

# AN ANNOTATED CHECKLIST OF THE CHIGGERS (ACARI: LEEUWENHOEKIIDAE AND TROMBICULIDAE) OF THE PHILIPPINES

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## ABSTRACT

The chigger (Acari: *Leeuwenhoekiidae* and *Trombiculidae*) fauna of the Philippines is currently considered to consist of 29 genera, 10 subgenera, 82 species and 2 subspecies. Recorded hosts are birds (cited to class), lizards (cited to class) and mammals (cited to orders). Information on the taxonomy, distribution and hosts is summarized, notes are included where appropriate, and a bibliography is provided.

Key words: Acari, chiggers, ectoparasites, Philippines.

## INTRODUCTION

The Philippine Islands support mammal fauna (Heaney et al., 1987), bird fauna (duPont, 1971) and lizard fauna (Taylor, 1922) (Brown & Alcala, 1978 & 1980) that is rich in both diversity and in number of endemics. Ewing (1931) reported *Trombicula piercei* as an ectoparasite of bats in Negros Occidental and since that time sporadic reports of other ectoparasitic chiggers have occurred. Phillip and Woodward (1946) listed the known genera and species that had been reported or were found in conjunction with scrub typhus studies at the conclusion of world war two. Wharton and Fuller (1952) provided a checklist of Philippine chiggers with fourteen species in five genera listed and Corpuz-Raros (1993) included chiggers in her checklist of mites and ticks infesting vertebrates and associated with their nests. New species not included in the above publications have been described, and creation or revisions of various genera has resulted in realignment of the taxonomic status of others. In the 1960s workers for the Bishop Museum, Honolulu and The Silliman University made chigger collections on several islands and in the 1980s the University of Michigan Museum of Zoology collected ectoparasites in conjunction with a survey of small mammals of the archipelago. Descriptions are scattered in various journals and since several species reported are involved in human pathology, notably members of the *Leptotrombidium* with scrub typhus and the *Blankaartia*, *Eutrombicula*, and *Schoengastia* with scrub itch (Vercammen-Grandjean, 1976) there is a need for a new consolidated summary of Philippine chiggers which this paper is intended to fill.

## ACARI: LEEUWENHOEKIIDAE AND TROMBICULIDAE

The terrestrial mammalian fauna of the Philippine Islands has traditionally been divided into four major regions: the Luzon Faunal Region (LFR), Mindanao Faunal Region (MFR), Negros/Panay Faunal Region (N/PFR), and the Palawan Faunal Region (PFR), along with mention

of a distinctness of Mindoro Island (MI) (Heaney, 1986). These regions will be cited, along with specific islands, in the distribution sections of terrestrial mammalian fauna that follow. For uniformity volent mammal, bird and lizard distribution will also be cited in this manner.

Current enumeration indicates that there are 82 species and 2 subspecies of chiggers in 29 genera and 10 subgenera in the two families of *Leeuwenhoekiiidae* and *Trombiculidae* occurring or having been reported from the Philippines.

Note. Two subfamilies are recognized in the *Leeuwenhoekiiidae*: *Apoloniinae* and *Leeuwenhoekiiinae* (Kranz, 1978). Only the *Leeuwenhoekiiinae* are represented in the Philippine fauna.

### LEEUVENHOEKIIDAE

Subfamily: *Leeuwenhoekiiinae* Womersley, 1944: 102.

Genus *Acomatacarus* Ewing, 1942: 490.

*Ac. keegani* Radford, 1953: 242.

Dist. MFR: Samar Is. Hosts. Aves.

Genus *Odontacarus* Ewing, 1929: 28.

*Od. dracophilis* Brown & Goff, 1988a: 214.

Dist. MFR: Leyte Is. Hosts. Sauria.

*Od. mahaplagensis* Brown & Goff, 1988a: 217.

Dist. MFR: Leyte Is. Hosts. Aves, Sauria.

Genus *Whartonia* Ewing, 1944a: 102.

*Wha. maai* Nadchatram & Wilson, 1965: 19.

Dist. MFR: Leyte and Mindanao Islands. Hosts. Chiroptera.

### TROMBICULIDAE

Genus *Ascoschoengastia* Ewing, 1946: 71.

*Asc. indica* (Hirst, 1915: 187).

Dist LFR. Luzon Is. Hosts. Rodentia.

*Asc. krishnani* Nadchatram & Domrow, 1964: 30. New record for the Philippines Brown, 1991.

Dist. LFR: Luzon Is. MFR: Biliran, Cebu, Leyte and Mindanao Islands, N/PFR: Negros Island. PFR: Palawan Is.. Hosts. Chiroptera.

