteronyssus centurus*, n. sp. Dorsal view of female, showing propodosomal and hysterosomal plates.

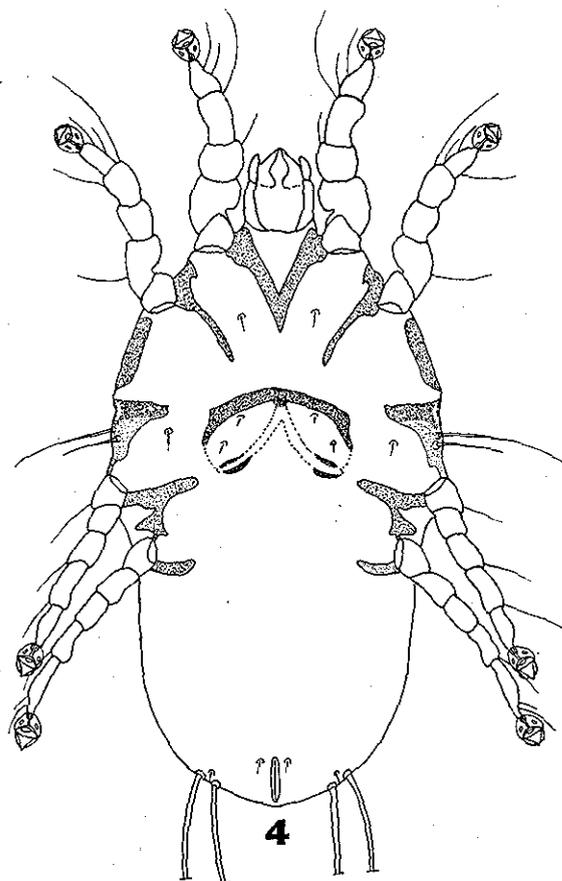


FIG. 4.—*Pteronyssus centurus*, n. sp. Ventral view of female.

low genital arch, bounded by extensions of arch. Genitalia inverted "V", more heavily sclerotized near posterior end. Anus a long slit, with anal seta on each side of anterior end; pair of seta similar in shape to anal setae between two large sacral setae. All legs bearing caruncles of type characteristic of subfamily Avenzoriinae of Gaud and Mouchet.

The material upon which this description is based consists of specimens taken from *Centurus aurifrons*, golden-fronted woodpecker, and *Dendrocopos scalaris*, ladder-backed woodpecker. The latter is commonly referred to by natives of south-central Texas as the "Mexican woodpecker." The specimens consist of three lots. The first lot was collected by M. A. Price, Lajoya, Hidalgo County, Texas, March 6, 1961, from *Centurus aurifrons*. The second lot was collected by Burruss and Shirley McDaniel, Palo Pinto County, Texas, Farm to Market Road 113, 2 miles west of Millsap, December 24, 1961, from *Dendrocopos scalaris*. The third lot was collected by Burruss McDaniel, Kleberg County, Texas, Farm to Market Road 1118, 13 miles south of Kingsville, December 30, 1961, from *Centurus aurifrons*. Additional material for this lot was obtained from Kleberg County, Texas, Highway 77, 1 mile south of Kingsville, December 30, 1961, from *Dendrocopos scalaris*.

The holotype male and allotype female, collected by M. A. Price, Lajoya, Hidalgo County, Texas, March 6, 1961, from *C. aurifrons*, are deposited in the United States National Museum, Washington, D. C. Paratypes have also been deposited at the Laboratoire d'Acarologie, LaVarenne (Seine),

France; the Agricultural and Mechanical College of Texas, College Station, Texas; and the Texas College of Arts and Industries, Kingsville, Texas.

*Pteronyssus centurus*, n. sp., is similar in structure to *Pteronyssus glossifer* Gaud, (Gaud 1953), from which it may be separated by the shape of the propodosomal shield in both male and female and by the hysterosomal plate of the female having two sections rather than three.

#### REFERENCES CITED

- Baker, E., and G. Wharton. 1952. An Introduction to Acarology. New York: The Macmillan Company. 465 pp.
- Dubin, V. B. 1953. Arachnida. Fauna S.S.S.R., Paukoobraznye t., Part 6: 1-411. (Insert showing classification of the feather mites.)
- Gaud, J. 1953. Sarcoptides plumicoles d'oiseaux d'Afrique. Ann. Parasitol. Humaine et Comp. 28: 193-226.
- Gaud, J., and J. Mouchet. 1959. Acariens plumicoles (Analgesoidea) des oiseaux du Cameroun. Ann. Parasitol. Humaine et Comp. 34: 493-545.
- Hull, J. 1934. Concerning British Analgesidae (Feather-Mites). Trans. North Nat. Union 1(3): 200-6.
- Oudemans, A. 1908. Acarologische Aanteekeningen, 27. Entomol. Ber. 11(48): 331-2.
- Radford, C. D. 1950. Systematic Check-List of Mite Genera and Type Species. Paris: Internatl. Union Biol. Sci. 232 pp.
- Robin, C. 1868. Mémoire sur les Sarcoptides avicoles et sur les métamorphoses des Acariens. Compt. Rend. Acad. Sci. 66: 776-86.
- Trouessart, E., and P. Megnin. 1884. Sur la classification des Sarcoptides plumicoles. Compt. Rend. Acad. Sci. 98: 155-7.
- Vitzthum, H. 1929. Milben, Acari. Die Tierwelt Mitteleuropas 111 (3). 122 pp.

### A Recessive Albinism in the Citrus Red Mite<sup>1</sup>

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#### ABSTRACT

A strain of citrus red mites, *Panonychus citri* (McGregor), lacking the normal red color was isolated from albino mites that occasionally appeared in the laboratory colonies. The albinism was due to a single Mendelian recessive. The dominant for red color did not begin to express itself until after the egg had hatched. Albinism did not affect mortality. The sex ratio of progeny from

crosses of heterozygous females and albino males fell within the limits found in normal red cultures. Paper chromatograph analysis of the pigments of the mites showed orange and red pigments in the homozygous and heterozygous red but not in the homozygous albino. All three genotypes contained the same green and yellow pigments.

The citrus red mite, *Panonychus citri* (McGregor), is one of the most important pests on citrus. Nearly all the mites are distinctly red, but an occasional albino has been observed in laboratory cultures. Breeding experiments were initiated to isolate pure strains of albino mites and to clarify the nature of the albinism. In this paper the mode of inheritance of the albinism, as well as the pigment differences between red and albino mites and the course of pigment development, is discussed.

Basic genetic work with the Acarina has been limited. Watson (1956) showed a multiple-gene complex to be responsible for parathion resistance in the two-spotted spider mite, *Tetranychus telarius* (L.). Taylor and Smith (1956) reported that malathion resistance in *T. telarius* was due to a single dominant allele. Hussey and Parr (1958) showed that coloration in *T. telarius* (*T. urticae* Koch) was under two nonallelic genes, with one producing quantitatively more color than the other. The coloration was derived from four dominant genes which produce a red color and four recessive genes which produce a green color. Intermediate colors ranged

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