*Asc. rousetti* Goff, 1981: 70.

Dist. MFR: Mindanao Is. Hosts. Chiroptera.

*Asc. tafia* Nadchatram & Domrow, 1964: 34. New record for the Philippines Brown, 1991.

Dist. PFR: Palawan Is. Hosts. Hosts were not recorded, however, cartilaginous material reported present appeared to be rodent nasal septum.

Genus *Blankaartia* Oudemans, 1911: 23.

*Blk. acuscutellaris* (Walch 1923: 78).

Note. *Blk. acuscutellaris*, a scrub itch chigger, is principally an ectoparasite of marsh birds, although it has been reported elsewhere from marsh mammals. *Ixobrychus sinensis*, a marsh bird which has adapted well to rice paddy environments, was found to be the principle host, and it and *Blk. acuscutellaris* doubtlessly exists throughout the extensive rice growing regions of the archipelago.

Dist. MFR. Mindanao Is. Hosts. Aves.

Genus *Cheladonta* Lipovsky, Crossley & Loomis, 1955: 136.

Note. Lakshana (1969) expanded the genus *Cheladonta* Lipovsky et al., 1955 and reduced the genus *Susa* Audy and Nadchatram, 1960 to a subgenus within *Cheladonta*. Brown and Goff (1988) followed this arrangement in describing a new species *Che. (Susa) palawanensis*, and this arrangement is continued here.

Subgenus *Susa* Audy and Nadchatram: 1960: 154.

*Che. (Susa) masawanensis* Brown, 1998a: 107.

Dist. MFR: Leyte Is. N/PFR: Negros Is. Hosts. Chiroptera.

*Che. (Susa) palawanensis* Brown & Goff, 1988b: 117.

Dist. PFR: Palawan Is. Hosts. Extracted from three unrecorded hosts Chigger collections from these were pooled.

Genus *Chiroptella* Vercammen-Grandjean, 1960: 469.

Subgenus *Chiroptella* Vercammen-Grandjean, 1960: 469.

*Chir. (Chir.) insolli* (Philip & Traub 1950: 32).

Dist. LFR: Luzon Is. MFR: Bohol and Leyte Islands. N/PFR: Negros Is. Hosts. Chiroptera, Rodentia.

*Chir. (Chir.) piercei* (Ewing, 1931: 13).

Note. This taxon was the first chigger described and reported from the Philippines as *Trombicula piercei* from *Hipposideros* bats, Negros Occidental by Ewing (1931).

Dist. N/PFR. Negros Is. Hosts. Chiroptera.

Subgenus *Neosomia* Vercammen-Grandjean and Nadchatram, 1965: 317.

*Chir. (Nsm.) heidemani* Brown, 1997c: 150.

Dist. MFR: Leyte Is. Hosts. Chiroptera.

*Chir. (Nsm.) nudusetosa* Brown, 1998b: 80.  
Dist. MFR: Mindanao Is. Hosts. Chiroptera.

Genus *Diplectria* (Vercammen-Grandjean, 1967: 128).

*Dip. asiatica* Wen & Corpuz-Raros, 1997: 29.  
Dist. LFR Luzon Is. Hosts Chiroptera.

*Dip. calva* (Domrow, 1962: 40). New record for the Philippines Brown, 1988.  
Dist. N/PFR: Negros Is. Hosts. Chiroptera.

*Dip. majuyodensis* Brown, 1997c: 153.  
Dist. N/PFR: Negros Is. Hosts. Chiroptera.

Genus *Doloisia* Oudemans, 1910: 87.

*Dol. domrowi* (Audy & Nadchatram, 1957: 217). New record for the Philippines Brown, 1988.  
Dist. MFR: Leyte Is. PFR: Palawan Island. Hosts. Rodentia.

Genus *Eutrombicula* Ewing, 1938: 293.

Note. Members of this genus are etiologial agents for scrub itch in man. *Eut. scincoides* (Womersley, 1944: 84).

Note. This taxon was previously reported from skinks and lizards by Philip and Woodward (1946) as *Trombicula scincoides*, (*Neotrombicula*) of Womersley (1952), from Mindoro, Samar and Guiuan Islands. Under the current diagnoses of *Trombicula* and *Neotrombicula*, this taxon belongs in neither of these taxa. The genus *Eutrombicula* is under current review and this taxon is provisionally placed there.

Dist. MFR: Samar Is. MI: Mindoro Is. Hosts. Sauria.

*Eut. wichmanni* Oudemans, 1905: 217.

Dist. LFR: Luzon Is.. MFR: Camiguan, Cebu, Leyte, Mindanao Islands. N/PFR: Negros Is.. MI: Mindoro Is. Hosts. Aves, Rodentia, Sauria.

Genus *Gahrlipeia* Oudemans 1912: 273.

Subgenus *Ripiaspichia* Vercammen-Grandjean, 1968: 112.

*Gahr. (Rip.) biliranensis* nBrown, 1997a: 29.  
Dist. MFR: Biliran and Leyte Islands. Hosts. Rodentia.

*Gahr. (Rip.) parmulaseta* Brown, 1997a: 29.  
Dist. MFR: Biliran and Leyte Islands. Hosts. Rodentia.

*Gahr. (Rip.) serrata* Brown & Goff, 1988b: 117.  
Dist. MFR: Leyte Is. Hosts. Rodentia.

Subgenus: *Scrobiculata* Vercammen-Grandjean, 1968: 117.

*Garh. (Scr.) busanga* Brown, 1998a: 117.

Dist. PFR: Busanga Is. Hosts. Rodentia

Subgenus *Walchia* (Ewing, 1931: 11).

*Gahr. (Wa.) fulleri* (Vercammen-Grandjean, 1971: 7-8). New record for the Philippines Brown, 1988.

Dist. MFR: Cebu, Leyte, Maripipi and Mindanao Islands. PFR: Palawan Is. Hosts. Rodentia, Scandentia.

Genus *Guntheria* Womersley & Heaslip, 1943: 132.

*Gun. philippensis* (Philip and Woodward, 1946: 158).

Dist. LFR: Luzon Is. MI: Mindoro Is. Hosts. Rodentia.

Genus *Heaslipia* Ewing, 1944: 103.

*Hea. gateri* (Womersley and Heaslip, 1943: 101).

Dist. MI: Mindoro Is. Hosts. Rodentia.

Genus *Helenicula* Audy, 1954: 152.

*Hel. comata* (Womersley, 1952: 178).

Dist. LFR. Luzon Is. Hosts. Rodentia.

*Hel. globulare* (Walch, 1927: 591).

Dist. LFR. Luzon Is. Hosts. Rodentia.

*Hel. kohlsi* (Philip and Woodward, 1946: 159).

Dist. MI. Mindoro Is. Hosts. Rodentia.

*Hel. ungomari* Nadchatram & Traub, 1971: 566.

Dist. PFR: Balbac Is. Hosts. Artiadactyla.

*Hel. lanius* (Radford, 1946: 577).

Dist. Reported from unknown locality. Hosts. Rodentia.

Genus *Leptotrombidium* Nagaya, Miyagawa, Mitamura and Imamura, 1916: 392.

Subgenus *Leptotrombidium* Nagayo, Miyagawa, Mitamura and Imamura, 1916: 392.

Note. The second and third taxa of this subgenus are transmitters of scrub typhus. The transmission capability of the others is unknown.

*Lep. (Lep.) bodense* (Gunther, 1940: 479). Described in Vercammen-Grandjean and Langston 1976: 333.

Dist. LFR Luzon Is. Hosts. Rodentia

- Lep. (Lep.) deliense* (Walch, 1922: 554). Described in Vercammen-Grandjean and Langston 1976: 239.  
Dist. LFR: Luzon Is. MFR: Billiran, Bohol, Cebu, Leyte, Maripipi, Mindanao Islands. N/PFR: Negros Is. PFR: Palawan Is. MI: Mindoro Is. Hosts. Aves. Artiadactyla, Chiroptera, Insectivora, Rodentia, Scandentia. Sauria.
- Lep. (Lep.) fletcheri* Ewing, 1945: 64. Described in Vercammen-Grandjean and Langston 1976: 301.  
Dist. LFR: Luzon Is. MFR: Bohol, Cebu, Leyte, Mindanao Islands. N/PFR: Negros Is. PFR: Palawan Is. MI: Mindoro Is. Hosts. Rodentia. Sauria.
- Lep. (Lep.) imphalum philippinensis* Kolebinova, 1980: 69.  
Dist. MFR Mindanao Is. Hosts. Rodentia.
- Lep. (Lep.) keukenschrijveri* (Walch, 1924: 509). Described in Vercammen-Grandjean and Langston 1976: 333.  
Dist. Reported from unknown locality. Hosts. Aves.
- Lep. (Lep.) linjeromae linjeromae* Vercammen-Grandjean & Langston 1976, 312.  
Dist. PFR Palawan Is. Hosts. Unidentified.
- Lep. (Lep.) longimedian* Brown, 1992: 285.  
Dist. MFR: Mindanao Is. Hosts. Rodentia.
- Lep. (Lep.) macacaphilus* Brown, 1992: 284.  
Dist. MFR: Mindanao Is. Hosts. Primates.
- Lep. (Lep.) mindanensis* Brown, 1992: 286.  
Dist. MFR: Mindanao Is. Hosts. Rodentia.
- Lep. (Lep.) oculascutum* Brown, 1992: 287.  
Dist. MFR: Mindanao Is. Hosts. Rodentia.
- Lep. (Lep.) paulum* Vercammen-Grandjean & Langston, 1976: 368.  
Dist. N/PFR Negros Is. Hosts. Rodentia.
- Lep. (Lep.) sandfordi* Goff, 1981: 69.  
Dist. MFR: Mindanao Is. Hosts. Aves.
- Lep. (Lep.) spicapilum* Vercammen-Grandjean & Langston, 1976: 376.  
Dist. Reported from unknown locality. Hosts. Rodentia.
- Lep. (Lep.) subobscurum* Kolebinova, 1980: 70.  
Dist. MFR Mindanao Is. Hosts. Rodentia.

*Lep. (Lep.) sylvestre* (Audy & Traub, 1950). Described in Vercammen-Grandjean & Langston. 1976: 383.

Dist. Reported from unknown locality. Hosts. Aves.

*Lep. (Lep.) urogale* Brown, 1992: 287.

Dist. MFR: Mindanao Is. Hosts. Scandentia.

Subgenus *Trombiculindus* Radford, 1948: 126.

*Lep. (Trombus.) roseannleilaniae* Brown 1992: 288.

Dist. MFR: Mindanao Is. Hosts. Rodentia.

Genus *Microtrombicula* Ewing, 1950: 297.

Subgenus *Eltonella* Audy, 1956: 33

*Mtr. (Elt.) dasia* Brown, 1999: 2.

Dist. MFR. Camotes Is. Hosts. Sauria.

*Mtr. (Elt.) lepidodactylus* Brown, 1999: 3.

Dist. MFR. Guimayas Is. Hosts. Sauria.

Subgenus *Microtrombicula* Ewing, 1950: 297.

*Mtr. (Mtr.) megaderma* Brown, 1997c: 154.

Dist. MFR: Mindanao Is. Hosts. Chiroptera.

*Mtr. (Mtr.) octaintercoxalaea* Brown, 1997c: 154.

Dist. N/PFR: Negros Is. Hosts. Chiroptera.

Genus *Myotrombicula* Womersley & Heaslip, 1943: 99.

*Myotr. armigera* Brown, 1997c: 157.

Dist. N/PFR: Negros Is. Hosts. Chiroptera.

*Myotr. oconnori* Brown, 1997c: 157.

Dist. N/PFR: Negros Is. Hosts. Chiroptera.

Genus *Neoschoengastia* Ewing, 1929: 187.

*Ns. heynemanni* Nadchatram & Upham, 1966: 347.

Dist. Reported from unknown locality. Hosts. Aves

*Ns. posekanyi* Wharton and Hardcastle, 1946: 302. Reported from unknown locality. Noted by Brown 1991 as below.

Dist. MFR: Mindanao Island. N/PFR: Negros and Panay Islands. Hosts. Aves.

*Ns. riversi* Wharton & Hardcastle, 1946: 299.

Dist. MFR: Samar Is. Hosts. Aves.

*Ns. thomasi* Radford, 1946: 262. New record for the Philippines Brown 1991.

Dist. MFR: Leyte Is. Hosts. Rodentia.

Genus *Octasternala* Brown, 1990: 23.

*Oct. taphozousa* Brown, 1990: 25.

Dist. N/PFR: Negros Is. Hosts. Chiroptera.

Genus *Paraschoengastia* Vercammen-Grandjean, 1960: 469.

*Par. monticola* (Wharton and Hardcastle, 1946: 301). New record for the Philippines Brown 1991.

Dist. MFR: Mindanao Is. Hosts. Aves.

Genus *Rudnicula* (Vercammen-Grandjean, 1964: 309).

*Rud. hexasternala* Brown, 1997c: 161.

Dist. MFR. Leyte Is. Hosts. Chiroptera.

*Rud. leytensis* Brown, Goff and Nadchatram, 1988: 17.

Dist. MFR. Bohol and Leyte Islands. Hosts. Chiroptera.

Genus *Sasatrombicula* Vercammen-Grandjean, 1960: 469.

*Sas. leegoffi* Brown, 1997c: 162.

Dist. MFR: Leyte Is. N/PFR: Negros Is.. Hosts. Chiroptera.

*Sas. keechongi* Nadchatram and Mitchel, 1965: 71.

Dist. N/PFR: Negros Is. Hosts. Chiroptera.

Genus *Schoengastia* Oudemans, 1910: 86.

Note. Members of this genus are etiological agents of scrub itch in man.

*Sch. baguioensis* Brown and Goff, 1988b: 115.

Dist. LFR. Luzon Is. Hosts. Rodentia.

*Sch. crossi* Nadchatram and Wooster, 1985: 59.

Dist. LFR. Luzon Is. Hosts. Unknown. Collected on black plates.

*Sch. schuffneri* (Walch, 1922: 18).

Dist. Reported from unknown locality. Hosts. Rodentia.

*Sch. vandersandei* (Oudemans 1905: 216).

Dist. Reported from unknown locality. Hosts. Rodentia.

Genus *Schoengastiella* Hirst, 1915: 188.

*Schl. birellasetosa* Brown and Goff, 1988a: 219.

Dist. MFR. Leyte Is. Hosts. Rodentia.

*Schl. dentata* Brown and Goff, 1988a: 217.

Dist. MFR. Leyte Is. Hosts. Rodentia.

Genus *Siseca* (Womersley and Audy, 1957: 268).

*Siseca gigarara* Brown, 1997b: 171.

Dist. MFR: Camiguin Is. Hosts. Sauria.

*Siseca rara* (Womersley and Audy, 1957: 268).

Dist. MFR. Leyte and Mindanao Islands. PFR. Palawan Is.. Hosts. Artiodactyla, Rodentia, Scandentia. Sauria.

Genus *Toritrombicula* Sasa, 1954: 480.

*Tor. asa* Nadchatram, 1967. Reference not found.

Dist. PFR Culion Is. Hosts. Aves.

*Tor. densipiliata* (Walch, 1922: 564).

Dist. PFR Balback Is. Hosts. Aves.

*Tor. samara* Radford, 1953: 242. Reported from Samar Is. Noted by Brown as below.

Dist. MFR. Leyte, Mindanao and Samar Islands; PFR. Palawan Is. Hosts. Aves.

Genus *Trombicula* Berlese, 1905: 155.

Note. One specimen examined by Brown in 1990 was not identifiably to species. The genus *Trombicula* has been previously reported from the Philippines, however all species reported as *Trombicula* have subsequently been assigned to other genera. The single specimen recorded here verifies the continued presence of the genus *Trombicula*.

*Tr. sp.* Berlese 1905: 155.

Dist. MFR. Bohol Is. Hosts. Chiroptera.

Genus *Trombigastia* Vercammen-Grandjean and Brennan, 1957: 486.

Note. Vercammen-Grandjean and Brennan (1957) proposed the genus *Trombigastia*. Subsequently, Vercammen-Grandjean (1964) revised the genus *Trombigastia*, and proposed the synonymy of *Trombigastia* with *Riedlinia* Oudemans, 1914. This synonymy was not widely accepted and *Trombigastia* was retained at the generic level by Nadchatram and Dohany (1974). This status is followed here.

*Trotia. tehminae* Brown, 1997c: 162.

Dist. N/PFR. Negros Is. Hosts. Chiroptera.

Genus *Walchiella* Fuller, 1952: 95.

*Wlc. bishopae* Brown, 1998a: 110.

Dist. MFR. Mindanao Is. N/PFR: Negros Is. Hosts. Insectivora, Rodentia, Scandentia.

*Wlc. impar* (Gunther, 1939: 85). New record for the Philippines Brown 1988.

Dist. MFR. Billiran and Leyte Islands. Hosts. Rodentia.

*Wlc. lobiensis* Brown and Goff, 1988a: 219.

Dist. MFR. Cullion and Leyte Islands. PFR: Palawan Is. Hosts. Rodentia, Scandentia.

*Wlc. oudemansi* Walch, 1922: 35.

Dist. MFR. Leyte and Mindanao Islands. N/PFR: Negros Is. Hosts. Aves. Insectivora, Rodentia, Scandentia.

*Wlc. oudemansi katangladensis* Kolebinova, 1984: 42.

Dist. MFR Mindanao Is. Hosts. Insectivora, Rodentia.

*Wlc. philippinensis* Kolebinova, 1984 40.

Dist. MFR Mindanao Is. Hosts. Rodentia.

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